

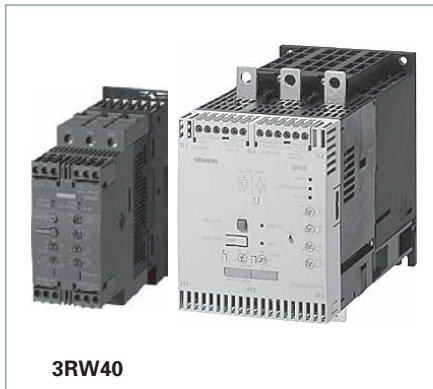
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NEMA & General Purpose Control

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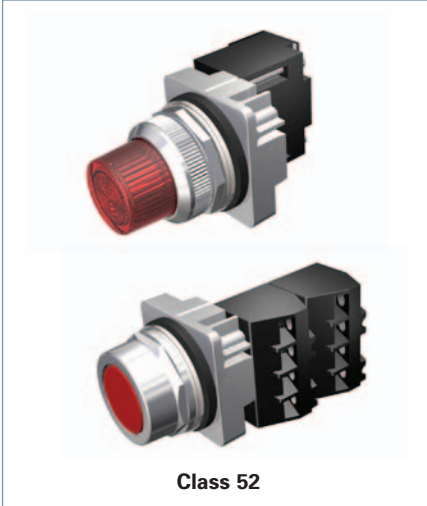
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Class 50



Class 51



Class 52

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Starters at the speed you need

Siemens NEMA starters, pump panels and lighting contactors are known for their dependability and ruggedness, and now they are delivered faster than ever before through Controls Express.

Controls Express puts our most popular products in your hands faster, because we stock more products across our entire product line. Our Class 14 NEMA starters, Class 87 pump panels, and LC & LE lighting contactors are now available in stock for immediate or next day shipping. In addition, thousands of our open and enclosed starters can now be built-to-order and shipped in 1-3 days through Controls Express.

Siemens is committed to making your job easier by stocking more products, offering more configurations, expediting factory modifications, and delivering industry leading turnaround times on our most requested control products.

To quickly identify products that are part of Controls Express and therefore available in 3 days or less, applicable catalog numbers have a light blue background. See the appropriate selection pages listed below.

Class 14 NEMA Starters see pages 17-15 & 17-17

Class 17 NEMA Combination Starters see pages 17-19 to 17-24. For quick ship versions with factory modifications see on-line at www.usa.siemens.com/controls-express

Class 18 NEMA Combination Starters see pages 17-25 & 17-27.

Class 40 NEMA Contactors see page 17-62

Class 87 Pump Panels see pages 17-80 & 17-81

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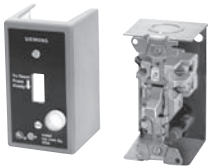
LC Lighting Contactors see page 17-93 & 17-94



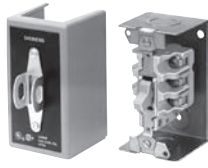
Controls Express lead times apply to orders of up to 6 units of the Class 14, Class 87, LC, or LE. Please contact customer service at 1-866-663-7324 for lead times of larger order volumes.

For more information on Controls Express and a complete list of available products, please visit our website at www.usa.siemens.com/controls-express

Control Products



Class SMF
Fractional Horsepower
Manual Starters
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Class MMS & MRS
Fractional Horsepower
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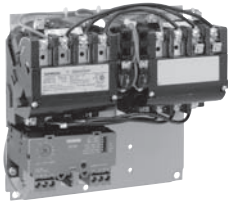
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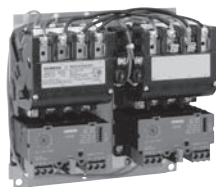
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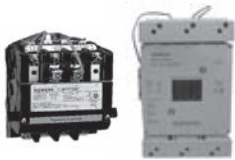
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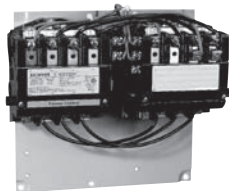
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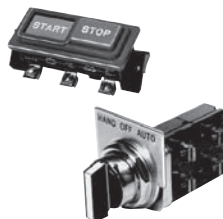
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Class SMF

Class SMF fractional horsepower starters provide overload protection as well as manual on-off control for small horsepower motors in a variety of industrial and commercial applications. Available in one or two pole versions, these devices are suitable for use with AC single phase motors up to 1 HP. Two pole starters can also be used with DC motors up to ¾ HP. Typical applications include fans, conveyors, pumps, and small machine tools.

Continuous Current Rating

16 amperes.

Overload Trip Assembly

Motor protection is provided by a Class SMFH heater element which must be installed before the starter will operate.

Two Speed Starters

Two speed manual starters are designed for control of small single phase AC motors having separate windings for high and low speed operation. Two toggle operated starters are used, with overload protection included for each motor winding. Surface mounting devices, and those with a gray flush plate, utilize a mechanical interlock which allows direct control of the motor by means of the toggle operators.

Enclosures

Class SMF, NEMA Type 1 surface mounting enclosures are sheet steel with a thermo-plastic wrap-around cover for convenience in wiring. The NEMA Type 1 enclosure is also available in an oversized version which allows more wiring space. A zinc alloy die casting is used for NEMA Type 4 enclosures.

Pilot Lights

Red or green neon pilot light units are available for flush mounting plates, NEMA Type 1 enclosures, and NEMA Type 4 enclosures. Pilot lights may be either factory or field installed. (For starters that contain a pilot light, a Red light is standard. For a Green pilot light add "G" to the end of the catalog number.)

Terminals

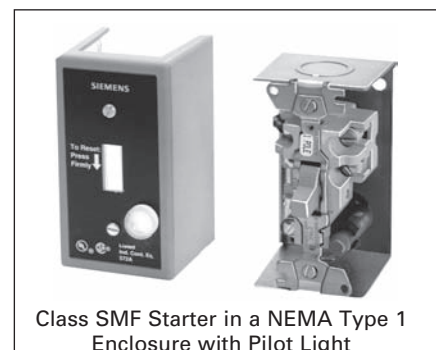
Binding head screw type terminals are suitable for #10 or smaller copper wire, and are accessible from the front. All terminals are clearly marked.

Mounting

Open types without a pilot light fit standard single gang switch boxes, and can be used with any cover plate having a standard toggle cutout. Single-unit flush mounting types, including those with pilot lights, are suitable for wall mounting in a standard switch box or for machine cavity mounting without a box.

Operation

Available with toggle handle or with removable key type operator to discourage unauthorized operation.



Class SMF Starter in a NEMA Type 1 Enclosure with Pilot Light

Emergency Off Actuator

A toggle operator extender is available for Class SMF, NEMA Type 1 surface mounted units. The extender has a red vinyl button that provides a fast and easy method for locating and switching the device's toggle operator into the OFF position. The Emergency Off Actuator is available in kit form only for field installation.

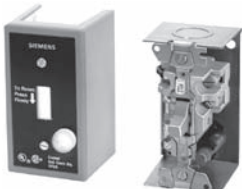
Handle Guard/Lock-Off

An optional handle guard on Class SMF, NEMA Type 1 enclosed starters prevents accidental operation of the toggle operator and also allows the toggle operator to be padlocked in either the "ON" or "OFF" position. This handle guard can be factory installed on NEMA Type 1 enclosed starters and is also available in kit form for field installation on NEMA Type 1 surface and flush mounting enclosures. Standard NEMA Type 4 metallic enclosures include provisions for padlocking the device in the OFF position.

Manual Control

Fractional HP Starters with Melting Alloy Overload, Class SMF

Selection

 <p>Class SMF Starter in a NEMA Type 1 Enclosure with Pilot Light</p>	Ordering Information			Horsepower Ratings		
	<ul style="list-style-type: none"> ▶ Heater Elements see page 17-126. ▶ Field Modification Kits see page 17-104. ▶ Dimensions see page 17-139. ▶ Wiring Diagrams see page 17-174. 			Maximum Horsepower		
	Volts	AC Single Phase		DC		
		1-Pole	2-Pole	2-Pole		
	115	1	1	¾		
230	1	2	¾			
277	1	1	—			

Starter—Class SMF, Single Phase^①

Type of Operator	No. of Poles	Starter Features ^⑤	General Purpose Flush Mounting Open Starter with Flush Plate (No Enclosure Provided)						NEMA Type 1 General Purpose Enclosure, Surface Mounting				NEMA Type 3R, 4 & 12 Watertight, Dust-tight Metallic Enclosure with Clear Cover		NEMA Type 4 Watertight, Dust-tight Metallic Enclosure		NEMA Type 3R, 7 & 9 Div 1 and Div 2 Class I Groups B, C, D & Class II Groups E, F, G Enclosures					
			Open Type		Gray Flush Plate		Standard Stainless Steel Flush Plate		Jumbo Stainless Steel Flush Plate		Standard		Oversized		Catalog Number		List Price \$		Catalog Number		List Price \$	
			Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
Toggle	1	Standard	SMFF01	—	SMFFF1	—	SMFFS1	—	—	—	SMFFG1	—	SMFFGJ1	—	SMFFWN1	—	—	—	—	—		
		Red Pilot Light	SMFF01P	—	SMFFF1P	—	SMFFS1P	—	SMFFSJ1P	—	SMFFG1P	—	SMFFGJ1P	—	SMFFWN1	—	—	—	—	—	—	
Key	2	Standard	SMFF02	—	SMFFF2	—	SMFFS2	—	—	—	SMFFG2	—	SMFFGJ2	—	SMFFWN2	—	—	—	—	—		
		Red Pilot Light	SMFF02P	—	SMFFF2P	—	SMFFS2P	—	SMFFSJ2P	—	SMFFG2P	—	SMFFGJ2P	—	SMFFWN2	—	—	—	—	—	—	
Key	1	Standard	SMFF03	—	SMFFF3	—	SMFFS3	—	—	—	SMFFG3	—	SMFFGJ3	—	SMFFWN3	—	—	—	—	—		
		Red Pilot Light	SMFF03P	—	SMFFF3P	—	SMFFS3P	—	SMFFSJ3P	—	SMFFG3P	—	SMFFGJ3P	—	SMFFWN3	—	—	—	—	—	—	
Key	2	Standard	SMFF04	—	SMFFF4	—	SMFFS4	—	—	—	SMFFG4	—	SMFFGJ4	—	SMFFWN4	—	—	—	—	—		
		Red Pilot Light	SMFF04P	—	SMFFF4P	—	SMFFS4P	—	SMFFSJ4P	—	SMFFG4P	—	SMFFGJ4P	—	SMFFWN4	—	—	—	—	—	—	

Starter With Handle Guard/Lock-Off—Class SMF, Single Phase^①

Toggle	1	Standard	—	—	④	—	④	—	④	—	SMFFG5	—	SMFFGJ5	—	—	—	SMFFW1 ^②	—	SMFFR1 ^②	—
		Red Pilot Light	—	—	④	—	④	—	④	—	SMFFG5P	—	SMFFGJ5P	—	—	—	SMFFW1P ^②	—	SMFFR1P ^②	—
		(2) ¾" NPT Outlets	—	—	④	—	④	—	④	—	—	—	—	—	—	—	SMFFW1H	—	SMFFR1H	—
		(2) ¾" NPT Outlets and Red Pilot Light	—	—	④	—	④	—	④	—	—	—	—	—	—	—	SMFFW1PH	—	SMFFR1PH	—
Key	2	Standard	—	—	④	—	④	—	④	—	SMFFG6	—	SMFFGJ6	—	—	—	SMFFW2 ^②	—	SMFFR2 ^②	—
		Red Pilot Light	—	—	④	—	④	—	④	—	SMFFG6P	—	SMFFGJ6P	—	—	—	SMFFW2P ^②	—	SMFFR2P ^②	—
		(2) ¾" NPT Outlets	—	—	④	—	④	—	④	—	—	—	—	—	—	—	SMFFW2H	—	SMFFR2H	—
		(2) ¾" NPT Outlets and Red Pilot Light	—	—	④	—	④	—	④	—	—	—	—	—	—	—	SMFFW2PH	—	SMFFR2PH	—

One Starter in Duplex Enclosure—Class SMF, Single Phase^①

Type of Operator	Number of Poles	Starter Features ^⑤	General Purpose Flush Mounting Open Starter with Flush Plate - (No Enclosure Provided)				NEMA Type 1 General Purpose Enclosure Surface Mounting		Replacement Starters	
			Gray Flush Plate For Wall or Cavity Mounting		Stainless Steel Flush Plate for Wall or Cavity Mounting		Catalog Number		List Price \$	
			Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
Toggle	2	Standard	—	—	—	—	SMFFG02	—	—	
		Red Pilot Light	—	—	—	—	SMFFG02P	—	—	
Key	2	Red Pilot Light	—	—	—	—	SMFFG04P	—	—	

Two Starters In Duplex Enclosure—Class SMF, Single Phase^①

Toggle	2 Per Starter	Standard	SMFFF222	—	—	SMFFG222	—	—
		Red Pilot Light on Each Starter	SMFFF222P	—	—	SMFFG222P	—	—
Key	2 Per Starter	Red Pilot Light on Each Starter	SMFFF44P	—	—	SMFFS44P	—	—

Starter And "Auto-Off-Hand" SPDT Selector Switch (AC Only)—Class SMF, Single Phase^①

Toggle	1	Standard	SMFFF71	—	—	SMFFG71	—	—
		Red Pilot Light	SMFFF71P	—	—	SMFFS71P	—	—
Key	2	Standard	—	—	—	SMFFG72	—	—
		Red Pilot Light	SMFFF72P	—	—	SMFFS72P	—	—
Key	2	Red Pilot Light	SMFFF74P	—	—	SMFFS74P	—	—

Two Speed Starters (AC Only)—Class SMF, Single Phase^③

Toggle	1	Mechanical Interlock	SMFFF11	—	—	SMFFG11	—	SMFF01T
		Mechanical Interlock and (2) Red Pilot Lights	SMFFF11P	—	—	SMFFG11P	—	SMFF01PT
		Mechanical Interlock, HIGH-OFF-LOW Selector Switch and (2) Red Pilot Lights	—	—	—	—	—	SMFF01PT
	2	Mechanical Interlock	SMFFF22	—	—	SMFFG22	—	—
		Mechanical Interlock and (2) Red Pilot Lights	SMFFF22P	—	—	SMFFG22P	—	SMFF02PT
		Mechanical Interlock, HIGH-OFF-LOW Selector Switch and (2) Red Pilot Lights	—	—	SMFFS202P	—	—	SMFF02PT

① One heater element required.

② Furnished with (1) ¾" NPT Outlet in bottom (reversible for top feed).

③ Two heater elements required.

④ Order Open Type starter plus separate handle guard kit.

⑤ For starters that contain a pilot light, a Red light is standard. For a Green pilot light add "G" to the end of the catalog number.

Class MMS, MRS

Class MMS and MRS motor starting switches provide manual "ON-OFF" control of single or three phase AC motors where overload protection is not required or is provided separately. Compact construction and a 600 volt rating make these switches suitable for a wide range of industrial and commercial uses. Typical applications include small machine tools, pumps, fans, conveyors and many other types of electrical machinery. They can also be used on non-motor loads such as resistance heating applications.

Continuous Current Rating

MMS & MRS: 30 amperes at 250 volts max, 26.4 amperes at 277 volts, 20 amperes at 600 volts max, 30 amperes resistive at 600 volts max.

Two Speed—Class MRS

Two speed manual switches may be used with separate winding three phase or single phase AC motors where overload protection is not required or is provided separately. Two switches are employed to give "ON-OFF" control in each speed.

Reversing—Class MRS

Reversing manual switches provide a compact means of starting, stopping and reversing AC motors where overload protection is not required or is provided separately. They are suitable for use with three phase squirrel cage motors and for single phase motors which can be reversed by reconnecting motor leads. Two switches are used, one to connect the motor forward rotation and one for reverse.

Enclosures

Class MMS, MRS, NEMA Type 1 surface mounting enclosures are sheet steel with a thermo-plastic wrap-around cover for convenience in wiring. The NEMA Type 1 enclosure is also available in an oversized version which allows more wiring space. A zinc alloy die casting is used for NEMA Type 4 enclosures.

Pilot Lights

Red or green neon pilot light units are available for flush mounting plates, NEMA Type 1 enclosures, and NEMA Type 4 enclosures. Pilot lights may be either factory or field installed. (For switches that contain a pilot light, a Red light is standard. For a Green pilot light add "G" to the end of the catalog number.)

Terminals

Binding head screw type terminals are suitable for #10 or smaller copper wire, and are accessible from the front. All terminals are clearly marked.

Mounting

Open types without a pilot light fit standard single gang switch boxes, and can be used with any cover plate having a standard toggle cutout. Single-unit flush mounting types, including those with pilot lights, are suitable for wall mounting in a standard switch box or for machine cavity mounting without a box.

Operation

Available with toggle handle or with removable key type operator to discourage unauthorized operation.



Class MMS Switch in a NEMA Type 1 Enclosure

Emergency Off Actuator

A toggle operator extender is available for Class MMS, MRS, NEMA Type 1 surface mounted units. The extender has a red vinyl button that provides a fast and easy method for locating and switching the device's toggle operator into the OFF position. The Emergency Off Actuator is available in kit form only for field installation.

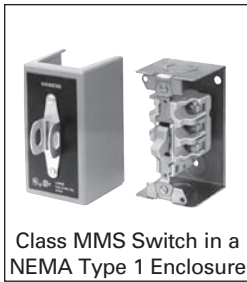
Handle Guard/Lock-Off

An optional handle guard on Class MMS, MRS, NEMA Type 1 enclosed switches prevents accidental operation of the toggle operator and also allows the toggle operator to be padlocked in either the "ON" or "OFF" position. This handle guard is available in kit form for field installation on NEMA Type 1 surface and flush mounting enclosures. Standard NEMA Type 4 metallic enclosures include provisions for padlocking the device in the OFF position.

Manual Control

Switches[®], Class MMS, MRS

Selection



Class MMS Switch in a NEMA Type 1 Enclosure

Ordering Information

- ▶ Heater Elements not Required.
- ▶ Field Modification Kits see page 17-104.
- ▶ Dimensions see page 17-139.
- ▶ Wiring Diagrams see page 17-174.

Horsepower Ratings			Maximum HP			DC Ratings		
Device	No of Poles	Motor Type AC	115V	230V	450-575V	90V	115V	230V
			Class MMS	2	Single Phase	2	2	3
	3	3-Phase	2	7 1/2	10	1	2	1 1/2
Class MRS	2	Single Phase	2	2	3	1	2	1 1/2
Reversing	3	3-Phase	2	7 1/2	10	1	2	1 1/2
Class MMS	2	Single Phase	2	2	3	1	2	1 1/2
Two Speed	3	3-Phase, Constant or Variable Torque	2	7 1/2	10	1	2	1 1/2
	3	3-Phase, Constant Horsepower	2	7 1/2	10	1	2	1 1/2

Switch—Class MMS, Single Phase and 3-Phase

Type of Operator	No of Poles	Switch Features ^④	General Purpose Flush Mounting Open Switch with Flush Plate (No Enclosure Provided)				NEMA Type 1 General Purpose Enclosure Surface Mounting				NEMA Type 3R, 4 & 12 Watertight, Dust-tight Metallic Enclosure with Clear Cover	NEMA Type 4 [®] Watertight, Dust-tight Metallic Enclosure	NEMA Type 7 & 9 [®] Class I Groups B, C & D & Class II Groups E, F, G Enclosures						
			Open Type		Gray Flush Plate	Standard Stainless Steel Flush Plate	Jumbo Stainless Steel Flush Plate	Standard		Oversized									
			Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$				Catalog Number	List Price \$				
Toggle	2	Standard	MMSK01		MMSKF1		MMSKS1		—	MMSKG1		—	MMSKWN1		MMSKW1		MMSKR1		
		Red Pilot Light 115V AC	MMSK01A ^③		MMSKF1A		MMSKS1A		—	MMSKG1A		MMSKGJ1A				MMSKW1A		—	
		Red Pilot Light 230V AC	MMSK01B ^③		MMSKF1B		MMSKS1B		MMSKSJ1B		MMSKG1B		—			MMSKW1B		—	
	3	Standard	MMSK02		MMSKF2		MMSKS2		—	MMSKG2		MMSKGJ2		MMSKWN2		MMSKW2		MMSKR2	
		Red Pilot Light 208-240V AC	MMSK02B ^③		MMSKF2B		MMSKS2B		—	MMSKG2B		MMSKGJ2B				MMSKW2B		—	
		Red Pilot Light 440-600V AC	MMSK02C ^③		—		MMSKS2C		MMSKSJ2C		MMSKG2C		MMSKGJ2C			MMSKW2C		—	
Key	2	Standard	MMSK03		MMSKF3		MMSKS3		—	MMSKG3		MMSKGJ3		MMSKWN3		—		—	
		Red Pilot Light 115V AC	—		MMSKF3A		MMSKS3A		MMSKSJ3A		MMSKG3A		MMSKGJ3A				—		—
		Red Pilot Light 230V AC	MMSK03B		MMSKF3B		MMSKS3B		MMSKSJ3B		MMSKG3B		MMSKGJ3B				—		—
	3	Standard	MMSK04		MMSKF4		MMSKS4		—	MMSKG4		MMSKGJ4		MMSKWN4		—		—	
		Red Pilot Light 208-240V AC	MMSK04B		MMSKF4B		MMSKS4B		MMSKSJ4B		MMSKG4B		MMSKGJ4B				—		—
		Red Pilot Light 440-600V AC	MMSK04C		MMSKF4C		MMSKS4C		MMSKSJ4C		MMSKG4C		MMSKGJ4C				—		—

Reversing Switch—Class MRS, Single Phase and 3-Phase

Type of Operator	Number of Poles	Suitable Motor Types	Switch Features ^④ (Including Mechanical Interlock)	General Purpose Flush Mounting Open Switch with Flush Plate (No Enclosure Provided)		NEMA Type 1 General Purpose Enclosure Surface Mounting		Replacement Switch Class MRS	
				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
Toggle	2	Single Phase 3-Lead Repulsion-Induction	Standard	MRSKF11		—		MRSK01T	
			Red Pilot Device—115V AC	MRSKF11A		—		MRSK01AT	
			Red Pilot Device—230V AC	MRSKF11B		MRSKG11B		MRSK01BT	
	3	3-Phase; Also Single Phase Capacitor, Split Phase, or 4-Lead Repulsion-Induction	Standard	MRSKF22		MRSKG22		—	
			Red Pilot Light—110-120V AC	MRSKF22A		MRSKG22A		MRSK02AT	
			Red Pilot Light—208-220V AC	MRSKF22B		—		MRSK02BT	
	Red Pilot Light—440-600V AC	MRSKF22C		MRSKG22C		MRSK02CT			

Two Speed Switch—Class MMS, Single Phase and 3-Phase

Type of Operator	Number of Poles	Suitable Motor Types	Switch Features ^④ (Including Mechanical Interlock)	General Purpose Flush Mounting Open Switch with Flush Plate (No Enclosure Provided)		NEMA Type 1 General Purpose Enclosure Surface Mounting		Replacement Switch Class MRS	
				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
Toggle	2	Single Phase Two Winding (3-Lead)	Standard	MMSKF11		MMSKG11		MRSK01T	
			(2) Red Pilot Devices—115V AC	MMSKF11A		MMSKG11A		MRSK01AT	
			(2) Red Pilot Devices—230V AC	MMSKF11B		MMSKG11B		MRSK01BT	
	3	3-Phase Separate Winding (Wye-Connected)	Standard	MMSKF22		MMSKG22		MRSK02T	
			(2) Red Pilot Lights—208-240V AC	MMSKF22B		MMSKG22B		MRSK02BT	
			(2) Red Pilot Lights—440-600V AC	MMSKF22C		MMSKG22C		MRSK02CT	

① Manual switches do not include overloads.

② Furnished with (1) 3/4" NPT outlet in bottom (reversible for top feed). In order to obtain a 3/4" NPT outlet in top and bottom, add suffix letter "H" to type number with List Price adder.

③ Do not use as replacement interiors for NEMA Type 4 metallic enclosures. For replacement unit, order Type MMSK01 or MMSK02 and separate pilot light kit.

④ For switches that contain a pilot light, a Red light is standard. For a Green pilot light add "G" to the end of the catalog number.

Now Available with the New 3RV2 Innovations MSP

Class 11 - 3RV

Class 11 across the line manual starters and switches provide control for machinery where remote start stop control is not required.

Class 11 - 3RV manual starters are used for single and poly-phase motors up to 20HP @ 575V. Starters have bimetallic heater elements to provide class 10 overcurrent protection. Each starter has a fourth bimetallic strip that reacts only to the ambient temperature inside the control panel. This ambient compensation helps prevent the starter from nuisance tripping when the panel temperature is higher than the ambient temperature of the motor.

A built-in differential trip bar causes the starter to trip faster on a phase loss condition to help reduce motor damage.

Magnetic trip elements in each starter take the device off line when it senses current of 13 times the maximum FLA dial setting.

Class 11 - 3RV switches provide control for inherently protected motors. Typical applications include metal and woodworking machinery, grinders, power saws, conveyors, fans, pumps, blowers, textile and packaging machinery, and paper cutters.

Each switch is provided with magnetic trip elements which take the device off line when it senses current of 13 times the maximum switch rating.

Class 11 - 3RV manual starters can be used as Type E self-protected manual combination starters (up to 22 amps) per UL508 or as components in Group Installation per NEC 430.53. When using the Class 11 - 3RV as a manual combination starter upstream protection is not required.

Class 11 - 3RV controllers are available with low voltage protection which will automatically open the power poles when the voltage drops or the power is interrupted.

Controllers with the LVP option provide the OSHA requirements for protecting personnel from potential injury caused by the automatic start-up of machinery following a voltage drop or power interruption when low voltage protection is specified.

Class 11 - 3RV is available as Open style, or in NEMA 1, NEMA 7 & 9 or NEMA 7 & 9 / 3 & 4 enclosures.

Standard Features include:

- ON/OFF rotary handle with lockout and visible trip indication
- Adjustment dial for setting to motor FLA (Starters only)
- Low Voltage Protection (LVP) Option
- Short Circuit trip at 13 times the maximum setting of the FLA dial or rated current
- Ambient compensated up to 140°F
- Phase loss sensitivity
- Test trip function
- LVP Option Meets OSHA Requirements
- UL Listed
- CSA Certified



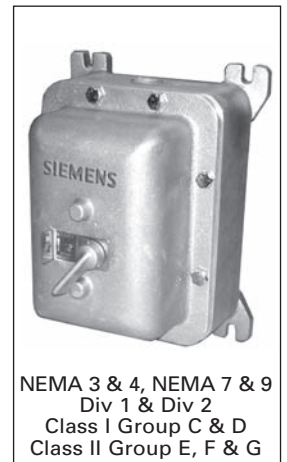
OPEN TYPE Starter



NEMA 1 General Purpose



NEMA 7 & 9 Div 1 & Div 2 Class I Group C & D Class II Group E, F & G




NEMA 3 & 4, NEMA 7 & 9 Div 1 & Div 2 Class I Group C & D Class II Group E, F & G

Manual Control

Starters and Switches, Class 11 - 3RV

Selection

 <p>Class 11 Manual Motor Starter</p>	Ordering Information <ul style="list-style-type: none"> ▶ No heaters required. ▶ Field Modification Kits see page 17-104. ▶ Dimensions see page 17-141. ▶ Wiring Diagrams see page 17-174. ▶ For applications requiring a low voltage protection coil see table at right. 	Low Voltage Protection Coil Table <table border="1"> <thead> <tr> <th>60 Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr> <td>120V</td> <td>*F</td> </tr> <tr> <td>208V</td> <td>*D</td> </tr> <tr> <td>240V</td> <td>*G</td> </tr> <tr> <td>460V</td> <td>*H</td> </tr> </tbody> </table> <p>*Add corresponding letter to end of base Class 11 catalog number for low voltage protection coil with List Price adder.</p> <p>Note: The LVP option for Open type 3RV is available from the factory, please order separately from the field modification kits on page 17-105.</p> <p>The coil voltage should correspond with the line voltage.</p>	60 Hz Voltage	Letter	120V	*F	208V	*D	240V	*G	460V	*H
	60 Hz Voltage	Letter										
120V	*F											
208V	*D											
240V	*G											
460V	*H											

Manual Starter—Class 11 - 3RV

FLA Adjustment Range ^①	Max HP						Enclosure							
	Single Phase		3-Phase				Open Type		NEMA 1		NEMA 7 & 9		NEMA 3 & 4, NEMA 7 & 9	
	HP Ratings		HP Ratings				Catalog No.		General Purpose		Class I Groups C & D Class II Groups E, F & G		Watertight Class I Groups C & D Class II Groups E, F & G	
	115V	230V	200V	230V	460V	575V	Catalog No.	List Price \$	Catalog No.	List Price \$	Catalog No.	List Price \$	Catalog No.	List Price \$
0.11-0.16	—	—	—	—	—	—	3RV2011-0AA10 ^②		11AD3B		11AD3H		11AD3W	
0.14-0.2	—	—	—	—	—	—	3RV2011-0BA10 ^②		11BD3B		11BD3H		11BD3W	
0.18-0.25	—	—	—	—	—	—	3RV2011-0CA10 ^②		11CD3B		11CD3H		11CD3W	
0.22-0.32	—	—	—	—	—	—	3RV2011-0DA10 ^②		11DD3B		11DD3H		11DD3W	
0.28-0.4	—	—	—	—	—	—	3RV2011-0EA10 ^②		11ED3B		11ED3H		11ED3W	
0.35-0.5	—	—	—	—	—	—	3RV2011-0FA10 ^②		11FD3B		11FD3H		11FD3W	
0.45-0.63	—	—	—	—	—	—	3RV2021-0GA10 ^②		11GD3B		11GD3H		11GD3W	
0.55-0.8	—	—	—	—	—	½	3RV2021-0HA10 ^②		11HD3B		11HD3H		11HD3W	
0.7-1	—	—	—	—	½	½	3RV2021-0JA10 ^②		11JD3B		11JD3H		11JD3W	
0.9-1.25	—	—	—	—	¾	¾	3RV2021-0KA10 ^②		11KD3B		11KD3H		11KD3W	
1.1-1.6	—	¼	—	—	¾	1	3RV2021-1AA10 ^②		11LD3B		11LD3H		11LD3W	
1.4-2	—	½	—	—	1	1 ½	3RV2021-1BA10 ^②		11MD3B		11MD3H		11MD3W	
1.8-2.5	—	¾	½	½	1 ½	1 ½	3RV2021-1CA10 ^②		11ND3B		11ND3H		11ND3W	
2.2-3.2	¼	¾	¾	¾	1 ½	2	3RV2021-1DA10 ^②		11PD3B		11PD3H		11PD3W	
2.8-4	½	1	¾	1	2	3	3RV2021-1EA10 ^②		11QD3B		11QD3H		11QD3W	
3.5-5	¾	1 ½	1	1	3	3	3RV2021-1FA10 ^②		11RD3B		11RD3H		11RD3W	
4.5-6.3	1	2	1 ½	1 ½	5	5	3RV2021-1GA10 ^②		11SD3B		11SD3H		11SD3W	
5.5-8	1 ½	3	2	2	5	5	3RV2021-1HA10 ^②		11TD3B		11TD3H		11TD3W	
7-10	2	4	3	3	7 ½	10	3RV2021-1JA10 ^②		11UD3B		11UD3H		11UD3W	
9-12.5	2 ½	5	3	3	7 ½	10	3RV2021-1KA10 ^②		11VD3B		11VD3H		11VD3W	
11-16	3	6	5	5	10	15 ^③	3RV2021-4AA10 ^②		11WD3B		11WD3H		11WD3W	
14-20	4	8	5	7 ½	15	20 ^③	3RV2021-4BA10 ^②		11XD3B		11XD3H		11XD3W	
17-22	5	10	7 ½	7 ½	15	20 ^③	3RV2021-4CA10 ^②		11YD3B		11YD3H		11YD3W	
20-25	6	12	7 ½	7 ½	15	20 ^③	3RV2021-4DA10 ^②		11ZD3B		11ZD3H		11ZD3W	

Manual Switch—Class 11 - 3RV

Rated Current ^①	Max HP						Enclosure							
	Single Phase		3-Phase				Open Type		NEMA 1		NEMA 7 & 9		NEMA 3 & 4, NEMA 7 & 9	
	HP Ratings		HP Ratings				Catalog No.		General Purpose		Class I Groups C & D Class II Groups E, F & G		Watertight Class I Groups C & D Class II Groups E, F & G	
	115V	230V	200V	230V	460V	575V	Catalog No.	List Price \$	Catalog No.	List Price \$	Catalog No.	List Price \$	Catalog No.	List Price \$
1	—	—	—	—	½ ^③	½ ^③	3RV2321-0JC10 ^②		111D3B		111D3H		111D3W	
5	½ ^③	1 ^③	1 ^③	1 ^③	3 ^③	3 ^③	3RV2321-1FC10 ^②		112D3B		112D3H		112D3W	
10	1 ^③	2 ^③	3 ^③	3 ^③	7 ½ ^③	10 ^③	3RV2321-1JC10 ^②		113D3B		113D3H		113D3W	
20	2 ^③	4 ^③	5 ^③	7 ½ ^③	15 ^③	20 ^③	3RV2321-4BC10 ^②		114D3B		114D3H		114D3W	
25	2 ½ ^③	5 ^③	7 ½ ^③	7 ½ ^③	15 ^③	20 ^③	3RV2321-4DC10 ^②		115D3B		115D3H		115D3W	

① Instantaneous Magnetic Trip will occur at 13 times the maximum FLA dial setting or rated switch current.
② Product Category: IEC

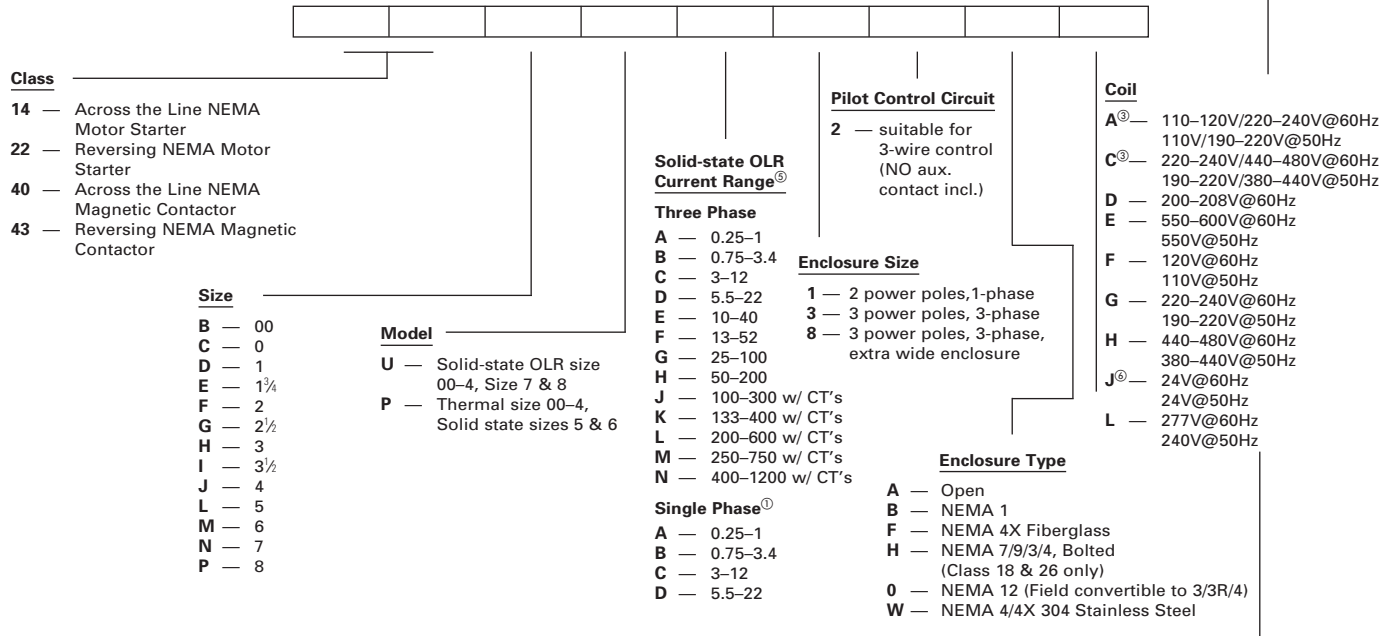
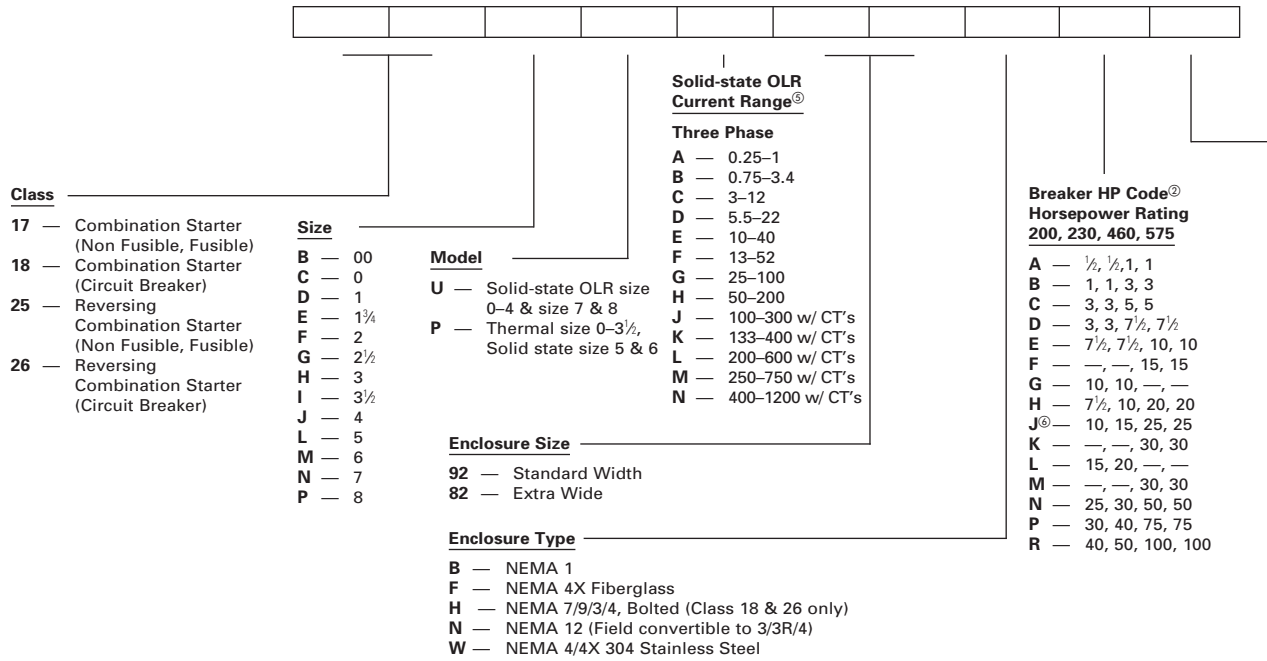
③ Shaded Ratings apply for Manual Motor Controllers Only! These Ratings do not apply as UL Listed Manual Combination Starters.

④ Add 1 to the end of the catalog number for 1/2 inch drain hole with plug and list price adder. Drain fitting not supplied, order separately XDB-2.

Heavy Duty Control

Catalog Numbering System

General



Class	Size	Model	Solid-state OLR Current Range ^②	Type	Line Volts	Enclosure Type	Coil	Disconnect Type ^③
36 — Non Combination Reduced Voltage Starter	C — 0	U — Solid-state OLR size 0-4 & size 7 & 8 P — Thermal size 0-3½, Solid state size 5 & 6	A — 0.25-1 B — 0.75-3.4 C — 3-12 D — 5.5-22	T — Auto XFMR	2 — 230	A — Open	D	D — Non Fused Disc.
	D — 1			P — Part Wind.	3 — 380	B — NEMA 1	E	F — Fusible Disc.
	E — 1½			O — Wye Delta Open Trans.	4 — 460	W — NEMA 4/4X Stainless Steel	F	P — MCP
	F — 2			C — Wye Delta Closed Trans.	5 — 575	0 — NEMA 12	G	
	G — 2½				6 — 200/208		H	
37 — Combination Reduced Voltage Starter	H — 3						L	
	I — 3½							
	J — 4							
	L — 5							
	M — 6							
N — 7								
P — 8								

① Single phase solid-state OLR available on Class 14 Starters only.

② Not used on Class 17, 25 or with solid-state OLR versions.

③ Not available on sizes 5-8.

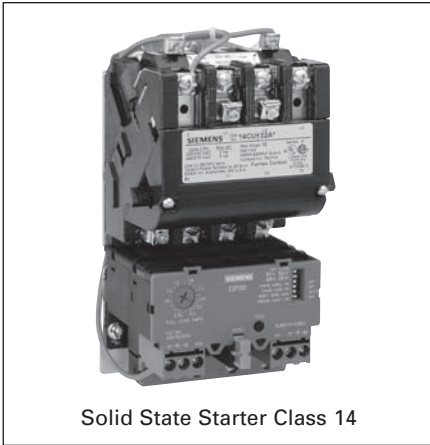
④ For Class 37 only.

⑤ Position used for solid-state OLR only.

⑥ Not available on sizes 7 and 8.

NEMA & General Purpose Control

CONTROL PRODUCTS 17



Solid State Starter Class 14

Standard Features

Size 00–4 magnetic starters include the following standard features:

- Rugged Industrial Design
- Half Sizes for Cost and Space Savings
- Dual Voltage, Dual Frequency Coils
- Solid State or Ambient Compensated Bimetal Overload Protection
- Wide Range of Accessories
- Easy Coil Access
- Overload Test Feature
- Straight Thru Wiring
- Gravity Dropout
- Large Silver Cadmium Contacts
- UL listed file #E14900 (class 14, 22, 30, 40 & 43)
- CSA certified file #LR 6535 (class 14, 22, 30, 40 & 43)

Application

Heavy Duty starters are designed for across the line starting of single phase and polyphase motors.

These controls are available in NEMA Sizes 00 through 8. In addition to the usual NEMA Starter Sizes, Siemens offers three exclusive Half Sizes; 1¾, 2½ and 3½. These integral sizes offer the same rugged, industrial construction as our NEMA Sizes and ensure efficient operating performance. Half Sizes provide a real cost savings by cutting down on over capacity when NEMA Sizes exceed the motor ratings. All Siemens Heavy Duty controls, including our popular Half Sizes comply with applicable NEMA and UL tests.

All starters are supplied with a NO holding interlock that in conjunction with an appropriate pilot device will provide low voltage protection or release.

NEMA starters are ideal for applications requiring dependability and durability. Typical applications include use with machine tools, air conditioning equipment, material handling equipment, compressors, hoists and various production and industrial equipment as well as in demanding automotive applications.

Starters are available as an open type or in NEMA 1, 12/3/3R, 4 (painted), 4/4X (stainless), 4X (fiberglass), and 7 & 9 enclosures.

Gravity Dropout

For added reliability, the gravity dropout of the armature and contacts is assisted by stainless steel springs which help provide quick, precise opening of the contacts.

45 Degree, Wedge Action Contacts

The 45 degree, wedge action contacts reduce tracking and provide faster arc quenching. The resulting self-cleaning and reduced contact bounce mean cooler operation and longer life for the large silver cadmium oxide contacts.

Terminal Design

Control terminals are self-rising pressure type.

Molded Coil

Magnetic coils are carefully wound and then sealed in epoxy. Encapsulation helps seal out moisture, promotes heat transfer and resists electrical, mechanical and thermal stresses.

Dual Voltage/Frequency Coil

Starters are available with dual voltage, dual frequency coils. They are designed to operate on either 50 or 60 Hertz.

Molded Stationary Contact Block

Thermoset materials resist arc tracking and the stresses of heat and severe impact.

Field Modification Kits

All starters can be modified in the field with a complete range of accessories. These include pushbuttons, selector switches, pilot lights, auxiliary contacts and surge suppressors.

Auxiliary Equipment

- NEMA starters are available with built-in START-STOP push buttons for 3-wire control or a HAND-OFF-AUTO selector switch for 2-wire control
- Field modifications such as auxiliary contacts, pilot lights, push buttons, selector switches, and fuse blocks are available to meet particular application requirements
- Normally opened or normally closed auxiliary power pole kits are available for Sizes 00 through 1¾
- Transformers can be ordered as either factory or field modifications. In some cases these may require a larger enclosure
- A full line of replacement parts are available including contact kits, coils, and overload relays

Size 5 & 6 Starters Additional Features

- Solid State Overload (3RB type) Standard
- Latest technology in arc quenching to extend contactor life
- Wide variety of enclosures in all starter configurations

Size 7 & 8 Starters Additional Features

- New Compact Design
- Can be mounted in any position
- Same coil voltage is AC or DC

Heavy Duty Starters

Features and Benefits

Selection



ESP200™ Solid State Starter

ESP200™ starters combine the rugged NEMA contactors with a state of the art solid state overload that provides phase loss, phase unbalance ground fault protection. It offers the user greater motor protection and extended life in heavy duty applications. The ESP200™ ultimately results in a cost savings to the user.

ESP200™ Solid State Overload Relays

Standard features provide Improved Starter Performance:

- True phase loss protection; trips within 3 seconds
- Phase unbalanced prevents motor running inefficiently
- Ground fault trip when selected
- Selectable trip class 5, 10, 20 or 30
- Reset trip can be selected Auto/Manual restart
- Easy to select and use, Dip Switch selectable
- Overload is self powered, no need for external power source

Half Size Starters

Half-Size starters feature all the rugged performance characteristics of our NEMA rated starter sizes, but are fractionally sized to more closely match your exact motor rating. As a result, significant economic savings are made possible without sacrificing the reliability you expect from a heavy duty starter.

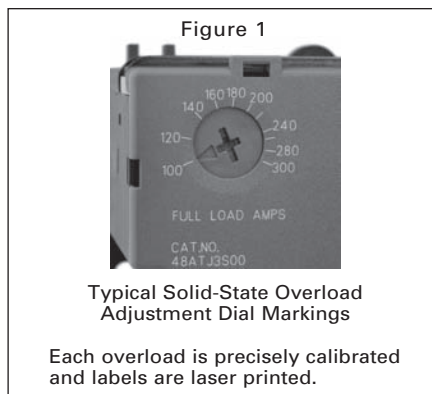
These additional starter sizes have the reserve capacity to handle occasional plugging and jogging applications without derating. Superior operating performance in heavy duty applications is assured by the large current carrying parts, not by derating the device.

Exclusive “half-sizes” save potentially hundreds, even thousands of dollars per project.

Using the table below, simply match the specific size starter to the horsepower rating of your motor. Every half-size starter saves you money—up to 31%.

All “half-sizes” comply to applicable NEMA and UL standards.

ESP200® FLA Adjustment Dial—Set the adjustment dial on the overload to the FLA of the motor.



Typical Solid-State Overload Adjustment Dial Markings

Each overload is precisely calibrated and labels are laser printed.



DIP Switch Settings

Adjust DIP switch settings to the Trip Class desired 5, 10, 20, or 30.

- Set Phase Unbalance ON or OFF
- Set Phase Loss ON or OFF
- Set Reset to Manual or Automatic
- Set Ground Fault ON or OFF

Savings for Siemens “Half-Size” Starters in NEMA 1 Enclosures, FVNR

Motor Size		Starter Size	Half Size	List Price \$	“Half-Size” Savings Over Next Full Size
230V	460V				
7½	10	1	—		—
10	15	—	1¾		31%
15	25	2	—		—
20	30	—	2½		20%
30	50	3	—		—
40	75	—	3½		13%
50	100	4	—		—

Standard Auxiliary Contacts			
Type	Size (3rd Character)	Configuration	Internal / External
All FVNR Starters & Contactors	B Thru E	1N.O.	Internal
	F Thru J	1N.O.	External
	L Thru M	2N.O., 2N.C.	External
	N Thru P	1N.O., 1N.C.	External

Heavy Duty Motor Starters

Solid State Overload with Auto/Manual Reset, Class 14

Selection



Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Field Modification Kits see page 17-106.
- ▶ Factory Modifications see page 17-121.
- ▶ Dimensions see pages 17-142 open and 17-159 enclosed.
- ▶ Wiring Diagrams see page 17-175.
- ▶ Replacement Parts see page 17-133.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110-120/220-240 [Ⓓ]	A
200-208	D
220-240	G
277	L
220-240/440-480 [Ⓓ]	C
440-480	H
575-600	E

For other voltages and frequencies, see Factory Modifications page 17-121.

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp					Overload		Enclosure												
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Open Type Standard Auxiliary Contacts [Ⓓ]		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant Ⓔ = W for 304 Stainless Steel Ⓕ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 NEMA 3/3R Industrial Use Weatherproof	
200	230	460	575	Size	Size	Range	Size	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/8	1/8	1/8	1/8	00	—	0.25-1	A	14BUA32A*		14BUA32B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1/8	1/8	1/8	1/8	00	—	0.75-3.4	A	14BUB32A*		14BUB32B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1/8	1/8	1/8	1/8	00	—	3-12	A1	14BUC32A*		14BUC32B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1/8	1/8	1/8	1/8	0	—	0.25-1	A	14CUA32A*		14CUA32B*		14CUB32@*		14CUB32F*		14CUB32H*		14CUB32@*	
1/8	1/8	1/8	1/8	0	—	0.75-3.4	A	14CUB32A*		14CUB32B*		14CUB32@*		14CUB32F*		14CUB32H*		14CUB32@*	
2	2	5	5	0	—	3-12	A1	14CUC32A*		14CUC32B*		14CUC32@*		14CUC32F*		14CUC32H*		14CUC32@*	
3	3	—	—	0	—	5.5-22	A1	14CUD32A*		14CUD32B*		14CUD32@*		14CUD32F*		14CUD32H*		14CUD32@*	
1/8	1/8	1/8	1/8	1	—	0.25-1	A	14DUA32A*		14DUA32B*		14DUB32@*		14DUB32F*		14DUB32H*		14DUB32@*	
1/8	1/8	1/8	1/8	1	—	0.75-3.4	A	14DUB32A*		14DUB32B*		14DUB32@*		14DUB32F*		14DUB32H*		14DUB32@*	
2	2	5	5	1	—	3-12	A1	14DUC32A*		14DUC32B*		14DUC32@*		14DUC32F*		14DUC32H*		14DUC32@*	
3	3	10	10	1	—	5.5-22	A1	14DUD32A*		14DUD32B*		14DUD32@*		14DUD32F*		14DUD32H*		14DUD32@*	
7 1/2	7 1/2	—	—	1	—	10-40	A1	14DUE32A*		14DUE32B*		14DUE32@*		14DUE32F*		14DUE32H*		14DUE32@*	
10	10	15	15	—	1 1/2	10-40	A1	14EUE32A*		14EUE32B*		14EUE32@*		14EUE32F*		14EUE32H*		14EUE32@*	
10	15	25	25	2	—	13-52	B	14FUF32A*		14FUF32B*		14FUF32@*		14FUF32F*		14FUF32H*		14FUF32@*	
15	20	30	30	—	2 1/2	25-100	B	14GUG32A*		14GUG32B*		14GUG32@*		14GUG32F*		14GUG32H*		14GUG32@*	
25	30	50	50	3	—	25-100	B	14HUG32A*		14HUG32B*		14HUG32@*		14HUG32F*		14HUG32H*		14HUG32@*	
30	40	75	75	—	3 1/2	50-200	B	14IUH32A*		14IUH32B*		14IUH32@*		14IUH32F*		14IUH32H*		14IUH32@*	
40	50	100	100	4	—	50-200	B	14JUH32A*		14JUH32B*		14JUH32@*		14JUH32F*		14JUH32H*		14JUH32@*	
75	100	200	200	5	—	55-250	—	14LPU32A*		14LPU32B*		14LPU32@*		—		14LPU32H*		14LPU32@*	
150	200	400	400	6	—	160-630	—	14MPX32A*		14MPX32B*		14MPX32@*		—		—		14MPX32@*	
—	300	600	600	7* [Ⓔ]	—	400-1220	A1+CT	14NUN32A*		14NUN32B*		14NUN32@*		—		—		14NUN32@*	
—	450	900	900	8 [Ⓕ]	—	400-1220	A1+CT	14PUN32A*		14PUN32B*		14PUN32@*		—		—		14PUN32@*	

Open Type & Standard Width Enclosure, Single Phase, 2-Pole^{ⒹⒺ}

Max Hp			Overload		Enclosure											
115 Volts	208/230 Volts	NEMA Size	Amp Range	Frame Size	Open Type Standard Auxiliary Contacts [Ⓓ]		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant Ⓔ = W for 304 Stainless Steel Ⓕ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 NEMA 3/3R Industrial Use Weatherproof	
115	208/230	Size	Range	Size	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/8	1/8	0	0.75-3.4	A	14CUB12A*		14CUB12B*		14CUB12@*		14CUB12F*		14CUB12H*		14CUB12@*	
1/8	1/8	0	3-12	A1	14CUC12A*		14CUC12B*		14CUC12@*		14CUC12F*		14CUC12H*		14CUC12@*	
1	1	0	5.5-22	A1	14CUD12A*		14CUD12B*		14CUD12@*		14CUD12F*		14CUD12H*		14CUD12@*	
1/8	1/8	1	0.75-3.4	A	14DUB12A*		14DUB12B*		14DUB12@*		14DUB12F*		14DUB12H*		14DUB12@*	
1/8	1/8	1	3-12	A1	14DUC12A*		14DUC12B*		14DUC12@*		14DUC12F*		14DUC12H*		14DUC12@*	
1	2	1	5.5-22	A1	14DUD12A*		14DUD12B*		14DUD12@*		14DUD12F*		14DUD12H*		14DUD12@*	
3	7 1/2	2	25-100	B	14FUG12A*		14FUG12B*		14FUG12@*		14FUG12F*		14FUG12H*		14FUG12@*	
7 1/2	15	3	25-100	B	14HUG12A*		14HUG12B*		14HUG12@*		14HUG12F*		14HUG12H*		14HUG12@*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Ⓓ Dual voltage coils not available in size 5-8 starters.

Ⓔ Coils D, F, or G will be wired for incoming voltage. J coil will be wired for separate source. Coils E, H, and L do not apply to single phase starters.

Ⓕ Enclosure is NEMA Type 4 (painted steel).

Ⓖ F coil 100-250V AC 50/60Hz, or DC,

H coil 150-500V AC 50/60Hz, or DC


Ⓗ Only available F coil 100-250V AC 50/60Hz, or DC

Ⓖ To receive a single phase starter in an extra wide enclosure order an enclosure kit from pg 17-115 and the open style starter from pg 17-15 or 17-17 as separate items.

Heavy Duty Motor Starters

Solid State Overload with Auto/Manual Reset, Class 14

Selection

 <p>NEMA 1</p>	Ordering Information <ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-159. ▶ Wiring Diagrams see page 17-175. ▶ Replacement Parts see page 17-133. 	Coil Table <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 17-121.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
24	J																					
120	F																					
110–120/220–240	A																					
200–208	D																					
220–240	G																					
277	L																					
220–240/440–480	C																					
440–480	H																					
575–600	E																					

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Overload		Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 7 & 9 NEMA 3 & 4 Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 NEMA 3/3R Industrial Use Weatherproof	
200	230	460	575					Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1/2	1/2	00	—	0.25–1	A	14BUA82B*		Use Size 0	—	Use Size 0	—	Use Size 0	—
1/2	3/4	1 1/2	2	00	—	0.75–3.4	A	14BUB82B*		Use Size 0	—	Use Size 0	—	Use Size 0	—
1 1/2	1 1/2	2	—	00	—	3–12	A1	14BUC82B*		Use Size 0	—	Use Size 0	—	Use Size 0	—
1/2	3/4	1 1/2	2	0	—	0.25–1	A	14CUA82B*		14CUA82@*		14CUA82H*		14CUA820*	
1/2	3/4	1 1/2	2	0	—	0.75–3.4	A	14CUB82B*		14CUB82@*		14CUB82H*		14CUB820*	
2	2	5	5	0	—	3–12	A1	14CUC82B*		14CUC82@*		14CUC82H*		14CUC820*	
3	3	—	—	0	—	5.5–22	A1	14CUD82B*		14CUD82@*		14CUD82H*		14CUD820*	
1/2	3/4	1 1/2	2	1	—	0.25–1	A	14DUA82B*		14DUA82@*		14DUA82H*		14DUA820*	
1/2	3/4	1 1/2	2	1	—	0.75–3.4	A	14DUB82B*		14DUB82@*		14DUB82H*		14DUB820*	
2	2	5	5	1	—	3–12	A1	14DUC82B*		14DUC82@*		14DUC82H*		14DUC820*	
3	3	10	10	1	—	5.5–22	A1	14DUD82B*		14DUD82@*		14DUD82H*		14DUD820*	
7 1/2	7 1/2	—	—	1	—	10–40	A1	14DUE82B*		14DUE82@*		14DUE82H*		14DUE820*	
10	10	15	15	—	1 1/2	10–40	A1	14EUE82B*		14EUE82@*		14EUE82H*		14EUE820*	
10	15	25	25	2	—	13–52	B	14FUF82B*		14FUF82@*		14FUF82H*		14FUF820*	
15	20	30	30	—	2 1/2	25–100	B	14GUG82B*		14GUG82@*		14GUG82H*		14GUG820*	
25	30	50	50	3	—	25–100	B	14HUG82B*		14HUG82@*		14HUG82H*		14HUG820*	
30	40	75	75	—	3 1/2	50–200	B	14IUH82B*		14IUH82@*		14IUH82H*		14IUH820*	

NEMA & General Purpose Control

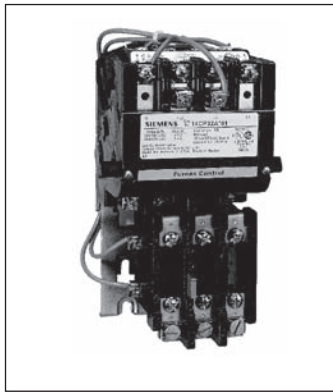
CONTROL PRODUCTS 17

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Heavy Duty Motor Starters

Ambient Compensated Bimetal Overload with Manual and Auto Reset, Class 14

Selection



Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Heater elements see page 17-126. Single phase starters require 1 heater element. 3-phase starters require 3 heater elements.
- ▶ Field Modification Kits page 17-106.
- ▶ Factory Modifications page 17-121.
- ▶ Dimensions see page 17-142 open and 17-159 enclosed.
- ▶ Wiring Diagrams see page 17-175.
- ▶ Replacement Parts see page 17-133.
- ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240	A
200–208	D
220–240	G
277	L
220–240/440–480	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-121.

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				Contactor Amp Rating	NEMA Size	Half Size	Enclosure											
200 Volts	230 Volts	460 Volts	575 Volts				Open Type Standard Auxiliary Contacts ^③		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 NEMA 3/3R Industrial Use Weatherproof	
							Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$
1½	1½	2	2	9	00	—	14BP32A*81	14BP32B*81	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—		
3	3	5	5	18	0	—	14CP32A*81	14CP32B*81	14CP32@*81	—	14CP32F*81	—	14CP32H*81	—	14CP320*81	—		
7½	7½	10	10	27	1	—	14DP32A*81	14DP32B*81	14DP32@*81	—	14DP32F*81	—	14DP32H*81	—	14DP320*81	—		
10	10	15	15	40	—	1¾	14EP32A*81	14EP32B*81	14EP32@*81	—	14EP32F*81	—	14EP32H*81	—	14EP320*81	—		
10	15	25	25	45	2	—	14FP32A*81	14FP32B*81	14FP32@*81	—	14FP32F*81	—	14FP32H*81	—	14FP320*81	—		
15	20	30	30	60	—	2½	14GP32A*81	14GP32B*81	14GP32@*81	—	14GP32F*81	—	14GP32H*81	—	14GP320*81	—		
25	30	50	50	90	3	—	14HP32A*81	14HP32B*81	14HP32@*81	—	14HP32F*81	—	14HP32H*81	—	14HP320*81	—		
30	40	75	75	115	—	3½	14IP32A*81	14IP32B*81	14IP32@*81	—	14IP32F*81	—	14IP32H*81	—	14IP320*81	—		
40	50	100	100	135	4	—	14JG32A*81	14JG32B*81	14JG32@*81	—	14JG32F*81	—	14JG32H*81	—	14JG320*81	—		

Open Type & Standard Width Enclosure, Single Phase, 2-Pole^{①②}

Max Hp				Contactor Amp Rating	NEMA Size	Half Size	Enclosure											
115 Volts	208/230 Volts	208/230 Volts	9				Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant Class II Groups E, F & G Class III		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Bolted Enclosures		NEMA 12 NEMA 3/3R Industrial Use Weatherproof	
							Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$
½	1	9	00	—	14BP12A*81	14BP12B*81	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—		
1	2	18	0	—	14CP12A*81	14CP12B*81	14CP12@*81	—	14CP12F*81	—	14CP12H*81	—	14CP120*81	—	14CP120*81	—		
2	3	27	1	—	14DP12A*81	14DP12B*81	14DP12@*81	—	14DP12F*81	—	14DP12H*81	—	14DP120*81	—	14DP120*81	—		
3	5	35	1P	—	14EP12A*81	14EP12B*81	14EP12@*81	—	14EP12F*81	—	14EP12H*81	—	14EP120*81	—	14EP120*81	—		
3	7½	45	2	—	14FP12A*81	14FP12B*81	14FP12@*81	—	14FP12F*81	—	14FP12H*81	—	14FP120*81	—	14FP120*81	—		
5	10	60	—	2½	14GP12A*81	14GP12B*81	14GP12@*81	—	14GP12F*81	—	14GP12H*81	—	14GP120*81	—	14GP120*81	—		

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				Contactor Amp Rating	NEMA Size	Half Size	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 7 & 9. NEMA 3 & 4 Div 1 and Div 2 Class II Groups E, F & G Bolted Enclosures		NEMA 12. NEMA 3/3R Industrial Use Weatherproof Class III	
							Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$
1½	1½	2	2	9	00	—	14BP82B*81	Use Size 0	—	Use Size 0	—	Use Size 0	—	
3	3	5	5	18	0	—	14CP82B*81	14CP82@*81	—	14CP82H*81	—	14CP820*81	—	
7½	7½	10	10	27	1	—	14DP82B*81	14DP82@*81	—	14DP82H*81	—	14DP820*81	—	
10	10	15	15	40	—	1¾	14EP82B*81	14EP82@*81	—	14EP82H*81	—	14EP820*81	—	
10	15	25	25	45	2	—	14FP82B*81	14FP82@*81	—	14FP82H*81	—	14FP820*81	—	
15	20	30	30	60	—	2½	14GP82B*81	14GP82@*81	—	14GP82H*81	—	14GP820*81	—	
25	30	50	50	90	3	—	14HP82B*81	14HP82@*81	—	14HP82H*81	—	14HP820*81	—	
30	40	75	75	115	—	3½	14IP82B*81	14IP82@*81	—	14IP82H*81	—	14IP820*81	—	

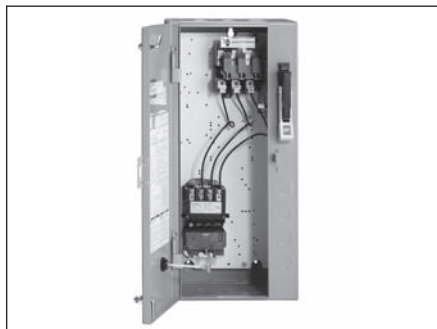
Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All Starter Sizes carry one maximum Hp rating. For higher Hp single phase motors, use 3-phase starters, wire and set per diagram on page 17-175.

- ① To receive a single phase starter in an extra wide enclosure order an enclosure kit from pg 17-115 and the open style starter from pg 17-15 or 17-17 as separate items.
- ② Coils D, F, or G will be wired for incoming voltage. J coil will be wired for separate source. Coils E, H, and L do not apply to single phase starters.
- ③ Standard Auxiliary Contacts, Same as Contactors, refer to page 17-62.

Combination Heavy Duty Starters

Features and Benefits

General



Combination Starter Features

Combination starters include the following features:

- Manufactured with Cold Forming "TOX" Process
- Solid State Overloads Standard on Sizes 5-8
- Easy to Install
- Wide Range of Enclosure Types Available
- Heavy Duty Quarter Turns
- 100kA Short Circuit Current Rating when Protected with Class R Fuses to 600V or MCP to 480V
- Visible Blade Disconnect
- Industrial Type Disconnect Handle
- UL listed file #E185287 (class 17, 18, 25, 26 & 32)
- CSA certified file #LR 6535 (class 17, 18, 25, 26 & 32)

Application

A combination starter meets National Electrical Code requirements for:

1. A means of providing short circuit motor protection with fused or breaker disconnection of line voltage.
2. A means of safeguarding personnel from contact with live parts and from accidental starting of machinery by disconnecting the motor and the controller.
3. A motor controller with overload protection.

Prewired combination starters eliminate the cost of wiring between separate disconnect and starter. Factory testing assures field performance. Combination starters also provide a more compact and attractive installation than separate units.

Enclosure Types

Combination starters are available in NEMA 1, 12/3/3R/4 (painted), 4/4X

(stainless), 4X fiberglass and 7 & 9 enclosures. Enclosures protect personnel from contact with live parts and depending upon the construction, protect the control in varying degrees from physical damage and harmful atmospheres. All enclosures are supplied with corrosion resistant finishes.

Heavy Duty Disconnect Switches

The disconnect switch that goes the distance in durability, performance and reliability has the following advantages:

- Visible blades for the highest level of safety
- Double break switching action to reduce arcing, increase lifetime and eliminate the "electric hinge"
- More rugged positive action switch
- Oversized lugs are standard
- Line side shield to help guard personnel from contact with live parts
- Higher horsepower rating for design E high efficiency motors
- UL listed for IlSCO, Burndy and T&B crimp type lugs
- The 200A switch accepts up to 300 MCM versus 250 MCM wire size

Its rugged construction - with a high fault withstand rating of 100kA at 600 VAC when fused with class R rated fuses - meets the most stringent industry standards set forth by the automotive, petro-chemical, and pulp and paper industries. UL recognized and CSA certified, our disconnect switches are available either non-fusible or fusible with class R and class J fuse clips.



Enclosure Kits for NEMA Combination Starters Description

You can assemble a non-stocked combination starter per your unanticipated needs in minutes. Say, for example, your customer needs a fusible combination starter that you don't have in stock. You need in now, but don't sweat it.

Simply start with the enclosure kit which has the handle preinstalled. You install the required starter and fusible disconnect, connect the power wire and you are finished. Within minutes, you have the required combination starter in your hands. No more waiting on the factory. You need it, you got it!

What Is In It For You!

- **Reduce Lead-time** - What used to take days to get now takes minutes
- **Reduced Inventory** - Instead of stocking scores of various combination starters, simply stock a few enclosure kits, disconnect kits, circuit breaker kits and open starters. With these basic "building blocks" you virtually have hundreds of products on-hand
- **Quality** - The same high level of quality you have been accustomed to with our products will also be found in these new enclosure kits
- **UL Listed** - By correctly following the instructions included with the kits, the product you build is UL/CSA Listed

Refer to page 17-117 for more details.

Siemens Type ETI Circuit Breaker

The ETI circuit breaker is a device designed specifically for application in motor circuits. The ETI is a magnetic only protective device designed to provide protection against short circuit current.

The instantaneous-only type ETI circuit breaker employs adjustable magnetic trip settings to allow broader application ranges and a higher degree of motor short circuit protection.



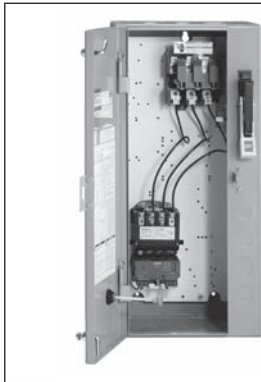
Heavy Duty Starters

These combination starters use the same starters described in the heavy duty starter section of this catalog.

Combination Heavy Duty Starters

Non-Fusible with Solid State Overload, Class 17

Selection



Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ For Fusible Styles see page 17-22.
- ▶ Field Modification Kits see page 17-106.
- ▶ Factory Modifications see page 17-121.
- ▶ Dimensions see page 17-161.
- ▶ Wiring Diagrams see page 17-176.
- ▶ Replacement Parts see page 17-133.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 [Ⓣ]	A
200–208	D
220–240	G
277	L
220–240/440–480 [Ⓣ]	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-121.

Standard Width Enclosure, 3 Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant Ⓣ = W for 304 Stainless Steel Ⓧ = X for 316 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R, NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight				
200	230	460	575						Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1/2	1/2	0	—	0.25–1	A	30	17CUA92B*		17CUA92@*		17CUA92F*		17CUA92N*	
1/2	3/4	1 1/2	2	0	—	0.75–3.4	A	30	17CUB92B*		17CUB92@*		17CUB92F*		17CUB92N*	
2	2	5	5	0	—	3–12	A1	30	17CUC92B*		17CUC92@*		17CUC92F*		17CUC92N*	
3	3	—	—	0	—	5.5–22	A1	30	17CUD92B*		17CUD92@*		17CUD92F*		17CUD92N*	
1/2	1/2	1/2	1/2	1	—	0.25–1	A	30	17DUA92B*		17DUA92@*		17DUA92F*		17DUA92N*	
1/2	3/4	1 1/2	2	1	—	0.75–3.4	A	30	17DUB92B*		17DUB92@*		17DUB92F*		17DUB92N*	
2	2	5	5	1	—	3–12	A1	30	17DUC92B*		17DUC92@*		17DUC92F*		17DUC92N*	
3	3	10	10	1	—	5.5–22	A1	30	17DUD92B*		17DUD92@*		17DUD92F*		17DUD92N*	
7 1/2	7 1/2	—	—	1	—	10–40	A1	60	17DUE92B*		17DUE92@*		17DUE92F*		17DUE92N*	
10	10	15	15	—	1 1/2	10–40	A1	60	17EUE92B*		17EUE92@*		17EUE92F*		17EUE92N*	
10	15	25	25	2	—	13–52	B	60	17FUF92B*		17FUF92@*		17FUF92F*		17FUF92N*	
15	20	30	30	—	2 1/2	25–100	B	100 [Ⓣ]	17GUG92B*		17GUG92@*		17GUG92F*		17GUG92N*	
20 [Ⓣ]	25 [Ⓣ]	50	50	3	—	25–100	B	100	17HUG92B*		17HUG92@*		17HUG92F*		17HUG92N*	
30	40	75	75	—	3 1/2	50–200	B	200	17IUH92B*		17IUH92@*		17IUH92F*		17IUH92N*	
40	50	100	100	4	—	50–200	B	200	17JUH92B*		17JUH92@*		17JUH92F*		17JUH92N*	
75	100	200	200	5	—	55–250	—	400 [Ⓣ]	17LPU92B*		17LPU92E* [Ⓣ]		—	—	17LPU92N*	
150	200	400	400	6	—	160–630	—	600	17MPX92B*		17MPX92E* [Ⓣ]		—	—	17MPX92N*	
—	300	600	600	7 [Ⓣ]	—	400–1220	A1+CT	1200	17NUN92B*		—		—	—	17NUN92N*	
—	450	900	900	8 [Ⓣ]	—	400–1220	A1+CT	1600	17PUN92B*		—		—	—	17PUN92N*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

- Ⓣ Dual voltage coils not available in starter sizes 5–8.
- Ⓣ For 60A disconnect, order fusible cat. no. page 17-22.


- Ⓣ For 20 HP and 200A disconnect, order fusible cat. no. page 17-22.
- Ⓣ For 25 HP and 200A disconnect, order fusible cat. no. page 17-22.
- Ⓣ For 600A disconnect, order fusible cat. no. page 17-22.
- Ⓣ Enclosure is NEMA Type 4 (painted steel).

- Ⓣ F coil 100-250V AC 50/60Hz, or DC, H coil 150-500V AC 50/60Hz, or DC
- Ⓣ Only available F coil 100-250V AC 50/60Hz, or DC

Combination Heavy Duty Starters

Non-Fusible with Solid State Overload, Class 17

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ For Fusible Styles see page 17-23. ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-161. ▶ Wiring Diagrams see page 17-176. ▶ Replacement Parts see page 17-133. 	Coil Table <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240[ⓐ]</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480[ⓐ]</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 17-121.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240 [ⓐ]	A	200–208	D	220–240	G	277	L	220–240/440–480 [ⓐ]	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
24	J																					
120	F																					
110–120/220–240 [ⓐ]	A																					
200–208	D																					
220–240	G																					
277	L																					
220–240/440–480 [ⓐ]	C																					
440–480	H																					
575–600	E																					

Extra Wide Enclosure, 3-Phase, 3-Pole

Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
									Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/8	1/8	1/8	1/8	0	—	0.25–1	A	30	17CUA82B*		17CUA82@*		17CUA82N*	
1/4	1/4	1/4	1/4	0	—	0.75–3.4	A	30	17CUB82B*		17CUB82@*		17CUB82N*	
2	2	5	5	0	—	3–12	A1	30	17CUC82B*		17CUC82@*		17CUC82N*	
3	3	—	—	0	—	5.5–22	A1	30	17CUD82B*		17CUD82@*		17CUD82N*	
1/2	1/2	1/2	1/2	1	—	0.25–1	A	30	17DUA82B*		17DUA82@*		17DUA82N*	
1/2	3/4	1 1/2	2	1	—	0.75–3.4	A	30	17DUB82B*		17DUB82@*		17DUB82N*	
2	2	5	5	1	—	3–12	A1	30	17DUC82B*		17DUC82@*		17DUC82N*	
3	3	10	10	1	—	5.5–22	A1	30	17DUD82B*		17DUD82@*		17DUD82N*	
7 1/2	7 1/2	—	—	1	—	10–40	A1	60	17DUE82B*		17DUE82@*		17DUE82N*	
10	10	15	15	—	1 1/4	10–40	A1	60	17EUE82B*		17EUE82@*		17EUE82N*	
10	15	25	25	2	—	13–52	B	60	17FUF82B*		17FUF82@*		17FUF82N*	
15	20	30	30	—	2 1/4	25–100	B	100 [ⓐ]	17GUG82B*		17GUG82@*		17GUG82N*	
20 [ⓐ]	25 [ⓐ]	50	50	3	—	25–100	B	100	17HUG82B*		17HUG82@*		17HUG82N*	

NEMA & General Purpose Control

17 CONTROL PRODUCTS

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).


[ⓐ] For 60A disconnect, order fusible cat. no. page 17-23.
[ⓑ] For 20 HP and 200A disconnect, order fusible cat. no. page 17-23.

[ⓒ] For 25 HP and 200A disconnect, order fusible cat. no. page 17-23.

Combination Heavy Duty Starters

Non-Fusible with Ambient Compensated Bimetal Overload, Class 17

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Heater elements see page 17-126. (3 required) ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-161. ▶ Wiring Diagrams see page 17-176. ▶ Replacement Parts see page 17-133. ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact. 	Coil Table <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 17-121.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
24	J																					
120	F																					
110–120/220–240	A																					
200–208	D																					
220–240	G																					
277	L																					
220–240/440–480	C																					
440–480	H																					
575–600	E																					

Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Disc Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant Weatherproof		NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Watertight, Dust-tight	
Catalog Number	List Price \$	Catalog Number	List Price \$				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$		
3	3	5	5	0	—	30	17CP92B*81		17CP92@*81		17CP92F*81		17CP92N*81	
7½	7½	10	10	1	—	30	17DP92B*81		17DP92@*81		17DP92F*81		17DP92N*81	
10	10	15	15	—	1¾	60	17EP92B*81		17EP92@*81		17EP92F*81		17EP92N*81	
10	15	25	25	2	—	60	17FP92B*81		17FP92@*81		17FP92F*81		17FP92N*81	
15	20	30	30	—	2½	100 [ⓐ]	17GP92B*81		17GP92@*81		17GP92F*81		17GP92N*81	
25 [ⓑ]	30 [ⓑ]	50	50	3	—	100	17HP92B*81		17HP92@*81		17HP92F*81		17HP92N*81	
30	40	75	75	—	3½	200	17IP92B*81		17IP92@*81		17IP92F*81		17IP92N*81	
40	50	100	100	4	—	200	17JP92B*81		17JP92@*81		17JP92F*81		17JP92N*81	

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Disc Amp Rating	Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
Catalog Number	List Price \$	Catalog Number	List Price \$				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	30	17CP82B*81		17CP82@*81		17CP82N*81	
7½	7½	10	10	1	—	30	17DP82B*81		17DP82@*81		17DP82N*81	
10	10	15	15	—	1¾	60	17EP82B*81		17EP82@*81		17EP82N*81	
10	15	25	25	2	—	60	17FP82B*81		17FP82@*81		17FP82N*81	
15	20	30	30	—	2½	100 [ⓐ]	17GP82B*81		17GP82@*81		17GP82N*81	
25 [ⓑ]	30 [ⓑ]	50	50	3	—	100	17HP82B*81		17HP82@*81		17HP82N*81	

Standard Width Enclosure, Single Phase, (Catalog Numbers are three phase, wire for single phase in the field)

Max Hp		NEMA Size	Half Size	Disc Amp Rating	Enclosure							
115 Volts	208/230 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
Catalog Number	List Price \$				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1	2	0	—	30	17CP92B*81		17CP92@*81		17CP92F*81		17CP92N*81	
2	3	1	—	30	17DP92B*81		17DP92@*81		17DP92F*81		17DP92N*81	
3	5	1P	—	60	17EP92B*81		17EP92@*81		17EP92F*81		17EP92N*81	
3	7½	2	—	60	17FP92B*81		17FP92@*81		17FP92F*81		17FP92N*81	
5	10	—	2½	100 [ⓐ]	17GP92B*81		17GP92@*81		17GP92F*81		17GP92N*81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

ⓐ For 60A disc, order fusible cat. no. page 17-24.
 ⓑ For 25 HP and 200A disconnect, order fusible cat. no. page 17-24.

ⓒ For 30 HP and 200A disconnect, order fusible cat. no. page 17-24.

Combination Heavy Duty Starters

Fusible with Solid State Overload, Class 17

Selection



Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Field Modification Kits see page 17-106.
- ▶ Factory Modifications see page 17-121.
- ▶ Dimensions see page 17-161.
- ▶ Wiring Diagrams see page 17-176.
- ▶ Replacement Parts see page 17-133.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110-120/220-240 [ⓐ]	A
200-208	D
220-240	G
277	L
220-240/440-480 [ⓐ]	C
440-480	H
575-600	E

For other voltages and frequencies, see Factory Modifications page 17-121.

Standard Width Enclosure, 3-Phase, 3-Pole[ⓐ]

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Fuse Clip Amp/Volts	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size			NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant ⓐ = W for 304 Stainless Steel ⓑ = X for 316 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R, NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight				
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$				
1/8	1/8	—	—	0	—	0.25-1	A	30	30A/250V	17CUA92B*10	—	17CUA92@*10	—	17CUA92F*10	—	17CUA92N*10	—
—	—	1/8	1/8	0	—	0.25-1	A	30	30A/600V	17CUA92B*11	—	17CUA92@*11	—	17CUA92F*11	—	17CUA92N*11	—
1/4	1/4	—	—	0	—	0.75-3.4	A	30	30A/250V	17CUB92B*10	—	17CUB92@*10	—	17CUB92F*10	—	17CUB92N*10	—
—	—	1/2	—	0	—	0.75-3.4	A	30	30A/600V	17CUB92B*11	—	17CUB92@*11	—	17CUB92F*11	—	17CUB92N*11	—
2	2	—	—	0	—	3-12	A1	30	30A/250V	17CUC92B*10	—	17CUC92@*10	—	17CUC92F*10	—	17CUC92N*10	—
—	—	5	—	0	—	3-12	A1	30	30A/600V	17CUC92B*11	—	17CUC92@*11	—	17CUC92F*11	—	17CUC92N*11	—
3	3	—	—	0	—	5.5-22	A1	30	30A/250V	17CUD92B*10	—	17CUD92@*10	—	17CUD92F*10	—	17CUD92N*10	—
1/2	1/2	—	—	1	—	0.25-1	A	30	30A/250V	17DUA92B*10	—	17DUA92@*10	—	17DUA92F*10	—	17DUA92N*10	—
—	—	1/2	1/2	1	—	0.25-1	A	30	30A/600V	17DUA92B*11	—	17DUA92@*11	—	17DUA92F*11	—	17DUA92N*11	—
1/2	3/4	—	—	1	—	0.75-3.4	A	30	30A/250V	17DUB92B*10	—	17DUB92@*10	—	17DUB92F*10	—	17DUB92N*10	—
—	—	1 1/2	—	1	—	0.75-3.4	A	30	30A/600V	17DUB92B*11	—	17DUB92@*11	—	17DUB92F*11	—	17DUB92N*11	—
2	2	—	—	1	—	3-12	A1	30	30A/250V	17DUC92B*10	—	17DUC92@*10	—	17DUC92F*10	—	17DUC92N*10	—
—	—	5	—	1	—	3-12	A1	30	30A/600V	17DUC92B*11	—	17DUC92@*11	—	17DUC92F*11	—	17DUC92N*11	—
3	3	—	—	1	—	5.5-22	A1	30	30A/250V	17DUD92B*10	—	17DUD92@*10	—	17DUD92F*10	—	17DUD92N*10	—
—	—	10	—	1	—	5.5-22	A1	30	30A/600V	17DUD92B*11	—	17DUD92@*11	—	17DUD92F*11	—	17DUD92N*11	—
7 1/2	7 1/2	—	—	1	—	10-40	A1	30	30A/250V	17DUE92B*10	—	17DUE92@*10	—	17DUE92F*10	—	17DUE92N*10	—
7 1/2	7 1/2	—	—	1	—	10-40	A1	60	60A/250V	17DUE92B*12	—	17DUE92@*12	—	17DUE92F*12	—	17DUE92N*12	—
—	—	15	15	—	1 1/2	10-40	A1	60	60A/600V	17EUE92B*13	—	17EUE92@*13	—	17EUE92F*13	—	17EUE92N*13	—
10	10	—	—	—	1 1/2	10-40	A1	60	60A/250V	17EUE92B*12	—	17EUE92@*12	—	17EUE92F*12	—	17EUE92N*12	—
10	15	—	—	2	—	13-52	B	60	60A/250V	17FUF92B*12	—	17FUF92@*12	—	17FUF92F*12	—	17FUF92N*12	—
—	—	25	25	2	—	13-52	B	60	60A/600V	17FUF92B*13	—	17FUF92@*13	—	17FUF92F*13	—	17FUF92N*13	—
—	—	—	30	—	2 1/2	25-100	B	60	60A/600V	17GUG92B*13	—	17GUG92@*13	—	17GUG92F*13	—	17GUG92N*13	—
—	—	—	30	—	2 1/2	25-100	B	100	100A/600V	17GUG92B*15	—	17GUG92@*15	—	17GUG92F*15	—	17GUG92N*15	—
15	20	—	—	—	2 1/2	25-100	B	100	100A/250V	17GUG92B*14	—	17GUG92@*14	—	17GUG92F*14	—	17GUG92N*14	—
20	25	—	—	3	—	25-100	B	100	100A/250V	17HUG92B*14	—	17HUG92@*14	—	17HUG92F*14	—	17HUG92N*14	—
—	—	50	50	3	—	25-100	B	100	100A/600V	17HUG92B*15	—	17HUG92@*15	—	17HUG92F*15	—	17HUG92N*15	—
25	30	—	—	3	—	25-100	B	200	200A/250V	17HUG92B*16	—	17HUG92@*16	—	17HUG92F*16	—	17HUG92N*16	—
30	40	—	—	—	3 1/2	50-200	B	200	200A/250V	17IUH92B*16	—	17IUH92@*16	—	17IUH92F*16	—	17IUH92N*16	—
—	—	75	75	—	3 1/2	50-200	B	200	200A/600V	17IUH92B*17	—	17IUH92@*17	—	17IUH92F*17	—	17IUH92N*17	—
40	50	—	—	4	—	50-200	B	200	200A/250V	17JUH92B*16	—	17JUH92@*16	—	17JUH92F*16	—	17JUH92N*16	—
—	—	100	100	4	—	50-200	B	200	200A/600V	17JUH92B*17	—	17JUH92@*17	—	17JUH92F*17	—	17JUH92N*17	—
75	100	—	—	5	—	55-250	—	400	400A/250V	17LPU92E*18 [ⓑ]	—	—	—	—	—	17LPU92N*18	—
—	100	—	—	5	—	55-250	—	600	600A/250V [ⓐ]	17LPU92B*20	—	—	—	—	—	17LPU92N*20	—
—	—	—	125	5	—	55-250	—	200	200A/600V	17LPU92B*17	—	—	—	—	—	17LPU92N*17	—
—	—	200	200	5	—	55-250	—	400	400A/600V	17LPU92B*19	—	—	—	—	—	17LPU92N*19	—
—	—	200	—	5	—	55-250	—	600	600A/600V [ⓑ]	17LPU92B*21	—	—	—	—	—	17LPU92N*21	—
150	200	—	—	6	—	160-630	—	600	600A/250V	17MPX92B*20	—	—	—	—	—	17MPX92N*20	—
—	—	400	400	6	—	160-630	—	600	600A/600V	17MPX92B*21	—	—	—	—	—	17MPX92N*21	—
—	—	400	400	6	—	160-630	—	800	800A/600V	17MPX92B*23	—	—	—	—	—	17MPX92N*23	—
—	—	600	600	7 [ⓐ]	—	400-1220	A1+CT	1200	1200A/600V	17NUN92B*24	—	—	—	—	—	17NUN92N*24	—
—	—	900	900	8 [ⓐ]	—	400-1220	A1+CT	1600	1600A/600V	17PUN92B*25	—	—	—	—	—	17PUN92N*25	—

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

- ⓐ Dual voltage coils not available in starter sizes 5-8.
- ⓑ Use Class J fuses only.

ⓐ Enclosure is NEMA Type 4 (painted steel).

- ⓑ Single phase wiring page 17-175.
- ⓒ F coil 100-250V AC 50/60Hz, or DC, H coil 150-500V AC 50/60Hz, or DC


ⓓ Only available

F coil 100-250V AC 50/60Hz, or DC

Combination Heavy Duty Starters

Fusible with Solid State Overload, Class 17

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-161. ▶ Wiring Diagrams see page 17-176. ▶ Replacement Parts see page 17-133. 	Coil Table <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 17-121.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
24	J																					
120	F																					
110–120/220–240	A																					
200–208	D																					
220–240	G																					
277	L																					
220–240/440–480	C																					
440–480	H																					
575–600	E																					

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Fuse Clip Amp/Volts	Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size			NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Ⓜ = W for 304 Stainless Steel Ⓧ = X for 316 Stainless Steel	NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	Catalog Number	List Price \$	Catalog Number
1/2	1/2	—	—	0	—	0.25–1	A	30	30A/250V	17CUA82B*10	—	17CUA82@*10	—	17CUA82N*10	—
—	—	1/2	1/2	0	—	0.25–1	A	30	30A/600V	17CUA82B*11	—	17CUA82@*11	—	17CUA82N*11	—
1/2	3/4	—	—	0	—	0.75–3.4	A	30	30A/250V	17CUB82B*10	—	17CUB82@*10	—	17CUB82N*10	—
—	—	1 1/2	2	0	—	0.75–3.4	A	30	30A/600V	17CUB82B*11	—	17CUB82@*11	—	17CUB82N*11	—
2	2	—	—	0	—	3–12	A1	30	30A/250V	17CUC82B*10	—	17CUC82@*10	—	17CUC82N*10	—
—	—	5	5	0	—	3–12	A1	30	30A/600V	17CUC82B*11	—	17CUC82@*11	—	17CUC82N*11	—
3	3	—	—	0	—	5.5–22	A1	30	30A/250V	17CUD82B*10	—	17CUD82@*10	—	17CUD82N*10	—
1/2	3/4	—	—	1	—	0.25–1	A	30	30A/250V	17DUA82B*10	—	17DUA82@*10	—	17DUA82N*10	—
—	—	1/2	1/2	1	—	0.25–1	A	30	30A/600V	17DUA82B*11	—	17DUA82@*11	—	17DUA82N*11	—
1/2	3/4	—	—	1	—	0.75–3.4	A	30	30A/250V	17DUB82B*10	—	17DUB82@*10	—	17DUB82N*10	—
—	—	1 1/2	2	1	—	0.75–3.4	A	30	30A/600V	17DUB82B*11	—	17DUB82@*11	—	17DUB82N*11	—
2	2	—	—	1	—	3–12	A1	30	30A/250V	17DUC82B*10	—	17DUC82@*10	—	17DUC82N*10	—
—	—	5	5	1	—	3–12	A1	30	30A/600V	17DUC82B*11	—	17DUC82@*11	—	17DUC82N*11	—
3	3	—	—	1	—	5.5–22	A1	30	30A/250V	17DUD82B*10	—	17DUD82@*10	—	17DUD82N*10	—
—	—	10	10	1	—	5.5–22	A1	30	30A/600V	17DUD82B*11	—	17DUD82@*11	—	17DUD82N*11	—
5	5	—	—	1	—	10–40	A1	30	30A/250V	17DUE82B*10	—	17DUE82@*10	—	17DUE82N*10	—
7 1/2	7 1/2	—	—	1	—	10–40	A1	60	60A/250V	17DUE82B*12	—	17DUE82@*12	—	17DUE82N*12	—
—	—	15	15	—	1 1/2	10–40	A1	60	60A/600V	17EUE82B*13	—	17EUE82@*13	—	17EUE82N*13	—
10	10	—	—	—	1 1/2	10–40	A1	60	60A/250V	17EUE82B*12	—	17EUE82@*12	—	17EUE82N*12	—
10	15	—	—	2	—	13–52	B	60	60A/250V	17FUF82B*12	—	17FUF82@*12	—	17FUF82N*12	—
—	—	25	25	2	—	13–52	B	60	60A/600V	17FUF82B*13	—	17FUF82@*13	—	17FUF82N*13	—
—	—	—	30	—	2 1/2	25–100	B	60	60A/600V	17GUG82B*13	—	17GUG82@*13	—	17GUG82N*13	—
—	—	30	—	—	2 1/2	25–100	B	100	100A/600V	17GUG82B*15	—	17GUG82@*15	—	17GUG82N*15	—
15	20	—	—	—	2 1/2	25–100	B	100	100A/250V	17GUG82B*14	—	17GUG82@*14	—	17GUG82N*14	—
20	25	—	—	3	—	25–100	B	100	100A/250V	17HUG82B*14	—	17HUG82@*14	—	17HUG82N*14	—
—	—	50	50	3	—	25–100	B	100	100A/600V	17HUG82B*15	—	17HUG82@*15	—	17HUG82N*15	—
25	30	—	—	3	—	25–100	B	200	200A/250V	17HUG82B*16	—	17HUG82@*16	—	17HUG82N*16	—

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).


NEMA & General Purpose Control

17 CONTROL PRODUCTS

Combination Heavy Duty Starters

Fusible with Ambient Compensated Bimetal Overload, Class 17

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Heater elements see page 17-126. (3 required) ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-161. ▶ Wiring Diagrams see page 17-176. ▶ Replacement Parts see page 17-133. ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact. 	Coil Table <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110-120/220-240</td><td>A</td></tr> <tr><td>200-208</td><td>D</td></tr> <tr><td>220-240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220-240/440-480</td><td>C</td></tr> <tr><td>440-480</td><td>H</td></tr> <tr><td>575-600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 17-121.</p>	60Hz Voltage	Letter	24	J	120	F	110-120/220-240	A	200-208	D	220-240	G	277	L	220-240/440-480	C	440-480	H	575-600	E
	60Hz Voltage	Letter																				
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440-480	H																					
575-600	E																					

Standard Width Enclosure, 3-Phase, 3-Pole^①

Max Hp								Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Disc Amp Rating	Fuse Clip Size Amps/Volts	NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight		
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	—	—	0	—	30	30A/250V	17CP92B*1081		17CP92@*1081		17CP92F*1081	
—	—	5	5	0	—	30	30A/600V	17CP92B*1181		17CP92@*1181		17CP92F*1181	
5	5	—	—	1	—	30	30A/250V	17DP92B*1081		17DP92@*1081		17DP92F*1081	
—	—	10	10	1	—	30	30A/600V	17DP92B*1181		17DP92@*1181		17DP92F*1181	
7½	7½	—	—	1	—	60	60A/250V	17DP92B*1281		17DP92@*1281		17DP92F*1281	
10	10	—	—	—	1¼	60	60A/250V	17EP92B*1281		17EP92@*1281		17EP92F*1281	
—	—	15	15	—	1¼	60	60A/600V	17EP92B*1381		17EP92@*1381		17EP92F*1381	
10	15	—	—	2	—	60	60A/250V	17FP92B*1281		17FP92@*1281		17FP92F*1281	
—	—	25	25	2	—	60	60A/600V	17FP92B*1381		17FP92@*1381		17FP92F*1381	
—	—	—	30	—	2½	60	60A/600V	17GP92B*1381		17GP92@*1381		17GP92F*1381	
—	—	30	—	—	2½	100	100A/600V	17GP92B*1581		17GP92@*1581		17GP92F*1581	
15	20	—	—	—	2½	100	100A/250V	17GP92B*1481		17GP92@*1481		17GP92F*1481	
20	25	—	—	3	—	100	100A/250V	17HP92B*1481		17HP92@*1481		17HP92F*1481	
—	—	50	50	3	—	100	100A/600V	17HP92B*1581		17HP92@*1581		17HP92F*1581	
25	30	—	—	3	—	200	200A/250V	17HP92B*1681		17HP92@*1681		17HP92F*1681	
30	40	—	—	—	3½	200	200A/250V	17IP92B*1681		17IP92@*1681		17IP92F*1681	
—	—	75	75	—	3½	200	200A/600V	17IP92B*1781		17IP92@*1781		17IP92F*1781	
40	50	—	—	4	—	200	200A/250V	17JP92B*1681		17JP92@*1681		17JP92F*1681	
—	—	100	100	4	—	200	200A/600V	17JP92B*1781		17JP92@*1781		17JP92F*1781	

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp								Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Disc Amp Rating	Fuse Clip Size Amps/Volts	NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight Industrial Use Weatherproof @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel	NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight			
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	—	—	0	—	30	30A/250V	17CP82B*1081		17CP82@*1081		17CP82N*1081	
—	—	5	5	0	—	30	30A/600V	17CP82B*1181		17CP82@*1181		17CP82N*1181	
5	5	—	—	1	—	30	30A/250V	17DP82B*1081		17DP82@*1081		17DP82N*1081	
—	—	10	10	1	—	30	30A/600V	17DP82B*1181		17DP82@*1181		17DP82N*1181	
7½	7½	—	—	1	—	60	60A/250V	17DP82B*1281		17DP82@*1281		17DP82N*1281	
10	10	—	—	—	1¼	60	60A/250V	17EP82B*1281		17EP82@*1281		17EP82N*1281	
—	—	15	15	—	1¼	60	60A/600V	17EP82B*1381		17EP82@*1381		17EP82N*1381	
10	15	—	—	2	—	60	60A/250V	17FP82B*1281		17FP82@*1281		17FP82N*1281	
—	—	25	25	2	—	60	60A/600V	17FP82B*1381		17FP82@*1381		17FP82N*1381	
—	—	—	30	—	2½	60	60A/600V	17GP82B*1381		17GP82@*1381		17GP82N*1381	
—	—	30	—	—	2½	100	100A/600V	17GP82B*1581		17GP82@*1581		17GP82N*1581	
15	20	—	—	—	2½	100	100A/250V	17GP82B*1481		17GP82@*1481		17GP82N*1481	
20	25	—	—	3	—	100	100A/250V	17HP82B*1481		17HP82@*1481		17HP82N*1481	
—	—	50	50	3	—	100	100A/600V	17HP82B*1581		17HP82@*1581		17HP82N*1581	
25	30	—	—	3	—	200	200A/250V	17HP82B*1681		17HP82@*1681		17HP82N*1681	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating. ^① Single phase wiring page 17-175.

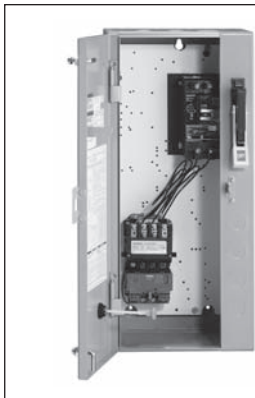
NEMA & General Purpose Control

CONTROL PRODUCTS 17

Combination Heavy Duty Starters

MCP Type with Solid State Overload, Class 18

Selection



Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Field Modification Kits see page 17-106.
- ▶ Factory Modifications see page 17-121.
- ▶ Dimensions see page 17-161.
- ▶ Wiring Diagrams see page 17-176.
- ▶ Replacement Parts see page 17-133.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 [Ⓣ]	A
200–208	D
220–240	G
277	L
220–240/440–480 [Ⓣ]	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-121.

Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure		NEMA 7 & 9 NEMA 3 & 4		NEMA 12, NEMA 3/3R, NEMA 4 Painted (thru size 4)	
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1	1	0	—	3	0.75–3.4	A	18CUB92B*	18CUB92@*	18CUB92F*	18CUB92H*	18CUB92N*	
2	2	5	5	0	—	10	3–12	A1	18CUC92B*	18CUC92@*	18CUC92F*	18CUC92H*	18CUC92N*	
3	3	—	—	0	—	25	5.5–22	A1	18CUD92B*	18CUD92@*	18CUD92F*	18CUD92H*	18CUD92N*	
1/2	1/2	1	1	1	—	3	0.75–3.4	A	18DUB92B*	18DUB92@*	18DUB92F*	18DUB92H*	18DUB92N*	
2	2	5	5	1	—	10	3–12	A1	18DUC92B*	18DUC92@*	18DUC92F*	18DUC92H*	18DUC92N*	
3	3	7 1/2	10	1	—	25	5.5–22	A1	18DUD92B*	18DUD92@*	18DUD92F*	18DUD92H*	18DUD92N*	
7 1/2	7 1/2	10	—	1	—	30	10–40	A1	18DUE92B*	18DUE92@*	18DUE92F*	18DUE92H*	18DUE92N*	
—	—	15	15	—	1 1/4	40	10–40	A1	18EUE92B*	18EUE92@*	18EUE92F*	18EUE92H*	18EUE92N*	
10	15	25	25	2	—	50	13–52	B	18FUF92B*	18FUF92@*	18FUF92F*	18FUF92H*	18FUF92N*	
15	20	30	30	—	2 1/2	100	25–100	B	18GUG92B*	18GUG92@*	18GUG92F*	18GUG92H*	18GUG92N*	
25	30	50	50	3	—	125	25–100	B	18HUG92B*	18HUG92@*	18HUG92F*	18HUG92H*	18HUG92N*	
30	40	75	75	—	3 1/2	125	50–200	B	18IUH92B*	18IUH92@*	18IUH92F*	18IUH92H*	18IUH92N*	
40	50	100	100	4	—	150	50–200	B	18JUH92B*	18JUH92@*	18JUH92F*	18JUH92H*	18JUH92N*	
50	75	150	200	5	—	250	55–250	—	18LPT92B*	18LPT92E* [Ⓣ]	—	18LPT92H*	18LPT92N*	
75	100	200	—	5	—	400	55–250	—	18LP92B*	18LP92E* [Ⓣ]	—	—	18LP92N*	
100	125	250	300	6	—	400	160–630	—	18MPW92B*	18MPW92E* [Ⓣ]	—	—	18MPW92N*	
150	200	400	400	6	—	600	160–630	—	18MPX92B*	18MPX92E* [Ⓣ]	—	—	18MPX92N*	
—	250	500	500	7 [Ⓣ]	—	800	400–1220	A1+CT	18NUV92B*	—	—	—	18NUV92N*	
—	300	600	600	7 [Ⓣ]	—	1000	400–1220	A1+CT	18NUY92B*	—	—	—	18NUY92N*	
—	400	800	800	8 [Ⓣ]	—	1200	400–1220	A1+CT	18PUW92B*	—	—	—	18PUW92N*	
—	450	900	900	8 [Ⓣ]	—	1600	400–1220	A1+CT	18PUZ92B*	—	—	—	18PUZ92N*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Ⓣ Dual voltage coils not available in starter sizes 5–8.

Ⓢ Enclosure is NEMA Type 4 (painted steel).

Ⓣ F coil 100-250V AC 50/60Hz, or DC, H coil 150-500V AC 50/60Hz, or DC

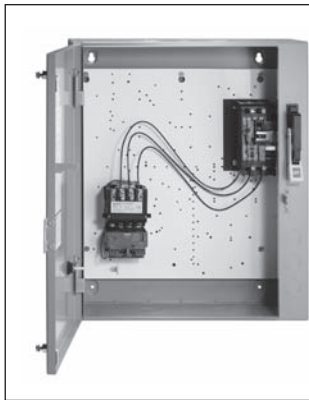
Ⓣ Only available

F coil 100-250V AC 50/60Hz, or DC

Combination Heavy Duty Starters

MCP Type with Solid State Overload, Class 18

Selection



Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Field Modification Kits see page 17-106.
- ▶ Factory Modifications see page 17-121.
- ▶ Dimensions see page 17-161.
- ▶ Wiring Diagrams see page 17-176.
- ▶ Replacement Parts see page 17-133.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240	A
200–208	D
220–240	G
277	L
220–240/440–480	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-121.

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
									Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1	1	0	—	3	0.75–3.4	A	18CUB82B*		18CUB82@*		18CUB82N*	
2	2	5	5	0	—	10	3–12	A1	18CUC82B*		18CUC82@*		18CUC82N*	
3	3	—	—	0	—	25	5.5–22	A1	18CUD82B*		18CUD82@*		18CUD82N*	
1/2	1/2	1	1	1	—	3	0.75–3.4	A	18DUB82B*		18DUB82@*		18DUB82N*	
2	2	5	5	1	—	10	3–12	A1	18DUC82B*		18DUC82@*		18DUC82N*	
3	3	7 1/2	10	1	—	25	5.5–22	A1	18DUD82B*		18DUD82@*		18DUD82N*	
7 1/2	7 1/2	10	—	1	—	30	10–40	A1	18DUE82B*		18DUE82@*		18DUE82N*	
—	—	15	15	—	1 1/2	40	10–40	A1	18EUE82B*		18EUE82@*		18EUE82N*	
10	15	25	25	2	—	50	13–52	B	18FUF82B*		18FUF82@*		18FUF82N*	
15	20	30	30	—	2 1/2	100	25–100	B	18GUG82B*		18GUG82@*		18GUG82N*	
25	30	50	50	3	—	125	25–100	B	18HUG82B*		18HUG82@*		18HUG82N*	

NEMA & General Purpose Control

17

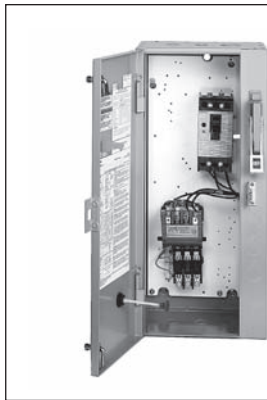
CONTROL PRODUCTS

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Combination Heavy Duty Starters

MCP Type with Ambient Compensated Bimetal Overload, Class 18

Selection



Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Heater elements see page 17-126. (3 required)
- ▶ Field Modification Kits see page 17-106.
- ▶ Factory Modifications see page 17-121.
- ▶ Dimensions see page 17-161.
- ▶ Wiring Diagrams see page 17-176.
- ▶ Replacement Parts see page 17-133.
- ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110-120/220-240	A
200-208	D
220-240	G
277	L
220-240/440-480	C
440-480	H
575-600	E

For other voltages and frequencies, see Factory Modifications page 17-121.

Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp							Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	NEMA 1 General Purpose Watertight, Dust-tight		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 4X Fiberglass NEMA 3 & 4 Corrosion Resistant Class I Groups C & D Class II Groups E, F & G		NEMA 7 & 9 Div 1 and Div 2 Weatherproof Watertight, Dust-tight Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use	
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1	1	0	—	3	18CP92BA*81		18CP92@A*81		18CP92FA*81		18CP92HA*81		18CP92NA*81	
1	1	3	3	0	—	10	18CP92BB*81		18CP92@B*81		18CP92FB*81		18CP92HB*81		18CP92NB*81	
3	3	5	5	0	—	25	18CP92BC*81		18CP92@C*81		18CP92FC*81		18CP92HC*81		18CP92NC*81	
1/2	1/2	1	1	1	—	3	18DP92BA*81		18DP92@A*81		18DP92FA*81		18DP92HA*81		18DP92NA*81	
1	1	3	3	1	—	10	18DP92BB*81		18DP92@B*81		18DP92FB*81		18DP92HB*81		18DP92NB*81	
3	3	7 1/2	7 1/2	1	—	25	18DP92BD*81		18DP92@D*81		18DP92FD*81		18DP92HD*81		18DP92ND*81	
7 1/2	7 1/2	10	10	1	—	30	18DP92BE*81		18DP92@E*81		18DP92FE*81		18DP92HE*81		18DP92NE*81	
—	—	15	15	—	1 1/4	40	18EP92BF*81		18EP92@F*81		18EP92FF*81		18EP92HF*81		18EP92NF*81	
10	10	—	—	—	1 1/4	50	18EP92BG*81		18EP92@G*81		18EP92FG*81		18EP92HG*81		18EP92NG*81	
—	—	20	20	2	—	40	18FP92BH*81		18FP92@H*81		18FP92FH*81		18FP92HH*81		18FP92NH*81	
10	15	25	25	2	—	50	18FP92BJ*81		18FP92@J*81		18FP92FJ*81		18FP92HJ*81		18FP92NJ*81	
10	15	30	30	—	2 1/2	50	18GP92BK*81		18GP92@K*81		18GP92FK*81		18GP92HK*81		18GP92NK*81	
15	20	—	—	—	2 1/2	100	18GP92BL*81		18GP92@L*81		18GP92FL*81		18GP92HL*81		18GP92NL*81	
—	—	30	30	3	—	50	18HP92BM*81		18HP92@M*81		18HP92FM*81		18HP92HM*81		18HP92NM*81	
25	30	50	50	3	—	125	18HP92BN*81		18HP92@N*81		18HP92FN*81		18HP92HN*81		18HP92NN*81	
30	40	75	75	—	3 1/2	125	18IP92BP*81		18IP92@P*81		18IP92FP*81		18IP92HP*81		18IP92NP*81	
40	50	100	100	4	—	150	18JP92BR*81		18JP92@R*81		18JP92FR*81		18JP92HR*81		18JP92NR*81	

Extra Wide Enclosure, 3-Phase, 3-Pole

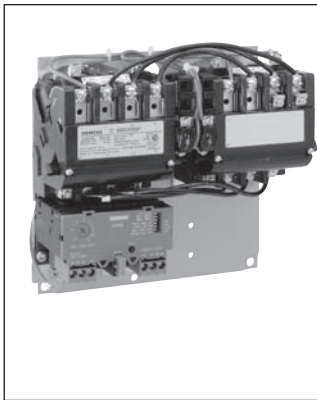
Max Hp							Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant @=W for 304 Stainless Steel @=X for 316 Stainless Steel		NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1	1	0	—	3	18CP82BA*81		18CP82@A*81		18CP82NA*81	
1	1	3	3	0	—	10	18CP82BB*81		18CP82@B*81		18CP82NB*81	
3	3	5	5	0	—	25	18CP82BC*81		18CP82@C*81		18CP82NC*81	
1/2	1/2	1	1	1	—	3	18DP82BA*81		18DP82@A*81		18DP82NA*81	
1	1	3	3	1	—	10	18DP82BB*81		18DP82@B*81		18DP82NB*81	
3	3	7 1/2	7 1/2	1	—	25	18DP82BD*81		18DP82@D*81		18DP82ND*81	
7 1/2	7 1/2	10	10	1	—	30	18DP82BE*81		18DP82@E*81		18DP82NE*81	
—	—	15	15	—	1 1/4	40	18EP82BF*81		18EP82@F*81		18EP82NF*81	
10	10	—	—	—	1 1/4	50	18EP82BG*81		18EP82@G*81		18EP82NG*81	
—	—	20	20	2	—	40	18FP82BH*81		18FP82@H*81		18FP82NH*81	
10	15	25	25	2	—	50	18FP82BJ*81		18FP82@J*81		18FP82NJ*81	
10	15	30	30	—	2 1/2	50	18GP82BK*81		18GP82@K*81		18GP82NK*81	
15	20	—	—	—	2 1/2	100	18GP82BL*81		18GP82@L*81		18GP82NL*81	
—	—	30	30	3	—	50	18HP82BM*81		18HP82@M*81		18HP82NM*81	
25	30	50	50	3	—	125	18HP82BN*81		18HP82@N*81		18HP82NN*81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

Reversing Heavy Duty Starters

Solid State Overload, Class 22

Selection



Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Field Modification Kits see page 17-106.
- ▶ Factory Modifications see page 17-121.
- ▶ Dimensions see page 17-144 open and 17-164 enclosed.
- ▶ Wiring Diagrams see page 17-178.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 [Ⓣ]	A
200–208	D
220–240	G
277	L
220–240/440–480 [Ⓣ]	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-121.

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Amp Range	Frame Size	Enclosure													
200 Volts	230 Volts	460 Volts	575 Volts					Open Type Standard Auxiliary Contacts [Ⓣ]		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/ Outdoor Use		NEMA 12 NEMA 3/3R Industrial Use Weatherproof			
Catalog Number		List Price \$		Catalog Number		List Price \$		Catalog Number		List Price \$		Catalog Number		List Price \$		Catalog Number		List Price \$			
1/4	1/4	1/4	1/2	00	—	0.25–1	A	22BUA32A*	22BUA32B*	Use Size 0	—	22CUB32A*	22CUB32B*	Use Size 0	—	22DUA32A*	22DUA32B*	22DUA32W*	22DUA32F*	22DUA32H*	22DUA320*
1/2	3/4	1 1/2	2	00	—	0.75–3.4	A	22BUB32A*	22BUB32B*	Use Size 0	—	22CUB32A*	22CUB32B*	Use Size 0	—	22DUB32A*	22DUB32B*	22DUB32W*	22DUB32F*	22DUB32H*	22DUB320*
1 1/2	2	—	—	00	—	3–12	A1	22BUC32A*	22BUC32B*	Use Size 0	—	22CUC32A*	22CUC32B*	Use Size 0	—	22DUC32A*	22DUC32B*	22DUC32W*	22DUC32F*	22DUC32H*	22DUC320*
1/2	3/4	1 1/2	2	0	—	0.25–1	A	22CUB32A*	22CUB32B*	22CUB32W*	22CUB32F*	22CUB32H*	22CUB320*	—	—	22DUB32A*	22DUB32B*	22DUB32W*	22DUB32F*	22DUB32H*	22DUB320*
2	2	5	5	0	—	3–12	A1	22CUC32A*	22CUC32B*	22CUC32W*	22CUC32F*	22CUC32H*	22CUC320*	—	—	22DUC32A*	22DUC32B*	22DUC32W*	22DUC32F*	22DUC32H*	22DUC320*
3	3	—	—	0	—	5.5–22	A1	22CUD32A*	22CUD32B*	22CUD32W*	22CUD32F*	22CUD32H*	22CUD320*	—	—	22DUD32A*	22DUD32B*	22DUD32W*	22DUD32F*	22DUD32H*	22DUD320*
1/4	1/4	1/4	1/2	1	—	0.25–1	A	22DUA32A*	22DUA32B*	22DUA32W*	22DUA32F*	22DUA32H*	22DUA320*	—	—	22DUE32A*	22DUE32B*	22DUE32W*	22DUE32F*	22DUE32H*	22DUE320*
1/2	3/4	1 1/2	2	1	—	0.75–3.4	A	22DUB32A*	22DUB32B*	22DUB32W*	22DUB32F*	22DUB32H*	22DUB320*	—	—	22DUE32A*	22DUE32B*	22DUE32W*	22DUE32F*	22DUE32H*	22DUE320*
2	2	5	5	1	—	3–12	A1	22DUC32A*	22DUC32B*	22DUC32W*	22DUC32F*	22DUC32H*	22DUC320*	—	—	22DUE32A*	22DUE32B*	22DUE32W*	22DUE32F*	22DUE32H*	22DUE320*
3	3	10	10	1	—	5.5–22	A1	22DUD32A*	22DUD32B*	22DUD32W*	22DUD32F*	22DUD32H*	22DUD320*	—	—	22DUE32A*	22DUE32B*	22DUE32W*	22DUE32F*	22DUE32H*	22DUE320*
7 1/2	7 1/2	—	—	1	—	10–40	A1	22DUE32A*	22DUE32B*	22DUE32W*	22DUE32F*	22DUE32H*	22DUE320*	—	—	—	—	—	—	—	—
10	10	15	15	—	1 1/4	10–40	A1	22EUE32A*	22EUE32B*	22EUE32W*	22EUE32F*	22EUE32H*	22EUE320*	—	—	—	—	—	—	—	—
10	15	25	25	2	—	13–52	B	22FUF32A*	22FUF32B*	22FUF32W*	22FUF32F*	22FUF32H*	22FUF320*	—	—	—	—	—	—	—	—
15	20	30	30	—	2 1/2	25–100	B	22GUG32A*	22GUG32B*	22GUG32W*	22GUG32F*	22GUG32H*	22GUG320*	—	—	—	—	—	—	—	—
25	30	50	50	3	—	25–100	B	22HUG32A*	22HUG32B*	22HUG32W*	22HUG32F*	22HUG32H*	22HUG320*	—	—	—	—	—	—	—	—
30	40	75	75	—	3 1/2	50–200	B	22IUH32A*	22IUH32B*	22IUH32W*	22IUH32F*	22IUH32H*	22IUH320*	—	—	—	—	—	—	—	—
40	50	100	100	4	—	50–200	B	22JUH32A*	22JUH32B*	22JUH32W*	22JUH32F*	22JUH32H*	22JUH320*	—	—	—	—	—	—	—	—
75	100	200	200	5	—	55–250	—	22LPU32A*	22LPU32B*	22LPU32E* [Ⓣ]	—	—	22LPU320*	—	—	—	—	—	—	—	—
150	200	400	400	6	—	160–630	—	22MPX32A*	22MPX32B*	22MPX32E* [Ⓣ]	—	—	22MPX320*	—	—	—	—	—	—	—	—
—	300	600	600	7 [Ⓣ]	—	400–1220	A1+CT	22NUN32A*	22NUN32B*	—	—	—	22NUN320*	—	—	—	—	—	—	—	—
—	450	900	900	8 [Ⓣ]	—	400–1220	A1+CT	22PUN32A*	22PUN32B*	—	—	—	22PUN320*	—	—	—	—	—	—	—	—

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Ⓣ Dual voltage coils not available in size 5–8 starters.

Ⓣ Enclosure is rated only NEMA 4 (painted steel).

Ⓣ Only available

F coil 100–250V AC 50/60Hz, or DC

H coil 150–500V AC 50/60Hz, or DC

Ⓣ Only available

F coil 100–250V AC 50/60Hz, or DC

Ⓣ Auxiliary contacts

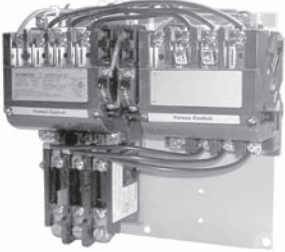
22B–22E 4th pole built-in

22F–22J 2 NO & 2 NC

Reversing Heavy Duty Starters

Ambient Compensated Bimetal Overload with Manual and Auto Reset, Class 22

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Heater elements see page 17-126. Single phase starters require 1 heater element. 3-phase starters require 3 heater elements. ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see pages 17-144 open and 17-164 enclosed. ▶ Wiring Diagrams see page 17-177. ▶ Replacement Parts see page 17-133. ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact. 	Coil Table <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 17-121.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
24	J																					
120	F																					
110–120/220–240	A																					
200–208	D																					
220–240	G																					
277	L																					
220–240/440–480	C																					
440–480	H																					
575–600	E																					

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				Enclosure														
200 Volts	230 Volts	460 Volts	575 Volts	Contactor Amp Rating	NEMA Size	Half Size	Open Type ^②		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant Indoor/Outdoor Use		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures		NEMA 12 NEMA 3/3R Industrial Use Weatherproof	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1½	1½	2	2	9	00	—	22BP32A*81	22BP32B*81	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
3	3	5	5	18	0	—	22CP32A*81	22CP32B*81	22CP32W*81	—	22CP32F*81	—	22CP32H*81	—	22CP320*81	—	22CP320*81	—
7½	7½	10	10	27	1	—	22DP32A*81	22DP32B*81	22DP32W*81	—	22DP32F*81	—	22DP32H*81	—	22DP320*81	—	22DP320*81	—
10	10	15	15	40	—	1¾	22EP32A*81	22EP32B*81	22EP32W*81	—	22EP32F*81	—	22EP32H*81	—	22EP320*81	—	22EP320*81	—
10	15	25	25	45	2	—	22FP32A*81	22FP32B*81	22FP32W*81	—	22FP32F*81	—	22FP32H*81	—	22FP320*81	—	22FP320*81	—
15	20	30	30	60	—	2½	22GP32A*81	22GP32B*81	22GP32W*81	—	22GP32F*81	—	22GP32H*81	—	22GP320*81	—	22GP320*81	—
25	30	50	50	90	3	—	22HP32A*81	22HP32B*81	22HP32W*81	—	22HP32F*81	—	22HP32H*81	—	22HP320*81	—	22HP320*81	—
30	40	75	75	115	—	3½	22IP32A*81	22IP32B*81	22IP32W*81	—	22IP32F*81	—	22IP32H*81	—	22IP320*81	—	22IP320*81	—
40	50	100	100	135	4	—	22JG32A*81	22JG32B*81	22JG32W*81	—	22JG32F*81	—	22JG32H*81	—	22JG320*81	—	22JG320*81	—

NEMA & General Purpose Control

Open Type & Standard Width Enclosure, Single Phase, 3-Wire, 2-Pole^①

Max Hp				Enclosure													
115 Volts	208/230 Volts	Contactor Amp Rating	NEMA Size	Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 NEMA 3/3R Industrial Use Weatherproof			
				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
½	1	9	00	22BP12A*81	22BP12B*81	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1	2	18	0	22CP12A*81	22CP12B*81	22CP12W*81	—	22CP12F*81	—	22CP12H*81	—	22CP120*81	—	22CP120*81	—	22CP120*81	—
2	3	27	1	22DP12A*81	22DP12B*81	22DP12W*81	—	22DP12F*81	—	22DP12H*81	—	22DP120*81	—	22DP120*81	—	22DP120*81	—
3	5	35	1P	22EP12A*81	22EP12B*81	22EP12W*81	—	22EP12F*81	—	22EP12H*81	—	22EP120*81	—	22EP120*81	—	22EP120*81	—

CONTROL PRODUCTS

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All Starter Sizes carry one maximum Hp rating.

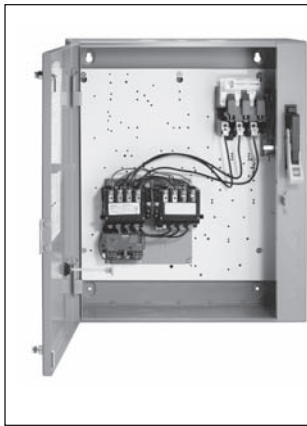
① Coil D, F, or G will be wired for Incoming Voltage. J coil will be wired for 24V separate source. Coils E, H, and L do not apply to single phase starters.

② Auxiliary contacts 22B-22E 4th pole built-in 22F-22J 2 NO & 2 NC

Combination Reversing Heavy Duty Starters

Non-Fusible, Class 25

Selection



Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Heater elements see page 17-126.
- ▶ Fuse clips see page 17-122.
- ▶ Field Modification Kits see page 17-106.
- ▶ Factory Modifications see page 17-121.
- ▶ Dimensions see page 17-166.
- ▶ Wiring Diagrams see page 17-179.
- ▶ Replacement Parts see page 17-133.
- ▶ For NO/NC SPDT contact on overload, replace "81" with "91". "81" indicates one NC contact.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110-120/220-240 [ⓓ]	A
200-208	D
220-240	G
277	L
220-240/440-480 [ⓓ]	C
440-480	H
575-600	E

For other voltages and frequencies, see Factory Modifications page 17-121.

Standard Width Enclosure with Solid State Overload, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Rating	Enclosure				
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R, NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight	
Catalog Number	List Price \$	Catalog Number	List Price \$			Catalog Number	List Price \$		Catalog Number	List Price \$	Catalog Number	List Price \$	
1/2	1/2	1/2	1/2	0	—	0.25-1	A	30	25CUA92B*	25CUA92W*	25CUA92F*	25CUA92N*	
1/2	3/4	1 1/2	2	0	—	0.75-3.4	A	30	25CUB92B*	25CUB92W*	25CUB92F*	25CUB92N*	
2	2	5	5	0	—	3-12	A1	30	25CUC92B*	25CUC92W*	25CUC92F*	25CUC92N*	
3	3	—	—	0	—	5.5-22	A1	30	25CUD92B*	25CUD92W*	25CUD92F*	25CUD92N*	
1/2	3/4	1 1/2	2	1	—	0.25-1	A	30	25DUA92B*	25DUA92W*	25DUA92F*	25DUA92N*	
1/2	3/4	1 1/2	2	1	—	0.75-3.4	A	30	25DUB92B*	25DUB92W*	25DUB92F*	25DUB92N*	
2	2	5	5	1	—	3-12	A1	30	25DUC92B*	25DUC92W*	25DUC92F*	25DUC92N*	
3	3	10	10	1	—	5.5-22	A1	30	25DUD92B*	25DUD92W*	25DUD92F*	25DUD92N*	
7 1/2	7 1/2	—	—	1	—	10-40	A1	60	25DUE92B*	25DUE92W*	25DUE92F*	25DUE92N*	
10	10	15	15	—	1 1/2	10-40	A1	60	25EUE92B*	25EUE92W*	25EUE92F*	25EUE92N*	
10	15	25	25	2	—	13-52	B	60	25FUF92B*	25FUF92W*	25FUF92F*	25FUF92N*	
15	20	30	30	—	2 1/2	25-100	B	100	25GUG92B*	25GUG92W*	25GUG92F*	25GUG92N*	
20	25	50	50	3	—	25-100	B	100	25HUG92B*	25HUG92W*	25HUG92F*	25HUG92N*	
30	40	75	75	—	3 1/2	50-200	B	200	25IUH92B*	25IUH92W*	25IUH92F*	25IUH92N*	
40	50	100	100	4	—	50-200	B	200	25JUH92B*	25JUH92W*	25JUH92F*	25JUH92N*	
75	100	200	200	5	—	55-250	—	400	25LPU92B*	25LPU92E* [ⓔ]	—	25LPU92N*	
150	200	400	400	6	—	160-630	—	600	25MPX92B*	25MPX92E* [ⓔ]	—	25MPX92N*	
—	300	600	600	7 [ⓔ]	—	400-1220	A1+CT	1200	25NUN92B*	—	—	25NUN92N*	
—	450	900	900	8 [ⓔ]	—	400-1220	A1+CT	1600	25PUN92B*	—	—	25PUN92N*	

Standard Width Enclosure with Ambient Compensated Bimetal Overload, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Disc. Amp Rating	Enclosure				
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12 NEMA 3/3R NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
Catalog Number	List Price \$	Catalog Number	List Price \$				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number
3	3	5	5	0	—	30	25CP92B*81	25CP92W*81	25CP92F*81	25CP92N*81	
7 1/2	7 1/2	10	10	1	—	30	25DP92B*81	25DP92W*81	25DP92F*81	25DP92N*81	
10	10	15	15	—	1 1/4	60	25EP92B*81	25EP92W*81	25EP92F*81	25EP92N*81	
10	15	25	25	2	—	60	25FP92B*81	25FP92W*81	25FP92F*81	25FP92N*81	
15	20	30	30	—	2 1/2	100	25GP92B*81	25GP92W*81	25GP92F*81	25GP92N*81	
25	30	50	50	3	—	100	25HP92B*81	25HP92W*81	25HP92F*81	25HP92N*81	
30	40	75	75	—	3 1/2	200	25IP92B*81	25IP92W*81	25IP92F*81	25IP92N*81	
40	50	100	100	4	—	200	25JP92B*81	25JP92W*81	25JP92F*81	25JP92N*81	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

ⓓ Dual voltage coils not available in starter sizes 5-8.

ⓔ Enclosure is NEMA Type 4 (painted steel).

ⓕ F coil 100-250V AC 50/60Hz, or DC, H coil 150-500V AC 50/60Hz, or DC

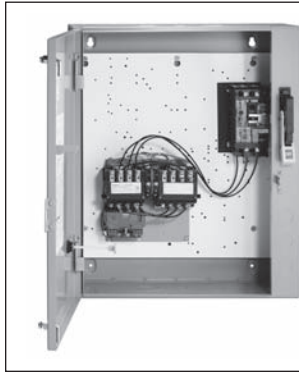
ⓖ Only available

F coil 100-250V AC 50/60Hz, or DC

Combination Reversing Heavy Duty Starters

MCP Type, Class 26

Selection



Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Field Modification Kits see page 17-106.
- ▶ Factory Modifications see page 17-121.
- ▶ Dimensions see page 17-166.
- ▶ Wiring Diagrams see page 17-179.
- ▶ Replacement Parts see page 17-133.
- ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110-120/220-240 ^①	A
200-208	D
220-240	G
277	L
220-240/440-480 ^①	C
440-480	H
575-600	E

For other voltages and frequencies, see Factory Modifications page 17-121.

Standard Width Enclosure with Solid State Overload, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 7 & 9 NEMA 3 & 4 Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12, NEMA 3/3R, NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight		
Catalog Number	List Price \$	Catalog Number	List Price \$				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$		
1/2	1/2	1	1	0	—	3	0.75-3.4	A	26CUB92B*	26CUB92W*	26CUB92F*	26CUB92H*	26CUB92N*			
2	2	5	5	0	—	10	3-12	A1	26CUC92B*	26CUC92W*	26CUC92F*	26CUC92H*	26CUC92N*			
3	3	—	—	0	—	25	5.5-22	A1	26CUD92B*	26CUD92W*	26CUD92F*	26CUD92H*	26CUD92N*			
1/2	1/2	1	1	1	—	3	0.75-3.4	A	26DUB92B*	26DUB92W*	26DUB92F*	26DUB92H*	26DUB92N*			
2	2	5	5	1	—	10	3-12	A1	26DUC92B*	26DUC92W*	26DUC92F*	26DUC92H*	26DUC92N*			
3	3	7 1/2	10	1	—	25	5.5-22	A1	26DUD92B*	26DUD92W*	26DUD92F*	26DUD92H*	26DUD92N*			
7 1/2	7 1/2	10	—	1	—	30	10-40	A1	26DUE92B*	26DUE92W*	26DUE92F*	26DUE92H*	26DUE92N*			
—	—	15	15	—	1 1/4	40	10-40	A1	26EUE92B*	26EUE92W*	26EUE92F*	26EUE92H*	26EUE92N*			
10	15	25	25	2	—	50	13-52	B	26FUF92B*	26FUF92W*	26FUF92F*	26FUF92H*	26FUF92N*			
15	20	30	30	—	2 1/4	100	25-100	B	26GUG92B*	26GUG92W*	26GUG92F*	26GUG92H*	26GUG92N*			
25	30	50	50	3	—	125	25-100	B	26HUG92B*	26HUG92W*	26HUG92F*	26HUG92H*	26HUG92N*			
30	40	75	75	—	3 1/4	125	50-200	B	26IUH92B*	26IUH92W*	26IUH92F*	26IUH92H*	26IUH92N*			
40	50	100	100	4	—	150	50-200	B	26JUH92B*	26JUH92W*	26JUH92F*	26JUH92H*	26JUH92N*			
50	75	150	200	5	—	250	55-250	—	26LPT92B*	26LPT92E* ^②	—	—	26LPT92N*			
75	100	200	—	5	—	400	55-250	—	26LP92B*	26LP92E* ^②	—	—	26LP92N*			
100	125	250	300	6	—	400	160-630	—	26MPW92B*	26MPW92E* ^②	—	—	26MPW92N*			
150	200	400	400	6	—	600	160-630	—	26MPX92B*	26MPX92E* ^②	—	—	26MPX92N*			
—	250	500	500	7* ^③	—	800	400-1220	A1+CT	26NUV92B*	—	—	—	26NUV92N*			
—	300	600	600	7* ^③	—	1000	400-1220	A1+CT	26NUY92B*	—	—	—	26NUY92N*			
—	400	800	800	8 ^④	—	1200	400-1220	A1+CT	26PUW92B*	—	—	—	26PUW92N*			
—	450	900	900	8 ^④	—	1600	400-1220	A1+CT	26PUZ92B*	—	—	—	26PUZ92N*			

Standard Width Enclosure with Ambient Compensated Bimetal Overload, 3-Phase, 3-Pole

1/2	1/2	1	1	0	—	3			26CP92BA*81	26CP92WA*81	26CP92FA*81	26CP92HA*81	26CP92NA*81
1	1	3	3	0	—	10			26CP92BB*81	26CP92WB*81	26CP92FB*81	26CP92HB*81	26CP92NB*81
3	3	5	5	0	—	25			26CP92BC*81	26CP92WC*81	26CP92FC*81	26CP92HC*81	26CP92NC*81
1/2	1/2	1	1	1	—	3			26DP92BA*81	26DP92WA*81	26DP92FA*81	26DP92HA*81	26DP92NA*81
1	1	3	3	1	—	10			26DP92BB*81	26DP92WB*81	26DP92FB*81	26DP92HB*81	26DP92NB*81
3	3	7 1/2	7 1/2	1	—	25			26DP92BD*81	26DP92WD*81	26DP92FD*81	26DP92HD*81	26DP92ND*81
7 1/2	7 1/2	10	10	1	—	30			26DP92BE*81	26DP92WE*81	26DP92FE*81	26DP92HE*81	26DP92NE*81
—	—	15	15	—	1 1/4	40			26EP92BF*81	26EP92WF*81	26EP92FF*81	26EP92HF*81	26EP92NF*81
10	10	—	—	—	1 1/4	50			26EP92BG*81	26EP92WG*81	26EP92FG*81	26EP92HG*81	26EP92NG*81
—	—	20	20	2	—	40			26FP92BH*81	26FP92WH*81	26FP92FH*81	26FP92HH*81	26FP92NH*81
10	15	25	25	2	—	50			26FP92BJ*81	26FP92WJ*81	26FP92FJ*81	26FP92HJ*81	26FP92NJ*81
10	15	30	30	—	2 1/2	50			26GP92BK*81	26GP92WK*81	26GP92FK*81	26GP92HK*81	26GP92NK*81
15	20	—	—	—	2 1/2	100			26GP92BL*81	26GP92WL*81	26GP92FL*81	26GP92HL*81	26GP92NL*81
—	—	30	30	3	—	50			26HP92BM*81	26HP92WM*81	26HP92FM*81	26HP92HM*81	26HP92NM*81
25	30	50	50	3	—	125			26HP92BN*81	26HP92WN*81	26HP92FN*81	26HP92HN*81	26HP92NN*81
30	40	75	75	—	3 1/2	125			26IP92BP*81	26IP92WP*81	26IP92FP*81	26IP92HP*81	26IP92NP*81
40	50	100	100	4	—	150			26JP92BR*81	26JP92WR*81	26JP92FR*81	26JP92HR*81	26JP92NR*81

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① Dual voltage coils not available in starter sizes 5-8.

② Enclosure is NEMA Type 4 (painted steel).

③ F coil 100-250V AC 50/60Hz, or DC,
H coil 150-500V AC 50/60Hz, or DC

④ Only available

F coil 100-250V AC 50/60Hz, or DC

Two Speed Heavy Duty Starters

Features and Benefits

General

Features

- Rugged Industrial Design
- Dual Voltage, Dual Frequency Coils
- Compact Design
- Snap-On Front Removable Auxiliary Contacts
- Electrical and Mechanical Interlocks
- Half Sizes — Space and Cost Savings
- Industrial Type Disconnect Operating Handle
- Visible Blade Disconnect Thru Size 4
- Adjustable Motor Circuit Protector
- 100,000 Amp Fault Protection with MCP or Class R Fuses
- Pilot Device Locations identified on All Enclosures
- UL Listed File #E14900
- CSA Certified File #LR6535

Applications

Multi-speed magnetic starters automatically reconnect multi-speed motor windings for the desired speed in response to a signal received from push button stations or other pilot devices.

These starters are available for two speed motors.

Consequent Pole multi-speed motors having two speeds on a single winding (consequent pole) require a starter which reconnects the motor leads to half the number of effective motor poles at the high speed point. In this type of motor, **the low speed is one half the high speed.**

Separate Windings motors having separate windings for each speed provide more varied speed combinations in that the low speed need not be one half the high speed.

Starters for separate winding motors consist of a starter unit for each speed.

Multi-speed motor starters are available for constant torque, variable torque and constant horsepower motors.

Constant Torque motors maintain constant torque at all speeds. Horsepower varies directly with speed. This type of motor is applicable to conveyors, mills and similar applications.

Variable Torque motors produce a torque characteristic which varies as the square of the speed. This type of motor is applicable to fans, blowers and centrifugal pumps.

Constant Horsepower motors maintain constant horsepower at all speeds and therefore torque varies inversely with speed. This type of motor is applicable where the same horsepower is required at all speeds. **The higher current required at low speed requires derating on starters for constant horsepower applications.** This type of motor is applicable to metal working machines such as drills, lathes, mills, bending machines, punch presses, and power wrenches.

Operation

Magnetic starters for multi-speed applications select the desired speed in accordance with the pilot control.

The shock to machinery upon the reduction of speed is greater than when the speed is increased. Therefore, the pilot control should be wired so that the stop button must be depressed before dropping to a lower speed or time delays should be used for applications requiring full automatic operations. The multi-speed controls are available with the necessary interlocks or relays to provide this type of operation.

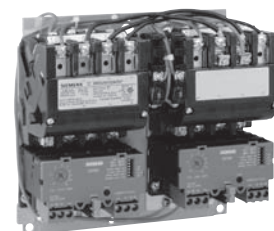
These controls may be modified for compelling or acceleration pilot control.

Selective Control permits the operator to start the motor at any speed and to change to a higher speed by merely pushing a button. To change to a lower speed it is necessary to first depress the stop button and to then press the proper speed button. Selective control is a function of the pilot control selected and requires no starter modifications.

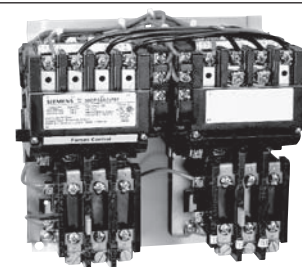
Compelling Control requires that the motor always be started at the lower speed and that the push buttons be operated in speed sequence to go to the next higher speed. To change to a lower speed, the stop button must be depressed and then the push buttons operated in speed sequence until the desired speed is reached. Compelling control can be added from the factory modification section page 17-124.

Acceleration Control provides that the motor be accelerated automatically with timers by progressively energizing the controls from the push button station from the lowest to highest speed. To change to a lower speed the stop button is depressed and then it is necessary to proceed as if starting from rest. Acceleration control can be added from the factory modification section page 17-124.

Deceleration Control provides that the motor be decelerated automatically with a timer when going from high speed to low speed. The timer allows the motor to decelerate from high speed to a lower speed before automatically restarting the motor in low speed. Deceleration control can be added from the factory modification section page 17-124.



Open Style Two Speed Starter
(ESP100 Overload)



Open Style Two Speed Starter
(Ambient Compensated Overload)

Two Speed Heavy Duty Starters

Constant or Variable Torque with Solid State Overload, Class 30

Selection

<p>2S2W Starter (ESP200 Overload)</p>	<p>Ordering Information</p> <ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Replace the (†) with the letter that corresponds to the correct low speed FLA in the FLA table.Ⓢ ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-152. ▶ Wiring Diagrams see page 17-180. ▶ Replacement Parts see page 17-133. 	<p>Coil Table</p> <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 17-121.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E	<p>Low Speed FLA Table</p> <table border="1"> <thead> <tr> <th>Size</th> <th>FLA</th> <th>OLR Frame Size</th> <th>†</th> </tr> </thead> <tbody> <tr><td>0,1</td><td>0.25–1</td><td>A</td><td>A</td></tr> <tr><td>0,1</td><td>0.75–3.4</td><td>A</td><td>B</td></tr> <tr><td>0,1</td><td>3–12</td><td>A1</td><td>C</td></tr> <tr><td>0,1</td><td>5.5–22</td><td>A1</td><td>D</td></tr> <tr><td>0-1³/₄</td><td>10–40</td><td>A1</td><td>E</td></tr> <tr><td>2-3</td><td>13–52</td><td>B</td><td>F</td></tr> <tr><td>2-3</td><td>25–100</td><td>B</td><td>G</td></tr> <tr><td>3¹/₂-4</td><td>50–200</td><td>B</td><td>H</td></tr> </tbody> </table>	Size	FLA	OLR Frame Size	†	0,1	0.25–1	A	A	0,1	0.75–3.4	A	B	0,1	3–12	A1	C	0,1	5.5–22	A1	D	0-1 ³ / ₄	10–40	A1	E	2-3	13–52	B	F	2-3	25–100	B	G	3 ¹ / ₂ -4	50–200	B	H
	60Hz Voltage	Letter																																																									
24	J																																																										
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3 ¹ / ₂ -4	50–200	B	H																																																								

One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Overload Amp Range	Frame Size	Enclosure		NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12 NEMA 3/3R Industrial Use Weatherproof			
200 Volts	230 Volts	460 Volts	575 Volts					Open Type Standard Auxiliary ContactsⓈ	List Price \$					Catalog Number	List Price \$	Catalog Number
1/2	3/4	1 1/2	2	0	—	0.75–3.4	A	30CUB†32A2V*		30CUB†32B2V*		30CUB†32W2V*		30CUB†32F2V*		30CUB†32O2V*
2	2	5	5	0	—	3–12	A1	30CUC†32A2V*		30CUC†32B2V*		30CUC†32W2V*		30CUC†32F2V*		30CUC†32O2V*
3	3	—	—	0	—	5.5–22	A1	30CUD†32A2V*		30CUD†32B2V*		30CUD†32W2V*		30CUD†32F2V*		30CUD†32O2V*
1/2	3/4	1 1/2	1 1/2	1	—	0.75–3.4	A	30DUB†32A2V*		30DUB†32B2V*		30DUB†32W2V*		30DUB†32F2V*		30DUB†32O2V*
2	2	5	5	1	—	3–12	A1	30DUC†32A2V*		30DUC†32B2V*		30DUC†32W2V*		30DUC†32F2V*		30DUC†32O2V*
3	3	10	10	1	—	5.5–22	A1	30DUD†32A2V*		30DUD†32B2V*		30DUD†32W2V*		30DUD†32F2V*		30DUD†32O2V*
7 1/2	7 1/2	—	—	1	—	10–40	A1	30DUE†32A2V*		30DUE†32B2V*		30DUE†32W2V*		30DUE†32F2V*		30DUE†32O2V*
10	10	15	15	—	1 1/2	10–40	A1	30EUE†32A2V*		30EUE†32B2V*		30EUE†32W2V*		30EUE†32F2V*		30EUE†32O2V*
10	15	25	25	2	—	13–52	B	30FUF†32A2V*		30FUF†32B2V*		30FUF†32W2V*		30FUF†32F2V*		30FUF†32O2V*
15	20	30	30	—	2 1/2	25–100	B	30GUG†32A2V*		30GUG†32B2V*		30GUG†32W2V*		30GUG†32F2V*		30GUG†32O2V*
25	30	50	50	3	—	25–100	B	30HUG†32A2V*		30HUG†32B2V*		30HUG†32W2V*		30HUG†32F2V*		30HUG†32O2V*
30	40	75	75	—	3 1/2	50–200	B	30IUH†32A2V*		30IUH†32B2V*		30IUH†32W2V*		30IUH†32F2V*		30IUH†32O2V*
40	50	100	100	4	—	50–200	B	30JUH†32A2V*		30JUH†32B2V*		30JUH†32W2V*		30JUH†32F2V*		30JUH†32O2V*

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Overload Amp Range	Frame Size	Enclosure		NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel 316 Stainless Steel (Optional)	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12 NEMA 3/3R Industrial Use Weatherproof			
200 Volts	230 Volts	460 Volts	575 Volts					Open TypeⓈ	List Price \$					Catalog Number	List Price \$	Catalog Number
1/2	3/4	1 1/2	2	0	—	0.75–3.4	A	30CUB†32A1V*		30CUB†32B1V*		30CUB†32W1V*		30CUB†32F1V*		30CUB†32O1V*
2	2	5	5	0	—	3–12	A1	30CUC†32A1V*		30CUC†32B1V*		30CUC†32W1V*		30CUC†32F1V*		30CUC†32O1V*
3	3	—	—	0	—	5.5–22	A1	30CUD†32A1V*		30CUD†32B1V*		30CUD†32W1V*		30CUD†32F1V*		30CUD†32O1V*
1/2	3/4	1 1/2	1 1/2	1	—	0.75–3.4	A	30DUB†32A1V*		30DUB†32B1V*		30DUB†32W1V*		30DUB†32F1V*		30DUB†32O1V*
2	2	5	5	1	—	3–12	A1	30DUC†32A1V*		30DUC†32B1V*		30DUC†32W1V*		30DUC†32F1V*		30DUC†32O1V*
3	3	10	10	1	—	5.5–22	A1	30DUD†32A1V*		30DUD†32B1V*		30DUD†32W1V*		30DUD†32F1V*		30DUD†32O1V*
7 1/2	7 1/2	—	—	1	—	10–40	A1	30DUE†32A1V*		30DUE†32B1V*		30DUE†32W1V*		30DUE†32F1V*		30DUE†32O1V*
10	10	15	15	—	1 1/2	10–40	A1	30EUE†32A1V*		30EUE†32B1V*		30EUE†32W1V*		30EUE†32F1V*		30EUE†32O1V*
10	15	25	25	2	—	13–52	B	30FUF†32A1V*		30FUF†32B1V*		30FUF†32W1V*		30FUF†32F1V*		30FUF†32O1V*
15	20	30	30	—	2 1/2	25–100	B	30GUG†32A1V*		30GUG†32B1V*		30GUG†32W1V*		30GUG†32F1V*		30GUG†32O1V*
25	30	50	50	3	—	25–100	B	30HUG†32A1V*		30HUG†32B1V*		30HUG†32W1V*		30HUG†32F1V*		30HUG†32O1V*
30	40	75	75	—	3 1/2	50–200	B	30IUH†32A1V*		30IUH†32B1V*		30IUH†32W1V*		30IUH†32F1V*		30IUH†32O1V*
40	50	100	100	4	—	50–200	B	30JUH†32A1V*		30JUH†32B1V*		30JUH†32W1V*		30JUH†32F1V*		30JUH†32O1V*

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

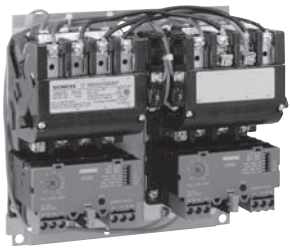
Ⓢ If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

Ⓢ Auxiliary contacts 30C-30E 4th pole built-in 30F-30J 2 NO & 2 NC

Two Speed Heavy Duty Starters

Constant HP with Solid State Overload, Class 30

Selection

 <p>2S2W Starter (ESP200 Overload)</p>	Ordering Information <ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Replace the (t) with the letter that corresponds to the correct FLA in High/Low Speed FLA Table.ⓐ ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-152. ▶ Wiring Diagrams see page 17-180. ▶ Replacement Parts see page 17-133. 	Coil Table <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 17-121.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E	High/Low Speed FLA Table ⓑ <table border="1"> <thead> <tr> <th>Size</th> <th>FLA</th> <th>OLR Frame Size</th> <th>t</th> </tr> </thead> <tbody> <tr><td>0,1</td><td>0.25–1</td><td>A</td><td>A</td></tr> <tr><td>0,1</td><td>0.75–3.4</td><td>A</td><td>B</td></tr> <tr><td>0,1</td><td>3–12</td><td>A1</td><td>C</td></tr> <tr><td>0,1</td><td>5.5–22</td><td>A1</td><td>D</td></tr> <tr><td>0-1³/₄</td><td>10–40</td><td>A1</td><td>E</td></tr> <tr><td>2-3</td><td>13–52</td><td>B</td><td>F</td></tr> <tr><td>2-3</td><td>25–100</td><td>B</td><td>G</td></tr> <tr><td>3¹/₂-4</td><td>50–200</td><td>B</td><td>H</td></tr> </tbody> </table> <p>* First (t) for high speed, second (t) for low speed. Use motor nameplate to select FLA. If motor FLA are unknown, select overload on the bases that the low speed FLA will be no greater than 50 % of high speed FLA.</p>	Size	FLA	OLR Frame Size	t	0,1	0.25–1	A	A	0,1	0.75–3.4	A	B	0,1	3–12	A1	C	0,1	5.5–22	A1	D	0-1 ³ / ₄	10–40	A1	E	2-3	13–52	B	F	2-3	25–100	B	G	3 ¹ / ₂ -4	50–200	B	H
	60Hz Voltage	Letter																																																									
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One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp						Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Open Type Standard Auxiliary Contactsⓐ		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 NEMA 3/3R Industrial Use Weatherproof	
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	0	—	30CU††32A2H*		30CU††32B2H*		30CU††32W2H*		30CU††32F2H*		30CU††32O2H*	
5	5	7½	7½	1	—	30DU††32A2H*		30DU††32B2H*		30DU††32W2H*		30DU††32F2H*		30DU††32O2H*	
7½	7½	10	10	—	1½	30EU††32A2H*		30EU††32B2H*		30EU††32W2H*		30EU††32F2H*		30EU††32O2H*	
7½	10	20	20	2	—	30FU††32A2H*		30FU††32B2H*		30FU††32W2H*		30FU††32F2H*		30FU††32O2H*	
10	15	25	25	—	2½	30GU††32A2H*		30GU††32B2H*		30GU††32W2H*		30GU††32F2H*		30GU††32O2H*	
20	25	40	40	3	—	30HU††32A2H*		30HU††32B2H*		30HU††32W2H*		30HU††32F2H*		30HU††32O2H*	
25	30	50	50	—	3½	30IU††32A2H*		30IU††32B2H*		30IU††32W2H*		30IU††32F2H*		30IU††32O2H*	
30	40	75	75	4	—	30JU††32A2H*		30JU††32B2H*		30JU††32W2H*		30JU††32F2H*		30JU††32O2H*	

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp						Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Open Type Standard Auxiliary Contactsⓐ		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 NEMA 3/3R Industrial Use Weatherproof	
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	0	—	30CU††32A1H*		30CU††32B1H*		30CU††32W1H*		30CU††32F1H*		30CU††32O1H*	
5	5	7½	7½	1	—	30DU††32A1H*		30DU††32B1H*		30DU††32W1H*		30DU††32F1H*		30DU††32O1H*	
7½	7½	10	10	—	1¾	30EU††32A1H*		30EU††32B1H*		30EU††32W1H*		30EU††32F1H*		30EU††32O1H*	
7½	10	20	20	2	—	30FU††32A1H*		30FU††32B1H*		30FU††32W1H*		30FU††32F1H*		30FU††32O1H*	
10	15	25	25	—	2½	30GU††32A1H*		30GU††32B1H*		30GU††32W1H*		30GU††32F1H*		30GU††32O1H*	
20	25	40	40	3	—	30HU††32A1H*		30HU††32B1H*		30HU††32W1H*		30HU††32F1H*		30HU††32O1H*	
25	30	50	50	—	3½	30IU††32A1H*		30IU††32B1H*		30IU††32W1H*		30IU††32F1H*		30IU††32O1H*	
30	40	75	75	4	—	30JU††32A1H*		30JU††32B1H*		30JU††32W1H*		30JU††32F1H*		30JU††32O1H*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

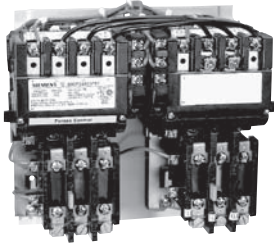
ⓐ First (t) for high speed, second (t) for low speed. Use motor nameplate information to select FLA. If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

ⓑ Auxiliary contacts
30C-30E 4th pole built-in
30F-30J 2 NO & 2 NC

Two Speed Heavy Duty Starters

Constant or Variable Torque with Ambient Compensated Bimetal Overload, Class 30

Selection

 <p>2S2W starter (Amb. Comp. Bimetal OL)</p>	Ordering Information <ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Heater elements see page 17-126 (6 required)® ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see pages 17-145 open and 17-152 enclosed. ▶ Wiring Diagrams see page 17-180. ▶ Replacement Parts see page 17-133. ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact. 	Coil Table <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 17-121.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
24	J																					
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277	L																					
220–240/440–480	C																					
440–480	H																					
575–600	E																					

One Winding Consequent Pole, 3 Phase (Constant or Variable Torque)

Max Hp				Contact Amp Rating	NEMA Size	Half Size	Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts				Open Type [®]		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 NEMA 3/3R Industrial Use Weatherproof	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	18	0	—	30CP32A2V*81		30CP32B2V*81		30CP32W2V*81		30CP32F2V*81		30CP32O2V*81	
7½	7½	10	10	27	1	—	30DP32A2V*81		30DP32B2V*81		30DP32W2V*81		30DP32F2V*81		30DP32O2V*81	
10	10	15	15	40	—	1¾	30EP32A2V*81		30EP32B2V*81		30EP32W2V*81		30EP32F2V*81		30EP32O2V*81	
10	15	25	25	45	2	—	30FP32A2V*81		30FP32B2V*81		30FP32W2V*81		30FP32F2V*81		30FP32O2V*81	
15	20	30	30	60	—	2½	30GP32A2V*81		30GP32B2V*81		30GP32W2V*81		30GP32F2V*81		30GP32O2V*81	
25	30	50	50	90	3	—	30HP32A2V*81		30HP32B2V*81		30HP32W2V*81		30HP32F2V*81		30HP32O2V*81	
30	40	75	75	115	—	3½	30IP32A2V*81		30IP32B2V*81		30IP32W2V*81		30IP32F2V*81		30IP32O2V*81	
40	50	100	100	135	4	—	30JG32A2V*81		30JG32B2V*81		30JG32W2V*81		30JG32F2V*81		30JG32O2V*81	

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp				Contact Amp Rating	NEMA Size	Half Size	Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts				Open Type [®]		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 NEMA 3/3R Industrial Use Weatherproof	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	18	0	—	30CP32A1V*81		30CP32B1V*81		30CP32W1V*81		30CP32F1V*81		30CP32O1V*81	
7½	7½	10	10	27	1	—	30DP32A1V*81		30DP32B1V*81		30DP32W1V*81		30DP32F1V*81		30DP32O1V*81	
10	10	15	15	40	—	1¾	30EP32A1V*81		30EP32B1V*81		30EP32W1V*81		30EP32F1V*81		30EP32O1V*81	
10	15	25	25	45	2	—	30FP32A1V*81		30FP32B1V*81		30FP32W1V*81		30FP32F1V*81		30FP32O1V*81	
15	20	30	30	60	—	2½	30GP32A1V*81		30GP32B1V*81		30GP32W1V*81		30GP32F1V*81		30GP32O1V*81	
25	30	50	50	90	3	—	30HP32A1V*81		30HP32B1V*81		30HP32W1V*81		30HP32F1V*81		30HP32O1V*81	
30	40	75	75	115	—	3½	30IP32A1V*81		30IP32B1V*81		30IP32W1V*81		30IP32F1V*81		30IP32O1V*81	
40	50	100	100	135	4	—	30JG32A1V*81		30JG32B1V*81		30JG32W1V*81		30JG32F1V*81		30JG32O1V*81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

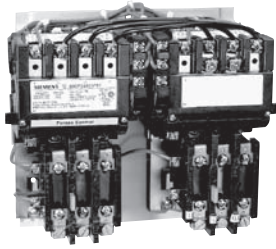
① If motor FLA are unknown, select heater elements on the basis that low speed FLA will be no greater than 50% of high speed FLA.

② Auxiliary contacts
30C-30E 4th pole built-in
30F-30J 2 NO & 2 NC

Two Speed Heavy Duty Starters

Constant HP with Ambient Compensated Bimetal Overload, Class 30

Selection



2S2W starter
(Amb. Comp. Bimetal OL)

Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Heater elements see page 17-126 (6 required)Ⓣ.
- ▶ Field Modification Kits see page 17-106.
- ▶ Factory Modifications see page 17-121.
- ▶ Dimensions see pages 17-145 open and 17-152 enclosed.
- ▶ Wiring Diagrams see page 17-180.
- ▶ Replacement Parts see page 17-133.
- ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240	A
200–208	D
220–240	G
277	L
220–240/440–480	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-121.

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp								Enclosure											
200 Volts	230 Volts	460 Volts	575 Volts	Cont-actor Amp Rating	NEMA Size	Half Size		Open Type [Ⓣ]		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 NEMA 3/3R Industrial Use Weatherproof			
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$		
2	2	3	3	18	0	—		30CP32A2H*81		30CP32B2H*81		30CP32W2H*81		30CP32F2H*81		30CP3202H*81			
5	5	7½	7½	27	1	—		30DP32A2H*81		30DP32B2H*81		30DP32W2H*81		30DP32F2H*81		30DP3202H*81			
7½	7½	10	10	40	—	1¼		30EP32A2H*81		30EP32B2H*81		30EP32W2H*81		30EP32F2H*81		30EP3202H*81			
7½	10	20	20	45	2	—		30FP32A2H*81		30FP32B2H*81		30FP32W2H*81		30FP32F2H*81		30FP3202H*81			
10	15	25	25	60	—	2½		30GP32A2H*81		30GP32B2H*81		30GP32W2H*81		30GP32F2H*81		30GP3202H*81			
20	25	40	40	90	3	—		30HP32A2H*81		30HP32B2H*81		30HP32W2H*81		30HP32F2H*81		30HP3202H*81			
25	30	50	50	115	—	3½		30IP32A2H*81		30IP32B2H*81		30IP32W2H*81		30IP32F2H*81		30IP3202H*81			
30	40	75	75	135	4	—		30JG32A2H*81		30JG32B2H*81		30JG32W2H*81		30JG32F2H*81		30JG3202H*81			

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp								Enclosure											
200 Volts	230 Volts	460 Volts	575 Volts	Cont-actor Amp Rating	NEMA Size	Half Size		Open Type [Ⓣ]		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 NEMA 3/3R Industrial Use Weatherproof			
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$		
2	2	3	3	18	0	—		30CP32A1H*81		30CP32B1H*81		30CP32W1H*81		30CP32F1H*81		30CP3201H*81			
5	5	7½	7½	27	1	—		30DP32A1H*81		30DP32B1H*81		30DP32W1H*81		30DP32F1H*81		30DP3201H*81			
7½	7½	10	10	40	—	1¼		30EP32A1H*81		30EP32B1H*81		30EP32W1H*81		30EP32F1H*81		30EP3201H*81			
7½	10	20	20	45	2	—		30FP32A1H*81		30FP32B1H*81		30FP32W1H*81		30FP32F1H*81		30FP3201H*81			
10	15	25	25	60	—	2½		30GP32A1H*81		30GP32B1H*81		30GP32W1H*81		30GP32F1H*81		30GP3201H*81			
20	25	40	40	90	3	—		30HP32A1H*81		30HP32B1H*81		30HP32W1H*81		30HP32F1H*81		30HP3201H*81			
25	30	50	50	115	—	3½		30IP32A1H*81		30IP32B1H*81		30IP32W1H*81		30IP32F1H*81		30IP3201H*81			
30	40	75	75	135	4	—		30JG32A1H*81		30JG32B1H*81		30JG32W1H*81		30JG32F1H*81		30JG3201H*81			

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

Ⓣ If motor FLA are unknown, select heater element on the basis that low speed FLA will be no greater than 50% of high speed FLA.

Ⓣ Auxiliary contacts
30C-30E 4th pole built-in
30F-30J 2 NO & 2 NC

Combination Two Speed Heavy Duty Starters

Non-Fusible, Constant or Variable Torque with Solid State Overload, Class 32

Selection



Ordering Information	Coil Table	Low Speed FLA Table																																																												
<ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Replace the (†) with the letter that corresponds to the correct low speed FLA in the FLA table.® ▶ Fuse clips see page 17-122. ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-168. ▶ Wiring Diagrams see page 17-180. ▶ Replacement Parts see page 17-133. 	<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> <th>Size</th> <th>FLA</th> <th>OLR Frame Size</th> <th>†</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td><td>0,1</td><td>0.25-1</td><td>A</td><td>A</td></tr> <tr><td>120</td><td>F</td><td>0,1</td><td>0.75-3.4</td><td>A</td><td>B</td></tr> <tr><td>110-120/220-240[Ⓢ]</td><td>A</td><td>0,1</td><td>3-12</td><td>A1</td><td>C</td></tr> <tr><td>200-208</td><td>D</td><td>0,1</td><td>5.5-22</td><td>A1</td><td>D</td></tr> <tr><td>220-240</td><td>G</td><td>0-1^{3/4}</td><td>10-40</td><td>A1</td><td>E</td></tr> <tr><td>277</td><td>L</td><td>2-3</td><td>13-52</td><td>B</td><td>F</td></tr> <tr><td>220-240/440-480[Ⓢ]</td><td>C</td><td>2-3</td><td>25-100</td><td>B</td><td>G</td></tr> <tr><td>440-480</td><td>H</td><td>3^{1/2}-4</td><td>50-200</td><td>B</td><td>H</td></tr> <tr><td>575-600</td><td>E</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†	24	J	0,1	0.25-1	A	A	120	F	0,1	0.75-3.4	A	B	110-120/220-240 [Ⓢ]	A	0,1	3-12	A1	C	200-208	D	0,1	5.5-22	A1	D	220-240	G	0-1 ^{3/4}	10-40	A1	E	277	L	2-3	13-52	B	F	220-240/440-480 [Ⓢ]	C	2-3	25-100	B	G	440-480	H	3 ^{1/2} -4	50-200	B	H	575-600	E					
	60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†																																																								
24	J	0,1	0.25-1	A	A																																																									
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440-480	H	3 ^{1/2} -4	50-200	B	H																																																									
575-600	E																																																													
	For other voltages and frequencies, see Factory Modifications page 17-121.																																																													

One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight				
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Disc. Amp Range	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	3/4	1 1/2	2	0	—	0.75-3.4	A	30	32CUB†92B2V2*		32CUB†92W2V2*		32CUB†92F2V2*		32CUB†92N2V2*	
2	2	5	5	0	—	3-12	A1	30	32CUC†92B2V2*		32CUC†92W2V2*		32CUC†92F2V2*		32CUC†92N2V2*	
3	3	—	—	0	—	5.5-22	A1	30	32CUD†92B2V2*		32CUD†92W2V2*		32CUD†92F2V2*		32CUD†92N2V2*	
1/2	3/4	1 1/2	1 1/2	1	—	0.75-3.4	A	30	32DUB†92B2V2*		32DUB†92W2V2*		32DUB†92F2V2*		32DUB†92N2V2*	
2	2	5	5	1	—	3-12	A1	30	32DUC†92B2V2*		32DUC†92W2V2*		32DUC†92F2V2*		32DUC†92N2V2*	
3	3	10	10	1	—	5.5-22	A1	30	32DUD†92B2V2*		32DUD†92W2V2*		32DUD†92F2V2*		32DUD†92N2V2*	
7 1/2	7 1/2	—	—	1	—	10-40	A1	60	32DUE†92B2V2*		32DUE†92W2V2*		32DUE†92F2V2*		32DUE†92N2V2*	
10	10	15	15	—	1 1/2	10-40	A1	60	32EUE†92B2V2*		32EUE†92W2V2*		32EUE†92F2V2*		32EUE†92N2V2*	
10	15	25	25	2	—	13-52	B	60	32FUF†92B2V2*		32FUF†92W2V2*		32FUF†92F2V2*		32FUF†92N2V2*	
15	20	30	30	—	2 1/2	25-100	B	100	32GUG†92B2V2*		32GUG†92W2V2*		32GUG†92F2V2*		32GUG†92N2V2*	
20	25	50	50	3	—	25-100	B	100	32HUG†92B2V2*		32HUG†92W2V2*		32HUG†92F2V2*		32HUG†92N2V2*	
30	40	75	75	—	3 1/2	50-200	B	200	32IUH†92B2V2*		32IUH†92W2V2*		32IUH†92F2V2*		32IUH†92N2V2*	
40	50	100	100	4	—	50-200	B	200	32JUH†92B2V2*		32JUH†92W2V2*		32JUH†92F2V2*		32JUH†92N2V2*	

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight				
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Disc. Amp Range	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	3/4	1 1/2	2	0	—	0.75-3.4	A	30	32CUB†92B1V2*		32CUB†92W1V2*		32CUB†92F1V2*		32CUB†92N1V2*	
2	2	5	5	0	—	3-12	A1	30	32CUC†92B1V2*		32CUC†92W1V2*		32CUC†92F1V2*		32CUC†92N1V2*	
3	3	—	—	0	—	5.5-22	A1	30	32CUD†92B1V2*		32CUD†92W1V2*		32CUD†92F1V2*		32CUD†92N1V2*	
1/2	3/4	1 1/2	1 1/2	1	—	0.75-3.4	A	30	32DUB†92B1V2*		32DUB†92W1V2*		32DUB†92F1V2*		32DUB†92N1V2*	
2	2	5	5	1	—	3-12	A1	30	32DUC†92B1V2*		32DUC†92W1V2*		32DUC†92F1V2*		32DUC†92N1V2*	
3	3	10	10	1	—	5.5-22	A1	30	32DUD†92B1V2*		32DUD†92W1V2*		32DUD†92F1V2*		32DUD†92N1V2*	
7 1/2	7 1/2	—	—	1	—	10-40	A1	60	32DUE†92B1V2*		32DUE†92W1V2*		32DUE†92F1V2*		32DUE†92N1V2*	
10	10	15	15	—	1 1/2	10-40	A1	60	32EUE†92B1V2*		32EUE†92W1V2*		32EUE†92F1V2*		32EUE†92N1V2*	
10	15	25	25	2	—	13-52	B	60	32FUF†92B1V2*		32FUF†92W1V2*		32FUF†92F1V2*		32FUF†92N1V2*	
15	20	30	30	—	2 1/2	25-100	B	100	32GUG†92B1V2*		32GUG†92W1V2*		32GUG†92F1V2*		32GUG†92N1V2*	
20	25	50	50	3	—	25-100	B	100	32HUG†92B1V2*		32HUG†92W1V2*		32HUG†92F1V2*		32HUG†92N1V2*	
30	40	75	75	—	3 1/2	50-200	B	200	32IUH†92B1V2*		32IUH†92W1V2*		32IUH†92F1V2*		32IUH†92N1V2*	
40	50	100	100	4	—	50-200	B	200	32JUH†92B1V2*		32JUH†92W1V2*		32JUH†92F1V2*		32JUH†92N1V2*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

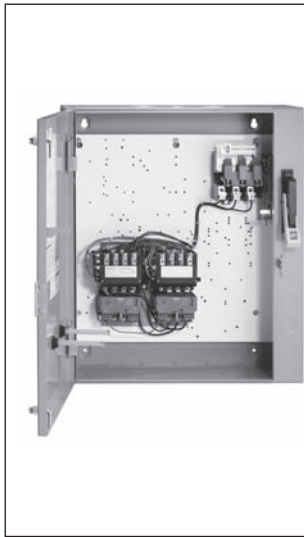
Ⓢ Dual voltage coils not available in modified starters.

Ⓢ If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

Combination Two Speed Heavy Duty Starters

Non-Fusible, Constant Horsepower with Solid State Overload, Class 32

Selection



Ordering Information	Coil Table	High/Low Speed FLA Table [Ⓞ]																																																												
<ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Replace the (†) with the letter that corresponds to the correct FLA in the High/Low Speed FLA Table.[Ⓞ] ▶ Fuse clips see page 17-122. ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-168. ▶ Wiring Diagrams see page 17-180. ▶ Replacement Parts see page 17-133. 	<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> <th>Size</th> <th>FLA</th> <th>OLR Frame Size</th> <th>†</th> </tr> </thead> <tbody> <tr> <td>24</td> <td>J</td> <td>0,1</td> <td>0.25-1</td> <td>A</td> <td>A</td> </tr> <tr> <td>120</td> <td>F</td> <td>0,1</td> <td>0.75-3.4</td> <td>A</td> <td>B</td> </tr> <tr> <td>110-120/220-240[Ⓞ]</td> <td>A</td> <td>0,1</td> <td>3-12</td> <td>A1</td> <td>C</td> </tr> <tr> <td>200-208</td> <td>D</td> <td>0,1</td> <td>5.5-22</td> <td>A1</td> <td>D</td> </tr> <tr> <td>220-240</td> <td>G</td> <td>0-1^{3/4}</td> <td>10-40</td> <td>A1</td> <td>E</td> </tr> <tr> <td>277</td> <td>L</td> <td>2-3</td> <td>13-52</td> <td>B</td> <td>F</td> </tr> <tr> <td>220-240/440-480[Ⓞ]</td> <td>C</td> <td>2-3</td> <td>25-100</td> <td>B</td> <td>G</td> </tr> <tr> <td>440-480</td> <td>H</td> <td>3^{1/2}-4</td> <td>50-200</td> <td>B</td> <td>H</td> </tr> <tr> <td>575-600</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†	24	J	0,1	0.25-1	A	A	120	F	0,1	0.75-3.4	A	B	110-120/220-240 [Ⓞ]	A	0,1	3-12	A1	C	200-208	D	0,1	5.5-22	A1	D	220-240	G	0-1 ^{3/4}	10-40	A1	E	277	L	2-3	13-52	B	F	220-240/440-480 [Ⓞ]	C	2-3	25-100	B	G	440-480	H	3 ^{1/2} -4	50-200	B	H	575-600	E					<p>* First (†) for high speed, second (†) for low speed. Use motor nameplate to select FLA. If motor FLA are unknown, select overload on the bases that the low speed FLA will be no greater than 50 % of high speed FLA.</p>
	60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†																																																								
24	J	0,1	0.25-1	A	A																																																									
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575-600	E																																																													
<p>For other voltages and frequencies see Factory Modifications page 17-121.</p>																																																														

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Enclosure				
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$		
2	2	3	3	0	—	—	—	30	32CU††92B2H2*	32CU††92W2H2*	4054.00	32CU††92F2H2*	32CU††92N2H2*
5	5	7½	7½	1	—	—	—	30	32DU††92B2H2*	32DU††92W2H2*	4173.00	32DU††92F2H2*	32DU††92N2H2*
7½	7½	10	10	—	1½	—	—	60	32EU††92B2H2*	32EU††92W2H2*	4873.00	32EU††92F2H2*	32EU††92N2H2*
7½	10	20	20	2	—	—	—	60	32FU††92B2H2*	32FU††92W2H2*	6146.00	32FU††92F2H2*	32FU††92N2H2*
10	15	25	25	—	2½	—	—	100	32GU††92B2H2*	32GU††92W2H2*	7219.00	32GU††92F2H2*	32GU††92N2H2*
20	25	40	40	3	—	—	—	100	32HU††92B2H2*	32HU††92W2H2*	9321.00	32HU††92F2H2*	32HU††92N2H2*
25	30	50	50	—	3½	—	—	200	32IU††92B2H2*	32IU††92W2H2*	18079.00	32IU††92F2H2*	32IU††92N2H2*
30	40	75	75	4	—	—	—	200	32JU††92B2H2*	32JU††92W2H2*	19263.00	32JU††92F2H2*	32JU††92N2H2*

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Enclosure			
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	
2	2	3	3	0	—	—	—	30	32CU††92B1H2*	32CU††92W1H2*	32CU††92F1H2*	32CU††92N1H2*
5	5	7½	7½	1	—	—	—	30	32DU††92B1H2*	32DU††92W1H2*	32DU††92F1H2*	32DU††92N1H2*
7½	7½	10	10	—	1½	—	—	60	32EU††92B1H2*	32EU††92W1H2*	32EU††92F1H2*	32EU††92N1H2*
7½	10	20	20	2	—	—	—	60	32FU††92B1H2*	32FU††92W1H2*	32FU††92F1H2*	32FU††92N1H2*
10	15	25	25	—	2½	—	—	100	32GU††92B1H2*	32GU††92W1H2*	32GU††92F1H2*	32GU††92N1H2*
20	25	40	40	3	—	—	—	100	32HU††92B1H2*	32HU††92W1H2*	32HU††92F1H2*	32HU††92N1H2*
25	30	50	50	—	3½	—	—	200	32IU††92B1H2*	32IU††92W1H2*	32IU††92F1H2*	32IU††92N1H2*
30	40	75	75	4	—	—	—	200	32JU††92B1H2*	32JU††92W1H2*	32JU††92F1H2*	32JU††92N1H2*

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

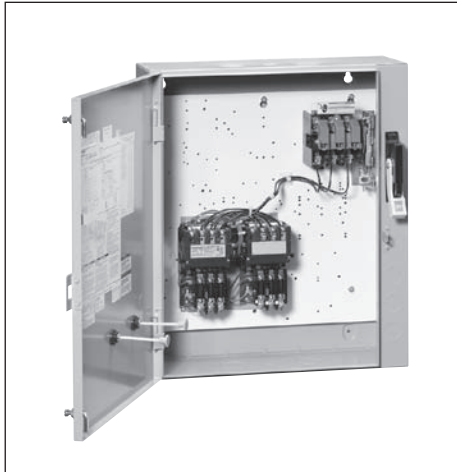
Ⓞ Dual voltage coils not available in modified starters.

Ⓞ First † for high speed, second † for low speed. Use motor nameplate information to select FLA. If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

Combination Two Speed Heavy Duty Starters

Non-Fusible, Constant or Variable Torque with Ambient Compensated Bimetal Overload, Class 32

Selection



Ordering Information	Coil Table																				
<ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Heater elements see page 17-126. (6 required) ▶ Fuse clips see page 17-122. ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-168. ▶ Wiring Diagrams see page 17-180. ▶ Replacement Parts see page 17-133. ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact. 	<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240[Ⓢ]</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480[Ⓢ]</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 17-121.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240 [Ⓢ]	A	200–208	D	220–240	G	277	L	220–240/440–480 [Ⓢ]	C	440–480	H	575–600	E
	60Hz Voltage	Letter																			
24	J																				
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220–240	G																				
277	L																				
220–240/440–480 [Ⓢ]	C																				
440–480	H																				
575–600	E																				

One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp								Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Disc Half Size	Amp Rating		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	30		32CP92B2V2*81		32CP92W2V2*81		32CP92F2V2*81		32CP92N2V2*81	
7½	7½	10	10	1	—	30		32DP92B2V2*81		32DP92W2V2*81		32DP92F2V2*81		32DP92N2V2*81	
10	10	15	15	—	1¼	60		32EP92B2V2*81		32EP92W2V2*81		32EP92F2V2*81		32EP92N2V2*81	
10	15	25	25	2	—	60		32FP92B2V2*81		32FP92W2V2*81		32FP92F2V2*81		32FP92N2V2*81	
15	20	30	30	—	2½	100		32GP92B2V2*81		32GP92W2V2*81		32GP92F2V2*81		32GP92N2V2*81	
20	25	50	50	3	—	100		32HP92B2V2*81		32HP92W2V2*81		32HP92F2V2*81		32HP92N2V2*81	
30	40	75	75	—	3½	200		32IP92B2V2*81		32IP92W2V2*81		32IP92F2V2*81		32IP92N2V2*81	
40	50	100	100	4	—	200		32JP92B2V2*81		32JP92W2V2*81		32JP92F2V2*81		32JP92N2V2*81	

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp								Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Disc Half Size	Amp Rating		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	30		32CP92B1V2*81		32CP92W1V2*81		32CP92F1V2*81		32CP92N1V2*81	
7½	7½	10	10	1	—	30		32DP92B1V2*81		32DP92W1V2*81		32DP92F1V2*81		32DP92N1V2*81	
10	10	15	15	—	1¼	60		32EP92B1V2*81		32EP92W1V2*81		32EP92F1V2*81		32EP92N1V2*81	
10	15	25	25	2	—	60		32FP92B1V2*81		32FP92W1V2*81		32FP92F1V2*81		32FP92N1V2*81	
15	20	30	30	—	2½	100		32GP92B1V2*81		32GP92W1V2*81		32GP92F1V2*81		32GP92N1V2*81	
20	25	50	50	3	—	100		32HP92B1V2*81		32HP92W1V2*81		32HP92F1V2*81		32HP92N1V2*81	
30	40	75	75	—	3½	200		32IP92B1V2*81		32IP92W1V2*81		32IP92F1V2*81		32IP92N1V2*81	
40	50	100	100	4	—	200		32JP92B1V2*81		32JP92W1V2*81		32JP92F1V2*81		32JP92N1V2*81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

Ⓢ Dual voltage coils not available in modified starters.

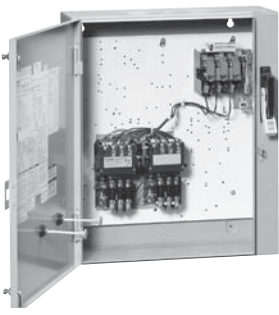
NEMA & General Purpose Control

CONTROL PRODUCTS

Combination Two Speed Heavy Duty Starters

Non-Fusible, Constant Horsepower with Ambient Compensated Bimetal Overload, Class 32

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Heater elements see page 17-126. (6 Required) ▶ Fuse clips see page 17-122. ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-168. ▶ Wiring Diagrams see page 17-180. ▶ Replacement Parts see page 17-133. ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact. 	Coil Table <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240^⓪</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480^⓪</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 17-121.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240 ^⓪	A	200–208	D	220–240	G	277	L	220–240/440–480 ^⓪	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
24	J																					
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277	L																					
220–240/440–480 ^⓪	C																					
440–480	H																					
575–600	E																					

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp				NEMA Size	Disc Half Size	Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	0	—	30	32CP92B2H2*81		32CP92W2H2*81		32CP92F2H2*81		32CP92N2H2*81	
5	5	7½	7½	1	—	30	32DP92B2H2*81		32DP92W2H2*81		32DP92F2H2*81		32DP92N2H2*81	
7½	7½	10	10	—	1¼	60	32EP92B2H2*81		32EP92W2H2*81		32EP92F2H2*81		32EP92N2H2*81	
7½	10	20	20	2	—	60	32FP92B2H2*81		32FP92W2H2*81		32FP92F2H2*81		32FP92N2H2*81	
10	15	25	25	—	2½	100	32GP92B2H2*81		32GP92W2H2*81		32GP92F2H2*81		32GP92N2H2*81	
20	25	40	40	3	—	100	32HP92B2H2*81		32HP92W2H2*81		32HP92F2H2*81		32HP92N2H2*81	
25	30	50	50	—	3½	200	32IP92B2H2*81		32IP92W2H2*81		32IP92F2H2*81		32IP92N2H2*81	
30	40	75	75	4	—	200	32JP92B2H2*81		32JP92W2H2*81		32JP92F2H2*81		32JP92N2H2*81	

NEMA & General Purpose Control

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp				NEMA Size	Half Size	Disc Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	0	—	30	32CP92B1H2*81		32CP92W1H2*81		32CP92F1H2*81		32CP92N1H2*81	
5	5	7½	7½	1	—	30	32DP92B1H2*81		32DP92W1H2*81		32DP92F1H2*81		32DP92N1H2*81	
7½	7½	10	10	—	1¼	60	32EP92B1H2*81		32EP92W1H2*81		32EP92F1H2*81		32EP92N1H2*81	
7½	10	20	20	2	—	60	32FP92B1H2*81		32FP92W1H2*81		32FP92F1H2*81		32FP92N1H2*81	
10	15	25	25	—	2½	100	32GP92B1H2*81		32GP92W1H2*81		32GP92F1H2*81		32GP92N1H2*81	
20	25	40	40	3	—	100	32HP92B1H2*81		32HP92W1H2*81		32HP92F1H2*81		32HP92N1H2*81	
25	30	50	50	—	3½	200	32IP92B1H2*81		32IP92W1H2*81		32IP92F1H2*81		32IP92N1H2*81	
30	40	75	75	4	—	200	32JP92B1H2*81		32JP92W1H2*81		32JP92F1H2*81		32JP92N1H2*81	

CONTROL PRODUCTS 17

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

^⓪ Dual voltage coils not available in modified starters.

Combination Two Speed Heavy Duty Starters

MCP Type, Constant or Variable Torque with Solid State Overload, Class 32

Selection



Ordering Information	Coil Table	Low Speed FLA Table																																																												
<ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Replace the (t) with the letter that corresponds to the correct low speed FLA in the FLA table.® ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-168. ▶ Wiring Diagrams see page 17-180. ▶ Replacement Parts see page 17-133. 	<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> <th>Size</th> <th>FLA</th> <th>OLR Frame Size</th> <th>†</th> </tr> </thead> <tbody> <tr> <td>24</td> <td>J</td> <td>0,1</td> <td>0.25-1</td> <td>A</td> <td>A</td> </tr> <tr> <td>120</td> <td>F</td> <td>0,1</td> <td>0.75-3.4</td> <td>A</td> <td>B</td> </tr> <tr> <td>110-120/220-240[ⓐ]</td> <td>A</td> <td>0,1</td> <td>3-12</td> <td>A1</td> <td>C</td> </tr> <tr> <td>200-208</td> <td>D</td> <td>0,1</td> <td>5.5-22</td> <td>A1</td> <td>D</td> </tr> <tr> <td>220-240</td> <td>G</td> <td>0-1³/₄</td> <td>10-40</td> <td>A1</td> <td>E</td> </tr> <tr> <td>277</td> <td>L</td> <td>2-3</td> <td>13-52</td> <td>B</td> <td>F</td> </tr> <tr> <td>220-240/440-480[ⓐ]</td> <td>C</td> <td>2-3</td> <td>25-100</td> <td>B</td> <td>G</td> </tr> <tr> <td>440-480</td> <td>H</td> <td>3¹/₂-4</td> <td>50-200</td> <td>B</td> <td>H</td> </tr> <tr> <td>575-600</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†	24	J	0,1	0.25-1	A	A	120	F	0,1	0.75-3.4	A	B	110-120/220-240 [ⓐ]	A	0,1	3-12	A1	C	200-208	D	0,1	5.5-22	A1	D	220-240	G	0-1 ³ / ₄	10-40	A1	E	277	L	2-3	13-52	B	F	220-240/440-480 [ⓐ]	C	2-3	25-100	B	G	440-480	H	3 ¹ / ₂ -4	50-200	B	H	575-600	E					
	60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†																																																								
24	J	0,1	0.25-1	A	A																																																									
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	For other voltages and frequencies, see Factory Modifications page 17-121.																																																													

One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight				
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Amp Range	Frame Size	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	3/4	1 1/2	2	0	—	3	0.75-3.4	A	32CUB†92B2V*		32CUB†92W2V*		32CUB†92F2V*		32CUB†92N2V*	
2	2	5	5	0	—	10	3-12	A1	32CUC†92B2V*		32CUC†92W2V*		32CUC†92F2V*		32CUC†92N2V*	
3	3	—	—	0	—	25	5.5-22	A1	32CUD†92B2V*		32CUD†92W2V*		32CUD†92F2V*		32CUD†92N2V*	
1/2	3/4	1 1/2	1 1/2	1	—	3	0.75-3.4	A	32DUB†92B2V*		32DUB†92W2V*		32DUB†92F2V*		32DUB†92N2V*	
2	2	5	5	1	—	10	3-12	A1	32DUC†92B2V*		32DUC†92W2V*		32DUC†92F2V*		32DUC†92N2V*	
3	3	10	10	1	—	25	5.5-22	A1	32DUD†92B2V*		32DUD†92W2V*		32DUD†92F2V*		32DUD†92N2V*	
7 1/2	7 1/2	—	—	1	—	30	10-40	A1	32DUE†92B2V*		32DUE†92W2V*		32DUE†92F2V*		32DUE†92N2V*	
—	—	15	15	—	1 1/2	40	10-40	A1	32EUE†92B2V*		32EUE†92W2V*		32EUE†92F2V*		32EUE†92N2V*	
10	15	25	25	2	—	50	13-52	B	32FUF†92B2V*		32FUF†92W2V*		32FUF†92F2V*		32FUF†92N2V*	
15	20	30	30	—	2 1/2	100	25-100	B	32GUG†92B2V*		32GUG†92W2V*		32GUG†92F2V*		32GUG†92N2V*	
25	30	50	50	3	—	125	25-100	B	32HUG†92B2V*		32HUG†92W2V*		32HUG†92F2V*		32HUG†92N2V*	
30	40	75	75	—	3 1/2	125	50-200	B	32IUH†92B2V*		32IUH†92W2V*		32IUH†92F2V*		32IUH†92N2V*	
40	50	100	100	4	—	150	50-200	B	32JUH†92B2V*		32JUH†92W2V*		32JUH†92F2V*		32JUH†92N2V*	

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight				
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Amp Range	Frame Size	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	3/4	1 1/2	2	0	—	3	0.75-3.4	A	32CUB†92B1V*		32CUB†92W1V*		32CUB†92F1V*		32CUB†92N1V*	
2	2	5	5	0	—	10	3-12	A1	32CUC†92B1V*		32CUC†92W1V*		32CUC†92F1V*		32CUC†92N1V*	
3	3	—	—	0	—	25	5.5-22	A1	32CUD†92B1V*		32CUD†92W1V*		32CUD†92F1V*		32CUD†92N1V*	
1/2	3/4	1 1/2	1 1/2	1	—	3	0.75-3.4	A	32DUB†92B1V*		32DUB†92W1V*		32DUB†92F1V*		32DUB†92N1V*	
2	2	5	5	1	—	10	3-12	A1	32DUC†92B1V*		32DUC†92W1V*		32DUC†92F1V*		32DUC†92N1V*	
3	3	10	10	1	—	25	5.5-22	A1	32DUD†92B1V*		32DUD†92W1V*		32DUD†92F1V*		32DUD†92N1V*	
7 1/2	7 1/2	—	—	1	—	30	10-40	A1	32DUE†92B1V*		32DUE†92W1V*		32DUE†92F1V*		32DUE†92N1V*	
—	—	15	15	—	1 1/2	40	10-40	A1	32EUE†92B1V*		32EUE†92W1V*		32EUE†92F1V*		32EUE†92N1V*	
10	15	25	25	2	—	50	13-52	B	32FUF†92B1V*		32FUF†92W1V*		32FUF†92F1V*		32FUF†92N1V*	
15	20	30	30	—	2 1/2	100	25-100	B	32GUG†92B1V*		32GUG†92W1V*		32GUG†92F1V*		32GUG†92N1V*	
25	30	50	50	3	—	125	25-100	B	32HUG†92B1V*		32HUG†92W1V*		32HUG†92F1V*		32HUG†92N1V*	
30	40	75	75	—	3 1/2	125	50-200	B	32IUH†92B1V*		32IUH†92W1V*		32IUH†92F1V*		32IUH†92N1V*	
40	50	100	100	4	—	150	50-200	B	32JUH†92B1V*		32JUH†92W1V*		32JUH†92F1V*		32JUH†92N1V*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

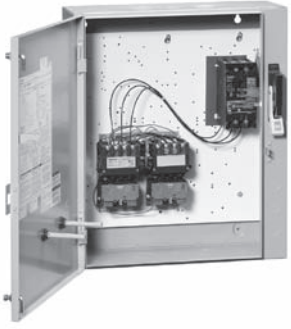
ⓐ Dual voltage coils not available in modified starters.

® If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

Combination Two Speed Heavy Duty Starters

MCP Type, Constant Horsepower with Solid State Overload, Class 32

Selection

	<p>Ordering Information</p> <ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Replace the (†) with the letter that corresponds to the correct FLA in the High/Low Speed FLA table.® ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-168. ▶ Wiring Diagrams see page 17-180. ▶ Replacement Parts see page 17-133. 	<p>Coil Table</p>		<p>High/Low Speed FLA Table®</p>																																																												
		<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> <th>Size</th> <th>FLA</th> <th>OLR Frame Size</th> <th>†</th> </tr> </thead> <tbody> <tr> <td>24</td> <td>J</td> <td>0,1</td> <td>0.25-1</td> <td>A</td> <td>A</td> </tr> <tr> <td>120</td> <td>F</td> <td>0,1</td> <td>0.75-3.4</td> <td>A</td> <td>B</td> </tr> <tr> <td>110-120/220-240[Ⓞ]</td> <td>A</td> <td>0,1</td> <td>3-12</td> <td>A1</td> <td>C</td> </tr> <tr> <td>200-208</td> <td>D</td> <td>0,1</td> <td>5.5-22</td> <td>A1</td> <td>D</td> </tr> <tr> <td>220-240</td> <td>G</td> <td>0-1^{3/4}</td> <td>10-40</td> <td>A1</td> <td>E</td> </tr> <tr> <td>277</td> <td>L</td> <td>2-3</td> <td>13-52</td> <td>B</td> <td>F</td> </tr> <tr> <td>220-240/440-480[Ⓞ]</td> <td>C</td> <td>2-3</td> <td>25-100</td> <td>B</td> <td>G</td> </tr> <tr> <td>440-480</td> <td>H</td> <td>3^{1/2}-4</td> <td>50-200</td> <td>B</td> <td>H</td> </tr> <tr> <td>575-600</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†	24	J	0,1	0.25-1	A	A	120	F	0,1	0.75-3.4	A	B	110-120/220-240 [Ⓞ]	A	0,1	3-12	A1	C	200-208	D	0,1	5.5-22	A1	D	220-240	G	0-1 ^{3/4}	10-40	A1	E	277	L	2-3	13-52	B	F	220-240/440-480 [Ⓞ]	C	2-3	25-100	B	G	440-480	H	3 ^{1/2} -4	50-200	B	H	575-600	E					<p>* First (†) for high speed, second (†) for low speed. Use motor nameplate to select FLA. If motor FLA are unknown, select overload on the bases that the low speed FLA will be no greater than 50 % of high speed FLA.</p>	
60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†																																																											
24	J	0,1	0.25-1	A	A																																																											
120	F	0,1	0.75-3.4	A	B																																																											
110-120/220-240 [Ⓞ]	A	0,1	3-12	A1	C																																																											
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220-240	G	0-1 ^{3/4}	10-40	A1	E																																																											
277	L	2-3	13-52	B	F																																																											
220-240/440-480 [Ⓞ]	C	2-3	25-100	B	G																																																											
440-480	H	3 ^{1/2} -4	50-200	B	H																																																											
575-600	E																																																															
		<p>For other voltages and frequencies see Factory Modifications page 17-121.</p>																																																														

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp							Overload		Enclosure								
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight		
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	0	—	10	—	A or A1	32CU††92B2H*		32CU††92W2H*		32CU††92F2H*		32CU††92N2H*		
5	5	7½	7½	1	—	25	—	A or A1	32DU††92B2H*		32DU††92W2H*		32DU††92F2H*		32DU††92N2H*		
7½	7½	10	10	—	1½	40	—	A1	32EU††92B2H*		32EU††92W2H*		32EU††92F2H*		32EU††92N2H*		
7½	10	20	20	2	—	50	—	B	32FU††92B2H*		32FU††92W2H*		32FU††92F2H*		32FU††92N2H*		
10	15	25	25	—	2½	100	—	B	32GU††92B2H*		32GU††92W2H*		32GU††92F2H*		32GU††92N2H*		
20	25	40	40	3	—	100	—	B	32HU††92B2H*		32HU††92W2H*		32HU††92F2H*		32HU††92N2H*		
25	30	50	50	—	3½	125	—	B	32IU††92B2H*		32IU††92W2H*		32IU††92F2H*		32IU††92N2H*		
30	40	75	75	4	—	150	—	B	32JU††92B2H*		32JU††92W2H*		32JU††92F2H*		32JU††92N2H*		

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp							Overload		Enclosure								
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight		
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	0	—	10	—	A or A1	32CU††92B1H*		32CU††92W1H*		32CU††92F1H*		32CU††92N1H*		
5	5	7½	7½	1	—	25	—	A or A1	32DU††92B1H*		32DU††92W1H*		32DU††92F1H*		32DU††92N1H*		
7½	7½	10	10	—	1½	40	—	A1	32EU††92B1H*		32EU††92W1H*		32EU††92F1H*		32EU††92N1H*		
7½	10	20	20	2	—	50	—	B	32FU††92B1H*		32FU††92W1H*		32FU††92F1H*		32FU††92N1H*		
10	15	25	25	—	2½	100	—	B	32GU††92B1H*		32GU††92W1H*		32GU††92F1H*		32GU††92N1H*		
20	25	40	40	3	—	100	—	B	32HU††92B1H*		32HU††92W1H*		32HU††92F1H*		32HU††92N1H*		
25	30	50	50	—	3½	125	—	B	32IU††92B1H*		32IU††92W1H*		32IU††92F1H*		32IU††92N1H*		
30	40	75	75	4	—	150	—	B	32JU††92B1H*		32JU††92W1H*		32JU††92F1H*		32JU††92N1H*		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Ⓞ Dual voltage coils not available in modified starters.

® First † for high speed, second † for low speed. Use motor nameplate information to select FLA. If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

NEMA & General Purpose Control

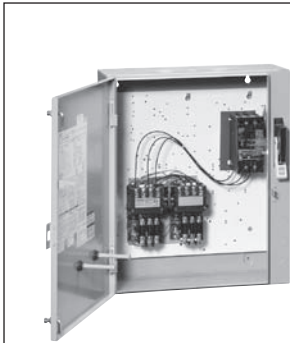
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CONTROL PRODUCTS

Combination Two Speed Heavy Duty Starters

MCP Type, Constant or Variable Torque w/Ambient Compensated Bimetal Overload, Class 32

Selection



Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Heater elements see page 17-126. (6 Required)
- ▶ Field Modification Kits see page 17-106.
- ▶ Factory Modifications see page 17-121.
- ▶ Dimensions see page 17-168.
- ▶ Wiring Diagrams see page 17-180.
- ▶ Replacement Parts see page 17-133.
- ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110-120/220-240 [Ⓢ]	A
200-208	D
220-240	G
277	L
220-240/440-480 [Ⓢ]	C
440-480	H
575-600	E

For other voltages and frequencies, see Factory Modifications page 17-121.

One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp						NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts	NEMA 1 General Purpose					NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight			
				Catalog Number	List Price \$				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$		
1/2	1/2	1	1	0	—	3	32CP92B2VA*81	32CP92W2VA*81	32CP92F2VA*81	32CP92N2VA*81						
1	1	3	3	0	—	10	32CP92B2VB*81	32CP92W2VB*81	32CP92F2VB*81	32CP92N2VB*81						
3	3	5	5	0	—	25	32CP92B2VC*81	32CP92W2VC*81	32CP92F2VC*81	32CP92N2VC*81						
1 1/2	1 1/2	1	1	1	—	3	32DP92B2VA*81	32DP92W2VA*81	32DP92F2VA*81	32DP92N2VA*81						
1	1	3	3	1	—	10	32DP92B2VB*81	32DP92W2VB*81	32DP92F2VB*81	32DP92N2VB*81						
3	3	7 1/2	7 1/2	1	—	25	32DP92B2VD*81	32DP92W2VD*81	32DP92F2VD*81	32DP92N2VD*81						
7 1/2	7 1/2	10	10	1	—	30	32DP92B2VE*81	32DP92W2VE*81	32DP92F2VE*81	32DP92N2VE*81						
—	—	15	15	—	1 1/4	40	32EP92B2VF*81	32EP92W2VF*81	32EP92F2VF*81	32EP92N2VF*81						
10	10	—	—	—	1 1/4	50	32EP92B2VG*81	32EP92W2VG*81	32EP92F2VG*81	32EP92N2VG*81						
—	—	20	20	2	—	40	32FP92B2VH*81	32FP92W2VH*81	32FP92F2VH*81	32FP92N2VH*81						
10	15	25	25	2	—	50	32FP92B2VJ*81	32FP92W2VJ*81	32FP92F2VJ*81	32FP92N2VJ*81						
10	15	30	30	—	2 1/2	50	32GP92B2VK*81	32GP92W2VK*81	32GP92F2VK*81	32GP92N2VK*81						
15	20	—	—	—	2 1/2	100	32GP92B2VL*81	32GP92W2VL*81	32GP92F2VL*81	32GP92N2VL*81						
—	—	30	30	3	—	50	32HP92B2VM*81	32HP92W2VM*81	32HP92F2VM*81	32HP92N2VM*81						
25	30	50	50	3	—	125	32HP92B2VN*81	32HP92W2VN*81	32HP92F2VN*81	32HP92N2VN*81						
30	40	75	75	—	3 1/2	125	32IP92B2VP*81	32IP92W2VP*81	32IP92F2VP*81	32IP92N2VP*81						
40	50	100	100	4	—	150	32JP92B2VR*81	32JP92W2VR*81	32JP92F2VR*81	32JP92N2VR*81						

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp						NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts	NEMA 1 General Purpose					NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight			
				Catalog Number	List Price \$				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$		
1/2	1/2	1	1	0	—	3	32CP92B1VA*81	32CP92W1VA*81	32CP92F1VA*81	32CP92N1VA*81						
1	1	3	3	0	—	10	32CP92B1VB*81	32CP92W1VB*81	32CP92F1VB*81	32CP92N1VB*81						
3	3	5	5	0	—	25	32CP92B1VC*81	32CP92W1VC*81	32CP92F1VC*81	32CP92N1VC*81						
1/2	1/2	1	1	1	—	3	32DP92B1VA*81	32DP92W1VA*81	32DP92F1VA*81	32DP92N1VA*81						
1	1	3	3	1	—	10	32DP92B1VB*81	32DP92W1VB*81	32DP92F1VB*81	32DP92N1VB*81						
3	3	7 1/2	7 1/2	1	—	25	32DP92B1VD*81	32DP92W1VD*81	32DP92F1VD*81	32DP92N1VD*81						
7 1/2	7 1/2	10	10	1	—	30	32DP92B1VE*81	32DP92W1VE*81	32DP92F1VE*81	32DP92N1VE*81						
—	—	15	15	—	1 1/4	40	32EP92B1VF*81	32EP92W1VF*81	32EP92F1VF*81	32EP92N1VF*81						
10	10	—	—	—	1 1/4	50	32EP92B1VG*81	32EP92W1VG*81	32EP92F1VG*81	32EP92N1VG*81						
—	—	20	20	2	—	40	32FP92B1VH*81	32FP92W1VH*81	32FP92F1VH*81	32FP92N1VH*81						
10	15	25	25	2	—	50	32FP92B1VJ*81	32FP92W1VJ*81	32FP92F1VJ*81	32FP92N1VJ*81						
10	15	30	30	—	2 1/2	50	32GP92B1VK*81	32GP92W1VK*81	32GP92F1VK*81	32GP92N1VK*81						
15	20	—	—	—	2 1/2	100	32GP92B1VL*81	32GP92W1VL*81	32GP92F1VL*81	32GP92N1VL*81						
—	—	30	30	3	—	50	32HP92B1VM*81	32HP92W1VM*81	32HP92F1VM*81	32HP92N1VM*81						
25	30	50	50	3	—	125	32HP92B1VN*81	32HP92W1VN*81	32HP92F1VN*81	32HP92N1VN*81						
30	40	75	75	—	3 1/2	125	32IP92B1VP*81	32IP92W1VP*81	32IP92F1VP*81	32IP92N1VP*81						
40	50	100	100	4	—	150	32JP92B1VR*81	32JP92W1VR*81	32JP92F1VR*81	32JP92N1VR*81						

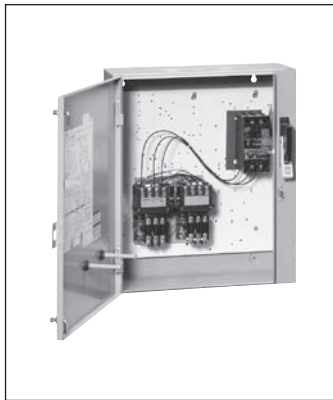
Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

Ⓢ Dual voltage coils not available in modified starters.

Combination Two Speed Heavy Duty Starters

MCP, Constant Horsepower w/ Ambient Compensated Bimetal Overload, Class 32

Selection



Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Heater elements see page 17-126. (6 Required)
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- ▶ Factory Modifications see page 17-121.
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Coil Table

60Hz Voltage	Letter
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110-120/220-240 [Ⓞ]	A
200-208	D
220-240	G
277	L
220-240/440-480 [Ⓞ]	C
440-480	H
575-600	E

For other voltages and frequencies, see Factory Modifications page 17-121.

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp						Motor Circuit Interrupter ETI Amps	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1	1	0	—	3	32CP92B2HA*81		32CP92W2HA*81		32CP92F2HA*81		32CP92N2HA*81	
1 1/2	1 1/2	3	3	0	—	10	32CP92B2HB*81		32CP92W2HB*81		32CP92F2HB*81		32CP92N2HB*81	
2	2	—	—	0	—	25	32CP92B2HC*81		32CP92W2HC*81		32CP92F2HC*81		32CP92N2HC*81	
1/2	1/2	1	1	1	—	3	32DP92B2HA*81		32DP92W2HA*81		32DP92F2HA*81		32DP92N2HA*81	
1 1/2	1 1/2	3	3	1	—	10	32DP92B2HB*81		32DP92W2HB*81		32DP92F2HB*81		32DP92N2HB*81	
3	3	7 1/2	7 1/2	1	—	25	32DP92B2HD*81		32DP92W2HD*81		32DP92F2HD*81		32DP92N2HD*81	
5	5	—	—	1	—	30	32DP92B2HE*81		32DP92W2HE*81		32DP92F2HE*81		32DP92N2HE*81	
—	—	10	10	—	1 1/4	40	32EP92B2HF*81		32EP92W2HF*81		32EP92F2HF*81		32EP92N2HF*81	
7 1/2	7 1/2	—	—	—	1 1/4	50	32EP92B2HG*81		32EP92W2HG*81		32EP92F2HG*81		32EP92N2HG*81	
—	7 1/2	15	20	2	—	40	32FP92B2HH*81		32FP92W2HH*81		32FP92F2HH*81		32FP92N2HH*81	
7 1/2	10	20	—	2	—	50	32FP92B2HJ*81		32FP92W2HJ*81		32FP92F2HJ*81		32FP92N2HJ*81	
—	—	30	30	—	2 1/2	50	32GP92B2HK*81		32GP92W2HK*81		32GP92F2HK*81		32GP92N2HK*81	
10	15	30	40	3	—	50	32HP92B2HM*81		32HP92W2HM*81		32HP92F2HM*81		32HP92N2HM*81	
20	25	40	—	3	—	100	32HP92B2HN*81		32HP92W2HN*81		32HP92F2HN*81		32HP92N2HN*81	
25	30	50	50	—	3 1/2	125	32IP92B2HP*81		32IP92W2HP*81		32IP92F2HP*81		32IP92N2HP*81	
30	40	75	75	4	—	150	32JP92B2HR*81		32JP92W2HR*81		32JP92F2HR*81		32JP92N2HR*81	

NEMA & General Purpose Control

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CONTROL PRODUCTS

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp						Motor Circuit Interrupter ETI Amps	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1	1	0	—	3	32CP92B1HA*81		32CP92W1HA*81		32CP92F1HA*81		32CP92N1HA*81	
1 1/2	1 1/2	3	3	0	—	10	32CP92B1HB*81		32CP92W1HB*81		32CP92F1HB*81		32CP92N1HB*81	
2	2	—	—	0	—	25	32CP92B1HC*81		32CP92W1HC*81		32CP92F1HC*81		32CP92N1HC*81	
1/2	1/2	1	1	1	—	3	32DP92B1HA*81		32DP92W1HA*81		32DP92F1HA*81		32DP92N1HA*81	
1 1/2	1 1/2	3	3	1	—	10	32DP92B1HB*81		32DP92W1HB*81		32DP92F1HB*81		32DP92N1HB*81	
3	3	7 1/2	7 1/2	1	—	25	32DP92B1HD*81		32DP92W1HD*81		32DP92F1HD*81		32DP92N1HD*81	
5	5	—	—	1	—	30	32DP92B1HE*81		32DP92W1HE*81		32DP92F1HE*81		32DP92N1HE*81	
—	—	10	10	—	1 1/4	40	32EP92B1HF*81		32EP92W1HF*81		32EP92F1HF*81		32EP92N1HF*81	
7 1/2	7 1/2	—	—	—	1 1/4	50	32EP92B1HG*81		32EP92W1HG*81		32EP92F1HG*81		32EP92N1HG*81	
—	7 1/2	15	20	2	—	40	32FP92B1HH*81		32FP92W1HH*81		32FP92F1HH*81		32FP92N1HH*81	
7 1/2	10	20	—	2	—	50	32FP92B1HJ*81		32FP92W1HJ*81		32FP92F1HJ*81		32FP92N1HJ*81	
—	—	30	30	—	2 1/2	50	32GP92B1HK*81		32GP92W1HK*81		32GP92F1HK*81		32GP92N1HK*81	
10	15	30	40	3	—	50	32HP92B1HM*81		32HP92W1HM*81		32HP92F1HM*81		32HP92N1HM*81	
20	25	40	—	3	—	100	32HP92B1HN*81		32HP92W1HN*81		32HP92F1HN*81		32HP92N1HN*81	
25	30	50	50	—	3 1/2	125	32IP92B1HP*81		32IP92W1HP*81		32IP92F1HP*81		32IP92N1HP*81	
30	40	75	75	4	—	150	32JP92B1HR*81		32JP92W1HR*81		32JP92F1HR*81		32JP92N1HR*81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

[Ⓞ] Dual voltage coils not available in modified starters.

Reduced Voltage Heavy Duty Starters

Features and Benefits

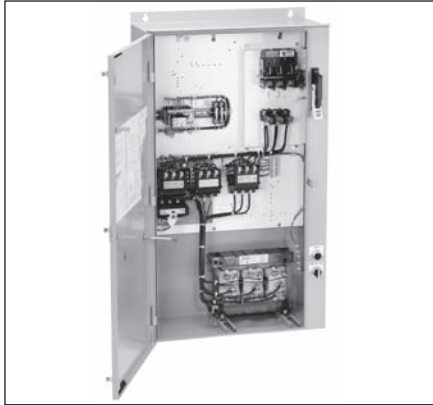
General

Siemens manufactures the three commonly used electromechanical reduced voltage starters. Each one is designed for specific application requirements and consists of auto transformer, wye-delta and partwinding starters.

The reduced voltage starter:

- Reduces inrush current
- Provides smoother acceleration of the load
- Reduces starting torque
- Reduces stresses on mechanical linkages

Combination and non-combination reduced voltage starter sizes range from 0 to 6 including Siemens exclusive motormatched half-sizes. Enclosure types include 1, 3R/12, 4 painted and 4/4X stainless steel. UL listed file #E14900 (class 36); file #E185287 (class 37). CSA certified file #LR 6535 (class 36 & 37).



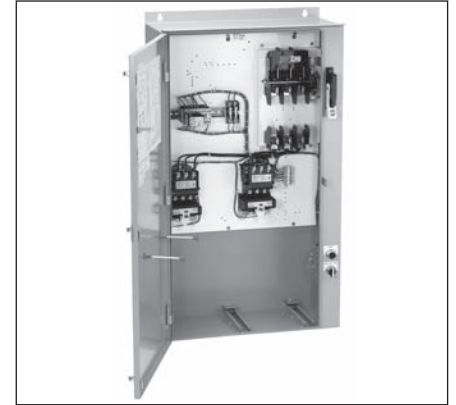
Auto Transformer Starter

- Maximum torque per amp
- Three coil auto transformer for balanced starting currents
- 50, 65 and 80% voltage taps
- Closed circuit transition
- Adjustable starting time
- Solid-state OLR overload as standard
- CPT supplied as standard
- Wide range of factory modifications



Wye-Delta Starter

- Lowest starting torque
- Closed or open circuit transition
- Adjustable starting time
- Solid-state OLR overload as standard
- CPT supplied as standard
- Wide range of factory modifications



Part-Winding Starter

- Simplest design – most economical
- Adjustable starting time
- Solid-state OLR overload as standard
- CPT supplied as standard
- Wide range of factory modifications

Various Methods of Electro-Mechanical Reduced Voltage Motor Starting —A General Comparison

Characteristic	Autotransformer			Part-Winding 2 step	Wye-Delta
	50% Tap	65% Tap	80% Tap		
Starting current drawn from line as % of that which would be drawn upon full voltage starting	25%	42%	64%	65%	33%
Starting current drawn by the motor	50%	65%	80%	65%	58%
Starting torque developed as % of that which would be developed on full voltage starting	25%	42%	64%	40%	33%
Smoothness of acceleration	First in order of Smoothness			Third in order of Smoothness	Second in order of Smoothness
Allowable accelerating times (typical)	15 seconds at 200HP max. or 30 seconds on 200HP based on NEMA medium duty transformers			5 seconds max. Limited by motor design	5-60 seconds Limited by motor design
Starting current and torque and adjustments	Adjustable within limits of various taps			Fixed	Fixed

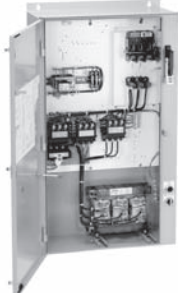
NEMA & General Purpose Control

17 CONTROL PRODUCTS

Reduced Voltage Heavy Duty Starters

Auto Transformer with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-169. ▶ Wiring Diagrams see page 17-183. ▶ Replacement Parts see page 17-133. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 1 General Purpose Enclosures

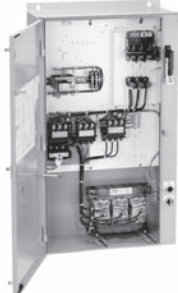
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	(1¼)	10-40	A1	36EJET6BD		60	37EJET6BDD		60A/250V	37EJET6BDF		50	37EJET6BDP	
	10	2	13-52	B	36FUFT6BD		60	37FUFT6BDD		60A/250V	37FUFT6BDF		50	37FUFT6BDP	
	15	(2½)	25-100	B	36GUGT6BD		100	37GUGT6BDD		100A/250V	37GUGT6BDF		100	37GUGT6BDP	
	25	3	25-100	B	36HUGT6BD		100	37HUGT6BDD		100A/250V	37HUGT6BDF		100	37HUGT6BDP	
	30	(3½)	50-200	B	36IUHT6BD		200	37IUHT6BDD		200A/250V	37IUHT6BDF		125	37IUHT6BDP	
	40	4	50-200	B	36JUHT6BD		200	37JUHT6BDD		200A/250V	37JUHT6BDF		150	37JUHT6BDP	
	50	5	55-250	—	—	—	—	—	—	—	—	—	250	37LPST6BDP	
	75	5	55-250	—	—	36LPUT6BD		400	37LPUT6BDD		400A/250V	37LPUT6BDF		400	37LPUT6BDP
150	6	160-630	—	—	36MPXT6BD		600	37MPXT6BDD		600A/250V	37MPXT6BDF		600	37MPXT6BDP	
230	10	(1¼)	10-40	A1	36EJET2BG		60	37EJET2BGD		60A/250V	37EJET2BGF		50	37EJET2BGP	
	15	2	13-52	B	36FUFT2BG		60	37FUFT2BGD		60A/250V	37FUFT2BGF		50	37FUFT2BGP	
	20	(2½)	25-100	B	36GUGT2BG		100	37GUGT2BGD		100A/250V	37GUGT2BGF		100	37GUGT2BGP	
	30	3	25-100	B	36HUGT2BG		100	37HUGT2BGD		100A/250V	37HUGT2BGF		100	37HUGT2BGP	
	40	(3½)	50-200	B	36IUHT2BG		200	37IUHT2BGD		200A/250V	37IUHT2BGF		125	37IUHT2BGP	
	50	4	50-200	B	36JUHT2BG		200	37JUHT2BGD		200A/250V	37JUHT2BGF		150	37JUHT2BGP	
	75	5	55-250	—	—	—	—	—	—	—	—	—	250	37LPST2BGP	
	100	5	55-250	—	—	36LPUT2BG		400	37LPUT2BGD		400A/250V	37LPUT2BGF		400	37LPUT2BGP
200	6	160-630	—	—	36MPXT2BG		600	37MPXT2BGD		600A/250V	37MPXT2BGF		600	37MPXT2BGP	
460	15	(1¼)	10-40	A1	36EJET4BH		60	37EJET4BHD		60A/600V	37EJET4BHF		50	37EJET4BHP	
	25	2	13-52	B	36FUFT4BH		60	37FUFT4BHD		60A/600V	37FUFT4BHF		50	37FUFT4BHP	
	30	(2½)	13-52	B	36GUGT4BH		100	37GUGT4BHD		100A/600V	37GUGT4BHF		100	37GUGT4BHP	
	50	3	25-100	B	36HUGT4BH		100	37HUGT4BHD		100A/600V	37HUGT4BHF		100	37HUGT4BHP	
	75	(3½)	50-200	B	36IUHT4BH		200	37IUHT4BHD		200A/600V	37IUHT4BHF		125	37IUHT4BHP	
	100	4	50-200	B	36JUHT4BH		200	37JUHT4BHD		200A/600V	37JUHT4BHF		150	37JUHT4BHP	
	150	5	55-250	—	—	—	—	—	—	—	—	—	250	37LPST4BHP	
	200	5	55-250	—	—	36LPUT4BH		400	37LPUT4BHD		400A/600V	37LPUT4BHF		400	37LPUT4BHP
400	6	160-630	—	—	36MPXT4BH		600	37MPXT4BHD		600A/600V	37MPXT4BHF		600	37MPXT4BHP	
575	15	(1¼)	10-40	A1	36EJET5BE		60	37EJET5BED		60A/600V	37EJET5BEF		50	37EJET5BEP	
	25	2	13-52	B	36FUFT5BE		60	37FUFT5BED		60A/600V	37FUFT5BEF		50	37FUFT5BEP	
	30	(2½)	13-52	B	36GUGT5BE		100	37GUGT5BED		100A/600V	37GUGT5BEF		100	37GUGT5BEP	
	50	3	25-100	B	36HUGT5BE		100	37HUGT5BED		100A/600V	37HUGT5BEF		100	37HUGT5BEP	
	75	(3½)	50-200	B	36IUHT5BE		200	37IUHT5BED		200A/600V	37IUHT5BEF		125	37IUHT5BEP	
	100	4	50-200	B	36JUHT5BE		200	37JUHT5BED		200A/600V	37JUHT5BEF		150	37JUHT5BEP	
	150	5	55-250	—	—	—	—	—	—	—	—	—	250	37LPST5BEP	
	200	5	55-250	—	—	36LPUT5BE		400	37LPUT5BED		400A/600V	37LPUT5BEF		400	37LPUT5BEP
400	6	160-630	—	—	36MPXT5BE		600	37MPXT5BED		600A/600V	37MPXT5BEF		600	37MPXT5BEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Auto Transformer with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-169. ▶ Wiring Diagrams see page 17-183. ▶ Replacement Parts see page 17-133. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 4 Painted Enclosures

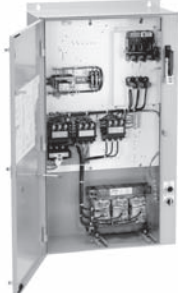
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	(1¼)	10-40	A1	36EUT6ED		60	37EUT6EDD		60A/250V	37EUT6EDF		50	37EUT6EDP	
	10	2	13-52	B	36FUT6ED		60	37FUT6EDD		60A/250V	37FUT6EDF		50	37FUT6EDP	
	15	(2½)	25-100	B	36GUGT6ED		100	37GUGT6EDD		100A/250V	37GUGT6EDF		100	37GUGT6EDP	
	25	3	25-100	B	36HUGT6ED		100	37HUGT6EDD		100A/250V	37HUGT6EDF		100	37HUGT6EDP	
	30	(3½)	50-200	B	36IUHT6ED		200	37IUHT6EDD		200A/250V	37IUHT6EDF		125	37IUHT6EDP	
	40	4	50-200	B	36JUHT6ED		200	37JUHT6EDD		200A/250V	37JUHT6EDF		150	37JUHT6EDP	
	50	5	55-250	—	—		—	—		—	—		250	37LPST6EDP	
	75	5	55-250	—	—	36LPUT6ED		400	37LPUT6EDD		400A/250V	37LPUT6EDF		400	37LPUT6EDP
150	6	160-630	—	—	36MPXT6ED		600	37MPXT6EDD		600A/250V	37MPXT6EDF		600	37MPXT6EDP	
230	10	(1¼)	10-40	A1	36EUT2EG		60	37EUT2EGD		60A/250V	37EUT2EGF		50	37EUT2EGP	
	15	2	13-52	B	36FUT2EG		60	37FUT2EGD		60A/250V	37FUT2EGF		50	37FUT2EGP	
	20	(2½)	25-100	B	36GUGT2EG		100	37GUGT2EGD		100A/250V	37GUGT2EGF		100	37GUGT2EGP	
	30	3	25-100	B	36HUGT2EG		100	37HUGT2EGD		100A/250V	37HUGT2EGF		100	37HUGT2EGP	
	40	(3½)	50-200	B	36IUHT2EG		200	37IUHT2EGD		200A/250V	37IUHT2EGF		125	37IUHT2EGP	
	50	4	50-200	B	36JUHT2EG		200	37JUHT2EGD		200A/250V	37JUHT2EGF		150	37JUHT2EGP	
	75	5	55-250	—	—		—	—		—	—		250	37LPST2EGP	
	100	5	55-250	—	—	36LPUT2EG		400	37LPUT2EGD		400A/250V	37LPUT2EGF		400	37LPUT2EGP
200	6	160-630	—	—	36MPXT2EG		600	37MPXT2EGD		600A/250V	37MPXT2EGF		600	37MPXT2EGP	
460	15	(1¼)	10-40	A1	36EUT4EH		60	37EUT4EHD		60A/600V	37EUT4EHF		50	37EUT4EHP	
	25	2	13-52	B	36FUT4EH		60	37FUT4EHD		60A/600V	37FUT4EHF		50	37FUT4EHP	
	30	(2½)	13-52	B	36GUGT4EH		100	37GUGT4EHD		100A/600V	37GUGT4EHF		100	37GUGT4EHP	
	50	3	25-100	B	36HUGT4EH		100	37HUGT4EHD		100A/600V	37HUGT4EHF		100	37HUGT4EHP	
	75	(3½)	50-200	B	36IUHT4EH		200	37IUHT4EHD		200A/600V	37IUHT4EHF		125	37IUHT4EHP	
	100	4	50-200	B	36JUHT4EH		200	37JUHT4EHD		200A/600V	37JUHT4EHF		150	37JUHT4EHP	
	150	5	55-250	—	—		—	—		—	—		250	37LPST4EHP	
	200	5	55-250	—	—	36LPUT4EH		400	37LPUT4EHD		400A/600V	37LPUT4EHF		400	37LPUT4EHP
400	6	160-630	—	—	36MPXT4EH		600	37MPXT4EHD		600A/600V	37MPXT4EHF		600	37MPXT4EHP	
575	15	(1¼)	10-40	A1	36EUT5EE		60	37EUT5EED		60A/600V	37EUT5EEF		50	37EUT5EEP	
	25	2	13-52	B	36FUT5EE		60	37FUT5EED		60A/600V	37FUT5EEF		50	37FUT5EEP	
	30	(2½)	13-52	B	36GUGT5EE		100	37GUGT5EED		100A/600V	37GUGT5EEF		100	37GUGT5EEP	
	50	3	25-100	B	36HUGT5EE		100	37HUGT5EED		100A/600V	37HUGT5EEF		100	37HUGT5EEP	
	75	(3½)	50-200	B	36IUHT5EE		200	37IUHT5EED		200A/600V	37IUHT5EEF		125	37IUHT5EEP	
	100	4	50-200	B	36JUHT5EE		200	37JUHT5EED		200A/600V	37JUHT5EEF		150	37JUHT5EEP	
	150	5	55-250	—	—		—	—		—	—		250	37LPST5EEP	
	200	5	55-250	—	—	36LPUT5EE		400	37LPUT5EED		400A/600V	37LPUT5EEF		400	37LPUT5EEP
400	6	160-630	—	—	36MPXT5EE		600	37MPXT5EED		600A/600V	37MPXT5EEF		600	37MPXT5EEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Auto Transformer with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-169. ▶ Wiring Diagrams see page 17-183. ▶ Replacement Parts see page 17-133. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

NEMA 4/4X Stainless Steel Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	(1¼)	10-40	A1	36EJET6WD		60	37EJET6WDD		60A/250V	37EJET6WDF		50	37EJET6WDP	
	10	2	13-52	B	36FUFT6WD		60	37FUFT6WDD		60A/250V	37FUFT6WDF		50	37FUFT6WDP	
	15	(2½)	25-100	B	36GUGT6WD		100	37GUGT6WDD		100A/250V	37GUGT6WDF		100	37GUGT6WDP	
	25	3	25-100	B	36HUGT6WD		100	37HUGT6WDD		100A/250V	37HUGT6WDF		100	37HUGT6WDP	
	30	(3½)	50-200	B	36IUHT6WD		200	37IUHT6WDD		200A/250V	37IUHT6WDF		125	37IUHT6WDP	
	40	4	50-200	B	36JUHT6WD		200	37JUHT6WDD		200A/250V	37JUHT6WDF		150	37JUHT6WDP	
230	10	(1¼)	10-40	A1	36EJET2WG		60	37EJET2WGD		60A/250V	37EJET2WGF		50	37EJET2WGP	
	15	2	13-52	B	36FUFT2WG		60	37FUFT2WGD		60A/250V	37FUFT2WGF		50	37FUFT2WGP	
	20	(2½)	25-100	B	36GUGT2WG		100	37GUGT2WGD		100A/250V	37GUGT2WGF		100	37GUGT2WGP	
	30	3	25-100	B	36HUGT2WG		100	37HUGT2WGD		100A/250V	37HUGT2WGF		100	37HUGT2WGP	
	40	(3½)	50-200	B	36IUHT2WG		200	37IUHT2WGD		200A/250V	37IUHT2WGF		125	37IUHT2WGP	
	50	4	50-200	B	36JUHT2WG		200	37JUHT2WGD		200A/250V	37JUHT2WGF		150	37JUHT2WGP	
460	15	(1¼)	10-40	A1	36EJET4WH		60	37EJET4WHD		60A/600V	37EJET4WHF		50	37EJET4WHP	
	25	2	13-52	B	36FUFT4WH		60	37FUFT4WHD		60A/600V	37FUFT4WHF		50	37FUFT4WHP	
	30	(2½)	13-52	B	36GUGT4WH		100	37GUGT4WHD		100A/600V	37GUGT4WHF		100	37GUGT4WHP	
	50	3	25-100	B	36HUGT4WH		100	37HUGT4WHD		100A/600V	37HUGT4WHF		100	37HUGT4WHP	
	75	(3½)	50-200	B	36IUHT4WH		200	37IUHT4WHD		200A/600V	37IUHT4WHF		125	37IUHT4WHP	
	100	4	50-200	B	36JUHT4WH		200	37JUHT4WHD		200A/600V	37JUHT4WHF		150	37JUHT4WHP	
575	15	(1¼)	10-40	A1	36EJET5WE		60	37EJET5WED		60A/600V	37EJET5WEF		50	37EJET5WEP	
	25	2	13-52	B	36FUFT5WE		60	37FUFT5WED		60A/600V	37FUFT5WEF		50	37FUFT5WEP	
	30	(2½)	13-52	B	36GUGT5WE		100	37GUGT5WED		100A/600V	37GUGT5WEF		100	37GUGT5WEP	
	50	3	25-100	B	36HUGT5WE		100	37HUGT5WED		100A/600V	37HUGT5WEF		100	37HUGT5WEP	
	75	(3½)	50-200	B	36IUHT5WE		200	37IUHT5WED		200A/600V	37IUHT5WEF		125	37IUHT5WEP	
	100	4	50-200	B	36JUHT5WE		200	37JUHT5WED		200A/600V	37JUHT5WEF		150	37JUHT5WEP	

NEMA & General Purpose Control


17 CONTROL PRODUCTS

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Auto Transformer with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-169. ▶ Wiring Diagrams see page 17-183. ▶ Replacement Parts see page 17-133. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 12, NEMA 3/3R


Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	(1¼)	10-40	A1	36EUET6ND		60	37EUET6NDD		60A/250V	37EUET6NDF		50	37EUET6NDP	
	10	2	13-52	B	36FUFT6ND		60	37FUFT6NDD		60A/250V	37FUFT6NDF		50	37FUFT6NDP	
	15	(2½)	25-100	B	36GUGT6ND		100	37GUGT6NDD		100A/250V	37GUGT6NDF		100	37GUGT6NDP	
	25	3	25-100	B	36HUGT6ND		100	37HUGT6NDD		100A/250V	37HUGT6NDF		100	37HUGT6NDP	
	30	(3½)	50-200	B	36IUHT6ND		200	37IUHT6NDD		200A/250V	37IUHT6NDF		125	37IUHT6NDP	
	40	4	50-200	B	36JUHT6ND		200	37JUHT6NDD		200A/250V	37JUHT6NDF		150	37JUHT6NDP	
	50	5	55-250	—	—		—	—		—	—		250	37LPST6NDP	
	75	5	55-250	—	—	36LPXT6ND		400	37LPXT6NDD		400A/250V	37LPXT6NDF		400	37LPXT6NDP
150	6	160-630	—	—	36MPXT6ND		600	37MPXT6NDD		600A/250V	37MPXT6NDF		600	37MPXT6NDP	
230	10	(1¼)	10-40	A1	36EUET2NG		60	37EUET2NGD		60A/250V	37EUET2NGF		50	37EUET2NGP	
	15	2	13-52	B	36FUFT2NG		60	37FUFT2NGD		60A/250V	37FUFT2NGF		50	37FUFT2NGP	
	20	(2½)	25-100	B	36GUGT2NG		100	37GUGT2NGD		100A/250V	37GUGT2NGF		100	37GUGT2NGP	
	30	3	25-100	B	36HUGT2NG		100	37HUGT2NGD		100A/250V	37HUGT2NGF		100	37HUGT2NGP	
	40	(3½)	50-200	B	36IUHT2NG		200	37IUHT2NGD		200A/250V	37IUHT2NGF		125	37IUHT2NGP	
	50	4	50-200	B	36JUHT2NG		200	37JUHT2NGD		200A/250V	37JUHT2NGF		150	37JUHT2NGP	
	75	5	55-250	—	—		—	—		—	—		250	37LPST2NGP	
	100	5	55-250	—	—	36LPXT2NG		400	37LPXT2NGD		400A/250V	37LPXT2NGF		400	37LPXT2NGP
200	6	160-630	—	—	36MPXT2NG		600	37MPXT2NGD		600A/250V	37MPXT2NGF		600	37MPXT2NGP	
460	15	(1¼)	10-40	A1	36EUET4NH		60	37EUET4NHD		60A/600V	37EUET4NHF		50	37EUET4NHP	
	25	2	13-52	B	36FUFT4NH		60	37FUFT4NHD		60A/600V	37FUFT4NHF		50	37FUFT4NHP	
	30	(2½)	13-52	B	36GUGT4NH		100	37GUGT4NHD		100A/600V	37GUGT4NHF		100	37GUGT4NHP	
	50	3	25-100	B	36HUGT4NH		100	37HUGT4NHD		100A/600V	37HUGT4NHF		100	37HUGT4NHP	
	75	(3½)	50-200	B	36IUHT4NH		200	37IUHT4NHD		200A/600V	37IUHT4NHF		125	37IUHT4NHP	
	100	4	50-200	B	36JUHT4NH		200	37JUHT4NHD		200A/600V	37JUHT4NHF		150	37JUHT4NHP	
	150	5	55-250	—	—		—	—		—	—		250	37LPST4NHP	
	200	5	55-250	—	—	36LPXT4NH		400	37LPXT4NHD		400A/600V	37LPXT4NHF		400	37LPXT4NHP
400	6	160-630	—	—	36MPXT4NH		600	37MPXT4NHD		600A/600V	37MPXT4NHF		600	37MPXT4NHP	
575	15	(1¼)	10-40	A1	36EUET5NE		60	37EUET5NED		60A/600V	37EUET5NEF		50	37EUET5NEP	
	25	2	13-52	B	36FUFT5NE		60	37FUFT5NED		60A/600V	37FUFT5NEF		50	37FUFT5NEP	
	30	(2½)	13-52	B	36GUGT5NE		100	37GUGT5NED		100A/600V	37GUGT5NEF		100	37GUGT5NEP	
	50	3	25-100	B	36HUGT5NE		100	37HUGT5NED		100A/600V	37HUGT5NEF		100	37HUGT5NEP	
	75	(3½)	50-200	B	36IUHT5NE		200	37IUHT5NED		200A/600V	37IUHT5NEF		125	37IUHT5NEP	
	100	4	50-200	B	36JUHT5NE		200	37JUHT5NED		200A/600V	37JUHT5NEF		150	37JUHT5NEP	
	150	5	55-250	—	—		—	—		—	—		250	37LPST5NEP	
	200	5	55-250	—	—	36LPXT5NE		400	37LPXT5NED		400A/600V	37LPXT5NEF		400	37LPXT5NEP
400	6	160-630	—	—	36MPXT5NE		600	37MPXT5NED		600A/600V	37MPXT5NEF		600	37MPXT5NEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

2 Step Part Winding with Solid State Overload, Class 36 & 37

Selection

	Ordering Information	Coil and Control Voltage
	<ul style="list-style-type: none"> ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page page 17-169. ▶ Wiring Diagrams see page 17-182. ▶ Replacement Parts see page 17-133. 	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

NEMA 1 General Purpose Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect		Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number
200	7½	0	5.5-22	A1	36CUDP6BD		60	37CUDP6BDD		60A/250V	37CUDP6BDF	30	37CUDP6BDP	
	10	1	5.5-22	A1	36DUDP6BD		60	37DUDP6BDD		60A/250V	37DUDP6BDF	50	37DUDP6BDP	
	15	(1¼)	10-40	A1	36EUEP6BD		100	37EUEP6BDD		100A/250V	37EUEP6BDF	100	37EUEP6BDP	
	20	2	13-52	B	36FUF6BD		100	37FUF6BDD		100A/250V	37FUF6BDF	100	37FUF6BDP	
	30	(2½)	25-100	B	36GUGP6BD		200	37GUGP6BDD		200A/250V	37GUGP6BDF	125	37GUGP6BDP	
	40	3	25-100	B	36HUGP6BD		200	37HUGP6BDD		200A/250V	37HUGP6BDF	150	37HUGP6BDP	
	50	(3½)	50-200	B	36IUHP6BD		200	37IUHP6BDD		200A/250V	37IUHP6BDF	250	37IUHP6BDP	
	75	4	50-200	B	36JUHP6BD		400	37JUHP6BDD		400A/250V	37JUHP6BDF	400	37JUHP6BDP	
100	5	55-250	—	—	—	—	—	—	—	—	600	37LSP6BDP		
150	5	55-250	—	—	36LPUP6BD		600	37LPUP6BDD		600A/250V	37LPUP6BDF	600	37LPUP6BDP	
230	7½	0	5.5-22	A1	36CUDP2BG		60	37CUDP2BGD		60A/250V	37CUDP2BGF	30	37CUDP2BGP	
	10	1	5.5-22	A1	36DUDP2BG		60	37DUDP2BGD		60A/250V	37DUDP2BGF	50	37DUDP2BGP	
	20	(1½)	10-40	A1	36EUEP2BG		100	37EUEP2BGD		100A/250V	37EUEP2BGF	100	37EUEP2BGP	
	25	2	13-52	B	36FUF2BG		100	37FUF2BGD		100A/250V	37FUF2BGF	100	37FUF2BGP	
	30	(2½)	25-100	B	36GUGP2BG		200	37GUGP2BGD		200A/250V	37GUGP2BGF	100	37GUGP2BGP	
	50	3	25-100	B	36HUGP2BG		200	37HUGP2BGD		200A/250V	37HUGP2BGF	150	37HUGP2BGP	
	60	(3½)	50-200	B	36IUHP2BG		200	37IUHP2BGD		200A/250V	37IUHP2BGF	250	37IUHP2BGP	
	75	4	50-200	B	36JUHP2BG		400	37JUHP2BGD		400A/250V	37JUHP2BGF	400	37JUHP2BGP	
125	5	55-250	—	—	—	—	—	—	—	—	400	37LSP2BGP		
150	5	55-250	—	—	36LPUP2BG		600	37LPUP2BGD		600A/250V	37LPUP2BGF	600	37LPUP2BGP	
300	6	160-630	—	—	36MPXP2BG		1200	37MPXP2BGD		1200A/250V	37MPXP2BGF	1200	37MPXP2BGP	
460	10	0	5.5-22	A1	36CUDP4BH		30	37CUDP4BHD		30A/600V	37CUDP4BHF	30	37CUDP4BHP	
	15	1	5.5-22	A1	36DUDP4BH		60	37DUDP4BHD		60A/600V	37DUDP4BHF	30	37DUDP4BHP	
	30	(1¼)	10-40	A1	36EUEP4BH		60	37EUEP4BHD		60A/600V	37EUEP4BHF	50	37EUEP4BHP	
	40	2	13-52	B	36FUF4BH		100	37FUF4BHD		100A/600V	37FUF4BHF	100	37FUF4BHP	
	60	(2½)	25-100	B	36GUGP4BH		200	37GUGP4BHD		200A/600V	37GUGP4BHF	100	37GUGP4BHP	
	75	3	25-100	B	36HUGP4BH		200	37HUGP4BHD		200A/600V	37HUGP4BHF	125	37HUGP4BHP	
	100	(3½)	50-200	B	36IUHP4BH		200	37IUHP4BHD		200A/600V	37IUHP4BHF	150	37IUHP4BHP	
	150	4	50-200	B	36JUHP4BH		400	37JUHP4BHD		400A/600V	37JUHP4BHF	250	37JUHP4BHP	
250	5	55-250	—	—	—	—	—	—	—	—	400	37LSP4BHP		
350	5	55-250	—	—	36LPUP4BH		600	37LPUP4BHD		600A/600V	37LPUP4BHF	600	37LPUP4BHP	
600	6	160-630	—	—	36MPXP4BH		1200	37MPXP4BHD		1200A/600V	37MPXP4BHF	1200	37MPXP4BHP	
575	10	0	5.5-22	A1	36CUDP5BE		30	37CUDP5BED		30A/600V	37CUDP5BEF	30	37CUDP5BEP	
	15	1	5.5-22	A1	36DUDP5BE		60	37DUDP5BED		60A/600V	37DUDP5BEF	30	37DUDP5BEP	
	30	(1¼)	10-40	A1	36EUEP5BE		60	37EUEP5BED		60A/600V	37EUEP5BEF	50	37EUEP5BEP	
	40	2	13-52	B	36FUF5BE		60	37FUF5BED		60A/600V	37FUF5BEF	50	37FUF5BEP	
	60	(2½)	25-100	B	36GUGP5BE		100	37GUGP5BED		100A/600V	37GUGP5BEF	100	37GUGP5BEP	
	75	3	25-100	B	36HUGP5BE		200	37HUGP5BED		200A/600V	37HUGP5BEF	125	37HUGP5BEP	
	100	(3½)	50-200	B	36IUHP5BE		400	37IUHP5BED		400A/600V	37IUHP5BEF	150	37IUHP5BEP	
	150	4	50-200	B	36JUHP5BE		400	37JUHP5BED		400A/600V	37JUHP5BEF	250	37JUHP5BEP	
250	5	55-250	—	—	—	—	—	—	400A/600V	37LSP5BEF	—	—		
350	5	55-250	—	—	36LPUP5BE		600	37LPUP5BED		600A/600V	37LPUP5BEF	400	37LPUP5BEP	
600	6	160-630	—	—	36MPXP5BE		1200	37MPXP5BED		1200A/600V	37MPXP5BEF	1200	37MPXP5BEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

2 Step Part Winding with Solid State Overload, Class 36 & 37

Selection



Ordering Information

- ▶ Field Modification Kits see page 17-106.
- ▶ Factory Modifications see page 17-121.
- ▶ Dimensions see page 17-169.
- ▶ Wiring Diagrams see page 17-182.
- ▶ Replacement Parts see page 17-133.

Coil and Control Voltage

The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".

NEMA 4 Painted Enclosures


Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect		Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number
200	7½	0	5.5-22	A1	36CUDP6ED		60	37CUDP6EDD		60A/250V	37CUDP6EDF	30	37CUDP6EDP	
	10	1	5.5-22	A1	36DUDP6ED		60	37DUDP6EDD		60A/250V	37DUDP6EDF	50	37DUDP6EDP	
	15	(1¼)	10-40	A1	36EUEP6ED		100	37EUEP6EDD		100A/250V	37EUEP6EDF	100	37EUEP6EDP	
	20	2	13-52	B	36FUF6ED		100	37FUF6EDD		100A/250V	37FUF6EDF	100	37FUF6EDP	
	30	(2½)	25-100	B	36GUGP6ED		200	37GUGP6EDD		200A/250V	37GUGP6EDF	125	37GUGP6EDP	
	40	3	25-100	B	36HUGP6ED		200	37HUGP6EDD		200A/250V	37HUGP6EDF	150	37HUGP6EDP	
	50	(3½)	50-200	B	36IUHP6ED		200	37IUHP6EDD		200A/250V	37IUHP6EDF	250	37IUHP6EDP	
	75	4	50-200	B	36JUHP6ED		400	37JUHP6EDD		400A/250V	37JUHP6EDF	400	37JUHP6EDP	
100	5	55-250	—	—	—	—	—	—	—	—	600	37LSP6EDP		
150	5	55-250	—	—	36LPUP6ED		600	37LPUP6EDD		600A/250V	37LPUP6EDF	600	37LPUP6EDP	
230	7½	0	5.5-22	A1	36CUDP2EG		60	37CUDP2EGD		60A/250V	37CUDP2EGF	30	37CUDP2EGP	
	10	1	5.5-22	A1	36DUDP2EG		60	37DUDP2EGD		60A/250V	37DUDP2EGF	50	37DUDP2EGP	
	20	(1½)	10-40	A1	36EUEP2EG		100	37EUEP2EGD		100A/250V	37EUEP2EGF	100	37EUEP2EGP	
	25	2	13-52	B	36FUF2EG		100	37FUF2EGD		100A/250V	37FUF2EGF	100	37FUF2EGP	
	30	(2½)	25-100	B	36GUGP2EG		200	37GUGP2EGD		200A/250V	37GUGP2EGF	100	37GUGP2EGP	
	50	3	25-100	B	36HUGP2EG		200	37HUGP2EGD		200A/250V	37HUGP2EGF	150	37HUGP2EGP	
	60	(3½)	50-200	B	36IUHP2EG		200	37IUHP2EGD		200A/250V	37IUHP2EGF	250	37IUHP2EGP	
	75	4	50-200	B	36JUHP2EG		400	37JUHP2EGD		400A/250V	37JUHP2EGF	250	37JUHP2EGP	
125	5	55-250	—	—	—	—	—	—	—	—	400	37LSP2EGP		
150	5	55-250	—	—	36LPUP2EG		600	37LPUP2EGD		600A/250V	37LPUP2EGF	600	37LPUP2EGP	
300	6	160-630	—	—	36MPXP2EG		1200	37MPXP2EGD		1200A/250V	37MPXP2EGF	1200	37MPXP2EGP	
460	10	0	5.5-22	A1	36CUDP4EH		30	37CUDP4EHD		30A/600V	37CUDP4EHF	30	37CUDP4EHP	
	15	1	5.5-22	A1	36DUDP4EH		60	37DUDP4EHD		60A/600V	37DUDP4EHF	30	37DUDP4EHP	
	30	(1¼)	10-40	A1	36EUEP4EH		60	37EUEP4EHD		60A/600V	37EUEP4EHF	50	37EUEP4EHP	
	40	2	13-52	B	36FUF4EH		100	37FUF4EHD		100A/600V	37FUF4EHF	100	37FUF4EHP	
	60	(2½)	25-100	B	36GUGP4EH		200	37GUGP4EHD		200A/600V	37GUGP4EHF	100	37GUGP4EHP	
	75	3	25-100	B	36HUGP4EH		200	37HUGP4EHD		200A/600V	37HUGP4EHF	125	37HUGP4EHP	
	100	(3½)	50-200	B	36IUHP4EH		200	37IUHP4EHD		200A/600V	37IUHP4EHF	150	37IUHP4EHP	
	150	4	50-200	B	36JUHP4EH		400	37JUHP4EHD		400A/600V	37JUHP4EHF	250	37JUHP4EHP	
250	5	55-250	—	—	—	—	—	—	—	—	400	37LSP4EHP		
350	5	55-250	—	—	36LPUP4EH		600	37LPUP4EHD		600A/600V	37LPUP4EHF	600	37LPUP4EHP	
600	6	160-630	—	—	36MPXP4EH		1200	37MPXP4EHD		1200A/600V	37MPXP4EHF	1200	37MPXP4EHP	
575	10	0	5.5-22	A1	36CUDP5EE		30	37CUDP5EED		30A/600V	37CUDP5EEF	30	37CUDP5EEP	
	15	1	5.5-22	A1	36DUDP5EE		60	37DUDP5EED		60A/600V	37DUDP5EEF	30	37DUDP5EEP	
	30	(1¼)	10-40	A1	36EUEP5EE		60	37EUEP5EED		60A/600V	37EUEP5EEF	50	37EUEP5EEP	
	40	2	13-52	B	36FUF5EE		60	37FUF5EED		60A/600V	37FUF5EEF	50	37FUF5EEP	
	60	(2½)	25-100	B	36GUGP5EE		100	37GUGP5EED		100A/600V	37GUGP5EEF	100	37GUGP5EEP	
	75	3	25-100	B	36HUGP5EE		200	37HUGP5EED		200A/600V	37HUGP5EEF	125	37HUGP5EEP	
	100	(3½)	50-200	B	36IUHP5EE		400	37IUHP5EED		400A/600V	37IUHP5EEF	150	37IUHP5EEP	
	150	4	50-200	B	36JUHP5EE		400	37JUHP5EED		400A/600V	37JUHP5EEF	250	37JUHP5EEP	
250	5	55-250	—	—	—	—	—	—	400A/600V	37LSP5EEF	—	—		
350	5	55-250	—	—	36LPUP5EE		600	37LPUP5EED		600A/600V	37LPUP5EEF	400	37LPUP5EEP	
600	6	160-630	—	—	36MPXP5EE		1200	37MPXP5EED		1200A/600V	37MPXP5EEF	1200	37MPXP5EEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

2 Step Part Winding with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page page 17-169. ▶ Wiring Diagrams see page 17-182. ▶ Replacement Parts see page 17-133. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 4/4X Stainless Steel Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect		Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	Circuit Breaker Amps	Catalog Number	List Price \$
200	7½	0	5.5-22	A1	36CUDP6WD		60	37CUDP6WDD		60A/250V	37CUDP6WDF	30	37CUDP6WDP	
	10	1	5.5-22	A1	36DUDP6WD		60	37DUDP6WDD		60A/250V	37DUDP6WDF	50	37DUDP6WDP	
	15	(1¾)	10-40	A1	36EUEP6WD		100	37EUEP6WDD		100A/250V	37EUEP6WDF	100	37EUEP6WDP	
	20	2	13-52	B	36FUEP6WD		100	37FUEP6WDD		100A/250V	37FUEP6WDF	100	37FUEP6WDP	
	30	(2½)	25-100	B	36GUGP6WD		200	37GUGP6WDD		200A/250V	37GUGP6WDF	125	37GUGP6WDP	
	40	3	25-100	B	36HUGP6WD		200	37HUGP6WDD		200A/250V	37HUGP6WDF	150	37HUGP6WDP	
	50	(3½)	50-200	B	36IUHP6WD		200	37IUHP6WDD		200A/250V	37IUHP6WDF	250	37IUHP6WDP	
75	4	50-200	B	36JUHP6WD		400	37JUHP6WDD		400A/250V	37JUHP6WDF	400	37JUHP6WDP		
230	7½	0	5.5-22	A1	36CUDP2WG		60	37CUDP2WGD		60A/250V	37CUDP2WGF	30	37CUDP2WGP	
	10	1	5.5-22	A1	36DUDP2WG		60	37DUDP2WGD		60A/250V	37DUDP2WGF	50	37DUDP2WGP	
	20	(1½)	10-40	A1	36EUEP2WG		100	37EUEP2WGD		100A/250V	37EUEP2WGF	100	37EUEP2WGP	
	25	2	13-52	B	36FUEP2WG		100	37FUEP2WGD		100A/250V	37FUEP2WGF	100	37FUEP2WGP	
	30	(2½)	25-100	B	36GUGP2WG		200	37GUGP2WGD		200A/250V	37GUGP2WGF	100	37GUGP2WGP	
	50	3	25-100	B	36HUGP2WG		200	37HUGP2WGD		200A/250V	37HUGP2WGF	150	37HUGP2WGP	
	60	(3½)	50-200	B	36IUHP2WG		200	37IUHP2WGD		200A/250V	37IUHP2WGF	250	37IUHP2WGP	
75	4	50-200	B	36JUHP2WG		400	37JUHP2WGD		400A/250V	37JUHP2WGF	250	37JUHP2WGP		
460	10	0	5.5-22	A1	36CUDP4WH		30	37CUDP4WHD		30A/600V	37CUDP4WHF	30	37CUDP4WHP	
	15	1	5.5-22	A1	36DUDP4WH		60	37DUDP4WHD		60A/600V	37DUDP4WHF	30	37DUDP4WHP	
	30	(1¾)	10-40	A1	36EUEP4WH		60	37EUEP4WHD		60A/600V	37EUEP4WHF	50	37EUEP4WHP	
	40	2	13-52	B	36FUEP4WH		100	37FUEP4WHD		100A/600V	37FUEP4WHF	100	37FUEP4WHP	
	60	(2½)	25-100	B	36GUGP4WH		200	37GUGP4WHD		200A/600V	37GUGP4WHF	100	37GUGP4WHP	
	75	3	25-100	B	36HUGP4WH		200	37HUGP4WHD		200A/600V	37HUGP4WHF	125	37HUGP4WHP	
	100	(3½)	50-200	B	36IUHP4WH		200	37IUHP4WHD		200A/600V	37IUHP4WHF	150	37IUHP4WHP	
150	4	50-200	B	36JUHP4WH		400	37JUHP4WHD		400A/600V	37JUHP4WHF	250	37JUHP4WHP		
575	10	0	5.5-22	A1	36CUDP5WE		30	37CUDP5WED		30A/600V	37CUDP5WEF	30	37CUDP5WEP	
	15	1	5.5-22	A1	36DUDP5WE		60	37DUDP5WED		60A/600V	37DUDP5WEF	30	37DUDP5WEP	
	30	(1¾)	10-40	A1	36EUEP5WE		60	37EUEP5WED		60A/600V	37EUEP5WEF	50	37EUEP5WEP	
	40	2	13-52	B	36FUEP5WE		60	37FUEP5WED		60A/600V	37FUEP5WEF	50	37FUEP5WEP	
	60	(2½)	25-100	B	36GUGP5WE		100	37GUGP5WED		100A/600V	37GUGP5WEF	100	37GUGP5WEP	
	75	3	25-100	B	36HUGP5WE		200	37HUGP5WED		200A/600V	37HUGP5WEF	125	37HUGP5WEP	
	100	(3½)	50-200	B	36IUHP5WE		400	37IUHP5WED		400A/600V	37IUHP5WEF	150	37IUHP5WEP	
150	4	50-200	B	36JUHP5WE		400	37JUHP5WED		400A/600V	37JUHP5WEF	250	37JUHP5WEP		

NEMA & General Purpose Control


CONTROL PRODUCTS 17

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

2 Step Part Winding with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page page 17-169. ▶ Wiring Diagrams see page 17-182. ▶ Replacement Parts see page 17-133. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 12, NEMA 3/3R

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect		Call Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number
200	7½	0	5.5-22	A1	36CUDP6ND		60	37CUDP6NDD		60A/250V	37CUDP6NDF	30	37CUDP6NDP	
	10	1	5.5-22	A1	36DUDP6ND		60	37DUDP6NDD		60A/250V	37DUDP6NDF	50	37DUDP6NDP	
	15	(1¼)	10-40	A1	36EUEP6ND		100	37EUEP6NDD		100A/250V	37EUEP6NDF	100	37EUEP6NDP	
	20	2	13-52	B	36FUF6ND		100	37FUF6NDD		100A/250V	37FUF6NDF	100	37FUF6NDP	
	30	(2½)	25-100	B	36GUGP6ND		200	37GUGP6NDD		200A/250V	37GUGP6NDF	125	37GUGP6NDP	
	40	3	25-100	B	36HUGP6ND		200	37HUGP6NDD		200A/250V	37HUGP6NDF	150	37HUGP6NDP	
	50	(3½)	50-200	B	36IUHP6ND		200	37IUHP6NDD		200A/250V	37IUHP6NDF	250	37IUHP6NDP	
	75	4	50-200	B	36JUHP6ND		400	37JUHP6NDD		400A/250V	37JUHP6NDF	400	37JUHP6NDP	
100	5	55-250	—	—	—	—	—	—	—	—	600	37LSP6NDP		
150	5	55-250	—	—	36LPUP6ND		600	37LPUP6NDD		600A/250V	37LPUP6NDF	600	37LPUP6NDP	
230	7½	0	5.5-22	A1	36CUDP2NG		60	37CUDP2NGD		60A/250V	37CUDP2NGF	30	37CUDP2NGP	
	10	1	5.5-22	A1	36DUDP2NG		60	37DUDP2NGD		60A/250V	37DUDP2NGF	50	37DUDP2NGP	
	20	(1½)	10-40	A1	36EUEP2NG		100	37EUEP2NGD		100A/250V	37EUEP2NGF	100	37EUEP2NGP	
	25	2	13-52	B	36FUF2NG		100	37FUF2NGD		100A/250V	37FUF2NGF	100	37FUF2NGP	
	30	(2½)	25-100	B	36GUGP2NG		200	37GUGP2NGD		200A/250V	37GUGP2NGF	100	37GUGP2NGP	
	50	3	25-100	B	36HUGP2NG		200	37HUGP2NGD		200A/250V	37HUGP2NGF	150	37HUGP2NGP	
	60	(3½)	50-200	B	36IUHP2NG		200	37IUHP2NGD		200A/250V	37IUHP2NGF	250	37IUHP2NGP	
	75	4	50-200	B	36JUHP2NG		400	37JUHP2NGD		400A/250V	37JUHP2NGF	250	37JUHP2NGP	
	125	5	55-250	—	—	—	—	—	—	—	—	400	37LSP2NGP	
	150	5	55-250	—	—	36LPUP2NG		600	37LPUP2NGD		600A/250V	37LPUP2NGF	600	37LPUP2NGP
300	6	160-630	—	—	36MPXP2NG		1200	37MPXP2NGD		1200A/250V	37MPXP2NGF	1200	37MPXP2NGP	
460	10	0	5.5-22	A1	36CUDP4NH		30	37CUDP4NHD		30A/600V	37CUDP4NHF	30	37CUDP4NHP	
	15	1	5.5-22	A1	36DUDP4NH		60	37DUDP4NHD		60A/600V	37DUDP4NHF	30	37DUDP4NHP	
	30	(1¼)	10-40	A1	36EUEP4NH		60	37EUEP4NHD		60A/600V	37EUEP4NHF	50	37EUEP4NHP	
	40	2	13-52	B	36FUF4NH		100	37FUF4NHD		100A/600V	37FUF4NHF	100	37FUF4NHP	
	60	(2½)	25-100	B	36GUGP4NH		200	37GUGP4NHD		200A/600V	37GUGP4NHF	100	37GUGP4NHP	
	75	3	25-100	B	36HUGP4NH		200	37HUGP4NHD		200A/600V	37HUGP4NHF	125	37HUGP4NHP	
	100	(3½)	50-200	B	36IUHP4NH		200	37IUHP4NHD		200A/600V	37IUHP4NHF	150	37IUHP4NHP	
	150	4	50-200	B	36JUHP4NH		400	37JUHP4NHD		400A/600V	37JUHP4NHF	250	37JUHP4NHP	
	250	5	55-250	—	—	—	—	—	—	—	—	400	37LSP4NHP	
	350	5	55-250	—	—	36LPUP4NH		600	37LPUP4NHD		600A/600V	37LPUP4NHF	600	37LPUP4NHP
600	6	160-630	—	—	36MPXP4NH		1200	37MPXP4NHD		1200A/600V	37MPXP4NHF	1200	37MPXP4NHP	
575	10	0	5.5-22	A1	36CUDP5NE		30	37CUDP5NED		30A/600V	37CUDP5NEF	30	37CUDP5NEP	
	15	1	5.5-22	A1	36DUDP5NE		60	37DUDP5NED		60A/600V	37DUDP5NEF	30	37DUDP5NEP	
	30	(1¼)	10-40	A1	36EUEP5NE		60	37EUEP5NED		60A/600V	37EUEP5NEF	50	37EUEP5NEP	
	40	2	13-52	B	36FUF5NE		60	37FUF5NED		60A/600V	37FUF5NEF	50	37FUF5NEP	
	60	(2½)	25-100	B	36GUGP5NE		100	37GUGP5NED		100A/600V	37GUGP5NEF	100	37GUGP5NEP	
	75	3	25-100	B	36HUGP5NE		200	37HUGP5NED		200A/600V	37HUGP5NEF	125	37HUGP5NEP	
	100	(3½)	50-200	B	36IUHP5NE		400	37IUHP5NED		400A/600V	37IUHP5NEF	150	37IUHP5NEP	
	150	4	50-200	B	36JUHP5NE		400	37JUHP5NED		400A/600V	37JUHP5NEF	250	37JUHP5NEP	
	250	5	55-250	—	—	—	—	—	—	400A/600V	37LSP5NEF	—	—	
	350	5	55-250	—	—	36LPUP5NE		600	37LPUP5NED		600A/600V	37LPUP5NEF	400	37LPUP5NEP
600	6	160-630	—	—	36MPXP5NE		1200	37MPXP5NED		1200A/600V	37MPXP5NEF	1200	37MPXP5NEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

NEMA & General Purpose Control

CONTROL PRODUCTS

Reduced Voltage Heavy Duty Starters

Wye Delta, Open Transition with Solid State Overload, Class 36 & 37

Selection



Ordering Information

- ▶ Field Modification Kits see page 17-106.
- ▶ Factory Modifications see page 17-121.
- ▶ Dimensions see page 17-169.
- ▶ Wiring Diagrams see page 17-184.
- ▶ Replacement Parts see page 17-133.

Coil and Control Voltage

The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".

NEMA 1 General Purpose Enclosures


Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUE06BD		60	37DUE06BDD		60A/250V	37DUE06BDF		50	37DUE06BDP	
	15	(1¾)	10-40	A1	36EUE06BD		100	37EUE06BDD		100A/250V	37EUE06BDF		100	37EUE06BDP	
	20	2	13-52	B	36FUF06BD		100	37FUF06BDD		100A/250V	37FUF06BDF		100	37FUF06BDP	
	30	(2½)	25-100	B	36GUG06BD		200	37GUG06BDD		200A/250V	37GUG06BDF		125	37GUG06BDP	
	40	3	25-100	B	36HUG06BD		200	37HUG06BDD		200A/250V	37HUG06BDF		150	37HUG06BDP	
	50	(3½)	50-200	B	36IUH06BD		200	37IUH06BDD		200A/250V	37IUH06BDF		250	37IUH06BDP	
	60	4	50-200	B	36JUH06BD		400	37JUH06BDD		400A/250V	37JUH06BDF		250	37JUH06BDP	
	75	5	55-250	—	36LPS06BD		400	37LPS06BDD		400A/250V	37LPS06BDF		400	37LPS06BDP	
150	5	55-250	—	36LPU06BD		600	37LPU06BDD		600A/250V	37LPU06BDF		600	37LPU06BDP		
300	6	160-630	—	36MPX06BD		1200	37MPX06BDD		1200A/250V	37MPX06BDF		1200	37MPX06BDP		
230	10	1	10-40	A1	36DUE02BG		60	37DUE02BGD		60A/250V	37DUE02BGF		50	37DUE02BGP	
	15	(1¾)	10-40	A1	36EUE02BG		60	37EUE02BGD		60A/250V	37EUE02BGF		50	37EUE02BGP	
	25	2	13-52	B	36FUF02BG		100	37FUF02BGD		100A/250V	37FUF02BGF		100	37FUF02BGP	
	30	(2½)	25-100	B	36GUG02BG		200	37GUG02BGD		200A/250V	37GUG02BGF		100	37GUG02BGP	
	50	3	25-100	B	36HUG02BG		200	37HUG02BGD		200A/250V	37HUG02BGF		150	37HUG02BGP	
	60	(3½)	50-200	B	36IUH02BG		200	37IUH02BGD		200A/250V	37IUH02BGF		250	37IUH02BGP	
	75	4	50-200	B	36JUH02BG		400	37JUH02BGD		400A/250V	37JUH02BGF		250	37JUH02BGP	
	100	5	55-250	—	36LPS02BG		400	37LPS02BGD		400A/250V	37LPS02BGF		400	37LPS02BGP	
150	5	55-250	—	36LPU02BG		600	37LPU02BGD		600A/250V	37LPU02BGF		600	37LPU02BGP		
350	6	160-630	—	36MPX02BG		1200	37MPX02BGD		1200A/250V	37MPX02BGF		1200	37MPX02BGP		
460	15	1	5.5-22	A1	36DUD04BH		30	37DUD04BHD		30A/600V	37DUD04BHF		30	37DUD04BHP	
	30	(1¾)	10-40	A1	36EUE04BH		60	37EUE04BHD		60A/600V	37EUE04BHF		50	37EUE04BHP	
	40	2	13-52	B	36FUF04BH		100	37FUF04BHD		100A/600V	37FUF04BHF		100	37FUF04BHP	
	60	(2½)	25-100	B	36GUG04BH		200	37GUG04BHD		200A/600V	37GUG04BHF		100	37GUG04BHP	
	75	3	25-100	B	36HUG04BH		200	37HUG04BHD		200A/600V	37HUG04BHF		125	37HUG04BHP	
	100	(3½)	50-200	B	36IUH04BH		200	37IUH04BHD		200A/600V	37IUH04BHF		150	37IUH04BHP	
	150	4	50-200	B	36JUH04BH		400	37JUH04BHD		400A/600V	37JUH04BHF		250	37JUH04BHP	
	200	5	55-250	—	36LPS04BH		400	37LPS04BHD		400A/600V	37LPS04BHF		400	37LPS04BHP	
300	5	55-250	—	36LPU04BH		600	37LPU04BHD		600A/600V	37LPU04BHF		600	37LPU04BHP		
700	6	160-630	—	36MPX04BH		1600	37MPX04BHD		1600A/600V	37MPX04BHF		1200	37MPX04BHP		
575	15	1	5.5-22	A1	36DUD05BE		30	37DUD05BED		30A/600V	37DUD05BEF		30	37DUD05BEP	
	30	(1¾)	10-40	A1	36EUE05BE		60	37EUE05BED		60A/600V	37EUE05BEF		50	37EUE05BEP	
	40	2	13-52	B	36FUF05BE		100	37FUF05BED		100A/600V	37FUF05BEF		50	37FUF05BEP	
	60	(2½)	25-100	B	36GUG05BE		100	37GUG05BED		100A/600V	37GUG05BEF		100	37GUG05BEP	
	75	3	25-100	B	36HUG05BE		200	37HUG05BED		200A/600V	37HUG05BEF		125	37HUG05BEP	
	100	(3½)	50-200	B	36IUH05BE		200	37IUH05BED		200A/600V	37IUH05BEF		150	37IUH05BEP	
	150	4	50-200	B	36JUH05BE		400	37JUH05BED		400A/600V	37JUH05BEF		250	37JUH05BEP	
	200	5	55-250	—	36LPS05BE		400	37LPS05BED		400A/600V	37LPS05BEF		250	37LPS05BEP	
300	5	55-250	—	36LPU05BE		600	37LPU05BED		600A/600V	37LPU05BEF		400	37LPU05BEP		
700	6	160-630	—	36MPX05BE		1600	37MPX05BED		1600A/600V	37MPX05BEF		1600	37MPX05BEP		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Wye Delta, Open Transition with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-169. ▶ Wiring Diagrams see page 17-184. ▶ Replacement Parts see page 17-133. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 4 Painted Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUE06ED		60	37DUE06EDD		60A/250V	37DUE06EDF		50	37DUE06EDP	
	15	(1¾)	10-40	A1	36EUE06ED		100	37EUE06EDD		100A/250V	37EUE06EDF		100	37EUE06EDP	
	20	2	13-52	B	36FUF06ED		100	37FUF06EDD		100A/250V	37FUF06EDF		100	37FUF06EDP	
	30	(2½)	25-100	B	36GUG06ED		200	37GUG06EDD		200A/250V	37GUG06EDF		125	37GUG06EDP	
	40	3	25-100	B	36HUG06ED		200	37HUG06EDD		200A/250V	37HUG06EDF		150	37HUG06EDP	
	50	(3½)	50-200	B	36IUH06ED		200	37IUH06EDD		200A/250V	37IUH06EDF		250	37IUH06EDP	
	60	4	50-200	B	36JUH06ED		400	37JUH06EDD		400A/250V	37JUH06EDF		250	37JUH06EDP	
	75	5	55-250	—	36LPS06ED		400	37LPS06EDD		400A/250V	37LPS06EDF		400	37LPS06EDP	
150	5	55-250	—	36LPU06ED		600	37LPU06EDD		600A/250V	37LPU06EDF		600	37LPU06EDP		
300	6	160-630	—	36MPX06ED		1200	37MPX06EDD		1200A/250V	37MPX06EDF		1200	37MPX06EDP		
230	10	1	10-40	A1	36DUE02EG		60	37DUE02EGD		60A/250V	37DUE02EGF		50	37DUE02EGP	
	15	(1¾)	10-40	A1	36EUE02EG		60	37EUE02EGD		60A/250V	37EUE02EGF		50	37EUE02EGP	
	25	2	13-52	B	36FUF02EG		100	37FUF02EGD		100A/250V	37FUF02EGF		100	37FUF02EGP	
	30	(2½)	25-100	B	36GUG02EG		200	37GUG02EGD		200A/250V	37GUG02EGF		100	37GUG02EGP	
	50	3	25-100	B	36HUG02EG		200	37HUG02EGD		200A/250V	37HUG02EGF		150	37HUG02EGP	
	60	(3½)	50-200	B	36IUH02EG		200	37IUH02EGD		200A/250V	37IUH02EGF		250	37IUH02EGP	
	75	4	50-200	B	36JUH02EG		400	37JUH02EGD		400A/250V	37JUH02EGF		250	37JUH02EGP	
	100	5	55-250	—	36LPS02EG		400	37LPS02EGD		400A/250V	37LPS02EGF		400	37LPS02EGP	
150	5	55-250	—	36LPU02EG		600	37LPU02EGD		600A/250V	37LPU02EGF		600	37LPU02EGP		
350	6	160-630	—	36MPX02EG		1200	37MPX02EGD		1200A/250V	37MPX02EGF		1200	37MPX02EGP		
460	15	1	5.5-22	A1	36DUD04EH		30	37DUD04EHD		30A/600V	37DUD04EHF		30	37DUD04EHP	
	30	(1¾)	10-40	A1	36EUE04EH		60	37EUE04EHD		60A/600V	37EUE04EHF		50	37EUE04EHP	
	40	2	13-52	B	36FUF04EH		100	37FUF04EHD		100A/600V	37FUF04EHF		100	37FUF04EHP	
	60	(2½)	25-100	B	36GUG04EH		200	37GUG04EHD		200A/600V	37GUG04EHF		100	37GUG04EHP	
	75	3	25-100	B	36HUG04EH		200	37HUG04EHD		200A/600V	37HUG04EHF		125	37HUG04EHP	
	100	(3½)	50-200	B	36IUH04EH		200	37IUH04EHD		200A/600V	37IUH04EHF		150	37IUH04EHP	
	150	4	50-200	B	36JUH04EH		400	37JUH04EHD		400A/600V	37JUH04EHF		250	37JUH04EHP	
	200	5	55-250	—	36LPS04EH		400	37LPS04EHD		400A/600V	37LPS04EHF		400	37LPS04EHP	
300	5	55-250	—	36LPU04EH		600	37LPU04EHD		600A/600V	37LPU04EHF		600	37LPU04EHP		
700	6	160-630	—	36MPX04EH		1600	37MPX04EHD		1600A/600V	37MPX04EHF		1200	37MPX04EHP		
575	15	1	5.5-22	A1	36DUD05EE		30	37DUD05EED		30A/600V	37DUD05EEF		30	37DUD05EEP	
	30	(1¾)	10-40	A1	36EUE05EE		60	37EUE05EED		60A/600V	37EUE05EEF		50	37EUE05EEP	
	40	2	13-52	B	36FUF05EE		100	37FUF05EED		100A/600V	37FUF05EEF		50	37FUF05EEP	
	60	(2½)	25-100	B	36GUG05EE		100	37GUG05EED		100A/600V	37GUG05EEF		100	37GUG05EEP	
	75	3	25-100	B	36HUG05EE		200	37HUG05EED		200A/600V	37HUG05EEF		125	37HUG05EEP	
	100	(3½)	50-200	B	36IUH05EE		200	37IUH05EED		200A/600V	37IUH05EEF		150	37IUH05EEP	
	150	4	50-200	B	36JUH05EE		400	37JUH05EED		400A/600V	37JUH05EEF		250	37JUH05EEP	
	200	5	55-250	—	36LPS05EE		400	37LPS05EED		400A/600V	37LPS05EEF		250	37LPS05EEP	
300	5	55-250	—	36LPU05EE		600	37LPU05EED		600A/600V	37LPU05EEF		400	37LPU05EEP		
700	6	160-630	—	37MPX05EF		1600	37MPX05EED		1600A/600V	37MPX05EEF		1600	37MPX05EEP		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

NEMA & General Purpose Control


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CONTROL PRODUCTS

Reduced Voltage Heavy Duty Starters

Wye Delta, Open Transition with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-169. ▶ Wiring Diagrams see page 17-184. ▶ Replacement Parts see page 17-133. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 4/4X Stainless Steel Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUE06WD		60	37DUE06WDD		60A/250V	37DUE06WDF		50	37DUE06WDP	
	15	(1¾)	10-40	A1	36EUE06WD		100	37EUE06WDD		100A/250V	37EUE06WDF		100	37EUE06WDP	
	20	2	13-52	B	36FUF06WD		100	37FUF06WDD		100A/250V	37FUF06WDF		100	37FUF06WDP	
	30	(2½)	25-100	B	36GUG06WD		200	37GUG06WDD		200A/250V	37GUG06WDF		125	37GUG06WDP	
	40	3	25-100	B	36HUG06WD		200	37HUG06WDD		200A/250V	37HUG06WDF		150	37HUG06WDP	
	50	(3½)	50-200	B	36IUH06WD		200	37IUH06WDD		200A/250V	37IUH06WDF		250	37IUH06WDP	
	60	4	50-200	B	36JUH06WD		400	37JUH06WDD		400A/250V	37JUH06WDF		250	37JUH06WDP	
230	10	1	10-40	A1	36DUE02WG		60	37DUE02WGD		60A/250V	37DUE02WGF		50	37DUE02WGP	
	15	(1¾)	10-40	A1	36EUE02WG		60	37EUE02WGD		60A/250V	37EUE02WGF		50	37EUE02WGP	
	25	2	13-52	B	36FUF02WG		100	37FUF02WGD		100A/250V	37FUF02WGF		100	37FUF02WGP	
	30	(2½)	25-100	B	36GUG02WG		200	37GUG02WGD		200A/250V	37GUG02WGF		100	37GUG02WGP	
	50	3	25-100	B	36HUG02WG		200	37HUG02WGD		200A/250V	37HUG02WGF		150	37HUG02WGP	
	60	(3½)	50-200	B	36IUH02WG		200	37IUH02WGD		200A/250V	37IUH02WGF		250	37IUH02WGP	
460	15	1	5.5-22	A1	36DUD04WH		30	37DUD04WHD		30A/600V	37DUD04WHF		30	37DUD04WHP	
	30	(1¾)	10-40	A1	36EUE04WH		60	37EUE04WHD		60A/600V	37EUE04WHF		50	37EUE04WHP	
	40	2	13-52	B	36FUF04WH		100	37FUF04WHD		100A/600V	37FUF04WHF		100	37FUF04WHP	
	60	(2½)	25-100	B	36GUG04WH		200	37GUG04WHD		200A/600V	37GUG04WHF		100	37GUG04WHP	
	75	3	25-100	B	36HUG04WH		200	37HUG04WHD		200A/600V	37HUG04WHF		125	37HUG04WHP	
	100	(3½)	50-200	B	36IUH04WH		200	37IUH04WHD		200A/600V	37IUH04WHF		150	37IUH04WHP	
575	150	4	50-200	B	36JUH04WH		400	37JUH04WHD		400A/600V	37JUH04WHF		250	37JUH04WHP	
	15	1	5.5-22	A1	36DUD05WE		30	37DUD05WED		30A/600V	37DUD05WEF		30	37DUD05WEP	
	30	(1¾)	10-40	A1	36EUE05WE		60	37EUE05WED		60A/600V	37EUE05WEF		50	37EUE05WEP	
	40	2	13-52	B	36FUF05WE		100	37FUF05WED		100A/600V	37FUF05WEF		50	37FUF05WEP	
	60	(2½)	25-100	B	36GUG05WE		100	37GUG05WED		100A/600V	37GUG05WEF		100	37GUG05WEP	
	75	3	25-100	B	36HUG05WE		200	37HUG05WED		200A/600V	37HUG05WEF		125	37HUG05WEP	
100	(3½)	50-200	B	36IUH05WE		200	37IUH05WED		200A/600V	37IUH05WEF		150	37IUH05WEP		
150	4	50-200	B	36JUH05WE		400	37JUH05WED		400A/600V	37JUH05WEF		250	37JUH05WEP		

NEMA & General Purpose Control


CONTROL PRODUCTS 17

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Wye Delta, Open Transition with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-169. ▶ Wiring Diagrams see page 17-184 . ▶ Replacement Parts see page 17-133. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 12, NEMA 3/3R

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUE06ND		60	37DUE06NDD		60A/250V	37DUE06NDF		50	37DUE06NDP	
	15	(1¾)	10-40	A1	36EUE06ND		100	37EUE06NDD		100A/250V	37EUE06NDF		100	37EUE06NDP	
	20	2	13-52	B	36FUF06ND		100	37FUF06NDD		100A/250V	37FUF06NDF		100	37FUF06NDP	
	30	(2½)	25-100	B	36GUG06ND		200	37GUG06NDD		200A/250V	37GUG06NDF		125	37GUG06NDP	
	40	3	25-100	B	36HUG06ND		200	37HUG06NDD		200A/250V	37HUG06NDF		150	37HUG06NDP	
	50	(3½)	50-200	B	36IUH06ND		200	37IUH06NDD		200A/250V	37IUH06NDF		250	37IUH06NDP	
	60	4	50-200	B	36JUH06ND		400	37JUH06NDD		400A/250V	37JUH06NDF		250	37JUH06NDP	
	75	5	55-250	—	36LPS06ND		400	37LPS06NDD		400A/250V	37LPS06NDF		400	37LPS06NDP	
	150	5	55-250	—	36LPU06ND		600	37LPU06NDD		600A/250V	37LPU06NDF		600	37LPU06NDP	
300	6	160-630	—	36MPX06ND		1200	37MPX06NDD		1200A/250V	37MPX06NDF		1200	37MPX06NDP		
230	10	1	10-40	A1	36DUE02NG		60	37DUE02NGD		60A/250V	37DUE02NGF		50	37DUE02NGP	
	15	(1¾)	10-40	A1	36EUE02NG		60	37EUE02NGD		60A/250V	37EUE02NGF		50	37EUE02NGP	
	25	2	13-52	B	36FUF02NG		100	37FUF02NGD		100A/250V	37FUF02NGF		100	37FUF02NGP	
	30	(2½)	25-100	B	36GUG02NG		200	37GUG02NGD		200A/250V	37GUG02NGF		100	37GUG02NGP	
	50	3	25-100	B	36HUG02NG		200	37HUG02NGD		200A/250V	37HUG02NGF		150	37HUG02NGP	
	60	(3½)	50-200	B	36IUH02NG		200	37IUH02NGD		200A/250V	37IUH02NGF		250	37IUH02NGP	
	75	4	50-200	B	36JUH02NG		400	37JUH02NGD		400A/250V	37JUH02NGF		250	37JUH02NGP	
	100	5	55-250	—	36LPS02NG		400	37LPS02NGD		400A/250V	37LPS02NGF		400	37LPS02NGP	
	150	5	55-250	—	36LPU02NG		600	37LPU02NGD		600A/250V	37LPU02NGF		600	37LPU02NGP	
350	6	160-630	—	36MPX02NG		1200	37MPX02NGD		1200A/250V	37MPX02NGF		1200	37MPX02NGP		
460	15	1	5.5-22	A1	36DUD04NH		30	37DUD04NHD		30A/600V	37DUD04NHF		30	37DUD04NHP	
	30	(1¾)	10-40	A1	36EUE04NH		60	37EUE04NHD		60A/600V	37EUE04NHF		50	37EUE04NHP	
	40	2	13-52	B	36FUF04NH		100	37FUF04NHD		100A/600V	37FUF04NHF		100	37FUF04NHP	
	60	(2½)	25-100	B	36GUG04NH		200	37GUG04NHD		200A/600V	37GUG04NHF		100	37GUG04NHP	
	75	3	25-100	B	36HUG04NH		200	37HUG04NHD		200A/600V	37HUG04NHF		125	37HUG04NHP	
	100	(3½)	50-200	B	36IUH04NH		200	37IUH04NHD		200A/600V	37IUH04NHF		150	37IUH04NHP	
	150	4	50-200	B	36JUH04NH		400	37JUH04NHD		400A/600V	37JUH04NHF		250	37JUH04NHP	
	200	5	55-250	—	36LPS04NH		400	37LPS04NHD		400A/600V	37LPS04NHF		400	37LPS04NHP	
300	5	55-250	—	36LPU04NH		600	37LPU04NHD		600A/600V	37LPU04NHF		600	37LPU04NHP		
700	6	160-630	—	36MPX04NH		1600	37MPX04NHD		1600A/600V	37MPX04NHF		1200	37MPX04NHP		
575	15	1	5.5-22	A1	36DUD05NE		30	37DUD05NED		30A/600V	37DUD05NEF		30	37DUD05NEP	
	30	(1¾)	10-40	A1	36EUE05NE		60	37EUE05NED		60A/600V	37EUE05NEF		50	37EUE05NEP	
	40	2	13-52	B	36FUF05NE		100	37FUF05NED		100A/600V	37FUF05NEF		50	37FUF05NEP	
	60	(2½)	25-100	B	36GUG05NE		100	37GUG05NED		100A/600V	37GUG05NEF		100	37GUG05NEP	
	75	3	25-100	B	36HUG05NE		200	37HUG05NED		200A/600V	37HUG05NEF		125	37HUG05NEP	
	100	(3½)	50-200	B	36IUH05NE		200	37IUH05NED		200A/600V	37IUH05NEF		150	37IUH05NEP	
	150	4	50-200	B	36JUH05NE		400	37JUH05NED		400A/600V	37JUH05NEF		250	37JUH05NEP	
	200	5	55-250	—	36LPS05NE		400	37LPS05NED		400A/600V	37LPS05NEF		250	37LPS05NEP	
300	5	55-250	—	36LPU05NE		600	37LPU05NED		600A/600V	37LPU05NEF		400	37LPU05NEP		
700	6	160-630	—	37MPX05NF		1600	37MPX05NED		1600A/600V	37MPX05NEF		1600	37MPX05NEP		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

NEMA & General Purpose Control

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CONTROL PRODUCTS

Reduced Voltage Heavy Duty Starters

Wye Delta, Closed Transition with Solid State Overload, Class 36 & 37

Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-169. ▶ Wiring Diagrams see page 17-185. ▶ Replacement Parts see page 17-133. 	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

NEMA 1 General Purpose Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUEC6BD		60	37DUEC6BDD		60A/250V	37DUEC6BDF		50	37DUEC6BDP	
	15	(1¾)	10-40	A1	36EUEC6BD		100	37EUEC6BDD		100A/250V	37EUEC6BDF		100	37EUEC6BDP	
	20	2	13-52	B	36FUF6BD		100	37FUF6BDD		100A/250V	37FUF6BDF		100	37FUF6BDP	
	30	(2½)	25-100	B	36GUGC6BD		200	37GUGC6BDD		200A/250V	37GUGC6BDF		125	37GUGC6BDP	
	40	3	25-100	B	36HUGC6BD		200	37HUGC6BDD		200A/250V	37HUGC6BDF		150	37HUGC6BDP	
	50	(3½)	50-200	B	36IUHC6BD		200	37IUHC6BDD		200A/250V	37IUHC6BDF		250	37IUHC6BDP	
	60	4	50-200	B	36JUHC6BD		400	37JUHC6BDD		400A/250V	37JUHC6BDF		250	37JUHC6BDP	
	75	5	55-250	—	36LPSC6BD		400	37LPSC6BDD		400A/250V	37LPSC6BDF		400	37LPSC6BDP	
	150	5	55-250	—	36LPUC6BD		600	37LPUC6BDD		600A/250V	37LPUC6BDF		600	37LPUC6BDP	
300	6	160-630	—	36MPXC6BD		1200	37MPXC6BDD		1200A/250V	37MPXC6BDF		1200	37MPXC6BDP		
230	10	1	10-40	A1	36DUEC2BG		60	37DUEC2BGD		60A/250V	37DUEC2BGF		50	37DUEC2BGP	
	15	(1¾)	10-40	A1	36EUEC2BG		60	37EUEC2BGD		60A/250V	37EUEC2BGF		50	37EUEC2BGP	
	25	2	13-52	B	36FUF2BG		100	37FUF2BGD		100A/250V	37FUF2BGF		100	37FUF2BGP	
	30	(2½)	25-100	B	36GUGC2BG		200	37GUGC2BGD		200A/250V	37GUGC2BGF		100	37GUGC2BGP	
	50	3	25-100	B	36HUGC2BG		200	37HUGC2BGD		200A/250V	37HUGC2BGF		150	37HUGC2BGP	
	60	(3½)	50-200	B	36IUHC2BG		200	37IUHC2BGD		200A/250V	37IUHC2BGF		250	37IUHC2BGP	
	75	4	50-200	B	36JUHC2BG		400	37JUHC2BGD		400A/250V	37JUHC2BGF		250	37JUHC2BGP	
	100	5	55-250	—	36LPSC2BG		400	37LPSC2BGD		400A/250V	37LPSC2BGF		400	37LPSC2BGP	
	150	5	55-250	—	36LPUC2BG		600	37LPUC2BGD		600A/250V	37LPUC2BGF		600	37LPUC2BGP	
350	6	160-630	—	36MPXC2BG		1200	37MPXC2BGD		1200A/250V	37MPXC2BGF		1200	37MPXC2BGP		
460	15	1	5.5-22	A1	36DUDC4BH		30	37DUDC4BHD		30A/600V	37DUDC4BHF		30	37DUDC4BHP	
	30	(1¾)	10-40	A1	36EUEC4BH		60	37EUEC4BHD		60A/600V	37EUEC4BHF		50	37EUEC4BHP	
	40	2	13-52	B	36FUF4BH		100	37FUF4BHD		100A/600V	37FUF4BHF		100	37FUF4BHP	
	60	(2½)	25-100	B	36GUGC4BH		200	37GUGC4BHD		200A/600V	37GUGC4BHF		100	37GUGC4BHP	
	75	3	25-100	B	36HUGC4BH		200	37HUGC4BHD		200A/600V	37HUGC4BHF		125	37HUGC4BHP	
	100	(3½)	50-200	B	36IUHC4BH		200	37IUHC4BHD		200A/600V	37IUHC4BHF		150	37IUHC4BHP	
	150	4	50-200	B	36JUHC4BH		400	37JUHC4BHD		400A/600V	37JUHC4BHF		250	37JUHC4BHP	
	200	5	55-250	—	36LPSC4BH		400	37LPSC4BHD		400A/600V	37LPSC4BHF		400	37LPSC4BHP	
	300	5	55-250	—	36LPUC4BH		600	37LPUC4BHD		600A/600V	37LPUC4BHF		600	37LPUC4BHP	
700	6	160-630	—	36MPXC4BH		1600	37MPXC4BHD		1600A/600V	37MPXC4BHF		1200	37MPXC4BHP		
575	15	1	5.5-22	A1	36DUDC5BE		30	37DUDC5BED		30A/600V	37DUDC5BEF		30	37DUDC5BEP	
	30	(1¾)	10-40	A1	36EUEC5BE		60	37EUEC5BED		60A/600V	37EUEC5BEF		50	37EUEC5BEP	
	40	2	13-52	B	36FUF5BE		100	37FUF5BED		100A/600V	37FUF5BEF		50	37FUF5BEP	
	60	(2½)	25-100	B	36GUGC5BE		100	37GUGC5BED		100A/600V	37GUGC5BEF		100	37GUGC5BEP	
	75	3	25-100	B	36HUGC5BE		200	37HUGC5BED		200A/600V	37HUGC5BEF		125	37HUGC5BEP	
	100	(3½)	50-200	B	36IUHC5BE		200	37IUHC5BED		200A/600V	37IUHC5BEF		150	37IUHC5BEP	
	150	4	50-200	B	36JUHC5BE		400	37JUHC5BED		400A/600V	37JUHC5BEF		250	37JUHC5BEP	
	200	5	55-250	—	36LPSC5BE		400	37LPSC5BED		400A/600V	37LPSC5BEF		250	37LPSC5BEP	
	300	5	55-250	—	36LPUC5BE		600	37LPUC5BED		600A/600V	37LPUC5BEF		400	37LPUC5BEP	
700	6	160-630	—	37MPXC5BF		1600	37MPXC5BED		1600A/600V	37MPXC5BEF		1600	37MPXC5BEP		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Wye Delta, Closed Transition with Solid State Overload, Class 36 & 37

Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-169. ▶ Wiring Diagrams see page 17-185. ▶ Replacement Parts see page 17-133. 	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

NEMA 4 Painted Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUEC6ED		60	37DUEC6EDD		60A/250V	37DUEC6EDF		50	37DUEC6EDP	
	15	(1¾)	10-40	A1	36EUEC6ED		100	37EUEC6EDD		100A/250V	37EUEC6EDF		100	37EUEC6EDP	
	20	2	13-52	B	36FUTC6ED		100	37FUTC6EDD		100A/250V	37FUTC6EDF		100	37FUTC6EDP	
	30	(2½)	25-100	B	36GUGC6ED		200	37GUGC6EDD		200A/250V	37GUGC6EDF		125	37GUGC6EDP	
	40	3	25-100	B	36HUGC6ED		200	37HUGC6EDD		200A/250V	37HUGC6EDF		150	37HUGC6EDP	
	50	(3½)	50-200	B	36IUHC6ED		200	37IUHC6EDD		200A/250V	37IUHC6EDF		250	37IUHC6EDP	
	60	4	50-200	B	36JUHC6ED		400	37JUHC6EDD		400A/250V	37JUHC6EDF		250	37JUHC6EDP	
	75	5	55-250	—	36LPSC6ED		400	37LPSC6EDD		400A/250V	37LPSC6EDF		400	37LPSC6EDP	
230	150	5	55-250	—	36LPUC6ED		600	37LPUC6EDD		600A/250V	37LPUC6EDF		600	37LPUC6EDP	
	300	6	160-630	—	36MPXC6ED		1200	37MPXC6EDD		1200A/250V	37MPXC6EDF		1200	37MPXC6EDP	
	10	1	10-40	A1	36DUEC2EG		60	37DUEC2EGD		60A/250V	37DUEC2EGF		50	37DUEC2EGP	
	15	(1¾)	10-40	A1	36EUEC2EG		60	37EUEC2EGD		60A/250V	37EUEC2EGF		50	37EUEC2EGP	
	25	2	13-52	B	36FUTC2EG		100	37FUTC2EGD		100A/250V	37FUTC2EGF		100	37FUTC2EGP	
	30	(2½)	25-100	B	36GUGC2EG		200	37GUGC2EGD		200A/250V	37GUGC2EGF		100	37GUGC2EGP	
	50	3	25-100	B	36HUGC2EG		200	37HUGC2EGD		200A/250V	37HUGC2EGF		150	37HUGC2EGP	
	60	(3½)	50-200	B	36IUHC2EG		200	37IUHC2EGD		200A/250V	37IUHC2EGF		250	37IUHC2EGP	
460	75	4	50-200	B	36JUHC2EG		400	37JUHC2EGD		400A/250V	37JUHC2EGF		250	37JUHC2EGP	
	100	5	55-250	—	36LPSC2EG		400	37LPSC2EGD		400A/250V	37LPSC2EGF		400	37LPSC2EGP	
	150	5	55-250	—	36LPUC2EG		600	37LPUC2EGD		600A/250V	37LPUC2EGF		600	37LPUC2EGP	
	350	6	160-630	—	36MPXC2EG		1200	37MPXC2EGD		1200A/250V	37MPXC2EGF		1200	37MPXC2EGP	
	15	1	5.5-22	A1	36DUDC4EH		30	37DUDC4EHD		30A/600V	37DUDC4EHF		30	37DUDC4EHP	
	30	(1¾)	10-40	A1	36EUEC4EH		60	37EUEC4EHD		60A/600V	37EUEC4EHF		50	37EUEC4EHP	
	40	2	13-52	B	36FUTC4EH		100	37FUTC4EHD		100A/600V	37FUTC4EHF		100	37FUTC4EHP	
	60	(2½)	25-100	B	36GUGC4EH		200	37GUGC4EHD		200A/600V	37GUGC4EHF		100	37GUGC4EHP	
575	75	3	25-100	B	36HUGC4EH		200	37HUGC4EHD		200A/600V	37HUGC4EHF		125	37HUGC4EHP	
	100	(3½)	50-200	B	36IUHC4EH		200	37IUHC4EHD		200A/600V	37IUHC4EHF		150	37IUHC4EHP	
	150	4	50-200	B	36JUHC4EH		400	37JUHC4EHD		400A/600V	37JUHC4EHF		250	37JUHC4EHP	
	200	5	55-250	—	36LPSC4EH		400	37LPSC4EHD		400A/600V	37LPSC4EHF		400	37LPSC4EHP	
	300	5	55-250	—	36LPUC4EH		600	37LPUC4EHD		600A/600V	37LPUC4EHF		600	37LPUC4EHP	
	700	6	160-630	—	36MPXC4EH		1600	37MPXC4EHD		1600A/600V	37MPXC4EHF		1200	37MPXC4EHP	
	15	1	5.5-22	A1	36DUDC5EE		30	37DUDC5EED		30A/600V	37DUDC5EEF		30	37DUDC5EEP	
	30	(1¾)	10-40	A1	36EUEC5EE		60	37EUEC5EED		60A/600V	37EUEC5EEF		50	37EUEC5EEP	
40	2	13-52	B	36FUTC5EE		100	37FUTC5EED		100A/600V	37FUTC5EEF		50	37FUTC5EEP		
60	(2½)	25-100	B	36GUGC5EE		100	37GUGC5EED		100A/600V	37GUGC5EEF		100	37GUGC5EEP		
75	3	25-100	B	36HUGC5EE		200	37HUGC5EED		200A/600V	37HUGC5EEF		125	37HUGC5EEP		
100	(3½)	50-200	B	36IUHC5EE		200	37IUHC5EED		200A/600V	37IUHC5EEF		150	37IUHC5EEP		
150	4	50-200	B	36JUHC5EE		400	37JUHC5EED		400A/600V	37JUHC5EEF		250	37JUHC5EEP		
200	5	55-250	—	36LPSC5EE		400	37LPSC5EED		400A/600V	37LPSC5EEF		250	37LPSC5EEP		
300	5	55-250	—	36LPUC5EE		600	37LPUC5EED		600A/600V	37LPUC5EEF		400	37LPUC5EEP		
700	6	160-630	—	37MPXC5EF		1600	37MPXC5EED		1600A/600V	37MPXC5EEF		1600	37MPXC5EEP		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Wye Delta, Closed Transition with Solid State Overload, Class 36 & 37

Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-169. ▶ Wiring Diagrams see page 17-185. ▶ Replacement Parts see page 17-133. 	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

NEMA 4/4X Stainless Steel Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUEC6WD		60	37DUEC6WDD		60A/250V	37DUEC6WDF		50	37DUEC6WDP	
	15	(1¾)	10-40	A1	36EUEC6WD		100	37EUEC6WDD		100A/250V	37EUEC6WDF		100	37EUEC6WDP	
	20	2	13-52	B	36FUFC6WD		100	37FUFC6WDD		100A/250V	37FUFC6WDF		100	37FUFC6WDP	
	30	(2½)	25-100	B	36GUGC6WD		200	37GUGC6WDD		200A/250V	37GUGC6WDF		125	37GUGC6WDP	
	40	3	25-100	B	36HUGC6WD		200	37HUGC6WDD		200A/250V	37HUGC6WDF		150	37HUGC6WDP	
	50	(3½)	50-200	B	36IUHC6WD		200	37IUHC6WDD		200A/250V	37IUHC6WDF		250	37IUHC6WDP	
230	60	4	50-200	B	36JUHC6WD		400	37JUHC6WDD		400A/250V	37JUHC6WDF		250	37JUHC6WDP	
	10	1	10-40	A1	36DUEC2WG		60	37DUEC2WGD		60A/250V	37DUEC2WGF		50	37DUEC2WGP	
	15	(1¾)	10-40	A1	36EUEC2WG		60	37EUEC2WGD		60A/250V	37EUEC2WGF		50	37EUEC2WGP	
	25	2	13-52	B	36FUFC2WG		100	37FUFC2WGD		100A/250V	37FUFC2WGF		100	37FUFC2WGP	
	30	(2½)	25-100	B	36GUGC2WG		200	37GUGC2WGD		200A/250V	37GUGC2WGF		100	37GUGC2WGP	
	50	3	25-100	B	36HUGC2WG		200	37HUGC2WGD		200A/250V	37HUGC2WGF		150	37HUGC2WGP	
460	60	(3½)	50-200	B	36IUHC2WG		200	37IUHC2WGD		200A/250V	37IUHC2WGF		250	37IUHC2WGP	
	75	4	50-200	B	36JUHC2WG		400	37JUHC2WGD		400A/250V	37JUHC2WGF		250	37JUHC2WGP	
	15	1	5.5-22	A1	36DUDC4WH		30	37DUDC4WHD		30A/600V	37DUDC4WHF		30	37DUDC4WHP	
	30	(1¾)	10-40	A1	36EUEC4WH		60	37EUEC4WHD		60A/600V	37EUEC4WHF		50	37EUEC4WHP	
	40	2	13-52	B	36FUFC4WH		100	37FUFC4WHD		100A/600V	37FUFC4WHF		100	37FUFC4WHP	
	60	(2½)	25-100	B	36GUGC4WH		200	37GUGC4WHD		200A/600V	37GUGC4WHF		100	37GUGC4WHP	
575	75	3	25-100	B	36HUGC4WH		200	37HUGC4WHD		200A/600V	37HUGC4WHF		125	37HUGC4WHP	
	100	(3½)	50-200	B	36IUHC4WH		200	37IUHC4WHD		200A/600V	37IUHC4WHF		150	37IUHC4WHP	
	150	4	50-200	B	36JUHC4WH		400	37JUHC4WHD		400A/600V	37JUHC4WHF		250	37JUHC4WHP	
	15	1	5.5-22	A1	36DUDC5WE		30	37DUDC5WED		30A/600V	37DUDC5WEF		30	37DUDC5WEP	
	30	(1¾)	10-40	A1	36EUEC5WE		60	37EUEC5WED		60A/600V	37EUEC5WEF		50	37EUEC5WEP	
	40	2	13-52	B	36FUFC5WE		100	37FUFC5WED		100A/600V	37FUFC5WEF		50	37FUFC5WEP	
	60	(2½)	25-100	B	36GUGC5WE		100	37GUGC5WED		100A/600V	37GUGC5WEF		100	37GUGC5WEP	
	75	3	25-100	B	36HUGC5WE		200	37HUGC5WED		200A/600V	37HUGC5WEF		125	37HUGC5WEP	
	100	(3½)	50-200	B	36IUHC5WE		200	37IUHC5WED		200A/600V	37IUHC5WEF		150	37IUHC5WEP	
	150	4	50-200	B	36JUHC5WE		400	37JUHC5WED		400A/600V	37JUHC5WEF		250	37JUHC5WEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Wye Delta, Closed Transition with Solid State Overload, Class 36 & 37

Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> ► Field Modification Kits see page 17-106. ► Factory Modifications see page 17-121. ► Dimensions see page 17-169. ► Wiring Diagrams see page 17-185. ► Replacement Parts see page 17-133. 	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

NEMA 12, NEMA 3/3R

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUEC6ND		60	37DUEC6NDD		60A/250V	37DUEC6NDF		50	37DUEC6NDP	
	15	(1¾)	10-40	A1	36EUEC6ND		100	37EUEC6NDD		100A/250V	37EUEC6NDF		100	37EUEC6NDP	
	20	2	13-52	B	36F UFC6ND		100	37F UFC6NDD		100A/250V	37F UFC6NDF		100	37F UFC6NDP	
	30	(2½)	25-100	B	36GUGC6ND		200	37GUGC6NDD		200A/250V	37GUGC6NDF		125	37GUGC6NDP	
	40	3	25-100	B	36HUGC6ND		200	37HUGC6NDD		200A/250V	37HUGC6NDF		150	37HUGC6NDP	
	50	(3½)	50-200	B	36IUHC6ND		200	37IUHC6NDD		200A/250V	37IUHC6NDF		250	37IUHC6NDP	
	60	4	50-200	B	36JUHC6ND		400	37JUHC6NDD		400A/250V	37JUHC6NDF		250	37JUHC6NDP	
	75	5	55-250	—	36LPSC6ND		400	37LPSC6NDD		400A/250V	37LPSC6NDF		400	37LPSC6NDP	
230	10	1	10-40	A1	36DUEC2NG		60	37DUEC2NGD		60A/250V	37DUEC2NGF		50	37DUEC2NGP	
	15	(1¾)	10-40	A1	36EUEC2NG		60	37EUEC2NGD		60A/250V	37EUEC2NGF		50	37EUEC2NGP	
	25	2	13-52	B	36F UFC2NG		100	37F UFC2NGD		100A/250V	37F UFC2NGF		100	37F UFC2NGP	
	30	(2½)	25-100	B	36GUGC2NG		200	37GUGC2NGD		200A/250V	37GUGC2NGF		100	37GUGC2NGP	
	50	3	25-100	B	36HUGC2NG		200	37HUGC2NGD		200A/250V	37HUGC2NGF		150	37HUGC2NGP	
	60	(3½)	50-200	B	36IUHC2NG		200	37IUHC2NGD		200A/250V	37IUHC2NGF		250	37IUHC2NGP	
	75	4	50-200	B	36JUHC2NG		400	37JUHC2NGD		400A/250V	37JUHC2NGF		250	37JUHC2NGP	
	100	5	55-250	—	36LPSC2NG		400	37LPSC2NGD		400A/250V	37LPSC2NGF		400	37LPSC2NGP	
460	150	5	55-250	—	36LPUC2NG		600	37LPUC2NGD		600A/250V	37LPUC2NGF		600	37LPUC2NGP	
	350	6	160-630	—	36MPXC2NG		1200	37MPXC2NGD		1200A/250V	37MPXC2NGF		1200	37MPXC2NGP	
	15	1	5.5-22	A1	36DUDC4NH		30	37DUDC4NHD		30A/600V	37DUDC4NHF		30	37DUDC4NHP	
	30	(1¾)	10-40	A1	36EUEC4NH		60	37EUEC4NHD		60A/600V	37EUEC4NHF		50	37EUEC4NHP	
	40	2	13-52	B	36F UFC4NH		100	37F UFC4NHD		100A/600V	37F UFC4NHF		100	37F UFC4NHP	
	60	(2½)	25-100	B	36GUGC4NH		200	37GUGC4NHD		200A/600V	37GUGC4NHF		100	37GUGC4NHP	
	75	3	25-100	B	36HUGC4NH		200	37HUGC4NHD		200A/600V	37HUGC4NHF		125	37HUGC4NHP	
	100	(3½)	50-200	B	36IUHC4NH		200	37IUHC4NHD		200A/600V	37IUHC4NHF		150	37IUHC4NHP	
575	150	4	50-200	B	36JUHC4NH		400	37JUHC4NHD		400A/600V	37JUHC4NHF		250	37JUHC4NHP	
	200	5	55-250	—	36LPSC4NH		400	37LPSC4NHD		400A/600V	37LPSC4NHF		400	37LPSC4NHP	
	300	5	55-250	—	36LPUC4NH		600	37LPUC4NHD		600A/600V	37LPUC4NHF		600	37LPUC4NHP	
	700	6	160-630	—	36MPXC4NH		1600	37MPXC4NHD		1600A/600V	37MPXC4NHF		1200	37MPXC4NHP	
	15	1	5.5-22	A1	36DUDC5NE		30	37DUDC5NED		30A/600V	37DUDC5NEF		30	37DUDC5NEP	
	30	(1¾)	10-40	A1	36EUEC5NE		60	37EUEC5NED		60A/600V	37EUEC5NEF		50	37EUEC5NEP	
	40	2	13-52	B	36F UFC5NE		100	37F UFC5NED		100A/600V	37F UFC5NEF		50	37F UFC5NEP	
	60	(2½)	25-100	B	36GUGC5NE		100	37GUGC5NED		100A/600V	37GUGC5NEF		100	37GUGC5NEP	
575	75	3	25-100	B	36HUGC5NE		200	37HUGC5NED		200A/600V	37HUGC5NEF		125	37HUGC5NEP	
	100	(3½)	50-200	B	36IUHC5NE		200	37IUHC5NED		200A/600V	37IUHC5NEF		150	37IUHC5NEP	
	150	4	50-200	B	36JUHC5NE		400	37JUHC5NED		400A/600V	37JUHC5NEF		250	37JUHC5NEP	
	200	5	55-250	—	36LPSC5NE		400	37LPSC5NED		400A/600V	37LPSC5NEF		250	37LPSC5NEP	
	300	5	55-250	—	36LPUC5NE		600	37LPUC5NED		600A/600V	37LPUC5NEF		400	37LPUC5NEP	
	700	6	160-630	—	37MPXC5NF		1600	37MPXC5NED		1600A/600V	37MPXC5NEF		1600	37MPXC5NEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

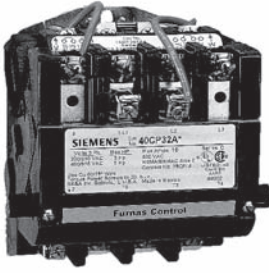
NEMA & General Purpose Control

CONTROL PRODUCTS

Heavy Duty Contactors

3-Phase, Class 40

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see pages 17-146 open and 17-159 enclosed. ▶ Wiring Diagrams see page 17-186. ▶ Replacement Parts see page 17-133. 	Coil Table <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240^①</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480^①</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 17-121.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240 ^①	A	200–208	D	220–240	G	277	L	220–240/440–480 ^①	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
24	J																					
120	F																					
110–120/220–240 ^①	A																					
200–208	D																					
220–240	G																					
277	L																					
220–240/440–480 ^①	C																					
440–480	H																					
575–600	E																					

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp					Contactor Amp Rating	NEMA Size	Half Size	Enclosure												
200 Volts	230 Volts	460 Volts	575 Volts	Open Type ^⑤				NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use	NEMA 12 NEMA 3/3R Industrial Use Weatherproof	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1½	1½	2	2	9	00	—	40BP32A*	40BP32B*	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
3	3	5	5	18	0	—	40CP32A*	40CP32B*	40CP32W*	—	40CP32F*	—	40CP32H*	—	40CP32*	—	40CP32*	—	40CP32*	—
7½	7½	10	10	27	1	—	40DP32A*	40DP32B*	40DP32W*	—	40DP32F*	—	40DP32H*	—	40DP32*	—	40DP32*	—	40DP32*	—
10	10	15	15	40	—	1¼	40EP32A*	40EP32B*	40EP32W*	—	40EP32F*	—	40EP32H*	—	40EP32*	—	40EP32*	—	40EP32*	—
10	15	25	25	45	2	—	40FP32A*	40FP32B*	40FP32W*	—	40FP32F*	—	40FP32H*	—	40FP32*	—	40FP32*	—	40FP32*	—
15	20	30	30	60	—	2½	40GP32A*	40GP32B*	40GP32W*	—	40GP32F*	—	40GP32H*	—	40GP32*	—	40GP32*	—	40GP32*	—
25	30	50	50	90	3	—	40HP32A*	40HP32B*	40HP32W*	—	40HP32F*	—	40HP32H*	—	40HP32*	—	40HP32*	—	40HP32*	—
30	40	75	75	115	—	3½	40IP32A*	40IP32B*	40IP32W*	—	40IP32F*	—	40IP32H*	—	40IP32*	—	40IP32*	—	40IP32*	—
40	50	100	100	135	4	—	40JG32A*	40JG32B*	40JG32W*	—	40JG32F*	—	40JG32H*	—	40JG32*	—	40JG32*	—	40JG32*	—
75	100	200	200	270	5	—	40LP32A*	40LP32B*	40LP32E* ^②	—	—	—	40LP32H*	—	—	—	—	—	—	—
150	200	400	400	540	6	—	40MP32A*	40MP32B*	40MP32E* ^②	—	—	—	—	—	—	—	—	—	—	—
—	300	600	600	810	7 ^{③④}	—	40NH32A*	40NH32B*	40NH32E* ^②	—	—	—	—	—	—	—	—	—	—	—
—	450	900	900	1215	8 ^{③④}	—	40PH32A*	40PH32B*	40PH32E* ^②	—	—	—	—	—	—	—	—	—	—	—

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp					Contactor Amp Range	NEMA Size	Half Size	Enclosure								
200 Volts	230 Volts	460 Volts	575 Volts	NEMA 1 ^⑤ General Purpose				NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel	NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use	NEMA 12 NEMA 3/3R Industrial Use Weatherproof	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1½	1½	2	2	9	00	—	40BP82B*	—	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
3	3	5	5	18	0	—	40CP82B*	—	40CP82W*	—	40CP82H*	—	40CP82*	—	40CP82*	—
7½	7½	10	10	27	1	—	40DP82B*	—	40DP82W*	—	40DP82H*	—	40DP82*	—	40DP82*	—
10	10	15	15	40	—	1¼	40EP82B*	—	40EP82W*	—	40EP82H*	—	40EP82*	—	40EP82*	—
10	15	25	25	45	2	—	40FP82B*	—	40FP82W*	—	40FP82H*	—	40FP82*	—	40FP82*	—
15	20	30	30	60	—	2½	40GP82B*	—	40GP82W*	—	40GP82H*	—	40GP82*	—	40GP82*	—
25	30	50	50	90	3	—	40HP82B*	—	40HP82W*	—	40HP82H*	—	40HP82*	—	40HP82*	—
30	40	75	75	115	—	3½	40IP82B*	—	40IP82W*	—	40IP82H*	—	40IP82*	—	40IP82*	—
40	50	100	100	135	4	—	40JG82B*	—	40JG82W*	—	40JG82H*	—	40JG82*	—	40JG82*	—

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① Dual voltage coils not available in size 5-8 starters.
 ② Enclosure is NEMA Type 4 (painted steel).

③ Only available
 F coil 100-250V AC 50/60Hz, or DC
 H coil 150-500V AC 50/60Hz, or DC
 ④ Only available
 F coil 100-250V AC 50/60Hz, or DC

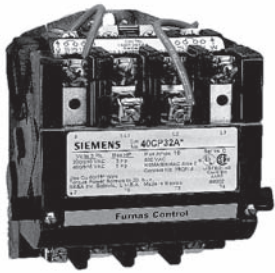
Standard Auxiliary Contacts			
Type	Size (3rd Character)	Configuration	Internal / External
All FVNR Starters & Contactors	B Thru E	1N.O.	Internal
	F Thru J	1N.O.	External
	L Thru M	2N.O., 2N.C.	External
	N Thru P	1N.O., 1N.C.	External

⑤ Lugs are not included, refer to page 17-110.

Heavy Duty Contactors

Single Phase, 4-Pole & Vacuum, Class 40

Selection

	Ordering Information		Coil Table																				
	<ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see pages 17-146 open and 17-159 enclosed. ▶ Wiring Diagrams see page 17-186. ▶ Replacement Parts see page 17-133. 		<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110-120/220-240^①</td><td>A</td></tr> <tr><td>200-208</td><td>D</td></tr> <tr><td>220-240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220-240/440-480^①</td><td>C</td></tr> <tr><td>440-480</td><td>H</td></tr> <tr><td>575-600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 17-121.</p>		60Hz Voltage	Letter	24	J	120	F	110-120/220-240 ^①	A	200-208	D	220-240	G	277	L	220-240/440-480 ^①	C	440-480	H	575-600
60Hz Voltage	Letter																						
24	J																						
120	F																						
110-120/220-240 ^①	A																						
200-208	D																						
220-240	G																						
277	L																						
220-240/440-480 ^①	C																						
440-480	H																						
575-600	E																						

Open Type & Standard Width Enclosure, Single Phase, 2-Pole^{②③}

Max Hp				Enclosure												
115 Volts	208/230 Volts	Contactor Amp Rating	NEMA Size	Half Size	Open Type ^④		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosure Indoor/Outdoor Use		NEMA 12 NEMA 3/3R Industrial Use Weatherproof	
					Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$
1/5	1	9	00	—	40BP12A*		40BP12B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1	2	18	0	—	40CP12A*		40CP12B*		40CP12W*		40CP12F*		40CP12H*		40CP120*	
2	3	27	1	—	40DP12A*		40DP12B*		40DP12W*		40DP12F*		40DP12H*		40DP120*	
3	5	35	1P	—	40EP12A*		40EP12B*		40EP12W*		40EP12F*		40EP12H*		40EP120*	
3	7 1/2	45	2	—	40FP12A*		40FP12B*		40FP12W*		40FP12F*		40FP12H*		40FP120*	
5	10	60	—	2 1/2	40GP12A*		40GP12B*		40GP12W*		40GP12F*		40GP12H*		40GP120*	
7 1/2	15	90	3	—	40HP12A*		40HP12B*		40HP12W*		40HP12F*		40HP12H*		40HP120*	


NEMA & General Purpose Control

Open Type & Standard Width Enclosure, 4-Pole

Max Hp					Enclosure													
200 Volts	230 Volts	460 Volts	575 Volts	Contactor Amp Rating	NEMA Size	Half Size	Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosure Indoor/Outdoor Use		NEMA 12 NEMA 3/3R Industrial Use Weatherproof	
							Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$
1/5	1 1/2	2	2	9	00	—	40BP22A*		40BP22B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
2	3	5	5	18	0	—	40CP22A*		40CP22B*		40CP22W*		40CP22F*		40CP22H*		40CP220*	
3	7 1/2	10	10	27	1	—	40DP22A*		40DP22B*		40DP22W*		40DP22F*		40DP22H*		40DP220*	
5	10	15	15	40	—	1 3/4	40EP22A*		40EP22B*		40EP22W*		40EP22F*		40EP22H*		40EP220*	

CONTROL PRODUCTS

Vacuum Contactors, 3-Phase, 3-Pole^①

	Max Hp				Contactor Amp Rating	NEMA Size	Open Type	
	200V	230V	460V	575V			Catalog Number	List Price \$
	40	50	100	100	135	4	40JV32A*	
75	100	200	200	270	5	40LV32A*		
150	200	400	400	540	6	40MV32A*		

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① Dual voltage coils not available for vacuum contactors. Refer to Page 17-121 for a complete list of available coil voltages.

② To order single phase contactor in an extra wide enclosure, order the enclosure kit from Page 17-115 and the open style contactor as separate items.

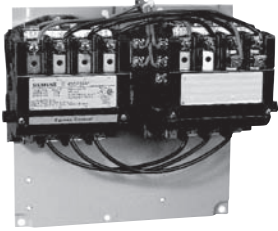
③ Coils D, F, or G will be wired for incoming voltage. J coil will be wired for separate source. Coils E, H, and L do not apply to single phase starters.

④ 1 NO Auxiliary.

Reversing Heavy Duty Contactors

Class 43

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see pages 17-147 open and 17-164 enclosed. ▶ Wiring Diagrams see page 17-186. ▶ Replacement Parts see page 17-133. 	Coil Table <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240^①</td><td>A</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220–240/440–480^①</td><td>C</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>575–600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 17-121.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240 ^①	A	200–208	D	220–240	G	277	L	220–240/440–480 ^①	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
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277	L																					
220–240/440–480 ^①	C																					
440–480	H																					
575–600	E																					

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp					Cont-actor Amp Rating	NEMA Size	Half Size	Enclosure											
200 Volts	230 Volts	460 Volts	575 Volts	Open Type ^⑥				NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 NEMA 3/3R Industrial Use Weatherproof			
Cat No	List Price \$	Cat No	List Price \$	Cat No	List Price \$	Cat No	List Price \$	Cat No	List Price \$	Cat No	List Price \$	Cat No	List Price \$	Cat No	List Price \$				
1/2	1/2	2	2	9	00	—	43BP32A*	43BP32B*	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—			
3	3	5	5	18	0	—	43CP32A*	43CP32B*	43CP32W*	—	43CP32F*	—	43CP32H*	—	43CP320*	—			
7 1/2	7 1/2	10	10	27	1	—	43DP32A*	43DP32B*	43DP32W*	—	43DP32F*	—	43DP32H*	—	43DP320*	—			
10	10	15	15	40	—	1 3/4	43EP32A*	43EP32B*	43EP32W*	—	43EP32F*	—	43EP32H*	—	43EP320*	—			
10	15	25	25	45	2	—	43FP32A*	43FP32B*	43FP32W*	—	43FP32F*	—	43FP32H*	—	43FP320*	—			
15	20	30	30	60	—	2 1/2	43GP32A*	43GP32B*	43GP32W*	—	43GP32F*	—	43GP32H*	—	43GP320*	—			
25	30	50	50	90	3	—	43HP32A*	43HP32B*	43HP32W*	—	43HP32F*	—	43HP32H*	—	43HP320*	—			
30	40	75	75	115	—	3 1/2	43IP32A*	43IP32B*	43IP32W*	—	43IP32F*	—	43IP32H*	—	43IP320*	—			
40	50	100	100	135	4	—	43JG32A*	43JG32B*	43JG32W*	—	43JG32F*	—	43JG32H*	—	43JG320*	—			
75	100	200	200	270	5	—	43LP32A*	43LP32B*	43LP32E* ^②	—	—	—	—	—	43LP320*	—			
100	200	400	400	540	6	—	43MP32A*	43MP32B*	43MP32E* ^②	—	—	—	—	—	43MP320*	—			
—	300	600	600	810	7 ^④	—	43NH32A*	43NH32B*	43NH32E* ^②	—	—	—	—	—	43NH320*	—			
—	450	900	900	1215	8 ^⑤	—	43PH32A*	—	—	—	—	—	—	—	—	—			

Open Type & Standard Width Enclosure, Single Phase, 3-Wire, 2-Pole^③

Max Hp				Cont-actor Amp Rating	NEMA Size	Enclosure											
115 Volts	208/230 Volts	208/230 Volts	208/230 Volts			Open Type	NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 NEMA 3/3R Industrial Use Weatherproof		
Cat No	List Price \$	Cat No	List Price \$	Cat No	List Price \$	Cat No	List Price \$	Cat No	List Price \$	Cat No	List Price \$	Cat No	List Price \$	Cat No	List Price \$		
1/2	1	9	00	43BP12A*	43BP12B*	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—		
1	2	18	0	43CP12A*	43CP12B*	43CP12W*	—	43CP12F*	—	43CP12H*	—	43CP120*	—	43CP120*	—		
2	3	27	1	43DP12A*	43DP12B*	43DP12W*	—	43DP12F*	—	43DP12H*	—	43DP120*	—	43DP120*	—		
3	5	35	1P	43EP12A*	43EP12B*	43EP12W*	—	43EP12F*	—	43EP12H*	—	43EP120*	—	43EP120*	—		

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① Dual voltage coils not available in size 5–8 starters.

② Enclosure is NEMA Type 4 (painted steel).

③ Coils D, F, or G will be wired for incoming voltage. J coil will be wired for separate source. Coils E, H, and L do not apply to single phase starters.

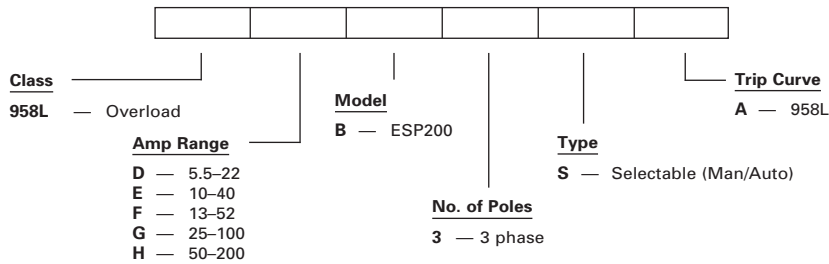
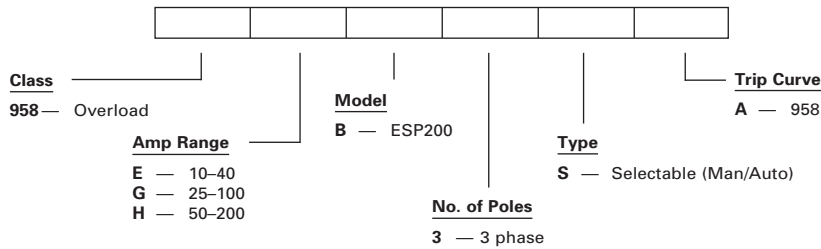
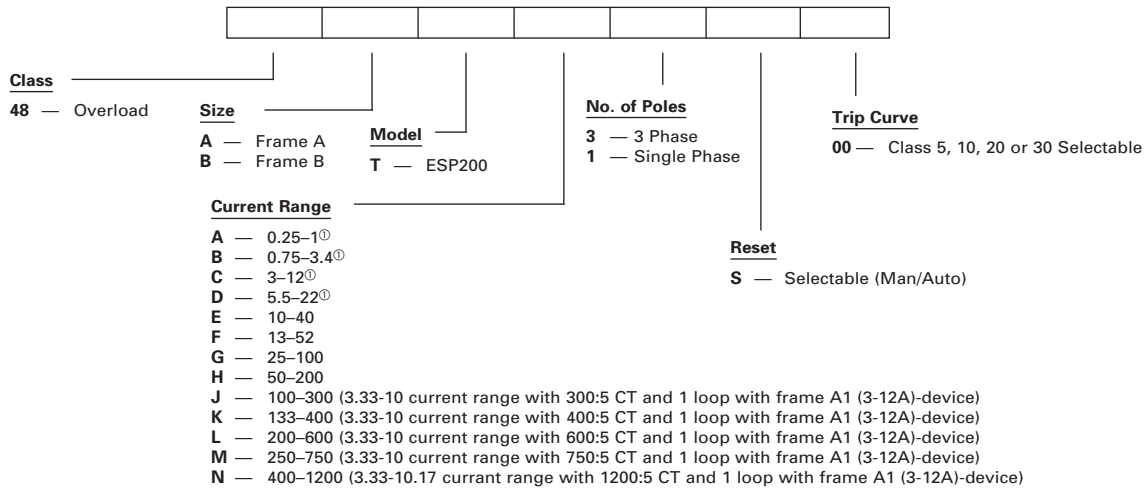
④ Only available
F coil 100-250V AC 50/60Hz, or DC
H coil 150-500V AC 50/60Hz, or DC

⑤ Only available

F coil 100-250V AC 50/60Hz, or DC

⑥ Auxiliary contacts
43B-43E 4th pole built-in
43F-43J 2 NO & 2 NC

Heavy Duty Control

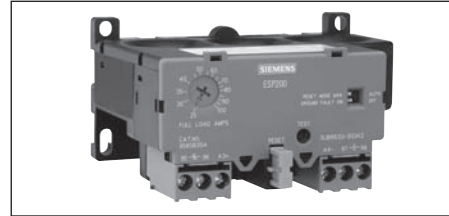


^① Ranges available in Single or 3-phase.

Overload Relays

Solid State ESP200, Class 48, 958 and 958L

General



NEMA & General
Purpose Control

17
CONTROL
PRODUCTS

Features	Benefits
<ul style="list-style-type: none"> ▪ Trip Classes - 5, 10, 20, or 30 Selectable by DIP-switches 	<ul style="list-style-type: none"> ▪ Field changeable reduces time and inventory. Suitable for light, normal and heavy starting conditions
<ul style="list-style-type: none"> ▪ Phase Loss Protection - Trips in less than 3 Seconds 	<ul style="list-style-type: none"> ▪ Protects motor burn out and minimizes motor heating up
<ul style="list-style-type: none"> ▪ Phase Unbalance - Trips based on Trip Class selected 	<ul style="list-style-type: none"> ▪ Minimizes temperature rise of the motor on a asymmetrical three-phase-system
<ul style="list-style-type: none"> ▪ Ground Fault - Trips 60% of Motor Current 	<ul style="list-style-type: none"> ▪ Provides optimum system protection of motors against high-resistance short-circuits or ground faults due to moisture, condensation, damage of insulation or any other reason
<ul style="list-style-type: none"> ▪ Trip Indicator - Visible 	<ul style="list-style-type: none"> ▪ Save time, faster to identify overload Trip
<ul style="list-style-type: none"> ▪ Ambient Insensitive 	<ul style="list-style-type: none"> ▪ Prevents nuisance tripping
<ul style="list-style-type: none"> ▪ No Heaters Required 	<ul style="list-style-type: none"> ▪ Saves cost and eliminates time for installation of heaters
<ul style="list-style-type: none"> ▪ Self-Powered - No outside source required 	<ul style="list-style-type: none"> ▪ Reduce cost for external power supply
<ul style="list-style-type: none"> ▪ FLA dial with wide Adjustment - 4:1 ratio 	<ul style="list-style-type: none"> ▪ Provides wide range, reduces inventory
<ul style="list-style-type: none"> ▪ Self Protected in short circuit condition (when used with proper fuses or motor starter protector) 	<ul style="list-style-type: none"> ▪ Unlike bimetal overloads, this eliminates replacement of the overload heaters after short circuit
<ul style="list-style-type: none"> ▪ Test Button - Tests Electronics 	<ul style="list-style-type: none"> ▪ Tests the complete electronic functions including the trip mechanism. Increases up time
<ul style="list-style-type: none"> ▪ Thermal Memory 	<ul style="list-style-type: none"> ▪ Prevents re-starting motor when it is still hot
<ul style="list-style-type: none"> ▪ Conformally coated circuit board 	<ul style="list-style-type: none"> ▪ Resists against environmental conditions
<ul style="list-style-type: none"> ▪ 1 NO and 1NC Contacts Standard. B600, R300 	<ul style="list-style-type: none"> ▪ Makes it easier for user to wire local contacts
<ul style="list-style-type: none"> ▪ Operating Temperature: -25 °C - 65 °C 	<ul style="list-style-type: none"> ▪ Wide operating temperature range prevents nuisance tripping with temperature changes
<ul style="list-style-type: none"> ▪ Repeat Accuracy <1%. 	<ul style="list-style-type: none"> ▪ For more precise settings and reduced nuisance tripping
<ul style="list-style-type: none"> ▪ Removable Terminal Block 	<ul style="list-style-type: none"> ▪ Terminal Block can be removed without removing wires. Saves time for replacements
<ul style="list-style-type: none"> ▪ Automatic reset 	<ul style="list-style-type: none"> ▪ Auto. Reset is 3 minutes after tripping, allowing motor to cool down before re-start. If Manual Reset is selected, overload can be reset immediately
<ul style="list-style-type: none"> ▪ Remote reset 	<ul style="list-style-type: none"> ▪ As an alternative to the mechanical RESET options, an electrical remote RESET can be used by applying 24 V DC to terminals A3 and A4
<ul style="list-style-type: none"> ▪ DIN Rail Mounted 	<ul style="list-style-type: none"> ▪ Reduces installation time
<ul style="list-style-type: none"> ▪ Touch - Safe Terminals 	<ul style="list-style-type: none"> ▪ Protects against accidental touching of live circuits
<ul style="list-style-type: none"> ▪ UL listed CSA certified 	<ul style="list-style-type: none"> ▪ Third party approval standard

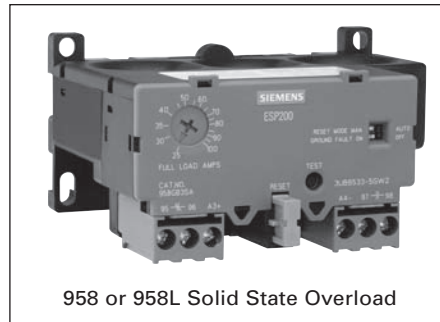
Overload Relays

Solid State ESP200, Class 48, 958, 958L and Bimetal

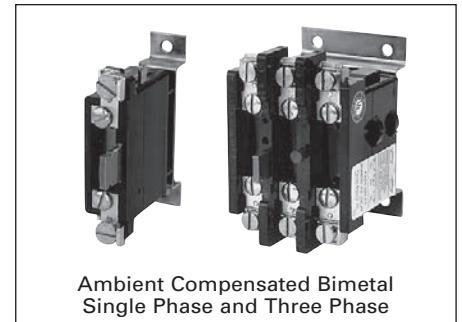
General



ESP200 Solid State Overload



958 or 958L Solid State Overload



Ambient Compensated Bimetal Single Phase and Three Phase

Applications

ESP200 Solid State Overloads

Designed for a wide variety of applications. The field selectable Trip Class 5, 10, 20 or 30 can easily be set by 2 DIP switches. This eliminates the guess factor of an application requirements and provides reduced inventory for multiple applications. The inherent benefits of the ESP200 ultimately results in cost savings for the user.

ESP200 has a 4:1 current adjustment range with a fine adjustment dial labeled in full load amps. The heaterless overload minimizes the heat trapped in the enclosures, reduces cost for ventilation or cooling. Easily accessible Reset button, provides visible and audible indications to ensure the tripped overload is ready to re-start.

Designed to replace thermal, or ESP100 overload relays for any application. It has the same dimensions and footprint of the ESP100 overload relays. It can be directly coupled to the contactors or remotely mounted. In addition to the NEMA contactor applications, it also can be used with other types of controllers for applications requiring DP or IEC contactors. As a retrofit for other brands, it is used with a plate available for retrofitting competitive products.

958 ESP200 Special Use Solid State Overloads

This overload is specifically designed for special applications, to provide excellent protection of hermetically sealed and artificially cooled motors that require ambient insensitive and quick trip response times. Combined with a series lockout relay, it provides unsurpassed protection for hermetically sealed compressor motors in air conditioning applications. The combination of high trip speed, current adjustment, and ease of installation makes it suitable for these applications. The trip curves are customized to provide proper overload protection for these loads without causing nuisance tripping.

It has selectable manual or automatic reset mode, and provides ground fault selection to protect equipment from damage in case of a fault.

958L ESP200 Oil Field Solid State Overloads

Specifically designed for the oil market and the cycling loads experienced with these types of pumping applications. These overload relays provide protection for standard motors, oil well pump motors, multi-torque connections, and ultra-high slip motors.

Rotors can be damaged in less than 15 seconds during motor stall conditions if electrical power is not removed. To prevent damage during motor stall, the 958L solid state overload removes the power in 7 seconds at 250% lock rotor current. Therefore, the motor casing and the rotor will be protected from being damage saving the user money and time.

Ambient Compensated Bimetal Overloads

- Automatic or manual reset adjustment
- A manual test button is provided to test the operation of the 3-pole overload relay control contacts
- $\pm 15\%$ nominal trip current adjustment
- Accept either standard Class 20 or Quick Trip (NEMA Class 10) heater elements without any other changes or adjustments
- Available with a normally open contact for an alarm circuit (SPDT) up to 60A
- Compensated bimetal overload relays provide a constant trip time in ambient temperatures from -20°F to $+170^{\circ}\text{F}$ for a given heater rating
- UL Listed File #E22655 or Component Recognized
- CSA Certified File #LR6535

Ambient Compensated Bimetal Overloads

These thermal type overload relays are used to protect motors from excessive heat resulting from sustained motor overloads, rapid motor cycling and stalled rotor conditions. Although these devices function based on thermal principles they are designed to compensate for the ambient air temperature surrounding the overload. This helps prevent the occurrence of nuisance tripping when there are high surrounding ambient temperatures. The percentage of overload determines the length of time required to open the circuit.

NEMA & General Purpose Control

CONTROL PRODUCTS

Overload Relays

Solid State Class 48, ESP200 and 3RB20

Selection



3-Phase, 48ATC3S00

Ordering Information

- ▶ For CT's see Accessories page 17-69.
- ▶ Dimensions see page 17-148.
- ▶ To retrofit or direct mount to a contactor, order 49ASMP1, 2, or 3 separately. See Retrofit Plates below.
- ▶ For remote mounting of frame size A order 49ASMS1 terminals separately, see page 17-110.

Solid State—Class 48

Current Adjustment Range	Phase	Frame Size	Catalog Number	MRPD/MLFB	List Price \$
0.25–1	3	"A"	48ATA3S00	3UB81134AB2	
0.75–3.4	3	"A"	48ATB3S00	3UB81134BB2	
3–12	3	"A1"	48ATC3S00	3UB81234CW2	
5.5–22	3	"A1"	48ATD3S00	3UB81234DW2	
10–40	3	"A1"	48ATE3S00	3UB81234EW2	
13–52	3	"B"	48BTF3S00	3UB81334FW2	
25–100	3	"B"	48BTG3S00	3UB81334GW2	
50–200	3	"B"	48BTH3S00	3UB81334HW2	
100–300	3	"A1" ②	48ATJ3S00	3UB81234JW2	
133–400	3	"A1" ③	48ATK3S00	3UB81234KW2	
200–600	3	"A1" ④	48ATL3S00	3UB81234LW2	
250–750	3	"A1" ⑤	48ATM3S00	3UB81234MW2	
400–1220	3	"A1" ⑥	48ATN3S00	3UB81234NW2	
0.25–1	1	"A"	48ATA1S00	3UB88134AB2	
0.75–3.4	1	"A"	48ATB1S00	3UB88134BB2	
3–12	1	"A1"	48ATC1S00	3UB88234CW2	
5.5–22	1	"A1"	48ATD1S00	3UB88234DW2	
25–100	1	"B"	48BTG1S00	3UB88334GW2	

Solid State—3RB206^{③④}, 3-Phase, Manual/Auto Reset

For Contactor Size	Setting Range Amps	Class 10 Catalog Number	List Price \$	Class 20 Catalog Number	List Price \$
5	55 - 250	3RB2066-1GC2		3RB2066-2GC2	
6	160 - 630	3RB2066-1MC2		3RB2066-2MC2	

Retrofit Plates for Contactors, Class 48

Replacement for Starter Sizes	ESP200 Overload Frame Size ^①	Retrofit Plate Suffix	Plate Kit Separate	Price Adder \$
Size 00–1¼ Size 2, 2½	A or A1 B	1P 2P	49ASMP1 49ASMP2	
Size 3, 3½ Size 4	B B	3P 4P	49ASMP3 49ASMP3	

Ambient Compensated Bimetal—Open Type Class 48 Single Phase, 3-Phase (Panel Mount Only)

Poles	Amp Rating	Auxiliary Contacts	Contact Rating	Catalog Number	List Price \$	
1	25	1 NC	5A (B600) & 5A (P300)	48DA18AA4		
	60	1 NC		48GA18AA4		
	100	1 NC		48HA18AA4		
	180	1 NC		48JA18AA4		
3	30	1 NC	10A (A600) & 5A (P300)	48DC38AA4		
	30	1 NO/NC		48DC39AA4		
	60	1 NC		48GC38AA4		
	60	1 NO/NC		48GC39AA4		
	100	3 NC		5A (B600) & 5A (P300)		48HA38AA4
	180	3 NC				48JA38AA4

① To determine frame size of replacement solid state overload, refer to retrofit plates table above.

② Requires use of 300:5 Current Transformers—3 of 97CT005.

③ Product Category: IEC.

④ Requires use of 600:5 Current Transformers—3 of 97CT008.

⑤ Requires use of 1200:5 Current Transformers—3 of 97CT012.

⑥ Overload has busbar connections.

⑦ Requires use of 750:5 Current Transformers—3 of 97CT009.

⑧ Requires use of 400:5 Current Transformers—3 of 97CT006.

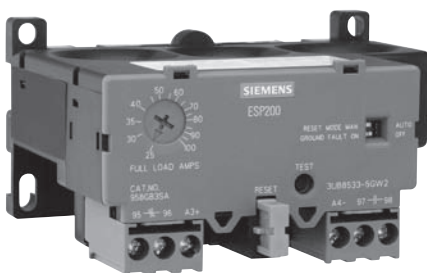
NEMA & General Purpose Control

CONTROL PRODUCTS 17

Overload Relays

Special Use Solid State Overloads, Class 958 and 958L

Selection



Class 958, 958L

Ordering Information

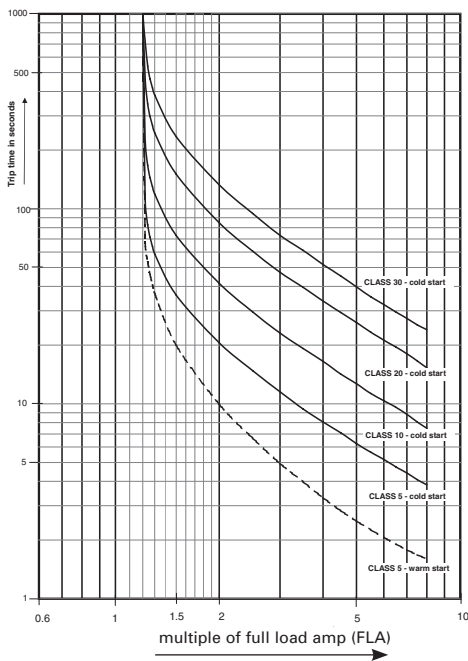
► Dimensions see page 17-148.

Current Transformers		
Rating	Catalog No.	List Price \$
150:5	97CT002	
200:5	97CT003	
250:5	97CT004	
300:5	97CT005	
400:5	97CT006	
600:5	97CT008	
750:5	97CT009	
1200:5	97CT012	

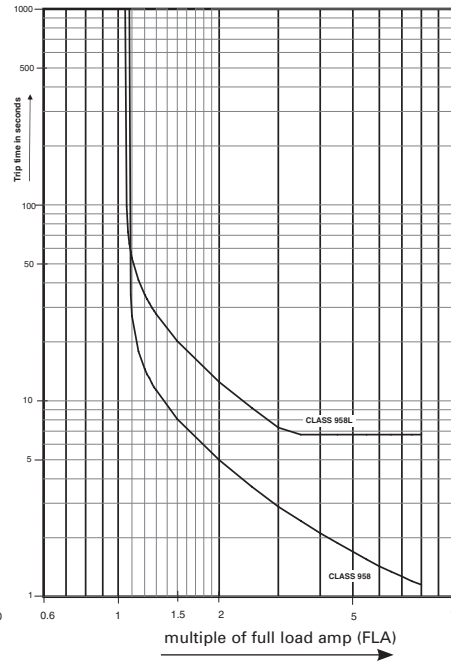
Solid State—Class 958 and 958L

Current Adjustment Range	Phase	Frame Size	Catalog Number	MRPD/MLFB	List Price \$
10–40	3	"A1"	958EB3SA	3UB85235EW2	
25–100	3	"B"	958GB3SA	3UB85335GW2	
50–200	3	"B"	958HB3SA	3UB85335HW2	
5.5–22	3	"A1"	958LDB3SA	3UB85236DW2	
10–40	3	"A1"	958LEB3SA	3UB85236EW2	
13–52	3	"B"	958LFB3SA	3UB85336FW2	
25–100	3	"B"	958LGB3SA	3UB85336GW2	
50–200	3	"B"	958LHB3SA	3UB85336HW2	

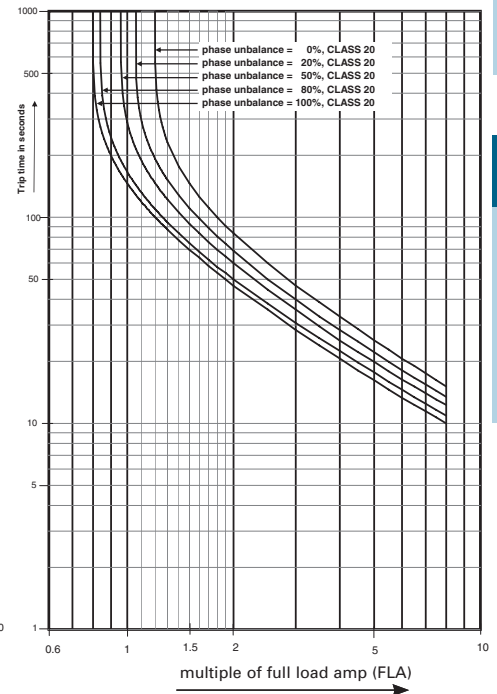
Time - Current - Characteristics CLASS 48



Time - Current - Characteristics CLASS 958, 958L



Trip - curve depending on unbalance CLASS 20



Ⓞ Temperature rating -25° to +60°C.

Pump Control Panels

Slim Line NEMA Pump Controller for the Agricultural industry, Class 82

General

Features

The Class 82 Slim Line NEMA Pump was designed specifically for the agricultural market. It is well suited for irrigation and similar pumping applications and is built to withstand the harsh elements of the outdoors

Typical applications include:

- Crop irrigation
- Sprinklers, misters and soakers
- Watering for livestock and other dairy applications
- Ground dewatering for excavation and construction sites

Why you should use the Class 82 Pump Panel

- Simplicity and its compact lightweight design makes this an attractive solution to your budgeting challenges.
- The contactor is NEMA rated to provide reliable motor control and protection expected in the most demanding applications.
- The ESP200 solid-state overload relay has a protective coating on the circuit board which gives it superior protection against high humidity, condensation and corrosive environments.
- Its size and weight is about half that of the Class 87 which increases the ease of installation.



Catalog Numbering System

82	A	D	C	6	F	B	H
----	---	---	---	---	---	---	---

Series

- A = Standard size enclosure
- B = Extra large enclosure (starter size 1 only)

Starter Size

- D = 1
- F = 2

OLR Current Range

- B = 0.75-3.4A
- C = 3-12A
- D = 5.5-22A
- E = 10-40A
- F = 13-52A

Cover Control

- 6 = HOA selector switch with Start push button

Disconnect Type

- F = Fusible disconnect

Disconnect & Fuse Clip Rating

- A = 30A/250V
- B = 30A/600V
- C = 60A/250V
- D = 60A/600V


Coil Voltage

- F = 110VAC 50HZ / 120VAC 60HZ
- G = 220VAC 50HZ / 240VAC 60HZ
- H = 480VAC 60HZ

Pump Control Panels

Slim Line NEMA Pump Controller for the Agricultural industry, Class 82

General

	Ordering Information	Coil Table	
	<ul style="list-style-type: none"> ▶ Field Modification Kits (see accessories on this page) ▶ Factory Modifications (NA) ▶ Dimensions see page 17-169 ▶ Wiring Diagram see page 17-189 ▶ Replacement Parts (refer to instruction sheet A5E35327591A) 	50/60Hz Voltage	Letter
		110VAC 50HZ / 120VAC 60HZ	F
		220VAC 50HZ / 240VAC 60HZ	G ^①
		480VAC 60HZ	H ^②

Product Selection

Max Hp Rating Motor Voltage		NEMA Size	Overload Relay Amp Range	Disc. Amp Rating	Fuse Clip Amp/Volts	HOA & Start Push Button		HOA & Start Push Button (Extra wide Encl)	
230	460					Catalog Number	List Price \$	Catalog Number	List Price \$
—	1	1	0.75–3.4	30	30A/600V	82ADB6FB*		82BDB6FB* ^③	
—	5	1	3–12	30	30A/600V	82ADC6FB*		82BDC6FB* ^③	
—	10	1	5.5–22	30	30A/600V	82ADD6FB*		82BDD6FB* ^③	
—	10	1	10–40	30	30A/600V	—		82BDE6FB* ^③	
2	—	1	3–12	30	30A/250V	82ADC6FA*		82BDC6FA* ^③	
3	—	1	5.5–22	30	30A/250V	82ADD6FA*		82BDD6FA* ^③	
7 1/2	—	1	10–40	30	30A/250V	82ADE6FA*		82BDE6FA* ^③	
—	25	2	13-52	60	60A/600V	82AFF6FD* ^③		—	
15	—	2	13-52	60	60A/250V	82AFF6FC* ^③		—	

Replace the (*) with a letter from the coil table.

③ Available in May 2017.

Accessories





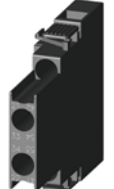

Image	Description	Catalog Number	List Price
	3/4" type 3R conduit hub	ECHS075	
	1" type 3R conduit hub	ECHS100	
	1 1/4" type 3R conduit hub	ECHS125	
	1 1/2" type 3R conduit hub	ECHS150	
	Disconnect switch auxiliary contacts 2 NO/2 NC DPDT (NEMA A600)	HA261234	
	Fuse puller kit for 30A switch (1 kit required per switch)	HP61	
	30A, 240V Class R Fuse Clip Kits	HR21	
	30A, 600V Class R Fuse Clip Kits	HR612	

Image	Description	Catalog Number	List Price
	Contacter auxiliary contacts, side mounted 1 NO/NC (NEMA A300/ Q300)	3RH29111DA11	
	ESP200 tamper resis- tance cover	49ASTC1	

① G coil is not available with a 600v disconnect
② H coil is not available with a 250v disconnect

Pump Control Panels

Slim Line NEMA Pump Controller for the Agricultural industry, Class 82

Selection

Class 82 Technical information

General Technical Data:	
Weight	Size 1 (Standard Encl.) 23lbs. Size 1 (Extra Wide Encl.) 47lbs. Size 2 (Standard Encl.) 47lbs.
Height x Width x Depth	Size 1 (Standard Encl.) 26 x 12 x 5in. Size 1 (Extra Wide Encl.) 35 x 17 x 6in. Size 2 (Standard Encl.) 35 x 17 x 6in.
Maximum altitude	6560 ft.
Ambient (outside enclosure) storage temperature	(-30 to 65)°C / (-22 to 149)°F
Ambient (outside enclosure) operating temperature	(-20 to 40)°C / (-4 to 104)°F
Country of origin	Mexico
Horsepower Rating:	
See selection table above	See selection table above
Contactor:	
Number of NO main contacts	3
Amp rating	32A, 50A
Mechanical operating cycles	10,000,000
Internal / Standard Auxiliary Contact:	
Number of NC / NO auxiliary contacts	1NC / 1NO
NEMA contact rating designation	A600 AC / Q600 DC
Optional auxiliary contacts available	Yes
Coil:	
Voltage	220/230V 50/60Hz, 460V 60Hz, or 110/120V 50/60Hz
Apparent pull-in / holding power	81 VA / 10.5 VA
Normal coil operating limits (% of rated voltage)	80% - 110% at 60Hz
Pick-up time / Drop-out time	8-40 / 4-16 msec
Overload Relay:	
Current range	0.75 - 3.4 or 3 - 12 or 5.5 - 22 or 10 - 40 Amps or 13 - 52 Amps
Trip Class	Class 5 / 10 (factory set) / 20 / 30
Trip detection	Overload, phase failure, phase unbalance, ground fault
Phase failure sensitivity	Trip time after phase loss: < 3 sec
Repeat accuracy	Within 1%
Reset options	Manual, automatic and remote
External reset	Yes
Test function	Electronics and manual actuation
Conformal coating on printed circuit board	Yes
Number of NC / NO auxiliary contacts	1NC / 1NO
Rating of auxiliary contacts	B600 AC / R300 DC
Single contact isolation	600 V
Dual contact isolation	300 V differing polarity / 600 V common polarity

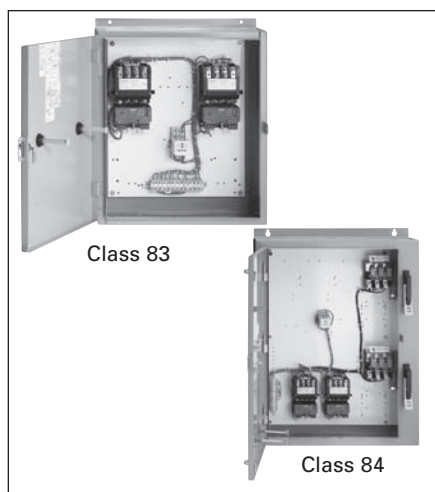
Pump Control Panels

Slim Line NEMA Pump Controller for the Agricultural industry, Class 82

Technical Data

Class 82 Technical information

Disconnect Switch:	
Rating	30 A with 30A/600 or 30A/250 V Class H fuse clips 60 A with 60A/600 or 60A/250 V Class H fuse clips
Fuse type accepted	Class H, J or R
Enclosure:	
Type	NEMA Type 3/3R enclosure
Rating	Weather proof for outdoor use
Standard Control Devices:	
Hand-Off-Auto selector switch	3SU1 30mm, round, metal with matte finish
Start push button	3SU1 30mm, round, metal with matte finish
Mounting / Wiring:	
Mounting orientation	Vertical
Mounting type	Pole and surface
Disconnect line side connection type / torque	Box lug / 35 lb in (14 - 10); 40 lb in (8); 45 lb in (6 - 4) AWG
Disconnect line side solid and stranded conductors	1x(14 - 2 AWG) 60/75°C AL or CU
Power terminal block connection type / torque	Screw / 24 - 32 lb - in
Power terminal block solid and stranded conductors	1x(18 - 2 AWG) 75°C CU
Control terminal block connection type / torque	Screw / 12 - 18 lb - in
Control terminal block solid and stranded conductors	1x(22 - 8 AWG) 75°C CU
Coil connection type / torque	Screw / 7 - 10 lb in
Coil solid and stranded conductors	2x(16 - 12 AWG) CU 60/75°C
Main auxiliary contact connection type / torque	Screw / 7 - 10 lb in
Main auxiliary contact solid and stranded conductors	2x(20 - 16), 2x(18 - 14) 75°C CU
OLR auxiliary contact connection type / torque	Screw / 7 - 10 lb in
OLR auxiliary contact solid and stranded conductors	2x(20 - 14 AWG) CU 60/75°C
Short Circuit Current Rating:	
Fuses	10kA@600V (Class H or K); 85kA@600V (Class R or J)
Certificates / Approvals:	
cULus	UL (file no. E185287)
UL rated Service Entrance Equipment	ISO 9001 certification



Features

- Heavy Duty NEMA Starters
- Solid State or Thermal Overload Relays
- Fusible or MCP
- Heavy Duty Disconnect Handle
- Flexibility with Field Modifications
- Alternator Transfer on De-energization
- UL Listed for Outdoor Use
- UL Listed file #E14900 (class 83); file #E185287 (class 84)
- CSA certified file #LR 6535 (class 83 & 84)

Application

Duplex pump controls are designed to perform one or both of two distinct functions: duplexing and alternation. The duplexing function provides capacity for system peaking or above normal demand without having the full motor capacity spinning at all times. It also provides standby capacity for use when one of the motors or pumps is disabled. The duplexing function is also referred to as lead/lag or main/standby. When two pumps or compressors are controlled by a duplex controller, they are started in sequence as necessary to attain preset values of pressure, flow or liquid level.

Two field devices such as pressure switches or float switches provide electrical signals to the duplex controller. One remote device is set to initiate the starting of the lead motor. This motor is rated to handle normal system demand. The second motor is usually the same rating and is referred to as the lag motor. It is only energized when the system demand is greater than the capacity of the lead motor. The lag motor is started when the second remote device is signalling for more output than the lead motor can produce.

The alternation function reverses the lead and lag mode for the two motors in a duplex system. Upon alternation the first motor as described above becomes the lag motor and the second motor assumes the lead function. The alternation is usually programmed to occur at any time both pumps come to rest. The alternation function equalizes wear on the two machines and extends the life of seals and bearings.

Enclosure Types

Duplex controllers are available in NEMA 1, 12/3/3R, 4 (painted) and 4/4X (stainless) enclosures. Enclosures protect personnel from contact with live parts and depending upon the construction, protect the control in varying degrees from physical damage and harmful atmospheres. All enclosures are supplied with corrosion resistant finishes.

Heavy Duty Starters

These Duplex controllers use the same starters described in the heavy duty starter section of this catalog.

Siemens Type ETI Circuit Breaker

The ETI circuit breaker is a device designed specifically for application in motor circuits. The ETI is a magnetic only protective device designed to provide protection against short circuit current.

The instantaneous-only type ETI circuit breaker employs adjustable magnetic trip settings to allow broader application ranges and a higher degree of motor short circuit protection.

Features

Two control transformers may be provided for low voltage control to safeguard personnel from high voltage. One transformer is required for each starter to provide independent control circuits.

A Hand-Off-Auto selector switch for each starter may be mounted in the enclosure door or furnished separately for remote control. Test push buttons or pilot lights may also be installed on the enclosure.

Solid-state or Ambient Compensated Bimetal Overload Relays are supplied as standard.

Heavy Duty Disconnect Switches

The disconnect switch that goes the distance in durability, performance and reliability has the following advantages:

- Visible blades for the highest level of safety
- Double break switching action to reduce arcing, increase lifetime and eliminate the "electric hinge"
- More rugged positive action switch
- Oversized lugs are standard
- Line side shield to help guard personnel from contact with live parts
- Higher horsepower rating for design E high efficiency motors
- UL listed for IlSCO, Burndy and T&B crimp type lugs
- The 200A switch accepts up to 300 MCM versus 250 MCM wire size

Its rugged construction - with a high fault withstand rating of 100kA at 600 VAC when fused with class R rated fuses - meets the most stringent industry standards set forth by the automotive, petro-chemical, and pulp and paper industries. UL recognized and CSA certified, our disconnect switches are available either non-fusible or fusible with class R and class J fuse clips.

Duplex Heavy Duty Controllers

Non-Combination, Class 83

Selection

Ordering Information	Coil Table																
<ul style="list-style-type: none"> ▶ Standard duplex controllers include an alternator indicated by characters "92" within the catalog number. The standard coil voltage supplied with the alternator is 120V separate control. This is the only control voltage available with the alternator. ▶ To omit the alternator, change the character string within the catalog number from "92" to "95". All coil voltages listed in the coil table are valid with non-alternator controllers. ▶ To change the coil voltage for non-alternator controllers with a solid-state OLR, change the 9th character in the catalog number with a letter shown in the coil table. To change the coil voltage for non-alternator controllers with a bimetal OLR, change the 8th character in the catalog number with a letter shown in the coil table. ▶ Heater elements for bimetal overloads see page 17-126 (6-Required). ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-170. 	<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr> <td>24[ⓐ]</td> <td>J</td> </tr> <tr> <td>120</td> <td>F</td> </tr> <tr> <td>200–208[ⓐ]</td> <td>D</td> </tr> <tr> <td>220–240[ⓐ]</td> <td>G</td> </tr> <tr> <td>277[ⓐ]</td> <td>L</td> </tr> <tr> <td>440–480[ⓐ]</td> <td>H</td> </tr> <tr> <td>550–600[ⓐ]</td> <td>E</td> </tr> </tbody> </table>	60Hz Voltage	Letter	24 [ⓐ]	J	120	F	200–208 [ⓐ]	D	220–240 [ⓐ]	G	277 [ⓐ]	L	440–480 [ⓐ]	H	550–600 [ⓐ]	E
60Hz Voltage	Letter																
24 [ⓐ]	J																
120	F																
200–208 [ⓐ]	D																
220–240 [ⓐ]	G																
277 [ⓐ]	L																
440–480 [ⓐ]	H																
550–600 [ⓐ]	E																

Non-Combination (with Solid-State Overload)

Max Hp				NEMA Size	Half Size	Overload		Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4 Painted Watertight, Dust-tight		NEMA 12 NEMA 3/3R Industrial Use Weatherproof	
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1/2	1/2	0	—	0.25–1	A	83CUA92BF		83CUA92WF		83CUA92EF		83CUA920F	
1/2	3/4	1 1/2	2	0	—	0.75–3.4	A	83CUB92BF		83CUB92WF		83CUB92EF		83CUB920F	
2	2	5	5	0	—	3–12	A1	83CUC92BF		83CUC92WF		83CUC92EF		83CUC920F	
3	3	—	—	0	—	5.5–22	A1	83CUD92BF		83CUD92WF		83CUD92EF		83CUD920F	
1/2	1/2	1/2	1/2	1	—	0.25–1	A	83DUA92BF		83DUA92WF		83DUA92EF		83DUA920F	
1/2	3/4	1 1/2	2	1	—	0.75–3.4	A	83DUB92BF		83DUB92WF		83DUB92EF		83DUB920F	
2	2	5	5	1	—	3–12	A1	83DUC92BF		83DUC92WF		83DUC92EF		83DUC920F	
3	3	10	10	1	—	5.5–22	A1	83DUD92BF		83DUD92WF		83DUD92EF		83DUD920F	
7 1/2	7 1/2	—	—	1	—	10–40	A1	83DUE92BF		83DUE92WF		83DUE92EF		83DUE920F	
10	10	15	15	—	1 1/4	10–40	A1	83EUE92BF		83EUE92WF		83EUE92EF		83EUE920F	
10	15	25	25	2	—	13–52	B	83FUF92BF		83FUF92WF		83FUF92EF		83FUF920F	
15	20	30	30	—	2 1/2	25–100	B	83GUG92BF		83GUG92WF		83GUG92EF		83GUG920F	
25	30	50	50	3	—	25–100	B	83HUG92BF		83HUG92WF		83HUG92EF		83HUG920F	
30	40	75	75	—	3 1/2	50–200	B	83IUH92BF		83IUH92WF		83IUH92EF		83IUH920F	
40	50	100	100	4	—	50–200	B	83JUH92BF		83JUH92WF		83JUH92EF		83JUH920F	

Non-Combination (with Ambient Compensated Bimetal Overload)[ⓐ]

Max Hp				NEMA Size	Half Size	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4 Painted Watertight Dust-tight		NEMA 12/3R Industrial Use Weatherproof	
						Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	83CP92BF81		83CP92WF81		83CP92EF81		83CP920F81	
7 1/2	7 1/2	10	10	1	—	83DP92BF81		83DP92WF81		83DP92EF81		83DP920F81	
10	10	15	15	—	1 1/4	83EP92BF81		83EP92WF81		83EP92EF81		83EP920F81	
10	15	25	25	2	—	83FP92BF81		83FP92WF81		83FP92EF81		83FP920F81	
15	20	30	30	—	2 1/2	83GP92BF81		83GP92WF81		83GP92EF81		83GP920F81	
25	30	50	50	3	—	83HP92BF81		83HP92WF81		83HP92EF81		83HP920F81	
30	40	75	75	—	3 1/2	83IP92BF81		83IP92WF81		83IP92EF81		83IP920F81	
40	50	100	100	4	—	83JP92BF81		83JP92WF81		83JP92EF81		83JP920F81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

ⓐ Not available on standard alternator style ('92' in the catalog number).
 ⓑ For NO/NC SPDT contact on overload, replace "81" with "91". "81" will give a NC contact.

Duplex Heavy Duty Controllers

Combination Disconnect (Fusible & Non-Fusible), Class 84

Selection

Ordering Information	Coil Table																
<ul style="list-style-type: none"> ▶ Standard duplex controllers include an alternator indicated by characters "92" within the catalog number. The standard coil voltage supplied with the alternator is 120V separate control. This is the only control voltage available with the alternator. ▶ To omit the alternator, change the character string within the catalog number from "92" to "95". All coil voltages listed in the coil table are valid with non-alternator controllers. ▶ To change the coil voltage for non-alternator controllers with a solid-state OLR, change the 10th character in the catalog number with a letter shown in the coil table. To change the coil voltage for non-alternator controllers with a bimetal OLR, change the 9th character in the catalog number with a letter shown in the coil table. ▶ Heater elements for bimetal overloads see page 17-126 (6-Required). ▶ For factory installed fusible disconnect, see page 17-122. ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. 	<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24[Ⓣ]</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>200-208[Ⓣ]</td><td>D</td></tr> <tr><td>220-240[Ⓣ]</td><td>G</td></tr> <tr><td>277[Ⓣ]</td><td>L</td></tr> <tr><td>440-480[Ⓣ]</td><td>H</td></tr> <tr><td>550-600[Ⓣ]</td><td>E</td></tr> </tbody> </table>	60Hz Voltage	Letter	24 [Ⓣ]	J	120	F	200-208 [Ⓣ]	D	220-240 [Ⓣ]	G	277 [Ⓣ]	L	440-480 [Ⓣ]	H	550-600 [Ⓣ]	E
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550-600 [Ⓣ]	E																
<ul style="list-style-type: none"> ▶ Dimensions see page 17-170. ▶ Wiring Diagrams see page 17-187. ▶ Replacement Parts see page 17-133. 																	

Two Disconnect Switches with Solid-State Overload

Max Hp				NEMA Size	Half Size	Amp Range	Frame Size	Disc. Amp Range	Enclosure			
200 Volts	230 Volts	460 Volts	575 Volts						NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4 Painted Watertight, Dust-tight	NEMA 12 NEMA 3/3R Industrial Use Weatherproof
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$			
1/2	1/2	1/2	1/2	0	—	0.25-1	A	30	84CUA92BDF	84CUA92WDF	84CUA92EDF	84CUA920DF
1/2	1/2	1 1/2	2	0	—	0.75-3.4	A	30	84CUB92BDF	84CUB92WDF	84CUB92EDF	84CUB920DF
2	2	5	5	0	—	3-12	A1	30	84CUC92BDF	84CUC92WDF	84CUC92EDF	84CUC920DF
3	3	—	—	0	—	5.5-22	A1	30	84CUD92BDF	84CUD92WDF	84CUD92EDF	84CUD920DF
1/2	1/2	1/2	1/2	1	—	0.25-1	A	30	84DUA92BDF	84DUA92WDF	84DUA92EDF	84DUA920DF
1/2	1/2	1 1/2	2	1	—	0.75-3.4	A	30	84DUB92BDF	84DUB92WDF	84DUB92EDF	84DUB920DF
2	2	5	5	1	—	3-12	A1	30	84DUC92BDF	84DUC92WDF	84DUC92EDF	84DUC920DF
3	3	10	10	1	—	5.5-22	A1	30	84DUD92BDF	84DUD92WDF	84DUD92EDF	84DUD920DF
7 1/2	7 1/2	—	—	1	—	10-40	A1	30	84DUE92BDF	84DUE92WDF	84DUE92EDF	84DUE920DF
10	10	15	15	—	1 1/2	10-40	A1	60	84EUE92BDF	84EUE92WDF	84EUE92EDF	84EUE920DF
10	15	25	25	2	—	13-52	B	60	84FUF92BDF	84FUF92WDF	84FUF92EDF	84FUF920DF
15	20	30	30	—	2 1/2	25-100	B	100	84GUG92BDF	84GUG92WDF	84GUG92EDF	84GUG920DF
20	25	50	50	3	—	25-100	B	100	84HUG92BDF	84HUG92WDF	84HUG92EDF	84HUG920DF
30	40	75	75	—	3 1/2	50-200	B	200	84IUH92BDF	84IUH92WDF	84IUH92EDF	84IUH920DF
40	50	100	100	4	—	50-200	B	200	84JUH92BDF	84JUH92WDF	84JUH92EDF	84JUH920DF

Two Disconnect Switches with Ambient Compensated Bimetal Overload[Ⓣ]

Max Hp				NEMA Size	Half Size	Disc. Amp Range	Enclosure			
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel	NEMA 4 Painted Watertight Dust-tight	NEMA 12/3R Industrial Use Weatherproof
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	
3	3	5	5	0	—	30	84CP92BDF81	84CP92WDF81	84CP92EDF81	84CP920DF81
7 1/2	7 1/2	10	10	1	—	30	84DP92BDF81	84DP92WDF81	84DP92EDF81	84DP920DF81
10	10	15	15	—	1 1/4	60	84EP92BDF81	84EP92WDF81	84EP92EDF81	84EP920DF81
10	15	25	25	2	—	60	84FP92BDF81	84FP92WDF81	84FP92EDF81	84FP920DF81
15	20	30	30	—	2 1/2	100	84GP92BDF81	84GP92WDF81	84GP92EDF81	84GP920DF81
20	25	50	50	3	—	100	84HP92BDF81	84HP92WDF81	84HP92EDF81	84HP920DF81
30	40	75	75	—	3 1/2	200	84IP92BDF81	84IP92WDF81	84IP92EDF81	84IP920DF81
40	50	100	100	4	—	200	84JP92BDF81	84JP92WDF81	84JP92EDF81	84JP920DF81

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

[Ⓣ] Not available on standard alternator style ('92' in the catalog number).

[Ⓣ] For NO/NC SPDT contact on overload, replace "81" with "91". "81" will give a NC contact.

Duplex Heavy Duty Controllers

Combination Circuit Breaker, Class 84

Selection

Ordering Information	Coil Table																
<ul style="list-style-type: none"> ▶ Standard duplex controllers include an alternator indicated by characters "92" within the catalog number. The standard coil voltage supplied with the alternator is 120V separate control. This is the only control voltage available with the alternator. ▶ To omit the alternator, change the character string within the catalog number from "92" to "95". All coil voltages listed in the coil table are valid with non-alternator controllers. ▶ To change the coil voltage for non-alternator controllers, change the 10th character in the catalog number with a letter shown in the coil table. ▶ Heater elements for bimetal overloads see page 17-126 (6-Required). ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. 	<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24[Ⓞ]</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>200-208[Ⓞ]</td><td>D</td></tr> <tr><td>220-240[Ⓞ]</td><td>G</td></tr> <tr><td>277[Ⓞ]</td><td>L</td></tr> <tr><td>440-480[Ⓞ]</td><td>H</td></tr> <tr><td>550-600[Ⓞ]</td><td>E</td></tr> </tbody> </table>	60Hz Voltage	Letter	24 [Ⓞ]	J	120	F	200-208 [Ⓞ]	D	220-240 [Ⓞ]	G	277 [Ⓞ]	L	440-480 [Ⓞ]	H	550-600 [Ⓞ]	E
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<ul style="list-style-type: none"> ▶ Dimensions see page 17-170. ▶ Wiring Diagrams see page 17-187. ▶ Replacement Parts see page 17-133. 																	

2 Motor Circuit Protectors (with Solid-State Overload)

Max Hp				NEMA Size	Half Size	Amp Range	Frame Size	Motor Circuit Interrupter ETI	Enclosure			
200 Volts	230 Volts	460 Volts	575 Volts						NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant, 304 Stainless Steel,	NEMA 4 Painted Watertight, Dust-tight	NEMA 12 NEMA 3/3R Industrial Use, Weatherproof
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$			
1/2	1/2	1/2	1/2	0	—	0.25-1	A	3	84CUA92BMF	84CUA92WMF	84CUA92EMF	84CUA92OMF
1/2	3/4	1 1/2	2	0	—	0.75-3.4	A	3	84CUB92BMF	84CUB92WMF	84CUB92EMF	84CUB92OMF
2	2	5	5	0	—	3-12	A1	10	84CUC92BMF	84CUC92WMF	84CUC92EMF	84CUC92OMF
3	3	—	—	0	—	5.5-22	A1	25	84CUD92BMF	84CUD92WMF	84CUD92EMF	84CUD92OMF
1/2	3/4	1 1/2	2	1	—	0.25-1	A	3	84DUA92BMF	84DUA92WMF	84DUA92EMF	84DUA92OMF
1/2	3/4	1 1/2	2	1	—	0.75-3.4	A	3	84DUB92BMF	84DUB92WMF	84DUB92EMF	84DUB92OMF
2	2	5	5	1	—	3-12	A1	10	84DUC92BMF	84DUC92WMF	84DUC92EMF	84DUC92OMF
3	3	10	10	1	—	5.5-22	A1	25	84DUD92BMF	84DUD92WMF	84DUD92EMF	84DUD92OMF
7 1/2	7 1/2	—	—	1	—	10-40	A1	30	84DUE92BMF	84DUE92WMF	84DUE92EMF	84DUE92OMF
—	—	15	15	—	1 1/2	10-40	A1	40	84EUE92BMF	84EUE92WMF	84EUE92EMF	84EUE92OMF
10	15	25	25	2	—	13-52	B	50	84FUF92BMF	84FUF92WMF	84FUF92EMF	84FUF92OMF
15	20	30	30	—	2 1/2	25-100	B	100	84GUG92BMF	84GUG92WMF	84GUG92EMF	84GUG92OMF
20	25	50	50	3	—	25-100	B	100	84HUG92BMF	84HUG92WMF	84HUG92EMF	84HUG92OMF
30	40	75	75	—	3 1/2	50-200	B	125	84IUH92BMF	84IUH92WMF	84IUH92EMF	84IUH92OMF
40	50	100	100	4	—	50-200	B	150	84JUH92BMF	84JUH92WMF	84JUH92EMF	84JUH92OMF

2 Motor Circuit Protectors (with Ambient Compensated Bimetal Overload)[Ⓞ]

Max Hp				NEMA Size	Half Size	Amp Range	Frame Size	Motor Circuit Interrupter ETI	Enclosure			
200 Volts	230 Volts	460 Volts	575 Volts						NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel	NEMA 4 Painted Watertight Dust-tight	NEMA 12/3R Industrial Use Weatherproof
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$			
1/2	3/4	1 1/2	2	0	—	3	84CPB92BMF81	84CPB92WMF81	84CPB92EMF81	84CPB92OMF81		
2	2	5	5	0	—	10	84CPD92BMF81	84CPD92WMF81	84CPD92EMF81	84CPD92OMF81		
3	3	—	—	0	—	25	84CPE92BMF81	84CPE92WMF81	84CPE92EMF81	84CPE92OMF81		
1/2	3/4	1 1/2	2	1	—	3	84DPB92BMF81	84DPB92WMF81	84DPB92EMF81	84DPB92OMF81		
2	2	5	5	1	—	10	84DPD92BMF81	84DPD92WMF81	84DPD92EMF81	84DPD92OMF81		
3	3	10	10	1	—	25	84DPE92BMF81	84DPE92WMF81	84DPE92EMF81	84DPE92OMF81		
7 1/2	7 1/2	—	—	1	—	30	84DPF92BMF81	84DPF92WMF81	84DPF92EMF81	84DPF92OMF81		
—	—	15	15	—	1 1/2	40	84EPF92BMF81	84EPF92WMF81	84EPF92EMF81	84EPF92OMF81		
10	10	—	—	—	1 1/2	50	84EPG92BMF81	84EPG92WMF81	84EPG92EMF81	84EPG92OMF81		
—	—	15	20	2	—	40	84FPF92BMF81	84FPF92WMF81	84FPF92EMF81	84FPF92OMF81		
10	15	25	25	2	—	50	84FPH92BMF81	84FPH92WMF81	84FPH92EMF81	84FPH92OMF81		
—	—	30	30	—	2 1/2	50	84GPH92BMF81	84GPH92WMF81	84GPH92EMF81	84GPH92OMF81		
15	20	—	—	—	2 1/2	100	84GPG92BMF81	84GPG92WMF81	84GPG92EMF81	84GPG92OMF81		
—	—	30	40	3	—	50	84HPJ92BMF81	84HPJ92WMF81	84HPJ92EMF81	84HPJ92OMF81		
20	25	50	50	3	—	100	84HPK92BMF81	84HPK92WMF81	84HPK92EMF81	84HPK92OMF81		
30	40	75	75	—	3 1/2	125	84IPL92BMF81	84IPL92WMF81	84IPL92EMF81	84IPL92OMF81		
40	50	100	100	4	—	150	84JPM92BMF81	84JPM92WMF81	84JPM92EMF81	84JPM92OMF81		

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

Ⓞ Not available on standard alternator style ('92' in the catalog number).

Ⓞ For NO/NC SPDT contact on overload, replace "81" with "91". "81" will give a NC contact.

Pump Control Panels

Class 87, 88

General

Features

- Fully Gasketed NEMA 3R Rainproof Enclosures
- 100,000 Amp Interrupting Capacity with Class R Fuses
- Heavy Duty NEMA Starters
- Solid State or Ambient Compensated Bimetal Overload Relays
- Heavy Duty Disconnect Handle
- Available in Reduced Voltage Versions
- Bold Pilot Legend on Front
- Generous Accessory Space
- Copper Grounding Lug For Three #6 Wires
- UL Listed for Outdoor Use and Service Equipment File #E185287

Application

Heavy duty pump control panels are designed to withstand the most demanding environments. Typical applications include irrigation, agriculture, petrochemical, wastewater treatment and wherever motor control is challenged by harsh elements.

Rugged pump control panels utilized cold forming "tox" process. They are more rainproof, sleet and ice resistant than in the past.

Installation is easy. Panels are factory wired to provide flexible control and protect against short circuits and overloads. Ample space is provided for field modifications and installation of accessories.

The pump control panels feature a full sized removable auxiliary panel for the mounting of accessories. The fusible version features fuse clips for full sized RK5 or compact class J fuses and accessory mounting space for the most commonly used accessories.

Class 87 pump panels become jockey pump panels with the addition of a pressure switch. The jockey pump's primary function is to maintain water pressure at a preset level and thus compensate for possible shortage of water in the pumping system. When the water pressure drops below the preset level, the pressure switch energizes the starter which in turn activates the jockey pump. The water pressure is then brought back up to the desired level. This insures the maintenance of proper water pressure at all times.

Features

Specified by Fortune 500 companies, Siemens NEMA starters offer prolonged service under severe duty conditions. NEMA rated, these starters utilize large silver cadmium oxide contacts and wide copper heat sinks to ensure rapid heat dissipation and maximum electrical life.

ESP200 solid state overload relay

Refer to the section on Class 48 overload relays for features and benefits. Pump panels are factory set at trip Class 10.

The ambient compensated bimetal overload relays

are designed to parallel thermal characteristics of typical pump motors. They prevent nuisance trips that may result from operation of the control in a higher ambient temperature than that at the pump. These relays are trip-free, tamperproof and can be set to reset automatically or manually.

HOA and Start Pushbutton

Every pump panel comes with an HOA and a start pushbutton.

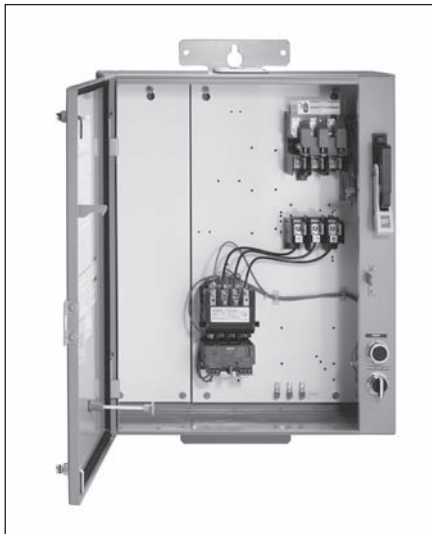
Half Size Starters

Siemens motor matched starters feature all the rugged performance characteristics of our NEMA rated starter sizes, but are fractionally sized to more closely match your exact motor rating. As a result, significant economic savings are made possible without sacrificing the reliability you expect from a heavy duty starter.

These additional starter sizes have the reserve capacity to handle occasional plugging and jogging without de-rating the device.

Siemens motor matched can save hundreds, even thousands of dollars per project.

Siemens motor matched starters comply with NEMA, UL and CSA standards.



NEMA & General Purpose Control

17 CONTROL PRODUCTS

Panels are predrilled for easy repositioning of the fuse trailer block to accommodate 250 and 600 volt fuses and full sized RK or compact J fuses. Circuit breakers are also available.

Heavy Duty Fusible Disconnect Switch

The disconnect switch has the following advantages:

- Visible blades for the highest level of safety
- Double Break Switching Action to reduce arcing, increase lifetime and eliminate the "electric hinge"
- Oversized lugs are standard
- Line side shield to help guard personnel from contact with live parts

Motor Circuit Protector

The motor circuit protector provides fast, accurate fault clearing that will minimize damage to the motor and control apparatus and protect branch circuit conductors. Continuous current ratings and adjustable trip ranges meet NEC requirements for full load and locked rotor currents. The adjustable instantaneous trip point can be set precisely to assure fault protection and eliminate nuisance tripping.

Removable Door

Enclosure door may be lifted off to make wiring easier.

Mounting Flanges

Convenient flanges at top and bottom of the enclosure provide easy mounting. They fit pole or flat surfaces using keyhole slots.

Quarter Turn Latches

Quarter turns are utilized to secure the door.

Wind Catches

A wind catch is provided to prevent the door from slamming shut (or open) due to high wind conditions.

Safety Disconnect Handle

Up to three padlocks can be used to lock the disconnect in the OFF position. Maintenance work can be performed without hazard to personnel.

External Reset

The overload relay may be quickly reset by means of a button on the front of the enclosure.

Bold Pilot Legend

Provides positive indication of the selector switch position for use to stop the pump motor.

Ground Lugs

Insures proper connecting of ground wires and lightning arresters.

UL Listed

Assures proper construction throughout control panel.

Reduced Voltage

Available in part winding, wye delta and auto transformer types, these controls may be necessary where the power company limits the amount of current drawn from its lines, or where starting torque must be reduced.

Fully gasketed NEMA 3/12 weather-proof enclosures are supplied with Class 88 reduced voltage starters.

Part Winding Starters apply starting current in timed steps to minimize voltage fluctuations.

Auto Transformer Starters maintain a closed circuit during transition and eliminate voltage or current surges. They draw less current than part winding starters and are well suited for starting motors over 20 Hp.

Wye Delta starters and motors are used in areas where the power supply is inadequate to supply full starting current without objectionable voltage drop or for applications where low starting torque is required. Centrifugal pumps and similar apparatus requiring a low starting torque are typical applications. Both ends of all three windings of the wye delta motor are brought out so that they may be accessible for reconnecting from wye to delta.

Auxiliary Equipment

Pilot Lights are easily installed on the enclosure. Oil Tight and Heavy Duty, they meet NEMA A600 requirements.

Lightning Arresters protect the control panel from lightning induced surges.

Undervoltage and Phase Sensing Relays protect the pump against low voltage, voltage imbalance, loss of phase and phase reversal.

Anti-Backspin Timers prevent the motor from starting during motor/shaft backspin.

The TOX Box

Siemens uses the TOX process to manufacture the enclosures for the pump panels.

Advantages of the TOX process:

- Joints are 50-70% stronger
- Since the TOX process compresses the metal at the joint, it does not leave the high stresses in the metal
- Increased corrosion resistance. The protective layer on the metal is not damaged in the process, but instead flows with the material

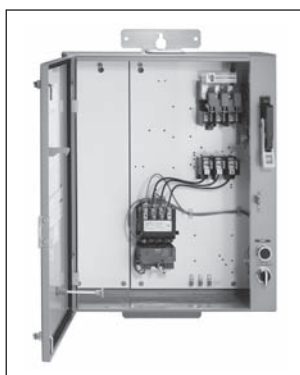
Class 87 NEMA Vacuum Starter Pump Control Panels

The Siemens vacuum starter pump controllers are designed for the harshest environments. Typical environments include chemical, petrochemical, waste water treatment and mining. Contaminations present in these severe environments are detrimental to conventional air-break contacts decreasing their life expectancy and reliability. The Siemens vacuum starter pump controllers are well suited for these environments because the contacts are contained in hermetically sealed contact tubes. This prevents contaminants in the atmosphere from affecting the operation of the contacts. Additionally, neither arcs nor arcing gases are produced which dramatically increases the electrical endurance of the contacts.

Pump Control Panels

Standard Pump Panel with Solid State Overload, Class 87

Selection



Ordering Information

- ▶ Field Modification Kits see page 17-106.
- ▶ Factory Modifications see page 17-121.
- ▶ Dimensions see page 17-171.
- ▶ Wiring Diagrams see page 17-189.
- ▶ Replacement Parts see page 17-133.
- ▶ Sizes 1-4 will be supplied standard with a 240/480 volt coil. To change the coil voltage, change the 8th character in the catalog number to the letter shown in the coil table.
- ▶ Sizes 5 & 6 will be supplied standard with a 480 volt coil. To change the coil voltage, change the 8th character in the catalog number to the letter shown in the coil table.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110-120/220-240	A [ⓐ]
200-208	D
220-240	G
220-240/440-480	C [ⓑ]
277	L
440-480	H
550-600	E

Fusible Disconnect

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Fuse Clip Amp / Volts	Catalog Number	List Price \$
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size				
—	—	1	1	1	—	0.75-3.4 [ⓐ]	A	30	30A/600V	87DUB6FC	
—	—	5	5	1	—	3-12	A1	30	30A/600V	87DUC6FC	
—	—	10	10	1	—	5.5-22	A1	30	30A/600V	87DUD6FC	
—	—	10	10	1	—	5.5-22	A1	60	60A/600V	87DUD60C	
—	—	15	15	—	1½	10-40	A1	30	30A/600V	87EUE6FC	
—	—	15	15	—	1½	10-40	A1	60	60A/600V	87EUE60C	
—	—	25	25	2	—	13-52	B	60	60A/600V	87FUF6FC	
—	—	25	25	2	—	13-52	B	100	100A/600V	87FUF60C	
—	—	30	30	—	2½	25-100	B	60	60A/600V	87GUG6FC	
—	—	30	30	—	2½	25-100	B	100	100A/600V	87GUG60C	
—	—	50	50	3	—	25-100	B	100	100A/600V	87HUG6FC	
—	—	50	50	3	—	25-100	B	200	200A/600V	87HUG60C	
—	—	75	75	—	3½	50-200	B	200	200A/600V	87IUH6FC	
—	—	100	100	4	—	50-200	B	200	200A/600V	87JUH6FC	
—	—	200	200	5	—	55-250	—	400	400A/600V	87LPU6FH	
—	—	250	—	6	—	160-630	—	600	600A/600V	87MSW6FH	
2	2	—	—	1	—	3-12	A1	30	30A/250V	87DUC6LC	
3	3	—	—	1	—	5.5-22	A1	30	30A/250V	87DUD6LC	
7½	7½	—	—	1	—	10-40	A1	30	30A/250V	87DUE6LC	
7½	7½	—	—	1	—	10-40	A1	60	60A/250V	87DUE6PC	
10	10	—	—	—	1½	10-40	A1	60	60A/250V	87EUE6LC	
10	15	—	—	2	—	13-52	B	60	60A/250V	87FUF6LC	
10	15	—	—	2	—	13-52	B	100	100A/250V	87FUF6PC	
15	20	—	—	—	2½	25-100	B	60	60A/250V	87GUG6LC	
15	20	—	—	—	2½	25-100	B	100	100A/250V	87GUG6PC	
20	30	—	—	3	—	25-100	B	100	100A/250V	87HUG6LC	
25	30	—	—	3	—	25-100	B	200	200A/250V	87HUG6PC	
30	40	—	—	—	3½	50-200	B	200	200A/250V	87IUH6LC	
40	50	—	—	4	—	50-200	B	200	200A/250V	87JUH6LC	
75	100	—	—	5	—	55-250	—	400	400A/250V	87LPU6LG	

Circuit Breaker

Max Hp				NEMA Size	Half Size	Overload		Motor Circuit Interrupter ETI Amps	Catalog Number	List Price \$
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size			
½	½	1	1	1	—	0.75-3.4 [ⓐ]	A	3	87DUB6MC	
2	2	5	5	1	—	3-12	A1	10	87DUC6MC	
3	3	10	10	1	—	5.5-22	A1	25	87DUD6MC	
7½	7½	10	—	1	—	10-40	A1	30	87DUE6MC	
—	—	15	15	—	1½	10-40	A1	40	87EUE6MC	
10	15	25	25	2	—	13-52	B	50	87FUF6MC	
15	20	30	30	—	2½	25-100	B	100	87GUG6MC	
25	30	50	50	3	—	25-100	B	100	87HUG6MC	
30	40	75	75	—	3½	50-200	B	125	87IUH6MC	
40	50	100	100	4	—	50-200	B	150	87JUH6MC	
50	75	150	200	5	—	55-250	—	250	87LPT6MH	
75	100	200	200	5	—	55-250	—	400	87LPU6MH	
100	125	250	300	6	—	160-630	—	400	87MSW6MH	
150	200	400	400	6	—	160-630	—	600	87MSX6MH	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

ⓐ Not available on Size 5 and larger.

ⓑ For an overload amp range of 0.25-1A, change the 5th character from a 'B' to an 'A'.

ⓐ A version with coil code A is also stocked via Controls Express.

Pump Control Panels

Pump Panel with Ambient Compensated Bimetal Overload, Class 87

Selection

Ordering Information	Coil Table	
<ul style="list-style-type: none"> ▶ Heater elements for bimetal overloads see page 17-126 (3-Required). ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-171. ▶ Wiring Diagrams see page 17-189. ▶ Replacement Parts see page 17-133. ▶ Sizes 1-4 will be supplied standard with a 230/480 volt coil. To change the coil voltage, change the 8th character in the catalog number to the letter shown in the coil table. ▶ Sizes 5 & 6 will be supplied standard with a 480 volt coil. To change the coil voltage, change the 8th character in the catalog number to the letter shown in the coil table. 	60Hz Voltage	Letter
	24	J
	120	F
	110-120/220-240	A [Ⓞ]
	200-208	D
	220-240	G
	220-240/440-480	C [Ⓞ]
	277	L
	440-480	H
	550-600	E

Fusible Disconnect

Max HP				NEMA Size	Half Size	Disc Amp Rating	Fuse Clip Amps/Volts	Catalog Number	List Price \$
200V	230V	460V	575V						
—	—	10	10	1	—	30	30A/600V	87DAE6FC	
—	—	10	10	1	—	60	60A/600V	87DAE60C	
—	—	15	15	—	1¾	30	30A/600V	87EAF6FC	
—	—	15	15	—	1¾	60	60A/600V	87EAF60C	
—	—	25	25	2	—	60	60A/600V	87FAJ6FC	
—	—	25	25	2	—	100	100A/600V	87FAJ60C	
—	—	30	30	—	2½	60	60A/600V	87GAK6FC	
—	—	30	30	—	2½	100	100A/600V	87GAK60C	
—	—	50	50	3	—	100	100A/600V	87HAN6FC	
—	—	50	50	3	—	200	200A/600V	87HAN60C	
—	—	75	75	—	3½	200	200A/600V	87IAP6FC	
—	—	100	100	4	—	200	200A/600V	87JAR6FC	
7½	7½	—	—	1	—	30	30A/250V	87DAE6LC	
7½	7½	—	—	1	—	60	60A/250V	87DAE6PC	
10	10	—	—	—	1¾	60	60A/250V	87EAG6LC	
10	15	—	—	2	—	60	60A/250V	87FAJ6LC	
10	15	—	—	2	—	100	100A/250V	87FAJ6PC	
15	20	—	—	—	2½	100	100A/250V	87GAL6LC	
25	30	—	—	3	—	100	100A/250V	87HAN6LC	
25	30	—	—	3	—	200	200A/250V	87HAN6PC	
30	40	—	—	—	3½	200	200A/250V	87IAP6LC	
40	50	—	—	4	—	200	200A/250V	87JAR6LC	

Circuit Breaker

Max HP				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Catalog Number	List Price \$
200V	230V	460V	575V					
½	½	1	1	1	—	3	87DAA6MC	
1	1	3	3	1	—	10	87DAB6MC	
3	3	7½	7½	1	—	25	87DAD6MC	
7½	7½	10	10	1	—	30	87DAE6MC	
7½	7½	15	15	—	1¾	40	87EAF6MC	
10	10	—	—	—	1¾	50	87EAG6MC	
—	—	15	20	2	—	40	87FAH6MC	
10	15	25	25	2	—	50	87FAJ6MC	
—	—	30	30	—	2½	50	87GAK6MC	
15	20	—	—	—	2½	100	87GAL6MC	
25	30	50	50	3	—	100	87HAN6MC	
30	40	75	75	—	3½	125	87IAP6MC	
40	50	100	100	4	—	150	87JAR6MC	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

Ⓞ Not available on Size 5 or above.

Vacuum Break and Oil Well Pump Control Panels, Class 87

Selection

Ordering Information	Coil Table	
<ul style="list-style-type: none"> ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-171. ▶ Wiring Diagrams see page 17-189. ▶ Replacement Parts see page 17-133. ▶ Replace the (*) in the catalog number with a letter from the coil table. ▶ Refer to page 17-49 for information on the 958L OLR 	60Hz Voltage	Letter
	24	J
	120	F
	200-208	D
	220-240	G
	277	L
440-480	H	
550-600	E	

Vacuum Break Pump Control Panels (Vacuum Contactor with Trip Class 10 Solid-State Overload Relay)

Max Hp		NEMA Size	Overload Relay Range	Fusible Disconnect			Circuit Breaker		
480 Volts	575 Volts			Fuse Clip Amps/Volts	Catalog Number	List Price \$	MCI Amps	Catalog Number	List Price \$
100	100	4	55-250A	200A/600V	87JCM4F*		250A	87JCM4M*	
200	200	5	55-250A	400A/600V	87LCU4F*		400A	87LCT4M*	
250	300	6	160-630A	—	—		400A	87MCW4M*	
400	400	6	160-630A	—	—		600A	87MCX4M*	

Oil Well Pump Control Panels (Open Air Contactor with 958L Solid-State Overload Relay)

Max Hp		NEMA Size	Overload Relay Range	Fusible Disconnect			Circuit Breaker		
480 Volts	575 Volts			Fuse Clip Amps/Volts	Catalog Number	List Price \$	MCI Amps	Catalog Number	List Price \$
25	25	2	13-52	60A/600V	87FPI6F*		50	87FPI6M*	
50	50	3	25-100	100A/600V	87HPK6F*		100	87HPK6M*	
100	100	4	50-200	200A/600V	87JPM6F*		150	87JPM6M*	

NEMA & General Purpose Control

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CONTROL PRODUCTS

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

Reduced Voltage Pump Panels

Auto Transformer & Part winding (2 Step) with Solid State Overload, Class 88

Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-171. ▶ Wiring Diagrams see pages 17-182 and 17-183. ▶ Replacement Parts see page 17-133. 	<p>The coil voltage on the contactors will be the motor voltage. A CPT will be supplied to provide the control voltage. The control voltage will be 120V.</p> <p>To change the control voltage to customer supplied (no CPT included), change the 9th character to the following: for 24V , use "J" for 120V, use "F"</p>

Auto Transformer Type

Motor Voltage	Max Hp	Overload		NEMA Size	Half Size	Fusible Disconnect			Circuit Breaker		
		Amp Range	Frame Size			Fuse Clip Size Amps/Volts	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
230	15	13-52	B	2	—	60A/250V	88FUFT2FG		50	88FUFT2MG	
	20	25-100	B	—	2½	100A/250V	88GUGT2FG		100	88GUGT2MG	
	30	25-100	B	3	—	100A/250V	88HUGT2FG		100	88HUGT2MG	
	40	50-200	B	—	3½	200A/250V	88IUHT2FG		125	88IUHT2MG	
	50	50-200	B	4	—	200A/250V	88JUHT2FG		150	88JUHT2MG	
	75	55-250	—	5	—	—	—		250	88LPST2MG	
	100	55-250	—	5	—	400A/250V	88LPST2FG		400	88LPST2MG	
200	160-630	—	6	—	—	—		600	88MSXT2MG		
460	25	13-52	B	2	—	60A/600V	88FUFT4FH		50	88FUFT4MH	
	30	25-100	B	—	2½	60A/600V	88GUGT4FH		50	88GUGT4MH	
	50	25-100	B	3	—	100A/600V	88HUGT4FH		100	88HUGT4MH	
	75	50-200	B	—	3½	200A/600V	88IUHT4FH		125	88IUHT4MH	
	100	50-200	B	4	—	200A/600V	88JUHT4FH		150	88JUHT4MH	
	150	55-250	—	5	—	—	—		250	88LPST4MH	
	200	55-250	—	5	—	400A/600V	88LPST4FH		400	88LPST4MH	
	250	160-630	—	6	—	—	—		400	88MSVT4MH	
400	160-630	—	6	—	600A/600V	88MSXT4FH		600	88MSXT4MH		

NEMA & General Purpose Control

Part Winding 2 Step

Motor Voltage	Max Hp	Overload		NEMA Size	Half Size	Fusible Disconnect			Circuit Breaker		
		Amp Range	Frame Size			Fuse Clip Size Amps/Volts	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
230	20	10-40	A1	—	1¾	100A/250V	88EUEP2FG		100	88EUEP2MG	
	25	13-52	B	2	—	100A/250V	88FUF2FG		100	88FUF2MG	
	40	25-100	B	—	2½	200A/250V	88GUGP2FG		100	88GUGP2MG	
	50	25-100	B	3	—	200A/250V	88HUGP2FG		150	88HUGP2MG	
	60	50-200	B	—	3½	200A/250V	88IUHP2FG		250	88IUHP2MG	
	75	50-200	B	4	—	400A/250V	88JUHP2FG		250	88JUHP2MG	
	125	55-250	—	5	—	—	—		400	88LPSP2MG	
150	55-250	—	5	—	600A/250V	88LPUP2FG		600	88LPUP2MG		
460	30	10-40	A1	—	1¾	100A/600V	88EUEP4FH		100	88EUEP4MH	
	40	13-52	B	2	—	100A/600V	88FUF4FH		100	88FUF4MH	
	60	25-100	B	—	2½	200A/600V	88GUGP4FH		100	88GUGP4MH	
	75	25-100	B	3	—	200A/600V	88HUGP4FH		150	88HUGP4MH	
	100	50-200	B	—	3½	200A/600V	88IUHP4FH		250	88IUHP4MH	
	150	50-200	B	4	—	400A/600V	88JUHP4FH		250	88JUHP4MH	
	250	55-250	—	5	—	—	—		400	88LPSP4MH	
350	55-250	—	5	—	600A/600V	88LPUP4FH		600	88LPUP4MH		

CONTROL PRODUCTS

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Pump Panels

Wye Delta with Solid State Overload, Class 88

Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-171. ▶ Wiring Diagrams see pages 17-184 and 17-185. ▶ Replacement Parts see page 17-133. 	<p>The coil voltage on the contactors will be the motor voltage. A CPT will be supplied to provide the control voltage. The control voltage will be 120V.</p> <p>To change the control voltage to customer supplied (no CPT included), change the 9th character to the following:</p> <p>for 24V , use "J" for 120V, use "F"</p>

Wye Delta

Motor Voltage	Max Hp	Overload		NEMA Size	Half Size	Fuse Clip Size Amps/Volts	Motor Circuit Interrupter ETI Amps	Open Transition				Closed Transition			
		Amp Range	Frame Size					Fusible Disconnect		Circuit Breaker		Fusible Disconnect		Circuit Breaker	
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
200	10	10-40	A1	1	—	60A/250V	50	88DUE06FD		88DUE06MD		88DUEC6FD		88DUEC6MD	
	15	10-40	A1	—	1½	100A/250V	100	88EUE06FD		88EUE06MD		88EUEC6FD		88EUEC6MD	
	20	13-52	B	2	—	100A/250V	100	88FUF06FD		88FUF06MD		88FUF06FD		88FUF06MD	
	30	25-100	B	—	2½	200A/250V	125	88GUG06FD		88GUG06MD		88GUG06FD		88GUG06MD	
	40	25-100	B	3	—	200A/250V	150	88HUG06FD		88HUG06MD		88HUG06FD		88HUG06MD	
	50	50-200	B	—	3½	200A/250V	250	88IUH06FD		88IUH06MD		88IUHC6FD		88IUHC6MD	
	60	50-200	B	4	—	400A/250V	250	88JUH06FD		88JUH06MD		88JUHC6FD		88JUHC6MD	
	75	55-250	—	5	—	400A/250V	400	88LPS06FD		88LPS06MD		88LPSC6FD		88LPSC6MD	
	150	55-250	—	5	—	600A/250V	600	88LPU06FD		88LPU06MD		88LPUC6FD		88LPUC6MD	
300	160-630	—	6	—	—	—	800	—		88MSX06MD		—		88MSXC6MD	
230	10	10-40	A1	1	—	60A/250V	50	88DUE02FG		88DUE02MG		88DUEC2FG		88DUEC2MG	
	15	10-40	A1	—	1½	60A/250V	50	88EUE02FG		88EUE02MG		88EUEC2FG		88EUEC2MG	
	25	13-52	B	2	—	100A/250V	100	88FUF02FG		88FUF02MG		88FUF02FG		88FUF02MG	
	30	25-100	B	—	2½	200A/250V	100	88GUG02FG		88GUG02MG		88GUG02FG		88GUG02MG	
	50	25-100	B	3	—	200A/250V	150	88HUG02FG		88HUG02MG		88HUG02FG		88HUG02MG	
	60	50-200	B	—	3½	200A/250V	250	88IUH02FG		88IUH02MG		88IUHC2FG		88IUHC2MG	
	75	50-200	B	4	—	400A/250V	250	88JUH02FG		88JUH02MG		88JUHC2FG		88JUHC2MG	
	100	55-250	—	5	—	400A/250V	400	88LPS02FG		88LPS02MG		88LPSC2FG		88LPSC2MG	
	150	55-250	—	5	—	600A/250V	600	88LPU02FG		88LPU02MG		88LPUC2FG		88LPUC2MG	
350	160-630	—	6	—	—	—	1200	—		88MSX02MG		—		88MSXC2MG	
460	15	5.5-22	A1	1	—	30A/600V	30	88DUD04FH		88DUD04MH		88DUD04FH		88DUD04MH	
	30	10-40	A1	—	1½	60A/600V	50	88EUE04FH		88EUE04MH		88EUEC4FH		88EUEC4MH	
	40	13-52	B	2	—	100A/600V	100	88FUF04FH		88FUF04MH		88FUF04FH		88FUF04MH	
	60	25-100	B	—	2½	200A/600V	100	88GUG04FH		88GUG04MH		88GUG04FH		88GUG04MH	
	75	25-100	B	3	—	200A/600V	125	88HUG04FH		88HUG04MH		88HUG04FH		88HUG04MH	
	100	50-200	B	—	3½	200A/600V	150	88IUH04FH		88IUH04MH		88IUHC4FH		88IUHC4MH	
	150	50-200	B	4	—	400A/600V	250	88JUH04FH		88JUH04MH		88JUHC4FH		88JUHC4MH	
	200	55-250	—	5	—	400A/600V	400	88LPS04FH		88LPS04MH		88LPSC4FH		88LPSC4MH	
	300	55-250	—	5	—	600A/600V	600	88LPU04FH		88LPU04MH		88LPUC4FH		88LPUC4MH	
700	160-630	—	6	—	—	—	1200	—		88MSX04MH		—		88MSXC4MH	
575	15	5.5-22	A1	1	—	30A/600V	30	88DUD05FE		88DUD05ME		88DUD05FE		88DUD05ME	
	30	10-40	A1	—	1½	60A/600V	50	88EUE05FE		88EUE05ME		88EUEC5FE		88EUEC5ME	
	40	13-52	B	2	—	100A/600V	50	88FUF05FE		88FUF05ME		88FUF05FE		88FUF05ME	
	60	25-100	B	—	2½	200A/600V	100	88GUG05FE		88GUG05ME		88GUG05FE		88GUG05ME	
	75	25-100	B	3	—	200A/600V	125	88HUG05FE		88HUG05ME		88HUG05FE		88HUG05ME	
	100	50-200	B	—	3½	200A/600V	150	88IUH05FE		88IUH05ME		88IUHC5FE		88IUHC5ME	
	150	50-200	B	4	—	400A/600V	250	88JUH05FE		88JUH05ME		88JUHC5FE		88JUHC5ME	
	200	55-250	—	5	—	400A/600V	400	88LPS05FE		88LPS05ME		88LPSC5FE		88LPSC5ME	
	300	55-250	—	5	—	600A/600V	400	88LPU05FE		88LPU05ME		88LPUC5FE		88LPUC5ME	
700	160-630	—	6	—	—	—	1200	—		88MSX05ME		—		88MSXC5ME	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LE

Features

Simplicity and compact lightweight design makes Class LE lighting contactors an attractive solution to your budgeting challenges.



- Used in applications where it is not critical that contacts remain closed if control power is lost
- Rated for tungsten lighting (incandescent filament), ballast lighting (fluorescent, HID, metal halide, mercury vapor, quartz halogen and sodium-lamp), resistive and general use loads
- Contacts are rated 20 - 400 amps at 600 volts
- 3 and 4 pole (up to 12 pole for 30 and 60 amp contactors)
- Most contactors have built-in auxiliary contacts for convenient 3-wire control
- Wide range of coil voltages from 24 to 600 VAC 50/60Hz
- Compact design allows for smaller panels and more wiring room
- Finger and back-of-hand safe terminals
- Panel and DIN rail mounting
- Full line of enclosures including NEMA 1, 3/3R, 4, 4/4X stainless steel and 12
- Available in combination form with choice of non-fusible disconnect, fusible disconnect or circuit breaker
- Full line of factory and field modifications

NEMA & General
Purpose Control

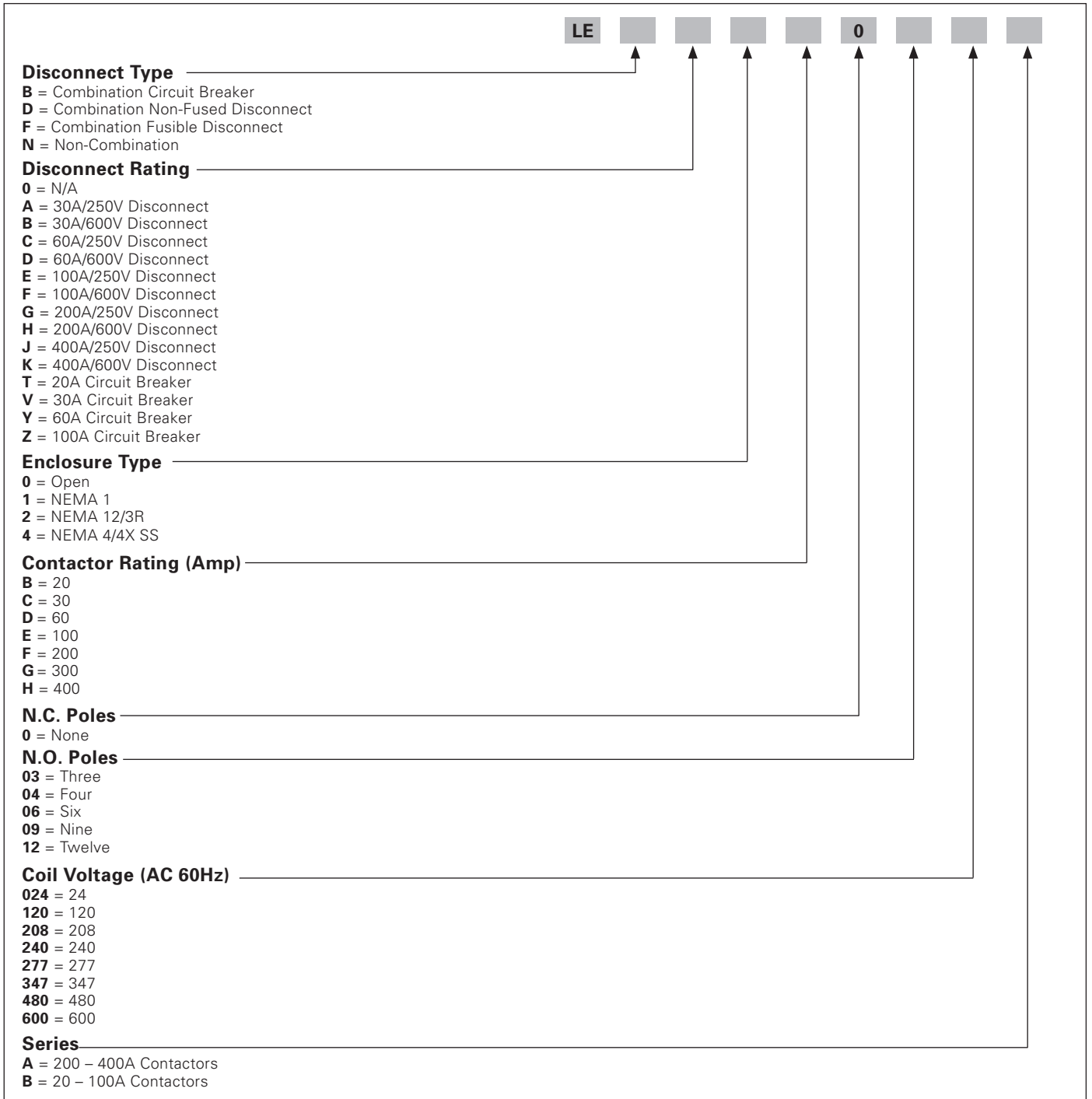
CONTROL
PRODUCTS

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LE

Features

Catalog Numbering System



NEMA & General
Purpose Control


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CONTROL
PRODUCTS

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LE

Selection



Ordering Information

- ▶ Replace *** with a number from the coil table.
- ▶ Field Modification Kits see page 17-106.
- ▶ Factory Modifications see page 17-121.
- ▶ Dimensions see page 17-151 for open, page 17-172 for enclosed.
- ▶ Wiring Diagram see page 17-190.
- ▶ Replacement Parts see page 17-136.

Coil Table

VAC 60Hz	***
24	024
120	120
208	208
240	240
277	277
347 ^①	347
480	480
600	600

Replace the (***) with a number from the coil table.

Non-Combination Contactor

Max. Amp Rating	Number of Poles	Normally Closed Contacts	Normally Open Contacts	Enclosure Type			
				Open	1	3/3R/12	4/4X 304 S.S.
				Catalog Number			
20	3	0	3	LEN00B003***B	LEN01B003***B	LEN02B003***B	LEN04B003***B
	4	0	4	LEN00B004***B	LEN01B004***B	LEN02B004***B	LEN04B004***B
30	3	0	3	LEN00C003***B	LEN01C003***B	LEN02C003***B	LEN04C003***B
	4	0	4	LEN00C004***B	LEN01C004***B	LEN02C004***B	LEN04C004***B
	6	0	6	LEN00C006***B	LEN01C006***B	LEN02C006***B	LEN04C006***B
	9	0	9	LEN00C009***B	LEN01C009***B	LEN02C009***B	LEN04C009***B
	12	0	12	LEN00C012***B	LEN01C012***B	LEN02C012***B	LEN04C012***B
60	3	0	3	LEN00D003***B	LEN01D003***B	LEN02D003***B	LEN04D003***B
	6	0	6	LEN00D006***B	LEN01D006***B	LEN02D006***B	LEN04D006***B
	9	0	9	LEN00D009***B	LEN01D009***B	LEN02D009***B	LEN04D009***B
	12	0	12	LEN00D012***B	LEN01D012***B	LEN02D012***B	LEN04D012***B
100	3	0	3	LEN00E003***B	LEN01E003***B	LEN02E003***B	LEN04E003***B
200	3	0	3	LEN00F003***A	LEN01F003***A	LEN02F003***A	LEN04F003***A
300	3	0	3	LEN00G003***A	LEN01G003***A	LEN02G003***A	LEN04G003***A
400	3	0	3	LEN00H003***A	LEN01H003***A	LEN02H003***A	LEN04H003***A

NEMA & General Purpose Control

17 CONTROL PRODUCTS

① Not available on 200 - 400A contactors.

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LE

Technical Data

Contactor	LEN00B003	LEN00B004	LEN00C003	LEN00C004
General technical data:				
Finger-safe (main circuit / control circuit)	yes / yes	yes / yes	yes / yes	yes / yes
Degree of pollution	3	3	3	3
Altitude (m)	2,000	2,000	2,000	2,000
Ambient storage temperature (°C)	-55 to 80	-55 to 80	-55 to 80	-55 to 80
Ambient operating temperature (°C)	0 to 40	0 to 40	0 to 40	0 to 40
Humidity (% non-condensing)	10 to 95	10 to 95	10 to 95	10 to 95
Shock resistance at rectangular impulse (g/ms)	6.7 / 5, 4.2 / 10	6.7 / 5, 4.2 / 10	7.5 / 5, 4.7 / 10	7.5 / 5, 4.7 / 10
Shock resistance at sine pulse (g/ms)	10.5 / 5, 6.6 / 10	10.5 / 5, 6.6 / 10	11.8 / 5, 7.4 / 10	11.8 / 5, 7.4 / 10
Rated impulse voltage resistance (kV)	no data	no data	no data	no data
Rated insulation voltage (V)	no data	no data	no data	no data
Mechanical operating cycles as operating time:				
of contactor	30,000,000	30,000,000	10,000,000	10,000,000
of contactor with additional aux contacts	10,000,000	10,000,000	10,000,000	10,000,000
Main circuit:				
Number of NC / NO main contacts	ONC / 3NO	ONC / 4NO	ONC / 3NO	ONC / 4NO
Typical power loss per conductor (W)	0.7	0.7	0.9	0.9
Off-load operating frequency (cycles per hour)	10,000	10,000	5,000	5,000
Current ratings:				
Tungsten (poles per phase)	20A @277V 1p 1ph 20A @480V 2p 1ph 20A @480V 3p 3ph	20A @277V 1p 1ph 20A @480V 2p 1ph 20A @480V 3p 3ph	30A @277V 1p 1ph 30A @480V 2p 1ph 30A @480V 3p 3ph	30A @277V 1p 1ph 30A @480V 2p 1ph 30A @480V 3p 3ph
Ballast (poles per phase)	20A @347V 1p 1ph 20A @600V 2p 1ph 20A @600V 3p 3ph	20A @347V 1p 1ph 20A @600V 2p 1ph 20A @600V 3p 3ph	30A @347V 1p 1ph 30A @600V 2p 1ph 30A @660V 3p 3ph	30A @347V 1p 1ph 30A @600V 2p 1ph 30A @600V 3p 3ph
General and resistive (poles per phase)	20A @600V 1p 1ph 20A @600V 2p 1ph 20A @600V 3p 3ph	20A @600V 1p 1ph 20A @600V 2p 1ph 20A @600V 3p 3ph	30A @600V 1p 1ph 30A @600V 2p 1ph 30A @600V 3p 3ph	30A @600V 1p 1ph 30A @600V 2p 1ph 30A @600V 3p 3ph
Coil ratings:				
Nominal voltage	2)	2)	2)	2)
Inrush / sealed power (VA)	31.7 / 4.8	31.7 / 4.8	87 / 9.4	87 / 9.4
Coil voltage tolerance factor	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1
Internal/standard auxiliary contact:				
Number of NC / NO auxiliary contacts	ONC / 1NO	NA ^①	1NC / 1NO	1NC / 1NO
Rating	A600 / Q600	NA	A600 / Q600	A600 / Q600
Installation/mounting/dimensions:				
Mounting orientation	vertical	vertical	vertical	vertical
Type of mounting: screw / DIN rail	yes / yes	yes / yes	yes / yes	yes / yes
Height x Width x Depth (mm)	57.5 x 45 x 73	57.5 x 45 x 73	85 x 45 x 97	85 x 60 x 97
Minimum clearance to sides (mm)	0	0	0	0
Minimum clearance to earthed parts (mm)	6	6	6	6
Connection type / torque for main circuit terminals	screw / 7-10 lb in	screw / 7-10 lb in	screw / 18-22 lb in	screw / 18-22 lb in
Connection type / torque for control circuit terminals	screw / 7-10 lb in	screw / 7-10 lb in	screw / 7-10 lb in	screw / 7-10 lb in
Solid and stranded conductors for main contacts (AWG)	2x(20-16), 2x(18-14), 2x(12)	2x(20-16), 2x(18-14), 2x(12)	2x(6-12), 2x(14-8)	2x(6-12), 2x(14-8)
Solid and stranded conductors for control circuit (AWG)	2x(20-16), 2x(18-14)	2x(20-16), 2x(18-14)	2x(20-16), 2x(18-14)	2x(20-16), 2x(18-14)
Conductor type for main and control circuits	75°C CU	75°C CU	75°C CU	75°C CU
Short circuit current rating of main circuit:				
Short circuit current rating	5kA @ 600V	5kA @ 600V	5kA @ 600V	5kA @ 600V
Max fuse / circuit breaker (Amp)	30 / 25	30 / 25	60 / 40	60 / 40
Certificates:	cULus	cULus	cULus	cULus

① Must use an external (optional) auxiliary contact.

② Refer to catalog selection tables for coil voltages.

NEMA & General
Purpose Control

17
CONTROL
PRODUCTS

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LE

Technical Data

LEN00D003	LEN00E003	LEN00F003	LEN00G003	LEN00H003
no / yes	no / yes	no / yes	no / yes	no / yes
3	3	3	3	3
2,000	2,000	2,000	2,000	2,000
-55 to 80	-55 to 80	-55 to 80	-55 to 80	-55 to 80
0 to 40	0 to 40	0 to 40	0 to 40	0 to 40
10 to 95	10 to 95	10 to 95	10 to 95	10 to 95
10 / 5, 5 / 10	6.8 / 5, 4 / 10	8.5 / 5, 4.2 / 10	8.5 / 5, 4.2 / 10	8.5 / 5, 4.2 / 10
15 / 5, 8 / 10	10.6 / 5, 6.2 / 10	13.4 / 5, 6.5 / 10	13.4 / 5, 6.5 / 10	13.4 / 5, 6.5 / 10
no data	no data	no data	no data	no data
no data	no data	no data	no data	no data
Mechanical operating cycles as operating time:				
10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
Main circuit:				
ONC / 3NO	ONC / 3NO	ONC / 3NO	ONC / 3NO	ONC / 3NO
2.6	7.7	13	18	35
5,000	5,000	2,000	2,000	2,000
Current ratings:				
60A @277V 1p 1ph 60A @480V 2p 1ph 60A @480V 3p 3ph	100A @277V 1p 1ph 100A @480V 2p 1ph 100A @480V 3p 3ph	200A @277V 1p 1ph 200A @480V 2p 1ph 200A @480V 3p 3ph	300A @277V 1p 1ph 300A @480V 2p 1ph 300A @480V 3p 3ph	400A @277V 1p 1ph 400A @480V 2p 1ph 400A @480V 3p 3ph
60A @600V 1p 1ph 60A @600V 2p 1ph 60A @600V 3p 3ph	100A @600V 1p 1ph 100A @600V 2p 1ph 100A @600V 3p 3ph	200A @600V 1p 1ph 200A @600V 2p 1ph 200A @600V 3p 3ph	300A @600V 1p 1ph 300A @600V 2p 1ph 300A @600V 3p 3ph	400A @600V 1p 1ph 400A @600V 2p 1ph 400A @600V 3p 3ph
60A @600V 1p 1ph 60A @600V 2p 1ph 60A @600V 3p 3ph	100A @600V 1p 1ph 100A @600V 2p 1ph 100A @600V 3p 3ph	200A @600V 1p 1ph 200A @600V 2p 1ph 200A @600V 3p 3ph	300A @600V 1p 1ph 300A @600V 2p 1ph 300A @600V 3p 3ph	400A @600V 1p 1ph 400A @600V 2p 1ph 400A @600V 3p 3ph
Coil ratings:				
2)	2)	2)	2)	2)
166 / 12.6	300 / 21	300 / 5.8	590 / 6.7	830 / 9.2
0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1
Internal/standard auxiliary contact:				
NA ⊕	NA ⊕	2NC / 2NO	2NC / 2NO	2NC / 2NO
NA	NA	A300 / Q300	A300 / Q300	A300 / Q300
Installation/mounting/dimensions:				
vertical	vertical	vertical	vertical	vertical
yes / yes	yes / yes	yes / no	yes / no	yes / no
112 x 55 x 115	146 x 70 x 139	172 x 120 x 180	210 x 145 x 202	214 x 160 x 225
6	6	10	10	10
6	6	10	10	10
screw / 27-40 lb in	screw / 36-53 lb in	screw / 90-110 lb in	screw / 180-195 lb in	screw / 180-195 lb in
screw / 7-10 lb in	screw / 7-10 lb in	screw / 7-10 lb in	screw / 7-10 lb in	screw / 7-10 lb in
2x(18-3), 1x(18-2)	2x(10-1/0), 1x(10-2/0)	2x(6-3/0)	2x(2/0-500MCM)	2x(2/0-500MCM)
2x(18-14)	2x(18-14)	2x(18-14)	2x(18-14)	2x(18-14)
75°C CU	75°C CU	75°C CU	75°C CU	75°C CU
Short circuit current rating of main circuit:				
5kA @ 600V	10kA @ 600V	10kA @ 600V	18kA @ 600V	18kA @ 600V
100 / 80	200 / 125	400 / 250	600 / 400	800 / 500
cULus	cULus	cULus	cULus	cULus


NEMA & General
Purpose Control

17
CONTROL
PRODUCTS

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LE

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Replace *** with a number from the coil table. ▶ Field Modification Kits see page 17-106. ▶ Factory Modifications see page 17-121. ▶ Dimensions see page 17-172. ▶ Wiring Diagram see page 17-190. ▶ Replacement Parts see page 17-136. 	Coil Table																	
		<table border="1"> <thead> <tr> <th>VAC 60Hz</th> <th>***</th> </tr> </thead> <tbody> <tr><td>24</td><td>024</td></tr> <tr><td>120</td><td>120</td></tr> <tr><td>208</td><td>208</td></tr> <tr><td>240</td><td>240</td></tr> <tr><td>277</td><td>277</td></tr> <tr><td>347^①</td><td>347</td></tr> <tr><td>480</td><td>480</td></tr> <tr><td>600</td><td>600</td></tr> </tbody> </table> <p>Replace the (***) with a number from the coil table.</p>	VAC 60Hz	***	24	024	120	120	208	208	240	240	277	277	347 ^①	347	480	480	600
VAC 60Hz	***																		
24	024																		
120	120																		
208	208																		
240	240																		
277	277																		
347 ^①	347																		
480	480																		
600	600																		

Combination Contactor

Disconnect Type	Max. Amp Rating	Number of NO Poles	Disc. Amp Rating	Disc Amp/ Fuse Clip Rating	Circuit Breaker Rating	Enclosure Type		
						1	3/3R/12, 4 ^②	4/4X 304 S.S.
						Catalog Number		
Non-Fusible	20	3	30A	—	—	LEDB1B003***B	LEDB2B003***B	LEDB4B003***B
	30	3	30A	—	—	LEDB1C003***B	LEDB2C003***B	LEDB4C003***B
	60	3	60A	—	—	LEDD1D003***B	LEDD2D003***B	LEDD4D003***B
	100	3	100A	—	—	LEDF1E003***B	LEDF2E003***B	LEDF4E003***B
	200	3	200A	—	—	LEDH1F003***A	LEDH2F003***A	LEDH4F003***A
	300	3	400A	—	—	LEDK1G003***A	LEDK2G003***A	LEDK4G003***A
Fusible	20	3	—	30A/250V	—	LEFA1B003***B	LEFA2B003***B	LEFA4B003***B
		3	—	30A/600V	—	LEFB1B003***B	LEFB2B003***B	LEFB4B003***B
	30	3	—	30A/250V	—	LEFA1C003***B	LEFA2C003***B	LEFA4C003***B
		3	—	30A/600V	—	LEFB1C003***B	LEFB2C003***B	LEFB4C003***B
	60	3	—	60A/250V	—	LEFC1D003***B	LEFC2D003***B	LEFC4D003***B
		3	—	60A/600V	—	LEFD1D003***B	LEFD2D003***B	LEFD4D003***B
	100	3	—	100A/250V	—	LEFE1E003***B	LEFE2E003***B	LEFE4E003***B
		3	—	100A/600V	—	LEFF1E003***B	LEFF2E003***B	LEFF4E003***B
	200	3	—	200A/250V	—	LEFG1F003***A	LEFG2F003***A	LEFG4F003***A
		3	—	200A/600V	—	LEFH1F003***A	LEFH2F003***A	LEFH4F003***A
	300	3	—	400A/250V	—	LEFJ1G003***A	LEFJ2G003***A	LEFJ4G003***A
		3	—	400A/600V	—	LEFK1G003***A	LEFK2G003***A	LEFK4G003***A
Circuit Breaker	20	3	—	—	20A	LEBT1B003***B	LEBT2B003***B	LEBT4B003***B
	30	3	—	—	30A	LEBV1C003***B	LEBV2C003***B	LEBV4C003***B
	60	3	—	—	60A	LEBY1D003***B	LEBY2D003***B	LEBY4D003***B
	100	3	—	—	100A	LEBZ1E003***B	LEBZ2E003***B	LEBZ4E003***B

① Not available on 200 - 400A contactors.

② Type 4 painted enclosure through 100 Amp only.

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LC

Features

Class LC lighting contactors deliver unprecedented versatility in application, simplicity in configuration and performance in operation. Ingenious design, rugged construction and a host

of truly useful features make them uniquely appealing to all those who use them.

Convenient side access field power wiring.

Contact position indication – when button protrudes, contact is closed

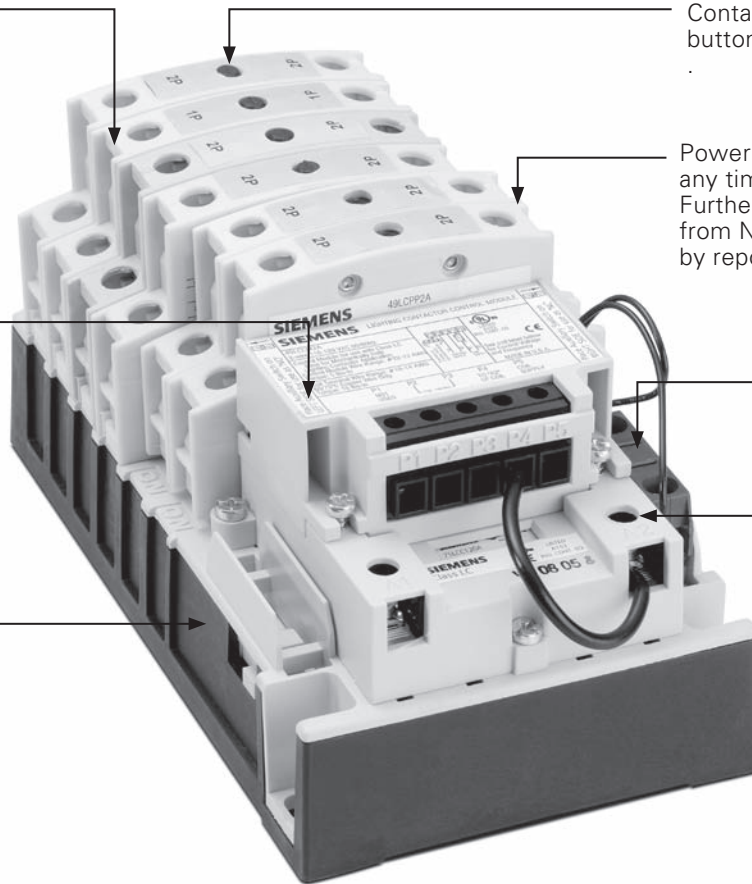
A simple kit easily converts electrically held units to mechanically held and includes a 2- or 3-wire control module.

Power poles can easily be added at any time based on changing needs. Furthermore, they may be converted from NO to NC (or vice versa) simply by repositioning.

Standard base enables contactor to be field expandable for flexibility and future needs.

Plug-in auxiliary contacts are NO when installed on the left side of the contactor, NC on the right.

Finger and back-of-hand safe terminals.



- Used in all applications where either electrically or mechanically held contactors are specifically suited and also ideal for maximum flexibility and future expansion
- Rated for tungsten lighting (incandescent filament), ballast lighting (fluorescent, HID, metal halide, mercury vapor, quartz halogen and sodium-lamp), resistive and general use loads
- Contacts are rated up to 30 amps at 600 volts
- Up to 12 poles (maximum of 8 normally closed)
- Wide range of coil voltages from 24 to 600 VAC 50/60Hz

- Can be ordered as either electrically or mechanically held and can also be converted from electrically to mechanically held in the field with a simple conversion kit
- Modular design enables you to stock the building block components to assemble all configurations of both the electrically and mechanically held contactors thus dramatically reducing inventory
- Full line of enclosures including NEMA 1, 3/3R, 4, 4/4X stainless steel and 12
- Full line of factory and field modifications

NEMA & General Purpose Control

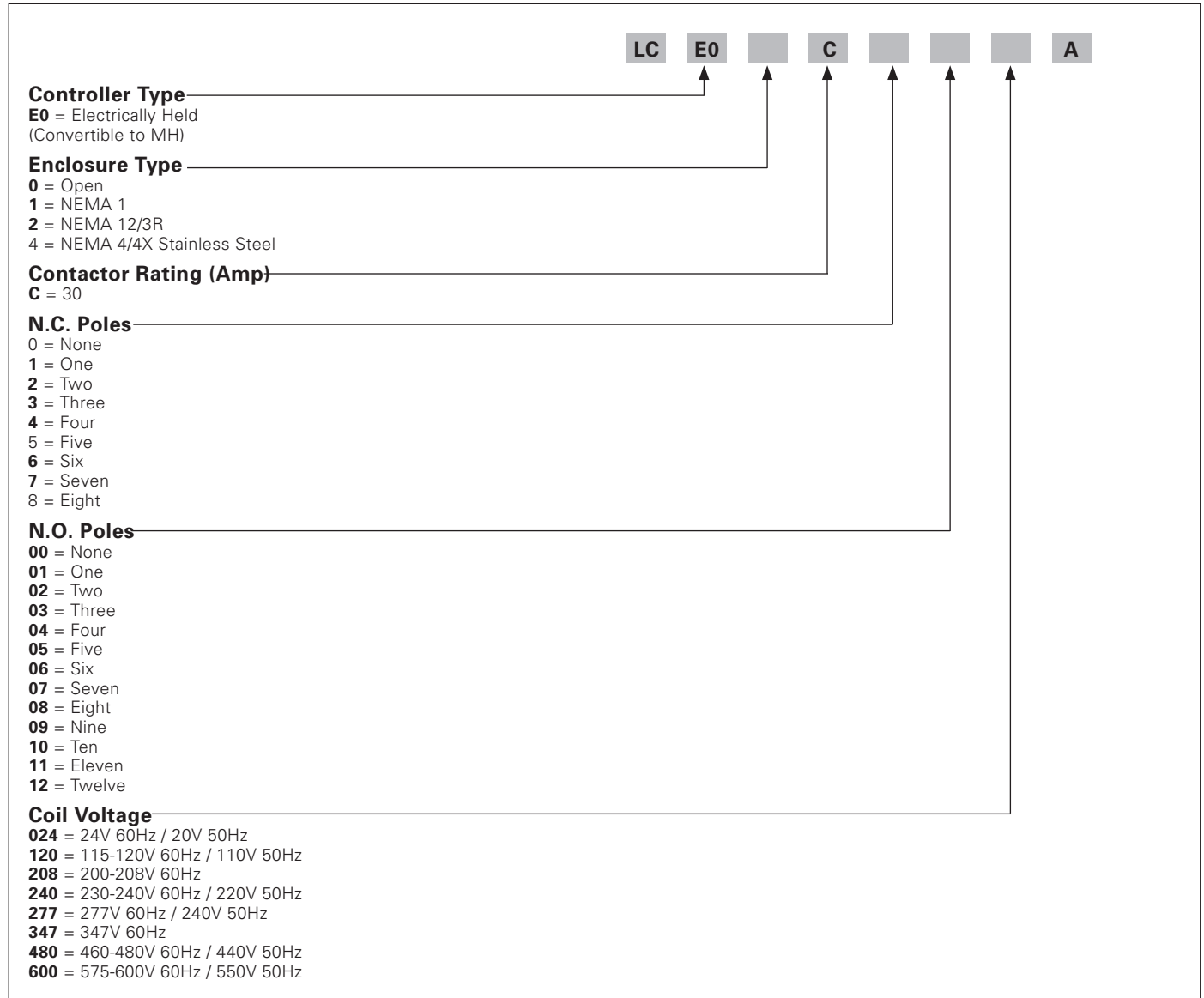
17 CONTROL PRODUCTS

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LC

Features

Catalog Numbering System



NEMA & General
Purpose Control


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CONTROL
PRODUCTS

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LC

Selection



Ordering Information

- ▶ To order standard electrically held contactor, simply select catalog number from tables below.
- ▶ To order mechanically held contactor, select catalog number from tables below and specify conversion module from factory modification section from page 17-124.
- ▶ To convert standard electrically held contactor to mechanically held in the field, select catalog number from tables below and select conversion module kit from field modification section on page 17-108.
- ▶ Replace *** with a number from the coil table.
- ▶ Field Modification Kits see page 17-106.
- ▶ Factory Modifications see page 17-121.
- ▶ Dimensions see page 17-150 open, page 17-172 enclosed.
- ▶ Wiring Diagrams see page 17-190.
- ▶ Replacement Parts see page 17-136.

Coil Table

VAC 60Hz	***
24	024
120	120
208	208
240	240
277	277
347	347
480	480
600	600

Replace the (***) with a number from the coil table.

Non-Combination Contactor (30 Amp max.)

No. of Poles		Enclosure Type			
		Open	1	3/3R/12	4/4X 304 S.S.
N.C.	N.O.	Catalog Number			
2	0	LCE00C200***A	LCE01C200***A	LCE02C200***A	LCE04C200***A
3		LCE00C300***A	LCE01C300***A	LCE02C300***A	LCE04C300***A
4		LCE00C400***A	LCE01C400***A	LCE02C400***A	LCE04C400***A
5		LCE00C500***A	LCE01C500***A	LCE02C500***A	LCE04C500***A
6		LCE00C600***A	LCE01C600***A	LCE02C600***A	LCE04C600***A
7		LCE00C700***A	LCE01C700***A	LCE02C700***A	LCE04C700***A
8		LCE00C800***A	LCE01C800***A	LCE02C800***A	LCE04C800***A
1		1	LCE00C101***A	LCE01C101***A	LCE02C101***A
2	LCE00C201***A		LCE01C201***A	LCE02C201***A	LCE04C201***A
3	LCE00C301***A		LCE01C301***A	LCE02C301***A	LCE04C301***A
4	LCE00C401***A		LCE01C401***A	LCE02C401***A	LCE04C401***A
5	LCE00C501***A		LCE01C501***A	LCE02C501***A	LCE04C501***A
6	LCE00C601***A		LCE01C601***A	LCE02C601***A	LCE04C601***A
7	LCE00C701***A		LCE01C701***A	LCE02C701***A	LCE04C701***A
8	LCE00C801***A		LCE01C801***A	LCE02C801***A	LCE04C801***A
0	2	LCE00C002***A	LCE01C002***A	LCE02C002***A	LCE04C002***A
1		LCE00C102***A	LCE01C102***A	LCE02C102***A	LCE04C102***A
2		LCE00C202***A	LCE01C202***A	LCE02C202***A	LCE04C202***A
3		LCE00C302***A	LCE01C302***A	LCE02C302***A	LCE04C302***A
4		LCE00C402***A	LCE01C402***A	LCE02C402***A	LCE04C402***A
5		LCE00C502***A	LCE01C502***A	LCE02C502***A	LCE04C502***A
6		LCE00C602***A	LCE01C602***A	LCE02C602***A	LCE04C602***A
7		LCE00C702***A	LCE01C702***A	LCE02C702***A	LCE04C702***A
8	LCE00C802***A	LCE01C802***A	LCE02C802***A	LCE04C802***A	
0	3	LCE00C003***A	LCE01C003***A	LCE02C003***A	LCE04C003***A
1		LCE00C103***A	LCE01C103***A	LCE02C103***A	LCE04C103***A
2		LCE00C203***A	LCE01C203***A	LCE02C203***A	LCE04C203***A
3		LCE00C303***A	LCE01C303***A	LCE02C303***A	LCE04C303***A
4		LCE00C403***A	LCE01C403***A	LCE02C403***A	LCE04C403***A
5		LCE00C503***A	LCE01C503***A	LCE02C503***A	LCE04C503***A
6		LCE00C603***A	LCE01C603***A	LCE02C603***A	LCE04C603***A
7		LCE00C703***A	LCE01C703***A	LCE02C703***A	LCE04C703***A
8	LCE00C803***A	LCE01C803***A	LCE02C803***A	LCE04C803***A	

NEMA & General Purpose Control

17 CONTROL PRODUCTS

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LC

Selection

Non-Combination Contactor (30 Amp max.)

No. of Poles		Enclosure Type			
		Open	1	3/3R/12	4/4X 304 S.S.
N.C.	N.O.	Catalog Number			
0	4	LCE00C004***A	LCE01C004***A	LCE02C004***A	LCE04C004***A
1		LCE00C104***A	LCE01C104***A	LCE02C104***A	LCE04C104***A
2		LCE00C204***A	LCE01C204***A	LCE02C204***A	LCE04C204***A
3		LCE00C304***A	LCE01C304***A	LCE02C304***A	LCE04C304***A
4		LCE00C404***A	LCE01C404***A	LCE02C404***A	LCE04C404***A
5		LCE00C504***A	LCE01C504***A	LCE02C504***A	LCE04C504***A
6		LCE00C604***A	LCE01C604***A	LCE02C604***A	LCE04C604***A
7		LCE00C704***A	LCE01C704***A	LCE02C704***A	LCE04C704***A
8		LCE00C804***A	LCE01C804***A	LCE02C804***A	LCE04C804***A
0	5	LCE00C005***A	LCE01C005***A	LCE02C005***A	LCE04C005***A
1		LCE00C105***A	LCE01C105***A	LCE02C105***A	LCE04C105***A
2		LCE00C205***A	LCE01C205***A	LCE02C205***A	LCE04C205***A
3		LCE00C305***A	LCE01C305***A	LCE02C305***A	LCE04C305***A
4		LCE00C405***A	LCE01C405***A	LCE02C405***A	LCE04C405***A
5		LCE00C505***A	LCE01C505***A	LCE02C505***A	LCE04C505***A
6		LCE00C605***A	LCE01C605***A	LCE02C605***A	LCE04C605***A
0	6	LCE00C006***A	LCE01C006***A	LCE02C006***A	LCE04C006***A
1		LCE00C106***A	LCE01C106***A	LCE02C106***A	LCE04C106***A
2		LCE00C206***A	LCE01C206***A	LCE02C206***A	LCE04C206***A
3		LCE00C306***A	LCE01C306***A	LCE02C306***A	LCE04C306***A
4		LCE00C406***A	LCE01C406***A	LCE02C406***A	LCE04C406***A
5		LCE00C506***A	LCE01C506***A	LCE02C506***A	LCE04C506***A
6		LCE00C606***A	LCE01C606***A	LCE02C606***A	LCE04C606***A
0	7	LCE00C007***A	LCE01C007***A	LCE02C007***A	LCE04C007***A
1		LCE00C107***A	LCE01C107***A	LCE02C107***A	LCE04C107***A
2		LCE00C207***A	LCE01C207***A	LCE02C207***A	LCE04C207***A
3		LCE00C307***A	LCE01C307***A	LCE02C307***A	LCE04C307***A
4		LCE00C407***A	LCE01C407***A	LCE02C407***A	LCE04C407***A
0	8	LCE00C008***A	LCE01C008***A	LCE02C008***A	LCE04C008***A
1		LCE00C108***A	LCE01C108***A	LCE02C108***A	LCE04C108***A
2		LCE00C208***A	LCE01C208***A	LCE02C208***A	LCE04C208***A
3		LCE00C308***A	LCE01C308***A	LCE02C308***A	LCE04C308***A
4		LCE00C408***A	LCE01C408***A	LCE02C408***A	LCE04C408***A
0	9	LCE00C009***A	LCE01C009***A	LCE02C009***A	LCE04C009***A
1		LCE00C109***A	LCE01C109***A	LCE02C109***A	LCE04C109***A
2		LCE00C209***A	LCE01C209***A	LCE02C209***A	LCE04C209***A
0	10	LCE00C010***A	LCE01C010***A	LCE02C010***A	LCE04C010***A
1		LCE00C110***A	LCE01C110***A	LCE02C110***A	LCE04C110***A
2		LCE00C210***A	LCE01C210***A	LCE02C210***A	LCE04C210***A
0	11	LCE00C011***A	LCE01C011***A	LCE02C011***A	LCE04C011***A
0	12	LCE00C012***A	LCE01C012***A	LCE02C012***A	LCE04C012***A

NEMA & General
Purpose ControlCONTROL
PRODUCTS
17

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LC

Technical Data

General technical data:	
Finger-safe (main circuit / control circuit)	yes / yes
Degree of pollution	3
Altitude (m)	2,000
Ambient storage temperature (°C)	-30 to 65
Ambient operating temperature (°C)	-25 to 40
Humidity (% non-condensing)	no data
Shock resistance at rectangular impulse (g/ms)	no data
Shock resistance at sine pulse (g/ms)	no data
Rated impulse voltage resistance (kV)	no data
Rated insulation voltage (V)	600
Mechanical operating cycles as operating time:	
of contactor	100,000
of contactor with additional aux contacts	100,000
Main circuit:	
Number of main contacts	2 - 12 (maximum of 8 NC)
Typical power loss per conductor (W)	no data
Off-load operating frequency (cycles per hour)	60 for continued operation
Current ratings:	
Tungsten (poles per phase)	20A @277V 1p 1ph 20A @480V 2p 1ph 20A @480V 3p 3ph
Ballast (poles per phase)	30A @347V 1p 1ph 30A @600V 2p 1ph 30A @600V 3p 3ph
General and resistive (poles per phase)	30A @600V 1p 1ph 30A @600V 2p 1ph 30A @600V 3p 3ph
Coil ratings:	
Nominal voltage	(refer to coil voltage table)
Inrush / sealed power (VA)	248 / 28
Coil voltage tolerance factor	0.85 - 1.1
External/optional auxiliary contact:	
Number of NC / NO auxiliary contacts	2NC / 2NO max
Rating	A600, 24VDC, 24VAC
Installation/mounting/dimensions:	
Mounting orientation	vertical
Type of mounting: screw / DIN rail	yes / no
Height x Width x Depth (mm)	188 x 106 x 98
Minimum clearance to sides (mm)	12.7
Minimum clearance to earthed parts (mm)	12.7
Connection type / torque:	
Main contact terminals	screw / 35 lb in
Coil terminals	screw / 15 lb in
Auxiliary contact terminals	screw / 7-12 lb in
Control module terminals	screw / 5 lb in
Solid and stranded conductors (AWG):	
Main contact terminals	1x(14-8), #8 solid or stranded 2x(14-8), #8 stranded only
Coil terminals	2x(18-14)
Auxiliary contact terminals	2x(22-12)
Control module terminals	1x(22-12)
Conductor type for main / control circuits	75°C CU / 60-75°C CU
Short circuit current rating of main circuit:	
Short circuit current rating	(see SCCR tables)
Certificates:	
	cUL

Coil voltages:
24V 60Hz / 20V 50Hz
115-120V 60Hz / 110V 50Hz
200-208V 60Hz
230-240V 60Hz / 220V 50Hz
277V 60Hz / 240V 50Hz
347V 60Hz
460-480V 60Hz / 440V 50Hz
575-600V 60Hz / 550V 50Hz

Short circuit current ratings with fuses:			
Max. Volt.	Fuse	Max. Device Rating (Amps)	SCCR (kA)
600	RK fuse	60	5

Short circuit current ratings with circuit breakers:			
Max. Volt.	Siemens Listed Circuit Breaker	Max. Device Rating (Amps)	SCCR (kA)
600	NGG3B040L	40	5
480	HEG3B040L	40	5
480	ED63B040L	40	5
480	NGG3B040L	40	5

Conversion module:		
Input Volt. (AC)	Steady State Current @ Rated Volts (mA)	Max. VA
24	80	5
115-120	83	12
200-277	91	30

Conversion module:	
Min. pulse duration (3-wire module)	250ms
Max. allowable leakage current	1.8 mA
EMI	35 V/m
Surge transient peak	6 kV
Frequency range	40-70 Hz

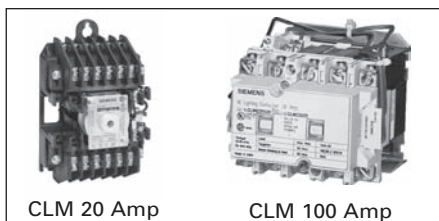
NEMA & General Purpose Control

17 CONTROL PRODUCTS

Lighting and Heating Contactors

Mechanically and Magnetically Held Lighting Contactors, Class CLM

Selection



Mechanically Latched Lighting and Heating Contactor

The CLM Lighting Contactors can be used with metal halide, mercury vapor, quartz halogen, tungsten and fluorescent lighting. They provide reliable and convenient lighting control in numerous applications, such as industrial plants, schools, hospitals, office buildings, shopping centers, airports, stadiums . . . literally everywhere lighting is required.

The CLMs are listed under UL 508 with no derating when used open or enclosed. Combination lighting contactors are listed for UL service entrance.

UL listed File #E60310
CSA Certified File LR 6535

Type CLM 20 Amp Lighting Contactor Solid State Control Modules

The CLM 20 amp lighting contactor is an electromagnetically operated, mechanically latched three wire control contactor. The most commonly used method of control is a three position momentary contact switch with a center-off position. The controlling device must be able to make the coil inrush current but need not break it. The coil current is interrupted by the control contacts within the CLM contactor. Power for the control line may come from a separate source or directly from the line side of the CLM contactor. The CLM contactor can also be controlled by devices such as:

- Break-glass control stations
- Timers having single pole, double throw contacts
- Photo-electric cells[Ⓢ]
- Energy management systems[Ⓢ]
- Microprocessors[Ⓢ]
- Occupancy sensors[Ⓢ]

Control modules make it possible to use a controlling device that does not have enough current-carrying capacity to control the CLM contactor directly. Control modules are also used when

the control station is to be located at a distance greater than the allowable contactor line run.

Another use for control modules occurs when the controlling device is only available as a single pole single-throw contact necessitating a two wire control line.

Still another application for control modules is when start-stop three wire control is needed.

Control modules also can make it possible to operate the CLM coil from its own incoming line at one voltage while providing the control at a second, perhaps lower voltage.

Two Wire Control Module (Accessory 47)

The advantages of two wire controls are:

1. Control station can have lower ampacity rating.
2. Control station can be located an extended distance from the CLM contactor.
3. Control module can frequently be controlled directly from microprocessor.
4. Control devices can be two wire single pole, single-throw types.
5. Control voltage may be different than the CLM coil circuit and at a lower voltage level.

Note: If the control power to the solid state control module is lost while the module is energized the lighting contactor will open. If the line power to the lighting contactor is lost while the contactor is energized the contactor will not change state with return of line voltage. Power will be restored to the load if the control module is still energized. Control station should be the maintained type.

Three Wire Control Module (Accessory 48)

1. The accessory 48 consists of two relays with contacts appropriately interconnected which provides for an interlocking that prevents both relays from being energized simultaneously.
2. This module has similar characteristics to the two wire module (Accessory 47) except there is no change of switch contact position upon loss of control line power. Control stations should be the momentary type.

Stop-Start Control Module (Accessory 49)

Stop-start three wire maintained control is an arrangement used mostly when controlling motors, but can be used in lighting applications.

Any number of momentary contact control stations consisting of normally open start buttons and normally closed stop buttons can be used. Start buttons are connected in parallel and stop buttons in series.

Operation (Magnetic Latch)

A permanent magnet is built into the contactor structure of the 30A, 60A, 100A, and 200A contactors that will maintain the contactor in its energized state indefinitely without using control power. When energized, a DC current is applied that produces a magnetic field that reinforces the polarity of the permanent magnet, and the contactor pulls in immediately. The current to the coil is disconnected by the coil clearing interlock. In order to drop out the contactor, it is necessary to apply a field through the OFF coil in the reverse direction to the permanent magnet. This momentarily cancels the magnetic attraction and the contactor drops out. Coil and module failures are possible when used with solid state relays and PLC outputs. 24-volt systems are ok to use, but 120 volts and above should be discouraged. If higher values cannot be avoided, an interposing relay should be used.

(Mechanically Latched)

The 300 & 400A lighting and heating contactors operate using a latching mechanism.

Closing – When the “close” pushbutton is operated, the closing coil is energized, closing the contactor. As the contactor closes, the latch lever hooks over the latch pin to mechanically latch the contactor closed. The coil-clearing auxiliary contact de-energizes the closing coil.

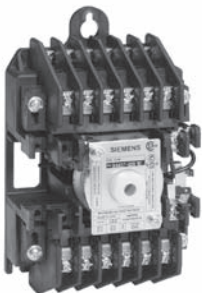
Opening – When the “Trip” pushbutton is operated, the trip solenoid coil is energized, unhooking the latch lever from the latch pin, which allows the contactor to open. As the contactor opens, the coil-clearing auxiliary contact de-energizes the trip solenoid coil.

[Ⓢ] Operation through control modules.

Lighting Control

Mechanically and Magnetically Held Lighting Contactors, Class CLM

Selection

	Ordering Information		Coil Table	
	<ul style="list-style-type: none"> ▶ Replace *** with a number from the coil table. ▶ Field modification kits see page 17-106. ▶ Factory modifications see page 17-121. ▶ Dimensions see page 17-155 open page 17-172 enclosed. ▶ Wiring Diagrams see page 17-193. ▶ Replacement parts see page 17-136. 		60Hz Voltage	Number
		24 [ⓐ]	024	
		120	120	
		208	208	
		240	240	
		277	277	
		480	480	
		600 [ⓐ]	600	

Open and Non-combination Enclosed Contactors

Max Amp Rating	Number of Poles	Open Type [ⓑ]		Enclosure					
		Catalog Number	List Price \$	NEMA 1 General Purpose		NEMA 12 NEMA 3/3R Industrial Use Weatherproof		NEMA 4/4X Stainless Steel Watertight, Dust-tight, Corrosion Resistant, 304 Stainless Steel	
				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
20	2	see table below		CLM1B02***		CLM2B02***		CLMSB02***	
	3			CLM1B03***		CLM2B03***		CLMSB03***	
	4			CLM1B04***		CLM2B04***		CLMSB04***	
	6			CLM1B06***		CLM2B06***		CLMSB06***	
	8			CLM1B08***		CLM2B08***		CLMSB08***	
	10			CLM1B10***		CLM2B10***		CLMSB10***	
30	2	CLM0C02***		CLM1C02***		CLM2C02***		CLMSC02***	
	3	CLM0C03***		CLM1C03***		CLM2C03***		CLMSC03***	
	4	CLM0C04***		CLM1C04***		CLM2C04***		CLMSC04***	
	5	CLM0C05***		CLM1C05***		CLM2C05***		CLMSC05***	
	6	CLM0C06***		CLM1C06***		CLM2C06***		—	
	8	CLM0C08***		CLM1C08***		CLM2C08***		—	
60	2	CLM0D02***		CLM1D02***		CLM2D02***		CLMSD02***	
	3	CLM0D03***		CLM1D03***		CLM2D03***		CLMSD03***	
	4	CLM0D04***		CLM1D04***		CLM2D04***		CLMSD04***	
	5	CLM0D05***		CLM1D05***		CLM2D05***		CLMSD05***	
	6	CLM0D06***		CLM1D06***		CLM2D06***		—	
	8	CLM0D08***		CLM1D08***		CLM2D08***		—	
100	2	CLM0E02***		CLM1E02***		CLM2E02***		CLMSE02***	
	3	CLM0E03***		CLM1E03***		CLM2E03***		CLMSE03***	
	4	CLM0E04***		CLM1E04***		CLM2E04***		CLMSE04***	
	5	CLM0E05***		CLM1E05***		CLM2E05***		CLMSE05***	
	2	CLM0F02***				CLM1F02***			
3	CLM0F03***	CLM1F03***	CLM2F03***		CLMSF03***				
4	CLM0F04***	CLM1F04***	CLM2F04***		CLMSF04***				
5	CLM0F05***	CLM1F05***	CLM2F05***		CLMSF05***				
300	2	CLM0G02***		CLM1G02***		CLM2G02***		—	
	3	CLM0G03***		CLM1G03***		CLM2G03***		—	
400	2	CLM0H02***		CLM1H02***		CLM2H02***		—	
	3	CLM0H03***		CLM1H03***		CLM2H03***		—	

Open 20 Amp Contactors

Max Amp Rating	Number of Poles [ⓑ]	110–120V Coil 50/60Hz		208–240V Coil 50/60Hz		265–277V Coil 50/60Hz	
		Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
20	2	CLM22031		CLM22061		CLM22071	
	3	CLM32031		CLM32061		CLM32071	
	4	CLM42031		CLM42061		CLM42071	
	6	CLM62031		CLM62061		CLM62071	
	8	CLM82031		CLM82061		CLM82071	
	10	CLM102031		CLM102061		CLM102071	
	12	CLM122031		CLM122061		CLM122071	

ⓐ Contactors with 2–6-poles will be assembled with all poles located in the top portion of the contactor. Contactors with 8–12-poles will be assembled with 6-poles in the top portion and the remaining poles in the bottom portion of the contactor.

ⓑ 24 volt coils are not available on 20, 300 and 400 amp contactor sizes. For 24 volt control of 20 amp contactor select solid state control module.


ⓒ CLM 30 & 60A 6-12-pole can be field assembled. Order mounting kit 49MCMPPMA and the appropriate number of 2-5 pole contactors.

ⓓ 24, 480 or 600 volt coils are not available on 20 amp contactors.

Lighting Control

Combination Mechanically and Magnetically Held Lighting Contactors, Class CM

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Replace *** with a number from the coil table. ▶ Field modification kits see page 17-106. ▶ Factory modifications see page 17-121. ▶ Dimensions see page 17-172. ▶ Wiring Diagrams see page 17-193. ▶ Replacement parts see page 17-136. 	Coil Table <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>24^①</td> <td>024</td> </tr> <tr> <td>120</td> <td>120</td> </tr> <tr> <td>208</td> <td>208</td> </tr> <tr> <td>240</td> <td>240</td> </tr> <tr> <td>277</td> <td>277</td> </tr> <tr> <td>480</td> <td>480</td> </tr> <tr> <td>600^②</td> <td>600</td> </tr> </tbody> </table>	60Hz Voltage	Number	24 ^①	024	120	120	208	208	240	240	277	277	480	480	600 ^②	600
	60Hz Voltage	Number																
24 ^①	024																	
120	120																	
208	208																	
240	240																	
277	277																	
480	480																	
600 ^②	600																	

Combination Lighting Contactors

Disconnect Type	Contactor Amp Rating	Number of NO Poles	Disc Amp Rating	Disc Amp/Fuse Clip Rating	Circuit Breaker Rating	Enclosure					
						NEMA 1 General Purpose		NEMA 12, NEMA 3/3R NEMA 4 Painted (thru 100 amps) Industrial Use Weatherproof, Watertight, Dust-tight		NEMA 4/4X Stainless Steel Watertight, Dust-tight, Corrosion Resistant, 304 Stainless Steel	
						Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
Non-Fusible	20	3	30A	—	—	CMNB14***		CMNB24***		CMNBS4***	
	30	3	30A	—	—	CMNC14***		CMNC24***		CMNCS4***	
	60	3	60A	—	—	CMND15***		CMND25***		CMNDS5***	
	100	3	100A	—	—	CMNE16***		CMNE26***		CMNES6***	
	200	3	200A	—	—	CMNF17***		CMNF27***		CMNFS7***	
	300	3	400A	—	—	CMNG18***		CMNG28***		CMNGS8***	
Fusible	20	3	—	30A/250V	—	CMFB10***		CMFB20***		CMFBS0***	
				30A/600V	—	CMFB11***		CMFB21***		CMFBS1***	
	30	3	—	30A/250V	—	CMFC10***		CMFC20***		CMFCS0***	
				30A/600V	—	CMFC11***		CMFC21***		CMFCS1***	
	60	3	—	60A/250V	—	CMFD12***		CMFD22***		CMFDS2***	
				60A/600V	—	CMFD13***		CMFD23***		CMFDS3***	
	100	3	—	100A/250V	—	CMFE14***		CMFE24***		CMFES4***	
				100A/600V	—	CMFE15***		CMFE25***		CMFES5***	
	200	3	—	200A/250V	—	CMFF16***		CMFF26***		CMFFS6***	
				200A/600V	—	CMFF17***		CMFF27***		CMFFS7***	
	300	3	—	400A/250V	—	CMFG18***		CMFG28***		CMFGS8***	
				400A/600V	—	CMFG19***		CMFG29***		CMFGS9***	
Circuit Breaker	20	3	—	—	20A	CMBB14***		CMBB24***		CMBBS4***	
	30	3	—	—	30A	CMBC15***		CMBC25***		CMBCS5***	
	60	3	—	—	60A	CMBD18***		CMBD28***		CMBDS8***	
	100	3	—	—	100A	CMBE18***		CMBE28***		CMBES8***	
	200	3	—	—	200A	CMBF10***		CMBF20***		CMBFS0***	
	300	3	—	—	300A	CMBG11***		CMBG21***		CMBGS1***	

NEMA & General Purpose Control

CONTROL PRODUCTS 17

Lighting & Heating Contactor Ratings CLM

Maximum AC/DC Voltage and Amp Ratings

Load Type	Amperes Continuous	Poles to Load	
		1 for 1-Phase	2 for 1-Phase 3 for 3-Phase
Tungsten	20	250V AC	250V AC
Ballast	20	347V AC	600V AC
General	30	347V AC	600V AC
General	20	125V DC	250V DC

Inrush Current Over Fuse Size (amps RMS) at AC Control Voltage 20A CLM					
Amps	120V	240V	277V	347V	480V
Inrush	5.0	2.5	2.2	1.8	1.3
Fuse	2.0	1.0	1.0	0.75	0.5

Contactor Ratings			
Load Type	Amperes Continuous	Max Volts Line to Line	Max Volts Line to Neutral
Tungsten	30-400	480	277
Ballast	30-400	600	346
Heating	30-400	600	346

AC Coil Data			
Contactor Amperes	No. Poles	Inrush VA	Dropout VA
20	2-12	625	6
30	2-5	410	40
60	2-3	410	40
60	4-5	600	40
100/200	2-3	900	200
100/200	4-5	1300	130
300/400	2-3	1600	550

① 24 volt coils are not available on 20 and 300 amp contactors. Use solid state control module on 20 amp size.

② 600 volt coils are not available on 20 amp contactors.

Industrial Control Power Transformers

Class MT

General

Features

- Enclosed coils (50-5000VA); Completely encloses the transformer coils against moisture, dust, dirt and industrial contaminants for maximum protection in hostile and industrial environments.
- Fuse clips (most models). Factory mounted for integral fusing on the secondary side to save panel space, save wiring time and save the cost of buying an add-on fuse block or kit
- Integrally finger safe terminals. Between terminals and transformer, protect against electrical creepage. Up to 30% greater terminal contact area permits low-loss connections. Extra-deep barriers reduce the chance of shorts from frayed leads or careless wiring
- Terminals. Molded into the transformer, are difficult to break during wiring. A full quarter-inch of thread on the 8-32 terminal screws prevents stripping and pullout
- Jumpers supplied. Two jumper links are standard with all transformers which can be wired for dual primary voltages

Operation

Industrial control circuits and motor control loads typically require more current when they are initially energized than under normal operating conditions. This period of high current demand, referred to as inrush, may be as great as ten times the current required under steady state (normal) operating conditions, and can last up to 40 milliseconds. A transformer in a circuit subject to inrush will typically attempt to provide the load with the required current during the inrush period. However, it will be at the expense of the secondary voltage stability by allowing the voltage to the load to decrease as the current increases. This period of secondary voltage instability, resulting from increased current, can be of such magnitude that the transformer is unable to supply sufficient voltage to energize the load. The transformer must therefore be designed and constructed to accommodate the high inrush current, while maintaining secondary voltage stability. According to NEMA standards, the secondary voltage would typically be at 85% of the rated voltage.



Industrial Control Power Transformers are specifically designed and built to provide adequate voltage to the load while accommodating the high current levels present at inrush. These transformers deliver excellent secondary voltage regulation and meet or exceed the standards established by NEMA, ANSI, UL and cUL. Their rugged construction and excellent electrical characteristics ensure reliable operation of electromagnetic devices and trouble-free performance.

Specifications

- Laminations are built with silicon steel to minimize core losses and to increase optimum performance and efficiency
- Copper magnet wire of the highest quality assures efficient operation
- Factory mounted type "K" fuse clips are standard on all secondary transformers where possible
- Two jumper links are standard with all transformers which can be wired for dual primary voltages
- cUL Listed and CSA certified

- 50/60 Hz rated
- Insulation materials are of the highest rating available for the temperature class
- Mounting plate is heavy gauge steel to add strength to core construction and provide stable mounting. Slotted mounting feet permit easy installation
- Attractive black finish; easy-to-read nameplate with complete rating data and wiring diagram
- Class 130°C (226°F) insulation system. 80°C (176°F) temperature rise. (50-750VA typical)
- Class 180°C (356°F) insulation system. 120°C (248°F) temperature rise. (1000-5000VA typical)
- Optional field mounted 2-pole primary Class CC fuse block is available

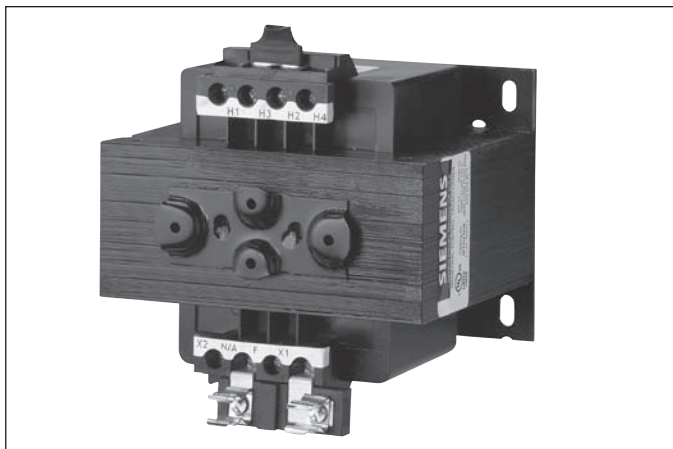
NEMA & General
Purpose Control

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CONTROL
PRODUCTS

Industrial Control Power Transformers

Class MTG

General



Features

- Class MTG Industrial Control Transformers are 100% certified for all domestic and International Applications
- The MTG line has full compliance with IEC Safety standards EN 61 558
- CE Mark in accordance with requirements for EN 61 558
- Meets IP-20 specifications per IEC 529 for finger-safe protection when used with Siemens Touch Safe snap on terminal cover kits. Meets IP-00 specifications when covers are not used.
- UL Listed
- Exceeds applicable requirements for control transformers as determined by NEMA and ANSI
- Insulation requirements is twice that of UL5085
- Available in 50 to 750 VA sizes, in all standard voltage combinations
- Class 130°C (226°F) insulation system. 80°C (176°F) temperature rise. (50-750VA typical)
- Class 180°C (356°F) insulation system. 120°C (248°F) temperature rise. (1000-5000VA typical)
- Primary and secondary fusing capability available as field installed kits for domestic or international fusing
- Integrally-molded terminals and barriers between terminals make breakage virtually impossible during wiring. The MTG transformer construction is the same as our high quality Class MT transformers

Optional Field Installed Fuse Clip Kits For Panel Mounting

- 2-Pole primary Class CC fuse block
- 1-Pole secondary midget fuse block for $1\frac{3}{32} \times 1\frac{1}{2}$ fuses
- 2-Pole primary international type fuse blocks
- 1-Pole secondary international type fuse blocks

Optional Touch-Safe Snap-On Terminal Cover Kits

The Touch-Safe terminal covers are designed to comply with IEC 742 and IP 20 requirements. When installed, the covers prevent contact with current carrying parts on the transformer and are available for 4 terminal configurations.

The international fuse block kits have inherent touch safe terminals and fuse clips.

Siemens Meets International Standards

CSA (Canadian Standards Association) was utilized as a Competent Body in reviewing, interpreting and properly complying with the requirements of IEC-742 to place a CE mark on its MTG Series product. As a National Certification Body, CSA also has the proper documentation and reports on file for MTG Series to utilize the CB Scheme ensuring acceptance throughout the world.

The standard Siemens MTG product is available with terminal covers which meets the requirements of IEC-529, IP20 degree of protection and meets the applicable requirements for covers per IEC-742.

IEC-742

The requirements for industrial control circuit transformers to be used in the European Common Market are identified by the International Electrotechnical Commission (IEC) and specified under IEC-742, Non-Short Circuit Proof Isolating Transformers, under the Low Voltage Directive 73/23/EEC. Manufacturers of control transformers indicate compliance with these requirements by placing a CE mark on the product.

- Winding to winding insulation requirements may be twice that for IEC-742 compared to UL506
- The electrical clearances between current carrying parts are one-third greater to comply with IEC-742 requirements for units up to 250VA with voltages up to 440 volts ac
- Transformers manufactured to IEC-742 requirements will have a minimum of 10% higher overload capacity than those manufactured only to UL506 requirements

While no requirement exists in IEC-742 for the electrical connections to be either finger safe or touch proof, the specification does state that IF a transformer is supplied with a cover to prevent incidental contact with current carrying parts, that cover must utilize two separate methods or places of securing it to the component, with neither being dependent upon the other. Additionally, one of these methods MUST require a tool to remove it.

IEC-529

The requirements for finger-safe or touch-proof electrical connections are identified by the International Electrotechnical Commission (IEC) under specification 529, Classification of Degrees of Protection Provided by Enclosures. These various degrees of protection are identified and differentiated by IP ratings.

The IP specification which most closely approximates protection to a human finger is IP20. This IP rating would be the most common degree of touch-proof connection for electrical components such as transformers.

EN 61 558

The requirements for industrial control transformers to be used in the European Common Market are identified by the IEC and specified in EN 61 558, Safety of Power Control Transformers, under Low Voltage Directive 73/23/EEC. CE mark on the product indicates compliance.

Transformer Selection Process

Selecting a transformer for industrial control circuit applications requires knowledge of the following terms:

Inrush VA is the product of load voltage (V) multiplied by the current (A) that is required during circuit start-up. It is calculated by adding the inrush VA requirements of all devices (contactors, timers, relays, pilot lights, solenoids, etc.), which will be energized together. Inrush VA requirements are best obtained from the component manufacturer.

Sealed VA is the product of load voltage (V) multiplied by the current (A) that is required to operate the circuit after initial start-up or under normal operating conditions. It is calculated by adding the sealed VA requirements of all electrical components of the circuit that will be energized at any given time. Sealed VA requirements are best obtained from the component manufacturer. Sealed VA is also referred to as steady state VA.

Primary Voltage is the voltage available from the electrical distribution system and its operational frequency, which is connected to the transformer supply voltage terminals.

Secondary Voltage is the voltage required for load operation which is connected to the transformer load voltage terminals.



Fuse Clip Kit KCCFPX2R

Primary Fuse Kit

In addition to factory installed secondary fusing, Siemens offers a primary fuse kit for class MT transformers size 50–750 VA for field installation. The primary fuse kit includes a 2-pole Class CC fuse block, instructions and all associated mounting and wiring hardware. Additionally, this fuse kit will fit most competitors' units. To order this kit, use catalog number **KCCFPX2R**. The primary fuse kit, when installed, will add a maximum of 0.69 in. (18 mm) to the transformer "A" dimension and 1.94 in. (49 mm) to the "C" dimension.

Once the circuit variables have been determined, transformer selection is a simple 5-step process as follows:

1. Determine the Application Inrush VA by using the following industry accepted formula:

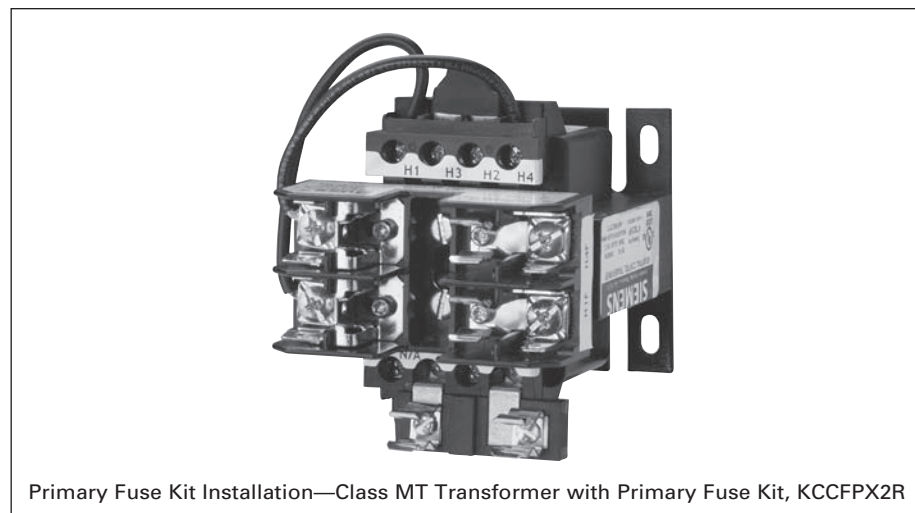
$$\text{Application Inrush VA} = \sqrt{(\text{Inrush VA})^2 + (\text{Sealed VA})^2}$$
2. Refer to the Regulation Data Chart. If the primary voltage is basically stable and does not vary by more than 5% from nominal, the 90% secondary voltage column should be used. If the primary voltage varies between 5% and 10% of nominal, the 95% secondary voltage column should be used.
3. After determining the proper secondary voltage column, read down until a value equal to or greater than the Application Inrush VA is found. In no case should a figure less than the Application Inrush VA be used.
4. Read left to the Transformer VA Rating column to determine the proper transformer for this application. As a final check, make sure that the Transformer VA Rating is equal to or greater than the total sealed requirements. If not, select a transformer with a VA rating equal to or greater than the total sealed VA.
5. Refer to the following pages to determine the proper catalog number based on the transformer VA, and primary and secondary voltage requirements.

Regulation Data Chart

Transformer VA Ratings	Inrush VA At 20% Power Factor		
	NEMA/IEC 95% Sec Voltage	NEMA/IEC 90% Sec Voltage	NEMA/IEC 85% Sec Voltage
25	100/—	130/—	150/—
50	170/190	200/220	240/270
75	310/350	410/460	540/600
100	370/410	540/600	730/810
150	780/860	930/1030	1150/1270
200	810/900	1150/1270	1450/1600
250	1400/1540	1900/2090	2300/2530
300	1900/2090	2700/2970	3850/4240
350	3100/3410	3650/4020	4800/5280
500	4000/4400	5300/5830	7000/7700
750	8300/9130	11000/12100	14000/15400
1000 ^①	15000/—	21000/—	27000/—
1000 ^②	9000/—	13000/—	18500/—
1500	10500/—	15000/—	20500/—
2000	17000/—	25500/—	34000/—
3000	24000/—	36000/—	47500/—
5000	55000/—	92500/—	115000/—

To comply with NEMA standards, which require all magnetic devices to operate successfully at 85% of rated voltage, the 90% secondary voltage column is most often used in selecting a transformer.

① For units with Class 105°C insulation systems.
 ② For units with Class 180°C insulation systems.

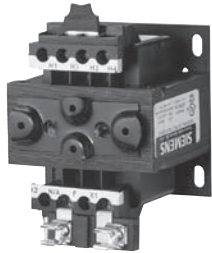


Primary Fuse Kit Installation—Class MT Transformer with Primary Fuse Kit, KCCFPX2R

Industrial Control Power Transformers

Domestic, Class MT

Selection



Ordering Information

- ▶ Use the Voltage Table to determine the primary and secondary voltage required.
- ▶ Field Modifications see page 17-114.
- ▶ Dimensions see page 17-157.
- ▶ Wiring Diagrams see page 17-195.
- ▶ Touchsafe cover chart see page 17-103.

Voltage Table

Primary Volts 50/60 Hz	Secondary Volts	Letter
240 X 480, 230 X 460, 220 X 440	120/115/110	A
240 X 480	24	B
120 X 240	24	C
115 X 230	24	D
550/575/600	110/115/120	E
208/277	120	F
208/230/460	115	G
230/460/575	95/115	H
380/400/415	110 X 220	I
208/230/460, 200/220/440, 240/480	24 X 115, 23 X 110, 25 X 120	J
240/416/480/600, 230/400/460/575, 220/380/440/550, 208/500	99/120/130, 95/115/125, 91/110/120, 85/100/110	L
240 X 480	120 X 240	M

VA Rating	Voltage Letter A		Voltage Letter B		Voltage Letter C		Voltage Letter D		Voltage Letter E		Voltage Letter F	
	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$
50	MT0050A		MT0050B		MT0050C		MT0050D		MT0050E		MT0050F	
75	MT0075A		MT0075B		MT0075C		MT0075D		MT0075E		MT0075F	
100	MT0100A		MT0100B		MT0100C		MT0100D		MT0100E		MT0100F	
150	MT0150A		MT0150B		MT0150C		MT0150D		MT0150E		MT0150F	
200	MT0200A		MT0200B		MT0200C		MT0200D		MT0200E		MT0200F	
250	MT0250A		MT0250B		MT0250C		MT0250D		MT0250E		MT0250F	
300	MT0300A		MT0300B		MT0300C		MT0300D		MT0300E		MT0300F	
350	MT0350A		MT0350B		MT0350C		MT0350D		MT0350E		MT0350F	
500	MT0500A		MT0500B		MT0500C		MT0500D		MT0500E		MT0500F	
750	MT0750A		MT0750B		—	—	—	—	MT0750E		MT0750F	
1000	MT1000A		—	—	—	—	—	—	MT1000E		—	—
1500	MT1500A		—	—	—	—	—	—	—	—	—	—
2000	MT2000A		—	—	—	—	—	—	—	—	—	—
3000	MT3000A		—	—	—	—	—	—	—	—	—	—
5000	MT5000A		—	—	—	—	—	—	—	—	—	—

VA Rating	Voltage Letter G		Voltage Letter H		Voltage Letter I		Voltage Letter J		Voltage Letter L		Voltage Letter M	
	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$
50	MT0050G		MT0050H		MT0050I		MT0050J		MT0050L		MT0050M	
75	MT0075G		MT0075H		MT0075I		MT0075J		—	—	MT0075M	
100	MT0100G		MT0100H		MT0100I		MT0100J		MT0100L		MT0100M	
150	MT0150G		MT0150H		MT0150I		MT0150J		MT0150L		MT0150M	
200	MT0200G		MT0200H		MT0200I		MT0200J		—	—	MT0200M	
250	MT0250G		MT0250H		MT0250I		MT0250J		MT0250L		MT0250M	
300	MT0300G		MT0300H		MT0300I		MT0300J		—	—	MT0300M	
350	MT0350G		MT0350H	—	MT0350I		MT0350J		MT0350L		MT0350M	
500	MT0500G		MT0500H		MT0500I		MT0500J		MT0500L		MT0500M	
750	MT0750G		MT0750H		MT0750I		—	—	MT0750L		MT0750M	
1000	MT1000G		MT1000H		MT1000I		—	—	—	—	MT1000M	
1500	MT1500G		MT1500H		MT1500I		—	—	—	—	MT1500M	—
2000	MT2000G		MT2000H		MT2000I		—	—	—	—	MT2000M	—
3000	MT3000G		MT3000H		MT3000I		—	—	—	—	MT3000M	—
5000	MT5000G		MT5000H		—	—	—	—	—	—	MT5000M	—

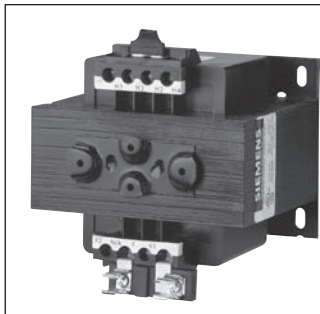
NEMA & General Purpose Control

CONTROL PRODUCTS 17

Industrial Control Power Transformers

International, Class MTG

Selection



Ordering Information

- ▶ Use the Voltage Table to determine the primary and secondary voltage required.
- ▶ Field Modifications see page 17-114.
- ▶ Dimensions see page 17-157.
- ▶ Wiring Diagrams see page 17-195.
- ▶ Touchsafe cover chart see below.

Voltage Table

Primary Volts 50/60 Hz	Secondary Volts	Letter
240 X 480, 230 X 460, 220 X 440	120/115/110	A
240 X 480	24	B
120 X 240	24	C
550/575/600	110/115/120	E
380/400/415	110 X 220	I
208/230/460, 200/220/440, 240/480	24 X 115, 23 X 110, 25 X 120	J
380	24	P

VA Rating	Voltage Letter A		Voltage Letter B		Voltage Letter C		Voltage Letter E		Voltage Letter I		Voltage Letter J		Voltage Letter P	
	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$
50	MTG0050A		MTG0050B		MTG0050C		MTG0050E		MTG0050I		MTG0050J		MTG0050P	
75	MTG0075A		MTG0075B		MTG0075C		MTG0075E		MTG0075I		MTG0075J		MTG0075P	
100	MTG0100A		MTG0100B		MTG0100C		MTG0100E		MTG0100I		MTG0100J		MTG0100P	
150	MTG0150A		MTG0150B		MTG0150C		MTG0150E		MTG0150I		MTG0150J		MTG0150P	
200	MTG0200A		MTG0200B		MTG0200C		MTG0200E		MTG0200I		MTG0200J		MTG0200P	
250	MTG0250A		MTG0250B		MTG0250C		MTG0250E		MTG0250I		MTG0250J		MTG0250P	
300	MTG0300A		MTG0300B		MTG0300C		MTG0300E		MTG0300I		MTG0300J		MTG0300P	
350	MTG0350A		MTG0350B		MTG0350C		MTG0350E		MTG0350I		MTG0350J		MTG0350P	
500	MTG0500A		MTG0500B		MTG0500C		MTG0500E		MTG0500I		MTG0500J		MTG0500P	
750	MTG0750A		MTG0750B		MTG0750C		MTG0750E		MTG0750I		MTG0750J		MTG0750P	
1000	MTG1000A		MTG1000B		MTG1000C		—	—	—	—	MTG1000J		—	—
1500	MTG1500A		—	—	—	—	—	—	—	—	—	—	—	—
2000	MTG2000A		—	—	—	—	—	—	—	—	—	—	—	—
3000	MTG3000A		—	—	—	—	—	—	—	—	—	—	—	—
5000	MTG5000A		—	—	—	—	—	—	—	—	—	—	—	—

Touchsafe Covers For MT style CPT

VA Rating	Voltage Letter	Primary Side Touchsafe?	Secondary Side Touchsafe?	Secondary Side Fuse Clips?
50	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes ^①
	I,L,M	Yes	Yes	No ^②
75	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes ^①
	I,M	Yes	Yes	No ^②
100	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes ^①
	I,L,M	Yes	Yes	No ^②
150	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes ^①
	I,L,M	Yes	Yes	No ^②
200	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes ^①
	I,M	Yes	Yes	No ^②
250	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes ^①
	I,L,M	Yes	Yes	No ^②
300	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes ^①
	I,M	Yes	Yes	No ^②
350	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes ^①
	I,L,M	Yes	Yes	No ^②
500	A,B,C,D,E,F,G,H,J	Yes	No ^③	Yes ^①
	I,L,M	Yes	Yes	No ^②
750	A,B,C,D,E,F,G,H	Yes	No ^③	Yes ^①
	I,L,M	Yes	Yes	No ^②
1000	A,E,G,H	Yes	No ^③	Yes ^①
	I,M	Yes	Yes	No ^②
1500	A,G,H	Yes	No ^③	Yes ^①
	I	Yes	Yes	No ^②
2000	A,G,H	Yes	No ^③	Yes ^①
	I	Yes	Yes	No ^②
3000	A,G,H,I	Yes	Yes	No ^②
5000	A,G,H	Yes	Yes	No ^②

① Needs US2:KCCSECFVCR to be Touchsafe

② If secondary fuse holder is required, use KCCF1G panel mount fuse holder

③ Needs US2:KCCSECFVCR2

④ International fusing options, see CPT accessory page

Touchsafe Covers For MTG style CPT

VA Rating	Voltage Letter	Primary Side Touchsafe?	Secondary Side Touchsafe?	Secondary Side Fuse Clips? ^④
50	A,B,C,E,I,J,P	Yes	Yes	No
75	A,B,C,E,I,J,P	Yes	Yes	No
100	A,B,C,E,I,J,P	Yes	Yes	No
150	A,B,C,E,I,J,P	Yes	Yes	No
200	A,B,C,E,I,J,P	Yes	Yes	No
250	A,B,C,E,I,J,P	Yes	Yes	No
300	A,B,C,E,I,J,P	Yes	Yes	No
350	A,B,C,E,I,J,P	Yes	Yes	No
500	A,B,C,E,I,J,P	Yes	Yes	No
750	A,B,C,E,I,J,P	Yes	Yes	No
1000	A,B,C,J	Yes	Yes	No
1500	A	Yes	Yes	No
2000	A	Yes	Yes	No
3000	A	Yes	Yes	No
5000	A	Yes	Yes	No

NEMA & General Purpose Control

CONTROL PRODUCTS

Field Modification Kits

Class SMF, MMS, MRS

Selection

Accessories—Class SMF

Description	Catalog Number	List Price \$
Handle Guard Kit with Padlock Provision	SMFFL1	
Emergency Off Actuator	SMFPB1	
Additional Key for Key Operated Devices	SMFFK1	

Pilot Light Kits—Class MMS, MRS^①

Device	Voltage Rating	Red Pilot Light		Green Pilot Light	
		Catalog Number	List Price \$	Catalog Number	List Price \$
Class SMF	115–277V AC	SMFPL10		SMFPL10G	

Accessories—Class MMS, MRS

Description	Catalog Number	List Price \$
Handle Guard Kit with Padlock Provision	SMFFL1	
Emergency Off Actuator	SMFPB1	
Additional Key for Key Operated Devices	SMFFK1	

Pilot Light Kits—Class MMS, MRS^①

Device	Voltage Rating	Red Pilot Light		Green Pilot Light	
		Catalog Number	List Price \$	Catalog Number	List Price \$
Class MMS	110–120V AC	SMFPL11		SMFPL11G	
	208–277V AC	SMFPL12		SMFPL12G	
	440–600V AC	SMFPL13		SMFPL13G	

Enclosures—Class SMF

Enclosure Type	For Use With SMF	Catalog Number	List Price \$
Standard Size NEMA 1 General Purpose	F01, F01P, F02, F02P, F03, F03P, F04, F04P	SMFFE2	
Oversized NEMA Type 1 General Purpose	F01, F01P, F02, F02P, F03, F03P, F04, F04P	SMFFE1	
NEMA 3R, 4, 12 Watertight Dust-tight	F01, F01P, F02, F02P, F03, F03P, F04, F04P	SMF40BC2	

Enclosures—Class MMS

Enclosure Type	For Use With MMS	Catalog Number	List Price \$
Standard Size NEMA 1 General Purpose	K01, K01P, K01B, K02, K02A, K02B, K03, K03A, K03B, K04, K04A, K04B	MMSKE3	
Oversized NEMA Type 1 General Purpose	K01, K02B, K02C, K03, K03A, K03B, K04, K04B, K04C, K02	SMFKE1	
Jumbo NEMA Type 1 General Purpose	K01, K02B, K02C, K03, K03A, K03B, K04, K04B, K04C, K02	SMFKE2	
NEMA 3R, 4, 12 Watertight Dust-tight	K01, K02B, K02C, K03, K03A, K03B, K04, K04B, K04C	SMF40BC2	

Nameplates—Class SMF

For Use On	Nameplate Marking	Without Pilot Light		With Pilot Light	
		Catalog Number	List Price \$	Catalog Number	List Price \$
Standard commercial switch box cover including stainless steel plates	None	SMFFN2		—	—
Stainless Steel Plate	None	SMFFSN3		SMFFSN4	
NEMA 1 surface mounted enclosure or gray flush plate	None	SMFFN30		SMFFN40	
	High	SMFFN31		SMFFN41	
	Low	SMFFN32		SMFFN42	

Nameplates—Class MMS

For Use On	Nameplate Marking	Without Pilot Light		With Pilot Light	
		Catalog Number	List Price \$	Catalog Number	List Price \$
Standard commercial switch box cover including stainless steel plates	None	SMFFN1		—	—
NEMA 1 surface mounted enclosure or gray flush plate	None	SMFFN10		SMFFN20	
	High	SMFFN11		SMFFN21	
	Low	SMFFN12		SMFFN22	
	Forward	SMFFN13		—	—
	Reverse	SMFFN14		SMFFN24	

Replacement Parts—Class SMF, MMS

Description	Catalog Number	List Price \$
Replacement Toggle Kits: Type FW and KW (NEMA 4 Metallic Enclosure)	SMFHW1	

^① Pilot lights can be field installed on standard NEMA 1 general purpose surface mount enclosures, and NEMA 3R, 4 and 12 enclosures only. For flush mounting units a complete switch unit with pilot light must be ordered.

Field Modification Kits

Class 11 - 3RV

Selection

	Description	Type	Catalog Number	List Price \$
 3RV2901-1D	Auxiliary Contact Blocks			
	Plug in contact block 1 block per 3RV mountable at the front	1 SPDT contact, NO/NC 1 NO + 1 NC 1 SPDT contact NO/NC electronic contact ^④	3RV2901-1D 3RV2901-1E 3RV2901-1G	
 3RV2901-1A	Side mount auxiliary contact with screw connection 1 side mount auxiliary contact per 3RV mountable on the left-hand side	1 NO + 1 NC 2 NO 2 NC 2 NO + 2 NC	3RV2901-1A 3RV2901-1B 3RV2901-1C 3RV2901-1J	
	Signaling Contact Block			
 3RV2922-1CP0	Signaling contact 1 signaling contact per 3RV mountable on the left-hand side. Can also be fitted together with side mount auxiliary contact.	1NO + 1NC for any trip + 1NO + 1NC for short circuit trip only.	3RV2921-1M	
	Auxiliary Releases			
 3RV2902-1AF0	Undervoltage release 1 undervoltage release per 3RV mountable on the right-hand side. Cannot be fitted together with shunt trip.	AC 50Hz — 230V 415V	AC 60Hz 120V 208V 240V 480V	3RV2902-1AF0 3RV2902-1AM1 3RV2902-1AP0 3RV2902-1AV1
	Undervoltage release with early make contacts (2NO) 1 undervoltage release per 3RV mountable at the right-hand side. Cannot be fitted together with shunt trip.	AC 50Hz 230V 415V	AC 60Hz 240V 480V	3RV2922-1CP0 3RV2922-1CV1
 3RV2902-1DP0	Shunt trip 1 shunt trip per 3RV mountable at the right-hand side. Cannot be fitted together with undervoltage release.	AC 50Hz/60Hz ^① 20–24V 90–110V 200–240V 350–415V	DC ^② 20–70V 70–190V 190–330V 330–500V	3RV2902-1DB0 3RV2902-1DF0 3RV2902-1DP0 3RV2902-1DV0
	Pilot Lights AC 50Hz/60Hz			
 3RV2928-1H		24V 120V 240V 480V 600V	49SBLBJ ^③ 49SBLBF ^③ 49SBLBG ^③ 49SBLBH ^③ 49SBLBE ^③	
	Lug Kit	Required for Type E Manual Combination Starter	For 3RV with amp range: 0.11-22A up to 480V Max. 0.11-12.5A up to 575V Max	3RV2928-1H
 3RV2901-0H	Mounting			
	Push-in Mounting Hole Kit For screw panel mounting of the 3RV	Four mounting holes required for each 3RV.	3RV2928-0B	
Sealing device				
Adjustment Dial covers	For sealing the FLA adjustment dial (Kit includes 10 covers)		3RV2908-0P	
Front mount auxiliary cover	For sealing the front mount auxiliary opening. (Kit includes 10 covers)		3RV2901-0H	
Door Operators				
 3RV2926-0B	Thru-the-door operators Rotary operating mechanism, rated NEMA 12, lockable with up to 3 padlocks in the OFF position. Includes extension shift and connecting element for the 3RV.	With Black Handle	130 mm depth	3RV2926-0B
			330 mm depth with supporting bracket	3RV2926-0K

① 100% on time.
② 5 sec. max. on time.
③ Product Category: PILO.

④ Compatible for use in dusty atmospheres. Contacts rated for 1-300mA @ 3-60V.





NEMA & General Purpose Control

17 CONTROL PRODUCTS

Field Modification Kits

Pilot Devices

Selection

Push Buttons and Selector Switches	Class	Enclosure Type	Controller Size or (Lighting Rating)	Type	Catalog Number	List Price \$	
 <p>49SBPB5</p>  <p>49SBSB1</p>  <p>49SAP05</p>  <p>49SAS01</p>	14, 40, LC, LEN, CLM [Ⓞ]	Open	00-4	Start, Stop Push Buttons	49SAPB5		
		1	00-4 or (20–100A)	Hand-Off-Auto Selector Switch	49SASB1		
				Off-On Selector Switch	49SASB4		
				Start, Stop Push Buttons	49SBPB5		
		1	5-8 or (200–400A)	Hand-Off-Auto Selector Switch	49SBSB1		
				Off-On Selector Switch	49SBSB4		
				Start, Stop Push Buttons	49SAP05		
		12, 4/4X	00-8 or (20–400A)	Hand-Off-Auto Selector Switch	49SAS01		
				Keyed Hand-Off-Auto (key removable in all positions)	49SAS09		
				Off-On Selector Switch	49SAS04		
		22, 43	Open	00-4	Forward-Off-Reverse Selector Switch	49SASB2	
					Forward-Off-Reverse Selector Switch	49SBSB2	
Forward, Reverse, Stop Push Buttons	49SAP02						
1	5-8		Forward-Off-Reverse Selector Switch	49SAP02			
			Forward, Reverse, Stop Push Buttons	49SAS02			
			Forward-Off-Reverse Selector Switch	49SAS02			
12, 4/4X	0-8		Forward, Reverse, Stop Push Buttons	49SAP02			
			Forward-Off-Reverse Selector Switch	49SAS02			
			High-Off-Low Selector Switch	49SASB3			
30 (2S1W)	Open		0-4	High-Off-Low Selector Switch	49SASB3		
				High-Off-Low Selector Switch	49SBSB3		
				High, Low, Stop Push Buttons	49SAP03		
	1	0-1 3/4	High-Off-Low Selector Switch	49SAS03			
			High, Low, Stop Push Buttons	49SAP03			
			High-Off-Low Selector Switch	49SAS03			
12, 4/4X	0-4	High, Low, Stop Push Buttons	49SAP03				
		High-Off-Low Selector Switch	49SAS03				
		High-Off-Low Selector Switch	49SASB3				
30 (2S2W)	Open	0-4	High-Off-Low Selector Switch	49SASB3			
			High-Off-Low Selector Switch	49SBSB3			
			High, Low, Stop Push Buttons	49SAP03			
1	0-4	High-Off-Low Selector Switch	49SAS03				
		High, Low, Stop Push Buttons	49SAP03				
		High-Off-Low Selector Switch	49SAS03				
17, 18, 36, 37, 83, 84, LED, LEF, LEB, CMN [Ⓞ] , CMF [Ⓞ] , CMB [Ⓞ]	1, 12, 4/4X	0-8 (20-400A)	Start, Stop Push Buttons	49SAP05			
			Hand-Off-Auto Selector Switch	49SAS01			
			Keyed Hand-Off-Auto (key removable in all positions)	49SAS09			
			Off-On Selector Switch	49SAS04			
25, 26	1, 12, 4/4X	0-8	Forward, Reverse, Stop Push Buttons	49SAP02			
			Forward-Off-Reverse Selector Switch	49SAS02			
32	1, 12, 4/4X	0-4	High, Low, Stop Push Buttons	49SAP03			
			High-Off-Low Selector Switch	49SAS03			

NEMA & General Purpose Control

17





CONTROL PRODUCTS

[Ⓞ] To be used for replacement of switch only. Does not include relay or extra contact block on 30-400A CLM and CM Lighting Contactors. Class 49SB not available for these devices.

Field Modification Kits

Pilot Lights

Selection

Description	Class	Enclosure Type	Controller Size or (Lighting Rating)	Lens Color(s)	Legend(s)	Voltage	Catalog Number	List Price \$
 <p>49SBLBF</p>	14, 40, 22 [ⓐ] , 43 [ⓐ] , 30 (2S2W) [ⓑ] , LC, LEN, CLM	1	00-4 or (20-200A)	Red, Green, Amber	ON, RUN, OFF [ⓐ] , OL TRIPPED [ⓐ] , FORWARD, REVERSE, LOW, HIGH	24 Vac	49SBLBJ	
						120 Vac	49SBLBF	
						208/240/277 Vac	49SBLBG	
						480 Vac	49SBLBH	
						600 Vac	49SBLBE	
						24 Vac (Full Voltage)	49SPL0BRJ	
	12, 4/4X	5-8 or (300-400A) 0-8 or (20-400A)	Red (Transformer Type)	ON	120 Vac	49SPL0BRF		
					240 Vac	49SPL0BRG		
					480 Vac	49SPL0BRH		
					600 Vac	49SPL0BRE		
					24 Vac (Full Voltage)	49SPL0AGJ		
					120 Vac	49SPL0AGF		
 <p>49SPL0BRF</p>	30 (2S1W) [ⓐ]	1	0-4	Red, Green, Amber	ON, RUN, OFF [ⓐ] , OL TRIPPED [ⓐ] , FORWARD, REVERSE, LOW, HIGH	24 Vac	49SBLBJ	
						120 Vac	49SBLBF	
						208/240/277 Vac	49SBLBG	
						480 Vac	49SBLBH	
						600 Vac	49SBLBE	
						24 Vac (Full Voltage)	49SPL0BRJ	
	12, 4/4X	0-4	Red (Transformer Type)	ON	120 Vac	49SPL0BRF		
					240 Vac	49SPL0BRG		
					480 Vac	49SPL0BRH		
					600 Vac	49SPL0BRE		
					24 Vac (Full Voltage)	49SPL0AGJ		
					120 Vac	49SPL0AGF		
1, 12, 4/4X	0-6 (20-400A)	Green (Transformer Type)	OFF [ⓐ]	240 Vac	49SPL0AGG			
				480 Vac	49SPL0AGH			
				600 Vac	49SPL0AGE			
				24 Vac (Full Voltage)	49SPL0BRJ			
				120 Vac	49SPL0BRF			
				240 Vac	49SPL0BRG			
 <p>49SBLBL</p>	Lens Kit ONLY (30 (2S1W)) (14, 40, 22, 43, 30 (2S2W), LC, LEN, CLM)	1	0-1 3/4 00-4 or (20-200A)	Red, Green, Amber	—	—	49SBLBL	
						120 Vac	49SPL0AGF	
						240 Vac	49SPL0AGG	
						480 Vac	49SPL0AGH	
						600 Vac	49SPL0AGE	
						 <p>LED bulb BA9s type Used to replace incandescent or LED bulbs[ⓐ]</p>	—	—
Green	52AED3							
Amber	52AED4							
White	52AEDB							
Red	52AEB2							
Green	52AEB3							
—	—	—	—	Amber	—	120 - 600 V AC/DC	52AEB4	
						White	52AEBB	

ⓐ "Off" PL requires: (1) N.C. aux contact, 49AB01 on sizes 00-4.
 ⓑ Class 22, 25, 26, 30, 32, 43, 83 & 84 requires qty. of (2) pilot light kits. Does not apply to 49SB kits. Select appropriate legend plate as a separate item per

type of starter; either "FORWARD" & "REVERSE" or "LOW" & "HIGH".
 ⓑ 2S2W is starter size 0-4.
 ⓐ Includes NC aux contact for NEMA starter Size 0-4.

ⓐ The "OL TRIPPED" pilot light with a bimetal OLR, requires the OLR to have a N.O. contact as well as a N.C. contact.
 ⓐ LED bulb applies to only 49SP* pilot lights. They do not apply to 49SB* pilot lights.

NEMA & General Purpose Control

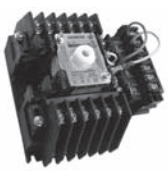
17 CONTROL PRODUCTS

Field Modification Kits

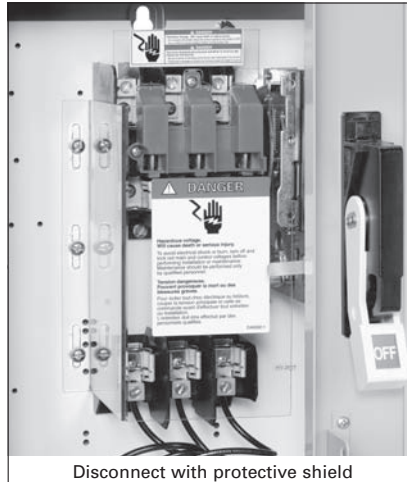
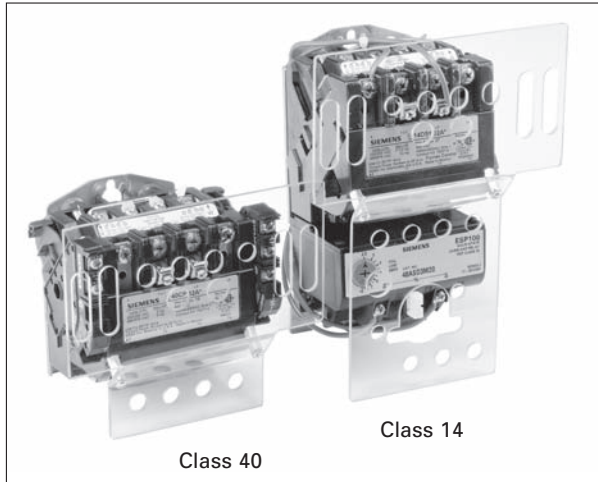
NEMA, Lighting and Heating Contactors, 20 Amp CLM, CMB, CMF, CMN

Selection

Solid State Control Module Kits For Lighting and Heating Contactors^①

	CLM 20 Amp Contactor Kit Description	Accessory	Catalog Number	List Price \$	Accessory	Catalog Number	List Price \$	Accessory	Catalog Number	List Price \$
	120V AC, 50/60 Hz	47 (2-Wire Control) (2W)	CLM4379771		48 (3-Wire Control) (3W)	CLM4379781		49 (Start/Stop Control) (3WS)	CLM4379791	
	24V AC/DC, 50/60 Hz		CLM4379772			CLM4379782			CLM4379792	
	240/277V AC, 50/60 Hz		CLM4379773			CLM4379783			CLM4379793	

Protective Shielding for NEMA Products





Class 14, 22, 30, 40, 43

Contactor or Starter Size	00-1%	List Price \$	2-2½	List Price \$	3-3½	List Price \$	4	List Price \$
Contactor Shield Catalog Number	49PSC1		49PSC2		49PSC3		49PSC4	
Starter Shield Catalog Number	49PSS1		49PSS2		49PSS3		49PSS4	

Class 17, 25, 32, 87

Disconnect Size	Catalog Number	List Price \$
30A	49PSD5	
60 & 100A	49PSD6	
200A	49PSD7	

Power Pole Kits	Class	Enclosure type	Contactor Size (Amp)	Description	Field Kit Catalog No.
	LC	Open, 1, 12, 4/4X	30	Single power pole Double power pole	49LCPP1A 49LCPP2A

Electrically Held to Mechanically Held Conversion Modules	Class	Enclosure type	Contactor Size (Amp)	Description	Field Kit Catalog No.
	LC	Open, 1, 12, 4/4X	30	2-wire, 24VAC 2-wire, 110-120VAC 2-wire, 200-277VAC 3-wire, 24VAC 3-wire, 110-120VAC 3-wire, 200-277VAC	49LCCM1A 49LCCM2A 49LCCM3A 49LCCM4A 49LCCM5A 49LCCM6A







^① These kits are only for use with 20A mechanically held lighting contactors.

Field Modification Kits

NEMA, Reduced Voltage and Lighting

Selection


Starter/Contactor Auxiliary Contact Kits

Description	Class	Size	Type	Catalog Number	List Price \$
	14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 40, 43, 83, 84, 87, 88	00-4	1 NO	49AB10	
			1 NC	49AB01	
			1 NC Early Break	49AB01EB	
			1 NC Late Break	49AB01LB	
			1 NC Extra Late Break	49AB01XLB	
			1 NO Extra Late Make	49AB10XLM	
			1 NO & 1 NC	49AB11	
			2 NO	49AB20	
			4 NO	49AB40	
			3 NO & 1 NC	49AB31	
			2 NO & 2 NC	49AB22	
				14, 17, 18, 22, 25, 26, 36, 37, 40, 43, 87, 88	5, 6
1 NO & 1 NC	3RH1921-1DA11				
2 NC	3RH1921-1EA02				
	14, 17, 18, 22, 25, 26, 40, 43	7, 8	1 NO & 1 NC (Inside L or R)	49CAL18-11	
			1 NO & 1 NC (Outside L or R)	49CAL18-11B	
	LC	30	1 NO/NC	49LCAC1PA	
			2 NO/NC	49LCAC2PA	
	LE	20	Front Mounted 1 NO/NC	3RH2911-1HA11	
		30	Side Mounted 1 NO/NC	3RH2911-1DA11	
		60-400	Side Mounted 1 NO/NC	3RH1921-1EA11	
	CLM, CMN, CMF, CMB	20 Amps	1 NO/NC SPDT	CLM4097291	
			2 NO/NC SPDT	CLM4097292	
		30-200 Amps	1 NO & 1 NC	CLMFCAK11	
			2 NC	CLMFCAK02	
			2 NO	CLMFCAK20	
		300-400 Amps	1 Coil Clearing NO & NC	CLMFCKK11	
			1 NO & 1 NC	CLMHCAK11	
			2 NC	CLMHCAK02	
			2 NO	CLMHCAK20	
			1 Coil Clearing NO & NC	CLMHCKK11	

Disconnect Auxiliary Switch Kits

Description	Class	Disconnect Amp or CB Rating	Type	Catalog Number	List Price \$
Non-fusible or Fusible Type	17, 25, 32, 37, 83, 84, 87, 88, LED, LEF, CMN, CMF	30 - 200A	2 NO/2 NC DPDT (NEMA A600)	HA261234	
MCP	18, 26, 32, 37, 83, 84, 87, 88, LEB, CMB	3A-125A	1 NO/1 NC 240V	A02ED62	
		250A	1 NO/1 NC 480V	A02FD64	
		400A-600A	(2) 1 NO/1 NC SPDT-480V	A02JLD64	

Control Power Transformer Kits^{①②}

Description	Recommended Transformer Size		VA Rating	Catalog Number	List Price \$	Transformer Table		
	Control Size	Transformer VA				Primary Volts	Secondary Volts	Code
 Transformer 50/60HZ	00-2½	45 or 50 ^③	45 VA	KT*050 ^{②③}		120	24	1
	3-3½	75	50 VA	KT*050P ^②		208	24	G
	4	150	100 VA	KT*100		208	120	H
	5-6	150	150 VA	KT*150		240/480	24	4
	7-8	300	200 VA	KT*200		240/480	120	8
	Lighting Control		300 VA	KT*300		277	24	5
	CLM		150	KT*500		277	120	7
	20A, 2 - 12P	100	Replace * with code from Transformer table. Kits used with NEMA 1 general purpose lift-off cover type require extra wide enclosure. Class 14 Sizes 0-2½ Class 30 (2S2W) Sizes 0-2½ Class 30 (2S1W) Sizes 0-1½			600	24	6
	30A, 3P	200				600	120	9
	30A, 6 - 12P	100						
	60A, 3P	150						
	60A, 4 - 6P	250						
	60A, 8 - 12P	200						
	100/200A, 3P	250						
	100/200A, 5P	250						
300/400A, 3P	250							
LC & LE		100						
LC 30A, 2-12P	45							
LE 20, 30, 60A, 3 & 4P	45							
LE 30A, 6P	100							
LE 30A, 9-12P	150							
LE 60A, 6-12P	100							
LE 100, 200A, 3P	150							
LE 300, 400A, 3P	150							

① Installation of CPTs may require a larger enclosure.
② 45VA transformer kits will include secondary but not primary fusing. Sizes 50VA and higher include

2-pole primary fusing and 1-pole secondary fusing.












③ For 24VAC control a minimum of 100VA CPT is required.

Field Modification Kits

ESP200 Accessories

Selection

Accessories



Description		Catalog Number	List Price \$
	ESP200 Tamper Resistance Cover	49ASTC1 3UB89848	
	ESP100/200 Mounting Plate	Frame Size	Controller Size
		A or A1	00 - 1 3/4
		B	2 - 2 1/2
B	3-4	49ASMP1	
	Mounting Kit	49ASMS1	
	Universal Reset Operator 8" for class 36, 37 and 87 in NEMA 1, 12 and 3/3R	49MARB	
	Overload Relay Reset Operator for Class 14, 22, 30 and 83 non-combination starters in NEMA type 1, 12 and 4/4X enclosures	49MBRS	
	Overload Relay Reset Operator for Class 17, 18, 25, 26, 32 and 84 combination starters in NEMA type 1 enclosures	49MBRS1	
	Overload Relay Reset Operator for Class 17, 18, 25, 26, 32 and 84 combination starters in NEMA type 12 and 4/4X enclosures	49MBRS2	
	Overload Relay Reset Operator with red button for any Class in NEMA type 1, 3R, 4/4X and 12 enclosures with a 30mm hole	49MARSR	
	ESP200 Reset Extender	49ASRE	
	Protective Boot Offers protection from ice and foreign substances from interfering with button operation. For use with 49MARSR reset.	52AABA	
	Current Transformer 300:5 use with 3UB81234JW2	97CT005	
	Current Transformer 400:5 use with 3UB81234KW2	97CT006	
	Current Transformer 600:5 use with 3UB81234LW2	97CT008	
	Current Transformer 750:5 use with 3UB81234MW2	97CT009	
	Current Transformer 1200:5 use with 3UB81234NW2	97CT012	

Field Modification Kits

NEMA Accessories


Selection

Miscellaneous Kits

Description	Class	Encl. Type	Controller Size	Catalog Number	List Price \$								
 <p>Mechanical Interlock for Horizontally Mounted Contactors</p>	Includes wire	14, 40	Open	00-1 1 1/4 2, 2 1/2 3, 3 1/2 4	49CCF22H 49EEF22H 49GGF22H 49HHP22H 49JG22H								
	Interlock Only	14, 40	Open	5, 6	3RA1954-2A								
	Wire Kit Only			5 6	3RA1963-2A 3RA1973-2A								
	Base Plate Only	14, 40	Open	5 6	3RA1962-2A 3RA1972-2A								
	Mechanical Interlock			7 8	49VM750H 49VM1650H								
	Includes wire & mounting plate	14, 40	Open	00-1 1 1/4 2, 2 1/2 3, 3 1/2 4	49CCF22HP 49EEF22HP 49GGF22HP 49HHP22HP 49JG22HP								
Includes mounting plate (Different Frame Sizes)	14, 40	Open	Left 2, 2 1/2 3, 3 1/2	Right 3, 3 1/2 2, 2 1/2	49L107944 49L107945								
 <p>Surge Suppressor</p>	Surge Suppressor for 120V AC coil. Limits transient voltage produced by the coil to 220% maximum peak line volts.	All but Class LC, LE, CLM	All	00-4 ^①	49D26344								
 <p>Auxiliary Power Pole</p>	NO 36A at 600V AC Max NC 25A at 600V AC Max	All but Class LC, LE, CLM	All	00-1 1/4	49SAF0 49SAFC								
 <p>Main Contacts Lighting Contactors</p>	Top or Bottom, 2-Pole Top, 3-Pole Top or Bottom, 4-Pole Top or Bottom, 6-Pole	CLM	All	20 Amps	CLM4097331 CLM4097332 CLM4097333 CLM4097334								
 <p>Load Side Power Take Off Kit</p>	Includes 3 power lugs for making extra connections to the load side of the contactor	All but Class LC, LE, CLM	All	00-1 1/4	49SAE								
 <p>Lug Kit for Contactors</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Wire Range</th> </tr> </thead> <tbody> <tr> <td>49SAAF</td> <td>2-14</td> </tr> <tr> <td>49SAAH</td> <td>2/0-14</td> </tr> <tr> <td>75D35994001</td> <td>250MCM-6</td> </tr> </tbody> </table>	Item	Wire Range	49SAAF	2-14	49SAAH	2/0-14	75D35994001	250MCM-6	For AL/CU Wire	14, 40	All	2-2 1/2 3-3 1/2 4 Line 4 Load	49SAAF ^③ 49SAAH ^③ 75D35994002 ^③
	Item	Wire Range											
	49SAAF	2-14											
49SAAH	2/0-14												
75D35994001	250MCM-6												
For AL/CU Wire	14, 40	All	5, 6	3RT1966-4G ^②									
Use CU Only	14, 40	All	7 8	49ZATK750-3 ^② 49ZATK1650-6 ^②									
 <p>Three Conductor Ground Lug Kit Meets UL 508 and CSA Standard 22.2 No 14-1973</p>	2-14 AWG AL/CU Wire	All	All	All	75D28182001								
 <p>Lightning Arrestor</p>		All	All	All	49D45584002								
 <p>Backspin Timer</p>	On delay timer that reduces risk of starting into a backspin	87, 88	All	All	3RP2025-1AQ30 3RP2025-1AP30								
 <p>Hole Plug</p>	Covers the hole that is typically used for the conduit hub	87	All	1-4	49D41149006								
 <p>Hole Plug</p>	Covers the hole in the enclosure door/cover normally filled by overload reset 49MBRS. Hole plug is used for enclosed contactors.	40, 43, LC, LE, CLM & CM	1	All	49MZPB2								

NEMA & General Purpose Control

CONTROL PRODUCTS

Illustration	Description	Contactors	Wire Size	Catalog Number	List Price \$
 <p>3RT1966-4G</p>	<p>Lug Kit</p> <p>1 Kit = 1 Terminal block. 1 kit necessary for each line and load.</p>	<p>NEMA size 4 (Vacuum)</p> <p>NEMA size 5</p> <p>NEMA size 6</p>	<p>2/0 to 600 MCM, max. one 500MCM & one 600MCM</p>	3RT1966-4G	

① Surge Suppression for NEMA sizes 5 – 8 are supplied internal with the coil. For size 4 panel mount.

② Only 3 lugs are supplied for line or load. If lugs for line and load are required order 2 kits.


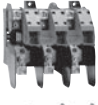



③ Lug Kit for contactors include 3 lugs for line or load. 75D35994001 for line side. 75D35994002 for load side.

Field Modification Kits


NEMA Accessories

Selection


Fused and Non-Fused Disconnect Switch Kits^②

	Basic Switch Ampere Rating	Switch Catalog Number Non-Fused	List Price \$	Switch Catalog Number Fused	List Price \$	Kit Description	Load Base Catalog Number Class J	List Price \$	Load Base Catalog Number Class H ^③	List Price \$	Lug Wire Size
	30	HNB612		HFB21		30A, 250V	—	—	HBB21		#14-2 AWG (Cu/Al)
				HFB612		30A, 600V	HBB612				
	60	HNB623		HFB22		60A, 250V	—	—	HBB22		#14-2 AWG (Cu/Al)
				HFB62		60A, 600V	HBB62				
	100	HNB623		HFB63		100A, 250V	—	—	HBB63		#14-1/0 AWG (Cu/Al)
						100A, 600V	HBB63				
	200	HNB64		HFB64		200A, 250V	—	—	HBB64		#6-300 AWG (Cu/Al)
						200A, 600V	HBB64				


Class R Fuse Conversion Kits

	Catalog Number	Description	List Price \$
	HR21	30A, 240V	
	HR612	30A, 600V	
	HR612	60A, 240V	
	HR62	60A, 600V	
	HR63	100A, 240/600V	
	HR64	200A, 240/600V	

Hazardous Location Accessories For Enclosure Types 7 & 9

		Description	Conduit Size Inches	Catalog Number	List Price \$
Breather/Drain		Install in bottom as drain. Install in top as breather. Suitable for Class I groups C & D and for Class II groups F & G applications only, for 1/2" NPT.		51AADB	

Metal Conduit Hubs

Description	Conduit Size	Class	Controller Size	Enclosure Type	Milbank Catalog No. ^④
	1"	87	All	3R	A7514
	1 1/2"				A7516
	2"				A7517
	2 1/2"				A7518

NEMA & General Purpose Control

17 CONTROL PRODUCTS

① Product Category: PILO.
② Product Category: HDSS.

③ For Class R fuses order Class H kit from this table and the Class R conversion kit.



④ Milbank catalog numbers are for reference only. Milbank conduit hubs are not sold by Siemens but can be purchased at a typical electrical hardware and supply distributor.

Field Modification Kits

NEMA, Overload Relays

Selection

Sirius 3RB20

Illustration	Description	For Overload Type	Catalog Number	List Price \$	
 Reset plunger with reset button  Flexible reset	Reset mechanisms Reset plunger Mounts directly to overload relay. Requires separate reset operator in enclosure door. Kit includes reset plunger, holder and funnel.	3RB206	3RU1900-1A		
	Flexible cable reset mechanism Requires a 6.5 mm hole in the enclosure with a maximum enclosure thickness of 8 mm.	Cable length 15.75 in (400mm)	3RB206	3RU1900-1B	
		Cable length 23.62 in (600mm)		3RU1900-1C	
	Covers Tamper resistant cover for current setting and manual/automatic reset button.		3RB206	3RB2984-0	

Competitive Retrofit Overload Plates

Manufacturer	NEMA Size	Plate Part Number	List Price \$
A-B	0, 1	49D57090	
A-B	2	49D57161	
Sq. D	0, 1	49D57091	

Electronic Coil System with Remaining Lifetime Indication and 24VDC PLC Output

Class	Size	Model Type	21 - 27V		96 - 127V		200 - 277V	
			Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
All	5	P	-	-	3RT1965-5PF31		3RT1965-5PP31	
		V	-	-	3RT1966-5PF31		3RT1966-5PP31	
	6	P	-	-	3RT1975-5PF31		3RT1975-5PP31	
		V	-	-	3RT1976-5PF31		3RT1976-5PP31	

NEMA & General Purpose Control

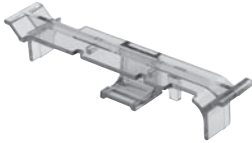




17 CONTROL PRODUCTS

Field Modification Kits



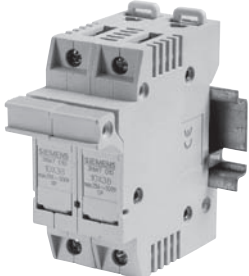


Class MT, MTG

Selection

Fuse Blocks, Touch-Safe Terminal Covers

Catalog Number	Description	List Price \$
KCCF1G	SECONDARY FUSE BLOCK, 1P, 250V MAX	
 KCCFBCK	SINGLE POLE FUSE BLOCK COVER KIT	
 KCCFP2RG	2 Pole PRIMARY FUSE BLOCK, 2P, 600V MAX (block only)	
 KCCFPX2R	2 Pole PRIMARY FUSE BLOCK KIT with wire Leads	
US2:49FCCT	Secondary Fuse Clips, 2 per pack	
US2:49JUCPT	Terminal Jumpers	
 US2:KCCSEFCVR	Terminal touchsafe cover Secondary Side: VAs 45 thru 350	
 US2:KCCSEFCVR2	Terminal touchsafe cover Secondary Side: VAs 500 thru 2K	
US2:KCCFP3POLE	3 pole fuse blk (2 pole primary and 1 pole secondary)	

International Fusing[Ⓞ]

Catalog Number	Description	List Price \$
 8WA1011-1SF12	1-Pole Fuse Block, Touch-Safe. Up to 6.3A for 5 mm × 20 mm or 5 mm × 25 mm (Requires DIN Rail Mounting)	
 3NW7013	1-Pole Fuse Block, Touch-Safe 32A, for 10 × 38 mm Cylindrical Fuses. (Requires DIN Rail Mounting.)	
 3NW7023	2-Pole Fuse Block, Touch-Safe 32A, for 10 × 38 mm Cylindrical Fuses. (Requires DIN Rail Mounting.)	
 3NW7111	1-Pole Fuse Block, Touch-Safe 4-50A, for 14 × 51 mm Cylindrical Fuses. (Requires DIN Rail Mounting.)	
 8WA1815	Fuse Block DIN Rail Mounting for separate screw mounting to panel. (Max 2-pole 2-25A size per rail.) (Max 1-pole 4-50A size per rail.)	

[Ⓞ] Product Category: IEC.

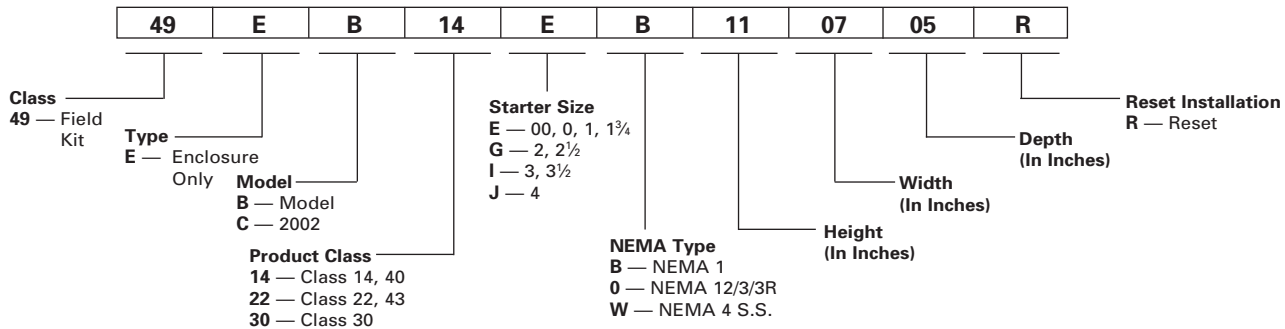
NEMA & General Purpose Control

17 CONTROL PRODUCTS

Heavy Duty Control

Non-Combination Enclosure Kits, Class 49

Selection



Non-Reversing Starters & Contactors Class 14, 40

Size	NEMA 1 General Purpose (Clamshell) ^{①④}				NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant ^{②⑥}				NEMA 12/3/3R Industrial Use, Weatherproof ^{②④}					
	Without CPT		With CPT (Extra Wide)		Without CPT		With CPT (Extra Wide)		Without CPT		With CPT (Extra Wide)			
	Model C Enclosure	Model B Enclosure	Max CPT VA	List Price \$	Model B Enclosure	List Price \$	Model B Enclosure	Max CPT VA	List Price \$	Model B Enclosure	List Price \$	Model B Enclosure	Max CPT VA	List Price \$
00-1 1/4	49EC14EB110705R	49EC14IB201208R	200	—	49EB14EW130806R	—	49EB22EW131306R	—	—	49EB14E0130806R	—	49EB22E0131306R	—	—
2, 2 1/2	49EC14GB140807R	49EC14IB201208R	200	—	49EB14GW160907R	—	49EB22GW161406R	—	—	49EB14G0160907R	—	49EB22G0161406R	—	—
3, 3 1/2	49EC14IB201208R	49EC14IB201208R	100	—	49EB14JW261408R	—	49EB14JW261408R	—	—	49EB14J0261408R	—	49EB14J0261408R	—	—
3, 3 1/2	—	49EC14JB251409R	250	—	—	—	—	—	—	—	—	—	—	—
4	49EC14JB251409R	49EC14JB251409R	300	—	49EB14JW261408R	—	49EB22JW302410R	—	—	49EB14J0261408R	—	49EB22J0302410R	—	—

Reversing Starters & Reversing Contactors Class 22, 43

Size	NEMA 1 General Purpose (Clamshell) ^{①④}				NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant ^{②⑤}				NEMA 12/3/3R Industrial Use, Weatherproof ^{②④}					
	Without CPT		With CPT (Extra Wide)		Without CPT		With CPT (Extra Wide)		Without CPT		With CPT (Extra Wide)			
	Model C Enclosure	Model B Enclosure	Max CPT VA	List Price \$	Model B Enclosure	List Price \$	Model B Enclosure	Max CPT VA	List Price \$	Model B Enclosure	List Price \$	Model B Enclosure	Max CPT VA	List Price \$
00-1 1/4	49EC14IB201208R	49EC14IB201208R	200	—	49EB22EW131306R	—	49EB22EW131306R	—	—	49EB22E0131306R	—	49EB22E0131306R	—	—
2, 2 1/2	49EC14IB201208R	49EC14IB201208R	200	—	49EB22GW161406R	—	49EB22GW161406R	—	—	49EB22G0161406R	—	49EB22G0161406R	—	—
3, 3 1/2	49EC14JB251409R	49EC14JB251409R	250	—	49EB22JW261808R	—	49EB22JW302410R	—	—	49EB22J0261808R	—	49EB22J0302410R	—	—
4	49EC14JB251409R	49EC14JB251409R	300	—	49EB22JW302410R	—	49EB22JW302410R	—	—	49EB22J0302410R	—	49EB22J0302410R	—	—

Two-Speed Two-Winding Starters Class 30

Size	NEMA 1 General Purpose (Clamshell) ^{①③}				NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant ^{②⑤}				NEMA 12/3/3R Industrial Use, Weatherproof ^{②④}					
	Without CPT		With CPT (Extra Wide)		Without CPT		With CPT (Extra Wide)		Without CPT		With CPT (Extra Wide)			
	Model C Enclosure	Model B Enclosure	Max CPT VA	List Price \$	Model B Enclosure	List Price \$	Model B Enclosure	Max CPT VA	List Price \$	Model B Enclosure	List Price \$	Model B Enclosure	Max CPT VA	List Price \$
0-1 1/4	49EC14IB201208R ^①	49EC14JB251409R ^①	200	—	49EB30EW131306R	—	49EB30GW161808R	—	—	49EB30E0131306R	—	49EB30G0161808R	—	—
2, 2 1/2	49EC14IB201208R ^①	49EC14JB251409R ^①	200	—	49EB30GW161406R	—	49EB30GW161808R	—	—	49EB30G0161406R	—	49EB30G0161808R	—	—
3, 3 1/2	49EC14JB251409R ^①	49EB22JB302410R ^②	300	—	49EB30IW261808R	—	49EB22JW302410R	—	—	49EB30I0261808R	—	49EB22J0302410R	—	—
4	49EC14JB251409R ^①	49EB22JB302410R ^②	300	—	49EB22JW302410R	—	49EB22JW302410R	—	—	49EB22J0302410R	—	49EB22J0302410R	—	—

Two-Speed One-Winding Starters Class 30

Size	NEMA 1 General Purpose (Clamshell) ^{①③}				NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant ^{②⑤}				NEMA 12/3/3R Industrial Use, Weatherproof ^{②④}					
	Without CPT		With CPT (Extra Wide)		Without CPT		With CPT (Extra Wide)		Without CPT		With CPT (Extra Wide)			
	Model C Enclosure	Model B Enclosure	Max CPT VA	List Price \$	Model B Enclosure	List Price \$	Model B Enclosure	Max CPT VA	List Price \$	Model B Enclosure	List Price \$	Model B Enclosure	Max CPT VA	List Price \$
0-1 1/4	49EC14IB201208R ^①	49EC14JB251409R ^①	200	—	49EB30EW131306R	—	49EB30GW161808R	—	—	49EB30E0131306R	—	49EB30G0161808R	—	—
2, 2 1/2	49EB30GB161808R ^②	49EB22JB302410R ^②	300	—	49EB30GW161808R	—	49EB22IW261808R	—	—	49EB30G0161808R	—	49EB22I0261808R	—	—
3, 3 1/2	49EB30IB192208R ^②	49EB22JB302410R ^②	300	—	49EB22JW302410R	—	49EB22JW302410R	—	—	49EB22J0302410R	—	49EB22J0302410R	—	—
4	49EB22JB302410R ^②	49EB22JB302410R ^②	300	—	49EB22JW302410R	—	49EB22JW302410R	—	—	49EB22J0302410R	—	49EB22J0302410R	—	—

Note: Dimensions...See appropriate Product Class Outline Drawing beginning on page 17-159.
^① Clamshell enclosure suitable for one operating device and two pilot lights. See Field Mods page 17-106.

^② Hinged cover enclosures, except for 49EB14E0130806R, are suitable for one or more class 52 operating devices and one or more class 52 pilot lights. See Field Mods page 17-98.
^③ Install NEMA 1 hole plug cat. no. 3SB1902-0AR (included) when the cover OL reset is not needed.

^④ Install NEMA 12 hole plug cat. no. 52ABH6 (not included) when the cover OL reset is not needed.
^⑤ Install NEMA 4X stainless steel hole plug cat. no. 52ABHS (not included) when the cover OL reset is not needed.

Heavy Duty Control

Lighting Enclosure Tables

Selection

Lighting Contactors Class LC and LE

Contactor	Type 1			Type 4/4X Stainless Steel ^①			Type 3/3R/12 ^②		
	Without CPT	With CPT	Max.	Without CPT	With CPT	Max.	Without CPT	With CPT	Max.
	Catalog Number	Catalog Number	CPT VA	Catalog Number	Catalog Number	CPT VA	Catalog Number	Catalog Number	CPT VA
LC 30A 2-12P	49EC14GB140807R	49EC14IB201208R	200	49EB22GW161406R	49EB30GW161808		49EB22G0161406R	49EB30G0B161808	
LE 20, 30A 3-4P	49EC14EB110705R	49EC14IB201208R	200	49EB22GW161406R	49EB22GW161406R		49EB22G0161406R	49EB22G0161406R	
LE 30A 6-9P	49EC14IB201208R	49EC14IB201208R	200	49ECLXXW161406	49EB14JW261408R		49ECLXX0161406	49EB14J0261408R	
LE 30A 12P	49EC14IB201208R	49EC14JB251409R	250	49ECLXXW161406	49EB14JW261408R		49ECLXX0161406	49EB14J0261408R	
LE 60A 3P	49EC14GB140807R	49EC14IB201208R	200	49EB22GW161406R	49EB22GW161406R		49EB22G0161406R	49EB22G0161406R	
LE 60A 6-9P	49EC14IB201208R	49EC14IB201208R	200	49ECLXXW161406	49EB14JW261408R		49ECLXX0161406	49EB14J0261408R	
LE 60A 12P	49EC14IB201208R	49EC14IB201209R	250	49ECLXXW161406	49EB14JW261408R		49ECLXX0161406	49EB14J0261408R	
LE 100A 3P	49EC14IB201208R	49EC14IB201208R	200	49ECLXXW161406	49EB14JW261408R		49ECLXX0161406	49EB14J0261408R	

Lighting & Heating Contactors Class CLM

Size	Pole	NEMA 1 General Purpose (Clamshell) ^{①③}					NEMA 4/4X Stainless Watertight, Corrosion Resistant ^{②⑤}					NEMA 12/3/3R Industrial Use ^{②④}				
		Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)		
		Model C/B Enclosure	List Price \$	Model C/B Enclosure	Max CPT	List Price \$	Model B Enclosure	List Price \$	Model B Enclosure	Max CPT	List Price \$	Model B Enclosure	List Price \$	Model B Enclosure	Max CPT	List Price \$
		Catalog Number		Catalog Number			Catalog Number		Catalog Number			Catalog Number		Catalog Number		
20A	2-12	49EC14GB140807R		49EC14IB201208R	200VA		49EB22GW161406R		49EB22GW161406R	—		49EB22G0161406R		49EB22G0161406R	—	
30A	2-5	49EC14EB110705R		49EC14IB201208R	200VA		49EB22GW161406R		49EB22GW161406R	—		49EB22G0161406R		49EB22G0161406R	—	
30A	6-12	49EB30GB161808R		49EB30GB161808R	200VA		49ECLXXW161406		49EB30GW161808R	—		49ECLXX0161406		49EB30G0161808R	—	
60A	2-5	49EC14GB140807R		49EC14IB201208R	200VA		—	—	—	—		—	—	—	—	
60A	6-12	49EB30IB192208R		49EB30IB192208R	250VA		—	—	—	—		—	—	—	—	
100A	2-5	49EC14IB201208R		49EC14IB201208R	200VA		—	—	—	—		—	—	—	—	

NEMA & General Purpose Control

CONTROL PRODUCTS 17

Note: Dimensions...See appropriate Product Class Outline Drawing on page 17-172.

① Clamshell enclosure suitable for one operating device and two pilot lights. See Field Mods page 17-106.

② Hinged cover enclosure suitable for one or more class 52 operating devices and one or more class 52 pilot lights. See Field Mods page 17-106.

③ Install NEMA 1 hole plug cat. no. 3SB1902-0AR (included) when the cover OL reset is not needed.

④ Install NEMA 12 hole plug cat. no. 52ABH6 (not included) when the cover OL reset is not needed.

⑤ Install NEMA 4X stainless steel hole plug cat. no. 52ABHS (not included) when the cover OL reset is not needed.

Combination Starter Enclosure Kits

Features and Benefits

Features

- Manufactured with a cold forming "TOX" process
- 100kA short circuit rating when protected with class R fuses to 600V or MCP to 480V and when installing listed components from the instruction guide
- Enclosure types available, Nema 1, 12, 3/3R and painted NEMA 4. Nema 12 field convertible to 3/3R/4 with the appropriate conduit hub and drain hole
- Pre-Drilled mounting panels
- Heavy duty quarter turns
- Industrial type disconnect handle

Disconnect Type Enclosure Kit

- Used to assemble both non-fusible and fusible combination starters
- Accommodates Class 14 full voltage non-reversing (FVNR) NEMA starters 00 – 4 including Siemens exclusive half sizes
- Handle mechanism, power wire, mounting panel, reset assembly, and instruction guide included. Hardware for panel mounted devices and disconnect switch are not included

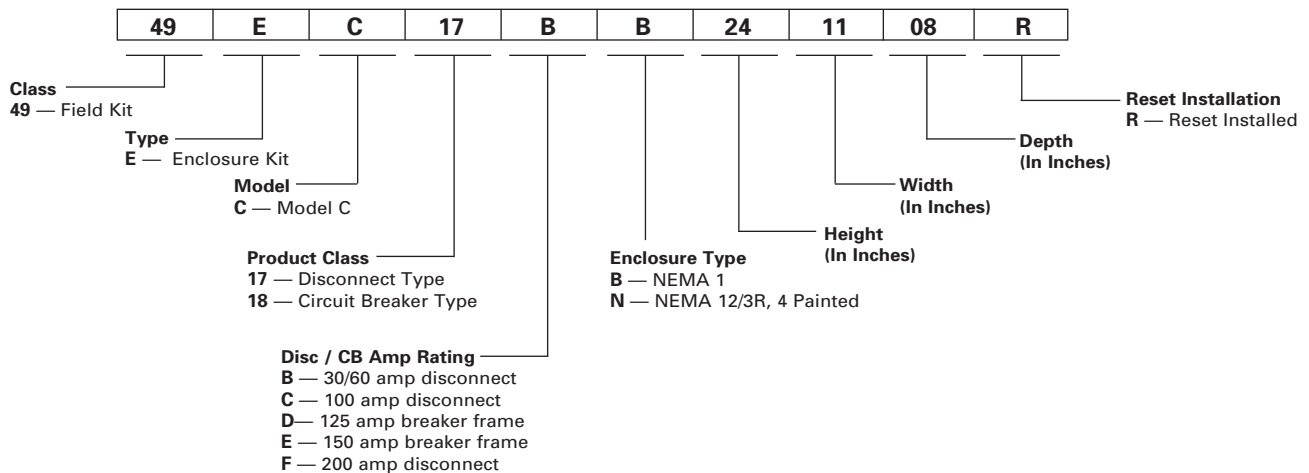
MCP Type Enclosure Kit

- Used to assemble combination starters with circuit breakers
- Accommodates Class 14 full voltage non-reversing (FVRN) NEMA starters 00 – 4 including Siemens exclusive half sizes
- Handle mechanism, power wire, mounting panel, reset assembly and instruction guide included. Circuit breaker not included however, mounting hardware for the circuit breaker is

How to Select the Required Kits to Assemble a Combination Starter

1. From the catalog, select a class 14 open type starter with the required starter size and overload relay type.
2. Based on the starter size, select the enclosure kit from table 1a for fusible or non-fusible combination starters or select from table 1b for combination starters with an MCP.
3. For a non-fusible combination starter, select the disconnect switch kit from table 2a. For a fusible combination starter, select the appropriate disconnect switch, fuse clip kit, and class R rejection kit from table 2b (for H fusing, class R rejection kit not required). For combination starters with MCP, select the appropriate circuit breaker kit from table 3.

Nomenclature for Combination Enclosure Kits



Combination Starter Enclosure Kits

Selection

Table 1a - FVNR Combination Starter Kits for use with Disconnect Devices

Starter Size	Disc. Amp Rating	NEMA 1 General Purpose		NEMA 12, 3/3R, 4 Painted Industrial Use, Weatherproof, Watertight, Dust-tight		NEMA 4/4X Stainless Steel Watertight, Dust-tight, Corrosion Resistant	
		Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
0 - 2	60	49EC17BB241108R		49EC17BN241108R		49EC17BW241108R	
2 ½ - 3	100	49EC17CB242008R		49EC17CN242008R		49EC17CW242008R	
3 ½ - 4	200	49EC17FB362408R		49EC17FN362408R		49EC17FW362408R	

Table 1b. – FVNR Combination Starter Kits for use with MCP Devices

Starter Size	Max MCP Amps	NEMA 1 General Purpose		NEMA 12, 3/3R, 4 Painted Industrial Use, Weatherproof, Watertight, Dust-tight		NEMA 4/4X Stainless Steel Watertight, Dust-tight, Corrosion Resistant	
		Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
0 - 2	50	49EC18DB241108R		49EC18DN241108R		49EC18DW241108R	
2 ½ - 3	125	49EC18DB242008R		49EC18DN242008R		49EC18DW242008R	
3 ½	125	49EC18DB362408R		49EC18DN362408R		49EC18DW362408R	
4	150	49EC18EB362408R		49EC18EN362408R		49EC18EW362408R	



Table 2a – Non-Fusible Disconnect Kits

Disconnect Switch		
Switch Rating	Catalog Number	List Price \$
30A	HNB612	
60A	HNB623	
100A	HNB623	
200A	HNB64	

Table 2b – Fusible Disconnect Kits

Fuse Clip Ratings	Class	Disconnect Switch		Load Base for Fuse		Rejection Clips for Class R Fusing	
		Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
30A-250V	H	HFB21		HBB21		HR21	
30A-600V	H	HFB612		HBB612		HR612	
60A-250V	H	HFB22		HBB22		HR612	
60A-600V	H	HFB62		HBB62		HR62	
100A-250V	H	HFB63		HBB63		HR63	
100A-600V	H	HFB63		HBB63		HR63	
200A-250V	H	HFB64		HBB64		HR64	
200A-600V	H	HFB64		HBB64		HR64	

Table 3 – Circuit Breaker Kits

Starter Size	MCP Type Used with Solid State Overload Relay			MCP Type Used with Thermal Overload Relay	
	Overload Amp Range	Motor Circuit Interrupter Amps	Circuit Breaker Kit	Motor Circuit Interrupter Amps	Circuit Breaker Kit
0	0.75-3.4	3	ED63A003	3	ED63A003
	3-12	10	ED63A010	10	ED63A010
	5.5-22	25	ED63A025	25	ED63A025
1	0.75-3.4	3	ED63A003	3	ED63A003
	3-12	10	ED63A010	10	ED63A010
	5.5-22	25	ED63A025	25	ED63A025
	10-40	30	ED63A030	30	ED63A030
1 ½	10-40	40	ED63A040	40	ED63A040
2	13-52	50	ED63A050	50	ED63A050
2 ½	25-100	100	ED63A100	100	ED63A100
3	25-100	100	ED63A100	100	ED63A100
3 ½	50-200	125	ED63A125	125	ED63A125
4	50-200	150	FXD63A150L	150	FXD63A150L


NEMA & General Purpose Control

CONTROL PRODUCTS 17

Heavy Duty Control

Class 87 Pump Panel Enclosure Kits

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Refer to Class 87 section of catalog for pump panel ratings and other details. ▶ Handle mechanism, power wire, mounting panel, reset assembly and instruction guide are included with the enclosure kit. 	Coil Table																			
		<table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24</td><td>J</td></tr> <tr><td>120</td><td>F</td></tr> <tr><td>110–120/220–240</td><td>A^①</td></tr> <tr><td>200–208</td><td>D</td></tr> <tr><td>220–240</td><td>G</td></tr> <tr><td>220–240/440–480</td><td>C^①</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>440–480</td><td>H</td></tr> <tr><td>550–600</td><td>E</td></tr> </tbody> </table>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A ^①	200–208	D	220–240	G	220–240/440–480	C ^①	277	L	440–480	H	550–600
60Hz Voltage	Letter																				
24	J																				
120	F																				
110–120/220–240	A ^①																				
200–208	D																				
220–240	G																				
220–240/440–480	C ^①																				
277	L																				
440–480	H																				
550–600	E																				

Pump Panels with Solid-State Overload Relay Class 87

To Field Assemble This Pump Panel:	Order these components						Enclosure List Price \$
	Enclosure Catalog Number	Starter with Solid-State Overload Relay	Disconnect Switch	Fuse Load Base	Class R Rejection Clips	Motor Circuit Interrupter	
87DUB6F*	49EB87GF242008	14DUB32A*	HFB612	HBB612	HR612	—	
87DUC6F*	49EB87GF242008	14DUC32A*	HFB612	HBB612	HR612	—	
87DUD6F*	49EB87GF242008	14DUD32A*	HFB612	HBB612	HR612	—	
87DUD60*	49EB87GF242008	14DUD32A*	HFB62	HBB62	HR62	—	
87EUE6F*	49EB87GF242008	14EUE32A*	HFB612	HBB612	HR612	—	
87EUE60*	49EB87GF242008	14EUE32A*	HFB62	HBB62	HR62	—	
87FUF6F*	49EB87GF242008	14FUF32A*	HFB62	HBB62	HR62	—	
87FUF60*	49EB87GF242008	14FUF32A*	HFB63	HBB63	HR63	—	
87GUG6F*	49EB87GF242008	14GUG32A*	HFB62	HBB62	HR62	—	
87GUG60*	49EB87GF242008	14GUG32A*	HFB63	HBB63	HR63	—	
87HUG6F*	49EB87JF362408	14HUG32A*	HFB63	HBB63	HR63	—	
87HUG60*	49EB87JM362408	14HUG32A*	MCS620R	FCK620	SSRK34	—	
87IUH6F*	49EB87JM362408	14IUH32A*	MCS620R	FCK620	SSRK34	—	
87JUH6F*	49EB87JM362408	14JUH32A*	MCS620R	FCK620	SSRK34	—	
87DUC6L*	49EB87GF242008	14DUC32A*	HFB21	HBB21	HR21	—	
87DUD6L*	49EB87GF242008	14DUD32A*	HFB21	HBB21	HR21	—	
87DUE6L*	49EB87GF242008	14DUE32A*	HFB21	HBB21	HR21	—	
87DUE6P*	49EB87GF242008	14DUE32A*	HFB22	HBB22	HR612	—	
87EUE6L*	49EB87GF242008	14EUE32A*	HFB22	HBB22	HR612	—	
87FUF6L*	49EB87GF242008	14FUF32A*	HFB22	HBB22	HR612	—	
87FUF6P*	49EB87GF242008	14FUF32A*	HFB63	HBB63	HR63	—	
87GUG6L*	49EB87GF242008	14GUG32A*	HFB22	HBB22	HR612	—	
87GUG6P*	49EB87GF242008	14GUG32A*	HFB63	HBB63	HR63	—	
87HUG6L*	49EB87JF362408	14HUG32A*	HFB63	HBB63	HR63	—	
87HUG6P*	49EB87JM362408	14HUG32A*	MCS620R	FCK620	SSRK34	—	
87IUH6L*	49EB87JM362408	14IUH32A*	MCS620R	FCK620	SSRK34	—	
87JUH6L*	49EB87JM362408	14JUH32A*	MCS620R	FCK620	SSRK34	—	
87DUB6M*	49EB87GB242008	14DUB32A*	—	—	—	ED63A003	
87DUC6M*	49EB87GB242008	14DUC32A*	—	—	—	ED63A010	
87DUD6M*	49EB87GB242008	14DUD32A*	—	—	—	ED63A025	
87DUE6M*	49EB87GB242008	14DUE32A*	—	—	—	ED63A030	
87EUE6M*	49EB87GB242008	14EUE32A*	—	—	—	ED63A040	
87FUF6M*	49EB87GB242008	14FUF32A*	—	—	—	ED63A050	
87GUG6M*	49EB87GB242008	14GUG32A*	—	—	—	ED63A100	
87HUG6M*	49EB87IB362408	14HUG32A*	—	—	—	ED63A100	
87IUH6M*	49EB87IB362408	14IUH32A*	—	—	—	ED63A125	
87JUH6M*	49EB87JB362408	14JUH32A*	—	—	—	FXD63A150L	

① Dual voltage coils not available in size 5-8 starters.


NEMA & General Purpose Control

CONTROL PRODUCTS

Heavy Duty Control

Class 87 Pump Panel Enclosure Kits

Selection

	Ordering Information <ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Refer to Class 87 section of catalog for pump panel ratings and other details. ▶ Handle mechanism, power wire, mounting panel, reset assembly and instruction guide are included with the enclosure kit. 	Coil Table	
		60Hz Voltage	Letter
		24	J
		120	F
		110–120/220–240	A ^①
		200–208	D
		220–240	G
		220–240/440–480	C ^①
		277	L
		440–480	H
		550–600	E

Pump Panels with Bimetal Overload Relay Class 87

To Field Assemble This Pump Panel:	Order these components						Enclosure List Price \$
	Enclosure Catalog Number	Starter with Bimetal Overload Relay	Disconnect Switch	Fuse Load Base	Class R Rejection Clips	Motor Circuit Interrupter	
87DAE6F*	49EB87GF242008	14DP32A*81	HFB612	HBB612	HR612	—	
87DAE60*	49EB87GF242008	14DP32A*81	HFB62	HBB62	HR62	—	
87EAF6F*	49EB87GF242008	14EP32A*81	HFB612	HBB612	HR612	—	
87EAF60*	49EB87GF242008	14EP32A*81	HFB62	HBB62	HR62	—	
87FAJ6F*	49EB87GF242008	14FP32A*81	HFB62	HBB62	HR62	—	
87FAJ60*	49EB87GF242008	14FP32A*81	HFB63	HBB63	HR63	—	
87GAK6F*	49EB87GF242008	14GP32A*81	HFB62	HBB62	HR62	—	
87GAK60*	49EB87GF242008	14GP32A*81	HFB63	HBB63	HR63	—	
87HAN6F*	49EB87JF362408	14HP32A*81	HFB63	HBB63	HR63	—	
87HAN60*	49EB87JM362408	14HP32A*81	MCS620R	FCK620	SSRK34	—	
87IAP6F*	49EB87JM362408	14IP32A*81	MCS620R	FCK620	SSRK34	—	
87JAR6F*	49EB87JM362408	14JG32A*81	MCS620R	FCK620	SSRK34	—	
87DAE6L*	49EB87GF242008	14DP32A*81	HFB21	HBB21	HR21	—	
87DAE6P*	49EB87GF242008	14DP32A*81	HFB22	HBB22	HR612	—	
87EAG6L*	49EB87GF242008	14EP32A*81	HFB22	HBB22	HR612	—	
87FAJ6L*	49EB87GF242008	14FP32A*81	HFB22	HBB22	HR612	—	
87FAJ6P*	49EB87GF242008	14FP32A*81	HFB63	HBB63	HR63	—	
87GAL6L*	49EB87GF242008	14GP32A*81	HFB63	HBB63	HR63	—	
87HAN6L*	49EB87JF362408	14HP32A*81	HFB63	HBB63	HR63	—	
87HAN6P*	49EB87JM362408	14HP32A*81	MCS620R	FCK620	SSRK34	—	
87IAP6L*	49EB87JM362408	14IP32A*81	MCS620R	FCK620	SSRK34	—	
87JAR6L*	49EB87JM362408	14JG32A*81	MCS620R	FCK620	SSRK34	—	
87DAA6M*	49EB87GB242008	14DP32A*81	—	—	—	ED63A003	
87DAB6M*	49EB87GB242008	14DP32A*81	—	—	—	ED63A010	
87DAD6M*	49EB87GB242008	14DP32A*81	—	—	—	ED63A025	
87DAE6M*	49EB87GB242008	14DP32A*81	—	—	—	ED63A030	
87EAF6M*	49EB87GB242008	14EP32A*81	—	—	—	ED63A040	
87EAG6M*	49EB87GB242008	14EP32A*81	—	—	—	ED63A050	
87FAH6M*	49EB87GB242008	14FP32A*81	—	—	—	ED63A040	
87FAJ6M*	49EB87GB242008	14FP32A*81	—	—	—	ED63A050	
87GAK6M*	49EB87GB242008	14GP32A*81	—	—	—	ED63A050	
87GAL6M*	49EB87GB242008	14GP32A*81	—	—	—	ED63A100	
87HAN6M*	49EB87IB362408	14HP32A*81	—	—	—	ED63A100	
87IAP6M*	49EB87IB362408	14IP32A*81	—	—	—	ED63A125	
87JAR6M*	49EB87JB362408	14JG32A*81	—	—	—	FXD63A150L	

① Dual voltage coils not available in size 5-8 starters.
 ② For NO/NC SPDT contact on overload, replace "81" with "91". "81" will give a NC contact.

NEMA & General Purpose Control

CONTROL PRODUCTS 17

Ordering Information

- All modifications will consist of Siemens standard components as available. Standard equipment dimensions and enclosure construction may not apply when certain modifications and special features are added.

Pilot Devices

Description	Modification	Class	Enclosure Type	Modification Code	List Price \$
Push Buttons	Start, Stop	14, 17, 18, 36, 37, 40, 83, 84, CLM, CM, LC, LE	All	A1	⑤
	Forward, Reverse, Stop	22, 25, 26, 43	All	A2	
	High, Low, Stop	30, 32	All		
	E-Stop	14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 40, 43	All	ES	
Selector Switches	Hand-Off-Auto	14, 17, 18, 36, 37, 40, 83, 84, LC, LE	All	A3	⑤
		CM, CLM	All	A3	
	For 24 volt HOA control, 20 Amp contactor only	CM, CLM	1	EM	
	Off-On	14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 40, 43, 83, 84, CLM, CM, LC, LE	All	A4	⑤
	Auto-Off	14, 17, 18, 40, 83, 84, CM, CLM, LC, LE	All	A6	⑤
	Forward-Off-Reverse	22, 25, 26, 43	All	A5	
	High-Off-Low	30, 32	All		
	Hand-Off-Auto (Keyed)	14, 17, 18, 36, 37, 40, 83, 84, LC, LE, CLM, CM	All	A9	⑤
Auto-Off-Low-High	30, 32	All	A0		

Pilot Lights

Class	Enclosure Type	Lens Color →	Red	Green	Red	Green	Red	Green	Amber	White	Red Push-To-Test	Green Push-To-Test	Green Push-To-Test	LED Bulb Upgrade
		Legend→	On For/Rev Low/High	On For/Rev Low/High	Run	Run	Off	Off	OL Tripped	Control Power On	On For/Rev Low/High	On For/Rev Low/High	Off	
		Mod Code →	FA	FB	FC	FD	FJ	FK	FL ^④	FW	FS	FT	FU	FE ^①
14, 40, 17, 18, 36, 37, 87, 88, LC, LE, CLM, CM	All													
22, 25, 26, 30, 32, 43, 83, 84	All				⑥	⑥								

Coil Options

Class 14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83 ^⑤ , 84 ^⑥ , 87, 88					
Volts 60 HZ	Volts 50 HZ	Coil Letter Change	Controller Size — List Price \$		
			00-2½	3, 3½	4
24	24	J			
120	110	F			
110-120/220-240	110/190-220	A			
200-208	—	D			
220-240	190-220	G			
277	240	L			
220-240/440-480	190-220/380-440	C			
440-480	380-440	H			
575-600	550	E			
DC Coil ^⑦	24V	S ^⑧			
	48V	U			
	125V	V			
	250V	W			

AC (50-60 HZ) or DC	Coil Letter Change	Controller Size 4 (Vacuum Only) Size 5 & 6 (ALL)
23-26V	J	
42-48V	U	
110-127V	F	
200-220V	D	
220-240V	G	
240-277V	L	
380-420V	K	
440-480V	H	
575-600V	E	

① Pilot lights are transformer type as standard. For LED type bulbs, order suffix FE in addition to the standard device suffix(es). For example, to order red "ON" and green "OFF" pilot lights with LED bulbs, order FA, FK and FE.

② DC coils include 1 NC, late break aux. contact. This aux. contact takes up one side of the starter (00-4 only).

③ Price x 2 for Classes 22, 25, 26, 30, 32, 43, 83, 84.

④ Bimetal OL - Size 00 - 2 1/2 available. Solid-state OL - Size 00 - 4, 7 & 8 available.

⑤ For Class 83, 84 two devices are provided. Price x 2.

⑥ For Class 83, 84 standard enclosure (92) alternating relay available in 24V or 120V control only.

⑦ S coil is not available for size 4 contactors or starters.

⑧ Class 83 and 84 only.

Ordering Information	Transformer Table		
► Replace (*) with letter from Transformer Table.	Primary Volts	Secondary Volts	Letter
	120	24	B
	208	24	S
	208	120	T
	240	24	J
	240	120	F
	277	24	N
	277	120	P
	380	110	U
	415	100	W
	480	240	R
	480/240	24	D
	480/240	120	A
	600	24	E
	600	120	C

Control Power Transformers^②

Description	Modification Code	Product Class	Enclosure Type	20-60	100	—	200	300-400	—	—	← Lighting & Heating Ratings (Amps)
				0-2½	3	3½, 4	5	6	7	8	
Standard Capacity ^① with 1-Secondary Fuse	B*	14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83 ^③ , 84 ^④ , 87, LE	1, 3, 4, 12 7 & 9		—	—	—	—	—	—	
Standard Capacity with 2-Primary and 1-Secondary Fuse	D*	14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83 ^③ , 84 ^④ , 87, LC, LE, CLM, CM	1, 3, 4, 12 7 & 9								
100VA Extra Capacity with 2-Primary and 1-Secondary Fuse	C*	14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83 ^③ , 84 ^④ , 87, LC, LE, CLM, CM	1, 3, 4, 12 7 & 9								
		36, 37, 88	All							—	—
150VA Extra Capacity with 2-Primary and 1-Secondary Fuse	C*1	14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83 ^③ , 84 ^④ , 87, LC, LE, CLM, CM	1, 3, 4, 12								
		36, 37, 88	All								—

Factory Assembled Fuse Clips—Class 25, 32, 84^④

Fuse Clip Amps	Volts	Modification Code	List Price \$
30	250	10	
30	600	11	
60	250	12	
60	600	13	
100	250	14	
100	600	15	
200	250	16	
200	600	17	
400	250	18	
400	600	19	
600	250	20	
600	600	21	
800	600	23	
1200	600	24	
1600	600	25	

Note: Factory will furnish the same voltage coils as transformer secondary voltage (except with class 36,37).

① The standard control transformer supplied for starter sizes 0 through 2½ will be rated 45VA and have the appropriate secondary fuse. Primary fuses will not be supplied as standard. For primary fuse option select appropriate suffix from table.

② For 24VAC control a minimum of 100VA CPT required.

③ Price x 2 Class 83 and 84.

④ Class 84 Duplex Controllers require two fusible disconnects thus multiply the price adder by two.

Additional Auxiliary Contacts

Class	NO Contacts	NC Contacts	Modification Code	Controller Size — List Price \$			
				00-1 $\frac{3}{4}$	2-4	5-6	7-8
14, 17, 18, 40, 83 ^③ , 84 ^③	—	1	G01			—	—
	—	2	G02			—	—
	1	—	G10			—	—
	1	1	G11			—	—
	1	2	G12			—	—
	2	—	G20			—	—
	2	1	G21			—	—
	2	2	G22			—	—
	2	3	G23			—	—
	3	1	G31			—	—
	3	2	G32			—	—
	3	3	G33		—	—	—
	4	—	G40			—	—
	4	1	G41			—	—
	4	2	G42		—	—	—
	4	4	G44		—	—	—
	5	—	G50			—	—
	5	1	G51			—	—
5	3	G53			—	—	
6	—	G60			—	—	
6	2	G62			—	—	
7	1	G71			—	—	
8	—	G80			—	—	
22, 25, 26, 43 & 30, 32 (2-winding)	—	2	G02 ^②			—	—
	2	—	G20 ^②			—	—
	2	2	G22 ^②			—	—
	4	0	G40 ^②			—	—
	4	4	G44 ^②			—	—
	6	2	G62 ^②			—	—
30, 32 (1-winding)	0	2	G02 ^②	—		—	—
	2	—	G20 ^②	—		—	—
	2	2	G22 ^②	—		—	—
	4	—	G40 ^②	—		—	—
	4	4	G44 ^②	—		—	—
	6	2	G62 ^②	—		—	—
8	—	G80 ^②	—		—	—	
LE, CLM, CM	1	1	G11		—	—	—
LC	0	1	G01				
	1	0	G10				
	1	1	G11				
	0	2	G02				
	2	0	G20				
LE, CLM, CM	0	2	G02 ^②		—	—	—
	2	0	G20 ^②		—	—	—
	2	2	G22 ^②		—	—	—

Description	Class	Modification Code	Controller Size - Price Deduction \$					
			0, 1	1 $\frac{1}{4}$ - 2 $\frac{1}{2}$	3	3 $\frac{1}{2}$, 4	5, 6	7, 8
Omit Overload Relay and Reset Button	17, 18, 25, 26	EX1						

① Auxiliary contacts will be added evenly across contactors. (i.e. Class 22, G02 suffix will add 2 NC contacts (one per contactor).)

② Double the price addition for Class 30 and 32.

③ For class 83 and 84 contacts will be added to both starters. Price x 2.

Factory Modifications

Selection

Control Options


Description	Class	Enclosure Type	Modification Code	List Price \$
Lighting Control Modules (does not include pilot devices)	CLM 20 Amp only	All	2W (2-wire control module) 3W (3-wire control module) 3WS (Start/Stop control module)	
Surge Suppression for 120V AC Coil ^②	14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 83, 84, 87, 88	All	SS	
Disconnect Switch Interlock 2 NO/2 NC DPDT	17, 25, 32, 37, 84, CM, LE	1, 3, 4, 4X, 12	GY	
Motor Circuit Protector Interlock NO/NC SPDT	18, 26, 32, 37, 84, CM, LE	All	GY	
Lightning Arrestor	All	All	L	
Circuit Breaker Shunt Trip	18, 26, 32, 37, 84, 87, 88, CM, LE	All	L6	
Circuit Breaker Undervoltage Trip	18, 26, 32, 37, 84, 87, 88, CM, LE	All	L7	
Circuit Breaker Alarm Switch Trip	18, 26, 32, 37, 84, 87, 88, CM, LE	All	L8	
Ground Lug – 3 Conductor	All	All	L10	
Control Circuit Fuse and Holder (Transformer Primary Fusing)	All	All	F1 (1 fuse) F2 (2 fuses)	
Control Circuit Circuit Breaker Internally Operated	All	All	F4	
Space Heater (120V separate control)	All	All	SH	
Space Heater with Thermostat (120V separate control)	All	All	ST	
Surge Capacitor	87, 88	All	SC	
Alarm Package (includes horn, light, relay & push-button)	83, 84, 87, 88	All	M7	
Backspin Protection	87, 88	All	T5	
Minimum Run Timer 0.2 sec. - 3 mins.	87, 88	All	T6	
Blown Control Fuse Indicator Light	17, 25, 32, 37, 84, 87, 88, CM, LC, LE	All	L11	
Single Phase 120VAC Combination Starter	17, 18, 25, 26	All	SP1	
Single Phase 240VAC Combination Starter	17, 18, 25, 26	All	SP2	

Reversing Options

Description	Class	Modification Code	Controller Size —List Price \$										
			0	1	1¼	2	2½	3	3½	4	5		
Reversing in one speed only 2 speed 1 winding	30, 32	R6											—
Reversing in one speed only 2 speed 2 winding		R7											—
Reversing in both speeds 2 speed 1 winding		R8											—
Reversing in both speeds 2 speed 2 winding		R9											—
Reversing for Reduced Voltage	36, 37	R											

Motor Management with PROFIBUS DP Communications^③

Description	Class	Enclosure Type	Modification Code	List Price
SIMOCODE pro C With 0.3-3A Current Module	14, 17, 18, 22, 25, 26	All	MC1	
SIMOCODE pro C With 2.4-25A Current Module			MC2	
SIMOCODE pro C With 10-100A Current Module			MC3	
SIMOCODE pro C With 20-200A Current Module			MC4	
SIMOCODE pro C With 63-630A Current Module			MC5	
SIMOCODE pro V With 0.3-3A Current/Voltage Module			MV1	
SIMOCODE pro V With 2.4-25A Current/Voltage Module			MV2	
SIMOCODE pro V With 10-100A Current/Voltage Module			MV3	
SIMOCODE pro V With 20-200A Current/Voltage Module			MV4	
SIMOCODE pro V With 63-630A Current/Voltage Module			MV5	
Factory Parameterization of SIMOCODE			MM0	

Electrically Held to Mechanically Held Conversion Modules	Class	Enclosure type	Contactors Size (Amp)	Description	Modification Code
	LC	Open, 1, 12, 4/4X	30	2-wire, 24VAC 2-wire, 110-120VAC 2-wire, 200-277VAC 3-wire, 24VAC 3-wire, 110-120VAC 3-wire, 200-277VAC	2W1 2W2 2W3 3W1 3W2 3W3

① Supplied as NEMA 12, field convertible to NEMA 3R.
② Surge Suppression for NEMA sizes 5 – 8 are supplied internal with the coil.

③ A CPT must also be ordered to power the motor management device. Motor management may be ordered with other product classes as specials.

Control Relays

Description	Class	Enclosure Type	Modification Code	List Price \$	
Control Relay 4-Poles Max	All	1, 3, 4, 7, 9, 12	R40		
4 NO			R22		
2 NO/2 NC 4 NC			R04		
Under/Over Voltage, Phase Failure, Phase Sequence, Phase Unbalance	All	All	R1		
Ground Fault Relay		All	R5		
Electronic On Delay Relay (.15s–100h) 24V/120V		1, 3, 4, 7, 9, 12		T1	
Electronic On Delay Relay (.15s–100h) 24V/240V ^①				T2	
Electronic Off Delay Relay (.15s–100s) 120V				T3	
Electronic Off Delay Relay (.15s–100s) 240V ^①			T4		
24 hour time clock 24 hour time clock with day omission 7 day time clock	LC, LE, CLM, CM	All	T7 T8 T9		
Compelling Relay	30, 32	1, 4, 12	A6		
Acceleration Control			A7		
Deceleration Control			A8		

Meters—Mounted on Enclosure

Description	Class	Enclosure Type	Modification Code	List ^② Price \$
Ammeter (includes a C.T. if necessary)	14, 17, 18, 22, 25, 26, 30 ^③ , 32 ^③ , 36, 37, 40, 43, 83, 84, 87, 88	1, 3, 4, 4X, 12	M1	
Ammeter and Switch (3-Phase with 3 C.T.'s)		1, 12	M2	
Voltmeter		1, 3, 4, 4X, 12	M3	
Voltmeter and Switch (3-Phase)		1, 12	M4	
Elapsed Time Meter ^④		1, 3, 4, 4X, 12	M5	

Function Identification Plates

Description	Class	Modification Code	List Price \$
Function identification plate, with marking as specified	All	N1	

Terminal Blocks

Description	Class	Modification Code	List Price \$
3 Point Terminal 6 Point Terminal 9 Point Terminal	All	TC3 ^④ TC6 ^④ TC9 ^④	

Special Ratings

Description	Class	Modification Code	List Price \$
Service Entrance Rating	17, 18, 25, 26, 32, 37, 84	N3	

Drawings

Description	Class	Catalog Number	List Price \$
Approval/submittal and as-built drawings for factory modified product may be ordered. The drawing set includes an enclosure outline, a panel layout and a schematic. When entering the order, use the line item notes to reference a product and modifications or an existing order that the drawings are to be engineered for. Specify the contact information and an email address in the ship to address field. Attach any reference drawings to the order or forward to National Customer Support. Once completed, the drawing set will emailed.	All	CONTROLDRAWING	

① Not available on Class 36, 37.
② Price x 2 Class 83 and 84.

③ ETM available with 120V coil only.
④ For terminal point more than 9 terminals use additional suffixes. Max 3 suffixes can be selected.

⑤ Class 30 and 32 can be modified with only an elapsed time meter. No other meters apply to class 30 or 32.

Overload Relay Heater Tables

Selection of Heater Elements for Overload Relays

General

Use only when motor full load current is not known. Motor amps will vary depending on the type and manufacturer of the motor. These average values, for motors with service factor of 1.15, are to be used only as a guide. The formulas at the bottom of the page may be used to obtain approximate amps for other motors.

Note: RPM shown for 60 cycle motors. For 50 cycle motors, multiply RPM by .83.

CAUTION: Actual motor amps may be higher or lower than the values listed below for a particular motor. For more reliable motor protection, select heater elements by using the full load motor nameplate amps.

Single Phase motor full load amps of the same horsepower, voltage and speed vary over wide ranges. The following table conforms with table 430.148 of the NEC.

1-Phase

Hp	Full Load Current (60Hz)	
	115 Volts	230 Volts
1/8	4.4	2.2
1/4	5.8	2.9
3/8	7.2	3.6
1/2	9.8	4.9
3/4	13.8	6.9
1	16	8
1 1/2	20	10
2	24	12
3	34	17
5	56	28
7 1/2	80	40
10	100	50

3-Phase

Hp	Syn Speed RPM	Full Load Current (60Hz)				50 Hz
		200 Volts	230 Volts	460 Volts	575 Volts	380 Volts
1/4	1800	1.09	0.95	0.48	0.38	0.55
	1200	1.61	1.40	0.70	0.56	0.81
	900	1.84	1.60	0.80	0.64	0.93
1/2	1800	1.37	1.19	0.60	0.48	0.64
	1200	1.83	1.59	0.80	0.64	0.92
	900	2.07	1.80	0.90	0.72	1.04
3/4	1800	1.98	1.72	0.86	0.69	0.99
	1200	2.47	2.15	1.08	0.86	1.24
	900	2.74	2.38	1.19	0.95	1.38
1	1800	2.83	2.46	1.23	0.98	1.42
	1200	3.36	2.82	1.46	1.17	—
	900	3.75	3.26	1.63	1.30	1.88
1 1/2	3600	3.22	2.80	1.40	1.12	1.70
	1800	4.09	3.56	1.78	1.42	2.06
	1200	4.32	3.76	1.88	1.50	2.28
2	900	4.95	4.30	2.15	1.72	2.60
	3600	5.01	4.36	2.18	1.74	2.69
	1800	5.59	4.86	2.43	1.94	2.94
3	1200	6.07	5.28	2.64	2.11	3.20
	900	6.44	5.60	2.80	2.24	3.39
	3600	6.44	5.60	2.80	2.24	3.39
4	1800	7.36	6.40	3.20	2.56	3.84
	1200	7.87	6.84	3.42	2.74	4.14
	900	9.09	7.90	3.95	3.16	4.77
5	3600	9.59	8.34	4.17	3.34	5.02
	1800	10.8	9.40	4.70	3.76	5.70
	1200	11.7	10.2	5.12	4.10	6.20
7 1/2	900	13.1	11.4	5.70	4.55	6.80
	3600	15.5	13.5	5.76	5.41	8.20
	1800	16.6	14.4	7.21	5.78	8.74
10	1200	18.2	15.8	7.91	6.32	9.59
	900	18.3	15.9	7.92	6.33	9.60
	3600	22.4	19.5	9.79	7.81	11.50
15	1800	24.7	21.5	10.7	8.55	13.00
	1200	25.1	21.8	10.9	8.70	13.20
	900	26.5	23.0	11.5	9.19	13.90
20	3600	29.2	25.4	12.7	10.1	15.40
	1800	30.8	25.8	13.4	10.7	16.30
	1200	32.2	28.0	14.0	11.2	16.90
30	900	35.1	30.5	15.2	12.2	18.50
	3600	41.9	36.4	18.2	14.5	22.00
	1800	45.1	39.2	19.6	15.7	23.70
40	1200	47.6	41.4	20.7	16.5	25.00
	900	51.2	44.5	22.2	17.8	26.90
	3600	58.0	50.4	25.2	20.1	30.50
50	1800	58.9	51.2	25.6	20.5	31.00
	1200	60.7	52.8	26.4	21.1	31.90
	900	63.1	54.9	27.4	21.9	33.20

3-Phase

Hp	Syn Speed RPM	Full Load Current (60Hz)				50 Hz
		200 Volts	230 Volts	460 Volts	575 Volts	380 Volts
25	3600	69.9	60.8	30.4	24.3	36.80
	1800	74.5	64.8	32.4	25.9	39.20
	1200	75.4	65.6	32.8	26.2	39.60
	900	77.4	67.3	33.7	27.0	40.70
30	3600	84.8	73.7	36.8	29.4	—
	1800	86.9	75.6	37.8	30.2	45.70
	1200	90.6	78.8	39.4	31.5	47.60
	900	94.1	81.8	40.9	32.7	49.50
40	3600	111	96.4	48.2	38.5	—
	1800	116	101	50.4	40.3	61.00
	1200	117	102	50.6	40.4	61.20
	900	121	105	52.2	41.7	63.20
50	3600	138	120	60.1	48.2	—
	1800	143	124	62.2	49.7	75.20
	1200	145	126	63.0	50.4	76.20
	900	150	130	65.0	52.0	78.50
60	3600	164	143	71.7	57.3	—
	1800	171	149	74.5	59.4	90.00
	1200	173	150	75.0	60.0	91.10
	900	177	154	77.0	61.5	93.10
75	3600	206	179	89.6	71.7	—
	1800	210	183	91.6	73.2	111.00
	1200	212	184	92.0	73.5	112.00
	900	222	193	96.5	77.5	117.00
100	3600	266	231	115	92.2	—
	1800	271	236	118	94.8	144.00
	1200	275	239	120	95.6	145.00
	900	290	252	126	101	153.00
125	3600	—	292	146	116	—
	1800	—	293	147	117	177.00
	1200	—	298	149	119	180.00
	900	—	305	153	122	186.00
150	3600	—	343	171	137	—
	1800	—	348	174	139	210.00
	1200	—	350	174	139	210.00
	900	—	365	183	146	211.00
200	3600	—	458	229	184	—
	1800	—	452	226	181	274.00
	1200	—	460	230	184	276.00
	900	—	482	241	193	279.00
250	3600	—	559	279	223	—
	1800	—	568	284	227	343.00
	1200	—	573	287	229	345.00
	900	—	600	300	240	347.00
300	1800	—	278	339	271	392.00
	1200	—	684	342	274	395.00
400	1800	—	896	448	358	—

Formula—Approximate Full Load Amps for Other Motors

208 Volt Full Load Amp \approx 230 Volt current \times 110%
 2-Phase FLA \approx 0.866 \times the 3-Phase FLA
 2-Phase, 3-wire current in common wire \approx 1.41 \times that in the other 2 lines

25Hz 1500 RPM, amps \approx amps of 60Hz, 3600 RPM
 25Hz 750 RPM, amps \approx amps of 60Hz, 1800 RPM
 Service factor 1.0 \approx amps \times 0.9
 50°C–55°C motor \approx amps \times 0.9

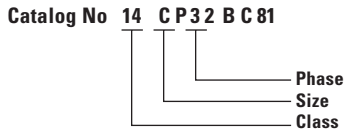
Overload Relay Heater Tables

Selection of Heater Elements for Overload Relays

General

To Select Heater Catalog Number Use

- Product Class
- Controller Size
- Motor Amp
- Phase



1. Find heater table number below, using the Product Class, Controller Size and Phase. Heater table number is found in the column under the type of overload and phase.

2. Refer to the specified table and use the controller size and motor amps to select the heater catalog number.

a. If motor amps are not known, an approximate value may be found on the previous page. These values should be used with caution and only when motor amps are not available.

Heaters shown on the following pages provide a maximum trip rating of 125% of minimum motor amperes for 40°C motors (service factor 1.15). For other motors (service factor 1.0), select the next lower listed heater catalog number within the designated table which provides a maximum trip rating of approximately 115%.

Overload relays do not provide protection against short circuits. To ensure proper coordination with short circuit protective device, select heaters from the information packaged with the control device.

Class	Description	Size or Amperage	Controller Size Letter	Heater Table Number			
				Bimetal Standard Trip (Class 20)		Bimetal Quick Trip (Class 10)	
				Compensated E Heaters Green Reset		Compensated K Heaters Green Reset	
				1Ph	3Ph	1Ph	3Ph
SMF	Manual Magnetic	All	—	See Page 17-128			
14, 22	Non-reversing, Reversing	00-4	B-J	213	233	313	332
17, 18 25, 26 30, 32 [ⓐ] 83, 84 87, 89	Combination Reversing Combination Multi Speed Pump Controllers Motor Control Centers	0-4	C-J	—	233	—	332
48	Panel Mounted Overload Relay	25-180A	D-J	216	238	316	335

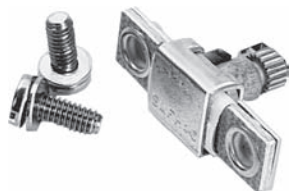
ESP200 starters do not require heater elements.

ⓐ **Overload Relay Selection Multi-Speed**

Each speed requires a separate set of overloads. The adjustment range must be selected on the basis of the full-load current for each particular speed.

NEMA & General Purpose Control

17 CONTROL PRODUCTS



Heater Elements Class SMF

Ordering Information

- Determine number of heater elements required from Table A.
- Determine motor full load current and service factor.
NOTE: If motor amps are unknown, an approximate value may be found on page 17-126. These values should be used with caution and only when motor amps are not available.
- If the motor and controller are in the same ambient temperature:
 - For 1.15 to 1.25 service factor motors use 100% of motor full load current for heater element selection.
 - For 1.0 service factor motors use 90% of motor full load current for heater element selection.
 - Heater elements are class 20.
- If the motor and controller are in different ambient temperatures multiply motor full load current by the multiplier in Table B. Use the resultant full load current for heater element selection.
- Select proper heater element from table below.
- All tables are based on the operation of the motor and controller in the same ambient temperature, 40°C (104°F) or less. Always be certain the correct heater element is installed in the starter before operating the motor.

Heater Catalog Number	Motor Full-Load Current (Amps)	List Price \$
SMFH01	0.157-0.173	
SMFH02	0.174-0.192	
SMFH03	0.193-0.212	
SMFH04	0.213-0.235	
SMFH05	0.236-0.261	
SMFH06	0.262-0.289	
SMFH07	0.290-0.321	
SMFH08	0.322-0.355	
SMFH09	0.356-0.399	
SMFH10	0.41-0.44	
SMFH11	0.45-0.49	
SMFH12	0.50-0.53	
SMFH13	0.54-0.58	
SMFH14	0.59-0.65	
SMFH15	0.66-0.71	
SMFH16	0.72-0.78	
SMFH17	0.79-0.85	
SMFH18	0.86-0.96	
SMFH19	0.97-1.04	
SMFH20	1.05-1.16	
SMFH21	1.17-1.25	
SMFH22	1.30-1.39	
SMFH23	1.38-1.54	
SMFH24	1.48-1.63	
SMFH25	1.57-1.75	
SMFH26	1.66-1.86	

Heater Catalog Number	Motor Full-Load Current (Amps)	List Price \$
SMFH27	1.80-1.99	
SMFH28	1.96-2.15	
SMFH29	2.16-2.38	
SMFH30	2.39-2.75	
SMFH31	2.76-2.84	
SMFH32	2.85-3.06	
SMFH33	3.07-3.45	
SMFH34	3.46-3.70	
SMFH35	3.71-4.07	
SMFH36	4.08-4.32	
SMFH37	4.33-4.90	
SMFH38	4.91-5.35	
SMFH39	5.36-5.85	
SMFH40	5.86-6.41	
SMFH41	6.42-6.79	
SMFH42	6.80-7.57	
SMFH43	7.58-8.15	
SMFH44	8.16-8.98	
SMFH45	8.99-9.67	
SMFH46	9.68-9.95	
SMFH47	9.96-10.8	
SMFH48	10.9-12.1	
SMFH49	12.2-13.1	
SMFH50	13.2-13.9	
SMFH51	14.0-15.0	
SMFH52	15.1-16.0	

Table A
Number of Heater Elements

Device	Number of Heater Elements	Notes
SMFF*1 SMFF*2 SMFF*3 SMFF*4 SMFF*5 SMFF*6	1	All single pole and two pole SMF starters require only 1 Heater Element.
SMFF*22 SMFF*44	2	Duplex Unit. One Heater Element per starter.
SMFF*11 SMFF*22	2	Two Speed Starter. One Heater Element per speed.

Table B—Special Applications
Heater Element Selection

Continuous Duty Motor Service Factor	Ambient Temperature of Motor		
	Same as Controller Ambient	Constant 10°C (18°F) Higher Than Controller Ambient	Constant 10°C (18°F) Lower Than Controller Ambient
	Full Load Current Multiplier		
1.15 to 1.25	1.0	0.9	1.05
1.0	0.9	0.8	0.95

Overload Relay Heater Tables

Full Load Motor Amps, Single Phase, Trip Class 20 – Tables 213, 216

Selection

Table 213 for Class 14, 22 (1-Phase)

Full Load Amps			Heater Catalog No	List Price \$
Size 00, 0, 1	Size 1P	Size 2, 2½		
0.37-0.40	—	—	E3	
0.41-0.44	0.41-0.44	—	E4	
0.45-0.47	0.45-0.47	—	E5	
0.48-0.52	0.48-0.52	—	E6	
0.53-0.57	0.53-0.57	—	E7	
0.58-0.62	0.58-0.62	—	E8	
0.63-0.69	0.63-0.69	—	E9	
0.70-0.74	0.70-0.74	—	E11	
0.75-0.81	0.75-0.81	—	E12	
0.82-0.85	0.82-0.85	—	E13	
0.86-0.93	0.86-0.93	—	E14	
0.94-1.03	0.94-1.03	—	E16	
1.04-1.11	1.04-1.11	—	E17	
1.12-1.22	1.12-1.22	—	E18	
1.23-1.34	1.23-1.34	—	E23	
1.35-1.53	1.35-1.53	—	E24	
1.54-1.71	1.54-1.71	—	E26	
1.72-1.92	1.72-1.92	—	E27	
1.93-2.12	1.93-2.12	—	E28	
2.13-2.24	2.13-2.24	—	E29	
2.25-2.43	2.25-2.43	—	E31	
2.44-2.57	2.44-2.57	—	E32	
2.58-2.86	2.58-2.86	—	E33	
2.87-3.16	2.87-3.16	—	E34	
3.17-3.35	3.17-3.35	—	E36	
3.36-3.58	3.36-3.58	—	E37	
3.59-3.90	3.59-3.90	—	E38	
3.91-4.25	3.91-4.25	—	E39	
4.26-4.77	4.26-4.77	—	E41	
4.78-5.35	4.78-5.35	—	E42	
5.36-5.76	5.36-5.76	—	E44	
5.77-6.33	5.77-6.33	—	E46	
6.34-6.98	6.34-6.98	—	E47	
6.99-7.37	6.99-7.37	—	E48	
7.38-7.71	7.38-7.71	—	E49	
7.72-8.51	7.72-8.51	—	E50	
8.52-9.31	8.52-9.31	—	E51	
9.32-10.1	9.32-10.1	—	E52	
10.2-10.9	10.2-10.9	—	E53	
11.0-12.2	11.0-12.2	—	E54	
12.3-13.5	12.3-13.5	—	E55	
13.6-15.7	13.6-15.7	—	E56	
15.8-17.3	15.8-17.3	19.4-22.0	E57	
17.4-19.9	17.4-19.9	22.1-23.5	E60	
20.0-21.7	20.0-21.7	23.6-25.0	E61	
21.8-23.4	21.8-23.4	25.1-27.0	E62	
23.5-24.0	23.5-23.7	27.1-28.9	E65	
—	23.8-25.1	29.0-31.0	E66	
—	25.2-27.9	31.1-34.8	E67	
—	28.0-32.2	34.9-36.9	E69	
—	32.3-34.0	37.0-43.9	E70	
—	—	44.0-46.0	E72	
—	—	46.1-48.3	E73	
—	—	48.4-55.0	E74	
—	—	55.1-60.0	E76	

Table 216 for Class 48

Full Load Amps			Heater Catalog No	List Price \$
48DA, 48GA	48HA	48JA		
0.34-0.36	—	—	E3	
0.37-0.40	—	—	E4	
0.41-0.43	—	—	E5	
0.44-0.47	—	—	E6	
0.48-0.51	—	—	E7	
0.52-0.56	—	—	E8	
0.57-0.62	—	—	E9	
0.63-0.67	—	—	E11	
0.68-0.73	—	—	E12	
0.74-0.77	—	—	E13	
0.78-0.84	—	—	E14	
0.85-0.93	—	—	E16	
0.94-1.00	—	—	E17	
1.01-1.10	—	—	E18	
—	—	—	E19	
1.11-1.21	—	—	E23	
1.22-1.38	—	—	E24	
1.39-1.54	—	—	E26	
1.55-1.73	—	—	E27	
1.74-1.91	—	—	E28	
1.92-2.02	—	—	E29	
2.03-2.19	—	—	E31	
2.20-2.32	—	—	E32	
2.33-2.58	—	—	E33	
2.59-2.85	—	—	E34	
2.86-3.02	—	—	E36	
3.03-3.23	—	—	E37	
3.24-3.52	—	—	E38	
3.53-3.83	—	—	E39	
3.84-4.30	—	—	E41	
4.31-4.82	—	—	E42	
4.83-5.19	—	—	E44	
5.20-5.71	—	—	E46	
5.72-6.29	—	—	E47	
6.30-6.64	—	—	E48	
6.65-6.95	—	—	E49	
6.96-7.67	—	—	E50	
7.68-8.39	—	—	E51	
8.40-9.19	—	—	E52	
9.20-9.94	—	—	E53	
9.95-10.9	—	—	E54	
11.0-12.2	—	—	E55	
12.3-14.2	—	—	E56	
14.3-15.6	—	—	E57	
—	—	—	E59	
15.7-17.9	—	—	E60	
18.0-19.6	—	—	E61	
19.7-22.3	—	—	E62	
22.4-24.0	—	—	E65	
24.1-25.9	—	—	E66	
26.0-29.5	27.1-30.0	—	E67	
29.6-32.5	30.1-33.2	—	E69	
32.6-33.5	33.3-35.7	—	E70	
33.6-36.9	35.8-39.4	—	E71	
37.0-39.2	39.5-43.4	—	E72	
39.3-43.1	43.5-46.9	—	E73	
43.2-47.4	47.0-51.5	—	E74	
47.5-50.0	51.6-57.0	—	E76	
50.1-55.2	57.1-62.8	—	E77	
55.3-60.0	62.9-69.1	—	E78	
—	69.2-75.0	—	E79	
—	75.1-83.3	—	E80	
—	—	50.0-55.9	E88	
—	—	56.0-60.9	E89	
—	—	61.0-65.9	E91	
—	—	66.0-69.9	E92	
—	—	70.0-75.9	E93	
—	—	76.0-81.9	E94	
—	83.4-86.9	82.0-86.9	E96	
—	87.0-92.9	87.0-92.9	E97	
—	93.0-100.0	93.0-97.9	E98	
—	—	98.0-107.9	E99	
—	—	108.0-113.9	E101	
—	—	114.0-125.0	E102	
—	—	126.0-138.0	E103	
—	—	139.0-153.0	E104	
—	—	154.0-163.0	E106	
—	—	164.0-180.0	E107	

NEMA & General Purpose Control

17 CONTROL PRODUCTS

Overload Relay Heater Tables

Full Load Motor Amps, Single Phase, Trip Class 10 – Tables 313, 316

Selection

Table 313 for Class 14, 22 (1-Phase)

Full Load Amps			Heater Catalog No	List Price \$
Size 00, 0, 1	Size 1P	Size 2, 2½		
1.85-2.05	1.85-2.05	—	K21	
2.06-2.35	2.06-2.35	—	K22	
2.36-2.64	2.36-2.64	—	K24	
2.65-2.96	2.65-2.96	—	K27	
2.97-3.31	2.97-3.31	—	K28	
3.32-3.51	3.32-3.51	—	K29	
3.52-3.87	3.52-3.87	—	K31	
3.88-4.31	3.88-4.31	—	K32	
4.32-4.79	4.32-4.79	—	K33	
4.80-5.21	4.80-5.21	—	K34	
5.22-5.75	5.22-5.75	—	K36	
5.76-6.11	5.76-6.11	—	K37	
6.12-6.95	6.12-6.95	—	K39	
6.96-7.73	6.96-7.73	—	K41	
7.74-8.47	7.74-8.47	—	K42	
8.48-9.52	8.48-9.52	—	K43	
9.53-10.4	9.53-10.4	—	K49	
10.5-11.1	10.5-11.1	—	K50	
11.2-12.4	11.2-12.4	—	K52	
12.5-13.5	12.5-13.5	—	K53	
13.6-15.1	13.6-15.1	—	K54	
15.2-16.6	15.2-16.6	—	K55	
16.7-17.6	16.7-17.6	—	K57	
17.7-18.8	17.7-18.8	18.7-19.7	K58	
18.9-21.6	18.9-21.6	19.8-21.3	K60	
21.7-22.7	21.7-22.7	21.4-22.8	K61	
22.8-25.3	22.8-25.3	22.9-24.2	K62	
—	25.4-26.6	24.3-26.5	K63	
—	26.7-30.1	26.6-29.3	K64	
—	30.2-33.0	29.4-32.0	K67	
—	33.1-34.1	32.1-35.6	K68	
—	—	35.7-37.9	K69	
—	—	38.0-40.3	K70	
—	—	40.4-44.3	K72	
—	—	44.4-49.5	K73	
—	—	49.6-52.1	K74	
—	—	52.2-53.7	K75	
—	—	53.8-60.0	K76	

Table 316 for Class 48

Full Load Amps				Heater Catalog No	List Price \$
48DA	48GA	48HA	48JA		
1.69-1.88	—	—	—	K21	
1.89-2.05	—	—	—	K22	
2.06-2.21	—	—	—	K23	
2.22-2.44	—	—	—	K24	
2.45-2.70	—	—	—	K26	
2.71-2.92	—	—	—	K27	
2.93-3.27	—	—	—	K28	
3.28-3.56	—	—	—	K29	
3.57-3.83	—	—	—	K31	
3.84-4.23	—	—	—	K32	
4.24-4.57	—	—	—	K33	
4.58-4.97	—	—	—	K34	
4.98-5.67	—	—	—	K36	
5.68-6.11	—	—	—	K37	
6.12-6.91	—	—	—	K39	
6.92-7.65	—	—	—	K41	
7.66-8.4	—	—	—	K42	
8.5-8.9	—	—	—	K43	
9.0-10.1	9.12-9.6	—	—	K49	
10.2-11.2	9.7-10.4	—	—	K50	
11.3-12.3	10.5-11.4	—	—	K52	
12.4-13.3	11.5-12.1	—	—	K53	
13.4-14.1	12.2-12.9	—	—	K54	
14.2-15.0	13.0-13.7	—	—	K55	
15.1-16.2	13.8-14.8	—	—	K56	
16.3-17.5	14.9-16.4	—	—	K57	
17.6-18.6	16.5-18.2	—	—	K58	
18.7-19.9	18.3-19.5	—	—	K60	
20.0-21.3	19.6-20.9	—	—	K61	
21.4-22.8	21.0-22.8	23.2-25.1	—	K62	
22.9-25.1	22.9-24.7	25.2-27.3	—	K63	
25.2-27.6	24.8-27.6	27.4-30.4	—	K64	
27.7-30.0	27.7-30.5	30.5-33.3	—	K67	
—	30.6-33.9	33.4-36.5	—	K68	
—	34.0-37.3	36.6-39.3	—	K69	
—	37.4-40.2	39.4-43.5	—	K70	
—	40.3-41.9	43.6-46.6	43.0-46.5	K72	
—	42.0-45.9	46.7-51.1	46.6-50.9	K73	
—	46.0-50.9	51.2-56.3	51.0-55.9	K74	
—	51.0-52.9	56.4-61.1	56.0-59.1	K75	
—	53.0-57.7	61.2-64.9	59.2-68.7	K76	
—	57.8-60.0	65.0-71.9	—	K77	
—	—	72.0-80.7	68.8-80.7	K78	
—	—	80.8-92.7	80.8-92.7	K85	
—	—	92.8-100.0	92.8-103.9	K86	
—	—	—	104.0-113.5	K87	
—	—	—	113.6-127.9	K89	
—	—	—	128.0-143.9	K92	
—	—	—	144.0-163.9	K94	
—	—	—	164.0-180.0	K96	

NEMA & General Purpose Control

CONTROL PRODUCTS

Overload Relay Heater Tables

Full Load Motor Amps, 3-Phase, Trip Class 10 – Tables 332, 335

Selection

Table 332 for Class 14, 17, 18, 22, 25, 26, 30, 32, 83, 84, 87 (3-Phase)

Full Load Amps					Heater Catalog No	List Price \$
Size 00, 0, 1	Size 1 $\frac{1}{4}$	Size 2, 2 $\frac{1}{2}$	Size 3, 3 $\frac{1}{2}$	Size 4		
1.52–1.65	1.52–1.65	—	—	—	K21	
1.66–1.79	1.66–1.79	—	—	—	K22	
1.80–1.94	1.80–1.94	—	—	—	K23	
1.95–2.15	1.95–2.15	—	—	—	K24	
2.16–2.37	2.16–2.37	—	—	—	K26	
2.38–2.56	2.38–2.56	—	—	—	K27	
2.57–2.87	2.57–2.87	—	—	—	K28	
2.88–3.13	2.88–3.13	—	—	—	K29	
3.14–3.37	3.14–3.37	—	—	—	K31	
3.38–3.72	3.38–3.72	—	—	—	K32	
3.73–4.00	3.73–4.00	—	—	—	K33	
4.01–4.35	4.01–4.35	—	—	—	K34	
4.36–4.99	4.36–4.99	—	—	—	K36	
5.00–5.38	5.00–5.38	—	—	—	K37	
5.39–5.79	5.39–5.79	—	—	—	K39	
5.80–6.43	5.80–6.43	—	—	—	K41	
6.44–6.83	6.44–6.83	—	—	—	K42	
6.84–7.83	6.84–7.83	—	—	—	K43	
7.84–8.23	7.84–8.23	—	—	—	K49	
8.24–9.59	8.24–9.59	—	—	—	K50	
9.60–9.90	9.60–9.90	—	—	—	K52	
10.0–10.7	10.0–10.7	—	—	—	K53	
10.8–11.6	10.8–11.6	12.1–12.7	—	—	K54	
11.7–12.3	11.7–12.3	12.8–13.5	—	—	K55	
12.4–13.4	12.4–13.4	13.6–14.6	—	—	K56	
13.5–14.2	13.5–14.2	14.7–15.9	—	—	K57	
14.3–15.1	14.3–15.1	16.0–16.9	—	—	K58	
15.2–17.5	15.2–17.5	17.0–18.2	—	—	K60	
17.6–18.7	17.6–18.7	18.3–19.5	—	—	K61	
18.8–20.0	18.8–20.0	19.6–20.9	—	—	K62	
20.1–21.5	20.1–21.5	21.0–23.1	—	—	K63	
21.6–23.9	21.6–23.9	23.2–25.4	—	—	K64	
24.0–25.8	24.0–25.8	25.5–27.9	—	—	K67	
—	—	25.9–29.5	—	—	K68	
—	—	28.0–30.5	—	—	K69	
—	29.6–32.7	30.6–33.5	36.8–40.0	—	K70	
—	32.8–36.0	33.6–37.2	40.1–42.4	—	K72	
—	—	37.3–40.7	42.5–46.3	—	K73	
—	—	40.8–43.0	46.4–49.6	—	K74	
—	—	43.1–47.9	49.7–52.3	49.7–52.3	K75	
—	—	48.0–52.7	52.4–57.5	52.4–57.5	K76	
—	—	52.8–58.3	57.6–63.9	57.6–63.0	K77	
—	—	58.4–60.0	64.0–67.9	63.1–68.1	K78	
—	—	—	68.0–74.3	68.2–74.3	K83	
—	—	—	74.4–77.9	74.4–79.9	K85	
—	—	—	78.0–83.1	80.0–87.4	K86	
—	—	—	83.2–91.4	87.5–90.0	K87	
—	—	—	91.5–99.9	90.1–100.0	K88	
—	—	—	100.0–108.0	100.1–108.0	K89	
—	—	—	—	108.1–119.0	K90	
—	—	—	—	119.1–130.0	K92	
—	—	—	—	—	K94	
—	—	—	—	—	K96	

Table 335 for Class 48

Full Load Amps				Heater Catalog No	List Price \$
48DC	48GC	48HA	48JA		
1.56–1.69	—	—	—	K21	
1.70–1.84	—	—	—	K22	
1.85–1.98	—	—	—	K23	
1.99–2.19	—	—	—	K24	
2.20–2.43	—	—	—	K26	
2.44–2.63	—	—	—	K27	
2.64–2.95	—	—	—	K28	
2.96–3.21	—	—	—	K29	
3.22–3.45	—	—	—	K31	
3.46–3.81	—	—	—	K32	
3.82–4.10	—	—	—	K33	
4.11–4.46	—	—	—	K34	
4.47–5.10	—	—	—	K36	
5.11–5.49	—	—	—	K37	
5.50–6.21	—	—	—	K39	
6.22–6.76	—	—	—	K41	
6.77–7.62	—	—	—	K42	
7.63–8.07	—	—	—	K43	
8.08–9.19	—	—	—	K49	
9.20–10.0	—	—	—	K50	
10.1–11.0	—	—	—	K52	
11.1–12.0	—	—	—	K53	
12.1–12.7	—	—	—	K54	
12.8–13.5	—	—	—	K55	
13.6–14.5	—	—	—	K56	
14.6–15.7	—	—	—	K57	
15.8–16.7	—	—	—	K58	
16.8–17.9	—	—	—	K60	
18.0–19.2	18.0–19.2	—	—	K61	
19.3–20.5	19.3–20.5	23.2–25.1	—	K62	
20.6–22.5	20.6–22.5	25.2–27.3	—	K63	
22.6–24.8	22.6–24.8	27.4–30.4	—	K64	
24.9–27.6	24.9–27.6	30.5–33.3	—	K67	
27.7–30.0	—	33.4–36.5	—	K68	
—	27.7–30.1	36.6–39.3	—	K69	
—	30.2–33.1	39.4–43.5	—	K70	
—	33.2–36.7	43.6–46.6	43.0–46.5	K72	
—	36.8–40.1	46.7–51.1	46.6–50.9	K73	
—	40.2–45.5	51.2–56.3	51.0–55.9	K74	
—	45.6–47.9	56.4–61.1	56.0–59.1	K75	
—	48.0–52.7	61.2–64.9	59.2–68.7	K76	
—	52.8–55.1	65.0–71.9	—	K77	
—	55.2–60.0	72.0–80.7	68.8–80.7	K78	
—	—	80.8–92.7	80.8–92.7	K85	
—	—	92.8–100.0	92.8–103.9	K86	
—	—	—	104.0–113.5	K87	
—	—	—	113.6–127.9	K89	
—	—	—	128.0–143.9	K92	
—	—	—	144.0–163.9	K94	
—	—	—	164.0–180.0	K96	

NEMA & General Purpose Control

CONTROL PRODUCTS 17

Replacement Parts

Ordering Information

► 4th character of starter or contactor catalog number indicates model.

AC Coils — For Class 14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 40, 43, 83, 84, 87, 88

	Size	Model	Volts		Catalog Number	List Price \$
			60Hz	50Hz		
	00-2½	P U (ESP200)	24 120 110-120/220-240 208 220-240 277 220-240/440-480 440-480 575-600	24 110 110/190-220 — 190-220 240 190-220/380-440 380-440 550	75D73070J 75D73070F 75D73070A 75D73070D 75D73070G 75D73070L 75D73070C 75D73070H 75D73070E	
	3, 3½	P U (ESP200)	24 120 110-120/220-240 208 220-240 277 220-240/440-480 440-480 575-600	24 110 110/190-220 — 190-220 240 190-220/380-440 380-440 550	75D73251J 75D73251F 75D73251A 75D73251D 75D73251G 75D73251L 75D73251C 75D73251H 75D73251E	
	4	G U (ESP200)	24 120 120/220-240 208 220-240 277 220-240/440-480 440-480 575-600	24 110 110/190-220 — 190-220 240 190-220/380-440 380-440 550	75D70131J 75D70131F 75D70131A 75D70131D 75D70131G 75D70131L 75D70131C 75D70131H 75D70131E	
	4, 5	V (Vacuum)	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	3RT1966-5AB31 3RT1966-5AF31 3RT1966-5AM31 3RT1966-5AP31 3RT1966-5AU31 3RT1966-5AV31 3RT1966-5AR31 3RT1966-5AT31	
	5	P	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	3RT1965-5AB31 3RT1965-5AF31 3RT1965-5AM31 3RT1965-5AP31 3RT1965-5AU31 3RT1965-5AV31 3RT1965-5AR31 3RT1965-5AT31	
	6	P V (Vacuum)	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	3RT1975-5AB31 3RT1975-5AF31 3RT1975-5AM31 3RT1975-5AP31 3RT1975-5AU31 3RT1975-5AV31 3RT1975-5AR31 3RT1975-5AT31	
	7	H	100-250 150-500	100-250 150-500	75ZAF750-70 75ZAF750-71	
	8	H	100-250	100-250	75ZAF1650-70 ^①	

^① Set of 2 coils. Recommend to change printed circuit board when changing coils. 49ZP1650 see page 17-134.

Replacement Parts

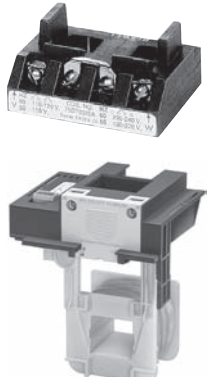
Starters and Contactors – DC Coils, Late Break Aux Contacts, Rectifiers, Contact Kits

Selection

Ordering Information

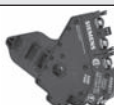
- ▶ 4th character of starter or contactor catalog number indicates model.
- ▶ DC Coils for Size 00-4 require Late Break Interlock.

DC Coils — For Class 14, 17, 18, 22, 25, 26, 30, 32, 40, 43


	Size	Model	Volts DC	Catalog Number	List Price \$
	00-2½	P U (ESP200)	12	75D73070R	
			24	75D73070S	
			32	75D73070T	
			48	75D73070U	
			125	75D73070V	
	250	75D73070W			
	3, 3½	P U (ESP200)	12	75D73251R	
			24	75D73251S	
			32	75D73251T	
			48	75D73251U	
			125	75D73251V	
	250	75D73251W			
	4	G U (ESP200)	48	75D70131U	
			125	75D70131V	
			250	75D70131W	
	4, 5	V (Vacuum)	23-26	3RT1966-5AB31	
42-48			3RT1966-5AD31		
110-127			3RT1966-5AF31		
240-277			3RT1966-5AU31		

Note: For sizes 7 & 8 contactors the AC coils are used for DC see page 17-131.


Late Break Auxiliary Contacts

	Control Size	Model	Catalog Number	List Price \$
	00-4	P, G, S, T	49AB01LB	

Board for Size 8 Contactor

	Control Size	Model	Catalog Number	List Price
	8	H	49ZP1650	

Contact Kits – Single Pole Stationary and Movable Contacts, Contact Spring^①

Description	Size	Number of Poles in Kit	Model (4th position in part number)	Catalog Number	List Price \$
	Internal Aux Contact (00-1-¾)		P, U	75AF14	
	00		P, U	75BF14	
	0		P, U	75CF14	
	1	1	P, U	75DF14	
	1¼-1P		P, U	75EF14	
	2	1	P, U	75FP14	
	2½	1	P, U	75GP14	
	3		P, U	75HF14	
	3½	1	P, U	75IF14	
	4	1	G, T	75JG14	
4 (Vacuum)	3 (Bottles)	V, C	3RT1964-6V		
Class 14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 40, 43, 83, 84, 87, 88	5	3	P	3RT1966-6A	
	5 (Vacuum)	3 (Bottles)	V, C	3RT1966-6V	
	6	3	P	3RT1976-6A	
14, 40	6 (Vacuum)	3 (Bottles)	V, C	3RT1976-6V	
	7	3	H	49ZL750	
	8	3	H	49ZL1650	

Armature and Magnet Kits

Size	Catalog Number	List Price \$
00-2½	49AMSA2	
3-3½	49AMSA3	
4	49AMSA4	

① On 3-phase controls, all 3-poles should be replaced - 3 kits required.

NEMA & General Purpose Control

17 CONTROL PRODUCTS

Replacement Parts

Starters and Contactors – Coil VA Ratings and Overload Relays

Selection

Coil VA Ratings

Device Type	Contactors Size	Amps	Volts	Number of Poles	Total Inrush VA	Total Sealed VA
NEMA Starter	00 thru 2 1/2	—	—	—	218	25
	3 thru 3 1/2	—	—	—	310	26
	4	—	—	—	510	51
	5	—	—	—	590	6.7
	6	—	—	—	830	9.2
	7	—	—	—	850	12
	8	—	—	—	1900	48
	4,5,6 (Vacuum)	—	—	—	630	7.4
Lighting Contactor Mechanically Held (CLM)	—	20	—	2-12	625	6
	—	30	—	2-5	410	40
	—	60	—	2-3	410	40
	—	60	—	4-5	600	40
	—	100 - 200	—	2-3	900	200
	—	100 - 200	—	4-5	1300	130
	300 - 400	—	3	1600	550	
Lighting Contactor Electrically Held (LC)	—	30	ALL	2-12	248	28
Lighting Contactor Electrically Held (LE)	—	20	ALL	3 and 4	31.7	4.8
	—	30	ALL	3 and 4	87	9.4
	—	60	ALL	3	166	12.6
	—	100	ALL	3	300	21
	—	200	ALL	3	300	5.6
	—	300	ALL	3	590	6.7
	—	400	ALL	3	830	9.2

Overload Relays^{①②} – For Class 14, 17, 18, 22, 25, 26, 30, 32, 83, 84, 87

Size	Half Size	Model	Number Poles	Ambient Comp Bimetal			
				Catalog Number (1) NC	List Price \$	Catalog Number (1) NO/NC	List Price \$
00-1	—	P	1	48DC18AA3			
			3	48DC38AA3		48DC39AA3	
1P	—	P	1	48EC18AA3			
—	1 1/4	P	3	48EC38AA3		48EC39AA3	
2	—	P	1	48GC18AA3			
			3	48GC38AA3		48GC39AA3	
—	2 1/2	P	1	48GC18AA3			
			3	48GC38AA3		48GC39AA3	
3	—	P	3	48HC38AA3			
—	3 1/2	P	3	48HC38AA3			
4	—	G	3	48JC38AA3			

For Starter and Contactor replacement parts not found in this section, please refer to Field Modification kits found starting on page 17-105.





① For replacement Solid State overload relays, please see the Overload Relay section found starting on page 17-66.

② Includes overload mounting plate to be coupled to contactor mounting plate.

Replacement Parts

Lighting and Heating Contactors, Type LC, LE, CLM, CMF, CMN


Selection

Power Pole Kits	Class	Enclosure type	Contactors Size (Amp)	Description	Catalog No.
	LC	Open, 1, 12, 4/4X	30	Single power pole Double power pole	49LCPP1A 49LCPP2A
Replacement Coil Kits	Class	Enclosure type	Description	Catalog No.	
	LC	30	24V 60Hz / 20V 50Hz 115-120V 60Hz / 110V 50Hz 200-208V 60Hz 230-240V 60Hz / 220V 50Hz 277V 60Hz / 240V 50Hz 347V 60Hz 460-480V 60Hz / 440V 50Hz 575-600V 60Hz / 550V 50Hz	75LCC024A 75LCC120A 75LCC208A 75LCC240A 75LCC277A 75LCC347A 75LCC480A 75LCC600A	
	LE	20, 30 60 100	NA	NA	3RT19355AC21 3RT19355AK61 3RT19355AM21 3RT19355AP61 3RT19355AU61 3RT19355AV61 3RT19355AT61 3RT19455AC21 3RT19455AK61 3RT19455AM21 3RT19455AP61 3RT19455AU61 3RT19455AV61 3RT19455AT61
Replacement Contact Kits	Class	Enclosure type	Description	Catalog No.	
	LC	30	NA	NA	
	LE	20, 30 60 100 200 300 400	1 contact kit includes 3 moving and 6 fixed contacts.	3RT1935-6A 3RT1945-6A 3RT1956-6A 3RT1965-6A 3RT1975-6A	



NEMA & General Purpose Control

17 CONTROL PRODUCTS

AC Coils 20 Amps^②

	Type	Contactors Size	Number of Poles	120V, 60Hz 110V, 50Hz	List Price \$	240V, 60Hz 208V, 50Hz	List Price \$	277V 50/60Hz	List Price \$
 CLM4097341	CLM	20 Amp	2-12	CLM4097341		CLM4097342		CLM4097343	

AC Coils 30-400 Amps^③

	Type	Contactors Size	Number of Poles	Catalog Number							List Price \$
				24V AC	120V AC	208V AC	220/240V AC	277V AC	480V AC	600V AC	
 CLMC4C120	CLM†C	30 Amp	2-3-Pole	CLMC4C024	CLMC4C120	CLMC4C208	CLMC4C240	CLMC4C277	CLMC4C480	CLMC4C600	
			4-Pole	CLMC4C024	CLMC4C120	CLMC4C208	CLMC4C240	CLMC4C277	CLMC4C480	CLMC4C600	
			5-Pole	CLMC5C024	CLMC5C120	CLMC5C208	CLMC5C240	CLMC5C277	CLMC5C480	CLMC5C600	
 CLMGU3C120	CLM†D	60 Amp	2-3-Pole	CLMD3C024	CLMD3C120	CLMD3C208	CLMD3C240	CLMD3C277	CLMD3C480	CLMD3C600	
			4-Pole	CLMD5C024	CLMD5C120	CLMD5C208	CLMD5C240	CLMD5C277	CLMD5C480	CLMD5C600	
			5-Pole	CLMD5C024	CLMD5C120	CLMD5C208	CLMD5C240	CLMD5C277	CLMD5C480	CLMD5C600	
	CLM†E	100, 200 Amp	2-3-Pole	CLME3C024	CLME3C120	CLME3C208	CLME3C240	CLME3C277	CLME3C480	CLME3C600	
			4-Pole	CLME5C024	CLME5C120	CLME5C208	CLME5C240	CLME5C277	CLME5C480	CLME5C600	
			5-Pole	CLME5C024	CLME5C120	CLME5C208	CLME5C240	CLME5C277	CLME5C480	CLME5C600	
	CLM†G Latching Coil	300/400 Amp	2-3-Pole	—	CLMGL3C120	CLMGL3C208	CLMGL3C240	CLMGL3C277	CLMGL3C480	CLMGL3C600	
			2-3-Pole Unlatch Coil	—	CLMGU3C120	CLMGU3C208	CLMGU3C240	CLMGU3C277	CLMGU3C480	CLMGU3C600	

Control Module Rectifier^③

Type	Device	Contactors Size	Number of Poles	Catalog Number	List Price \$
CLM	CLM†C to CLM†F	30-200 Amps	All	CLMKCMR	

① Product Category: IEC.

② Coil kits for 20 amp CLM contactors include the coil clearing auxiliary contact.

③ For 30-200 amp CLM contactors, in the event that either the coil or the control module fails, it is recommended that both be replaced.

Replacement Parts


Lighting Contactors, CLM, CMB, CMF & CMN

Selection

Ordering Information

- **For CLM:** 5th character of contactor catalog number indicates Frame Size.
- **For CMB, CMF, CMN:** 4th character of contactor catalog number indicates Frame Size.

Main Contacts 20 Amp Lighting Contactors

 <p>CLM4097334</p>	Type	Contact Size	Number of Poles	Location	Catalog Number	List Price \$
	CLM	20 Amp	2	Top or Bottom	CLM4097331 CLM4097332 CLM4097333 CLM4097334	
			3	Top		
			4	Top or Bottom		
			6	Top or Bottom		


Main Contacts 30–400 Amp Lighting Contactors

Type	Frame Size	Contact Size	Number of Poles	Catalog Number	List Price \$
CLM	C	30 Amp	2	CLMCCK02 CLMCCK03 CLMCCK04 CLMCCK05	
			3		
			4		
			5		
	D	60 Amp	2	CLMDCK02 CLMDCK03 CLMDCK04 CLMDCK05	
			3		
			4		
			5		
	E	100 Amp	2	CLMECK02 CLMECK03 CLMECK04 CLMECK05	
			3		
			4		
			5		
F	200 Amp	2	CLMFCK02 CLMFCK03 CLMFCK04 CLMFCK05		
		3			
		4			
		5			
G	300 Amp	2	CLMGCK02 CLMGCK03		
		3			
H	400 Amp	2	CLMHCK02 CLMHCK03		
		3			

Auxiliary Contact Blocks 20 Amp Lighting Contactors^②

Type	Contact Size	Contacts	Catalog Number	List Price \$
CLM	20 Amp	1 Form C NO, NC Contact 2 Form C NO, NC Contacts	CLM4097291 CLM4097292	

Auxiliary Contact Blocks 30–400 Amp Lighting Contactors

 <p>CLMFCAK11</p>	Type	Frame Size	Contact Size	Contact Configuration	Catalog Number	List Price \$
	CLM	C to F ^①	30–200 Amps	1 NO and 1 NC 2 NC 2 NO 1 Coil Clearing NO and NC	CLMFCAK11 CLMFCAK02 CLMFCAK20 CLMFCC11	
G to H ^①		300–400 Amps		1 NO and 1 NC 2 NC 2 NO 1 Coil Clearing NO and NC	CLMHCAK11 CLMHCAK02 CLMHCAK20 CLMHCC11	

① Maximum 1 block per contactor.
② Maximum 2 blocks per contactor.

Replacement Parts

Miscellaneous


Selection

Replacement Handle Assemblies and Disconnect Mechanisms Enclosure Types 1, 3R, 4, 4X Stainless Steel & 12

Class	Disconnect (Amps)	Enclosure Size	Handle Assembly Only		Handle Assembly and Disconnect Mechanism	
			Catalog Number	List Price \$	Catalog Number	List Price \$
17, 25, 32, 84, 87, CM, LE	30, 60 & 100	All Standard and Extra-wide Sizes	75D73944015		75D68257103	
37, 88	30 & 60		75D73944018		75D68257048	
17, 25, 32, 84	200		75D73944015		75D68257105	
37, 88, CM, LE	200		75D73944015		75D68257063	
87	200		75D73944023		75D68257068	
17, 25, 37, 87, 88, CM, LE	400 & 600		75D73944027		75D68257078	
Class	Motor Circuit Interrupter (Amps)	Enclosure Size	Handle Assembly Only		Handle Assembly and Disconnect Mechanism	
			Catalog Number	List Price \$	Catalog Number	List Price \$
18, 26, 32, CM, LE	3 - 125	(24"H x 11"W x 8"D), (24"H x 20"W x 8"D)	75D73944025		75D68257080	
18, 26, 32	100 - 125	(36"H x 24"W x 8"D)	75D73944025		75D68257073	
18, 26, 32	150 & 250	All Standard Sizes	75D73944028		75D68257089	
18, 26, 37, 87, 88, CM	300 - 600		75D73944027		75D68257078	
87	3 - 125		75D73944025		75D68257080	
87	150		75D73944028		75D68257089	
87	250		75D73944011		75D68257077	
37, 88	30 - 125		75D73944025		75D68257073	
37, 84, 88, CM	150 - 250		75D73944011		75D68257077	
84	3 - 125		75D73944025		75D68257074	

NEMA & General Purpose Control

Quarter Turn Assemblies

Description	Class	Enclosure Type	Catalog Number	List Price \$
 Quarter-Turn Latch	17, 18, 25, 26, 32, 87 & 88	1, 3/3R & 12	75D46260004	
		4 & 4X	75D46260005	

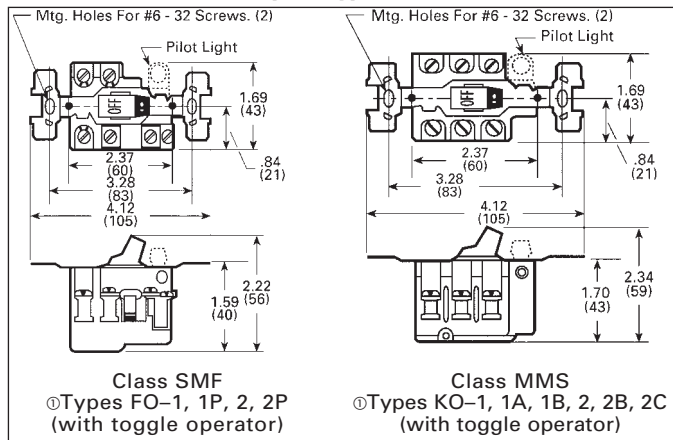
17 CONTROL PRODUCTS

Manual Control

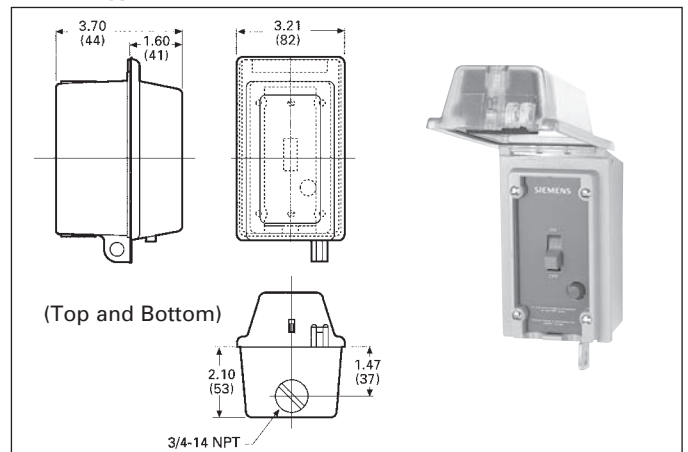
Class SMF, MMS

Dimensions

Class SMF and MMS Open Type

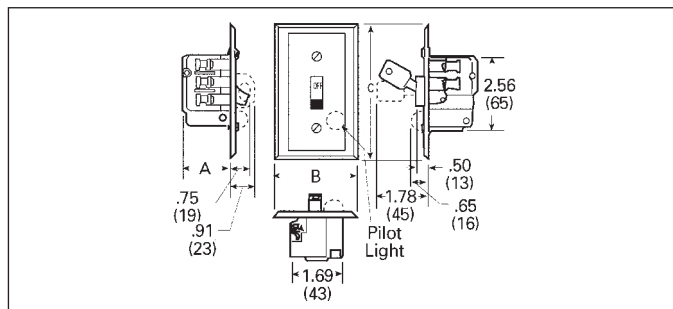


NEMA Type 3R, 4 and 12



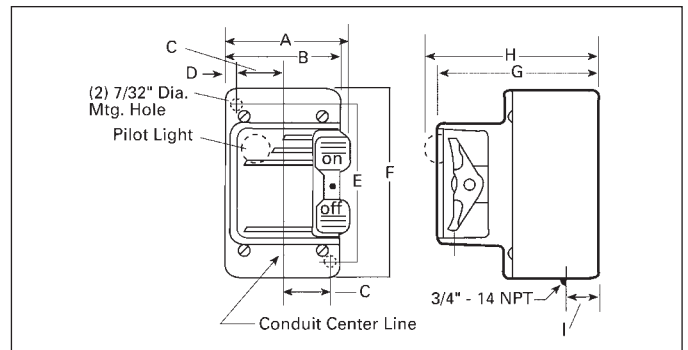
Device	Class	Type
Fractional HP Starter	SMF	FWN1, 1P, FWN2, 2P FWN3, 3P, FW4, 4P
Motor Starting Switch	MMS	KWN1, 1A, 1B, KWN2, 2B, 2C KWN3, 3A, 3B, KWN4, 4B, 4C

NEMA Type 1B General Purpose Flush Mounting



Device	Type of Operator	Type	Dimensions in Inches (mm)		
			A	B	C
Class SMF Fractional HP Starter	Toggle	FF1, 1P, 2, 2P	1.44 (37)	2.75 (70)	4.50 (114)
		FS1, 1P, 2, 2P	1.44 (37)	3.50 (89)	5.25 (133)
	Key	FF3, 3P, 4, 4P	1.44 (37)	2.75 (70)	4.50 (114)
		FS3, 3P, 4, 4P	1.44 (37)	3.50 (89)	5.25 (133)
Class MMS Motor Starting Switch	Toggle	KF1, 1A, 1B, 2, 2B, 2C	1.75 (44)	2.75 (70)	4.50 (114)
		KS1, 1A, 1B, 2, 2B, 2C	1.75 (44)	3.50 (89)	5.25 (133)
	Key	KF3, 3A, 3B, 4, 4B, 4C	1.75 (44)	2.75 (70)	4.50 (114)
		KS3, 3A, 3B, 4, 4B, 4C	1.75 (44)	3.50 (89)	5.25 (133)

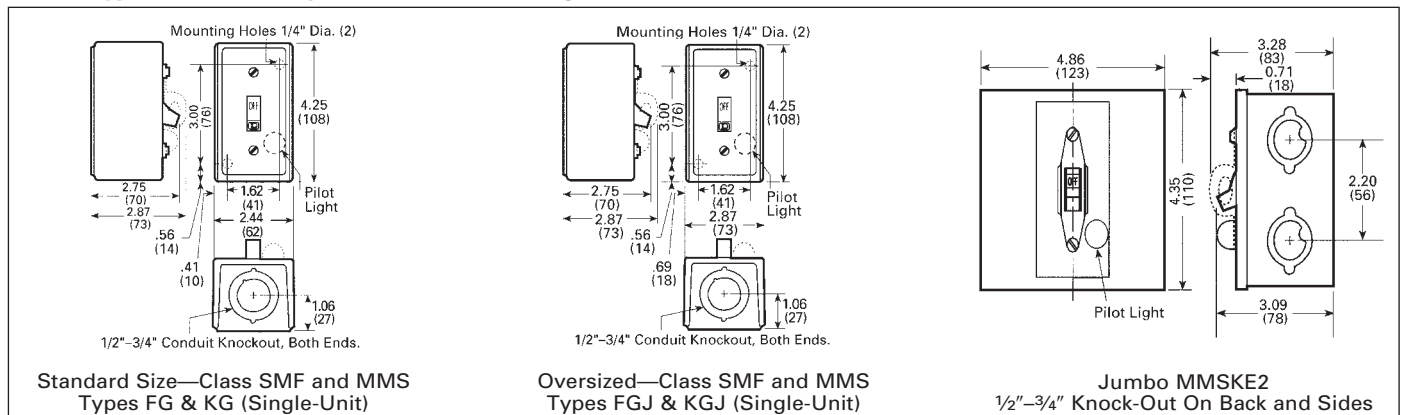
NEMA Type 4 Watertight Die Cast Zinc Enclosure



Dimensions in Inches (mm)								
A	B	C	D	E	F	G	H	I
3.00 (76)	2.75 (70)	1.13 (28)	0.25 (6)	3.75 (95)	4.69 (119)	4.25 (108)	4.56 (116)	0.78 (20)

Device	Class	Type
Fractional HP Starter	SMF	FW1, 1P, 2, 2P
Motor Starting Switch	MMS	KW1, 1A, 1B, 2, 2B, 2C

NEMA Type 1 General Purpose Surface Mounting Enclosures



Note: Dimensions for reference, not for construction. Dimensions are in inches (mm).

⊙ Dimensions typical for key operator devices.

NEMA & General Purpose Control

CONTROL PRODUCTS

Manual Control

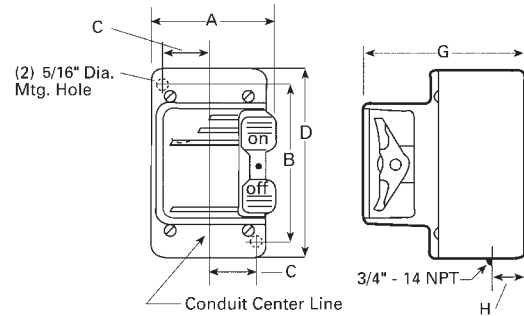
Class SMF, MMS

Dimensions

NEMA Type 7 and 9 Cast Aluminum Enclosure

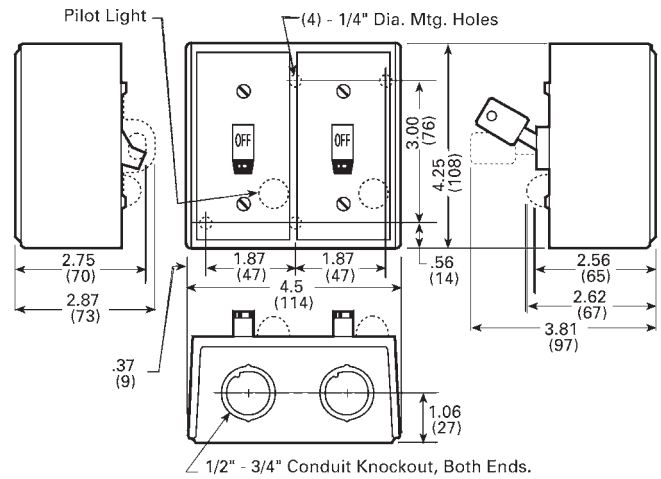
Dimensions in Inches (mm)					
A	B	C	D	G	H
4.00 (101)	5.75 (146)	1.38 (35)	6.36 (161)	4.38 (111)	1.20 (30)

Device	Class	Type
Fractional HP Starter	SMF	FR1, FR2
Motor Starting Switch	MMS	KR1, KR2



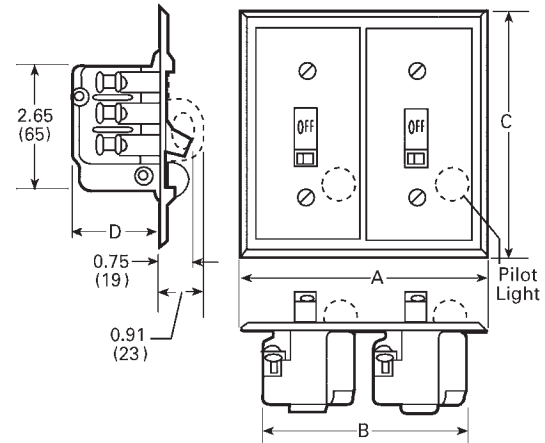
NEMA Type 1 General Purpose Enclosure For Two Unit Devices

Device	Type of Operator	Class	Type
One Starter	Toggle	SMF	FG02, 02P
	Key	SMF	FG04P
Two Starters	Toggle	SMF	FG222, 222P
	Key	SMF	FG44P
One Starter and One Sel. Switch ^①	Toggle	SMF	FG71, 71P, 72, 72P
	Key	SMF	FG74P
Reversing Switch ^②	Toggle	MRS	KG11, 11A, 11B, 22, 22A, 22B, 22C
Two Speed Starter	Toggle	SMF	FG11, 11P, 22, 22P
Two Speed Switch	Toggle	MMS	KG11, 11A, 11B, 22, 22B, 22C



NEMA Type 1B General Purpose Flush Mounting For Two Unit Devices

Device ^③	Type of Operator	Class	Type	A	B	C	D
Two Starters	Toggle	SMF	FF22, 22P	5.25 (133)	3.75 (95)	5.25 (133)	1.44 (37)
			FS22P	4.56 (116)	3.50 (89)	4.50 (114)	1.44 (37)
	Key	SMF	FF44P	5.25 (133)	3.75 (95)	5.25 (133)	1.44 (37)
			FS44P	4.56 (116)	3.50 (89)	4.50 (114)	1.44 (37)
One Starter and One Selector Switch ^④	Toggle	SMF	FF71, 71P, 72, 72P	5.25 (133)	0.75 (19)	5.25 (133)	2.00 (51)
			FS71P, 72P	4.56 (116)	3.50 (89)	4.50 (114)	2.00 (51)
	Key	SMF	FF74P	5.25 (133)	3.75 (95)	5.25 (133)	2.00 (51)
			FS74P	4.56 (116)	3.50 (89)	4.50 (114)	2.00 (51)
Reversing Switch	Toggle	MRS	KF11, 11A, 11B KF22, 22A 22B, 22C	5.25 (133)	3.75 (95)	5.25 (133)	1.75 (44)
Two Speed Switch	Toggle	SMF	FF11, 11P, 22, 22P	5.25 (133)	3.75 (95)	5.25 (133)	1.44 (37)
Two Speed Switch	Toggle	MMS	KF11, 11A, 11B 22, 22B, 22C	5.25 (133)	3.75 (95)	5.25 (133)	1.44 (37)



Note: Dimensions for reference, not for construction. Dimensions are in inches (mm).

- ① Selector switch is on the left, increases overall depth to 3.50 in. (89 mm).
- ② Only one pilot light (located on right) is used on MRS switches.

- ③ Dimensions include factory wired power connections.
- ④ Selector switch is on the left, extends 1.62 in. (41 mm) from mounting surface.

NEMA & General Purpose Control

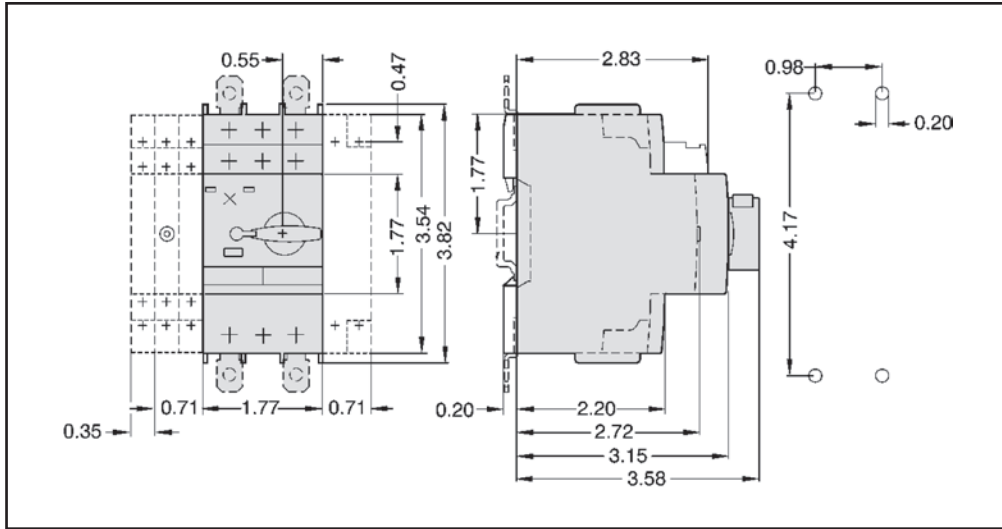
CONTROL PRODUCTS 17

Manual Control

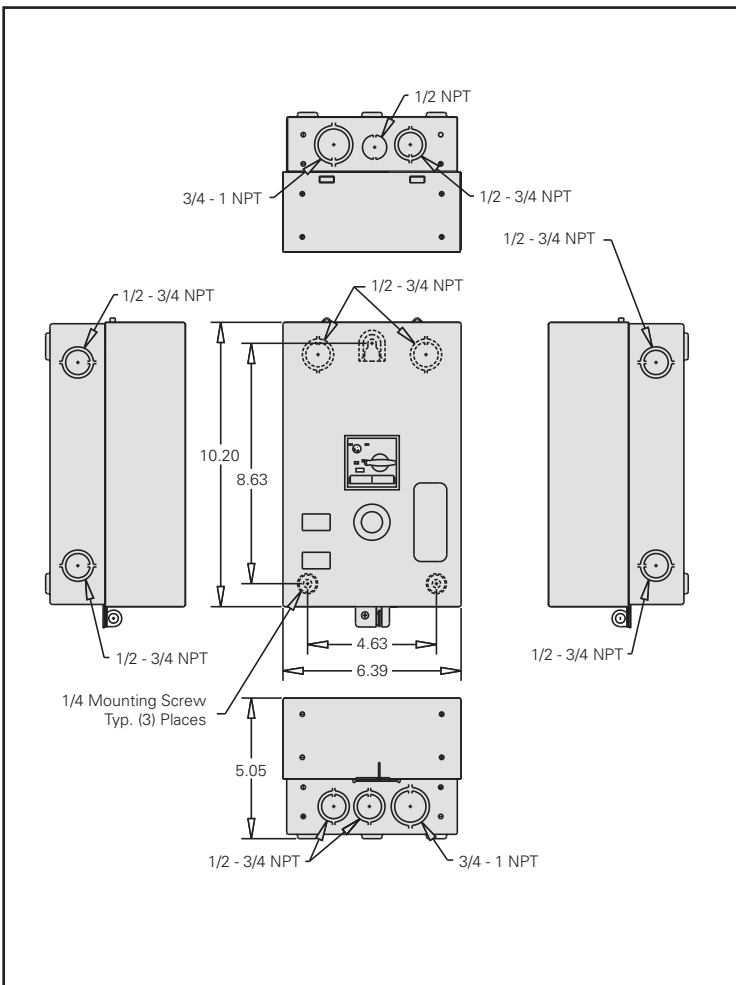
Class 11 - 3RV

Dimensions

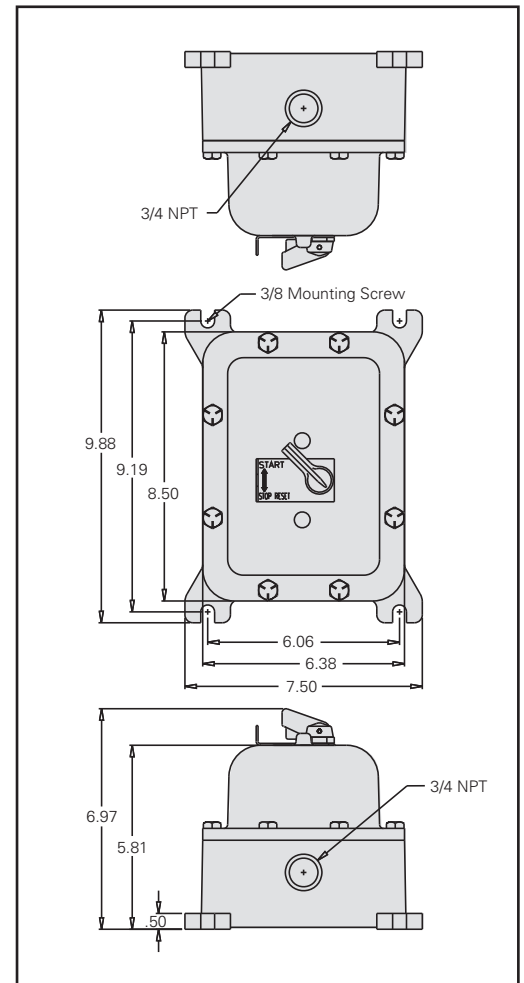
3RV102



Class 11 - NEMA 1 Enclosure



Class 11 - NEMA 7 & 9, 3 & 4, and NEMA 7 & 9 Enclosure



Note: Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

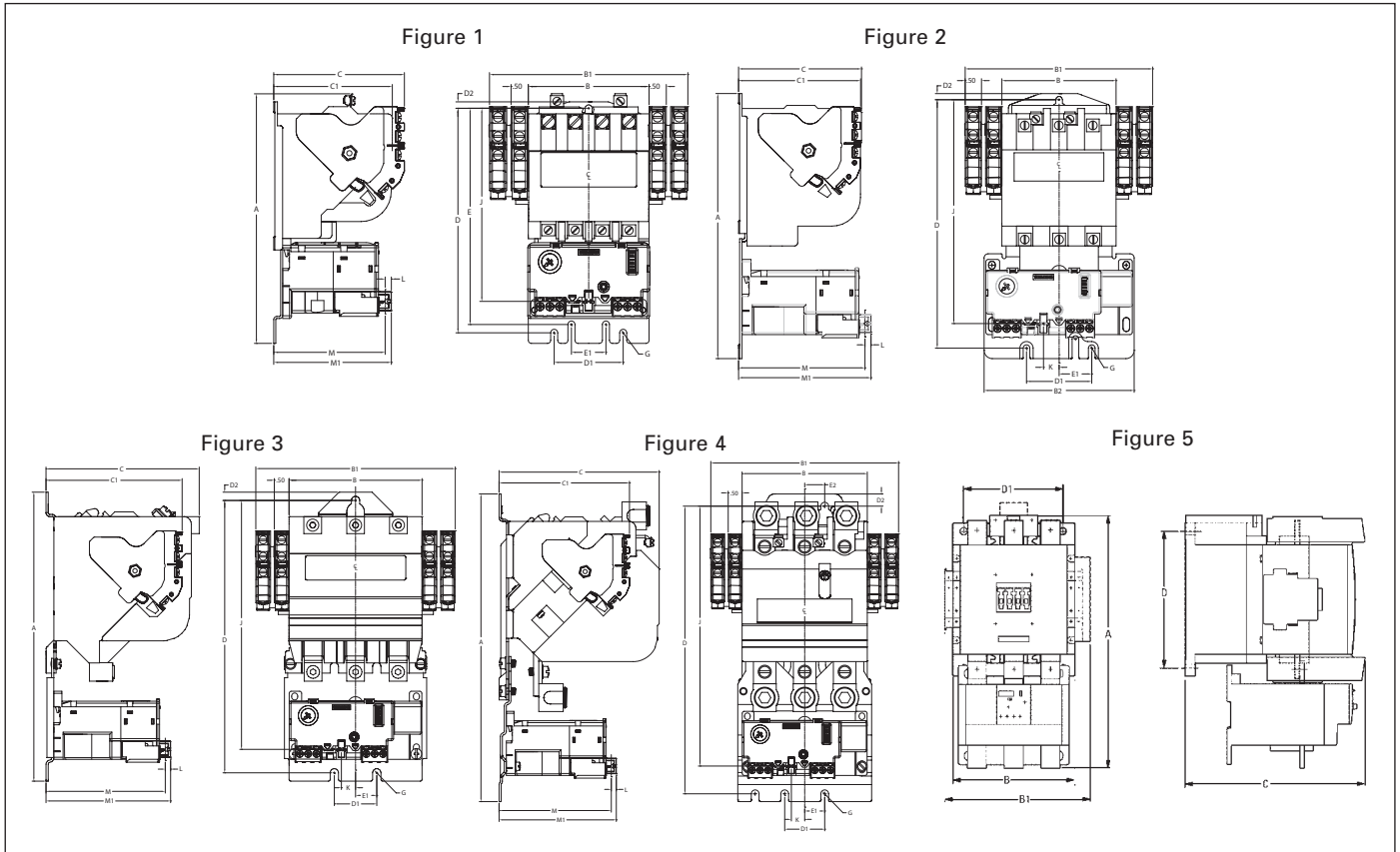
NEMA & General Purpose Control

17 CONTROL PRODUCTS

Heavy Duty Motor Starters

Solid State Overload, Class 14

Dimensions



NEMA & General Purpose Control

CONTROL PRODUCTS 17

Open Type Solid State Overload

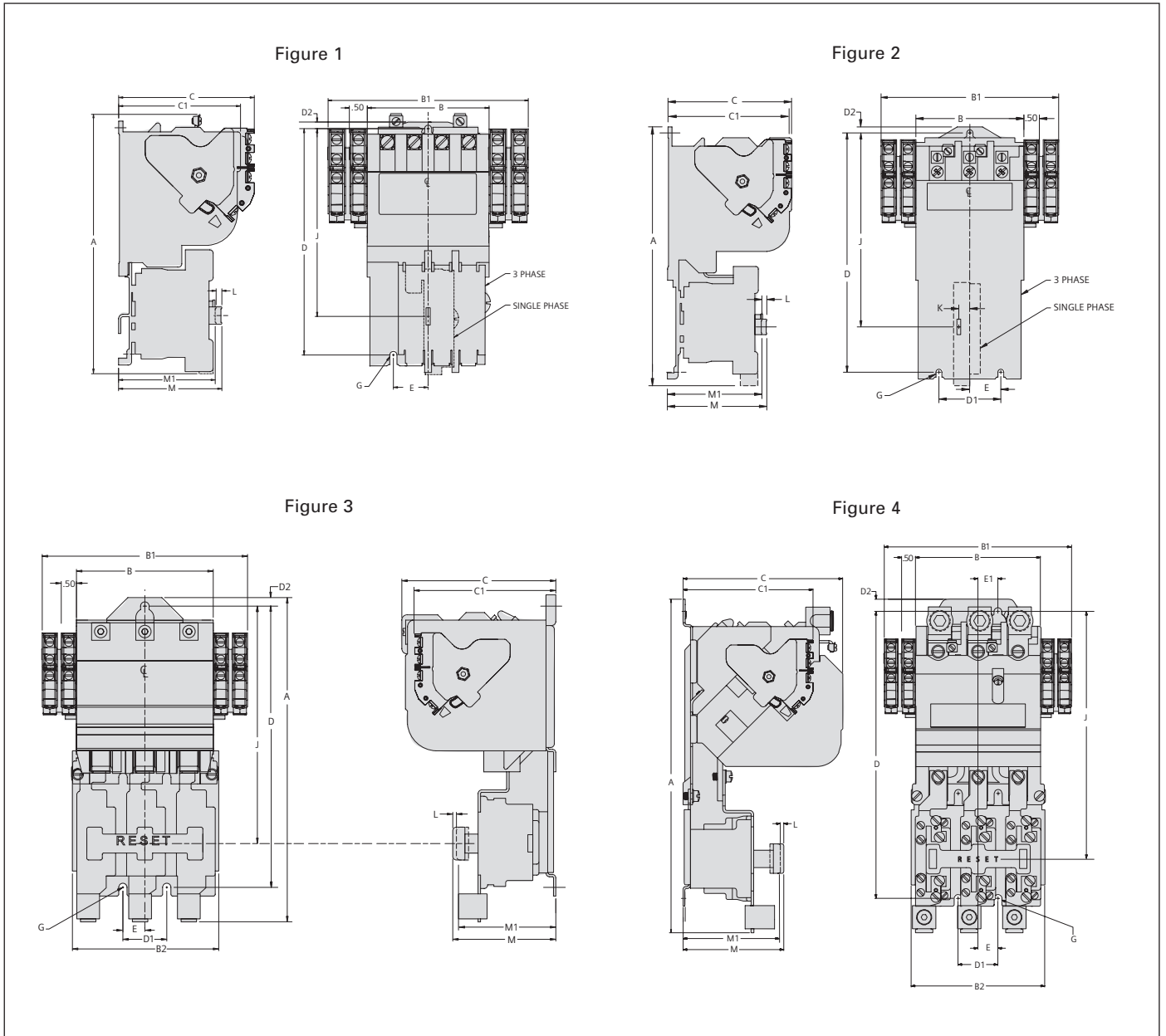
Size	Figure	Outline Dimensions					Mounting Dimensions						Mounting Screw	Reset Dimensions					
		A	B	B1	B2	C	C1	D	D1	D2	E	E1		E2	G	J	K	L	M
00-1/4	1	7.44 (189)	3.50 (89)	5.75 (146)	—	3.75 (95)	3.50 (89)	6.50 (165)	2.00 (51)	0.19 (5)	6.27 (159)	1.00 (25)	—	#10	5.60 (142)	—	0.18 (5)	3.23 (82)	3.41 (87)
2-2 1/2	2	8.13 (207)	3.50 (89)	5.75 (146)	4.60 (117)	4.00 (102)	3.77 (96)	7.62 (194)	2.00 (51)	0.19 (5)	—	1.00 (25)	—	#10	6.87 (174)	0.48 (12)	0.18 (5)	3.88 (99)	4.06 (103)
3-3 1/2	3	9.78 (248)	4.50 (114)	6.75 (171)	—	5.19 (132)	4.66 (118)	9.22 (234)	1.44 (37)	0.28 (7)	—	0.72 (18)	—	0.25 (6)	8.43 (214)	0.48 (12)	0.18 (5)	4.04 (103)	4.22 (107)
4	4	11.06 (281)	4.50 (114)	6.75 (171)	—	5.75 (146)	4.66 (118)	10.34 (263)	1.44 (37)	0.44 (11)	—	0.72 (18)	0.72 (18)	0.25 (6)	9.35 (237)	0.48 (12)	0.18 (5)	4.04 (103)	4.22 (107)
5	5	12.76 (324)	5.71 (145)	6.89 (175)	—	8.54 (217)	—	7.09 (180)	4.72 (120)	—	—	—	—	0.35 (9)	—	—	—	—	—
6	6	13.03 (331)	6.30 (160)	7.48 (190)	—	9.29 (236)	—	7.09 (180)	5.12 (130)	—	—	—	—	0.35 (9)	—	—	—	—	—

Note: Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

Heavy Duty Motor Starters & Contactors

Ambient Compensated Bimetal Class 14

Dimensions



NEMA & General Purpose Control

CONTROL PRODUCTS

Open Type Ambient Compensated Bimetal Overload

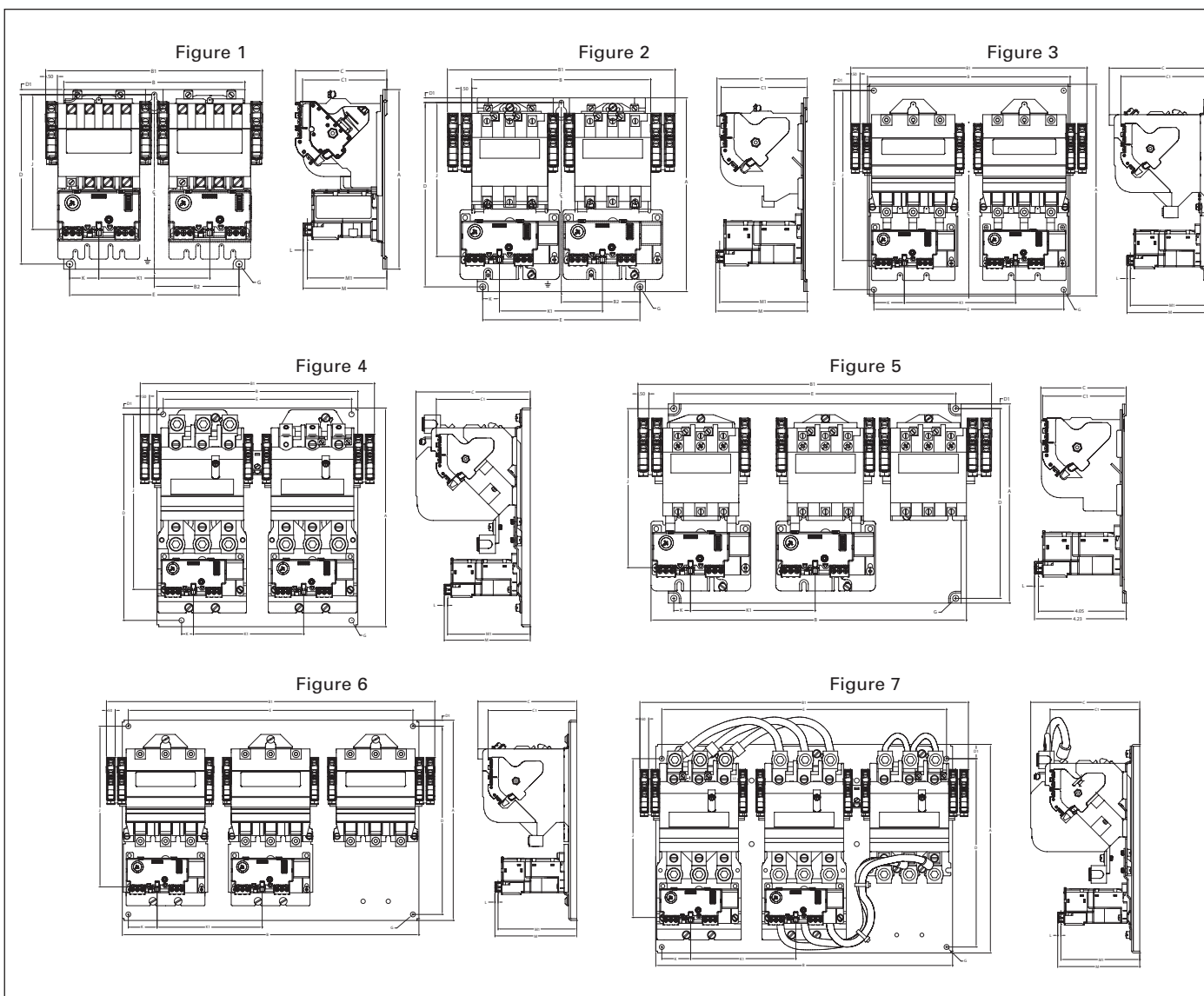
Size	Figure	Outline Dimensions					Mounting Dimensions					Mounting Screw	Reset Dimensions				
		A	B	B1	C	C1	D	D1	D2	E	E1		G	J	K	L	M
00-1½	1	7.45 (189)	3.50 (89)	5.75 (146)	3.89 (99)	3.50 (89)	6.50 (165)	—	0.19 (4.8)	1.00 (25)	—	#10	5.39 (137)	—	0.16 (4)	2.97 (75)	2.81 (71)
2-2½	2	8.38 (213)	3.50 (89)	5.75 (146)	4.00 (102)	3.77 (96)	7.75 (197)	2.00 (51)	0.19 (4.8)	1.00 (25)	—	#10	6.28 (160)	0.36 (9)	0.16 (4)	3.22 (82)	3.06 (78)
3-3½	3	10.66 (271)	4.50 (114)	6.75 (171)	5.06 (129)	4.66 (118)	9.25 (235)	1.44 (37)	0.28 (7)	0.72 (18)	—	0.25 (6)	7.81 (198)	—	0.12 (3)	3.39 (86)	3.27 (83)
4	4	12.02 (305)	4.50 (114)	6.75 (171)	5.75 (146)	4.66 (118)	10.34 (263)	1.44 (37)	0.44 (11)	0.72 (18)	0.72 (18)	0.25 (6)	8.78 (223)	—	0.12 (3)	3.63 (92)	3.51 (89)

Note: Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

Reversing & Multispeed Heavy Duty Starters

Solid State Overload Class 22, 30

Dimensions



NEMA & General Purpose Control

17 CONTROL PRODUCTS

Class 22 Reversing & Class 30 2 Speed/2 Winding

Size	Figure	Outline Dimensions						Mounting Dimensions			Mounting Screw	Reset Dimensions					
		A	B	B1	B2	C	C1	D	D1	E		G	J	K	K1	L	M
00-1½	1	7.69	7.75	10.50	3.62	3.92	3.61	7.25	0.22	7.25	#10	5.77	1.25	4.75	0.18	3.58	3.40
2-2½	2	8.94	8.25	10.50	3.62	4.17	3.98	8.50	0.22	7.25	#10	7.10	0.77	4.75	0.18	4.23	4.05
3-3½	3	11.44	10.94	12.75	—	5.65	5.03	10.75	0.34	10.25	#10	9.18	1.64	6.00	0.18	4.69	4.51
4	4	11.91	10.94	12.75	—	6.22	5.12	11.22	0.34	10.25	0.25	9.53	0.65	6.00	0.18	4.68	4.50

Class 30 2 Speed/1 Winding

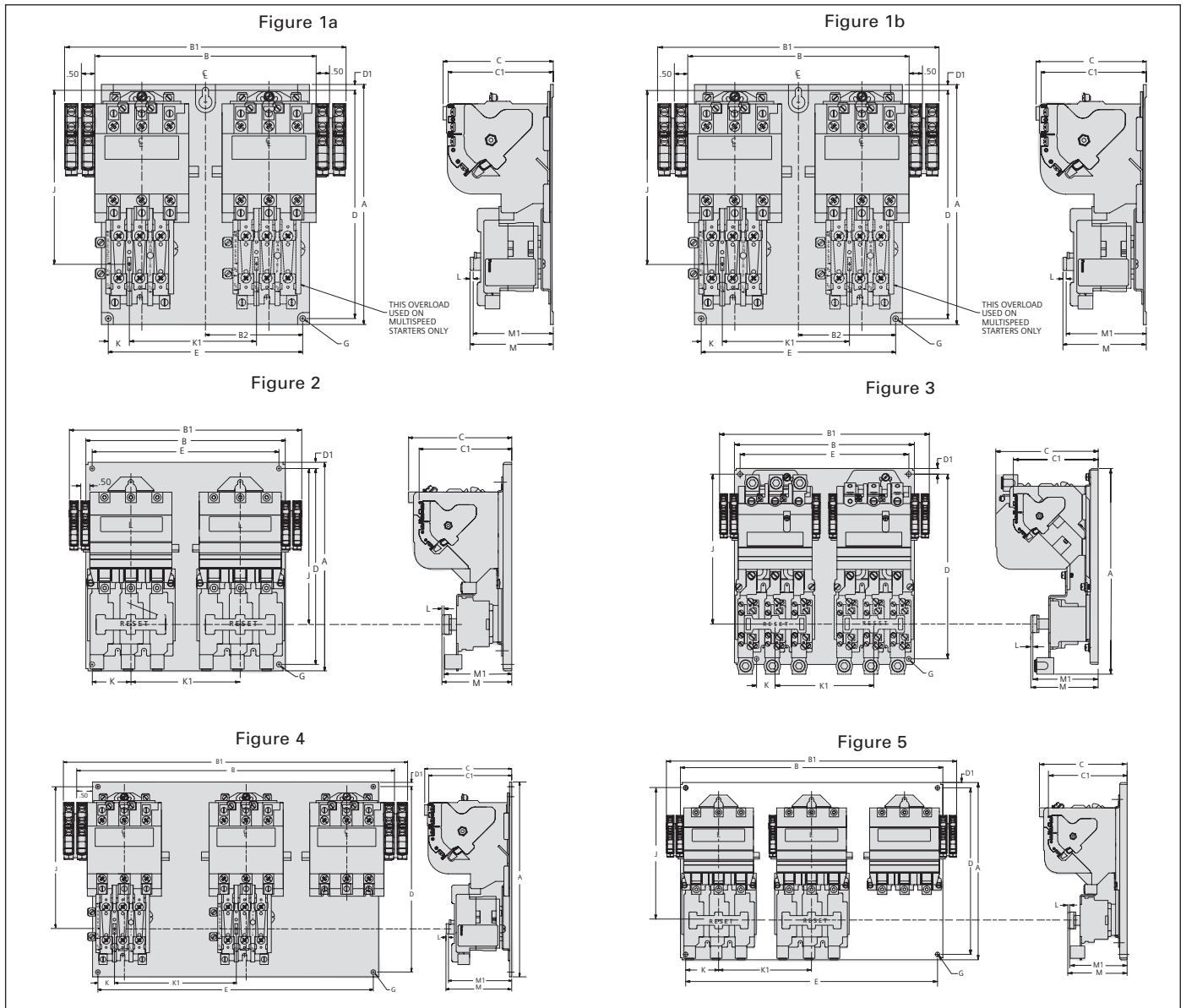
Size	Figure	Outline Dimensions						Mounting Dimensions			Mounting Screw	Reset Dimensions					
		A	B	B1	B2	C	C1	D	D1	E		G	J	K	K1	L	M
00-1½	1	7.69	7.75	10.50	3.62	3.92	3.61	7.25	0.22	7.25	#10	5.77	1.25	4.75	0.18	3.58	3.40
2-2½	5	9.19	14.55	16.30	—	3.94	3.85	8.75	0.22	13.00	#10	7.33	0.77	5.75	0.18	4.23	4.05
3-3½	6	11.44	16.94	18.75	—	5.65	5.07	10.75	0.34	16.25	#10	9.18	1.64	6.00	0.18	4.68	4.50
4	7	11.91	16.94	17.75	—	6.22	5.12	10.75	0.82	16.25	#10	9.06	1.64	6.00	0.18	4.68	4.50

Note: Dimensions for reference, not for construction.
Contact sales office for dimensions not listed.
Dimensions are in inches (mm).

Reversing & Multispeed Heavy Duty Starters

Ambient Compensated Bimetal Overload Class 22, 30

Dimensions



Class 22 Reversing & Class 30 2 Speed/2 Winding with Bimetal Overload

Size	Figure	Outline Dimensions						Mounting Screw			Mounting Dimensions		Reset Dimensions				
		A	B	B1	B2	C	C1	D	D1	E	G	J	K	K1	L	M	M1
00-1/4	1a	7.69	8.25	10.50	3.62	3.92	3.61	7.25	0.22	7.25	#10	5.60	1.25	4.75	0.16	3.12	3.07
2-2 1/2	1b	8.94	8.25	10.50	3.62	4.17	3.98	8.50	0.22	7.25	#10	6.46	0.79	4.75	0.16	3.10	3.05
3-3 1/2	2	11.44	10.94	12.94	—	5.66	5.08	10.75	0.34	10.25	#10	8.56	2.12	6.00	0.12	3.83	3.71
4	3	12.50	10.94	12.75	—	6.22	5.16	11.22	0.34	10.25	0.25	9.11	2.12	6.00	0.12	4.09	3.97

Class 30 2 Speed/1 Winding with Bimetal Overload

Size	Figure	Outline Dimensions						Mounting Screw			Mounting Dimensions		Reset Dimensions				
		A	B	B1	B2	C	C1	D	D1	E	G	J	K	K1	L	M	M1
00-1/4	1a	7.69	8.25	10.50	3.62	3.92	3.61	7.25	0.22	7.25	#10	5.60	1.25	4.75	0.16	3.12	3.07
2-2 1/2	4	9.19	14.56	16.25	—	4.11	3.92	8.75	0.22	13.00	0.25	6.71	0.78	5.75	0.16	3.10	3.05
3-3 1/2	5	11.44	16.94	18.75	—	5.66	5.08	10.75	0.34	16.25	0.25	8.56	2.12	6.00	0.12	3.83	3.71

Note: Dimensions for reference, not for construction.
Contact sales office for dimensions not listed.
Dimensions are in inches (mm).

NEMA & General Purpose Control

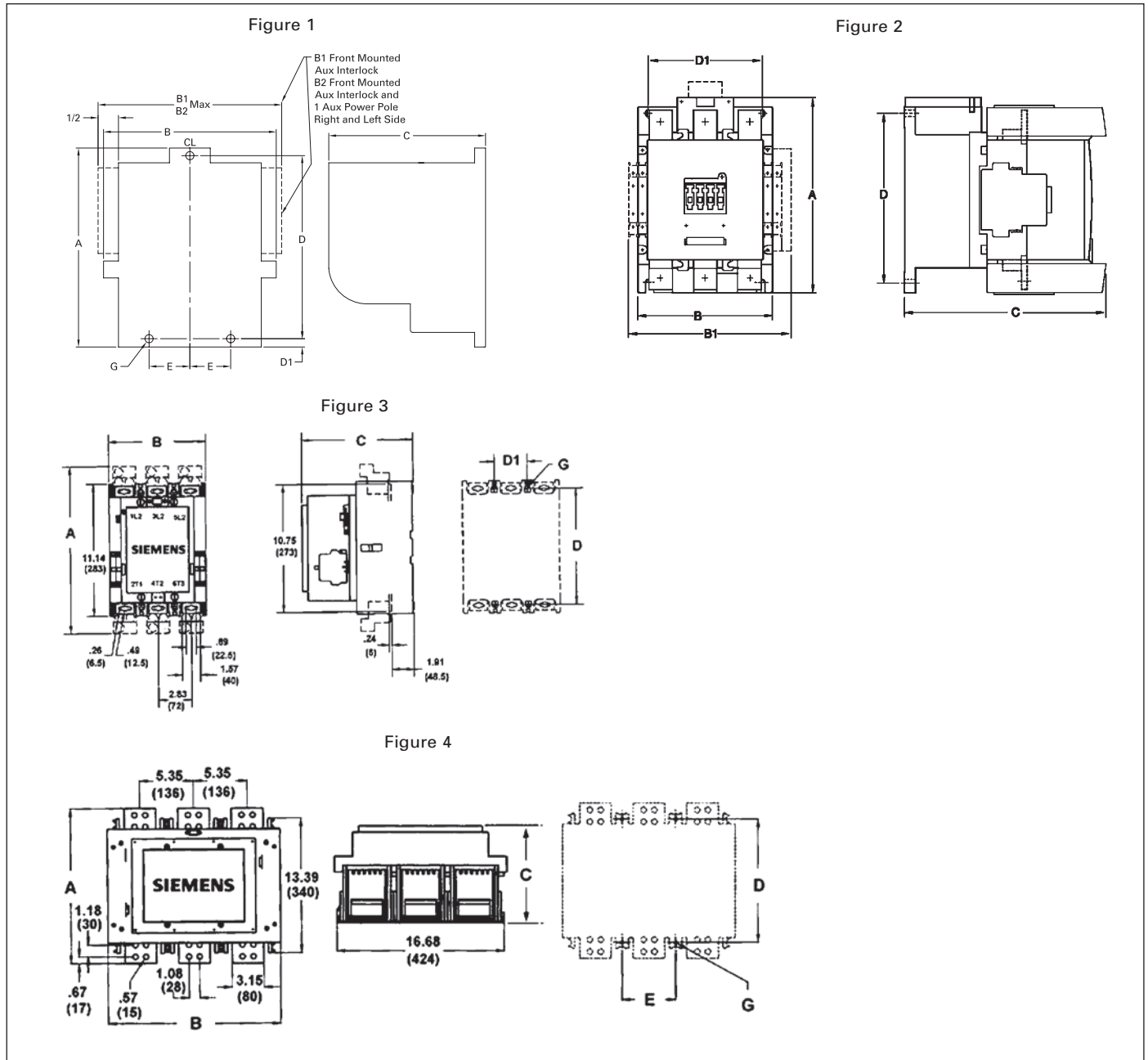
CONTROL PRODUCTS

Heavy Duty Contactors

Class 40

Dimensions

Full Voltage Open Type NEMA Contactor Size 00-8



Open Type

Size	3rd Character of Catalog No. ①	Outline Dimensions						Mounting Dimensions				Mounting Screw
		Fig	A	B	B1	B2	C	D	D1	E	G	
00-1/4	C, D, E	1	4.31 (110)	3.94 (100)	4.25 (108)	4.75 (121)	3.75 (70)	3.94 (100)	0.19 (5)	1.00 (25)	#10	
2-2 1/2	F, G	1	4.88 (124)	3.94 (100)	4.25 (108)	—	4.00 (102)	4.50 (114)	0.19 (5)	1.00 (25)	#10	
3-3 1/2	H, I	1	6.13 (156)	5.13 (130)	5.50 (140)	—	5.06 (129)	5.63 (143)	0.25 (6)	0.75 (19)	0.25 (6)	
4	J	1	7.81 (198)	5.19 (132)	5.50 (140)	—	5.75 (146)	6.56 (167)	0.81 (21)	0.75 (19)	0.5 (13)	
5	L	2	8.27 (210)	5.71 (145)	6.89 (175)	—	8.54 (217)	7.09 (180)	4.72 (120)	—	0.35 (9)	
6	M	2	8.43 (214)	6.3 (160)	7.48 (190)	—	9.29 (236)	7.09 (180)	5.12 (130)	—	0.35 (9)	
7	N	3	14.05 (357)	8.27 (210)	—	—	9.53 (242)	9.80 (249)	2.83 (72)	—	0.25 (6)	
8	P	4	15.41 (392)	17.23 (438)	—	—	10.56 (268)	12.28 (312)	—	5.35 (136)	0.35 (9)	

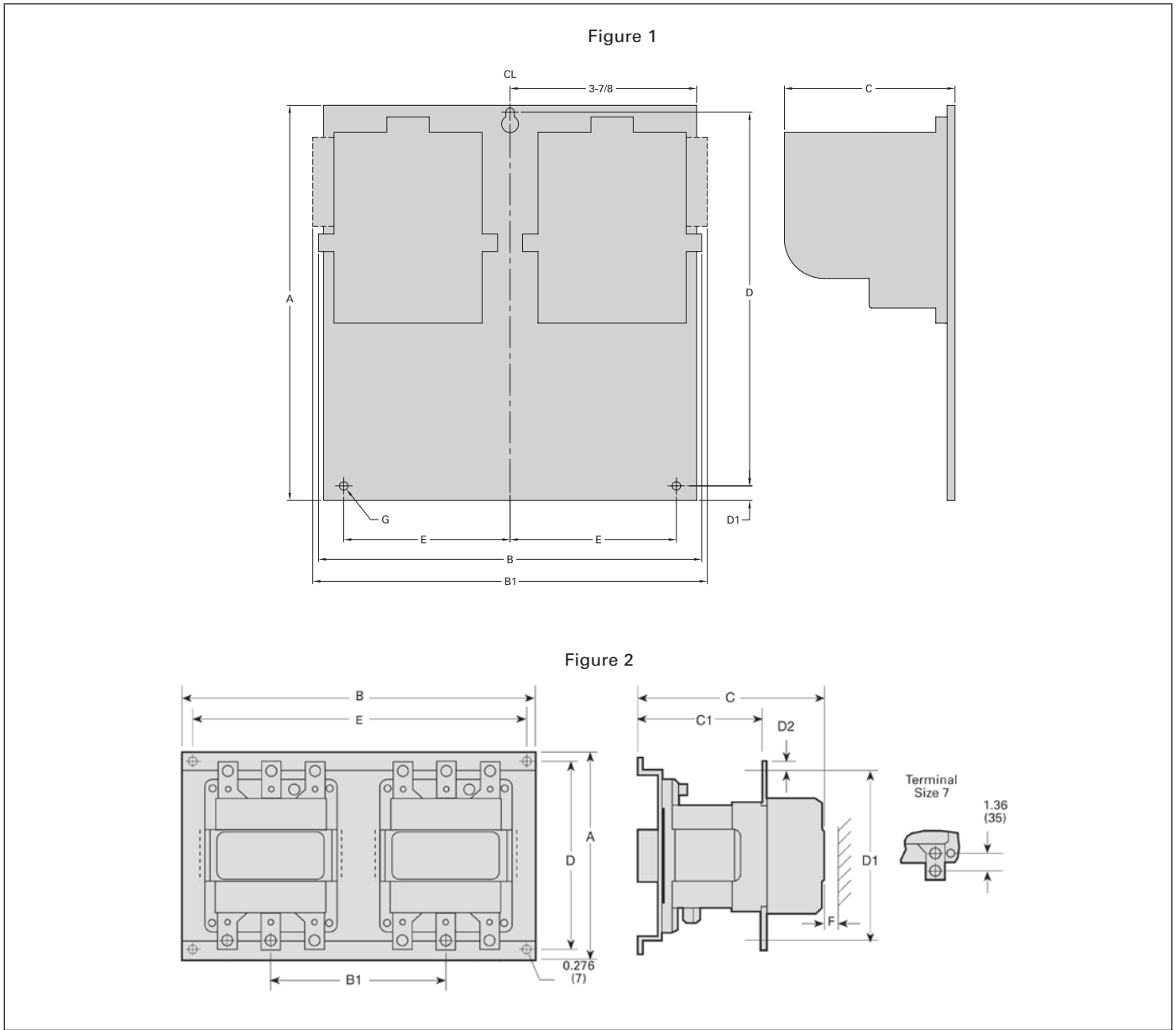
Note: Dimensions for reference, not for construction. Contact sales office for dimensions not listed. Dimensions are in inches (mm).

① 3rd character of catalog number identifies contactor rating.

Magnetic Reversing Contactors

Class 43

Dimensions



Open Type Horizontal Mounted

Size	Fig.	Outline Dimensions					Mounting Dimensions					Mounting Screw
		A	B	B1	C	C1	D	D1	E	F	G	
00-1¼	1	7.69 (195)	7.75 (197)	9.25 (235)	3.88 (98)	—	7.25 (184)	0.25 (6)	3.63 (92)	—	#10	
2, 2½	1	8.94 (227)	7.75 (197)	9.25 (235)	4.56 (116)	—	8.5 (216)	0.25 (6)	3.63 (92)	—	#10	
3-3½	1	11.44 (291)	10.94 (278)	11.50 (292)	5.19 (132)	—	10.75 (273)	0.38 (6)	5.13 (130)	—	0.25	
4	1	8.50 (216)	10.94 (278)	11.50 (292)	6.25 (159)	—	7.81 (198)	0.38 (6)	5.13 (130)	—	0.25	
5	2	18.07 (459)	14.20 (361)	—	9.44 (240)	—	17.20 (437)	—	9.61 (244)	—	—	
6	2	11.61 (295)	18.88 (480)	9.45 (240)	10.85 (276)	7.44 (189)	10.44 (265)	10.71 (272)	17.72 (450)	1.18 (30)	—	

Note: Dimensions for reference, not for construction.
 Contact sales office for dimensions not listed.
 Dimensions are in inches (mm).

NEMA & General Purpose Control

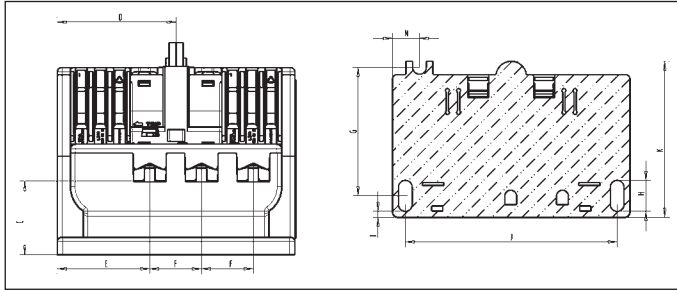
17 CONTROL PRODUCTS

Overload Relays & Current Transformers

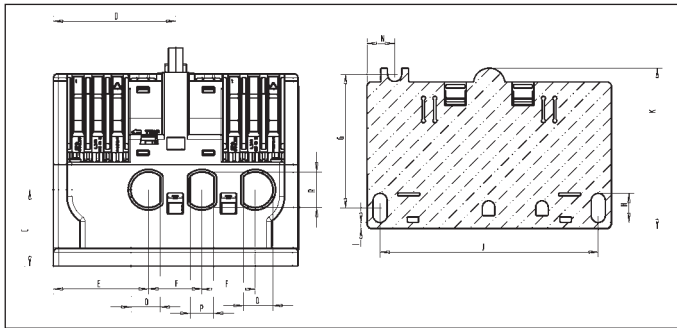
Solid State Overload

Dimensions

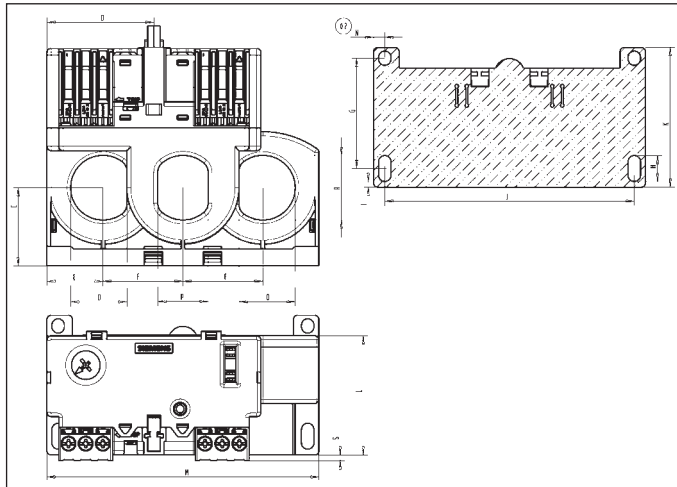
Dimensions "A" Frame—ESP200 Solid State Overload



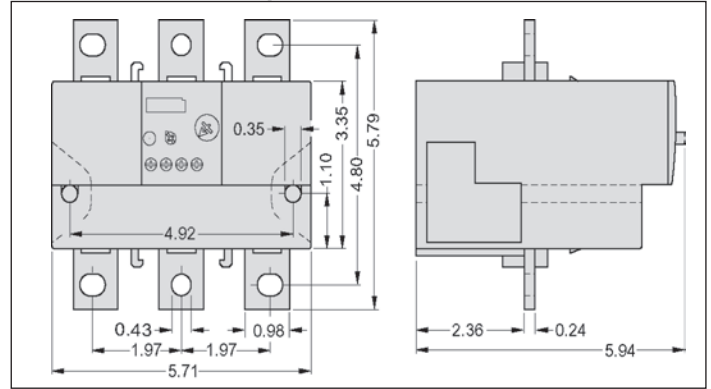
Dimensions "A1" Frame—ESP200 Solid State Overload



Dimensions "B" Frame—ESP200 Solid State Overload

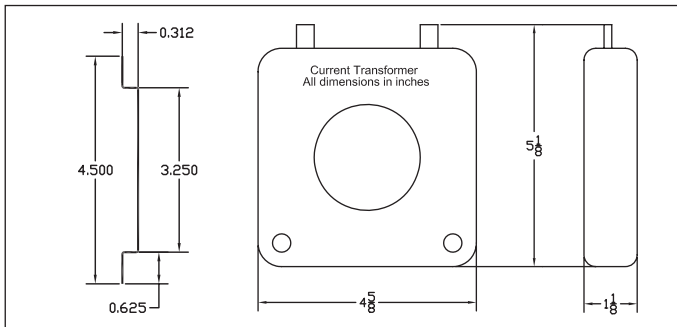


Overload (55 - 630 Amps), SIRIUS 3RB20



Dimensions	Frame Size A		Frame Size A1		Frame Size B	
	mm	in.	mm	in.	mm	in.
A	80	3.15	80	3.15	100.4	3.95
B	12.6	0.5	12.6	0.5	8.6	0.34
C	27.7	1.1	28	1.10	32.6	1.28
D	44.85	1.77	44.85	1.77	44.85	1.77
E	34.9	1.37	34.9	1.37	23.5	0.93
F	19.6	0.77	19.6	.077	33.5	1.32
G	48.95	1.93	48.95	1.93	46.23	1.82
H	10.7	0.42	10.7	0.42	10.9	0.43
I	2.3	0.09	2.3	0.09	2.4	0.09
J	80	3.15	80	3.15	104.6	4.12
K	53.9	2.12	53.9	2.12	58.6	2.31
L	66.0	2.6	55.9	2.20	50	1.97
M	89.7	3.53	89.7	3.53	114	4.49
N	10.18	0.40	10.18	0.40	4.7	0.19
O	—	—	10.77	0.42	23.6	0.93
P	—	—	8.62	0.34	21.1	0.83
R	—	—	12.9	0.51	27.1	1.07
S	9.5	0.37	—	—	2.45	0.1
T	5.2	0.21	5.2	0.21	5.2	0.21

Current Transformers (all CT's have the same dimensions)



Note: When mounted on a plate, torque screws to 11 lb.in. (1.2 Nm).

NEMA & General Purpose Control

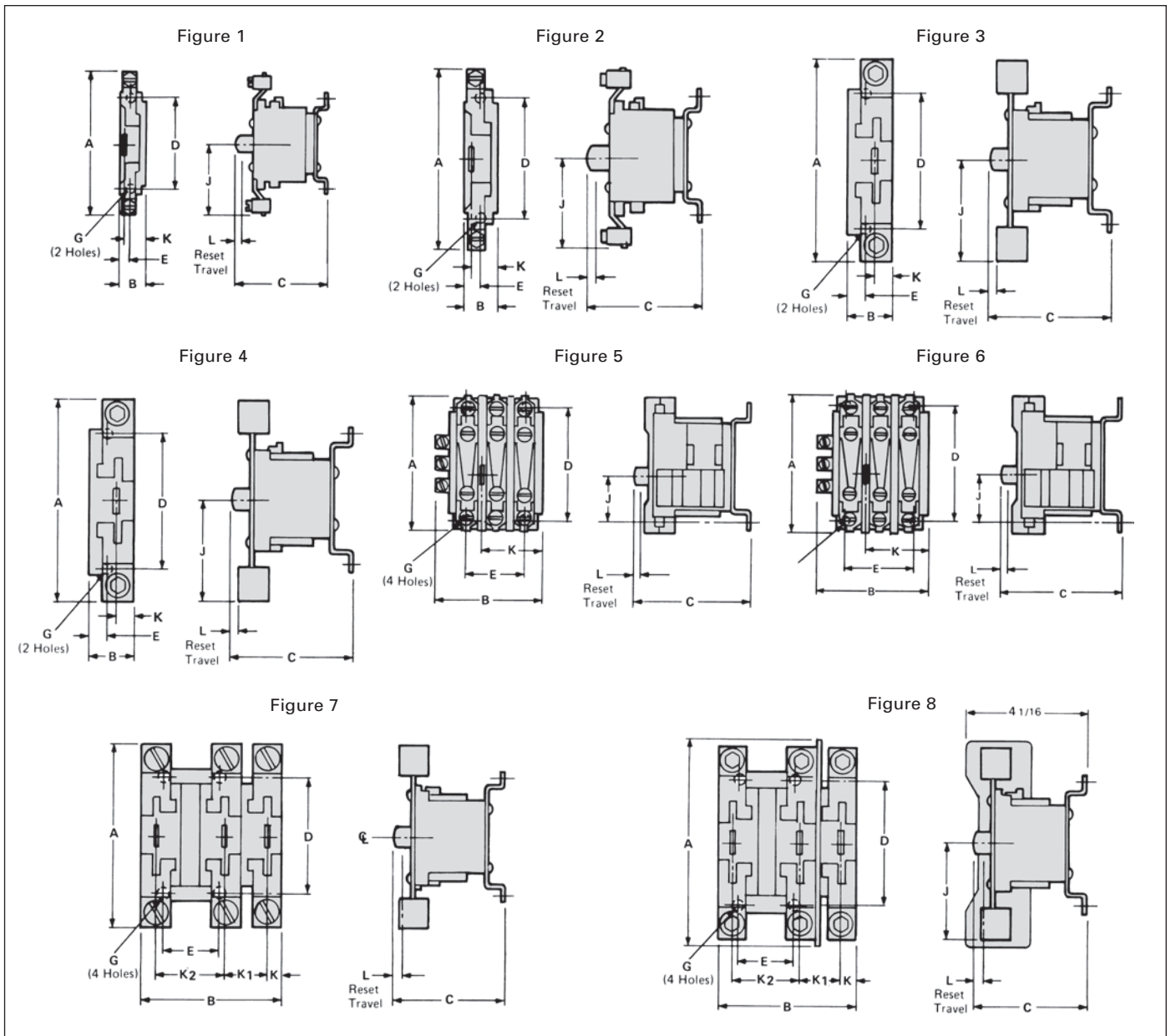
17

CONTROL PRODUCTS

Overload Relays

Panel Mounted Class 48 — Bimetal

Dimensions



Description	Amp Rating	Fig	Outline Dimensions			Mounting Dimensions		Reset Dimensions			Mounting Screw G	Max Wire Size	Approx Ship Wt Lbs (Kg)	Ref Dwg
			A	B	C	D	E	J	K	L				
1-Pole Bimetal	25	1	3 1/2 (89)	7/8 (22)	3 3/16 (81)	3 (76)	1/2 (13)	1 1/4 (44)	3/4 (19)	1/8 (3)	#10	8	2 (1)	D51820
Ambient	60	2	4 1/8 (124)	7/8 (22)	3 3/16 (81)	3 (76)	1/2 (13)	2 1/16	3/4 (19)	1/8 (3)	#10	1	2 (1)	D51830
Compensated	100	3	4 7/8 (124)	1 1/4 (32)	3 3/8 (90)	3 1/2 (89)	9/16 (14)	2 1/16	1/2 (13)	1/8 (3)	#10	00	3 (1)	D51833
	180	4	5 1/2 (151)	1 1/4 (32)	3 3/8 (90)	3 1/2 (89)	9/16 (14)	3 (76)	1/2 (13)	1/8 (3)	#10	250 MCM	4 (2)	D52206

Description	Amp Rating	Fig	Outline Dimensions			Mounting Dimensions		Reset Dimensions					Mtg Screw G	Max Wire Size	Approx Ship Wt Lbs (Kg)	Ref Dwg
			A	B	C	D	E	J	K	K1	K2	L				
3-Pole Bimetal	30	5	3 3/8 (92)	3 3/8 (78)	3 3/8 (79)	3 (76)	1 1/2 (38)	1 1/4 (32)	1 13/16 (46)	—	—	3/16 (5)	#10	8	3 (1)	D54791
Ambient	60	6	3 7/8 (98)	3 3/8 (78)	3 3/4 (79)	3 (76)	1 1/2 (38)	1 1/4 (32)	1 13/16 (46)	—	—	3/16 (5)	#10	2	3 (1)	D54823
Compensated	100	7	4 7/8 (124)	4 1/8 (113)	3 3/8 (90)	3 1/2 (89)	1 3/4 (41)	2 1/8 (62)	9/16 (14)	1 1/8 (49)	2 (51)	1/8 (3)	#10	00	4 (2)	D51868
	180	8	6 1/2 (165)	4 7/8 (113)	3 3/8 (90)	3 1/2 (89)	1 3/4 (41)	3 (76)	9/16 (14)	1 1/8 (49)	2 (51)	1/8 (3)	#10	250 MCM	5 (2)	D52038

Note: Dimensions for reference, not for construction.
Dimensions in inches (mm).

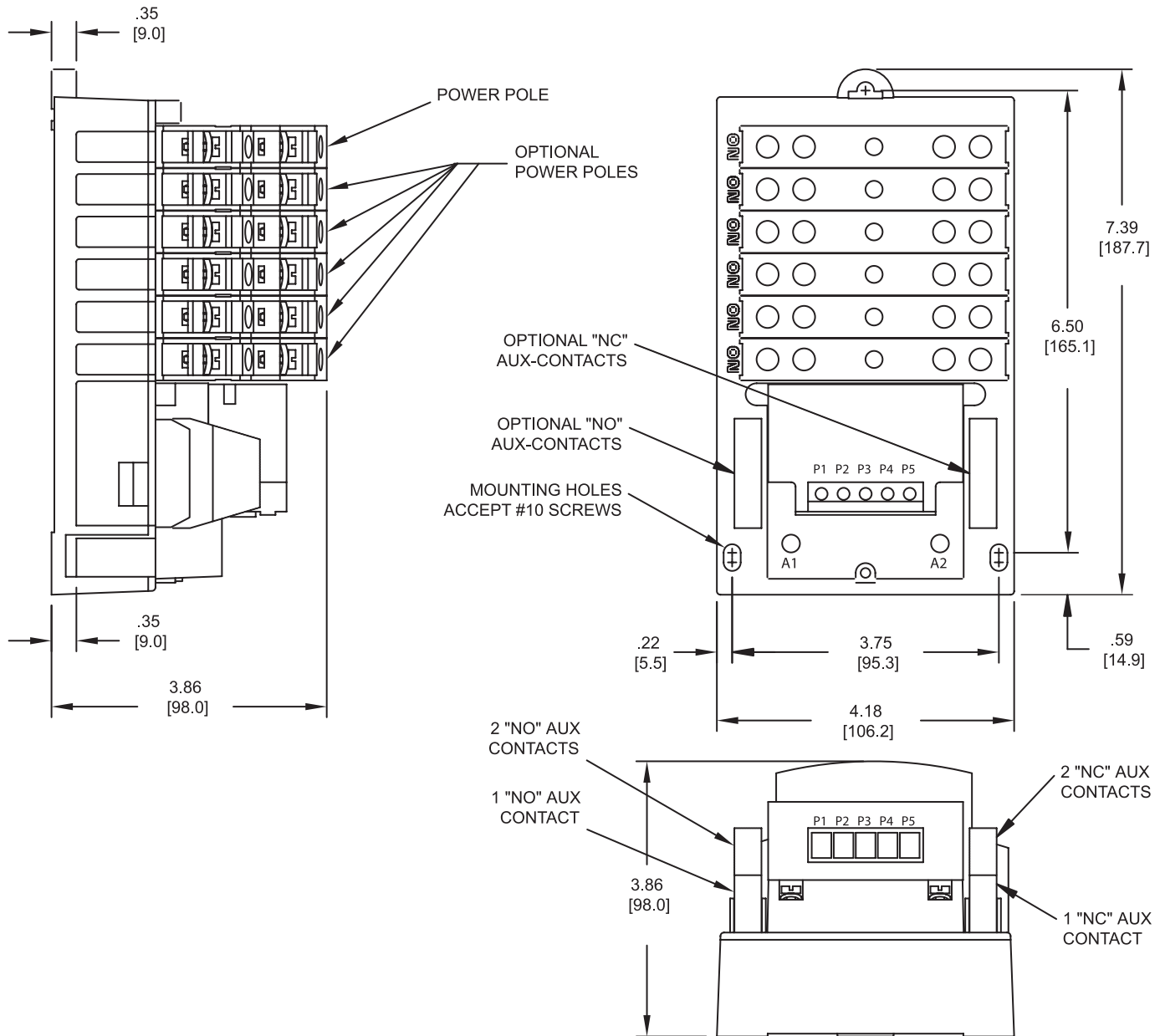
NEMA & General Purpose Control

17 CONTROL PRODUCTS

Lighting & Heating Contactors

Class LC Open Contactors

Dimensions



Note:

- 1) Mounting Dimensions remain the same for 1 to 12 Poles
- 2) Line and Load terminals are inter-changeable
- 3) Up to 2NO and 2NC auxiliary contacts can be added onto the base product
- 4) Same Power Pole can be configured as NO type or NC type

NEMA & General Purpose Control

17

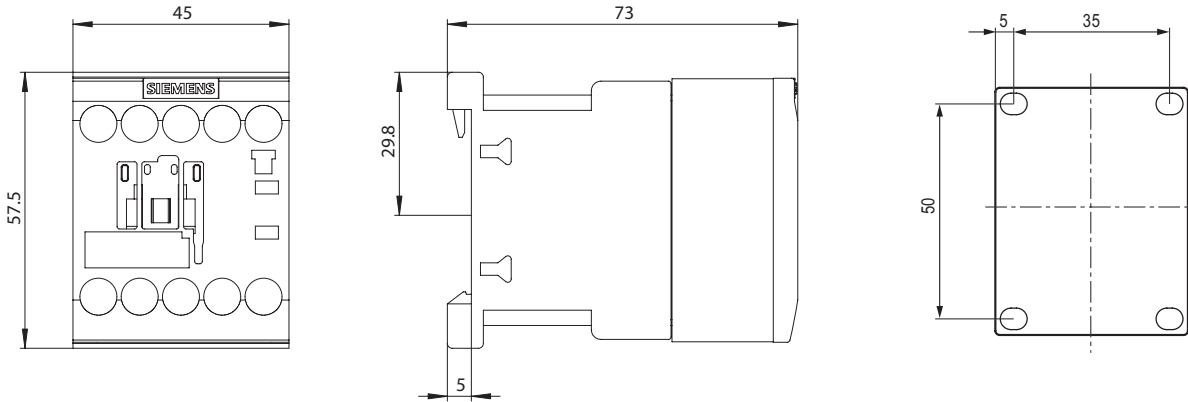
CONTROL PRODUCTS

Lighting & Heating Contactors

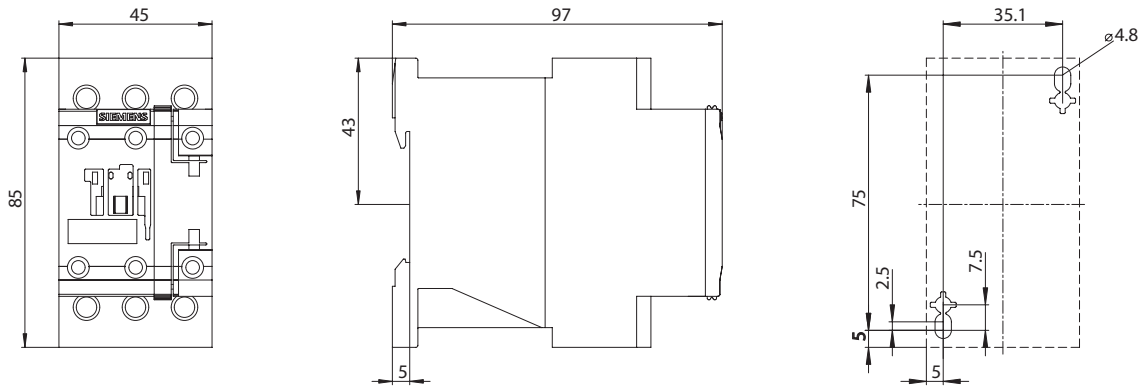
Open Contactors, Class LE

Dimensions

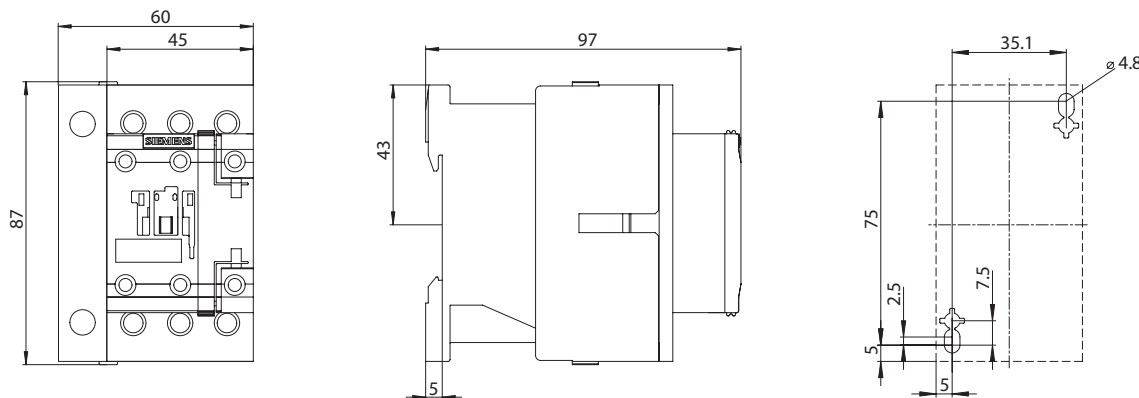
LEN00B (20A 3 Pole and 4 Pole)



LEN00C003 (30A 3 Pole)



LEN00C004 (30A 4 Pole)



NEMA & General
Purpose Control

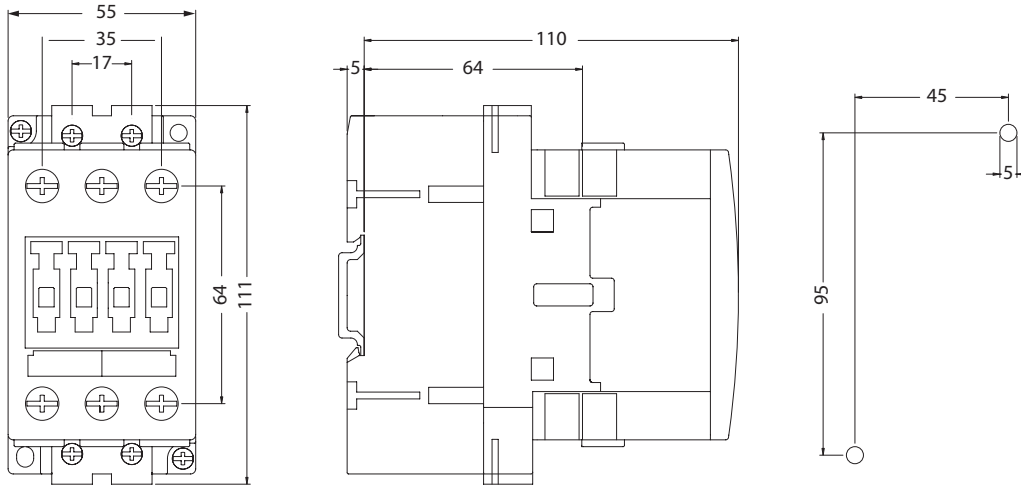
17
CONTROL
PRODUCTS

Lighting & Heating Contactors

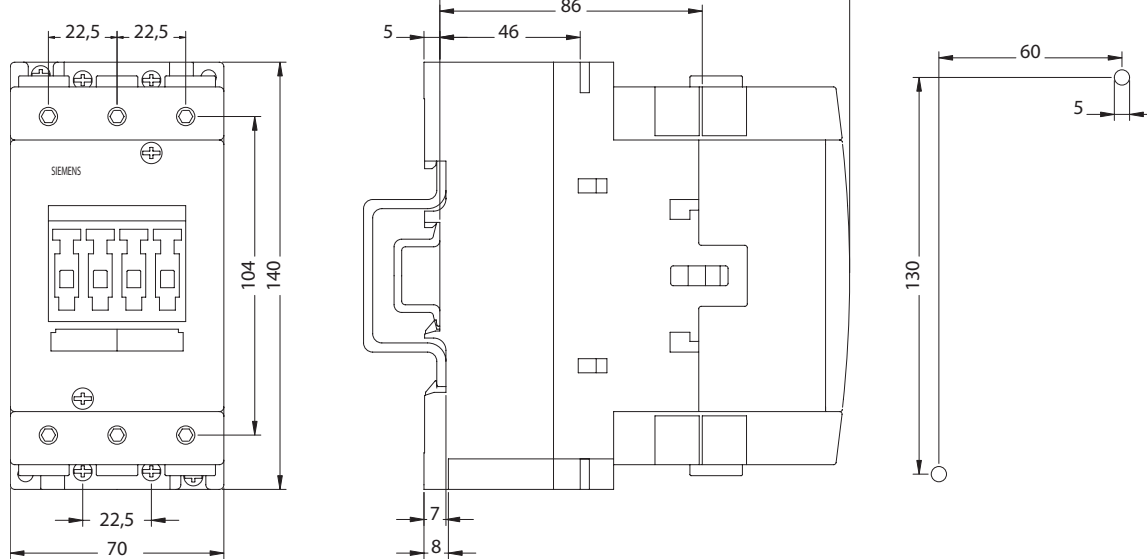
Open Contactors, Class LE

Dimensions

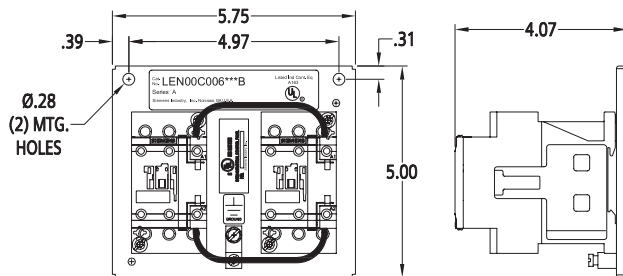
LEN00D003 (60A 3 Pole)



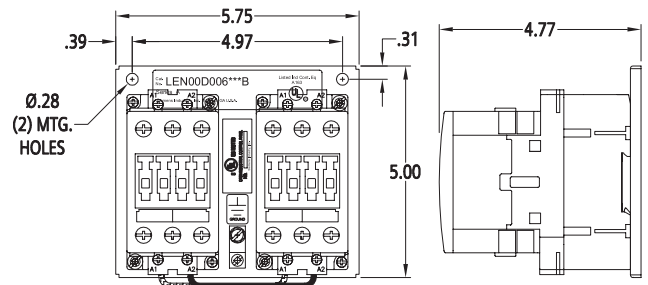
LEN00E003 (100A 3 Pole)



LEN00C006 (30A 6 Pole)



LEN00D006 (60A 6 Pole)



NEMA & General Purpose Control

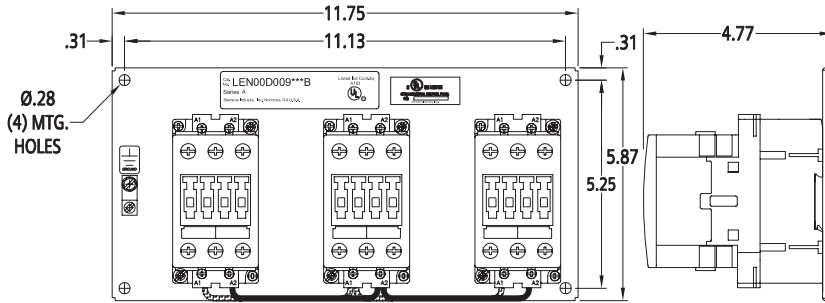
17 CONTROL PRODUCTS

Lighting & Heating Contactors

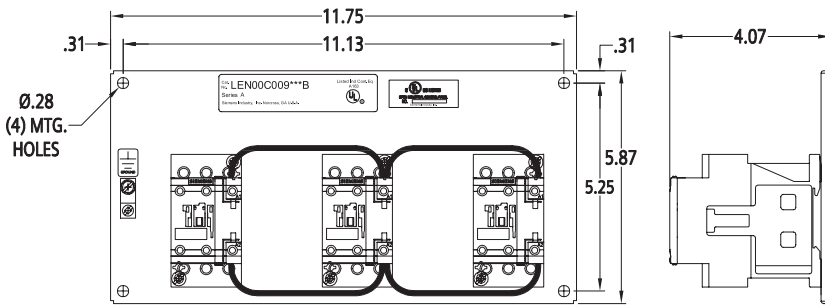
Open Contactors, Class LE

Dimensions

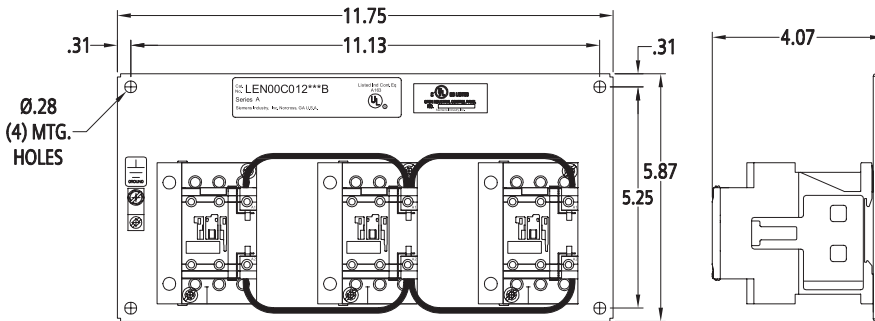
LEN00C009 (30A 9 Pole)



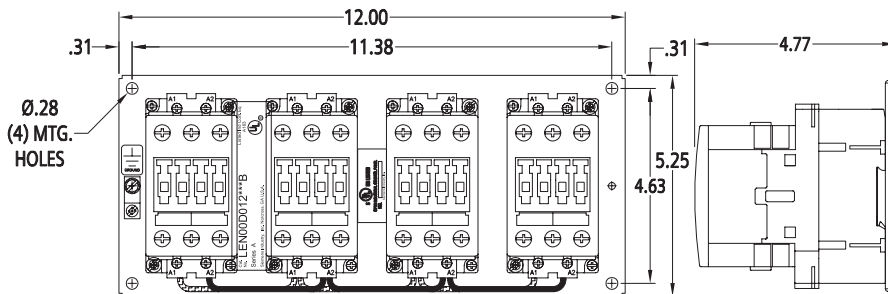
LEN00D009 (60A 9 Pole)



LEN00C012 (30A 12 Pole)



LEN00D012 (60A 12 Pole)



NEMA & General Purpose Control

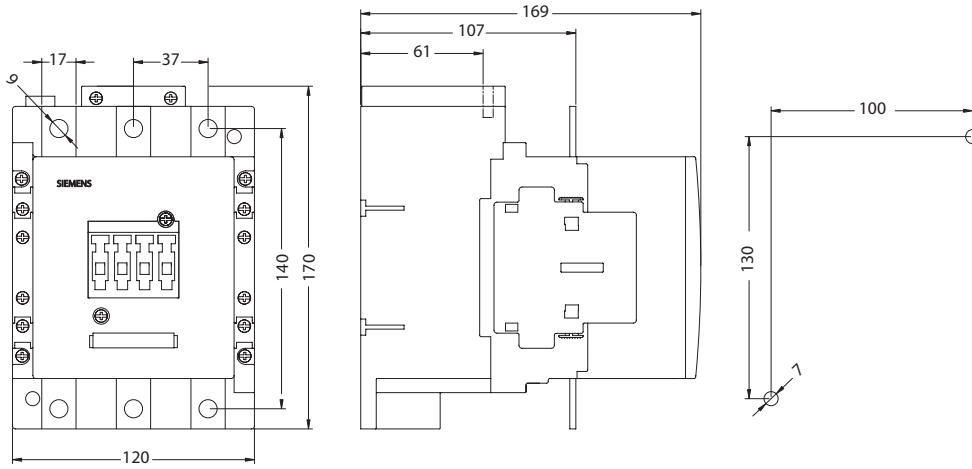
17 CONTROL PRODUCTS

Lighting & Heating Contactors

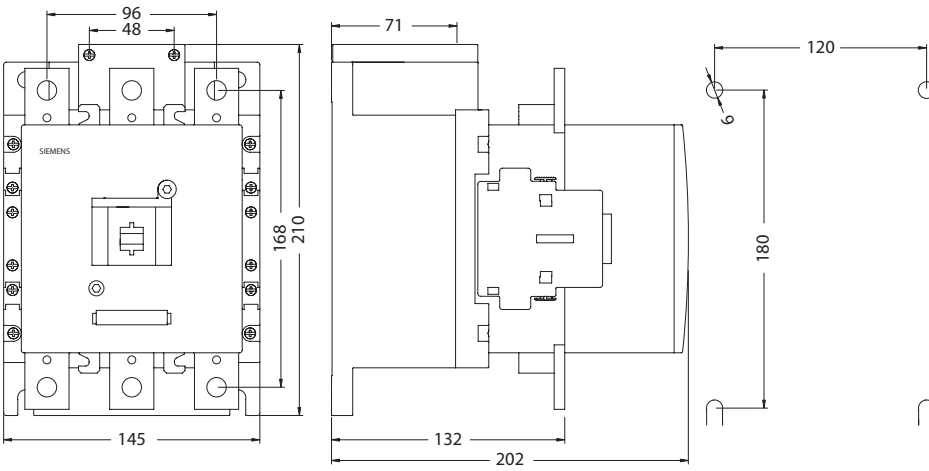
Open Contactors, Class LE

Dimensions

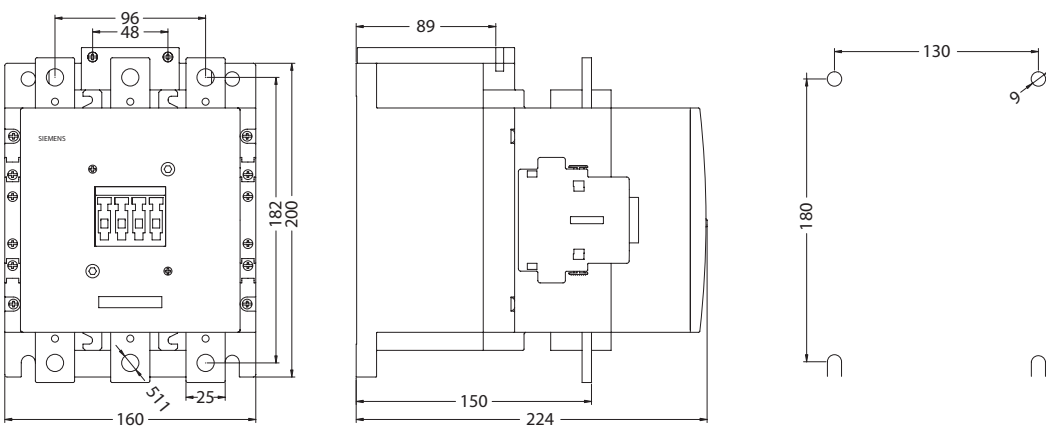
LEN00F003 (200A 3 Pole)



LEN00G003 (300A 3 Pole)



LEN00H003 (400A 3 Pole)



NEMA & General Purpose Control

17 CONTROL PRODUCTS

Lighting & Heating Contactors

Mechanically / Magnetically Held Lighting Contactors, Class CLM

Dimensions

CLM Contactor, 20 Amp

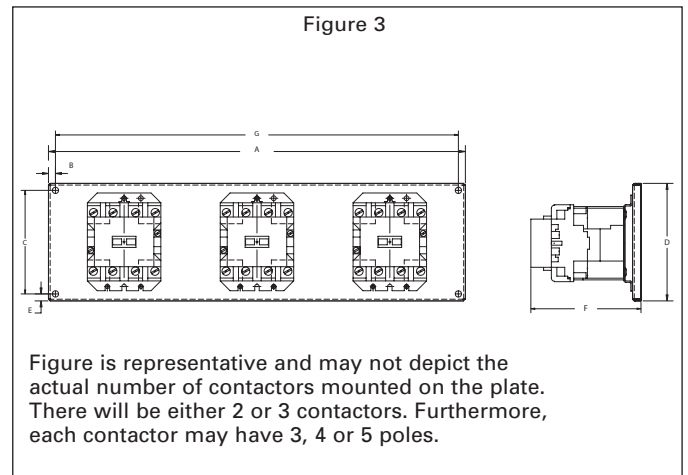
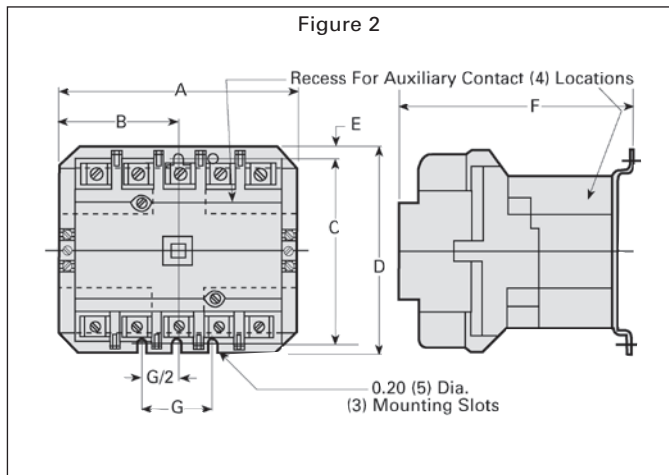
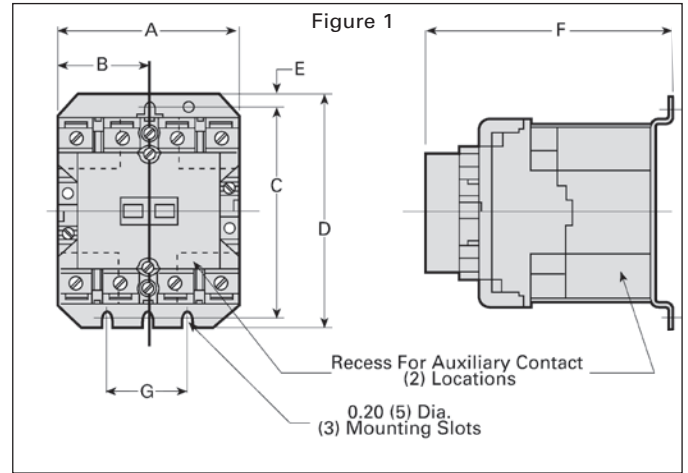
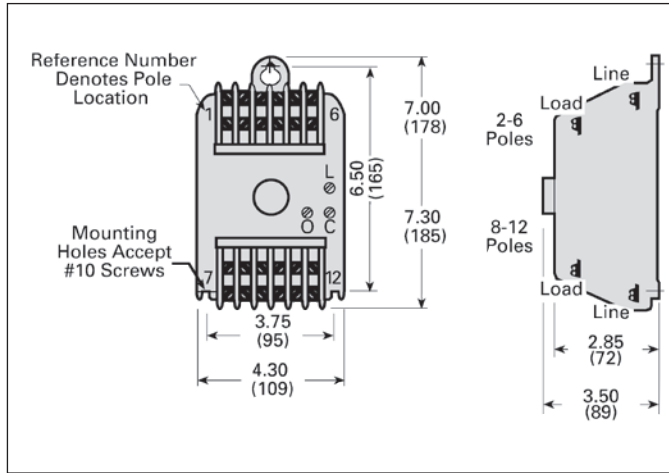


Figure is representative and may not depict the actual number of contactors mounted on the plate. There will be either 2 or 3 contactors. Furthermore, each contactor may have 3, 4 or 5 poles.

Open Type Lighting and Heating Contactors

Class	Figure Number	Amp Rating	Number of Poles	A	B	C	D	E	F	G
CLM	1	30	2-4	3.31 (84)	1.65 (42)	3.95 (100)	4.38 (111)	0.23 (6)	4.61 (117)	1.50 (38)
		30	5	4.19 (106)	2.09 (53)	3.95 (100)	4.38 (111)	0.23 (6)	4.61 (117)	1.50 (38)
	2	60	2, 3	3.31 (84)	1.65 (42)	3.95 (100)	4.38 (111)	0.23 (6)	4.94 (125)	1.50 (38)
		60	4, 5	5.06 (129)	2.53 (64)	3.95 (100)	4.38 (111)	0.23 (6)	4.94 (125)	1.50 (38)
		100	2, 3	4.62 (117)	2.31 (59)	6.00 (152)	6.62 (168)	0.38 (10)	6.75 (171)	1.88 (48)
		100	4, 5	7.25 (184)	3.62 (92)	6.00 (152)	6.62 (168)	0.38 (10)	6.75 (171)	1.88 (48)
		200	2, 3	4.62 (117)	2.31 (59)	6.00 (152)	6.62 (168)	0.38 (10)	6.75 (171)	1.88 (48)
		200	4, 5	7.25 (184)	3.62 (92)	6.00 (152)	6.62 (168)	0.38 (10)	6.75 (171)	1.88 (48)
	3	30	6, 8	8.00 (196)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	4.86 (119)	7.38 (181)
		30	9, 10, 12	11.75 (289)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	4.86 (119)	11.13 (273)
		60	6	8.00 (196)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	5.19 (127)	7.38 (181)
		60	8, 9, 10	11.75 (289)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	5.19 (127)	11.13 (273)
60		12	16.75 (410)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	5.19 (127)	16.13 (395)	

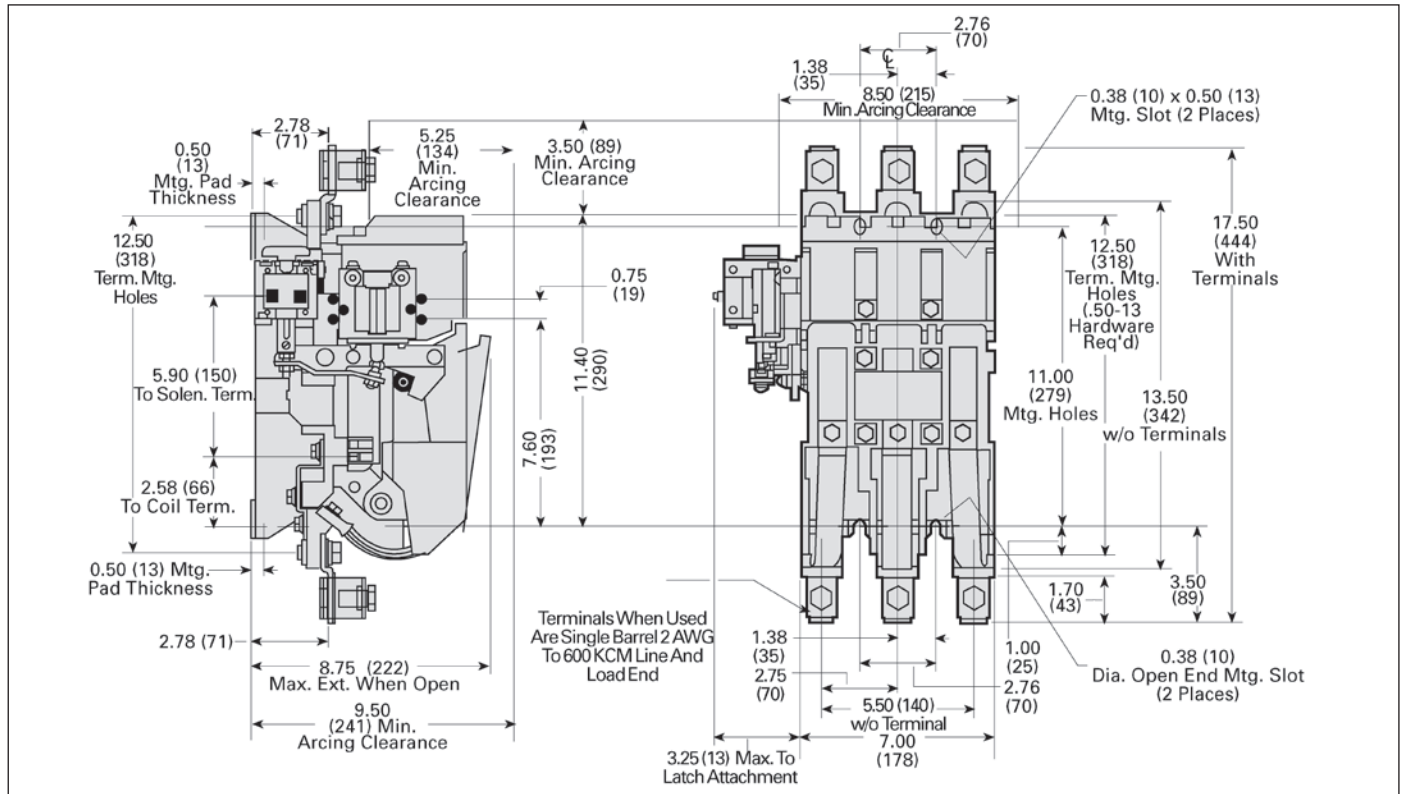
Note: Dimensions for reference, not for construction. Dimensions in inches (mm).

Lighting Control

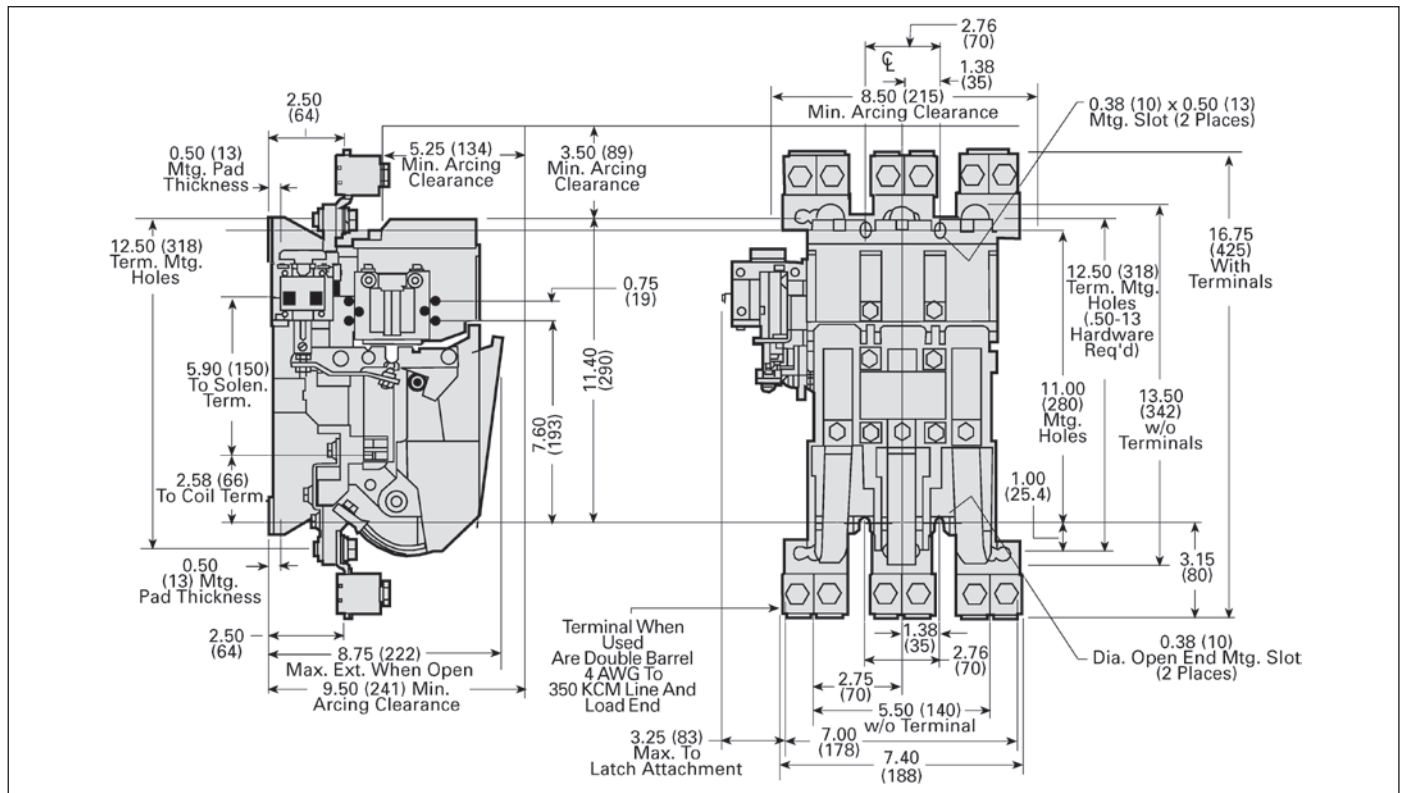
Mechanically Latched 300 and 400 Amps, Class CLM

Dimensions

CLM Contactors 300 Amp



CLM Contactors 400 Amp



Note: Dimensions for reference, not for construction.
Dimensions in inches (mm).

NEMA & General Purpose Control

CONTROL PRODUCTS 17

Industrial Control Power Transformers

Class MT

Dimensions

For the latest CAD or PDF dimension drawings, look on our website at <http://www.industry.usa.siemens.com/automation/us/en/industrial-controls/products/control-circuit-components/control-power-transformers/Pages/dimensional-drawings.aspx>

NEMA & General
Purpose Control

17

CONTROL
PRODUCTS

Industrial Control Power Transformers

Class MTG

Dimensions

For the latest CAD or PDF dimension drawings, look on our website at <http://www.industry.usa.siemens.com/automation/us/en/industrial-controls/products/control-circuit-components/control-power-transformers/Pages/dimensional-drawings.aspx>

NEMA & General
Purpose Control

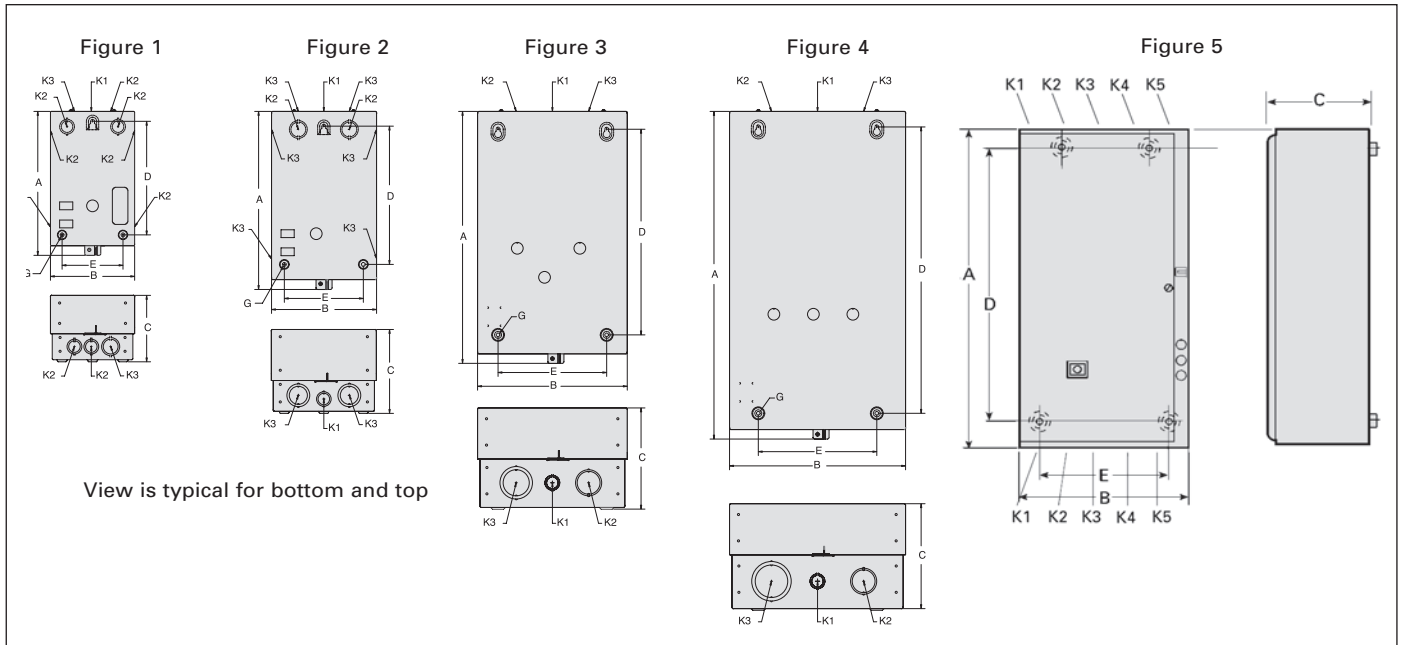
17

CONTROL
PRODUCTS

Heavy Duty Motor Starters & Contactors

Enclosed, Class 14, 40

Dimensions



NEMA 1 General Purpose Enclosure (Standard width for use with or without CPT)^①

Size	Max CPT Size	Figure	Outline Dimensions			Mounting Dimensions		Mounting Screw	Conduit Size					Approx Ship Wt Lbs (Kg)	Ref Dwg
			A	B	C	D	E		K1	K2	K3	K4	K5		
00-1¼	w/o CPT	1	10 ³ / ₂ (279)	6 ¹ / ₂ (163)	5 ¹ / ₂ (128)	8 ¹ / ₂ (209)	4 ³ / ₈ (117)	¼	½	½-¾	¾-1	—	—	10 (5)	D68870
2-2½	w/o CPT	2	13 ¹ / ₂ (344)	7 ³ / ₂ (202)	6 ³ / ₈ (162)	10¼ (260)	6 (152)	¼	½-¾	¾-1	1-1¼	—	—	15 (7)	D68870
3-3½	(100VA)	3	19¼ (486)	11 ³ / ₈ (289)	7 ¹ / ₈ (195)	15 ³ / ₈ (397)	8¼ (210)	¼	½-¾	1-1¼	1½-2	—	—	26 (12)	D68870
4	(300VA)	4	24¼ (632)	13 ³ / ₈ (340)	8 ³ / ₈ (206)	21¼ (552)	9 (229)	¼	½-¾	1¼-1½	2-2½	—	—	37 (17)	D68870
5	(300VA)	5	40 (1016)	20 (508)	11 (279)	37 ³ / ₈ (956)	15¼ (387)	¼	2-3	1¼-1½	½-¾	1¼-1½	2-3	135 (36)	D65608
6, 7	(300VA)	5	48 (1219)	20 (508)	12½ (317)	45 ¹ / ₈ (1148)	10 (254)	¼	2-2½	1¼-1½	½-¾	1¼-1½	2-2½	150 (44)	D65608013
8		5	79 (2010)	22 (559)	13 (330)	78 (1981)	18 (457)							275 (125)	D56032006

NEMA 1 General Purpose Enclosure (Extra wide for use with CPT)^①

Size	Max CPT Size	Figure	Outline Dimensions			Mounting Dimensions		Mounting Screw	Conduit Size					Approx Ship Wt Lbs (Kg)	Ref Dwg
			A	B	C	D	E		K1	K2	K3	K4	K5		
00-1¼	(200VA)	3	19¼ (486)	11 ³ / ₈ (289)	7 ¹ / ₈ (195)	15 ³ / ₈ (397)	8¼ (210)	¼	½-¾	1-1¼	1½-2	—	—	26 (12)	D68870
2-2½	(200VA)	3	19¼ (486)	11 ³ / ₈ (289)	7 ¹ / ₈ (195)	15 ³ / ₈ (397)	8¼ (210)	¼	½-¾	1-1¼	1½-2	—	—	26 (12)	D68870
3-3½	(250VA)	4	24¼ (632)	13 ³ / ₈ (340)	8 ³ / ₈ (206)	21¼ (552)	9 (229)	¼	½-¾	1-1¼-1½	2-2½	—	—	37 (17)	D68870

Note: Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

① Clamshell enclosure Size 00 - 4; Standard width and Extra wide.

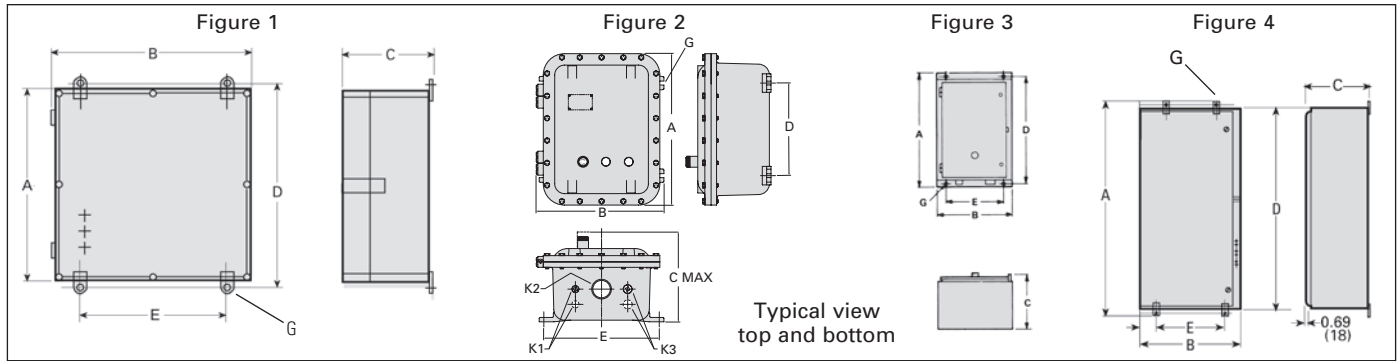
NEMA & General Purpose Control

CONTROL PRODUCTS

Heavy Duty Motor Starters & Contactors

Enclosed, Class 14, 40

Dimensions



NEMA 4X Fiberglass Enclosures (Standard width for use with or without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-2½	1	14.620 (371)	11.880 (302)	6.890 (175)	15.000 (381)	9.750 (248)	¼	—	—	—	11 (4.9)	24-139-861-001
3-4	1	23.780 (604)	23.780 (604)	6.890 (175)	24.125 (612.7)	21.250 (539.7)	¼	—	—	—	28 (12.7)	24-139-861-003

NEMA 7/9/3/4 Hazardous Location Enclosure (Standard width for use with or without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-1¼ w/o CPT	2	15.250 (387)	10.688 (272)	10.000 (254)	8.500 (216)	9.125 (132)	¾	½	1½	¾	33 (14.9)	24-139-865-002
2-2½ (0-1¼ w/ CPT)	2	17.750 (451)	14.688 (373)	10.375 (264)	10.625 (270)	13.250 (337)	¾	½	2	¾	60 (27.0)	24-139-865-003
3	2	17.750 (451)	14.688 (373)	10.375 (264)	10.625 (270)	13.250 (337)	¾	½	2	¾	60 (27.0)	24-139-865-003
3½-4	2	28.688 (729)	17.750 (451)	11.750 (298)	18.375 (467)	15.750 (400)	½	½	3	¾	140 (63.5)	24-139-865-004
5	2	48.875 (1038)	22.875 (581)	14 7/8 (377)	29 (373)	21¼ (533)	¾	½	3	¾	352 (159)	24-139-865-006

NEMA 7/9/3/4 Hazardous Location Enclosure (Extra wide for use with CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-2½ [Ⓞ]	2	17.750 (451)	14.688 (373)	10.375 (264)	10.625 (270)	13.250 (337)	¾	½	2	¾	60 (27.0)	24-139-865-003

NEMA 12/3/3R Industrial Use Enclosure (Standard width for use without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-1¼	3	13.000 (330)	7.750 (197)	5.438 (138)	12.250 (311)	5.000 (127)	¼	—	—	—	12 (5)	D41547
2-2½	3	16.000 (406)	8.125 (206)	6.063 (154)	15.250 (387)	5.000 (127)	¼	—	—	—	18 (8)	D41547
3-4	3	26.000 (660)	13.125 (333)	7.563 (192)	25.250 (641)	10.000 (254)	¼	—	—	—	49 (22)	D41552

NEMA 12/3/3R Industrial Use Enclosure (Extra wide for use with CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-1¼	3	13.000 (330)	12.625 (321)	5.375 (137)	12.250 (311)	10.000 (254)	¼	—	—	—	30 (14)	D17150
2-2½	3	16.000 (406)	13.250 (337)	6.125 (156)	15.250 (387)	11.000 (279)	¼	—	—	—	33 (15)	D17150
3-3½	3	26.000 (660)	13.125 (333)	7.563 (192)	25.250 (641)	10.000 (254)	¼	—	—	—	49 (22)	D41552
4	3	29.063 (738)	23.188 (589)	9.250 (235)	27.563 (700)	20.000 (508)	¾	—	—	—	64 (29)	D17150
5	4	40.000 (1016)	20.000 (508)	11.000 (279)	41.000 (1041)	10.000 (254)	¾	—	—	—	—	D65608007
6, 7	4	48.000 (1219)	20.000 (508)	12.500 (317)	49.000 (1244)	10.000 (254)	¾	—	—	—	—	D65608009
8	5	79.000 (2010)	22.000 (559)	13.000 (330)	78.000 (1981)	18.000 (457)	¾	—	—	—	275 (125)	D65632006

NEMA 4/4X Stainless Steel Enclosure (Standard width for use without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-1¼	3	13.000 (330)	7.750 (197)	5.438 (138)	12.250 (311)	5.000 (127)	¼	—	—	—	17.5 (8)	D41546
2-2½	3	16.000 (406)	8.125 (206)	6.063 (154)	15.250 (387)	5.000 (127)	¼	—	—	—	36 (16)	D41546
3-4	3	26.000 (660)	13.125 (333)	7.563 (192)	25.250 (641)	10.000 (254)	¼	—	—	—	67 (30)	D41551

NEMA 4/4X Stainless Steel Enclosure (Extra wide for use with CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-1¼	3	13.000 (330)	12.625 (321)	5.375 (137)	12.250 (311)	10.000 (254)	¼	—	—	—	30 (14)	D41917
2-2½	3	16.000 (406)	13.250 (337)	6.000 (152)	15.250 (387)	11.000 (279)	¼	—	—	—	33 (15)	D42935
3-3½	3	26.000 (660)	18.000 (457)	7.563 (192)	25.250 (641)	10.000 (254)	¼	—	—	—	67 (30)	D41551
4	3	29.000 (737)	23.188 (589)	9.250 (235)	27.500 (699)	20.000 (508)	¾	—	—	—	64 (29)	D43292
5 (Painted)	4	40.000 (1016)	20.000 (508)	11.000 (279)	41.000 (1041)	10.000 (254)	¾	—	—	—	—	D65608007
6, 7 (Painted)	4	48.000 (1219)	20.000 (508)	12.500 (317)	49.000 (1244)	10.000 (254)	¾	—	—	—	—	D65608009
8 (Painted)	5	79.000 (2010)	22.000 (559)	13.000 (330)	78.000 (1981)	18.000 (457)	¾	—	—	—	275 (125)	D65632006

Note: Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

Ⓞ Used for addition of only CPT on size 2½. If pilot devices are needed, use size 3-3½ enclosure.

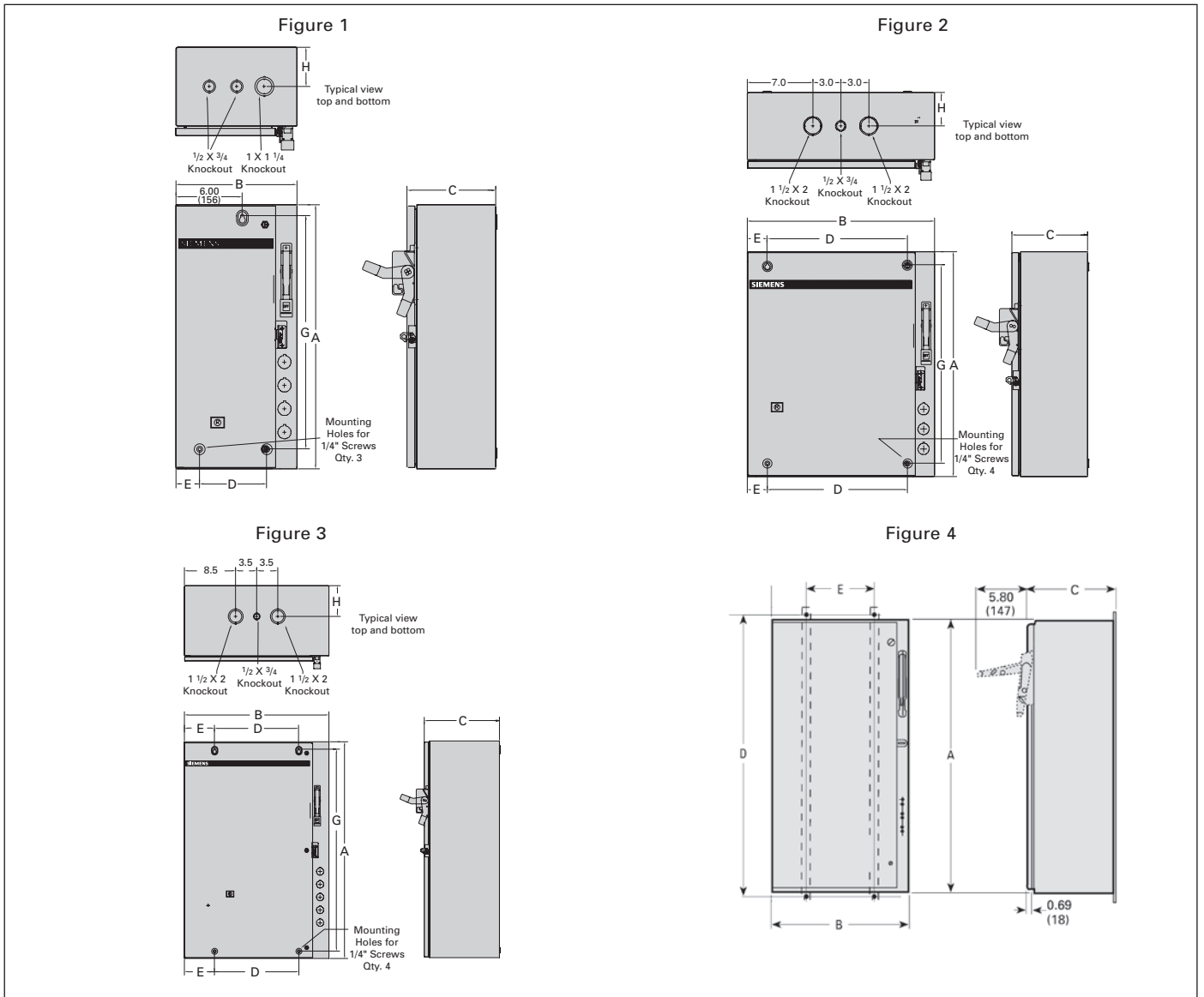
NEMA & General Purpose Control

CONTROL PRODUCTS 17

Combination Heavy Duty Starters

Enclosed, Class 17, 18

Dimensions



NEMA 1 Standard Width 0-6

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2	1	24 (610)	11 (279)	8 (203)	6.125 (156)	2.125 (54)	21.00 (533)	3.50 (90)	35 (16)	D68774001
2 1/2, 3 (except 200A Disc)	2	24 (610)	20 (508)	8 (203)	15.00 (381)	2.125 (54)	21.00 (533)	3.50 (90)	48 (22)	D68774002
3 (200A Disc.), 3 1/2, 4	3	36 (914)	24 (610)	8 (203)	14.00 (356)	5.00 (127)	33.50 (851)	5.00 (127)	101 (46)	D68774003
5	4	72.156 (1833)	20 (508)	11.031 (280)	71 (1803)	16 (406)	—	—	250 (113)	D56032005
6	4	79.125 (2010)	22 (559)	13 (330)	78 (1981)	18 (457)	—	—	275 (125)	D56032006

NEMA 1 Extra Wide 0-3

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2	2	24 (610)	20 (508)	8 (203)	15.00 (381)	2.125 (54)	21.00 (533)	3.50 (90)	48 (22)	D68774002
2 1/2, 3	3	36 (914)	24 (610)	8 (203)	14.00 (356)	5.00 (127)	33.50 (851)	5.00 (127)	101 (46)	D68774003

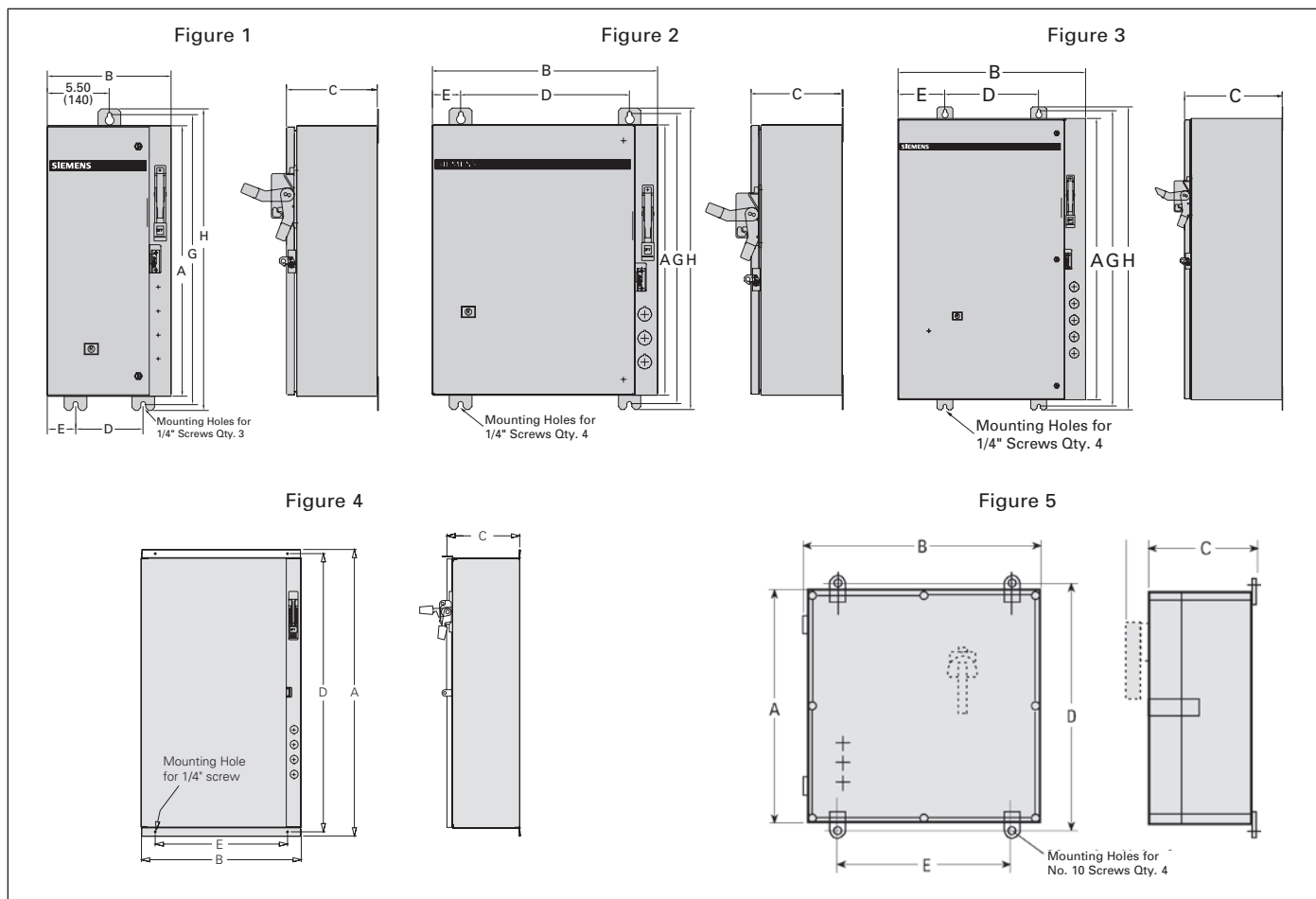
NEMA & General
Purpose Control

17
CONTROL
PRODUCTS

Combination Heavy Duty Starters

Enclosed, Class 17, 18

Dimensions



NEMA & General Purpose Control

17 CONTROL PRODUCTS

NEMA 12/3/3R/4 (Painted), 4/4X (Stainless) Standard Width 0-6

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2	1	24 (610)	11 (279)	8 (203)	6.00 (152)	2.50 (64)	25.75 (654)	26.75 (680)	35 (16)	D56033
2 1/2, 3 (except 200A Disc)	2	24 (610)	20 (508)	8 (203)	15.00 (381)	2.50 (64)	25.75 (654)	26.75 (680)	48 (22)	D56033
3 (200A Disc.), 3 1/2, 4	3	36 (914)	24 (610)	8 (203)	12 (305)	6.00 (152)	37.75 (959)	38.75 (984)	101 (46)	D56033
5 (Painted)	4	72.156 (1833)	20 (508)	11.031 (280)	71 (1830)	16 (406)	—	—	250 (113)	D56032005
6 (Painted)	4	79.125 (2010)	22 (559)	13 (330)	78 (1981)	18 (457)	—	—	275 (125)	D56032006

NEMA 12/3/3R/4 (Painted), 4/4X (Stainless) Extra Wide 0-3

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2	2	24 (610)	20 (508)	8 (203)	15.00 (381)	2.50 (64)	25.75 (654)	26.75 (654)	49 (22)	D56033
2 1/2, 3	3	36 (914)	24 (610)	8 (203)	12.00 (305)	6.00 (152)	37.75 (959)	38.75 (984)	102 (46)	D56033

NEMA 4X Fiberglass Standard Width 0-4

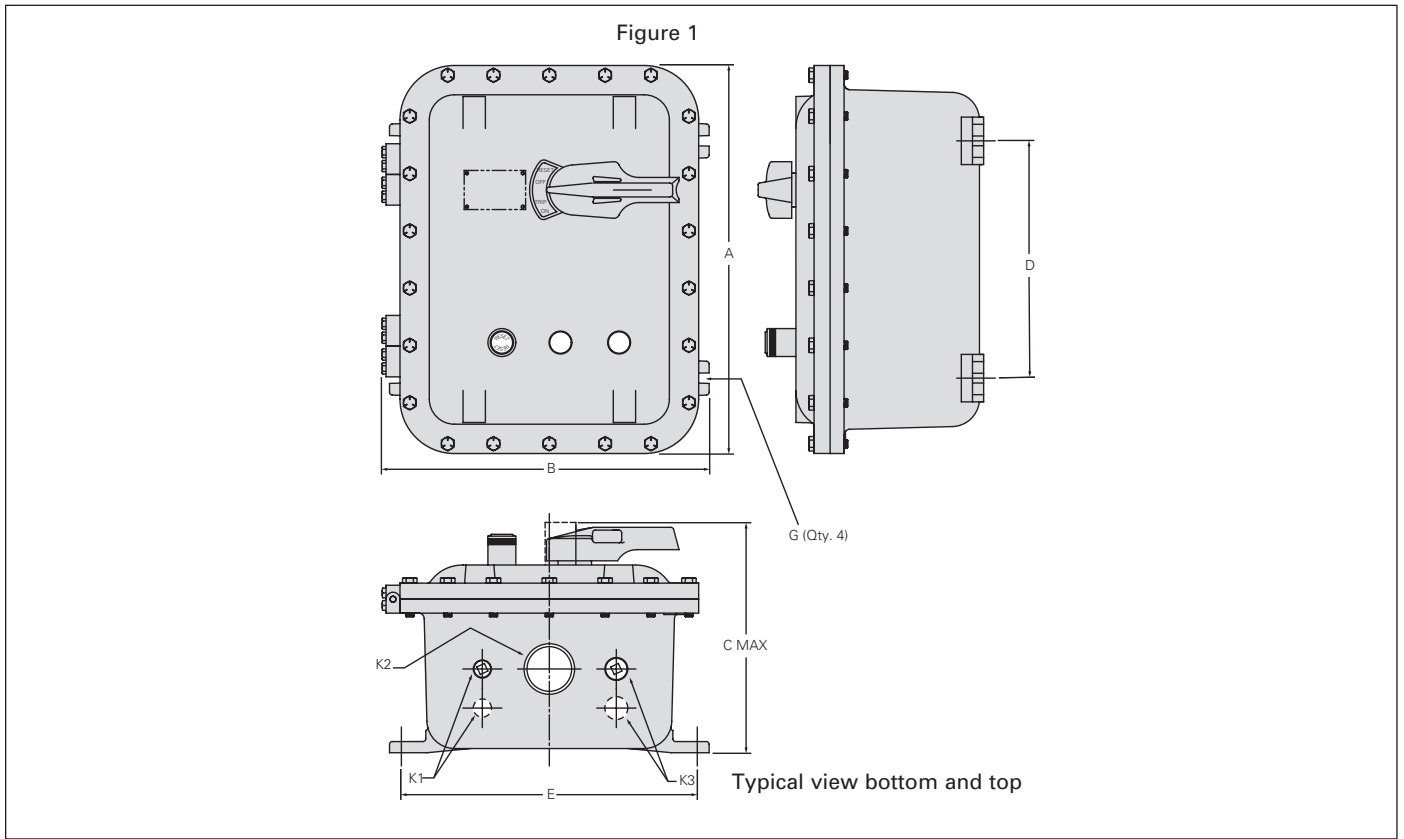
Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-1 1/4	5	23.75 (603)	14.62 (371)	7.12 (181)	24.09 (612)	12.20 (310)	—	—	42 (19)	—
2-3 1/2	5	23.75 (603)	23.75 (603)	8.50 (216)	24.06 (611)	21.30 (541)	—	—	44 (20)	—
4	5	39.37 (1000)	29.52 (750)	12.20 (310)	40.94 (1040)	27.95 (710)	—	—	55 (25)	—

Note: Dimensions in inches (mm).
 Dimensions for reference, not for construction.
 Contact sales office for dimensions not listed.

Combination Heavy Duty Starters

Enclosed, Class 18

Dimensions



NEMA 7 & 9, 3, 4 Standard Width 0-4

Size	Figure	Outline Dimensions			Mounting Dimensions		Mounting Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-1 $\frac{3}{4}$	1	17.38 (441)	14.69 (373)	10.38 (264)	10.63 (270)	13.25 (337)	$\frac{3}{8}$	$\frac{3}{4}$	2	$\frac{1}{2}$	60 (27)	24-139-865-003
2-3 $\frac{1}{2}$	1	28.25 (718)	17.75 (451)	11.19 (284)	18.38 (467)	15.75 (400)	$\frac{3}{8}$	$\frac{3}{4}$	2 $\frac{1}{2}$	$\frac{1}{2}$	160 (72)	24-139-865-004
4	1	32.25 (819)	20.00 (508)	11.50 (292)	22.50 (572)	17.75 (451)	$\frac{5}{8}$	$\frac{3}{4}$	2 $\frac{1}{2}$	$\frac{1}{2}$	250 (113)	24-139-865-005
5	1	40.875 (1038)	22.875 (581)	14.875 (378)	29 (737)	21.75 (552)	$\frac{5}{8}$	$\frac{1}{2}$	3	$\frac{3}{4}$	360 (163)	—

Note: Dimensions in inches (mm). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

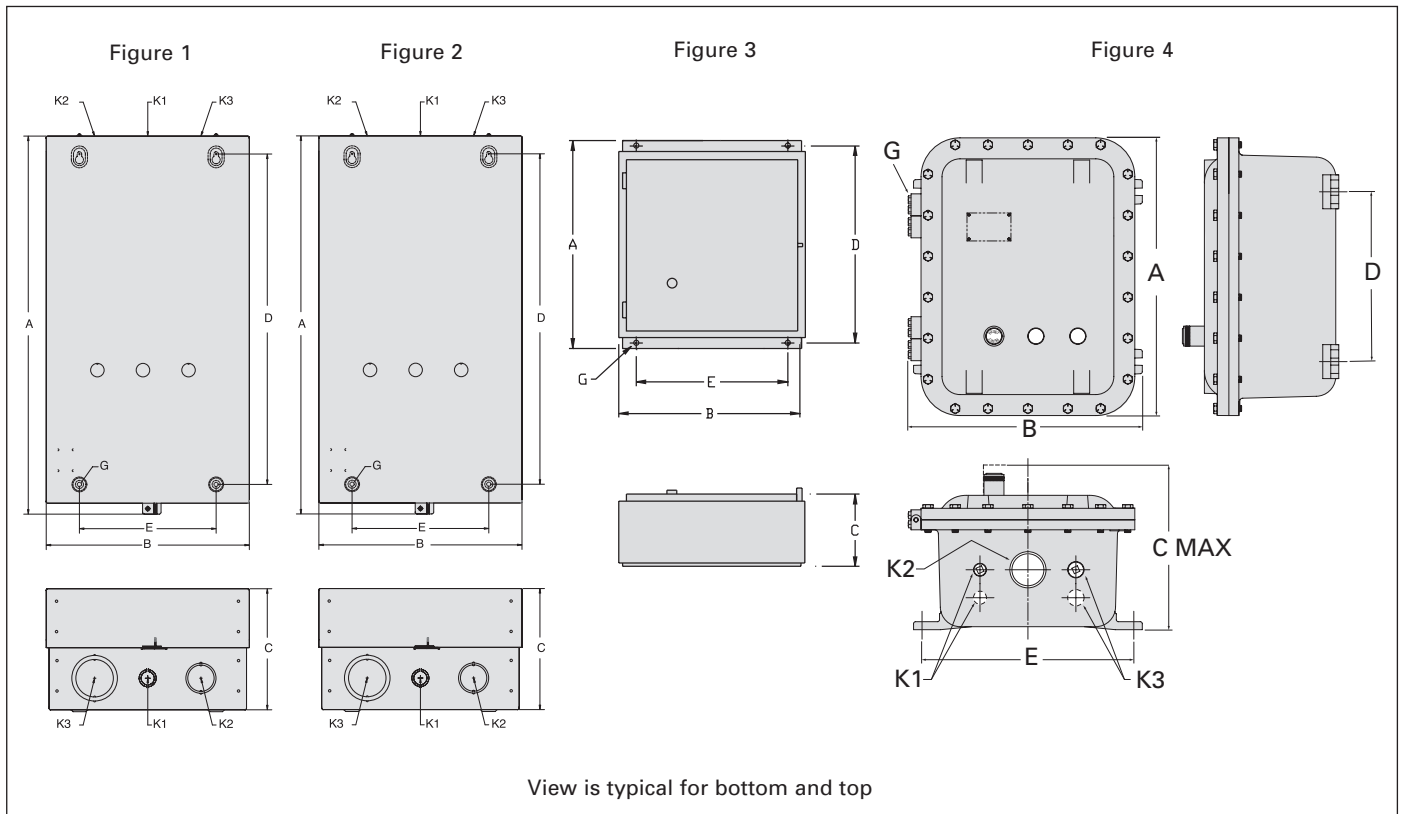
NEMA & General Purpose Control

CONTROL PRODUCTS

Reversing Heavy Duty Starters & Contactors

Enclosed, Class 22, 43

Dimensions



NEMA & General Purpose Control

17 CONTROL PRODUCTS

NEMA 1 General Purpose Enclosure (Standard width for use with and without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mounting Screw	Conduit Size				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2	K3		
0-2½ (200 VA)	1	19½ (486)	11½ (289)	7⅞ (195)	15½ (397)	8¼ (210)	¼	½-¾	1-1½	1½-2	—	30 (14)	D68870
3-4 (300 VA)	2	24¼ (632)	13¾ (340)	8⅞ (206)	21¼ (552)	9 (229)	¼	½-¾	1¼-1½	2-2½	—	52 (24)	D68870
5 (300 VA)		40 (1016)	20 (508)	11 (279)	37¾ (956)	15¼ (387)	¼	2-3	1¼-1½	½-¾	1¼-1½	135 (36)	D65608
6, 7 (300 VA)		48 (1219)	20 (508)	12½ (317)	45⅞ (1148)	10 (254)	¼	2-2½	1¼-1½	½-¾	1¼-1½	150 (44)	D65608013

NEMA 4/4X Stainless Steel Enclosure (with or without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-1¼	3	13 (330)	12¾ (321)	5¾ (137)	12¼ (311)	10 (254)	¼	—	—	—	30 (14)	D41917
2-2½	3	16 (406)	13¼ (337)	6 (152)	15¼ (387)	11 (279)	¼	—	—	—	33 (15)	D42935
3-3½ (w/o CPT)	3	25⅞ (637)	17¾ (437)	7¾ (187)	24⅞ (618)	14 (356)	¼	—	—	—	53 (24)	D17423
3-3½ (w/ CPT) 4	3	29 (737)	23¾ (589)	9¼ (235)	27½ (699)	20 (508)	⅜	—	—	—	64 (29)	D43292
5 (Painted)		40 (1016)	20 (508)	11 (279)	41 (1041)	10 (254)	¾	—	—	—		D65608007
6, 7 (Painted)		48(1219)	20 (508)	12½ (317)	49 (1244)	10 (254)	¾	—	—	—		65608009

NEMA 7/9/3/4 Hazardous Location Enclosure (with or without CPT)

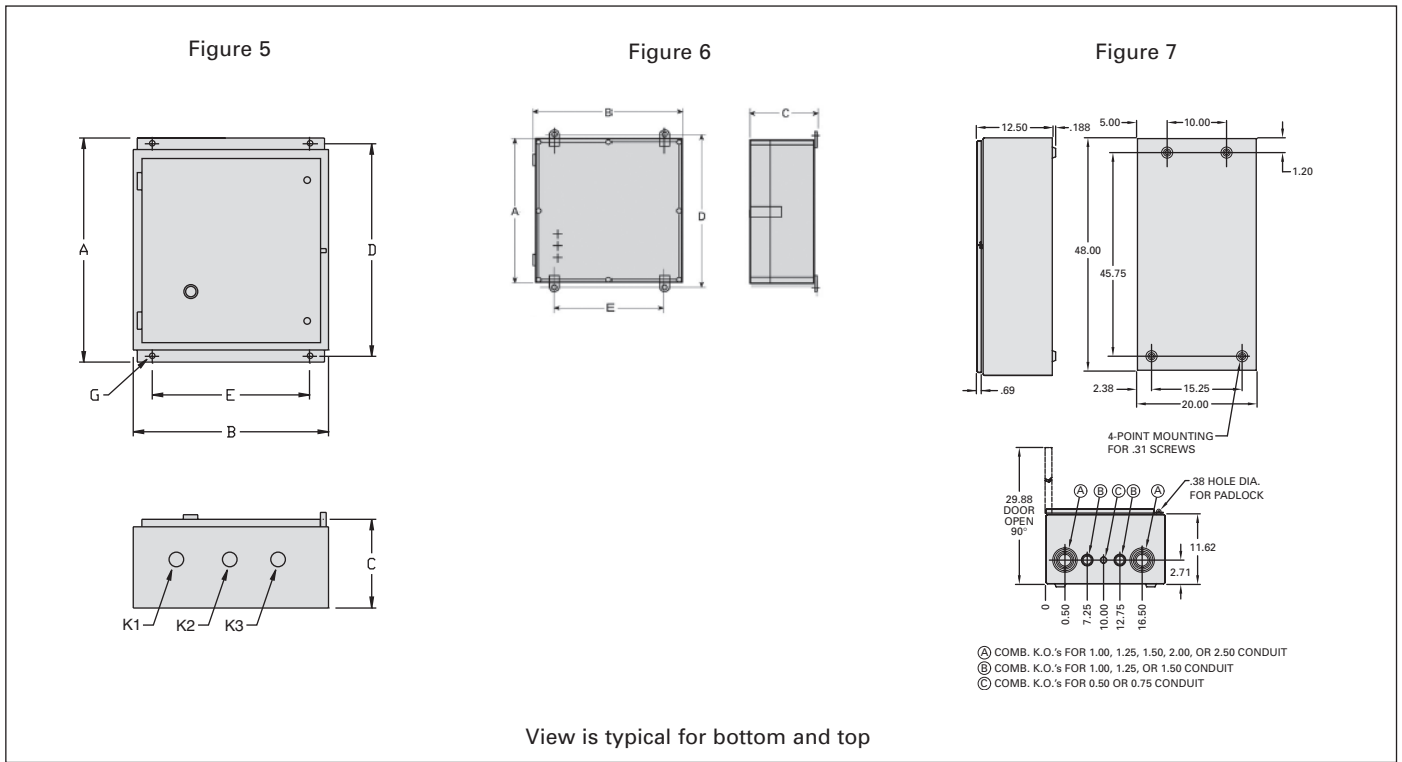
Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-2½	4	28¼ (718)	16¼ (413)	9¼ (235)	18¾ (467)	15¾ (400)	½	½	3	¾	140	24-139-865-004
3-4	4	32¼ (819)	18¼ (464)	9¾ (243)	22½ (572)	17¾ (451)	½	½	3	¾	150	24-139-865-005

Note: Dimensions in inches (mm).
 Dimensions for reference, not for construction.
 Contact sales office for dimensions not listed.

Reversing Heavy Duty Starters & Contactors

Enclosed, Class 22, 43

Dimensions



NEMA 12/3/3R Industrial Use Enclosure (with or without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-1 3/4	5	13 (330)	12 5/8 (321)	5 5/8 (137)	12 1/4 (311)	10 (254)	1/4	—	—	—	30 (14)	D17150
2-2 1/2	5	16 (406)	13 1/4 (337)	6 1/8 (156)	15 1/4 (387)	11 (279)	1/4	—	—	—	33 (15)	D17150
3-3 1/2 (w/o CPT)	5	25 1/16 (637)	17 3/16 (437)	7 3/8 (187)	24 3/16 (618)	14 (356)	1/4	—	—	—	53 (24)	D17150
3-3 1/2 (w/ CPT)	5	29 1/16 (738)	23 3/16 (589)	9 1/4 (235)	27 1/16 (700)	20 (508)	3/16	—	—	—	64 (29)	D17150
4	7	40 (1016)	20 (508)	11 (279)	41 (1041)	10 (254)	3/8	—	—	—	—	D65608007
6 (300 VA CPT max.)	7	48 (1219)	20 (508)	12 1/2 (318)	45 1/4 (1162)	10 (254)	1/4	—	—	—	—	—

NEMA 4X Fiberglass Enclosure (with or without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-2 1/2	6	23.78 (604)	14.68 (373)	6.89 (175)	22 5/8 (579)	13 3/8 (351)	1/4	—	—	—	35	—
3-4	6	23.78 (604)	23.78 (604)	6.89 (175)	22 5/8 (579)	22 5/8 (579)	1/4	—	—	—	38	—

Note: Dimensions in inches (mm).
Dimensions for reference, not for construction.
Contact sales office for dimensions not listed.

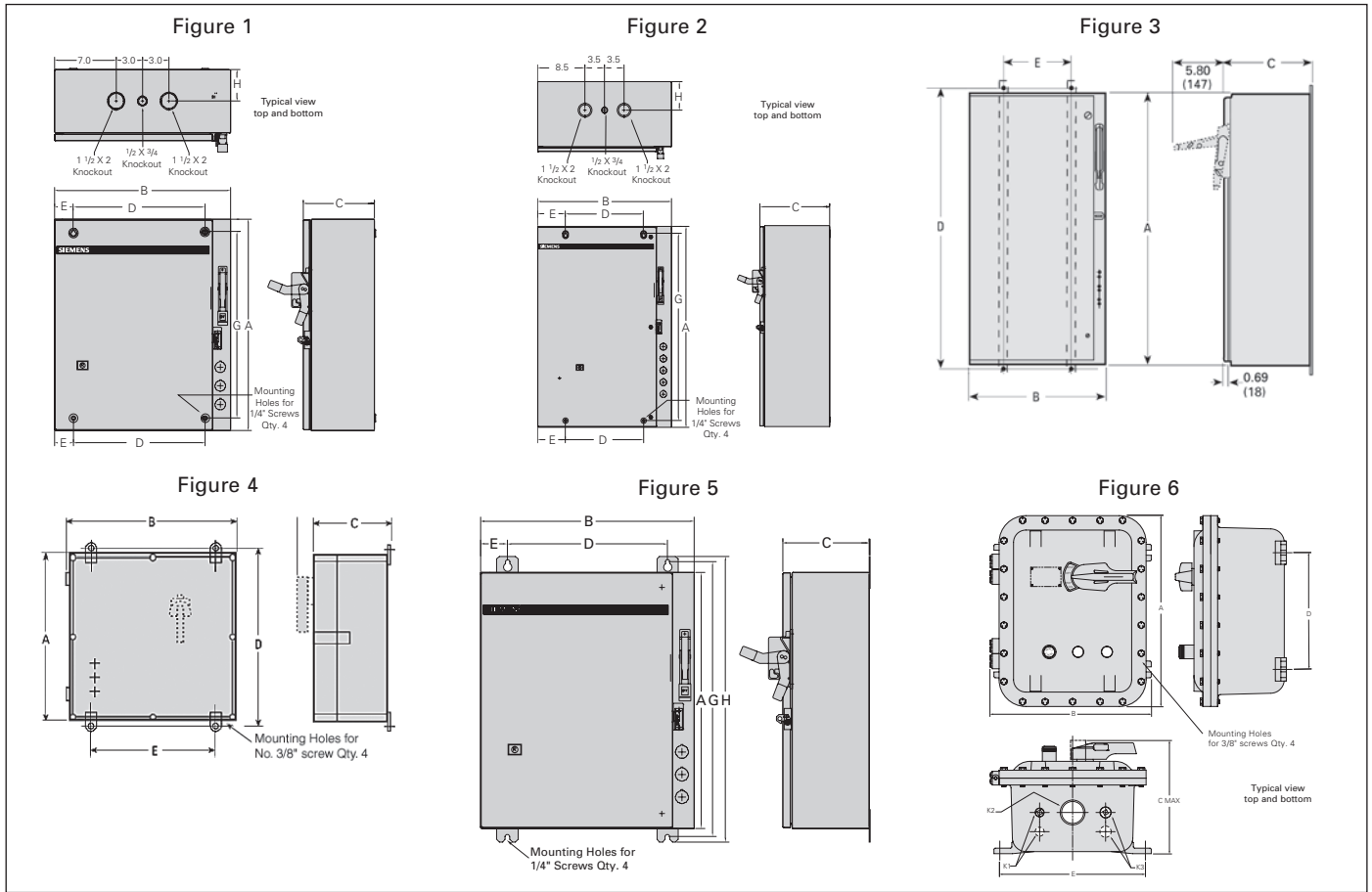
NEMA & General Purpose Control

CONTROL PRODUCTS

Combination Reversing Heavy Duty Starters

Enclosed, Class 25, 26

Dimensions



NEMA & General Purpose Control

CONTROL PRODUCTS 17

NEMA 1 Standard Width 0-6

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2 1/2	1	24 (610)	20 (508)	8 (203)	15.00 (381)	2.125 (54)	21.00 (533)	3.50 (90)	60 (27)	D68774002
3-4	2	36 (914)	24 (610)	8 (203)	14.00 (356)	5.00 (127)	33.50 (851)	5.00 (127)	121 (55)	D68774003
5 (Painted)	3	72.156 (1833)	20 (508)	11.031 (280)	71 (1803)	16 (406)	—	—	250 (113)	D56032005
6 (Painted)	3	79.125 (2010)	22 (559)	13 (330)	78 (1981)	18 (457)	—	—	275 (125)	D56032006

NEMA 12/3/3R/4 (Painted), 4/4X (Stainless) Standard Width 0-6

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2 1/2	5	24 (610)	20 (508)	8 (203)	15.00 (381)	3.50 (90)	25.75 (654)	26.75 (654)	63 (29)	D68774005
3-4	5	36 (914)	24 (610)	8 (203)	12 (305)	6.00 (152)	37.75 (959)	38.75 (984)	124 (56)	D68774006
5 (Painted)	3	72.156 (1833)	20 (508)	11.031 (280)	71 (1803)	16 (406)	—	—	250 (113)	D56032005
6 (Painted)	3	79.125 (2010)	22 (559)	13 (330)	78 (1981)	18 (457)	—	—	275 (125)	D56032006

NEMA 4X Fiberglass 0-4

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-2 1/2	4	23.780 (604)	14.680 (373)	6.890 (175)	24.125 (612.7)	12.250 (311)	3/8	—	—	—	18 (8)	24-139-861-001
3-4	4	23.780 (604)	23.780 (604)	6.890 (175)	24.125 (612.7)	21.250 (539.7)	3/8	—	—	—	28 (12.7)	24-139-861-003

NEMA 7/9/3/4 Hazardous Location 0-4

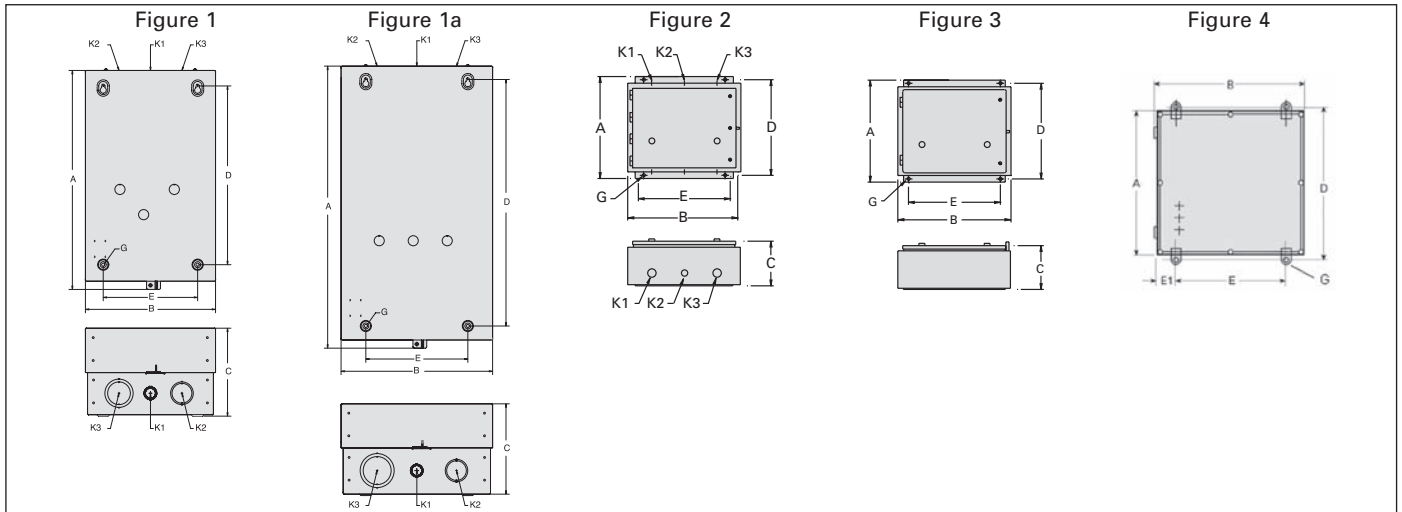
Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-2 1/2	6	28.688 (729)	17.750 (451)	11.750 (298)	18.375 (467)	15.750 (400)	3/8	1/2	3	3/4	140 (63.5)	24-139-865-004
3-4												Contact Sales Office

Note: Dimensions in inches (mm).
 Dimensions for reference, not for construction.
 Contact sales office for dimensions not listed.

Two Speed Heavy Duty Starters

Enclosed, Class 30

Dimensions



2 Speed 1 Winding

NEMA 1 General Purpose Enclosure (Standard width for use with or without CPT)													
Size	Fig	Outline Dimensions			Mounting Dimensions			Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G		K1	K2	K3		
0-1 3/4 w/o CPT	1	19 1/8 (486)	11 3/8 (289)	7 1/16 (195)	15 5/8 (397)	8 1/4 (210)	1/4	1/2-3/4	1-1 1/4	1 1/2-2	26 (12)	D68870	
0-1 3/4 (200 VA)	1a	24 7/8 (632)	13 3/8 (340)	8 1/8 (206)	21 3/4 (552)	9 (229)	1/4	1/2-3/4	1 1/4-1 1/2	2-2 1/2	52 (24)	D68870	
2-2 1/2	2	16 (406)	17.13 (435)	7.63 (194)	15.25 (387)	14 (355)	1/4	1/2-3/4	1 1/4-1 1/2	1 1/4-1 1/2	39 (20)	D42932001	
3-3 1/2	2	18.31 (465)	21.19 (538)	7.38 (187)	17.56 (446)	18 (457)	1/4	1 1/4-1 1/2	1/2-3/4	1 1/2-2	60 (27)	D72956002	
4	3	29 (737)	23 3/16 (589)	9 1/4 (235)	27 1/2 (699)	20 (508)	5/16	—	—	—	61 (28)	D43292001	
NEMA 4/4X Stainless Steel Enclosure (Standard width for use with or without CPT)													
0-1 3/4 w/o CPT	3	13 (330)	12 5/8 (321)	5 5/8 (137)	12 1/4 (311)	10 (254)	1/4	—	—	—	34 (15)	D41917000	
0-1 3/4 w/ CPT	3	16 (406)	17 1/8 (435)	7 5/8 (194)	15 1/4 (387)	14 (355)	1/4	—	—	—	47 (21)		
2-2 1/2 w/o CPT	3	16 (406)	17 1/8 (435)	7 5/8 (194)	15 1/4 (387)	14 (355)	1/4	—	—	—	47 (21)		
2-2 1/2 w/ CPT	3	25 1/16 (637)	17 3/16 (437)	7 3/8 (187)	24 5/16 (618)	14 (355)	1/4	—	—	—	55 (25)		
3-3 1/2	3	29 (737)	23 3/16 (589)	9 1/4 (235)	27 1/2 (699)	20 (508)	5/16	—	—	—	61 (28)	D43292001	
4	3	29 (737)	23 3/16 (589)	9 1/4 (235)	27 1/2 (699)	20 (508)	5/16	—	—	—	61 (28)	D43292001	
NEMA 12/3/3R Industrial Use Enclosure (Standard width for use with or without CPT)													
0-1 3/4 w/o CPT	3	13 (330)	12 5/8 (321)	5 5/8 (137)	12 1/4 (311)	10 (254)	1/4	—	—	—	34 (15)		
0-1 3/4 w/ CPT	3	16 (406)	17 1/8 (435)	7 5/8 (194)	15 1/4 (387)	14 (355)	1/4	—	—	—	47 (21)	D17150010	
2-2 1/2 w/o CPT	3	16 (406)	17 1/8 (435)	7 5/8 (194)	15 1/4 (387)	14 (355)	1/4	—	—	—	47 (21)	D17150010	
2-2 1/2 w/ CPT	3	25 1/16 (637)	17 3/16 (437)	7 3/8 (187)	24 5/16 (618)	14 (355)	1/4	—	—	—	55 (25)		
3-4	3	29 (737)	23 3/16 (589)	9 1/4 (235)	27 1/2 (699)	20 (508)	5/16	—	—	—	61 (28)	D19673000	
NEMA 4X Fiberglass Enclosure (Standard width for use with or without CPT)													
0-2 1/2	4	23.780 (604)	23.780 (604)	6.890 (175)	—	—	1/4	—	—	—	28 (13)	24139861003	
3-4	4	39.37 (1000)	29.53 (750)	12.60 (320)	—	—	—	—	—	—	—	24139861004	

2 Speed 2 Winding

NEMA 1 General Purpose Enclosure (Standard width for use with or without CPT)													
Size	Fig	Outline Dimensions			Mounting Dimensions			Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G		K1	K2	K3		
0-2 1/2 w/o CPT	1	19 1/8 (486)	11 3/8 (289)	7 1/16 (195)	15 5/8 (397)	8 1/4 (210)	1/4	1/2-3/4	1-1 1/4	1 1/2-2	30 (14)	D68870	
0-2 1/2 (200 VA)	1a	24 7/8 (632)	13 3/8 (340)	8 1/8 (206)	21 3/4 (552)	9 (229)	1/4	1/2-3/4	1 1/4-1 1/2	2-2 1/2	52 (24)	D68870	
3-4 w/o CPT	1a	24 7/8 (632)	13 3/8 (340)	8 1/8 (206)	21 3/4 (552)	9 (229)	1/4	1/2-3/4	1 1/4-1 1/2	2-2 1/2	52 (24)	D68870	
NEMA 4/4X Stainless Steel Enclosure (Standard width for use with or without CPT)													
0-1 3/4 w/o CPT	3	13 (330)	12 5/8 (321)	5 5/8 (137)	12 1/4 (311)	10 (254)	1/4	—	—	—	34 (15)		
0-1 3/4 w/ CPT	3	16 (406)	17 1/8 (435)	7 5/8 (194)	15 1/4 (387)	14 (355)	1/4	—	—	—	41 (19)		
2-2 1/2 w/o CPT	3	16 (406)	13 1/4 (337)	6 (152)	15 1/4 (387)	11 (279)	1/4	—	—	—	41 (19)		
2-2 1/2 w/ CPT	3	16 (406)	17 1/8 (435)	7 5/8 (194)	15 1/4 (387)	14 (355)	1/4	—	—	—	41 (19)		
3-3 1/2 w/o CPT	3	25 1/16 (637)	17 3/16 (437)	7 3/8 (187)	24 5/16 (618)	14 (355)	1/4	—	—	—	55 (25)		
3-3 1/2 w/ CPT	3	29 (737)	23 3/16 (589)	9 1/4 (235)	27 1/2 (699)	20 (508)	5/16	—	—	—	61 (28)	D43292001	
4	3	29 (737)	23 3/16 (589)	9 1/4 (235)	27 1/2 (699)	20 (508)	5/16	—	—	—	61 (28)	D43292001	
NEMA 12/3/3R Industrial Use Enclosure (Standard width for use with or without CPT)													
0-1 3/4 w/o CPT	3	13 (330)	12 5/8 (321)	5 5/8 (137)	12 1/4 (311)	10 (254)	1/4	—	—	—	34 (15)		
0-1 3/4 w/ CPT	3	16 (406)	17 1/8 (435)	7 5/8 (194)	15 1/4 (387)	14 (355)	1/4	—	—	—	41 (19)	D17150010	
2-2 1/2 w/o CPT	3	16 (406)	13 1/4 (337)	6 1/8 (156)	15 1/4 (387)	11 (279)	1/4	—	—	—	41 (19)		
2-2 1/2 w/ CPT	3	16 (406)	17 1/8 (435)	7 5/8 (194)	15 1/4 (387)	14 (355)	1/4	—	—	—	41 (19)	D17150010	
3-3 1/2 w/o CPT	3	25 1/16 (637)	17 3/16 (437)	7 3/8 (187)	24 5/16 (618)	14 (355)	1/4	—	—	—	55 (25)		
3-4 w/ CPT	3	29 1/16 (738)	23 3/16 (589)	9 1/4 (235)	27 1/2 (700)	20 (508)	5/16	—	—	—	61 (28)	D19673000	
NEMA 4X Fiberglass Enclosure (Standard width for use with or without CPT)													
0-2 1/2	4	23.780 (604)	23.780 (604)	6.890 (175)	—	—	1/4	—	—	—	28 (13)	24139861003	
3-4	4	39.37 (1000)	29.53 (750)	12.60 (320)	—	—	—	—	—	—	—	24139861004	

Note: Dimensions in inches (mm). Dimensions for reference, not for construction. Contact sales office for dimensions not listed.

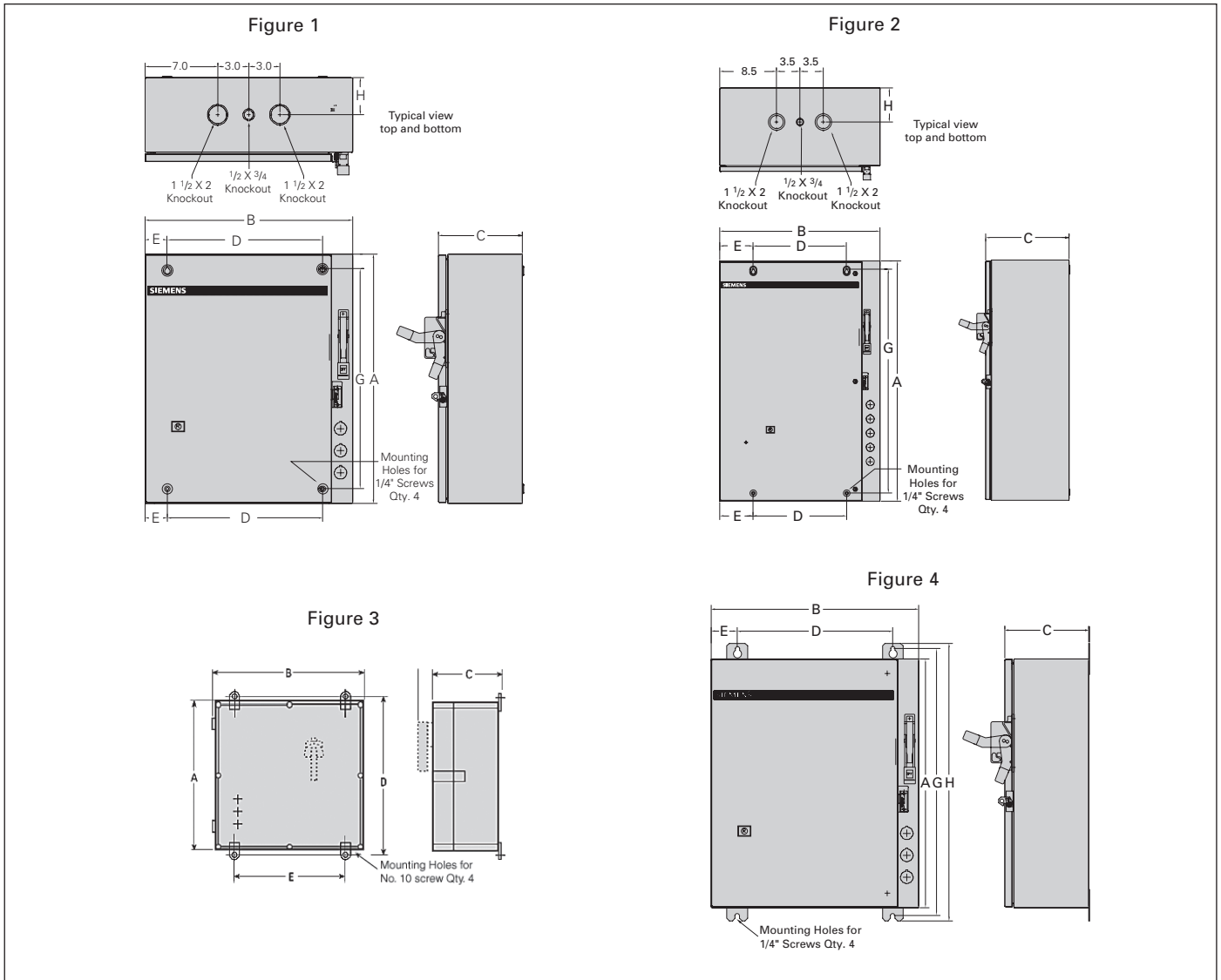
NEMA & General Purpose Control

CONTROL PRODUCTS

Combination Two Speed Heavy Duty Starters

Enclosed, Class 32

Dimensions



NEMA & General Purpose Control

17

CONTROL PRODUCTS

NEMA 1 Standard Width 0-4

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-1 3/4 (1 Winding)	1	24 (610)	20 (508)	8 (203)	15.00 (381)	2.125 (54)	21.00 (533)	3.50 (90)	68 (31)	D68774
2-4 (1 Winding)	2	36 (914)	24 (610)	8 (203)	14.00 (356)	5.00 (127)	33.50 (851)	3.50 (90)	71 (32)	D68774
0-2 1/2 (2 Winding)	1	24 (610)	20 (508)	8 (203)	15.00 (381)	2.125 (54)	21.00 (533)	3.50 (90)	135 (61)	D68774
3-4 (2 Winding)	2	36 (914)	24 (610)	8 (203)	14.00 (356)	5.00 (127)	33.50 (851)	3.50 (90)	138 (63)	D68774

NEMA 12/3/3R/4 (Painted), 4/4X Stainless Standard Width 0-4

0-1 3/4 (1 Winding)	4	24 (610)	20 (508)	8 (203)	15.00 (381)	2.50 (64)	25.75 (654)	26.75 (680)	68 (31)	D68774
2-4 (1 Winding)	4	36 (914)	24 (610)	8 (203)	12 (305)	6.00 (152)	37.75 (959)	38.75 (984)	71 (32)	D68774
0-2 1/2 (2 Winding)	4	24 (610)	20 (508)	8 (203)	15.00 (381)	2.50 (64)	25.75 (654)	26.75 (680)	135 (61)	D68774
3-4 (2 Winding)	4	36 (914)	24 (610)	8 (203)	12 (305)	6.00 (152)	37.75 (959)	38.75 (984)	138 (63)	D68774

Nema 4X Fiberglass 0-4

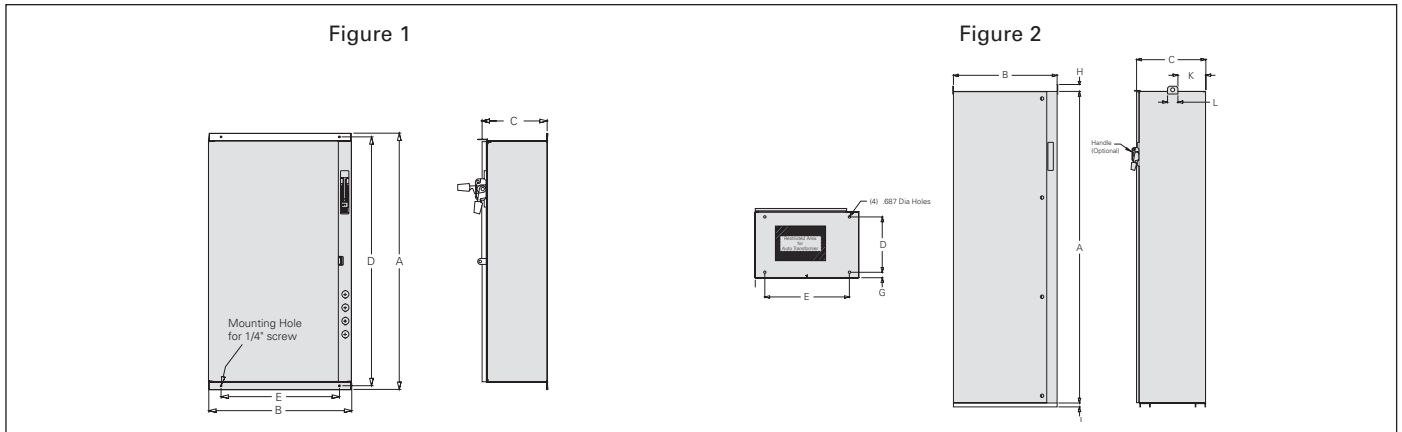
Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		G	K1	K2		
0-1 3/4	3	23.780 (604)	14.680 (373)	6.890 (175)	24.125 (613)	12.250 (311)	1/4	—	—	—	18 (8)	—
2-4	3	23.780 (604)	23.780 (604)	6.890 (175)	24.125 (613)	21.250 (540)	1/4	—	—	—	28 (13)	—

Note: Dimensions in inches (mm).
 Dimensions for reference, not for construction.
 Contact sales office for dimensions not listed.

Reduced Voltage Starters

Class 36, 37, 82

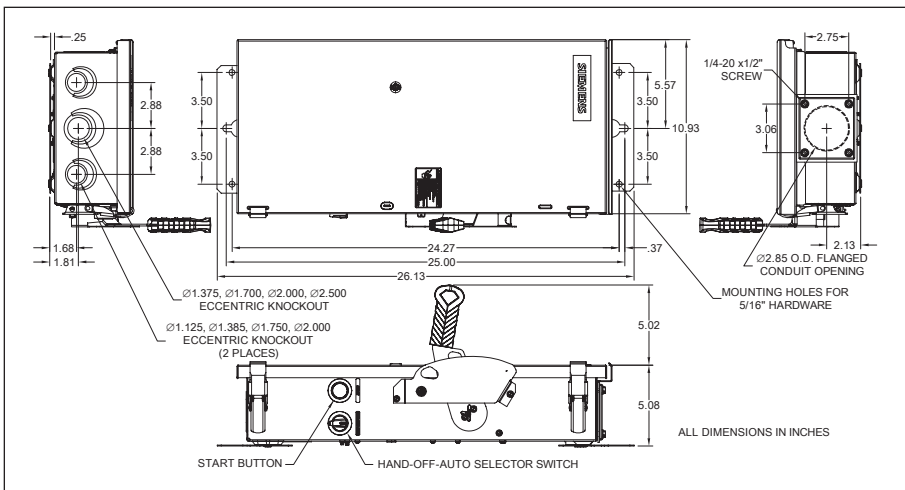
Dimensions



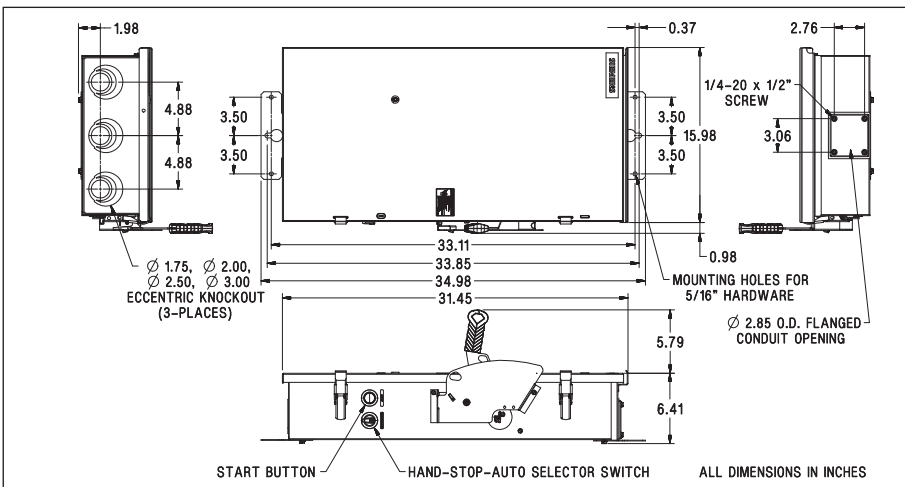
Class 36, 37, NEMA 1, 4, 4X, 12/3R, Combination and Non-combination

Reduced Voltage AutoTransformer Size	Part Winding & Wye Delta		Figure	A	B	C	D	E	G	H	I	J	K	L
	Disconnect	Circuit Breaker												
1 3/4-2 1/2	0-2	0-2 1/2	1	43 5/16	24 5/32	11	42 11/32	20	—	—	—	—	—	—
3-3 1/2	2 1/2-3 1/2	3-3 1/2	1	55 5/16	28 9/32	11	54 11/32	24	—	—	—	—	—	—
4	4	4	1	74 21/32	28 9/32	11	73 13/32	24	—	—	—	—	—	—
5, 6	5, 6	5, 6	2	90	29 30/31	20	16	24 7/16	2 16/21	1 23/40	—	1 1/8	8 3/40	3

Class 82 size 1



Class 82 Size 1 1/2, 2



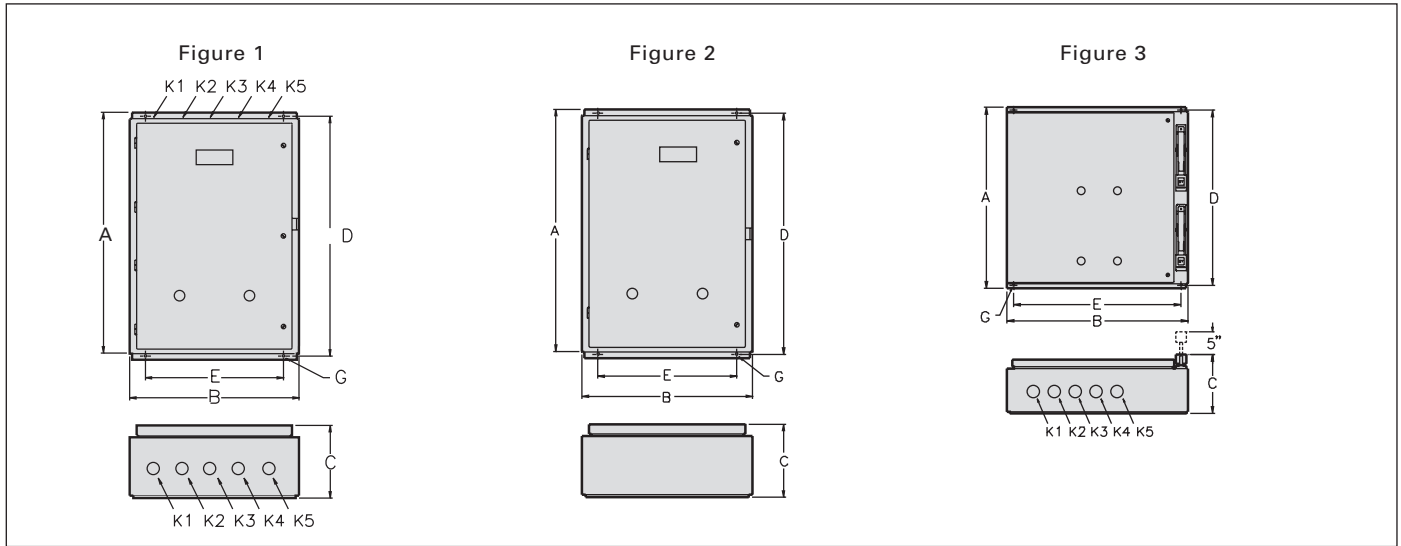
NEMA & General Purpose Control

CONTROL PRODUCTS

Duplex Heavy Duty Controllers

Class 83, 84

Dimensions



Class 83 Non-Combination Type

Enclosure Type	Size	Outline Dimensions			Mounting Dimensions		Mounting Screw	Conduit Size					Approx Ship Wt Lbs		
		Figure	A	B	C	D		E	K1	K2	K3	K4		K5	
NEMA 1	0-1¼	1	19½	16⅞	6½	18¾	13	¼	1¼-1½	½-¾	½	½-¾	1¼-1½	1½-2	20
	2, 2½	1	25⅞	17⅞	7⅞	24⅞	14	¼	1¼-1½	½-¾	½-¾	1¼-1½	1½-2	57	
	3-4	1	29⅞	23⅞	9¼	27⅞	20	⅝	2-2½	1¼-1½	½-¾	1¼-1½	2-2½-3	93	
NEMA 12	0-1¼	2	19½	16⅞	6½	18¾	13	¼	—	—	—	—	—	20	
	2, 2½	2	25⅞	17⅞	7⅞	24⅞	14	¼	—	—	—	—	—	57	
	3-4	2	29⅞	23⅞	9¼	27⅞	20	⅝	—	—	—	—	—	93	
NEMA 4/4X ²	0-1¼	2	19½	16⅞	6½	18¾	13	¼	—	—	—	—	—	20	
	2, 2½	2	25⅞	17⅞	7⅞	24⅞	14	¼	—	—	—	—	—	57	
	3-4	2	29⅞	23⅞	9¼	27⅞	20	⅝	—	—	—	—	—	93	

Class 84 Combination Type

Enclosure Type	Size	Outline Dimensions			Mounting Dimensions		Mounting Screw	Conduit Size					Approx Ship Wt Lbs	
		Figure	A	B	C	D		E	K1	K2	K3	K4		K5
NEMA 1	0-1¼	3	34⅞	24⅞	7⅞	33	20	⅝	⅞-1⅞	⅞-1⅞	1⅞-1 ²³ / ₆₄	1⅞-1 ²³ / ₆₄	1 ²³ / ₆₄ -1 ²³ / ₃₂	70
	2-4	3	56	28½	9⅞	54⅞	24¼	⅝	—	—	—	—	—	106
NEMA 4(painted) 4X, 12	0-1¼	3	34⅞	24⅞	7⅞	33	20	⅝	—	—	—	—	—	70
	2-4	3	56	28½	9⅞	54⅞	24¼	⅝	—	—	—	—	—	106

© Dimensions may vary for size 3 & 4 stainless steel enclosures.

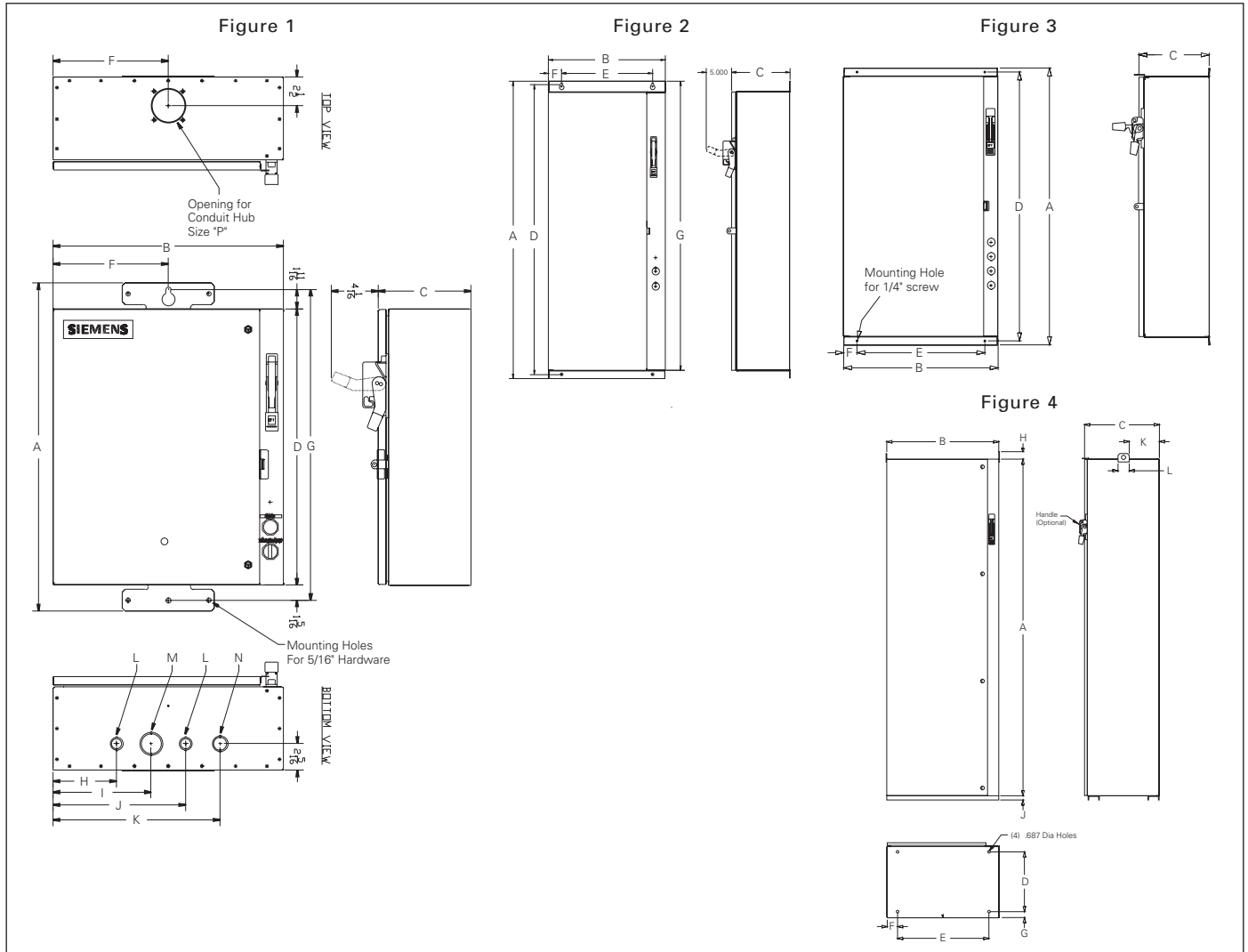
© NEMA 4 Painted, 4X Stainless Steel.

Pump Control Panels

Class 87, 88

Dimensions

Outline Drawings



Class 87 Standard and Vacuum Starter Pump Panel

Size	Figure	A	B	C	D	E	F	G	H	I	J	K	Conduit Knockout			
													L	M	N	P
1-2½	1	28½	20	8 ¹ / ₁₆	24	—	10	27	5 ¹ / ₂	8 ¹ / ₂	11 ¹ / ₂	14 ¹ / ₂	1/2 x 3/4	1 ¹ / ₄ x 1	3/4 x 1	1 ¹ / ₂
3-4	1	40½	24	8 ³ / ₃₂	36	—	12	39	8 ⁷ / ₁₆	11 ¹⁵ / ₁₆	15 ⁷ / ₁₆	—	1 ³ / ₃₂ x 2 ¹⁵ / ₃₂	7/8 x 1 ¹ / ₈	—	2 ¹ / ₂
5	2	72 ⁵ / ₃₂	20	11	71	16	2 ¹ / ₈	70 ²⁹ / ₃₂	—	—	—	—	—	—	—	—
6	2	79 ¹ / ₈	22	12 ¹⁵ / ₁₆	78	18	2 ¹ / ₈	77 ⁷ / ₈	—	—	—	—	—	—	—	—
4 (Vac)	2	55 ³ / ₃₂	24 ³ / ₈	9 ²² / ₃₂	54 ²⁶ / ₃₂	20 ¹ / ₄	2 ¹ / ₈	54 ²³ / ₃₂	26 ³ / ₁₆	—	5	27 ¹⁴ / ₃₂	—	—	—	—

Class 88 Reduced Voltage Pump Panels

RVAT Size	Part Winding & Wye Delta		Figure	A	B	C	D	E	F	H	I	J	K	L
	Fusible Disconnect	Circuit Breaker												
2-2½	1-2	1-2½	3	43 ⁵ / ₁₆	24 ⁵ / ₃₂	11	42 ¹¹ / ₃₂	20	2 ¹ / ₁₆	—	—	—	—	—
3-3½	2½-3½	3-3½	3	55 ⁵ / ₁₆	28 ⁹ / ₃₂	11	54 ¹¹ / ₃₂	24	2 ¹ / ₈	—	—	—	—	—
4	4	4	3	74 ²¹ / ₃₂	28 ⁹ / ₃₂	11	73 ¹³ / ₃₂	24	2 ¹ / ₈	—	—	—	—	—
5, 6	5, 6	5, 6	4	90	30	20	16	24 ⁷ / ₁₆	2 ³ / ₄	1 ¹ / ₂	—	1 ¹ / ₈	8 ¹ / ₁₆	3

Note: Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

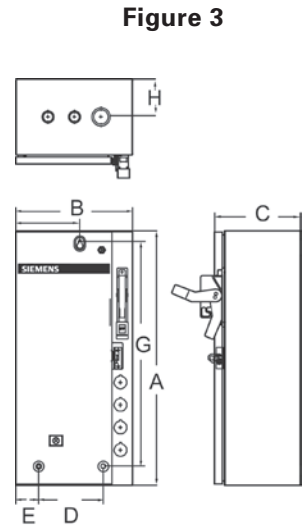
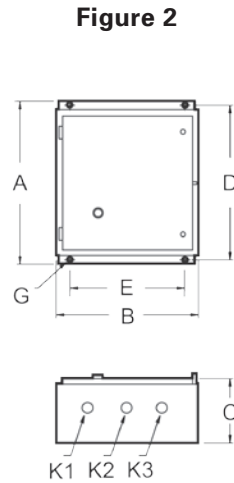
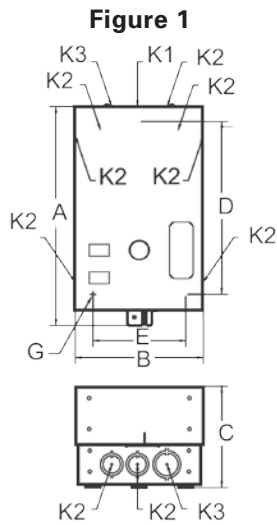
NEMA & General Purpose Control

CONTROL PRODUCTS

Lighting Contactors

Enclosed Contactors, Class LC and LE

Dimensions



Enclosure Type	Contactor Rating (Class LC and LE)	Fig.	Outline Dimensions			Mounting		Conduit Size				
			A	B	C	D	E	K1	K2	K3	K4	K5
1 without CPT	LE 20/30A 3-4P	1	10.97	6.41	5.03	8.22	4.62	0.5	0.50-0.75	0.75-1	—	—
	LC 30A 2-12P, LE 60A 3P	1	13.53	7.97	6.38	10.25	6.00	0.50-0.75	0.75-1	1-1.25	—	—
	LE 30/60A 6-12P, LE 100A 3P	1	19.12	11.38	7.69	15.62	8.25	0.50-0.75	1-1.25	1.5-2	—	—
	LE 200-400A 3P	2	26.00	17.62	12.50	25.19	15.50	0.50-0.75	1.25-1.5	1.25-1.5	—	—
1 with CPT	LC 30A 2-12P, LE 20A 3-4P, LE 30A 3-9P, LE 60A 3-9P, LE 100A 3P	1	19.12	11.38	7.69	15.62	8.25	0.50-0.75	1-1.25	1.5-2	—	—
	LE 30/60A 12P	1	24.88	13.38	8.12	21.75	9.00	0.50-0.75	1.25-1.5	2-2.5	—	—
	LE 200-400A 3P	2	26.00	17.62	12.50	25.19	15.50	—	1.25-1.5	1.25-1.5	—	—
12/3R & 4/4X without CPT	LE 20A 3-4P, LE 30/60A 3-9P, LE 100A 3P, LC 30A 2-12P	2	16.00	13.25	6.12	15.25	11.00	—	—	—	—	—
	LE 30/60A 12P	2	26.00	13.12	7.56	25.25	10.00	—	—	—	—	—
	LE 200-400A 3P	2	26.00	17.62	12.50	23.19	15.50	—	—	—	—	—
12/3R & 4/4X with CPT	LE 20/30A 3-4P, LE 60A 3P	2	16.00	13.25	6.12	15.25	11.00	—	—	—	—	—
	LC 30A 2-12P	2	16.00	17.13	7.63	15.25	11.00	—	—	—	—	—
	LE 30/60A 6-12P, LE 100A 3P	2	26.00	13.12	7.56	15.25	14.00	—	—	—	—	—
	LE 200-400A 3P	2	26.00	17.62	12.50	25.19	15.50	—	—	—	—	—

Enclosure Type	Type (Class LE)	Contactor Rating	Fig.	Outline Dimensions		
				A	B	C
1, 12 & 4/4X with and without CPT	Fusible and Non-fusible Disconnect	20-60A	3	24	11	8
		100A	3	24	20	8
		200A	3	46	20	10
		300A	3	76	22	13
	Circuit Breaker	20-100A	3	24	11	8

Dimensions are in inches.

1) G designates 0.25" mounting screw.

2) Enclosures shown in figure 1 have lift-off covers. All other enclosures have hinged covers.

Lighting Contactors

Enclosed Contactors, Class CLM, CM

Dimensions

Figure 1

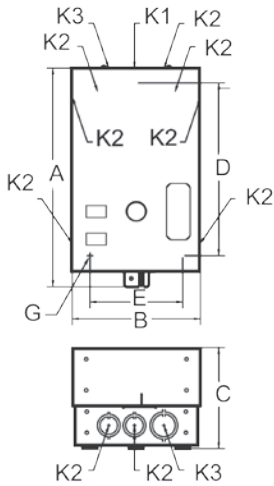


Figure 2

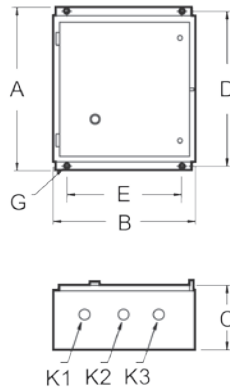
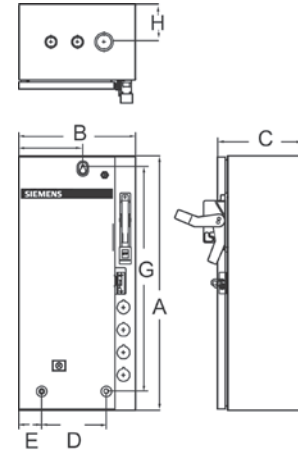


Figure 3



Enclosure Type	Contactor Rating (Class CLM)	Fig.	Outline Dimensions			Mounting		Conduit Size				
			A	B	C	D	E	K1	K2	K3	K4	K5
1 without CPT	30-60A (2-5p)	1	10.97	6.41	5.03	8.22	4.62	0.5	0.50-0.75	0.75-1	—	—
	20A (2-12p)	1	13.53	7.97	6.38	10.25	6.00	0.50-0.75	0.75-1	1-1.25	—	—
	30-60A (6-12p)	2	16.00	17.12	7.62	15.25	14.00	0.50-0.75	1.25-1.5	1.25-1.5	—	—
	100A (2-5p)	1	19.12	11.38	7.69	15.62	8.25	0.50-0.75	1-1.25	1.5-2	—	—
	200A (2-5p)	1	24.88	13.38	8.12	21.75	9.00	0.50-0.75	1.25-1.5	2.5	—	—
	300-400A (2-5p)	2	48.00	20.00	12.50	45.19	10.00	2.00-2.50	1.25-1.5	0.5-0.75	1.25-1.5	2-2.5
1 with CPT	20A (2-12p), 30A (2-5p)	1	19.12	11.38	7.69	15.62	8.25	0.50-0.75	1-1.25	1.5-2	—	—
	30-60A (6-12p)	2	16.00	17.12	7.62	15.25	14.00	0.50-0.75	1.25-1.5	1.25-1.5	—	—
	100-200A (2-5p)	2	26.00	17.62	12.50	25.19	15.50	—	1.25-1.5	1.25-1.5	—	—
	300-400A (2-5p)	2	48.00	20.00	12.50	45.19	10.00	2.00-2.50	1.25-1.5	0.5-0.75	1.25-1.5	2-2.5
12/3R & 4/4X without CPT	20A (2-12p), 30A (2-12p), 60A (2-10p)	2	16.00	13.25	6.12	15.25	11.00	—	—	—	—	—
	100A (2-5p)	2	16.00	13.00	9.50	15.12	11.00	—	—	—	—	—
	60A (12p)	2	19.00	22.00	8.00			—	—	—	—	—
	200A (2-5p)	2	26.00	17.62	12.50	23.19	15.50	—	—	—	—	—
	300A-400A (3p)	2	48.00	20.00	12.50	49.00	10.00	—	—	—	—	—
12/3R & 4/4X with CPT	20A (2-12p), 30A (2-5p)	2	16.00	13.25	6.12	15.25	11.00	—	—	—	—	—
	30A (6-12p)	2	16.00	17.12	7.62	15.25	14.00	—	—	—	—	—
	60-100A (2-5p)	2	16.00	13.00	9.50	15.12	11.00	—	—	—	—	—
	60A (6-12p)	2	19.00	22.00	8.00			—	—	—	—	—
	200A (3p)	2	26.00	17.62	12.50	25.19	15.50	—	—	—	—	—
	300-400A (3p)	2	48.00	20.00	12.50	49.00	10.00	—	—	—	—	—

Enclosure Type	Type (Class CM)	Contactor Rating	Fig.	Outline Dimensions		
				A	B	C
1, 12 & 4/4X with and without CPT	Fusible and Non-fusible Disconnect	20-60A	3	24	11	8
		100A	3	24	20	8
		200A	3	46	20	10
		300A	3	76	22	13
	Circuit Breaker	20-100A	3	24	11	8

Dimensions are in inches.

1) G designates 0.25" mounting screw.

2) Enclosures shown in figure 1 have lift-off covers. All other enclosures have hinged covers.

NEMA & General Purpose Control

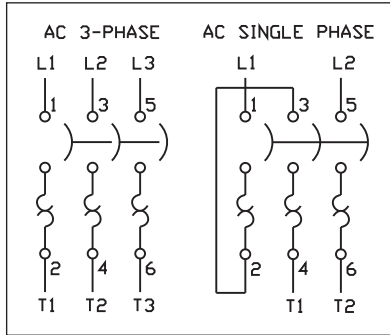
CONTROL PRODUCTS

Manual Control

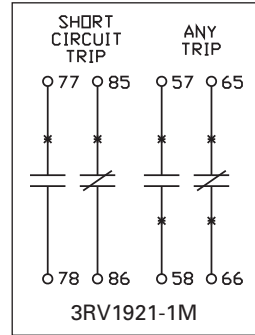
Class 11 - 3RV, SMF, MMS

Wiring Diagrams

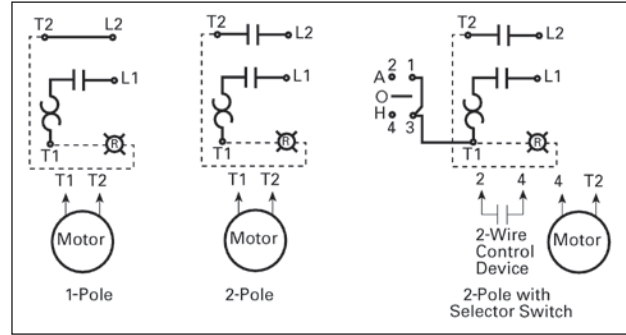
Class 11 - 3RV



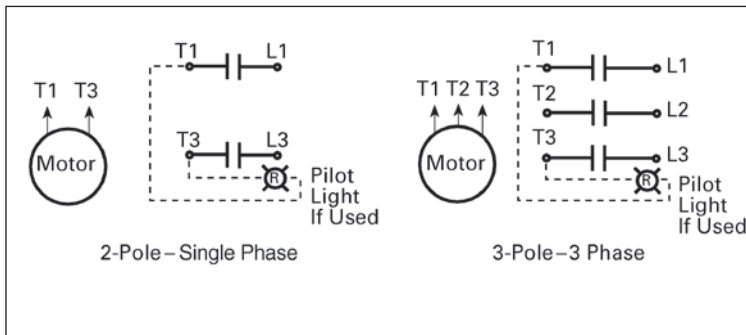
Signaling Contact for Class 11 - 3RV



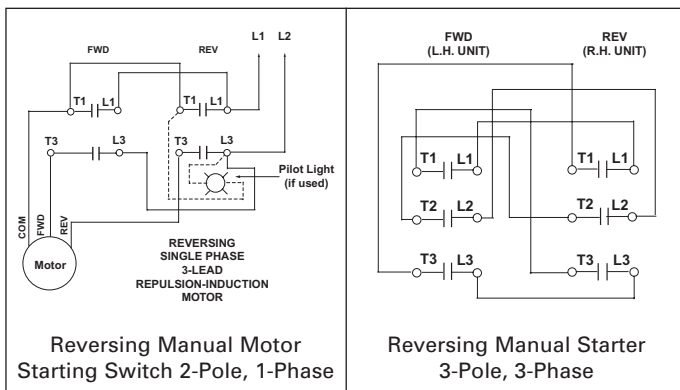
Typical Wiring Diagrams—Class SMF



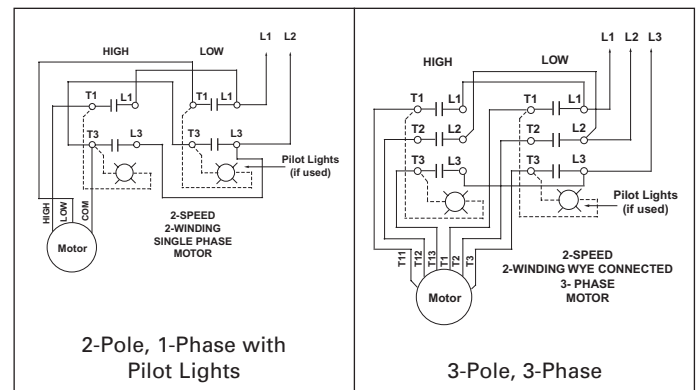
Typical Wiring Diagrams—MMS



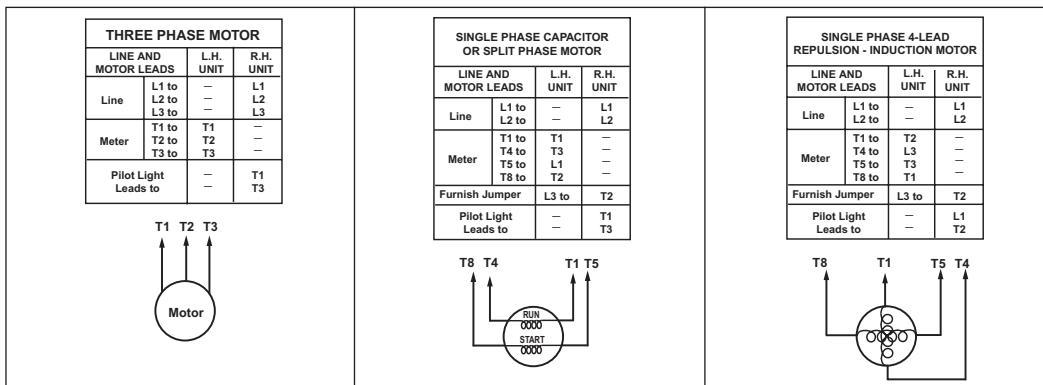
AC Reversing Manual Starter and Manual Motor Starting Switches



AC 2-Speed Manual Motor Starting Switches



3-Pole Reversing Switches

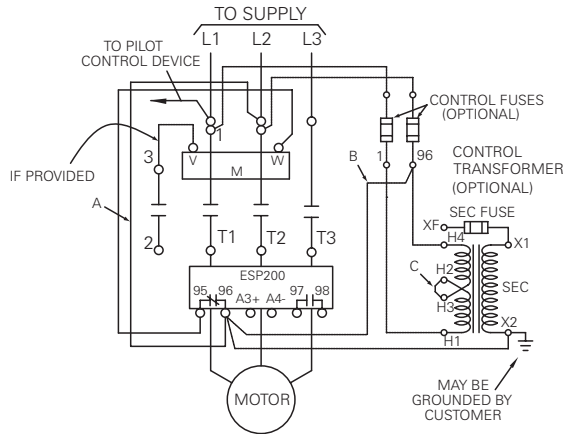


NEMA & General Purpose Control

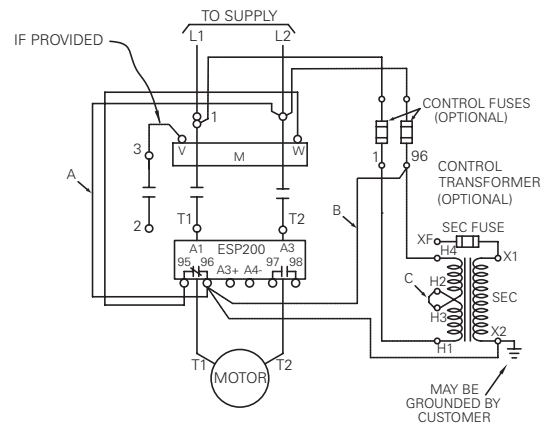
CONTROL PRODUCTS 17

3-Phase and Single Phase Magnetic Starters

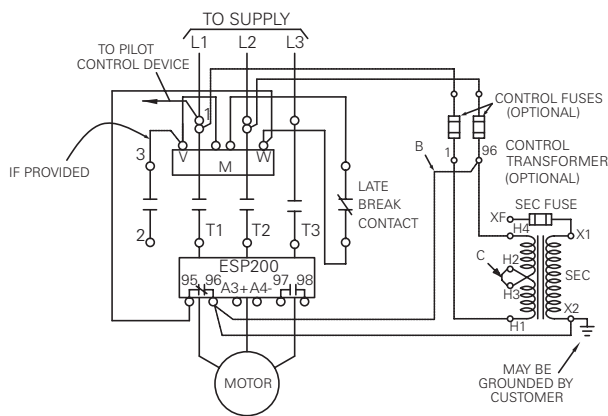
Three Phase Magnetic Starter, Size 00-4



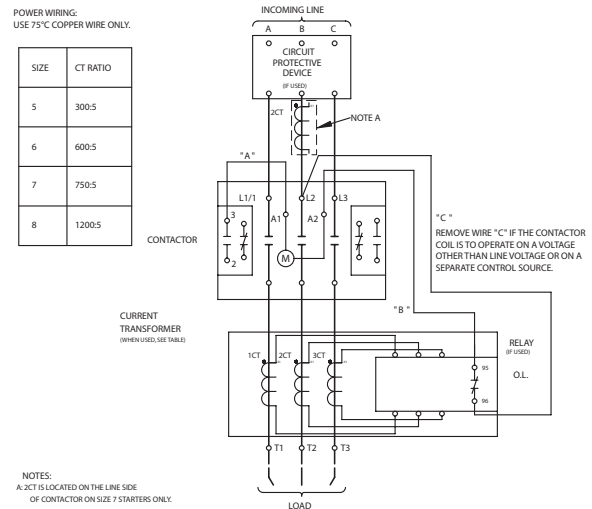
Single Phase Magnetic Starter[Ⓜ]



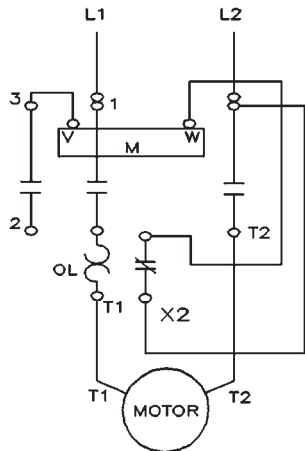
Three Phase Magnetic Starter with DC Coil, Sizes 00-4



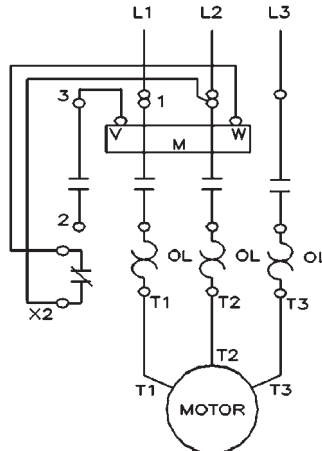
Solid State Overload 3-Phase Sizes 5-8



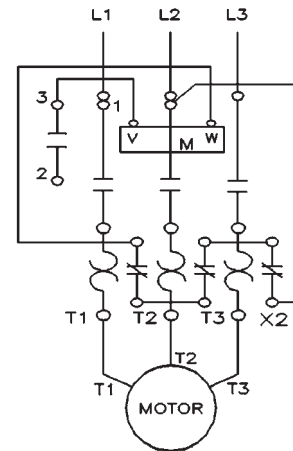
Ambient Compensated Single Phase Sizes 00-2 1/2



Ambient Compensated 3-Phase Sizes 00-2 1/2



Ambient Compensated 3-Phase Sizes 3-4



Ⓜ Warning: The ESP200 Starter and Single Phase Motor must be wired as shown above. For L1, L2 do not use the middle terminal or hole.

Ⓜ Full Load Amps (FLA): Adjustment of the ESP200 solid state overload relay accommodates the single phase motor.

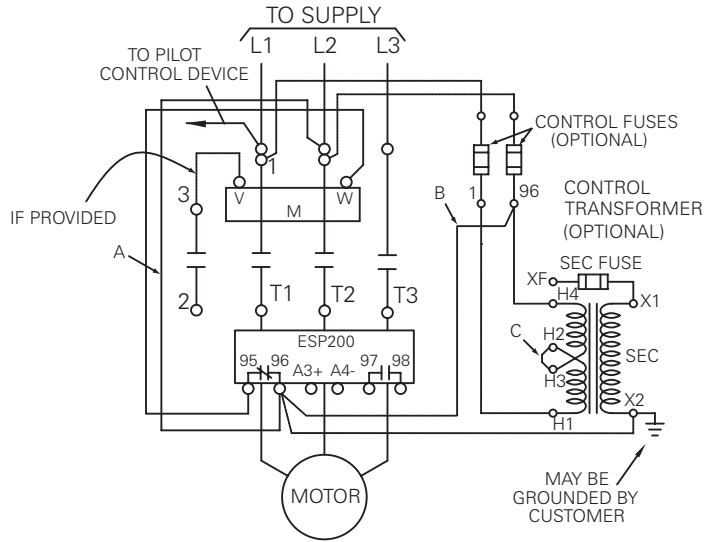
Combination Heavy Duty Starters

Class 17, 18

Wiring Diagrams

3-Phase

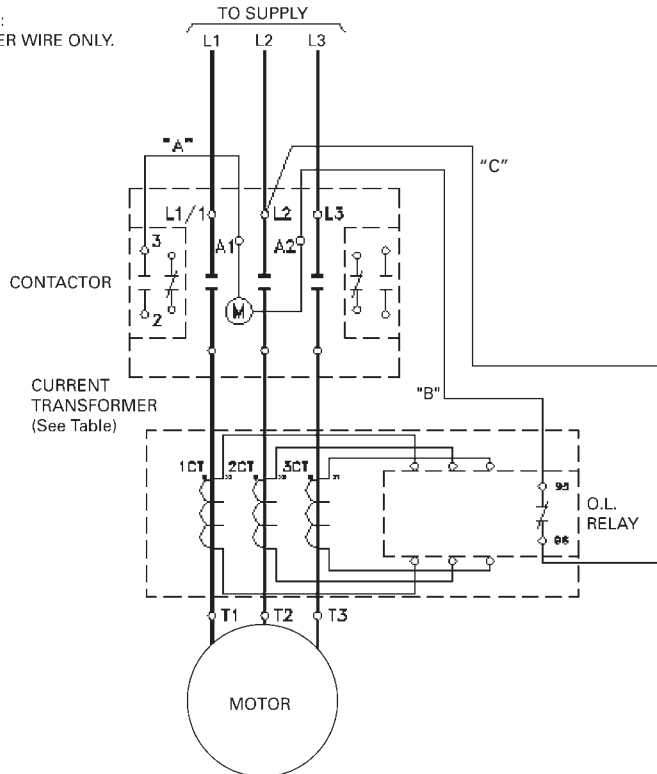
Size 00-4^①



Size 5-8^②

POWER WIRING:
USE 75°C COPPER WIRE ONLY.

SIZE	CT RATIO
5	300:5
6	600:5
7	750:5
8	1200:5

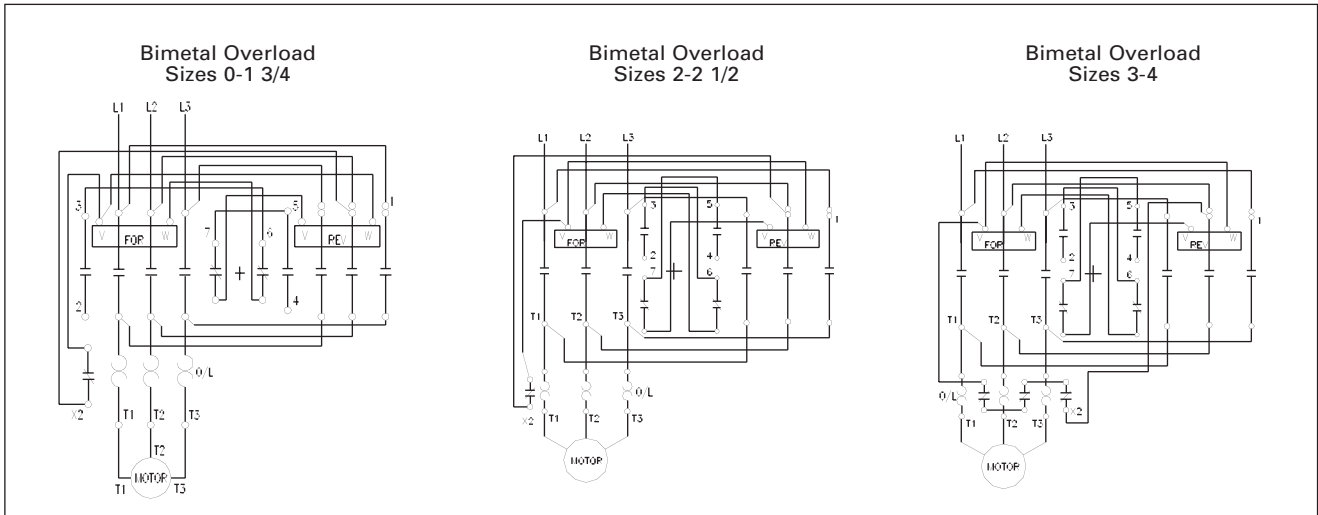


^① Remove wire "C" if control transformer is used. For separate control voltage source, remove jumpers "A" and "B" and connect source to control fuse line terminals.

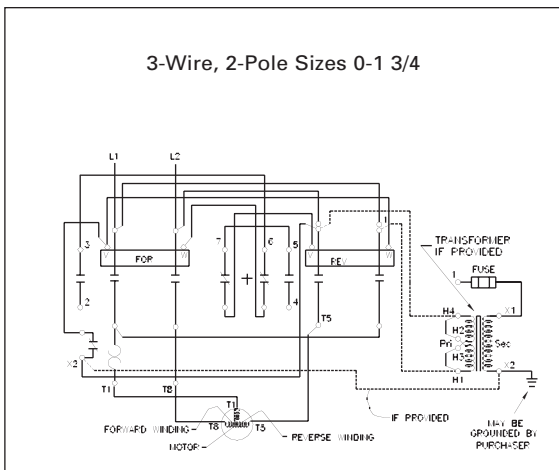
^② Remove wire "C" if the contactor coil is to operate on a voltage other than line voltage or in a separate control source.

Reversing Heavy Duty Starters

3-Phase Ambient Compensated Overload



Single Phase Ambient Compensated Overload



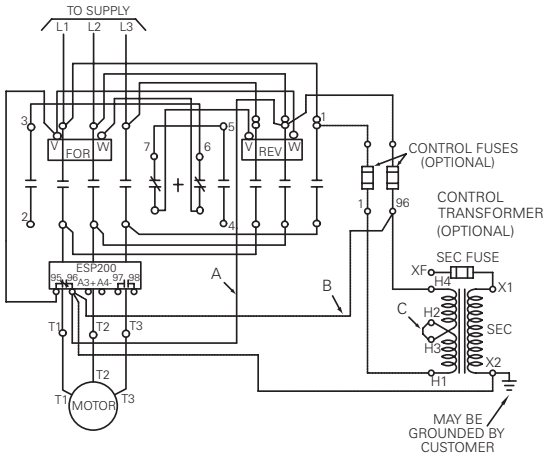
Reversing Heavy Duty Starters

Class 22

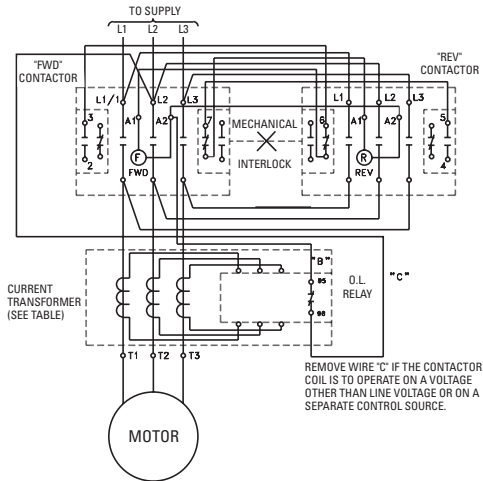
Wiring Diagrams

3-Phase Solid State Overload

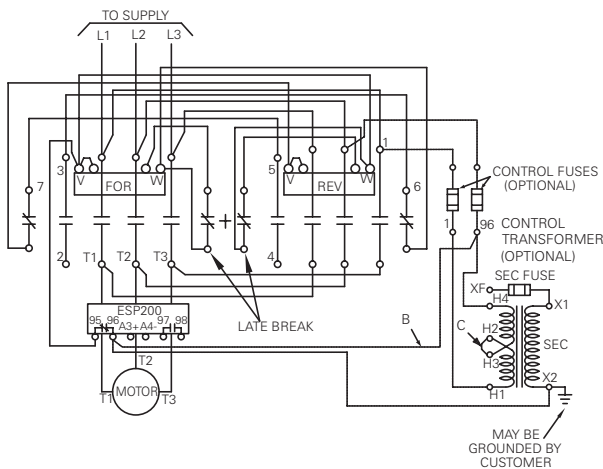
3-Phase Reversing Magnetic Starter
Sizes 00-1¼



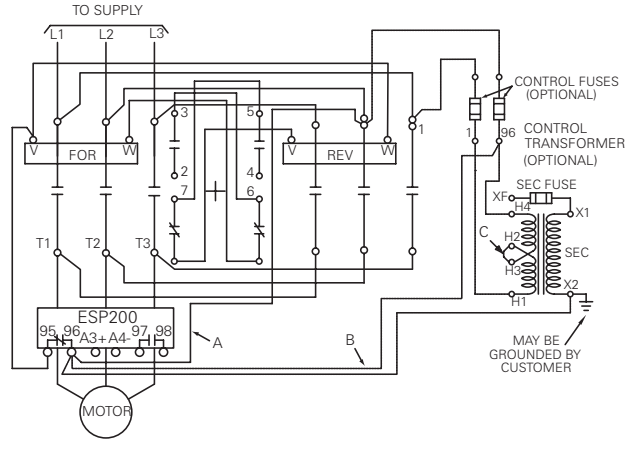
Solid State Overload
Sizes 5-6



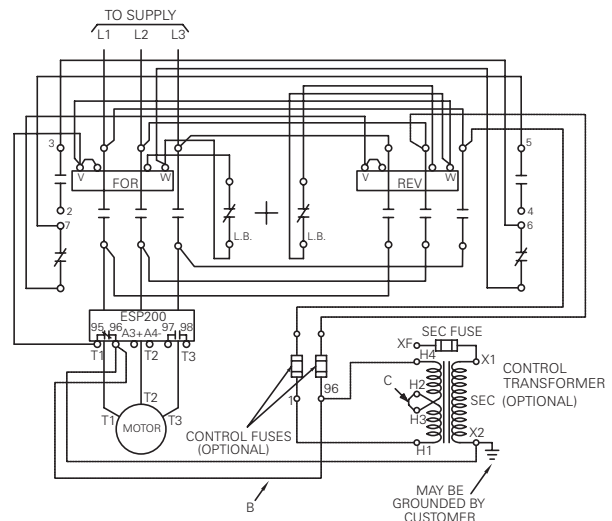
3-Phase Reversing Magnetic Starter
with DC Coil, Sizes 00-1¼



3-Phase Reversing Magnetic Starter
Sizes 2-4



3-Phase Reversing Magnetic Starter
with DC Coil, Sizes 2-4



NEMA & General
Purpose Control

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CONTROL
PRODUCTS

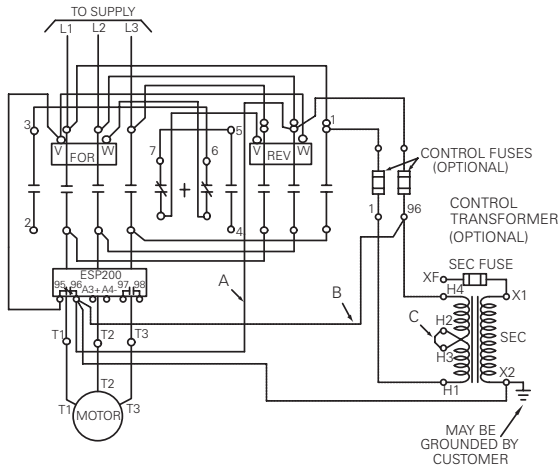
Combination Reversing Heavy Duty Starters

Class 25, 26

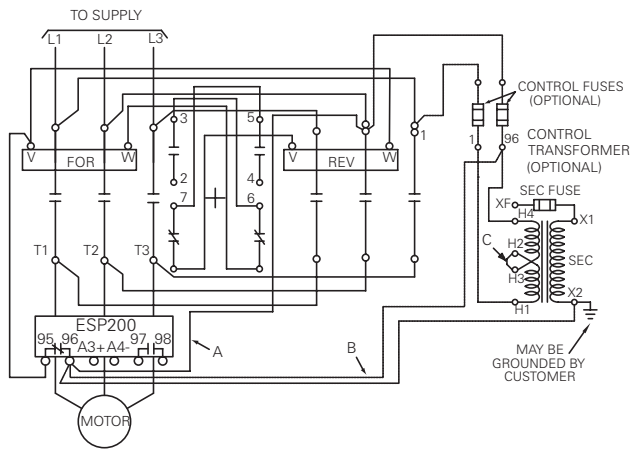
Wiring Diagrams

3-Phase

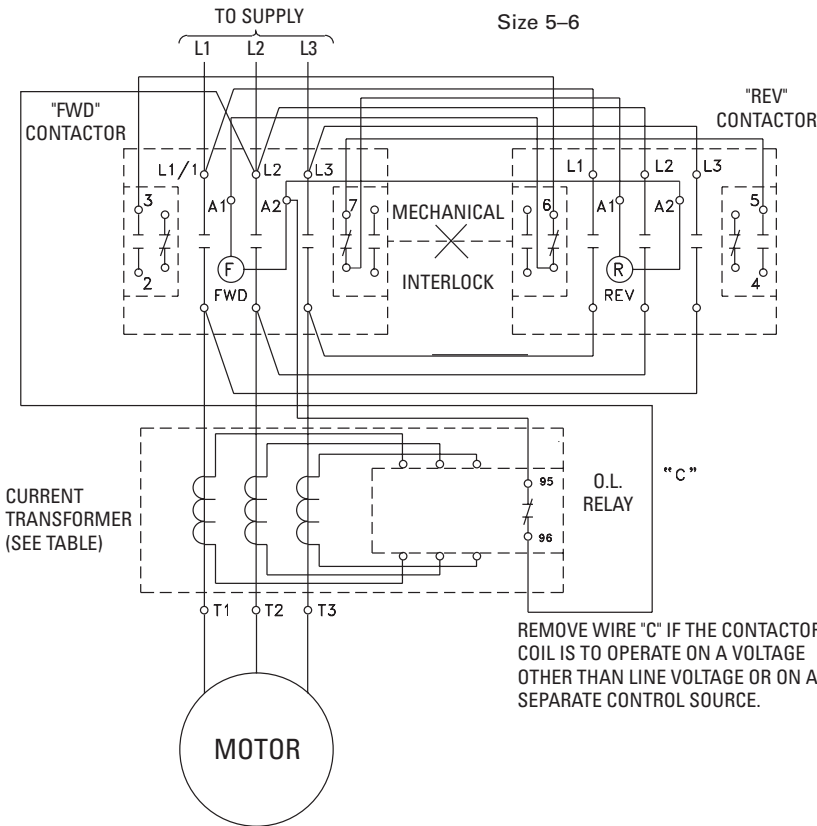
3-Phase Reversing Magnetic Starter
Sizes 00-1 $\frac{3}{4}$



3-Phase Reversing Magnetic Starter
Sizes 2-4



Size 5-6



SIZE	CT RATIO
5	300:5
6	600:5

NEMA & General
Purpose Control

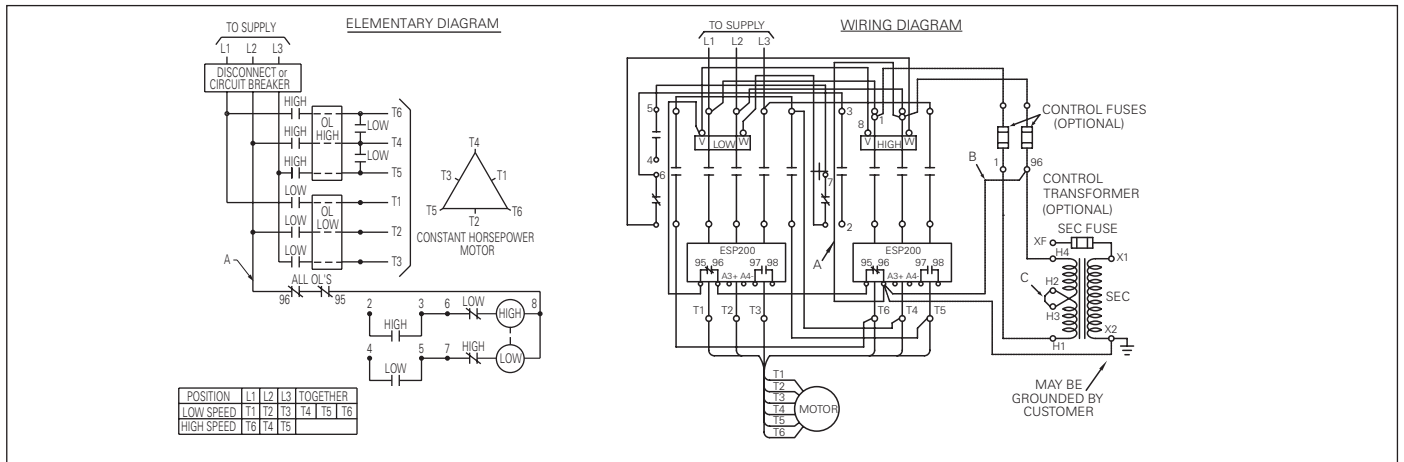
CONTROL
PRODUCTS

Two Speed Heavy Duty Starters

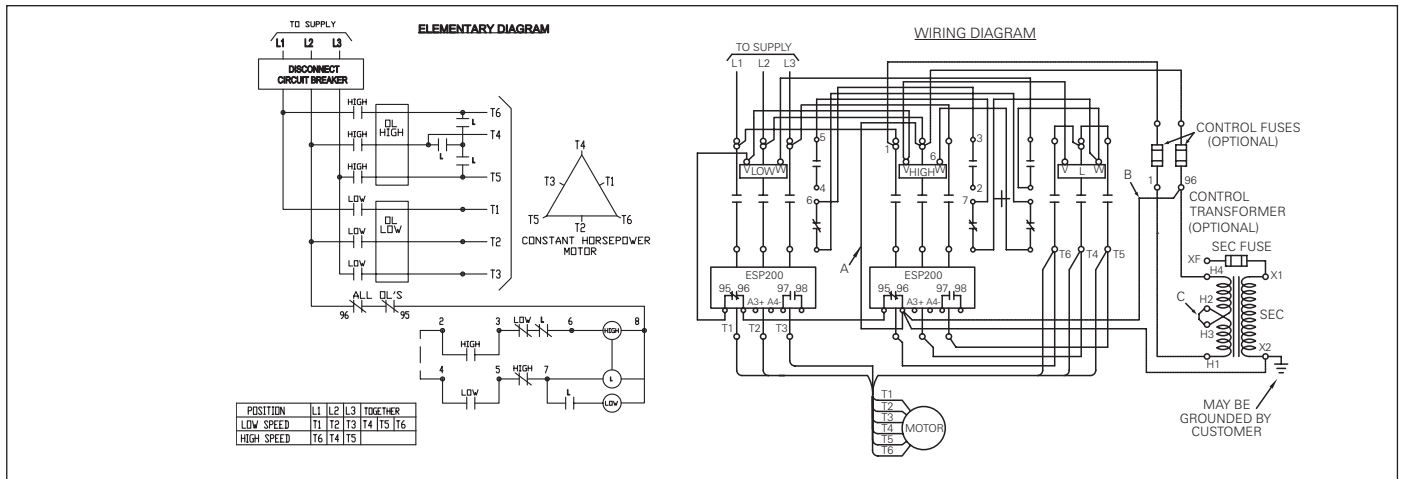
Class 30 & 32 Non-Combination and Combination Starters

Wiring Diagrams

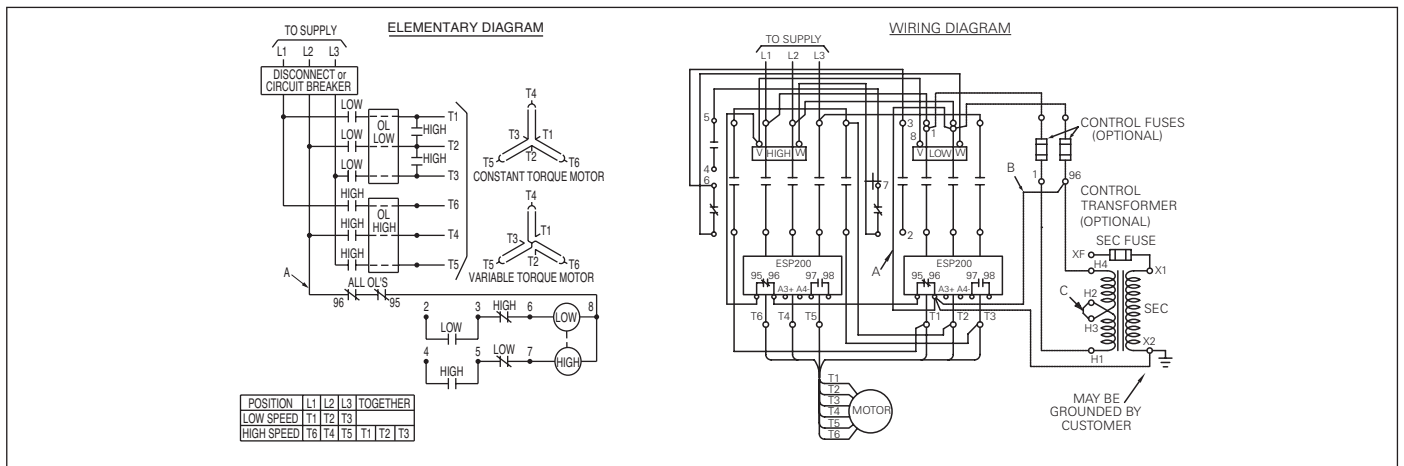
1 Winding Constant Horsepower Size 0-1³/₄



1 Winding Constant Horsepower Size 2-4



1 Winding Constant or Variable Torque Size 0-1³/₄



Note: For separate control voltage source, remove jumpers "A" and "B" and connect source to control fuse terminal. Remove jumper "C" if control transformer is used.

NEMA & General Purpose Control

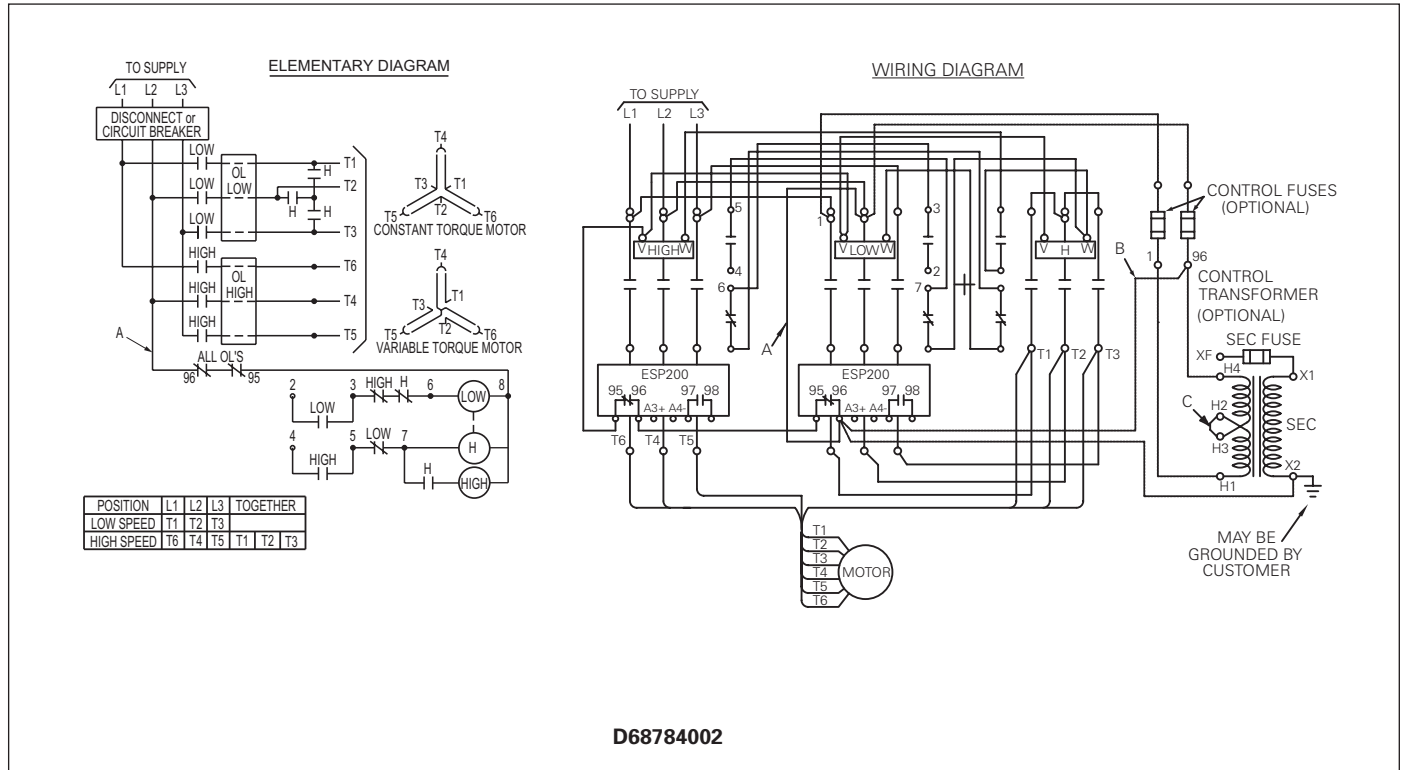
17 CONTROL PRODUCTS

Two Speed Heavy Duty Starters

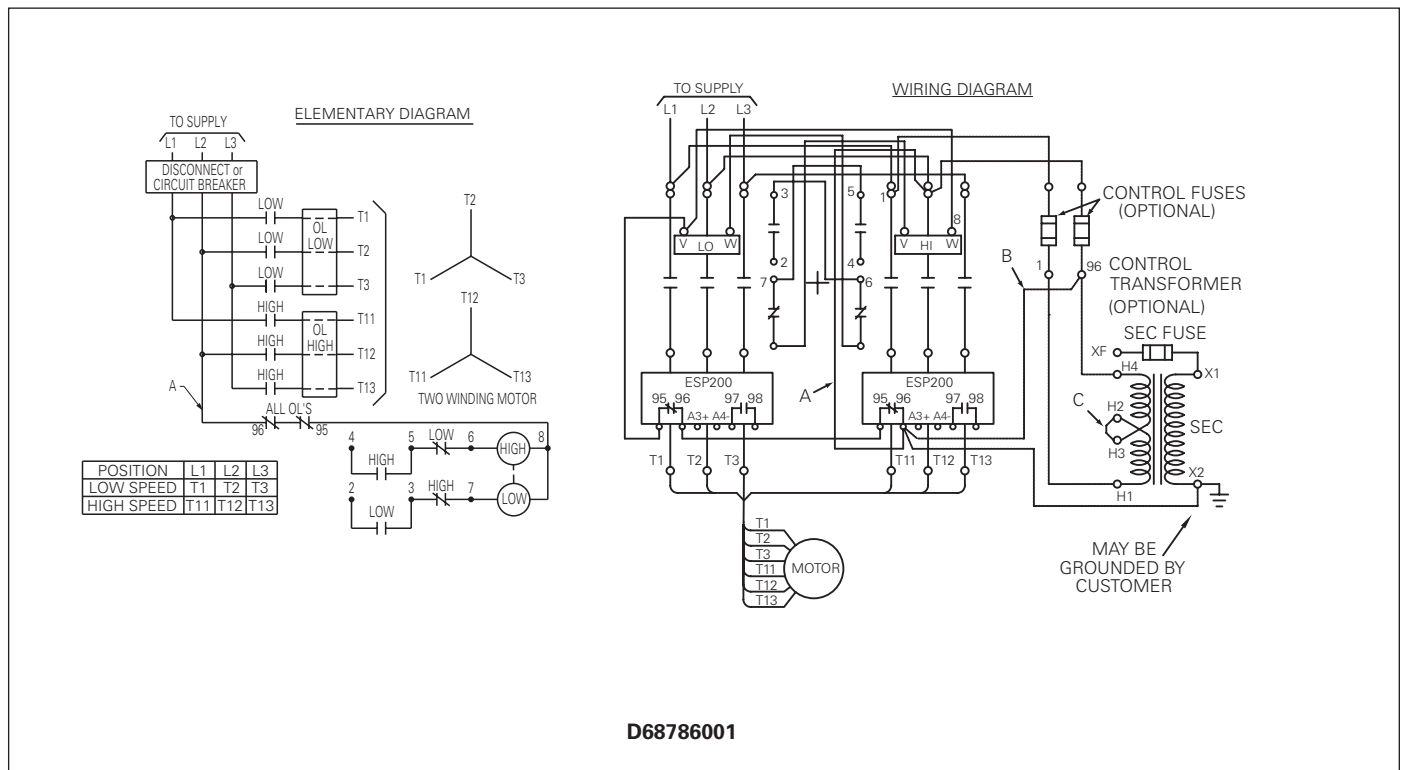
Class 30 & 32 Non-Combination and Combination Starters

Wiring Diagrams

1 Winding Constant or Variable Torque Size 2-4



2 Winding Constant Horsepower & 2 Winding Constant or Variable Torque Size 0-4



Note: For separate control voltage source, remove jumpers "A" and "B" and connect source to control fuse terminal. Remove jumper "C" if control transformer is used.

NEMA & General Purpose Control

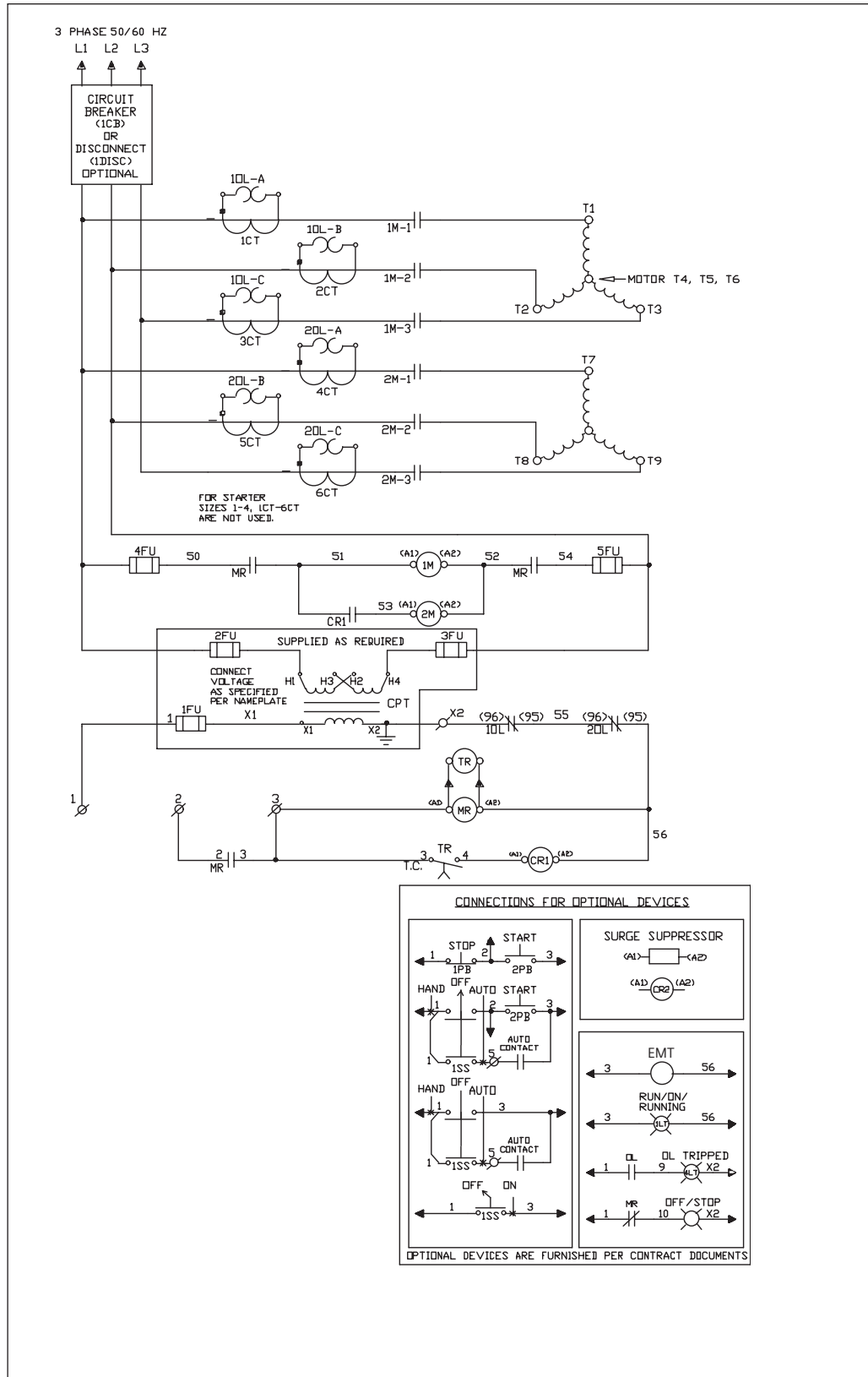
CONTROL PRODUCTS

Reduced Voltage Starters & Pump Panels

Class 36, 37, 88

Wiring Diagrams

Part Winding



NEMA & General Purpose Control

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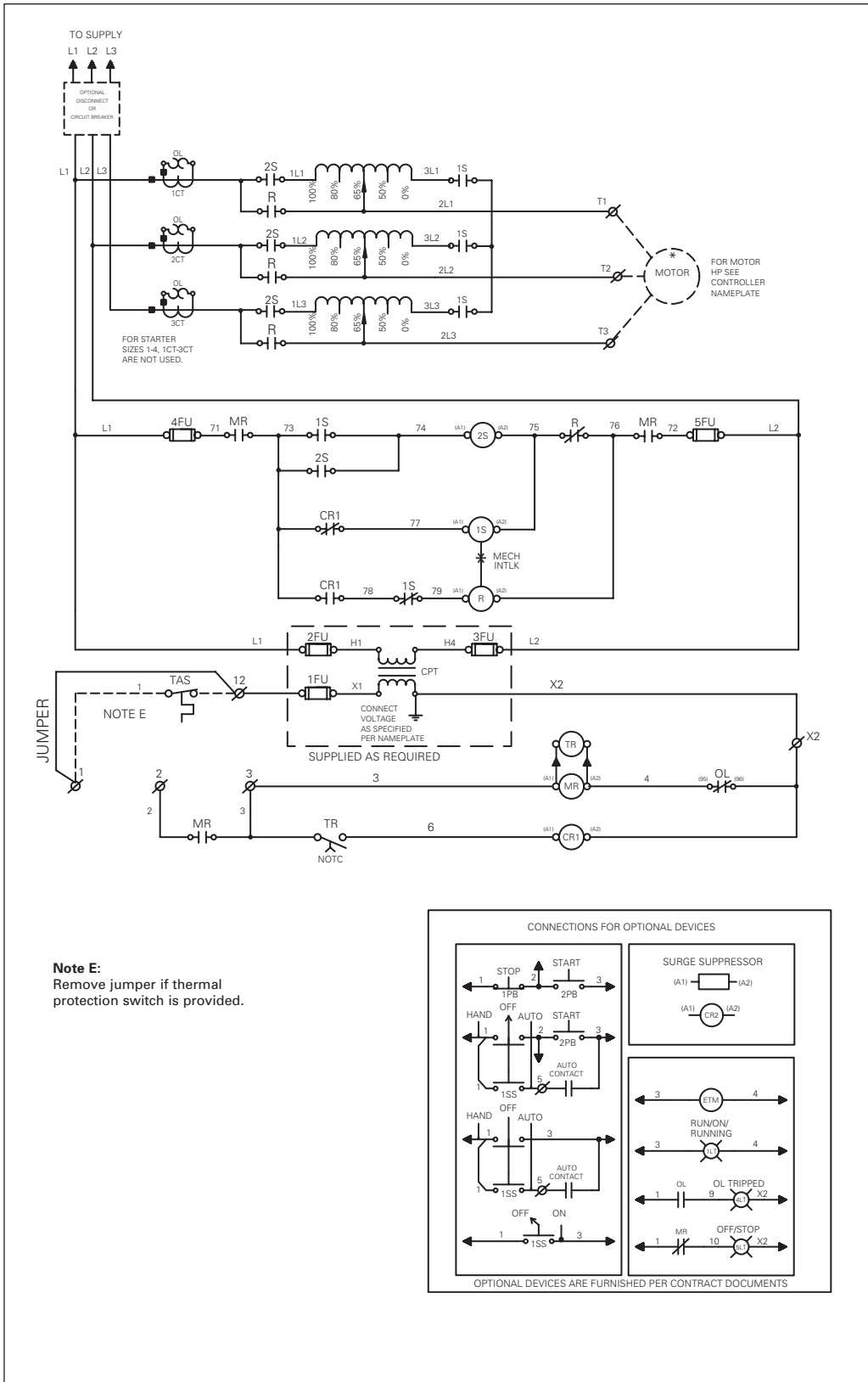
CONTROL PRODUCTS

Reduced Voltage Starters & Pump Panels

Class 36, 37, 88

Wiring Diagrams

Auto Transformer



NEMA & General Purpose Control

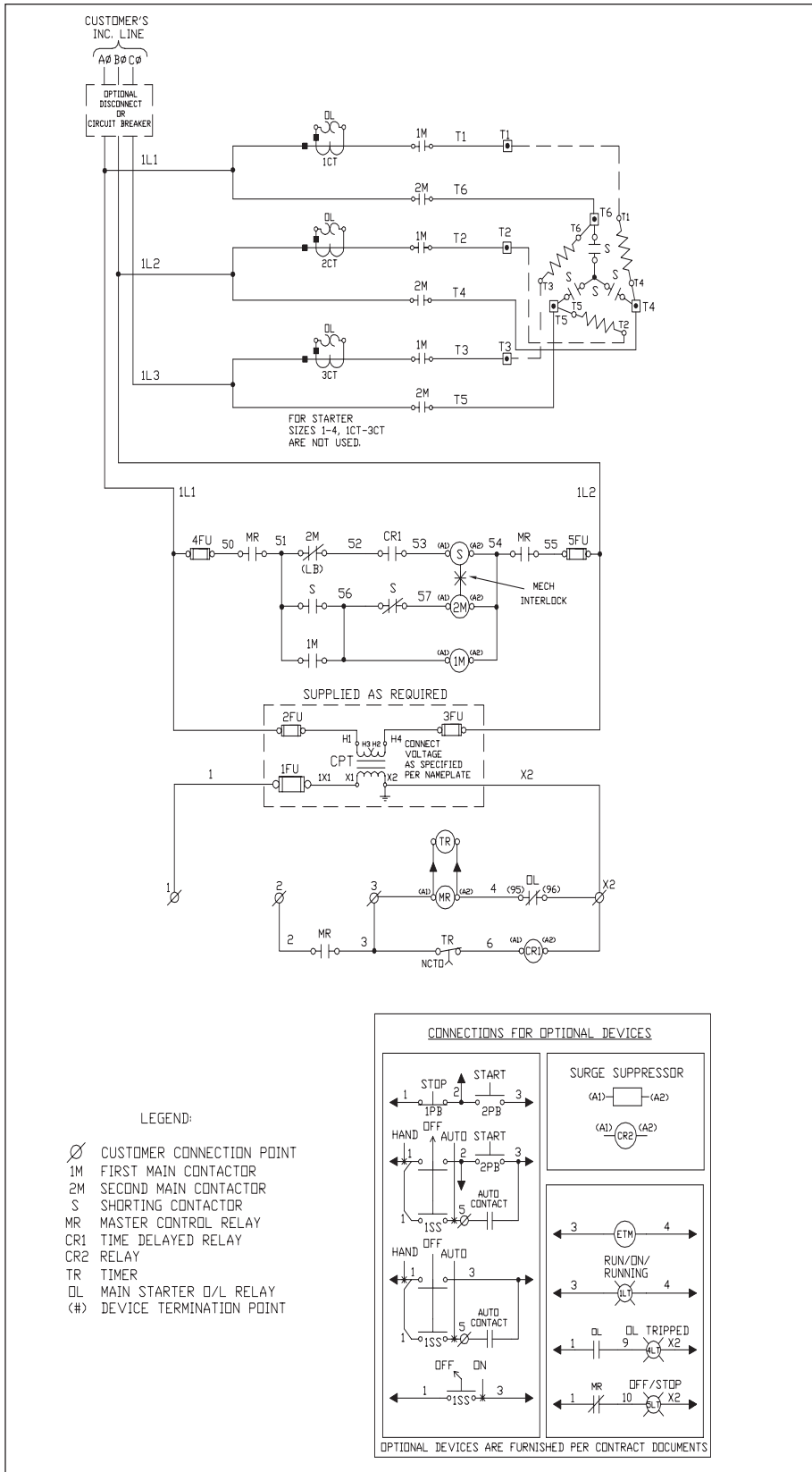
CONTROL PRODUCTS

Reduced Voltage Starters & Pump Panels

Class 36, 37, 88

Wiring Diagrams

Wye Delta (Open Transition)



NEMA & General Purpose Control

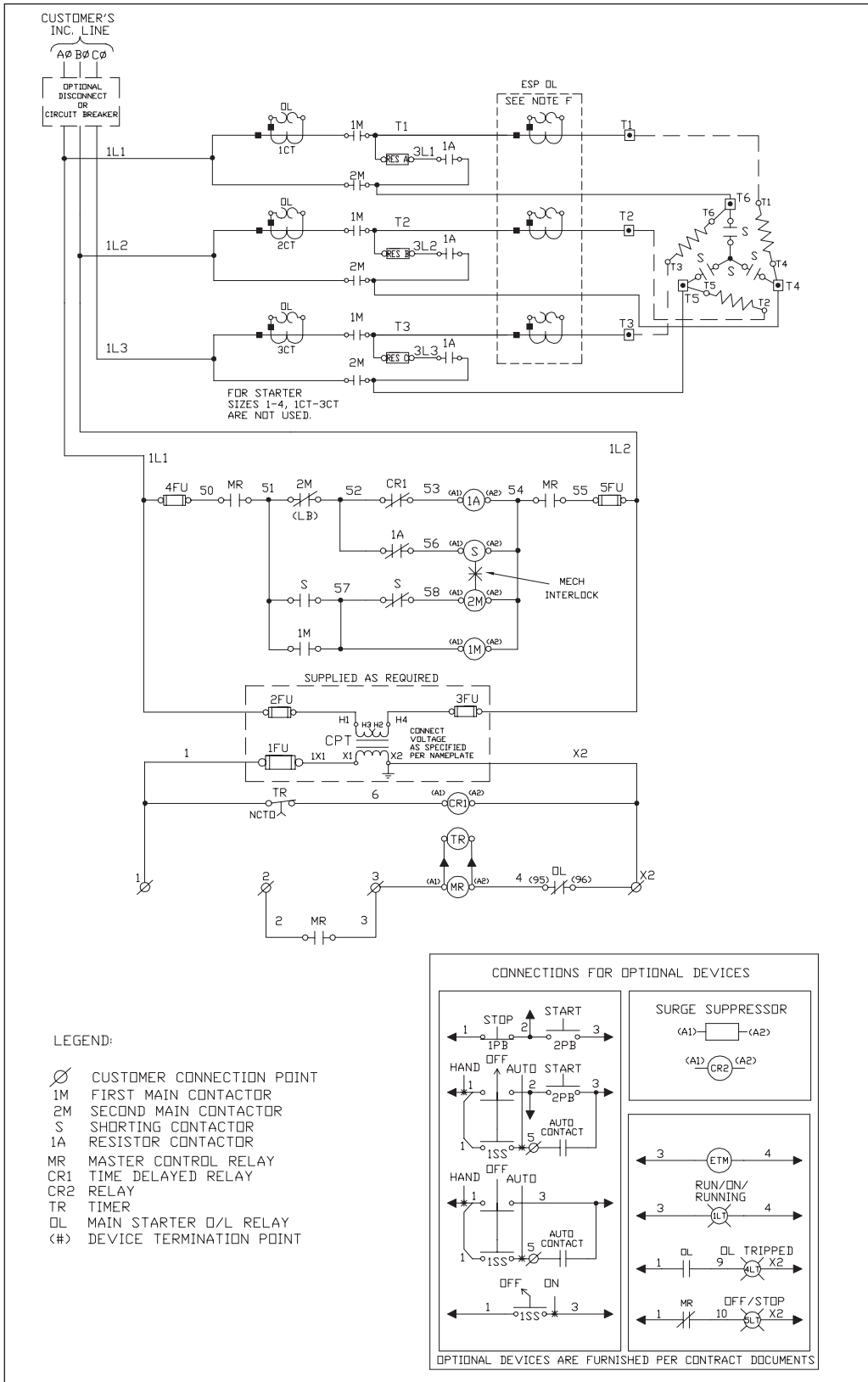
17 CONTROL PRODUCTS

Reduced Voltage Starters & Pump Panels

Class 36, 37, 88

Wiring Diagrams

Wye Delta (Closed Transition)



NEMA & General Purpose Control

CONTROL PRODUCTS

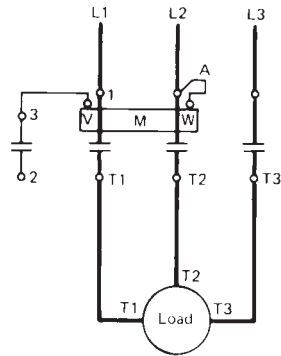
Heavy Duty Contactors and Reversing Contactors

Class 40, 43

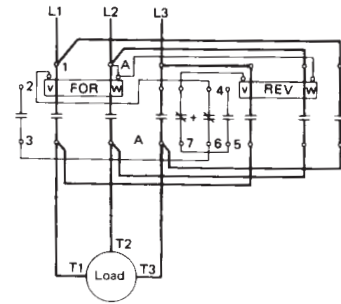
Wiring Diagrams

3-Phase Magnetic Contactors and Reversing Contactors

3-Phase Contactors—Size 00–4

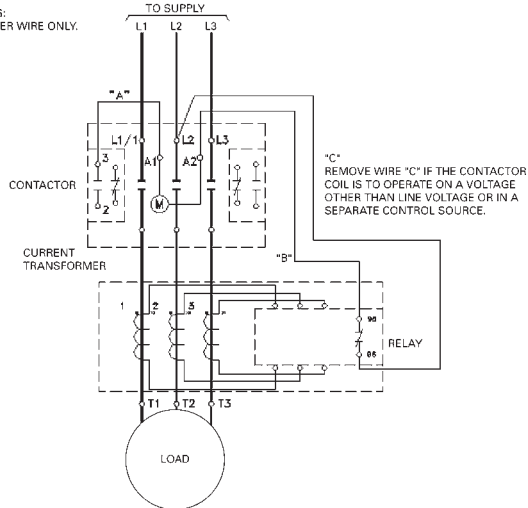


3-Phase Reversing Contactors—Size 00–4

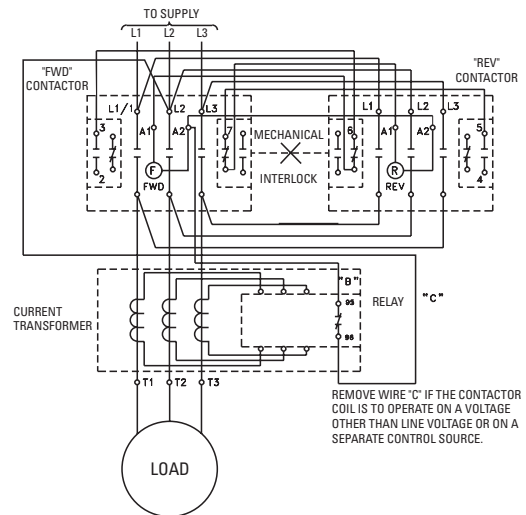


3-Phase Contactors—Size 5, 6

POWER WIRING:
USE 75°C COPPER WIRE ONLY.



3-Phase Reversing Contactors—Size 5, 6



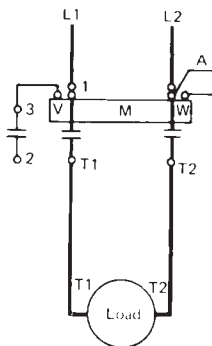
NEMA & General
Purpose Control

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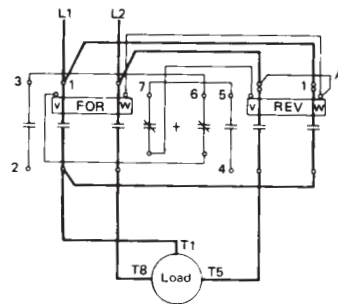
CONTROL
PRODUCTS

Single Phase Magnetic Contactors and Reversing Contactors

Single Phase Contactors—Size 00–4



Single Phase Reversing Contactors—Size 00–1P

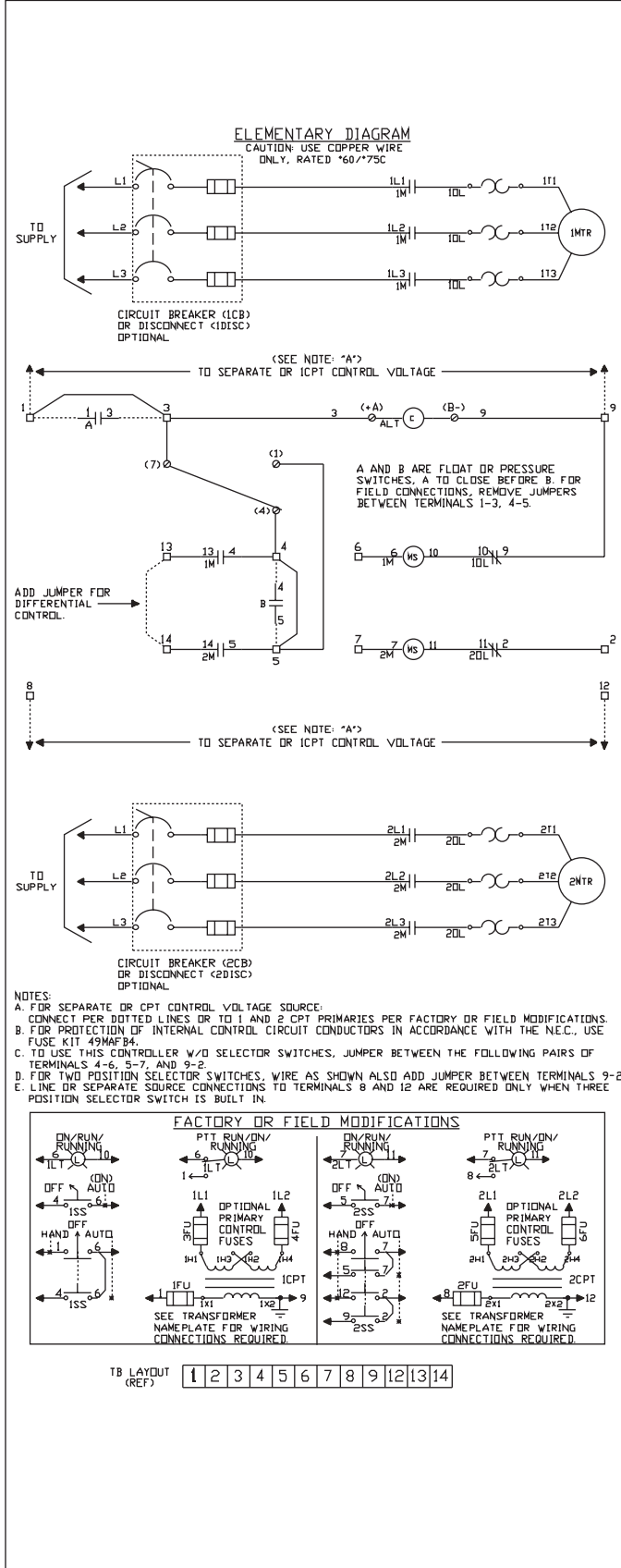


Duplex Heavy Duty Controllers

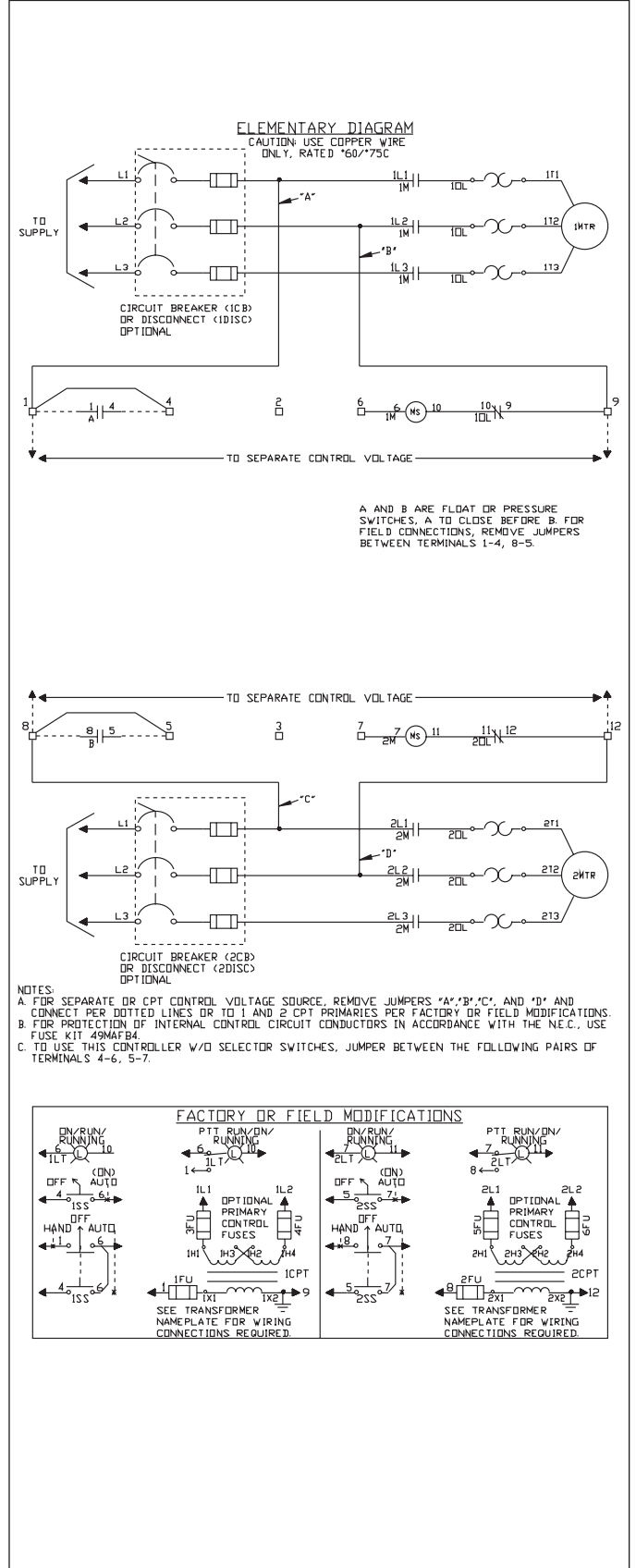
Class 83, 84

Wiring Diagrams

Standard Duplex Pump Panel (92)



Duplex Panel w/o alternator (95)



NEMA & General Purpose Control

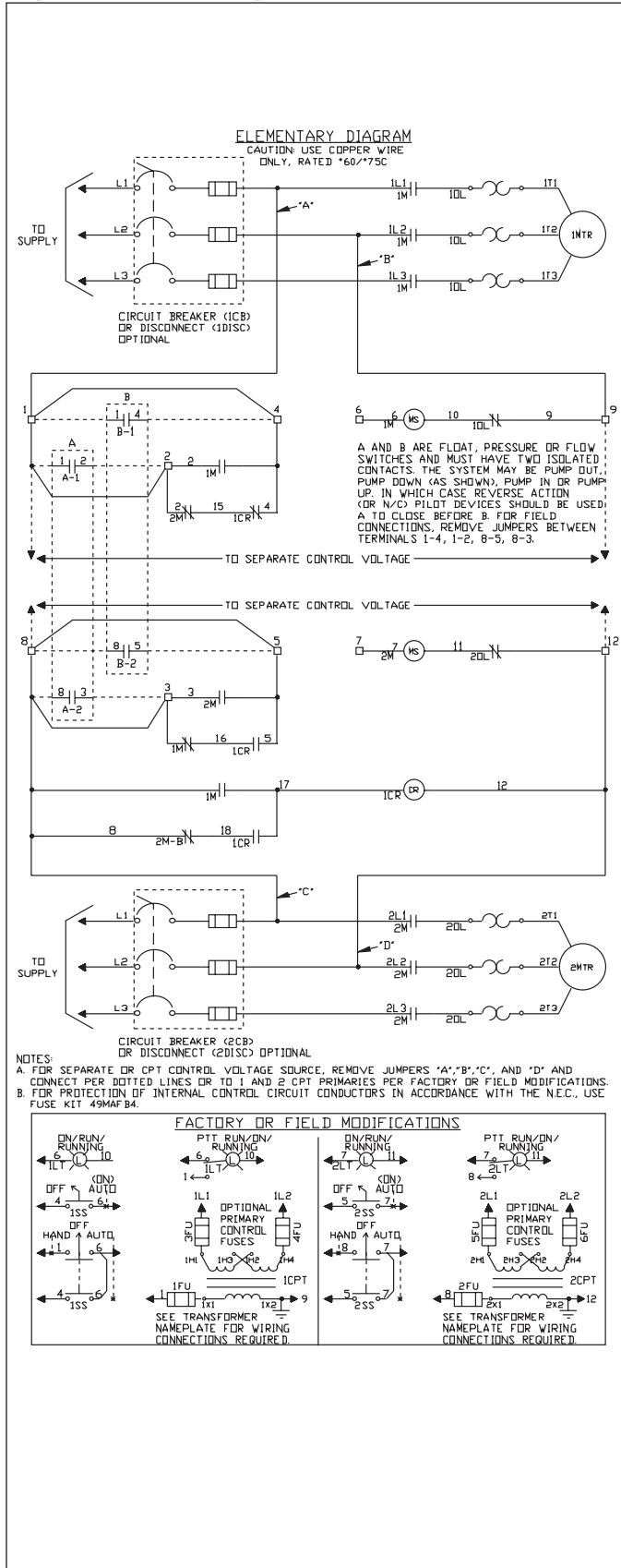
CONTROL PRODUCTS

Duplex Heavy Duty Controllers

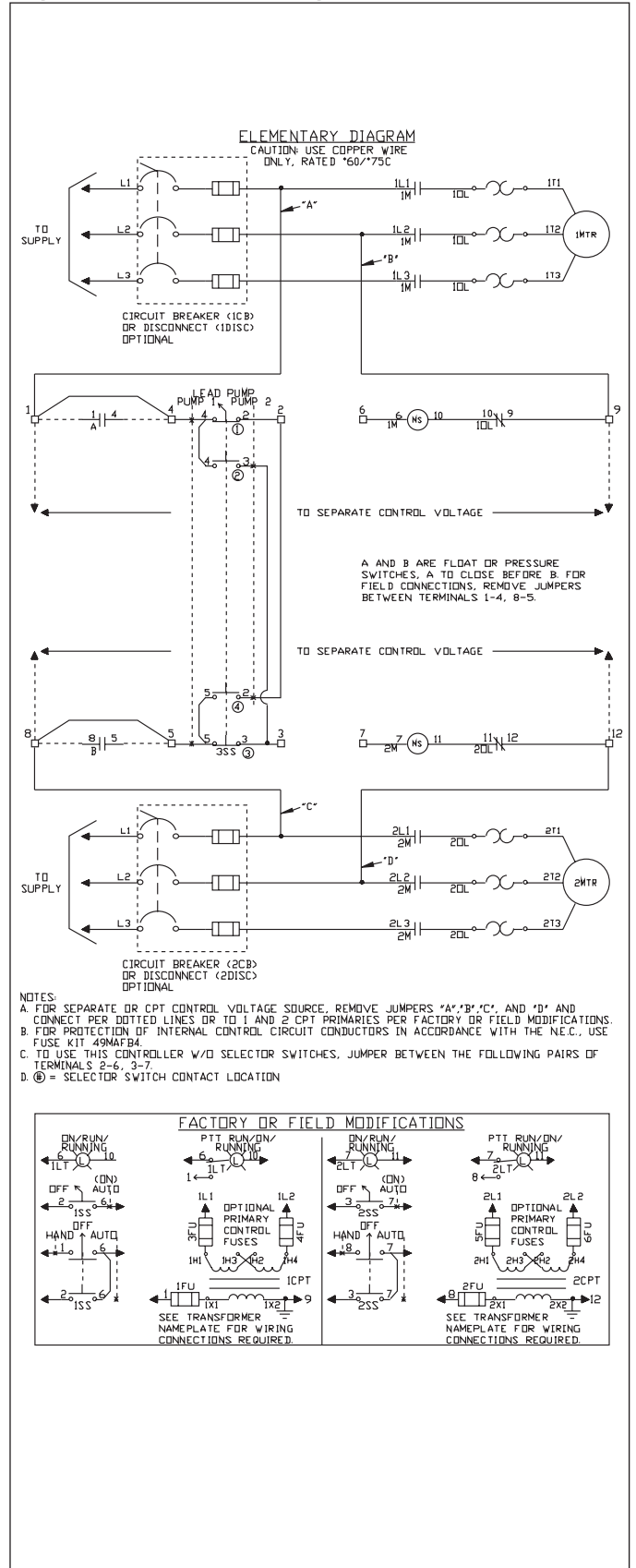
Class 83, 84

Wiring Diagrams

Duplex Panel with Relay Alternation (93)



Duplex Panel with Lead Pump Transfer Switch (94)



NEMA & General Purpose Control

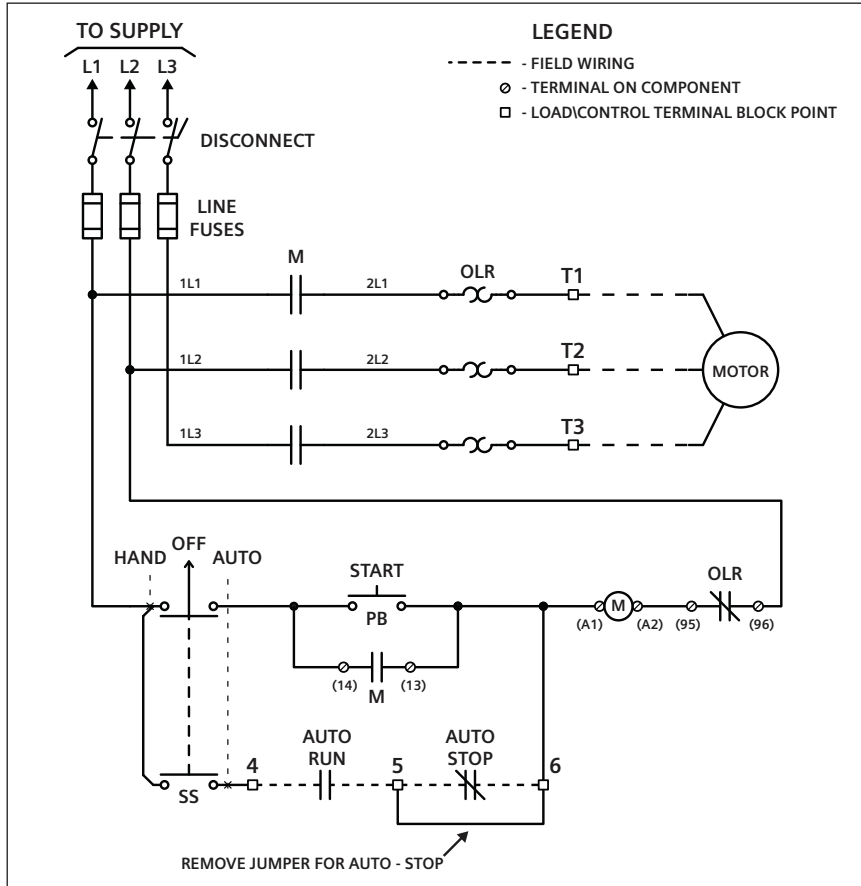
CONTROL PRODUCTS 17

Standard & Irrigation Pump Panels

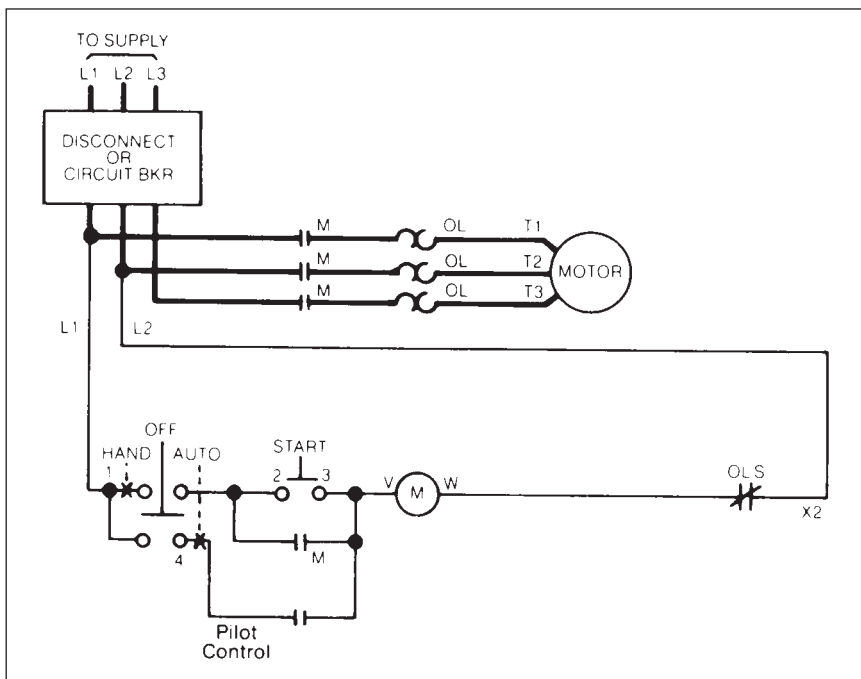
Class 82, 87

Wiring Diagrams

Class 82 Pump Panel



Standard Class 87 Pump Panel



NEMA & General Purpose Control

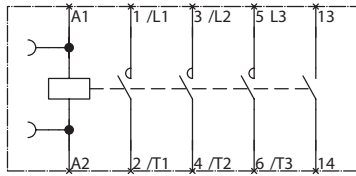
CONTROL PRODUCTS

Duplex Heavy Duty Controllers

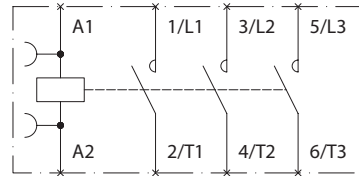
Class LC and LE Electrically Held Contactors

Wiring Diagrams

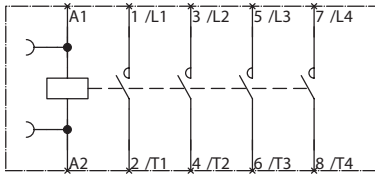
LEN00B003 (20A 3 Pole)



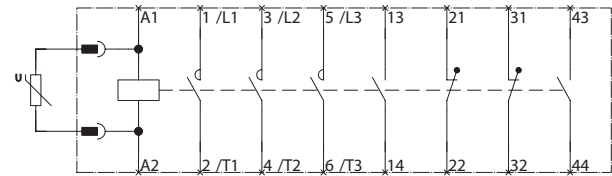
LEN00D003 (60A 3 Pole)
LEN00E003 (100A 3 Pole)



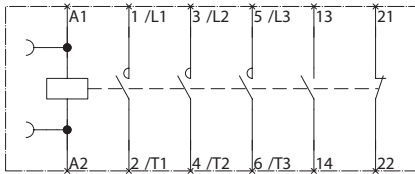
LEN00B004 (20A 4 Pole)



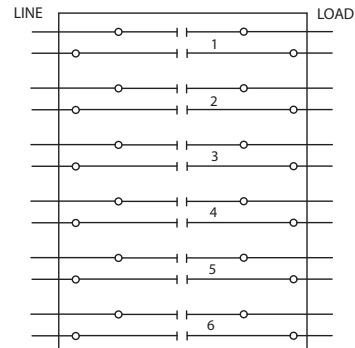
LEN00F003 (200A 3 Pole)
LEN00G003 (300A 3 Pole)
LEN00H003 (400A 3 Pole)



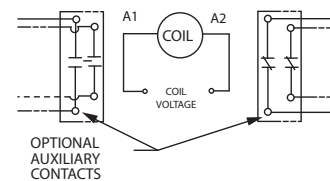
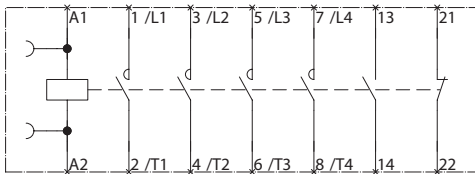
LEN00C003 (30A 3 Pole)



LCE00C (30A 2-12 Pole)



LEN00C004 (30A 4 Pole)

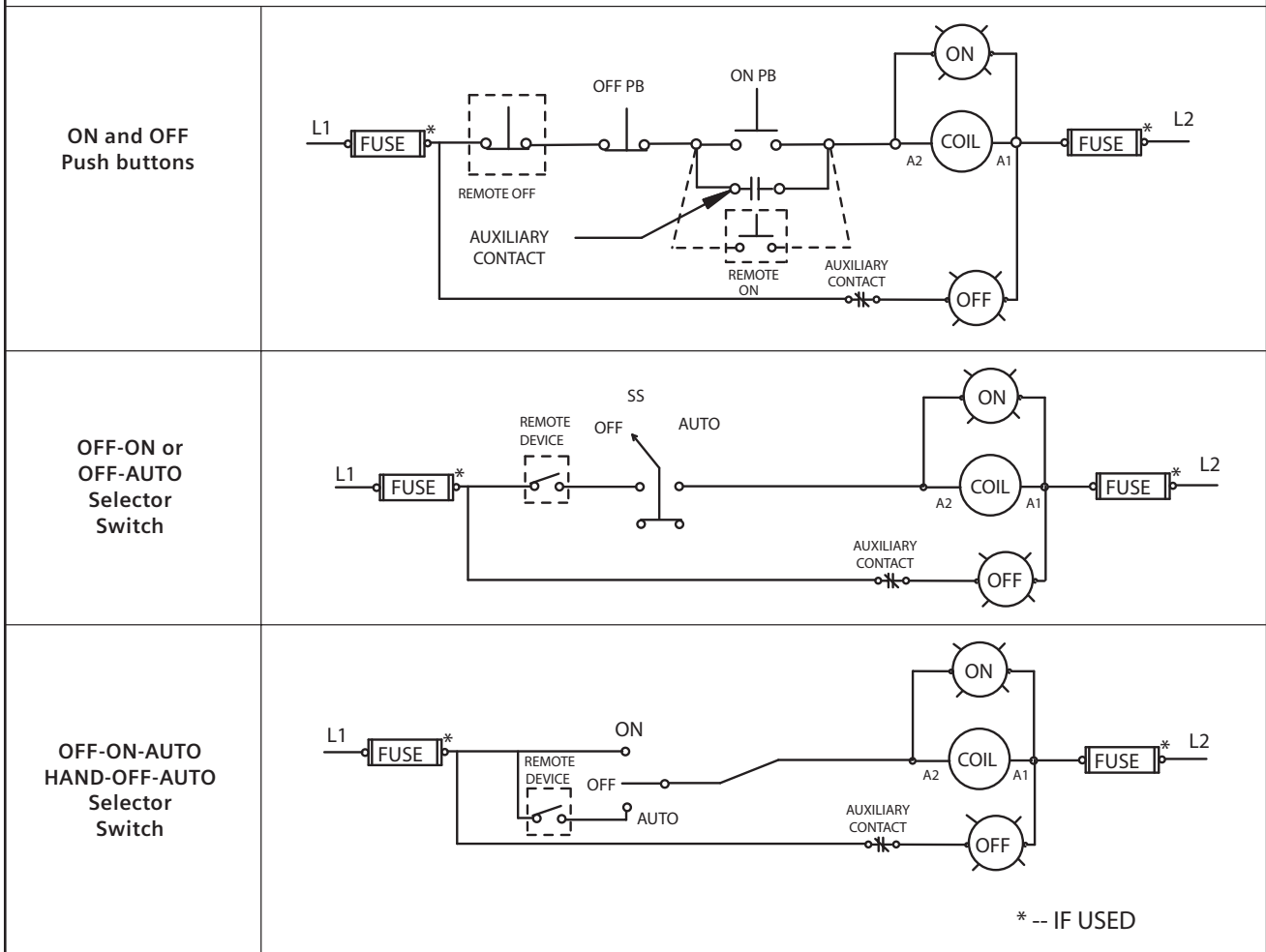


NEMA & General
Purpose Control

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PRODUCTS

Duplex Heavy Duty Controllers

Optional Pilot Devices for Electrically Held Contactor



NEMA & General Purpose Control

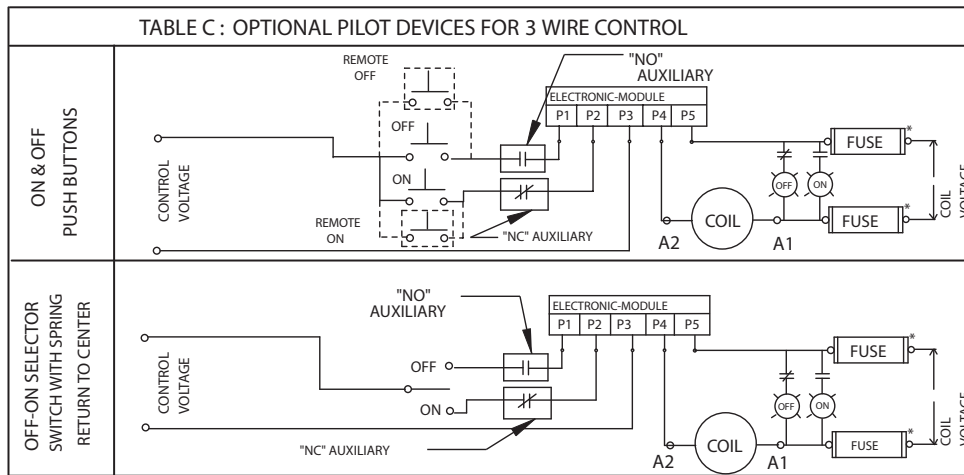
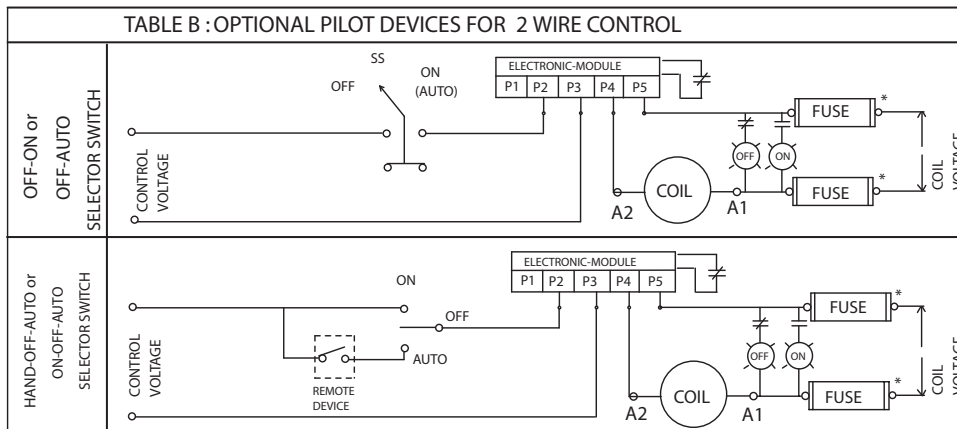
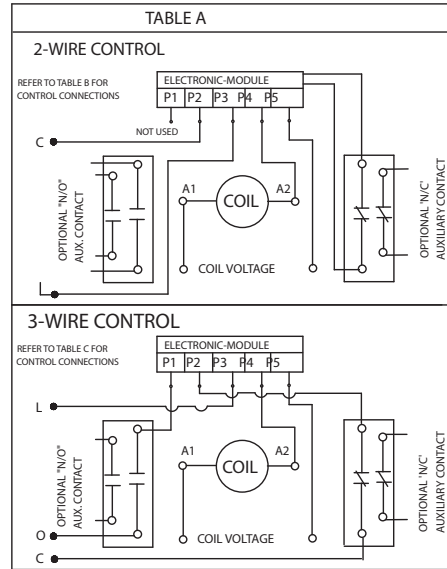
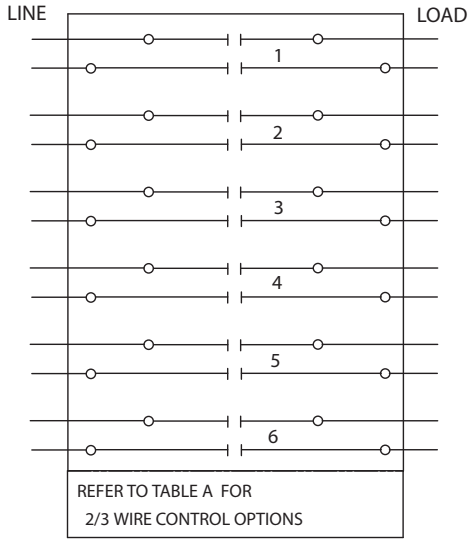
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CONTROL PRODUCTS

Lighting and Heating Contactors

Class LC (converted to mechanically held)

Wiring Diagrams

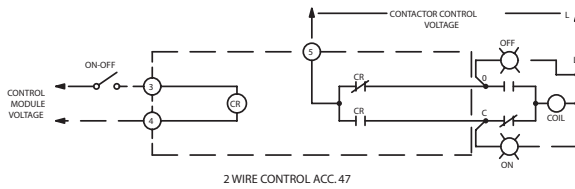
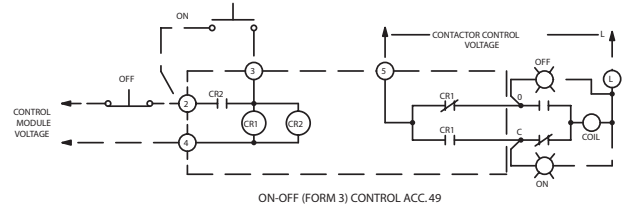
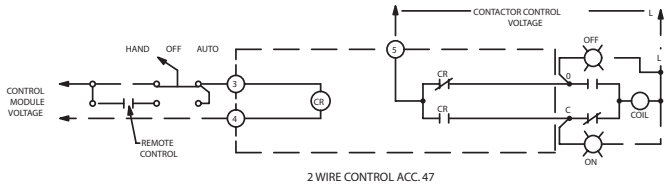
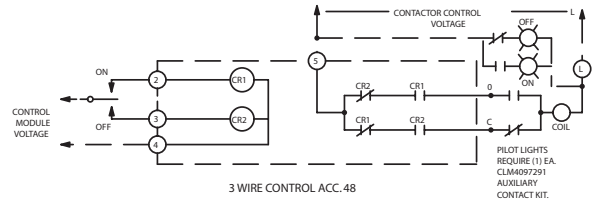
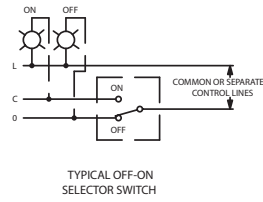


* -- IF USED

Lighting and Heating Contactors

Mechanically Latched 20 Amp, Class CLM

Wiring Diagrams



CONNECTIONS TO CONTROL MODULES	
MODULE TERMINAL	CONNECT TO:
1	NOT USED
2	CONT. STATION FOR ACC. 48 & 49
3	CONT. STATION FOR ACC. 47, 48 & 49
4	MODULE CONTROL VOLTAGE *
5	CONTACTOR CONTROL VOLTAGE
O	TERMINAL O ON CONTACTOR
C	TERMINAL C ON CONTACTOR

* FOR 24 VDC CONTROL MODULES
CONNECT TERMINAL 4 TO NEGATIVE (-)

NEMA & General Purpose Control

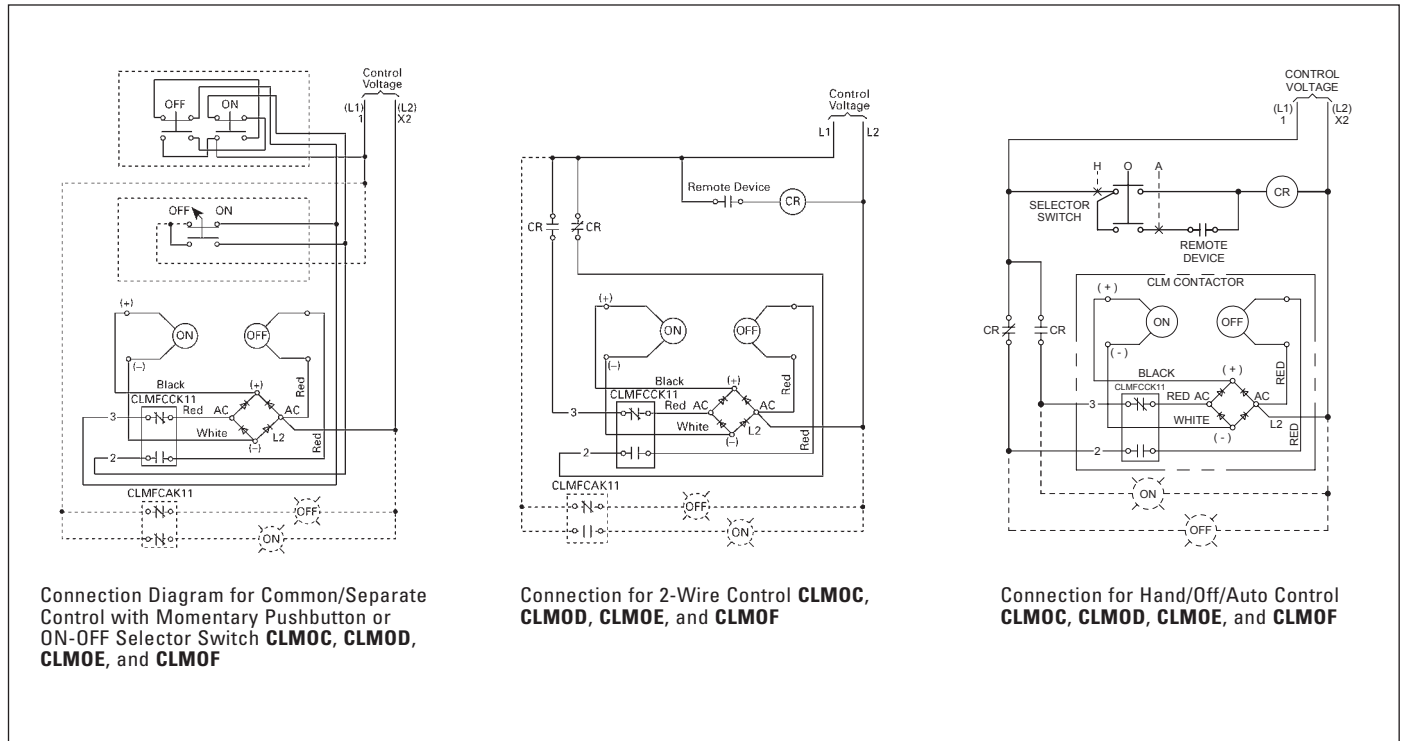
CONTROL PRODUCTS

Lighting and Heating Contactors

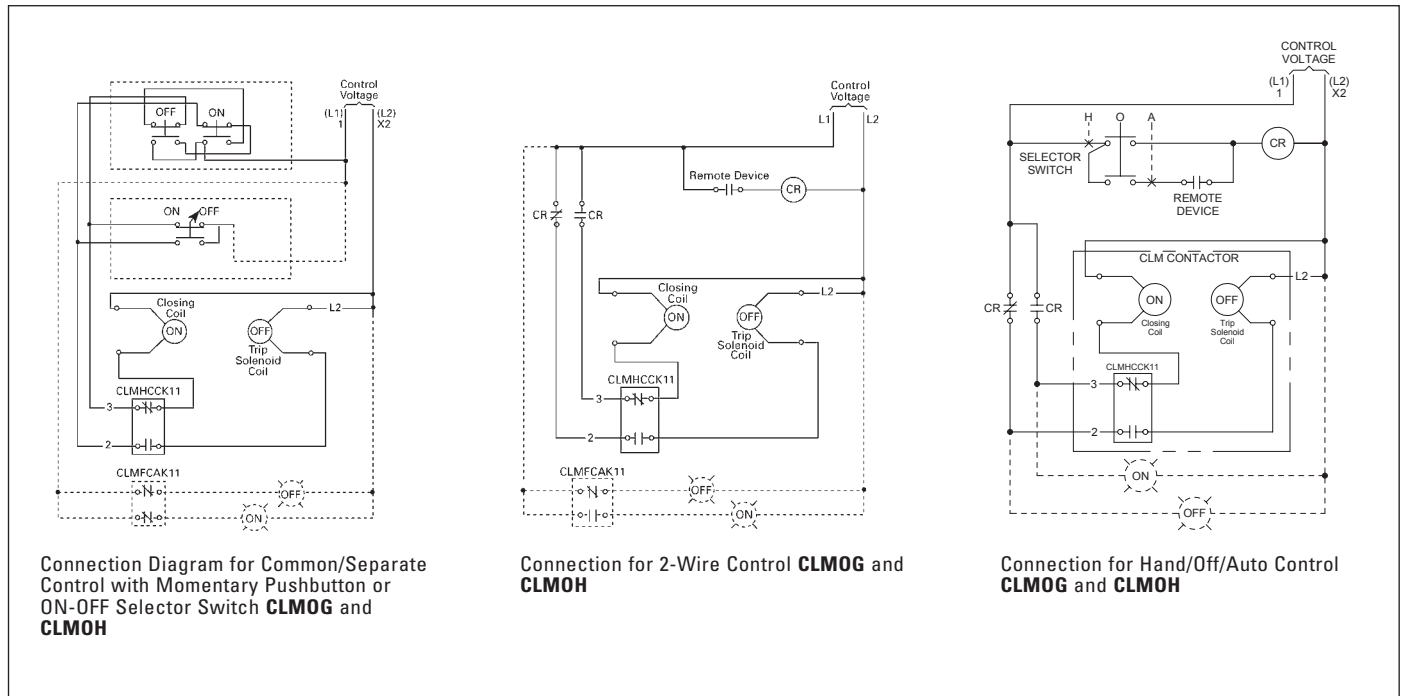
Mechanically Latched 30-400 Amps, Class CLM

Wiring Diagrams

Mechanically Latched, CLM 30–200 Amps^①



Mechanically Latched Type CLM 300 and 400 Amp^①



^① Control relay is required for 2-wire and Hand/Off/Auto Control, as shown in diagram.

NEMA & General Purpose Control

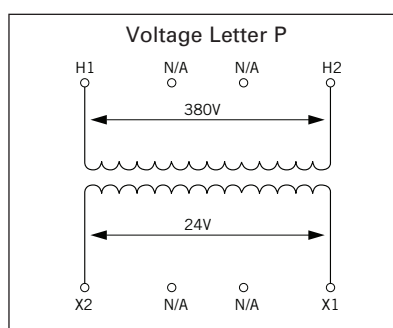
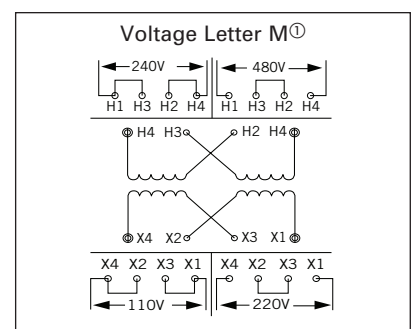
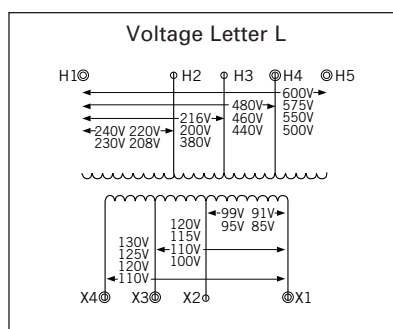
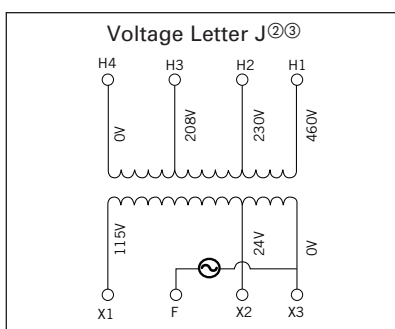
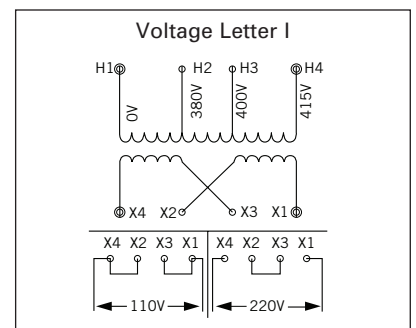
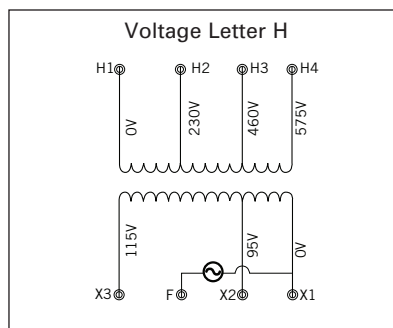
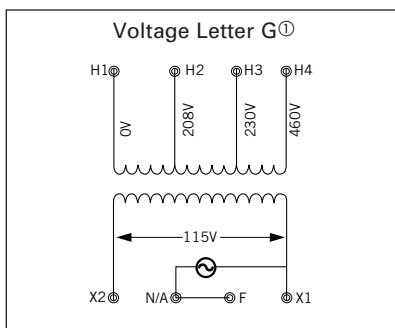
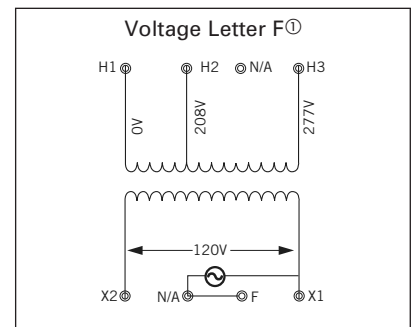
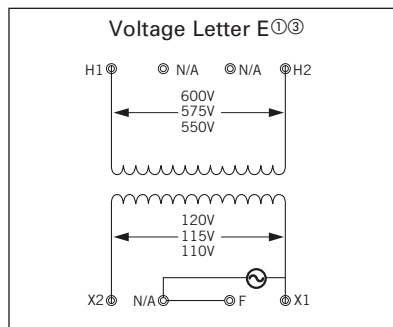
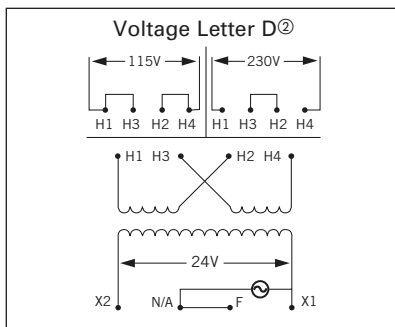
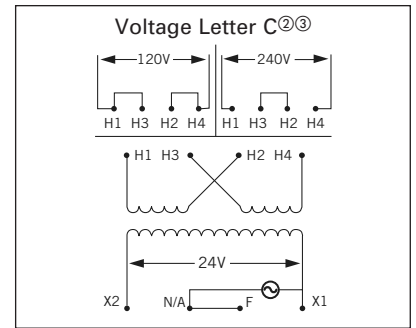
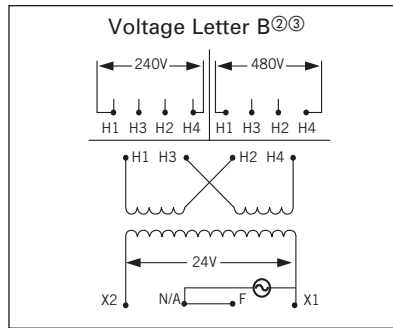
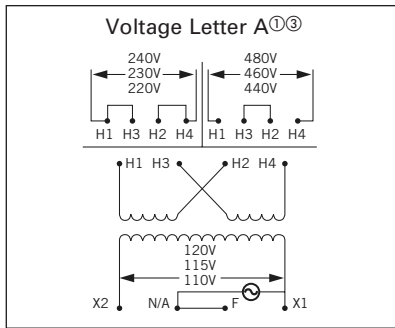
17

CONTROL PRODUCTS

Industrial Control Power Transformers

Class MT, MTG

Wiring Diagrams



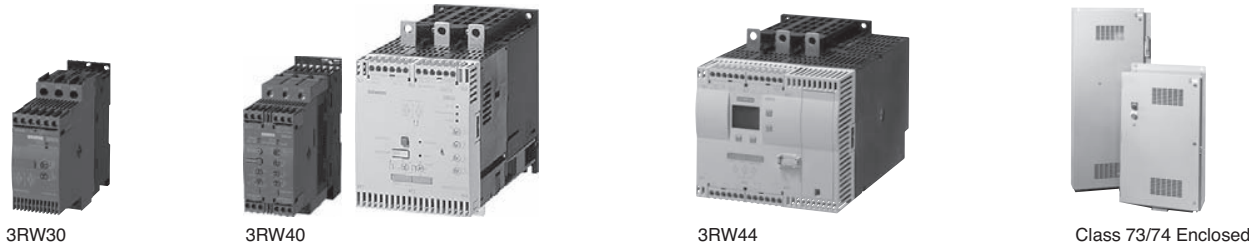
① Includes secondary fuse clips on sizes 50-750VA
 ② Includes secondary fuse clips on sizes 50-500VA
 ③ Secondary fuse clips are not included on MTG transformers.

NEMA & General Purpose Control

17

CONTROL PRODUCTS

Overview



3RW30

3RW40

3RW44

Class 73/74 Enclosed

Order No.	Page
-----------	------

For operation in the control cabinet

3RW soft starters for standard applications

- Application areas
 - Fans
 - Building/construction machines
 - Escalators
 - Air conditioning systems
 - Assembly lines
 - Operating mechanisms
- Pumps
- Presses
- Transport systems
- Fans
- Compressors and coolers

3RW30 soft starters

- SIRIUS 3RW30 soft starters for soft starting and smooth ramp-down of three-phase asynchronous motors
- Performance range of up to 75 Hp (at 460 V)

3RW30

17-198

3RW40 soft starters

- SIRIUS 3RW40 soft starters with the integral functions
 - Solid-state motor overload and intrinsic device protection and
 - Adjustable current limiting
- Performance range of up to 300 Hp (at 460 V)

3RW40

17-202

3RW soft starters for high-feature applications

- Application areas
 - Pumps
 - Compressors
 - Industrial refrigerating systems
 - Conveying systems
 - Machine tools
- Fans
- Cooling systems
- Water transport
- Hydraulics
- Mills

3RW44 soft starters

- In addition to soft starting and soft ramp-down, the solid-state SIRIUS 3RW44 soft starters provide numerous functions for higher-level requirements
- Performance range
 - Up to 900 Hp (at 460 V) in inline circuit and
 - Up to 1600 Hp (at 460 V) in inside-delta circuit

3RW44

17-210

For enclosed applications

Enclosures in NEMA 1, 3, 4, & 12 types UL/CSA listed

- Complete starter includes 3RW40 or 3RW44 and CPT
- Performance Range of up to 600 Hp (at 460 V)
- Combination options include circuit breaker or fusible disconnect

Class 73/74

17-277

- Application areas:
 - Compressors
 - Pumps
 - Stamping presses
 - Cooling towers
 - Molding and extruding
 - Chippers and debarkers
- Lumber processing
- Pulp & paper processing
- Conveyors
- Textiles
- HVAC

For Operation in the Control Cabinet

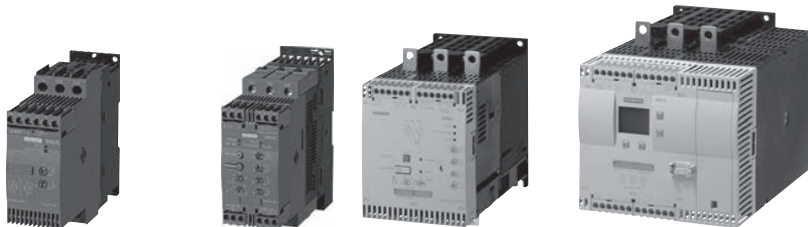
3RW Soft Starters

General Data

Overview

The advantages of the SIRIUS soft starters at a glance:

- Soft starting and smooth ramp-down¹⁾
- Stepless starting
- Reduction of current peaks
- Avoidance of mains voltage fluctuations during starting
- Reduced load on the power supply network
- Reduction of the mechanical load in the operating mechanism
- Considerable space savings and reduced wiring compared with conventional starters
- Maintenance-free switching
- Very easy handling
- Fits perfectly in the SIRIUS modular system



		SIRIUS 3RW30 Standard applications	SIRIUS 3RW40 Standard applications	SIRIUS 3RW44 High-Feature applications
Rated current up to 50 °C	A	3 ... 98	11 ... 385	26 ... 1076
Rated operational voltage	V	200 ... 480	200 ... 600	200 ... 690
Motor rating at 460 V				
• Inline circuit	Hp	1.5 ... 75	7.5 ... 300	15 ... 900
• Inside-delta circuit	Hp	--	--	22 ... 1600
Ambient temperature	°C	-25 ... +60	-25 ... +60	0 ... +60
Soft starting/ramp-down		✓ ¹⁾	✓	✓
Voltage ramp		✓	✓	✓
Starting/stopping voltage	%	40 ... 100	40 ... 100	20 ... 100
Starting and ramp-down time ⁷⁾	s	0 ... 20	0 ... 20	1 ... 360
Torque control		--	--	✓
Starting/stopping torque	%	--	--	20 ... 100
Torque limit	%	--	--	20 ... 200
Ramp time	s	--	--	1 ... 360
Integral bypass contact system		✓	✓	✓
Intrinsic device protection		--	✓	✓
Motor overload protection		--	✓	✓
Thermistor motor protection		--	✓ ²⁾	✓
Integrated remote RESET		--	✓ ³⁾	✓
Adjustable current limiting		--	✓	✓
Inside-delta circuit		--	--	✓
Breakaway pulse		--	--	✓
Creep speed in both directions of rotation		--	--	✓
Pump ramp-down		--	--	✓ ⁴⁾
DC braking		--	--	✓ ^{4) 5)}
Combined braking		--	--	✓ ^{4) 5)}
Motor heating		--	--	✓
Communication		--	--	With PROFIBUS DP (optional)
External display and operator module		--	--	(optional)
Operating measured value display		--	--	✓
Error logbook		--	--	✓
Event list		--	--	✓
Slave pointer function		--	--	✓
Trace function		--	--	✓ ⁶⁾
Programmable control inputs and outputs		--	--	✓
Number of parameter sets		1	1	3
Parameterization software (Soft Starter ES)		--	--	✓
Power semiconductors (thyristors)		2 controlled phases	2 controlled phases	3 controlled phases
Screw terminals		✓	✓	✓
Spring-type terminals		✓	✓	✓
UL/CSA		✓	✓	✓
CE marking		✓	✓	✓
Soft starting under heavy starting conditions		--	--	✓ ⁴⁾

Configuring support

Win-Soft Starter, Electronic Application Selector, Technical Assistance Tel.: 1-800-333-7421

✓ Function is available; -- Function is not available.

¹⁾ Only soft starting available for 3RW30.

²⁾ Optional up to size S3 (device variant).

³⁾ Available for 3RW40 2... to 3RW40 4...; optional for 3RW40 5... and 3RW40 7....

⁴⁾ Calculate soft starter and motor with size allowance where required.

⁵⁾ Not possible in inside-delta circuit.

⁶⁾ Trace function with Soft Starter ES software.

⁷⁾ Actual motor start times are load dependent.

You can find further information on the Internet at:

www.usa.siemens.com/softstarters

Soft Starter
Control

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CONTROL
PRODUCTS

For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

Overview

The SIRIUS 3RW30 soft starters reduce the motor voltage through variable phase control and increase it in ramp-like mode from a selectable starting voltage up to mains voltage. During starting, these devices limit the torque as well as the current and prevent the shocks which arise during direct starts or wye-delta starts. In this way, mechanical loads and mains voltage dips can be reliably reduced.

Soft starting reduces the stress on the connected equipment and results in lower wear and therefore longer periods of trouble-free production. The selectable start value means that the soft starters can be adjusted individually to the requirements of the application in question and unlike wye-delta starters are not restricted to two-stage starting with fixed voltage ratios.¹⁾

The SIRIUS 3RW30 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that minimal power loss is used at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

Various versions of the SIRIUS 3RW30 soft starters are available:

- Standard version for fixed-speed three-phase motors, sizes S00, S0, S2 and S3, with integrated bypass contact system
- Version for fixed-speed three-phase motors in a 22.5 mm enclosure without bypass

Soft starters rated up to 75 Hp (at 460 V) for standard applications in three-phase networks are available. Extremely small sizes, low power losses and simple start-up are just three of the many advantages of this soft starter.

¹⁾ Actual motor start times are load dependent.

Application

The 3RW30 soft starters are suitable for soft starting of three-phase asynchronous motors.

Due to two-phase control, the current is kept at minimum values in all three phases throughout the entire starting time. Due to continuous voltage influencing, current and torque peaks, which are unavoidable in the case of wye-delta starters, for instance, do not occur.

Application areas

- Pumps
- Heat pumps
- Hydraulic pumps
- Presses
- Conveyors
- Roller conveyor
- Screw conveyors

For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

Selection and ordering data



Ambient temperature 40 °C				Ambient temperature 50 °C				Size	Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current I_e ¹⁾	Rated power of induction motors for rated operational voltage U_e			Rated operational current I_e ¹⁾	Rated power of induction motors for rated operational voltage U_e							
	230 V	400 V	500 V		200 V	230 V	460 V					575 V
A	kW			A	hp							

Rated operational voltage U_e 200 ... 480 V												
• With screw terminals												
3.6	0.75	1.5	--	3	0.5	0.5	1.5	--	S00	3RW30 13-1BB□4	1 unit	0.580
6.5	1.5	3	--	4.8	1	1	3	--	S00	3RW30 14-1BB□4	1 unit	0.580
9	2.2	4	--	7.8	2	2	5	--	S00	3RW30 16-1BB□4	1 unit	0.580
12.5	3	5.5	--	11	3	3	7.5	--	S00	3RW30 17-1BB□4	1 unit	0.580
17.6	4	7.5	--	17	3	3	10	--	S00	3RW30 18-1BB□4	1 unit	0.580
• With spring-type terminals												
3.6	0.75	1.5	--	3	0.5	0.5	1.5	--	S00	3RW30 13-2BB□4	1 unit	0.580
6.5	1.5	3	--	4.8	1	1	3	--	S00	3RW30 14-2BB□4	1 unit	0.580
9	2.2	4	--	7.8	2	2	5	--	S00	3RW30 16-2BB□4	1 unit	0.580
12.5	3	5.5	--	11	3	3	7.5	--	S00	3RW30 17-2BB□4	1 unit	0.580
17.6	4	7.5	--	17	3	3	10	--	S00	3RW30 18-2BB□4	1 unit	0.580
• With screw terminals												
25	5.5	11	--	23	5	5	15	--	S0	3RW30 26-1BB□4	1 unit	0.690
32	7.5	15	--	29	7.5	7.5	20	--	S0	3RW30 27-1BB□4	1 unit	0.690
38	11	18.5	--	34	10	10	25	--	S0	3RW30 28-1BB□4	1 unit	0.690
• With spring-type terminals												
25	5.5	11	--	23	5	5	15	--	S0	3RW30 26-2BB□4	1 unit	0.690
32	7.5	15	--	29	7.5	7.5	20	--	S0	3RW30 27-2BB□4	1 unit	0.690
38	11	18.5	--	34	10	10	25	--	S0	3RW30 28-2BB□4	1 unit	0.690
• With screw-type or spring-type terminals												
45	11	22	--	42	10	15	30	--	S2	3RW30 36-□BB□4	1 unit	1.200
63	18.5	30	--	58	15	20	40	--	S2	3RW30 37-□BB□4	1 unit	1.200
72	22	37	--	62	20	20	40	--	S2	3RW30 38-□BB□4	1 unit	1.200
• With screw-type or spring-type terminals												
80	22	45	--	73	20	25	50	--	S3	3RW30 46-□BB□4	1 unit	1.710
106	30	55	--	98	30	30	75	--	S3	3RW30 47-□BB□4	1 unit	1.710
Order No. supplement for connection types												
• With screw terminals												
• With spring-type terminals ²⁾												
Order No. supplement for rated control supply voltage U_s												
• 24 V AC/DC												
• 110 ... 230 V												

Soft starters for easy starting conditions and high switching frequency, rated operational voltage U_e 200 ... 400 V, rated control supply voltage U_s 24 ... 230 V AC/DC												
3	0.55	1.1	--	2.6	0.5	0.5	--	--	22.5 mm	3RW30 03-1CB54	1 unit	0.207
										3RW30 03-2CB54	1 unit	0.188

1) Stand-alone installation.
2) Power connection: screw terminals.

Note:
Selection of the soft starter depends on the rated motor current.
The SIRIUS 3RW30 solid-state soft starters are designed for easy starting conditions. $J_{Load} < 10 \times J_{Motor}$. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device.
Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures > 40 °C, see technical specifications (see technical information on page 17-238).

Soft Starter
Control




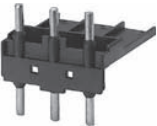
CONTROL
PRODUCTS

For Operation in the Control Cabinet



3RW Soft Starters

3RW30 for standard applications

Accessories

For soft starters		Motor starter protectors		Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Type	Size	Size	Size				
Auxiliary terminals							
Auxiliary terminals, 3-pole							
3RW30 4.	S3			3RT19 46-4F		1 unit	0.035
Covers for soft starters							
Terminal covers for box terminals							
Additional touch protection to be fitted at the box terminals (2 units required per device)							
	3RW30 3.	S2		3RT19 36-4EA2		1 unit	0.020
	3RW30 4.	S3		3RT19 46-4EA2		1 unit	0.025
Terminal covers for cable lugs and busbar connections							
For complying with the phase clearances and as touch protection if box terminal is removed (2 units required per contactor)							
	3RW30 4.	S3		3RT19 46-4EA1		1 unit	0.040
Link modules to motor starter protectors							
	3RW30 13, 3RW30 14, 3RW30 16, 3RW30 17, 3RW30 18	S00	S0	3RA19 21-1A		10 units	0.028
	3RW30 26	S0	S0	3RA19 21-1A		10 units	0.028
	3RW30 36	S2	S2	3RA19 31-1A		5 units	0.033
	3RW30 46, 3RW30 47	S3	S3	3RA19 41-1A		5 units	0.072
Operating instructions¹⁾							
For soft starters							
	3RW30 1.	S00		3ZX10 12-0RW30-2DA1			
	3RW30 2.	S0					
	3RW30 3.	S2					
	3RW30 4.	S3					

¹⁾ The operating instructions are included in the scope of supply.

Version	Functionality Functions	Order No.	List Price \$ per PU	Weight per PU approx. kg
Covers and push-in lugs (only for 3RW30 03)				
	Sealable covers For securing against unauthorized adjustment of setting knobs	3RP1 902		5 units 0.004
	Push-in lugs For screw fixing	3RP1 903		10 units 0.002

Soft Starter Control

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CONTROL PRODUCTS

For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 300 % $I_{n \text{ motor}}$).
The soft starter rating can be selected to be as high as the rating of the motor used.

Application	Conveyor belt	Roller conveyoyr	Compressor	Small fan	Pump	Hydraulic pump
Starting parameters						
• Voltage ramp and current limiting						
- Starting voltage	% 70	60	50	40	40	40
- Starting time	s 10	10	20	20	10	10

Note:
These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during start-up. Actual start times are load dependent.
The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

Configuration

The 3RW solid-state motor controllers are designed for easy starting conditions. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. For accurate dimensioning, use the Win-Soft Starter selection and simulation program.

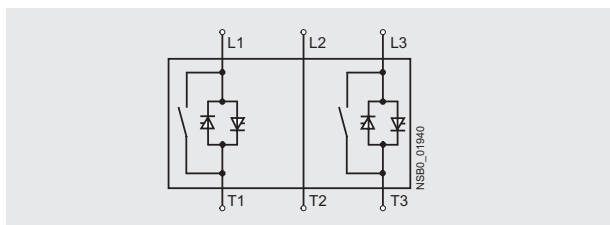
If necessary, an overload relay for heavy starting must be selected where long starting times are involved. PTC sensors are recommended.

In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses, controls and overload relays) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

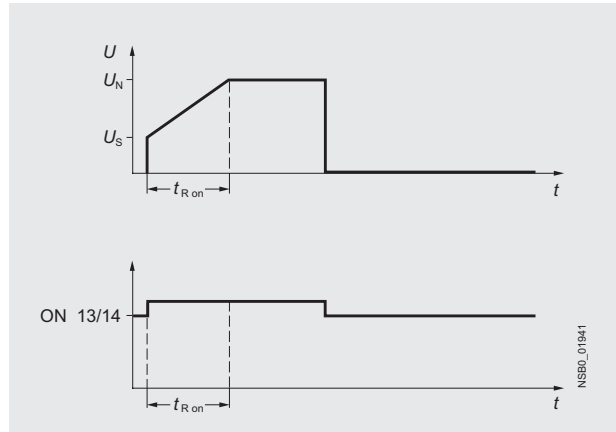
Note:
When induction motors are switched on, voltage drops normally appear on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

Power electronics schematic circuit diagram



A bypass contact system is already integrated in the 3RW30 soft starter and therefore does not have to be ordered separately.

Status graphs



Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded from:

<http://www.siemens.de/sanftstarter> > Software

More information can be found on the Internet at:
<http://www.sea.siemens.com/softstarters>

Soft Starter
Control

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Overview

SIRIUS 3RW40 soft starters have all the same advantages as the 3RW30 soft starters.

The SIRIUS 3RW40 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that minimal power is used at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

At the same time this soft starter comes with additional integrated functions such as adjustable current limiting, motor overload and intrinsic device protection, and optional thermistor motor protection on some models.

Internal intrinsic device protection prevents the thermal overloading of the thyristors and the power section defects this can cause. As an option the thyristors can also be protected by semiconductor fuses from short-circuiting.

Thanks to integrated status monitoring and fault monitoring, this compact soft starter offers many different diagnostics options. Up to four LEDs and relay outputs permit differentiated monitoring and diagnostics of the operating mechanism by indicating the operating state as well as for example mains or phase failure, missing load, non-permissible tripping time/class setting, thermal overloading or device faults.

Soft starters rated up to 300 Hp (at 460 V) for standard applications in three-phase systems are available. Extremely small sizes, low power losses and simple start-up are just three of the many advantages of the SIRIUS 3RW40 soft starters.

"Increased safety" type of protection EEx e according to ATEX directive 94/9/EC

The 3RW40 soft starter sizes S0 to S12 are suitable for the starting of explosion-proof motors with "increased safety" type of protection EEx e.

See "Appendix" → "Standards and approvals" → "Type overview of approved devices for potentially explosive areas (ATEX explosion protection)".

Application

The SIRIUS 3RW40 solid-state soft starters are suitable for soft starting and stopping of three-phase asynchronous motors.

Due to two-phase control, the current is kept at minimum values in all three phases throughout the entire starting time and disturbing direct current components are eliminated in addition. This not only enables the two-phase starting of motors up to 300 Hp (at 460 V) but also avoids the current and torque peaks which occur e. g. with wye-delta starters.

Application areas

- Pumps
- Heat pumps
- Hydraulic pumps
- Presses
- Conveyors
- Roller conveyor
- Screw conveyors
- Escalators
- Small fans
- Centrifugal blowers
- Bow thrusters
- Stirrers
- Extruders
- Lathes
- Milling machines

For Operation in the Control Cabinet

3RW Soft Starters

3RW40 for standard applications

Soft Starter
Control

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CONTROL
PRODUCTS

Selection and ordering data



3RW40 28-1BB14



3RW40 38-1BB14



3RW40 47-1BB14

Ambient temperature 50 °C		Rated power of induction motors for rated operational voltage U_e				Size	Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current $I_e^{(1)}$					A					kg
	200 V	230 V	460 V	575 V						
	hp	hp	hp	hp						
Rated operational voltage U_e 200 ... 480 V										
• With screw terminals										
11	3	3	7.5	--	S0	3RW40 24-1BB□4		1 unit	0.770	
23	5	5	15	--	S0	3RW40 26-1BB□4		1 unit	0.770	
29	7.5	7.5	20	--	S0	3RW40 27-1BB□4		1 unit	0.770	
34	10	10	25	--	S0	3RW40 28-1BB□4		1 unit	0.770	
• With spring-type terminals										
11	3	3	7.5	--	S0	3RW40 24-2BB□4		1 unit	0.770	
23	5	5	15	--	S0	3RW40 26-2BB□4		1 unit	0.770	
29	7.5	7.5	20	--	S0	3RW40 27-2BB□4		1 unit	0.770	
34	10	10	25	--	S0	3RW40 28-2BB□4		1 unit	0.770	
• With screw or spring-type terminals										
42	10	15	30	--	S2	3RW40 36-□BB□4		1 unit	1.350	
58	15	20	40	--	S2	3RW40 37-□BB□4		1 unit	1.350	
62	20	20	40	--	S2	3RW40 38-□BB□4		1 unit	1.350	
• With screw or spring-type terminals										
73	20	25	50	--	S3	3RW40 46-□BB□4		1 unit	1.900	
98	30	30	75	--	S3	3RW40 47-□BB□4		1 unit	1.900	
Rated operational voltage U_e 400 ... 600 V										
• With screw terminals										
11	--	--	7.5	10	S0	3RW40 24-1BB□5		1 unit	0.770	
23	--	--	15	20	S0	3RW40 26-1BB□5		1 unit	0.770	
29	--	--	20	25	S0	3RW40 27-1BB□5		1 unit	0.770	
34	--	--	25	30	S0	3RW40 28-1BB□5		1 unit	0.770	
• With spring-type terminals										
11	--	--	7.5	10	S0	3RW40 24-2BB□5		1 unit	0.770	
23	--	--	15	20	S0	3RW40 26-2BB□5		1 unit	0.770	
29	--	--	20	25	S0	3RW40 27-2BB□5		1 unit	0.770	
34	--	--	25	30	S0	3RW40 28-2BB□5		1 unit	0.770	
• With screw or spring-type terminals										
42	--	--	30	40	S2	3RW40 36-□BB□5		1 unit	1.350	
58	--	--	40	50	S2	3RW40 37-□BB□5		1 unit	1.350	
62	--	--	40	60	S2	3RW40 38-□BB□5		1 unit	1.350	
• With screw or spring-type terminals										
73	--	--	50	60	S3	3RW40 46-□BB□5		1 unit	1.900	
98	--	--	75	75	S3	3RW40 47-□BB□5		1 unit	1.900	

Order No. supplement for connection types

- With screw terminals
- With spring-type terminals²⁾

Order No. supplement for rated control supply voltage U_s

- 24 V AC/DC
- 110 ... 230 V AC/DC

¹⁾ Stand-alone installation without auxiliary fan.

²⁾ Power connection: screw terminals.

1
2

0
1

Note:

Selection of the soft starter depends on the rated motor current. The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions. $J_{Load} < 10 \times J_{Motor}$. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures other than 50°C, see technical information on page 17-250

For Operation in the Control Cabinet

3RW Soft Starters

3RW40 for standard applications



3RW40 28-1TB04



3RW40 38-1TB04



3RW40 47-1TB04

Ambient temperature 50 °C		Size				Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Rated operational current $I_e^{1)}$	Rated power of induction motors for rated operational voltage U_e								
A	200 V	230 V	460 V	575 V					
	hp	hp	hp	hp					
Rated operational voltage U_e 200 ... 480 V, with thermistor motor protection, rated control supply voltage U_c 24 V AC/DC									
• With screw terminals									
11	3	3	7.5	--	S0	3RW40 24-1TB04		1 unit	0.770
23	5	5	15	--	S0	3RW40 26-1TB04		1 unit	0.770
29	7.5	7.5	20	--	S0	3RW40 27-1TB04		1 unit	0.770
34	10	10	25	--	S0	3RW40 28-1TB04		1 unit	0.770
• With spring-type terminals									
11	3	3	7.5	--	S0	3RW40 24-2TB04		1 unit	0.770
23	5	5	15	--	S0	3RW40 26-2TB04		1 unit	0.770
29	7.5	7.5	20	--	S0	3RW40 27-2TB04		1 unit	0.770
34	10	10	25	--	S0	3RW40 28-2TB04		1 unit	0.770
• With screw or spring-type terminals									
42	10	15	30	--	S2	3RW40 36-□TB04		1 unit	1.350
58	15	20	40	--	S2	3RW40 37-□TB04		1 unit	1.350
62	20	20	40	--	S2	3RW40 38-□TB04		1 unit	1.350
• With screw or spring-type terminals									
73	20	25	50	--	S3	3RW40 46-□TB04		1 unit	1.900
98	30	30	75	--	S3	3RW40 47-□TB04		1 unit	1.900
Rated operational voltage U_e 400 ... 600 V, with thermistor motor protection, rated control supply voltage U_c 24 V AC/DC									
• With screw terminals									
11	--	--	7.5	10	S0	3RW40 24-1TB05		1 unit	0.770
23	--	--	15	20	S0	3RW40 26-1TB05		1 unit	0.770
29	--	--	20	25	S0	3RW40 27-1TB05		1 unit	0.770
34	--	--	25	30	S0	3RW40 28-1TB05		1 unit	0.770
• With spring-type terminals									
11	--	--	7.5	10	S0	3RW40 24-2TB05		1 unit	0.770
23	--	--	15	20	S0	3RW40 26-2TB05		1 unit	0.770
29	--	--	20	25	S0	3RW40 27-2TB05		1 unit	0.770
34	--	--	25	30	S0	3RW40 28-2TB05		1 unit	0.770
• With screw or spring-type terminals									
42	--	--	30	40	S2	3RW40 36-□TB05		1 unit	1.350
58	--	--	40	50	S2	3RW40 37-□TB05		1 unit	1.350
62	--	--	40	60	S2	3RW40 38-□TB05		1 unit	1.350
• With screw or spring-type terminals									
73	--	--	50	60	S3	3RW40 46-□TB05		1 unit	1.900
98	--	--	75	75	S3	3RW40 47-□TB05		1 unit	1.900

Order No. supplement for connection types

- With screw terminals
- With spring-type terminals²⁾

1) Stand-alone installation without auxiliary fan.

2) Power connection: screw terminals.

1
2

Note:
Selection of the soft starter depends on the rated motor current. The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions. $J_{Load} < 10 \times J_{Motor}$. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures > 40° C, see technical information on page 17-250

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3RW Soft Starters

3RW40 for standard applications



3RW40 56-6BB44



3RW40 76-6BB44

Ambient temperature 50 °C					Size	Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current I_e ¹⁾	Rated power of induction motors for rated operational voltage U_e				A				kg
	200 V	230 V	460 V	575 V					
	hp	hp	hp	hp					
Rated operational voltage U_e 200 ... 460 V									
• With screw or spring-type terminals									
117	30	40	75	--	S6	3RW40 55-□BB□4		1 unit	4.900
145	40	50	100	--		3RW40 56-□BB□4		1 unit	6.900
• With screw or spring-type terminals									
205	60	75	150	--	S12	3RW40 73-□BB□4		1 unit	8.900
248	75	100	200	--		3RW40 74-□BB□4		1 unit	8.900
315	100	125	250	--		3RW40 75-□BB□4		1 unit	8.900
385	125	150	300	--		3RW40 76-□BB□4		1 unit	8.900
Rated operational voltage U_e 400 ... 600 V									
• With screw or spring-type terminals									
117	--	--	75	100	S6	3RW40 55-□BB□5		1 unit	4.900
145	--	--	100	150		3RW40 56-□BB□5		1 unit	6.900
• With screw or spring-type terminals									
205	--	--	150	200	S12	3RW40 73-□BB□5		1 unit	8.900
248	--	--	200	250		3RW40 74-□BB□5		1 unit	8.900
315	--	--	250	300		3RW40 75-□BB□5		1 unit	8.900
385	--	--	300	400		3RW40 76-□BB□5		1 unit	8.900
Order No. supplement for connection types²⁾									
• With screw terminals									
• With spring-type terminals									
Order No. supplement for the rated control supply voltage U_s³⁾									
• 115 V AC									
• 230 V AC									

1) Stand-alone installation.

2) Power connection: busbar connection.

3) Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

Note:

Selection of the soft starter depends on the rated motor current.

The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions. $J_{Load} < 10 \times J_{Motor}$. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures > 40° C, see technical information on page 17-250

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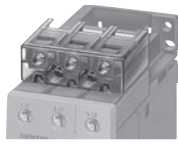





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For Operation in the Control Cabinet

3RW Soft Starters

3RW40 for standard applications

Accessories

For soft starters		Version	Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Type	Size					
Box terminal blocks for soft starters						
For round and flat wires						
	3RW40 5.	S6	<ul style="list-style-type: none"> Up to 70 mm² Up to 120 mm² 	3RT19 55-4G	1 unit	0.230
	3RW40 7.	S12	<ul style="list-style-type: none"> Up to 240 mm² 	3RT19 56-4G 3RT19 66-4G	1 unit	0.260 0.676
Auxiliary terminals						
Auxiliary terminals, 3-pole						
	3RW40 4.	S3		3RT19 46-4F	1 unit	0.035
Covers for soft starters						
Terminal covers for box terminals						
Additional touch protection to be fitted at the box terminals (2 units required per device)						
	3RW40 3.	S2		3RT19 36-4EA2	1 unit	0.020
	3RW40 4.	S3		3RT19 46-4EA2	1 unit	0.025
	3RW40 5.	S6		3RT19 56-4EA2	1 unit	0.030
	3RW40 7.	S12		3RT19 66-4EA2	1 unit	0.040
Terminal covers for cable lugs and busbar connections						
	3RW40 4.	S3	For complying with the phase clearances and as touch protection if box terminal is removed (2 units required per contactor)	3RT19 46-4EA1	1 unit	0.040
	3RW40 5.	S6		3RT19 56-4EA1	1 unit	0.070
	3RW40 7.	S12		3RT19 66-4EA1	1 unit	0.130
Sealing covers						
	3RW40 2. to 3RW40 4.	S0, S2, S3		3RW49 00-0PB10	1 unit	0.005
	3RW40 5. and 3RW40 7.	S6, S12		3RW49 00-0PB00	1 unit	0.010
Modules for RESET¹⁾						
Modules for remote RESET, electrical						
Operating range 0.85 ... 1.1 x U _n , power consumption 80 VA AC, 70 W DC, ON period 0.2 s ... 4 s, switching frequency 60/h						
	3RW40 5. and 3RW40 7.	S6, S12	<ul style="list-style-type: none"> 24 ... 30 V AC/DC 110 ... 127 V AC/DC 220 ... 250 V AC/DC 	3RU19 00-2AB71 3RU19 00-2AF71 3RU19 00-2AM71	1 unit 1 unit 1 unit	0.066 0.067 0.066
Mechanical RESET comprising						
	3RW40 5. and 3RW40 7.	S6, S12	<ul style="list-style-type: none"> Resetting plungers, holders and formers Suitable pushbutton IP65, Ø 22 mm, 12 mm stroke Extension plunger 	3RU19 00-1A 3SB30 00-0EA11 3SX13 35	1 unit 1 unit 1 unit	0.038 0.020 0.004
Cable releases with holder for RESET						
For Ø 6.5 mm holes in the control panel; max. control panel thickness 8 mm						
	3RW40 5. and 3RW40 7.	S6, S12	<ul style="list-style-type: none"> Length 400 mm Length 600 mm 	3RU19 00-1B 3RU19 00-1C	1 unit 1 unit	0.063 0.073

¹⁾ Remote RESET already integrated in the 3RW40 2. to 3RW40 4. soft starters.



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3RW Soft Starters

3RW40 for standard applications

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For soft starters		Motor starter protectors		Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Type	Size	Size	Size				
Link modules to motor starter protectors							
	3RW40 24, 3RW40 26	S0	S0	3RA19 21-1A		10 units	0.028
	3RW40 36	S2	S2	3RA19 31-1A		5 units	0.033
	3RW40 46, 3RW40 47	S3	S3	3RA19 41-1A		5 units	0.072
Fans (to increase switching frequency and for device mounting in positions different from the normal position)							
	3RW40 2.	S0		3RW49 28-8VB00		1 unit	0.010
	3RW40 3., 3RW40 4.	S2 , S3		3RW49 47-8VB00		1 unit	0.020
Operating instructions¹⁾							
For soft starters							
3RW40 2.	S0			3ZX10 12-0RW40-1AA1			
3RW40 3.	S2						
3RW40 4.	S3						
3RW40 5.	S6			3ZX10 12-0RW40-2DA1			
3RW40 7.	S12						

¹⁾ The operating instructions are included in the scope of supply.

They are also available on the Internet at:

www.usa.siemens.com/softstarters

Spare parts

For soft starters		Version		Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Type	Size	Size	Rated control supply voltage U_s				
Fans							
	3RW40 5.-. BB3.	S6	115 V AC	3RW49 36-8VX30		1 unit	0.300
	3RW40 5.-. BB4.	S6	230 V AC	3RW49 36-8VX40		1 unit	0.300
	3RW40 7.-. BB3.	S12	115 V AC	3RW49 47-8VX30		1 unit	0.500
	3RW40 7.-. BB4.	S12	230 V AC	3RW49 47-8VX40		1 unit	0.500

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3RW Soft Starters

3RW40 for standard applications

More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 350 % $I_{n, motor}$).

The soft starter rating can be selected to be as high as the rating of the motor used.

Application	Conveyor belt	Roller conveyor	Small fan	Pump	Hydraulic pump
Starting parameters					
• Voltage ramp and current limiting					
- Starting voltage	%	70	60	40	40
- Starting time	s	10	10	10	10
- Current limit value		$5 \times I_M$	$5 \times I_M$	$4 \times I_M$	$4 \times I_M$
Ramp-down time	s	5	5	0	10

Application examples for heavy starting (Class 20)

Heavy starting Class 20 (up to 40 s with 350 % $I_{n, motor}$).

The soft starter has to be selected at least one rating class higher than the motor used.

Application	Stirrer	Centrifuge
Starting parameters		
• Voltage ramp and current limiting		
- Starting voltage	%	40
- Starting time	s	20
- Current limit value		$4 \times I_M$
Ramp-down time	s	0

Note:

These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during start-up. Actual start times are load dependent.

The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

For Operation in the Control Cabinet

3RW Soft Starters

3RW40 for standard applications

Configuration

The 3RW solid-state soft starters are designed for easy starting conditions. In the event of severe conditions or increased switching frequency, it may be necessary to choose a larger device. For accurate dimensioning, use the Win-Soft Starter selection and simulation program.

Where long starting times are involved, the integrated solid-state overload relay for heavy starting should not be disconnected. PTC sensors are recommended. This also applies for the smooth ramp-down because during the ramp-down time an additional current loading applies in contrast to free ramp-down.

In the case of high switching frequencies in S4 mode, Siemens recommends the use of PTC sensors. For corresponding device versions with integrated thermistor motor protection or separate thermistor evaluation devices see Industrial Controls catalog Chapter 11 "Function Relays, Interfaces and Converters".

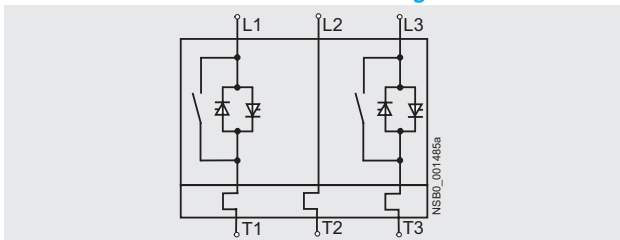
In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment, PFC capacitors). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses and controls) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

Note:

When induction motors are switched on, voltage drops normally appear on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

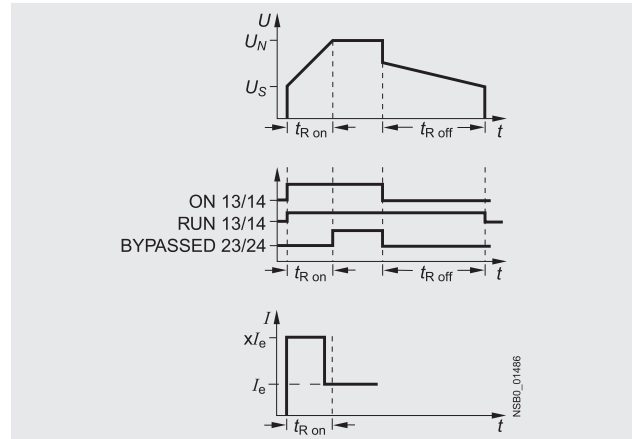
Power electronics schematic circuit diagram



A bypass contact system and solid-state overload relay are already integrated in the 3RW40 soft starter and therefore do not have to be ordered separately.

- 1) U_n = Full Voltage
- 2) U_s = Starting (Initial) Voltage
- 3) t_{R} = Time Running
- 4) I_e = Rated operational current

Status graphs¹⁾



Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded from:

www.usa.siemens.com/softstarters > Software

More information can be found on the Internet at:

www.usa.siemens.com/softstarters

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Overview

In addition to soft starting and soft ramp-down, the solid-state SIRIUS 3RW44 soft starters provide numerous functions for higher-level requirements. They cover a performance range up to 900 Hp (at 460 V) in the inline circuit and up to 1600Hp (at 460 V) in the inside-delta circuit.

The SIRIUS 3RW44 soft starters are characterized by a compact design for space-saving and clearly arranged control cabinet layouts. For optimized motor starting and stopping the innovative SIRIUS 3RW44 soft starters are an attractive alternative with considerable savings potential compared to applications with a frequency converter. The new torque control and adjustable current limiting enable the High-Feature soft starters to be used in nearly every conceivable task. They guarantee the reliable avoidance of sudden torque applications and current peaks during motor starting and stopping. This creates savings potential when calculating the size of the switchgear and when servicing the machinery installed. Whether it's for inline circuits or inside-delta circuits – the SIRIUS 3RW44 soft starter offers savings especially in terms of size and equipment costs.

The bypass contacts already integrated in the soft starter bypass the thyristors after a motor ramp-up is detected. This results in a further reduction in the heat loss occurring during operation of the soft starter.

Combinations of various starting, operating and ramp-down possibilities ensure an optimum adaptation to the application-specific requirements. Operation and commissioning can be performed with the menu-controlled keypad and a menu-prompted, multi-line graphical display with background lighting. The optimized motor ramp-up and ramp-down can be effected quickly, easily and reliably by means of just a few settings with a previously selected language. Four-key operation and plain-text displays for each menu point guarantee full clarity at every moment of the parameterization and operation.

Applicable standards

- IEC 60947-4-2
- UL/CSA

Soft Starter ES parameterization software

Soft Starter ES software is used for the parameterization, monitoring and service diagnostics of SIRIUS 3RW44 High Feature soft starters.

Application

The SIRIUS 3RW44 solid-state soft starters are suitable for the torque-controlled soft starting and smooth ramp-down as well as braking of three-phase asynchronous motors.

Application areas, e. g.

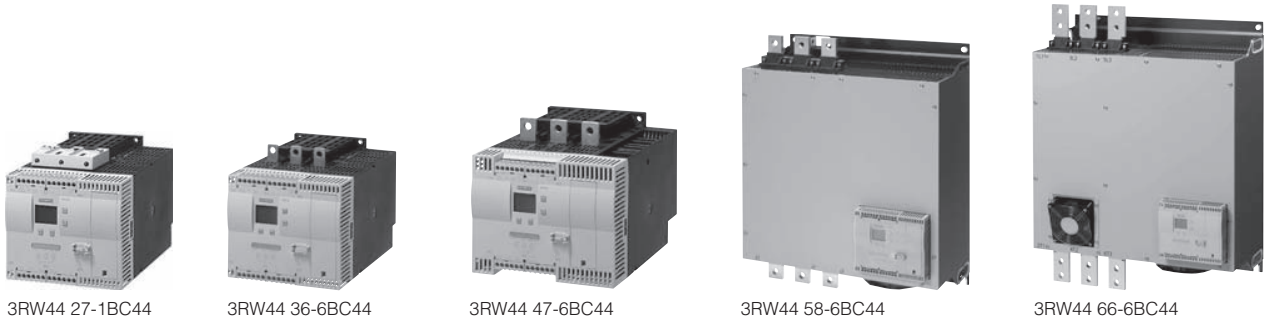
- Pumps
- Fans
- Compressors
- Water transport
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills
- Saws
- Crushers
- Mixers
- Centrifuges
- Industrial cooling and refrigerating systems

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3RW Soft Starters

3RW44 for high-feature applications

Selection and ordering data



Ambient temperature 50 °C				Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Rated operational current I_e	Rated power of induction motors for rated operational voltage U_e						
A	200 V hp	230 V hp	460 V hp	575 V hp			
Inline circuits²⁾, rated operational voltage 200 ... 460 V							
26	7.5	7.5	15	--	3RW44 22-□BC□4	1 unit	6.500
32	10	10	20	--	3RW44 23-□BC□4	1 unit	6.500
42	10	15	25	--	3RW44 24-□BC□4	1 unit	6.500
51	15	15	30	--	3RW44 25-□BC□4	1 unit	6.500
68	20	20	50	--	3RW44 26-□BC□4	1 unit	6.500
82	25	25	60	--	3RW44 27-□BC□4	1 unit	6.500
Order No. supplement for connection types							
<ul style="list-style-type: none"> • With spring-type terminals • With screw terminals 							
100	30	30	75	--	3RW44 34-□BC□4	1 unit	7.900
117	30	40	75	--	3RW44 35-□BC□4	1 unit	7.900
145	40	50	100	--	3RW44 36-□BC□4	1 unit	7.900
180	50	60	125	--	3RW44 43-□BC□4	1 unit	11.500
215	60	75	150	--	3RW44 44-□BC□4	1 unit	11.500
280	75	100	200	--	3RW44 45-□BC□4	1 unit	11.500
315	100	125	250	--	3RW44 46-□BC□4	1 unit	11.500
385	125	150	300	--	3RW44 47-□BC□4	1 unit	11.500
494	150	200	400	--	3RW44 53-□BC□4	1 unit	50.000
551	150	200	450	--	3RW44 54-□BC□4	1 unit	50.000
615	200	250	500	--	3RW44 55-□BC□4	1 unit	50.000
693	200	250	550	--	3RW44 56-□BC□4	1 unit	50.000
780	250	300	600	--	3RW44 57-□BC□4	1 unit	50.000
850	300	350	700	--	3RW44 58-□BC□4	1 unit	50.000
970	350	400	800	--	3RW44 65-□BC□4	1 unit	78.000
1076	350	400	900	--	3RW44 66-□BC□4	1 unit	78.000
Order No. supplement for connection types							
<ul style="list-style-type: none"> • With spring-type terminals • With screw terminals 							
Order No. supplement for the rated control supply voltage U_s¹⁾							
<ul style="list-style-type: none"> • 115 V AC • 230 V AC 							

¹⁾ Control by way of the internal 24 V DC supply and direct control by means of PLC possible.
²⁾ For inside delta selection, see page 17-270.

Note:
 Soft starter selection depends on the rated motor current.
 The 3RW44 solid-state soft starters are designed for normal starting (Class 10). (Inertia load of the overall operating mechanism $J_{Load} < 10 \times J_{Motor}$; starting current 350 % $\times I_e$ for 20 s similar load). For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical specifications for information about rated currents for ambient temperatures > 40 °C and switching frequency.

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3RW Soft Starters

3RW44 for high-feature applications

Ambient temperature 50 °C					Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current I_e	Rated power of induction motors for rated operational voltage U_e							
	200 V	230 V	460 V	575 V				
A	hp	hp	hp	hp				kg
Inline circuits²⁾, rated operational voltage 400 ... 600 V								
26	--	--	15	20	3RW44 22-□BC□5		1 unit	6.500
32	--	--	20	25	3RW44 23-□BC□5		1 unit	6.500
42	--	--	25	30	3RW44 24-□BC□5		1 unit	6.500
51	--	--	30	40	3RW44 25-□BC□5		1 unit	6.500
68	--	--	50	50	3RW44 26-□BC□5		1 unit	6.500
82	--	--	60	75	3RW44 27-□BC□5		1 unit	6.500
Order No. supplement for connection types								
<ul style="list-style-type: none"> • With spring-type terminals • With screw terminals 					3	1		
100	--	--	75	75	3RW44 34-□BC□5		1 unit	7.900
117	--	--	75	100	3RW44 35-□BC□5		1 unit	7.900
145	--	--	100	125	3RW44 36-□BC□5		1 unit	7.900
180	--	--	125	150	3RW44 43-□BC□5		1 unit	11.500
215	--	--	150	200	3RW44 44-□BC□5		1 unit	11.500
280	--	--	200	250	3RW44 45-□BC□5		1 unit	11.500
315	--	--	250	300	3RW44 46-□BC□5		1 unit	11.500
385	--	--	300	400	3RW44 47-□BC□5		1 unit	11.500
494	--	--	400	500	3RW44 53-□BC□5		1 unit	50.000
551	--	--	450	550	3RW44 54-□BC□5		1 unit	50.000
615	--	--	500	600	3RW44 55-□BC□5		1 unit	50.000
693	--	--	550	700	3RW44 56-□BC□5		1 unit	50.000
780	--	--	600	800	3RW44 57-□BC□5		1 unit	50.000
850	--	--	700	850	3RW44 58-□BC□5		1 unit	50.000
970	--	--	800	1000	3RW44 65-□BC□5		1 unit	78.000
1076	--	--	900	1100	3RW44 66-□BC□5		1 unit	78.000

Order No. supplement for connection types

- With spring-type terminals
- With screw terminals

Order No. supplement for the rated control supply voltage U_s ¹⁾

- 115 V AC
- 230 V AC

¹⁾ Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

²⁾ For inside delta selection, see page 17-270.

Note:

Soft starter selection depends on the rated motor current.

The 3RW44 solid-state soft starters are designed for normal starting (Class 10). (Inertia load of the overall operating mechanism $J_{Load} < 10 \times J_{Motor}$; starting current 350 % $\times I_e$ for 20 s similar load). For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical specifications for information about rated currents for ambient temperatures > 40 °C and switching frequency.

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3RW Soft Starters

3RW44 for high-feature applications

Ambient temperature 50 °C					Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current I_e	Rated power of induction motors for rated operational voltage U_e							
	200 V	230 V	460 V	575 V				
A	hp	hp	hp	hp				kg
Inline circuits, rated operational voltage 400 ... 690 V								
26	--	--	15	20	3RW44 22-□BC□6		1 unit	6.500
32	--	--	20	25	3RW44 23-□BC□6		1 unit	6.500
42	--	--	25	30	3RW44 24-□BC□6		1 unit	6.500
51	--	--	30	40	3RW44 25-□BC□6		1 unit	6.500
68	--	--	50	50	3RW44 26-□BC□6		1 unit	6.500
82	--	--	60	75	3RW44 27-□BC□6		1 unit	6.500
Order No. supplement for connection types								
• With spring-type terminals					3			
• With screw terminals					1			
100	--	--	75	75	3RW44 34-□BC□6		1 unit	7.900
117	--	--	75	100	3RW44 35-□BC□6		1 unit	7.900
145	--	--	100	125	3RW44 36-□BC□6		1 unit	7.900
180	--	--	125	150	3RW44 43-□BC□6		1 unit	11.500
215	--	--	150	200	3RW44 44-□BC□6		1 unit	11.500
280	--	--	200	250	3RW44 45-□BC□6		1 unit	11.500
315	--	--	250	300	3RW44 46-□BC□6		1 unit	11.500
385	--	--	300	400	3RW44 47-□BC□6		1 unit	11.500
494	--	--	400	500	3RW44 53-□BC□6		1 unit	50.000
551	--	--	450	550	3RW44 54-□BC□6		1 unit	50.000
615	--	--	500	600	3RW44 55-□BC□6		1 unit	50.000
693	--	--	550	700	3RW44 56-□BC□6		1 unit	50.000
780	--	--	600	800	3RW44 57-□BC□6		1 unit	50.000
850	--	--	700	850	3RW44 58-□BC□6		1 unit	50.000
970	--	--	800	1000	3RW44 65-□BC□6		1 unit	78.000
1076	--	--	900	1100	3RW44 66-□BC□6		1 unit	78.000

Order No. supplement for connection types

- With spring-type terminals
- With screw terminals

Order No. supplement for the rated control supply voltage U_s 1)

- 115 V AC
- 230 V AC

1) Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

Note:

Soft starter selection depends on the rated motor current.

The 3RW44 solid-state soft starters are designed for normal starting (Class 10). (Inertia load of the overall operating mechanism $J_{Load} < 10 \times J_{Motor}$; starting current 350 % $\times I_e$ for 20 s similar load). For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical specifications for information about rated currents for ambient temperatures > 40 °C and switching frequency.

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Overview



SIRIUS ES engineering software (E-SW)

The programs of the SIRIUS ES software family enable:

- Clearly arranged configuring of device functions and their parameters – online and offline
- Efficient diagnostics functions and display of the most important measured values
- Time savings through shorter startup times.

The SIRIUS ES programs such as Motor Starter ES, Soft Starter ES and SIMOCODE ES are available in three versions which differ in user-friendliness, scope of functions and price (for details see the descriptions of the individual products).

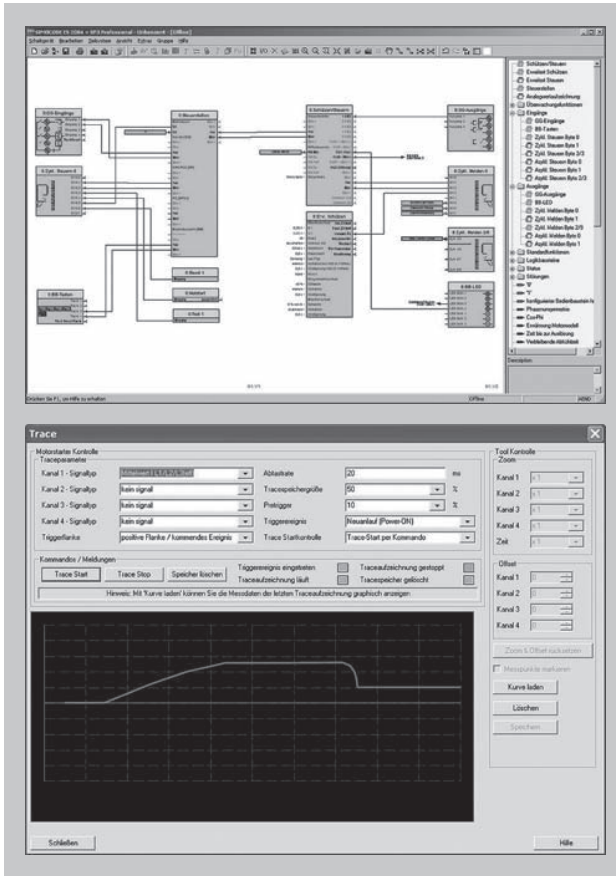
SIRIUS ES	Basic	Standard	Premium
Local interface on the device (system interface)	✓	✓	✓
Basic functions for parameterizing the devices			
• Parameter assignment	✓	✓	✓
• Operating	✓	✓	✓
• Diagnostics	✓	✓	✓
• Test	✓	✓	✓
Standard functionality			
• Parameterizing with the integrated graphics editor ¹⁾	--	✓	✓
• Creating typicals	--	✓	✓
• Exporting parameters	--	✓	✓
Complete functionality			
• Group functions	--	--	✓
• S7 Routing	--	--	✓
• Teleservice through MPI	--	--	✓
• STEP7 Object Manager	--	--	✓
• PROFIBUS interface	--	--	✓

¹⁾ Depending on SIRIUS ES program.

Application

In addition to device-specific parameterization, the programs of the SIRIUS ES software family also provide the following functionality in a uniform look and feel. These functions are available in many SIRIUS ES programs.

- Standards-conform printouts
The programs of the SIRIUS ES software family greatly simplify machine documentation. Parameterization printouts according to EN ISO 7200 are possible. The elements to be printed are easy to select and compile as required.
- Easy creation of parameter templates
Parameter templates can be created for devices and applications with only minimum differences in their parameters. These templates contain all the parameters which are needed for the parameterization. In addition it is possible to specify which of these parameters are fixed and which can be customized, e. g. by the startup engineer.
- Group function
For the user-friendly parameterization of numerous devices or applications of the same type, the programs of the SIRIUS ES software family offer a group function which enables the parameterization of several devices to be read out or written through PROFIBUS. In conjunction with templates it is even possible to selectively adapt the same parameters in any number of parameterizations.
- Teleservice through MPI
The premium versions of the SIRIUS ES software families support the use of MPI Teleservice (comprising the Teleservice software and various Teleservice adapters) for remote diagnostics of the devices. This facilitates diagnostics and maintenance and it shortens response times for service purposes.



Efficient engineering and startup with graphic interfaces and diagnostics options

Types of delivery and license

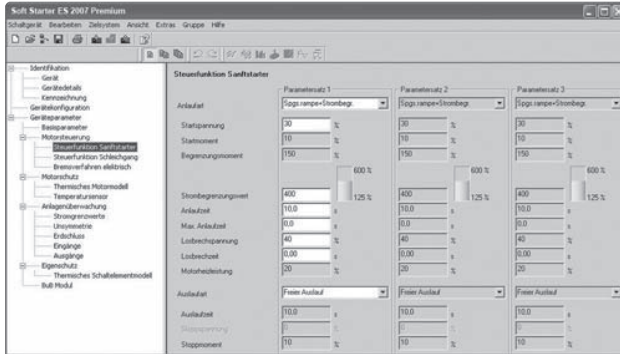
The programs of the SIRIUS ES software family are available as follows:

- Floating license – the license for any one user at any one time
 - Authorizes any one user
 - Independent of the number of installations (unlike the single license which is allowed to be installed once only)
 - Only the actual use of the program has to be licensed
- Trial license (free use of all program functions for 14 days for test and evaluation purposes, included on every product CD, available in the download file of the SIRIUS ES program in the Service&Support portal).

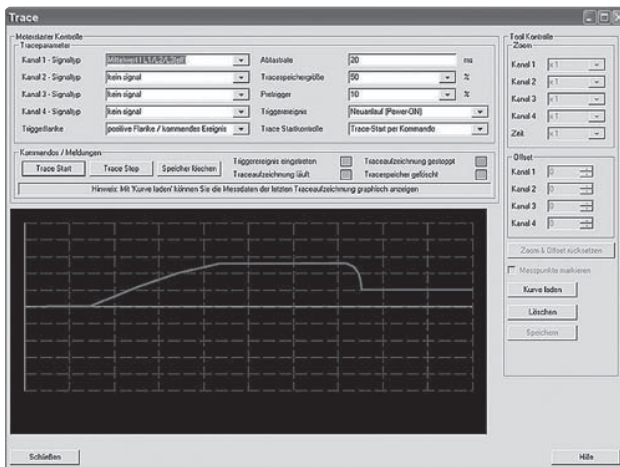
Following delivery versions are available in addition for the programs of the SIRIUS ES software family:

- Upgrade
 - Upgrade from an old to a new version with expanded functions, e. g. upgrade from Motor Starter ES 2006 to Motor Starter ES 2007
- Powerpack
 - Special pack for switching within the same software version to a more powerful version with more functionality, e. g. Powerpack Motor Starter ES 2007 for switching from Standard to Premium
- Software Update Service
 - To keep you up to date at all times we offer a special service which supplies you automatically with all service packs and upgrades

Overview



Easy and clearly arranged parameter setting of the 3RW44 soft starter with Soft Starter ES 2007



Graphic presentation of measured values with the trace function (oscilloscope function) of Soft Starter ES 2007 Standard and Premium

Soft Starter ES 2007

The Soft Starter ES software permits the quick and easy parameterization, monitoring and diagnostics of SIRIUS 3RW44 High Feature soft starters for service purposes. The device parameters can be configured directly on the PC and transferred to the soft starter through a serial cable or an optional PROFIBUS interface.

The advantages of Soft Starter ES:

- Clearly arranged configuring of device functions and their parameters – online and offline
- Effective diagnostics functions on the soft starter and display of the most important measured values
- Trace function (oscilloscope function) for recording measured values and events (in the Soft Starter ES Standard and Premium software versions).

Efficient engineering with new program versions

The Soft Starter ES software program is available in three versions which differ in their user-friendliness, scope of functions and price.

Soft starters ES	Basic	Standard	Premium
Access through the local interface on the device	✓	✓	✓
Parameter assignment	✓	✓	✓
Operating	✓	✓	✓
Diagnostics	✓	✓	✓
Creating templates	--	✓ ¹⁾	✓
Exporting parameters	--	✓	✓
Comparison functions	--	✓	✓
Standards-conform printout according to EN ISO 7200	--	✓	✓
Service data (slave pointer, statistics data)	--	✓	✓
Access through PROFIBUS	--	--	✓
Group functions	--	--	✓
Teleservice through MPI	--	--	✓
S7 Routing	--	--	✓
STEP7 Object Manager	--	--	✓

¹⁾ Templates with Service Pack 1 and higher.

More functions

- Standards-conform printouts
The software tool greatly simplifies machine documentation. Parameterization printouts according to EN ISO 7200 are possible. The elements to be printed are easy to select and compile as required.
- Easy creation of parameter templates
Parameter templates can be created for devices and applications with only minimum differences in their parameters. These templates contain all the parameters which are needed for the parameterization. In addition it is possible to specify which of these parameters are fixed and which can be adapted, e. g. by the startup engineer.
- Group function
For the user-friendly parameterization of numerous devices or applications of the same type, the programs of the SIRIUS ES software family offer a group function which enables the parameterization of several devices to be read out or written through PROFIBUS. In conjunction with typicals it is even possible to selectively adapt the same parameters in any number of parameterizations.
- Teleservice through MPI
The Soft Starter ES Premium version supports the use of MPI Teleservice (comprising the Teleservice software and various Teleservice adapters) for remote diagnostics of the devices. This facilitates diagnostics and maintenance, and it shortens response times for service purposes.

Types of delivery and license

Soft Starter ES is available as follows:

- Floating license – the license for any one user at any one time
 - Authorizes any one user
 - Independent of the number of installations (unlike the single license which is allowed to be installed once only)
 - Only the actual use of the program has to be licensed
 - Trial license (free use of all program functions for 14 days for test and evaluation purposes, included on every product CD, available in the download file of the SIRIUS ES program in the Service&Support portal).

Following delivery versions are available in addition for Soft Starter ES 2007:

- Upgrade
Upgrade from an old to a new version with expanded functions, e. g. upgrade from Soft Starter ES 2006 to Soft Starter ES 2007

- Powerpack
Special pack for switching within the same software version to a more powerful version with more functionality, e. g. Powerpack Soft Starter ES 2007 for switching from Standard to Premium
- Software Update Service
To keep you up to date at all times we offer a special service which supplies you automatically with all service packs and upgrades

New licensing procedure

To make licensing easier, the three versions of Soft Starter ES are available with immediate effect with the following license:

14 day trial license for Premium functions: for test and evaluation purposes, included on every product CD, available also in the download file of the SIRIUS Soft Starter ES 2007 program at www.sea.siemens.com/softstarters.

System requirements

Soft Starter ES 2007 parameterization, start-up and diagnostics software for the SIRIUS 3RW44 soft starter	Basic/Standard	Premium
	Firmware version ≥ *E04* ¹⁾	Firmware version ≥ *E06* ²⁾
Operating system	Windows 2000 (Service Pack 3 or 4), Windows XP Professional (Service Pack 2), Windows Vista Ultimate 32/ Business 32 ³⁾	
Processor	≥ Pentium 800 MHz/≥ 1 GHz (Windows Vista)	
RAM	≥ 512 MB/≥ 1 GB (Windows Vista)	
Free space on hard disk	≥ 150 MB	
CD-ROM/DVD drive	Yes (only when installing from CD)	
Serial interface (COM)	Yes	
PC cable/parameterization cable/connection cable	Yes	
PROFIBUS communication module (optional)	--	Yes

¹⁾ SIRIUS 3RW44 with firmware version ≥ *E04*. Installed in starters delivered after December 2005.

²⁾ SIRIUS 3RW44 with firmware version ≥ *E06*. Installed in starters delivered after May 2006.



³⁾ Windows Vista Ultimate 32/ Business 32 from Soft Starter ES 2007+SP1.

Selection and ordering data

Parameterization and service software for SIRIUS 3RW44 soft starters

- Can be run under WIN 2000/WIN XP PROF/Windows Vista Ultimate 32/Business 32
- Without PC cable

Version	Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Soft Starter ES 2007 Basic Floating license for one user E-SW, software and documentation on CD, 3 languages (German/English/French), communication through system interface • License key on USB stick, Class A, including CD				
	3ZS1 313-4CC10-0YA5		1 unit	0.230
Soft Starter ES 2007 Standard Floating license for one user E-SW, software and documentation on CD, 3 languages (German/English/French), communication through system interface • License key on USB stick, Class A, including CD				
	3ZS1 313-5CC10-0YA5		1 unit	0.230





Version	Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Upgrade for Soft Starter ES 2006 Floating license for one user, E-SW, software and documentation on CD, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface	3ZS1 313-5CC10-0YE5		1 unit	0.230
Powerpack for Soft Starter ES 2007 Basic Floating license for one user, E-SW, software and documentation on CD, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface	3ZS1 313-5CC10-0YD5		1 unit	0.230
Software Update Service For 1 year with automatic extension, assuming the current software version is in use, E-SW, software and documentation on CD, communication through the system interface	3ZS1 313-5CC10-0YL5		1 unit	0.230
Soft Starter ES 2007 Premium				
Floating license for one user E-SW, software and documentation on CD, 3 languages (German/English/French), communication through system interface or PROFIBUS • License key on USB stick, Class A, including CD	3ZS1 313-6CC10-0YA5		1 unit	0.230
Upgrade for Soft Starter ES 2006 Floating license for one user, E-SW, software and documentation on CD, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface or PROFIBUS	3ZS1 313-6CC10-0YE5		1 unit	0.230
Powerpack for Soft Starter ES 2007 Standard Floating license for one user, E-SW, software and documentation on CD, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface or PROFIBUS	3ZS1 313-6CC10-0YD5		1 unit	0.230
Software Update Service For 1 year with automatic extension, assuming the current software version is in use, E-SW, software and documentation on CD, communication through the system interface or PROFIBUS	3ZS1 313-6CC10-0YL5		1 unit	0.230
PC cables				
 For PC/PG communication with SIRIUS 3RW44 soft starters Through the system interface, for connecting to the serial interface of the PC/PG 3UF7 940-0AA00-0	3UF7 940-0AA00-0		1 unit	0.150
Serial/USB				
 For PC/PG communication with SIRIUS 3RW44 soft starters Through the system interface, for connecting to the USB interface of the PC/PG	3UF7 946-0AA00-0		1 unit	0.150

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3RW Soft Starters

3RW44 for high-feature applications

Accessories

For soft starters	Version	Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Type					
PROFIBUS communication modules					
	<p>Modules can be plugged into the soft starters for integrating the starters in the PROFIBUS network with DPV1 slave functionality.</p> <p>On Y-link the soft starter has only DPV0 slave functionality.</p>	3RW49 00-0KC00		1 unit	0.320
3RW49 00-0KC00					
PROFINET communication modules					
	<p>For 3RW44 soft starter integration in the PROFINET network, suitable for devices with firmware version E12 or higher</p>	3RW49 00-0NC00		1 unit	0.320
3RW49 00-0NC00					
External display and operator modules					
	<p>For indicating and operating the functions provided by the soft starter using an externally mounted display and operator module in degree of protection IP54, N1, N12 (e. g. in the control cabinet door)</p>	3RW49 00-0AC00		1 unit	0.320
3RW49 00-0AC00					
Connection cables					
<p>From the device interface (serial) of the 3RW44 soft starter to the external display and operator module</p> <ul style="list-style-type: none"> • Length 0.5 m, flat • Length 0.5 m, round • Length 1.0 m, round • Length 2.5 m, round 		3UF7 932-0AA00-0		1 unit	0.020
		3UF7 932-0BA00-0		1 unit	0.050
		3UF7 937-0BA00-0		1 unit	0.100
		3UF7 933-0BA00-0		1 unit	0.150
Box terminal blocks for soft starters					
	<p>Box terminal blocks</p> <p>3RW44 2. Included in the scope of supply</p> <p>3RW44 3. <ul style="list-style-type: none">• Up to 70 mm²• Up to 120 mm²</p> <p>3RW44 4. <ul style="list-style-type: none">• Up to 240 mm²</p>	3RT19 55-4G		1 unit	0.230
3RT19					
		3RT19 56-4G		1 unit	0.260
		3RT19 66-4G		1 unit	0.676

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For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Spare parts

For soft starters	Version	Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Covers for soft starters					
Terminal covers for box terminals					
Additional touch protection to be fitted at the box terminals (2 units required per device)					
3RW44 2. and 3RW44 3.		3RT19 56-4EA2		1 unit	0.030
3RW44 4.		3RT19 66-4EA2		1 unit	0.040
Terminal covers for cable lugs and busbar connections					
3RW44 2. and 3RW44 3.		3RT19 56-4EA1		1 unit	0.070
3RW44 4.		3RT19 66-4EA1		1 unit	0.130
Operating instructions¹⁾					
For 3RW44 soft starters		3ZX10 12-0RW44-1AA1			
Fans					
 <p>3RW49</p>	Fans				
	3RW44 2. and 3RW44 3.	115 V AC 230 V AC	3RW49 36-8VX30 3RW49 36-8VX40	1 unit 1 unit	0.300 0.300
	3RW44 4.	115 V AC 230 V AC	3RW49 47-8VX30 3RW49 47-8VX40	1 unit 1 unit	0.500 0.500
	3RW44 5. and 3RW44 6. ²⁾	115 V AC 230 V AC	3RW49 57-8VX30 3RW49 57-8VX40	1 unit 1 unit	0.800 0.800
	3RW44 6. ³⁾	115 V AC 230 V AC	3RW49 66-8VX30 3RW49 66-8VX40	1 unit 1 unit	0.300 0.300

¹⁾ The operating instructions are included in the scope of supply.

²⁾ 3RW44 6., mounting on output side.

³⁾ For mounting on front side.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 350 % $I_{n \text{ motor}}$).

The soft starter rating can be selected to be as high as the rating of the motor used.

Application	Conveyor belt	Roller conveyor	Compressor	Small fan	Pump	Hydraulic pump
Starting parameters¹⁾						
• Voltage ramp and current limiting						
- Starting voltage	% 70	60	50	30	30	30
- Starting time	s 10	10	10	10	10	10
- Current limit value	Deactivated	Deactivated	$4 \times I_M$	$4 \times I_M$	Deactivated	Deactivated
• Torque ramp						
- Starting torque	60	50	40	20	10	10
- End torque	150	150	150	150	150	150
- Starting time	10	10	10	10	10	10
• Breakaway pulse	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)
Ramp-down mode	Smooth ramp-down	Smooth ramp-down	Free ramp-down	Free ramp-down	Pump ramp-down	Free ramp-down

Application examples for heavy starting (Class 20)

Heavy starting Class 20 (up to 40 s with 350 % $I_{n \text{ motor}}$).

The soft starter has to be selected one rating class higher than the motor used.

Application	Mixer	Centrifuge	Milling machine
Starting parameters¹⁾			
• Voltage ramp and current limiting			
- Starting voltage	% 30	30	30
- Starting time	s 30	30	30
- Current limit value	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
• Torque ramp			
- Starting torque	30	30	30
- End torque	150	150	150
- Starting time	30	30	30
• Breakaway pulse	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)
Ramp-down mode	Free ramp-down	Free ramp-down	Free ramp-down or DC braking

Application examples for very heavy starting (Class 30)

Very heavy starting Class 30 (up to 60 s with 350 % $I_{n \text{ motor}}$).

The soft starter has to be selected two rating classes higher than the motor used.

Application	Large fan	Mill	Crushers	Circular saw/bandsaw
Starting parameters¹⁾				
• Voltage ramp and current limiting				
- Starting voltage	% 30	50	50	30
- Starting time	s 60	60	60	60
- Current limit value	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
• Torque ramp				
- Starting torque	20	50	50	20
- End torque	150	150	150	150
- Starting time	60	60	60	60
• Breakaway pulse	Deactivated (0 ms)	80 %, 300 ms	80 %, 300 ms	Deactivated (0 ms)
Ramp-down mode	Free ramp-down	Free ramp-down	Free ramp-down	Free ramp-down

Note:

These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during start-up.

The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

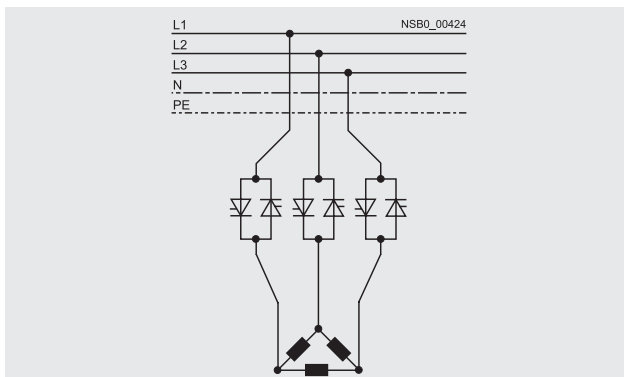
¹⁾ Actual motor starting times are load dependent.

Circuit concept

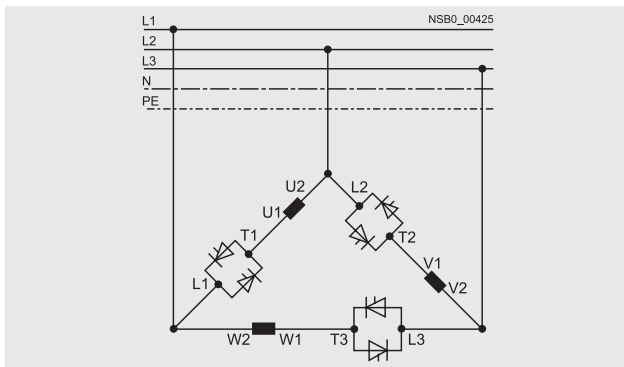
The SIRIUS 3RW44 soft starters can be operated in two different types of circuit.

- **Inline circuit**
The controls for isolating and protecting the motor are simply connected in series with the soft starter. The motor is connected to the soft starter with three cables.
- **Inside-delta circuit**
The wiring is similar to that of wye-delta starters. The phases of the soft starter are connected in series with the individual motor windings. The soft starter then only has to carry the phase current, amounting to about 58 % of the rated motor current (conductor current).

Comparison of the types of circuit



Inline circuit:
Rated current I_e corresponds to the rated motor current I_n , 3 cables to the motor



Inside-delta circuit:
Rated current I_e corresponds to approx. 58 % of the rated motor current I_n , 6 cables to the motor (as with wye-delta starters)

Which circuit?

Using the inline circuit involves the lowest wiring outlay. If the soft starter to motor connections are long, this circuit is preferable. With the inside-delta circuit there is double the wiring complexity but a smaller size of device can be used at the same rating. It is also recommended to use an isolating contactor in series with each motor winding.

Thanks to the choice of operating mode between the inline circuit and inside-delta circuit, it is always possible to select the most favorable solution.

The braking function is possible only in the inline circuit.

Configuration

The 3RW44 solid-state soft starters are designed for normal starting. In case of heavy starting or increased starting frequency, a larger device must be selected.

For long starting times it is recommended to have a PTC sensor in the motor. This also applies for the ramp-down modes smooth ramp-down, pump ramp-down and DC braking, because during the ramp-down time in these modes, an additional current load applies in contrast to free ramp-down.

In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses and controls) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately.

A bypass contact system and solid-state overload relay are already integrated in the 3RW44 soft starter and therefore do not have to be ordered separately.

The harmonic component load for starting currents must be taken into consideration for the selection of motor starter protectors (selection of release).

Note:

When induction motors are switched on, voltage drops normally appear on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

Device interface, PROFIBUS DP communication module, Soft Starter ES parameterizing and operating software

The 3RW44 electronic soft starters have a PC interface for communicating with the Soft Starter ES software or for connecting the external display and operator module. If the optional PROFIBUS communication module is used, the 3RW44 soft starter can be integrated in the PROFIBUS network and communicate using the GSD file or Soft Starter ES Premium software.

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3RW Soft Starters

3RW44 for high-feature applications

System Manual for SIRIUS 3RW44

Besides containing all important information on configuring, commissioning and servicing, the manual also contains example circuits and the technical specifications for all devices. This manual can be downloaded off the internet.

Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded free of charge from:

www.usa.siemens.com/softstarters > Software

More information can be found on the Internet at:

www.usa.siemens.com/softstarters

For Operation in the Control Cabinet

3RW Soft Starters

Soft starters for enclosed applications

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Overview

The family of 3RW40 and 3RW44 softstarters are available in stand alone enclosed control designs for smooth starting and stopping of standard NEMA design B three phase inductive motors, thus eliminating physical stresses to the system and load while minimizing starting current. These pre-engineered enclosed designs offer convenience and flexibility in and UL/CSA certified offering. Enclosed styles are available in combination and non-combination configurations through 600HP and system voltages of 200V, 230V, 480V, and 600V.

The Class 73 offers either the 3RW40 or 3RW44 in a non-combination style offering. These non-combination styles come standard with a choice of Type 1, 3R, 12, 4 NEMA rated enclosure, a control transformer, Sirius softstarter with built-in overload and bypass, line side power terminal block, and a reset pushbutton. The enclosed offering can be powerfully matched with a wide variety of factory modified options such as pushbutton control, pilot lights, metering and other control options such as isolation contactors and emergency start bypass starters. 3RW44 enclosed styles are also available with optional through the door keypad and Profibus communication.

The Class 74 offering includes all of the features of the Class 73 in a combination style design. Standard options are either a circuit breaker or fusible disconnect providing short circuit protection and soft starting in one package.

Application

The Class 73/74 product is a fully enclosed solid state reduced voltage starter designed for a wide variety of industrial applications. The enclosed softstarter offerings are ideal for new as well as existing applications where total motor controls is required.

Proper selection based on application data is made simple following these easy steps:

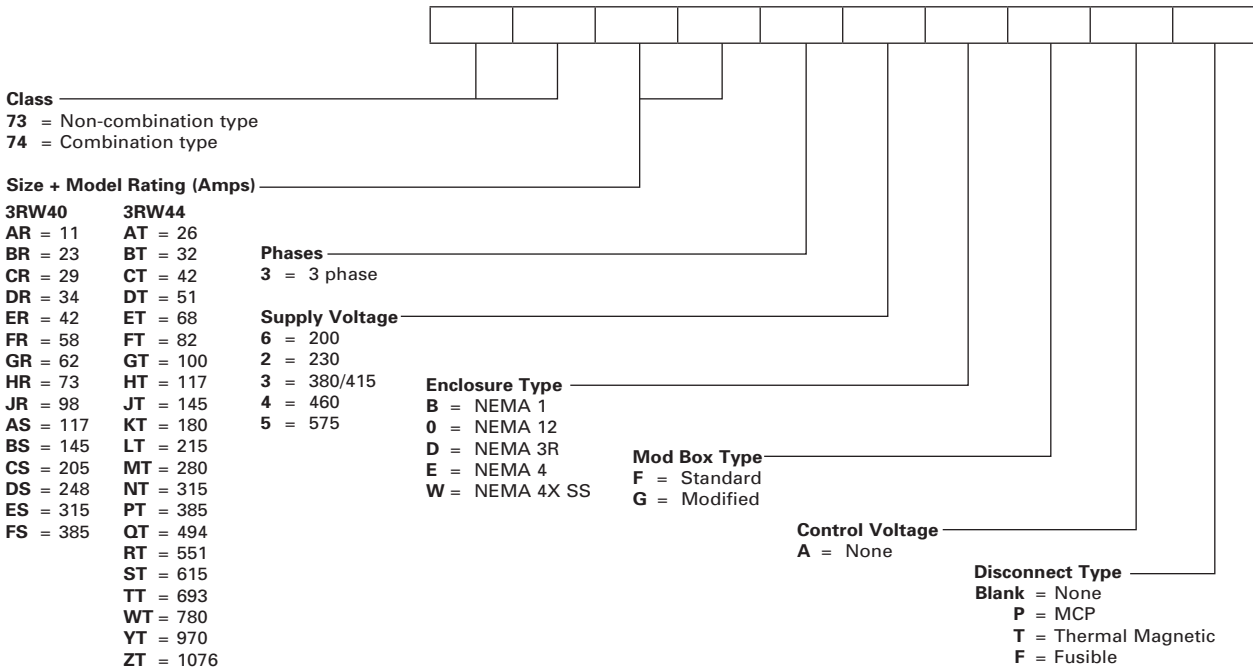
- Select proper RVSS by application
 - Select the 3RW40 versus the 3RW44 using the application info provided in the open section of the catalog
- Select the rating chart for normal starting or sever duty starting
 - Normal starting is rated at 350% of rated motor current IM for 10 seconds and based on starts per hour – representative of a class 20 application.
 - Severe starting is rated at 350% of rated motor current Im for 20 seconds and based on starts per hour – representative of a Class 20 application
- Select model using Motor nameplate data
 - Identify correct motor voltage column
 - Select rate current or HP row
 - Find ordering number under desired enclosure type column (e.g. NEMA 1)
 - Select appropriate system voltage
- Select factory modification on page 6/40¹⁾

Example:
3RW44, N12, CB disconnect, 460V, 200HP with a start/stop and red run light

Order No.
74MT34BFAP A1 FC

Product Nomenclature

Class 73 and 74 Enclosed Soft Starters



¹⁾ Some modifications will require a larger 'Modified' box than the standard box e.g. Isolation contactor, space heater, etc. See page 17-237 for instructions.

For Operation in the Control Cabinet

3RW Soft Starters

3RW40 Size S0-S3 Non-Combo



3RW40 Enclosed features:

- Available in NEMA 1,12,3R,4, and 4 stainless steel
- Compact size
- Built-in Bypass contactor
- Voltage ramp up and ramp down
- Current limit adjustment of 125 - 550%
- Internal overload class 10,15,or 20
- Internal self protection
- Fault monitoring
- Isolation Contactor

Ordering Information

- ▶ Enclosed devices should be ordered by the FLA of the motor.
- ▶ The 3RW40 is designed for normal starting applications.
- ▶ For factory modifications see page 17-237.
- ▶ For complete derating and application info see page 17-253
- ▶ For dimensional drawings see page 17-289.

Class 73 non-combination starters include:

- NEMA rated enclosure
- 3RW40 Sirius softstarter with built-in OL and bypass
- Control Circuit Transformer
- Line side power terminal block
- Reset button
- Isolation Contactor

Ideal applications for 3RW40 enclosed softstarters

- Fans
- Pumps
- Easy starting loads starting in less than 10 seconds

Class 73 starters are built to UL and CSA standards

3RW40 for Standard Applications

Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP ^①				KW	Class 10 Light Duty (350% * I _e for 10s) ^②									
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$
11	3	3	7.5	—	6	3RW4024-1BB14	73AR3_BFA		73AR3_DFA		73AR3_OFA		73AR3_EFA		73AR3_WFA
23	5	7.5	15	—	13	3RW4026-1BB14	73BR3_BFA		73BR3_DFA		73BR3_OFA		73BR3_EFA		73BR3_WFA
29	7.5	10	20	—	16	3RW4027-1BB14	73CR3_BFA		73CR3_DFA		73CR3_OFA		73CR3_EFA		73CR3_WFA
34	10	10	25	—	18	3RW4028-1BB14	73DR3_BFA		73DR3_DFA		73DR3_OFA		73DR3_EFA		73DR3_WFA
42	10	15	30	—	23	3RW4036-1BB14	73ER3_BFA		73ER3_DFA		73ER3_OFA		73ER3_EFA		73ER3_WFA
58	15	20	40	—	31	3RW4037-1BB14	73FR3_BFA		73FR3_DFA		73FR3_OFA		73FR3_EFA		73FR3_WFA
62	20	20	40	—	33	3RW4038-1BB14	73GR3_BFA		73GR3_DFA		73GR3_OFA		73GR3_EFA		73GR3_WFA
73	20	25	50	—	39	3RW4046-1BB14	73HR3_BFA		73HR3_DFA		73HR3_OFA		73HR3_EFA		73HR3_WFA
98	30	30	75	—	52	3RW4047-1BB14	73JR3_BFA		73JR3_DFA		73JR3_OFA		73JR3_EFA		73JR3_WFA
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C

② Starter selection is dependent on type of application. I_e = FLA rating of motor

For Operation in the Control Cabinet

3RW Soft Starters

Enclosed 3RW40



- 3RW40 Enclosed features:
- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
 - Compact size
 - Built-in bypass contactor
 - Voltage ramp up and ramp down
 - Current limit adjustment of 125 - 550%
 - Internal overload class 10, 15, or 20
 - Internal self protection
 - Fault monitoring

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW40 is designed for normal starting applications (Class 10 applications).
- For factory modifications see page 17-237.
- For complete derating and application info see page 17-253.
- For dimensional drawings see page 17-289.

Class 73 non-combination starters include:

- NEMA rated enclosure
- 3RW40 Sirius softstarter with built-in OL and bypass
- Control circuit transformer
- Line side power terminal block
- Reset button

Ideal applications for 3RW40 enclosed softstarters:

- Fans
- Pumps
- Building/construction machines
- Presses
- Escalators
- Transport systems
- Air conditioning systems
- Ventilators
- Assembly lines

Class 73 starters are built to UL and CSA standards.

For all technical information, please consult the 2006 Industrial Controls Catalog or contact your local sales support center.

3RW40 for Standard Applications

Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP ^①				kW	Class 10 Light Duty (350% * Im for 10s) ^②										
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
117	30	40	75	—	56	3RW4055-6BB34	73AS3_BFA		73AS3_DFA		73AS3_OFA		73AS3_EFA		73AS3_WFA	
145	40	50	100	—	75	3RW4056-6BB34	73BS3_BFA		73BS3_DFA		73BS3_OFA		73BS3_EFA		73BS3_WFA	
205	60	75	150	—	112	3RW4073-6BB34	73CS3_BFA		73CS3_DFA		73CS3_OFA		73CS3_EFA		73CS3_WFA	
248	75	100	200	—	149	3RW4074-6BB34	73DS3_BFA		73DS3_DFA		73DS3_OFA		73DS3_EFA		73DS3_WFA	
315	100	125	250	—	186	3RW4075-6BB34	73ES3_BFA		73ES3_DFA		73ES3_OFA		73ES3_EFA		73ES3_WFA	
385	125	150	300	—	224	3RW4076-6BB34	73FS3_BFA		73FS3_DFA		73FS3_OFA		73FS3_EFA		73FS3_WFA	
						200V	6		6		6		6		6	
						230V	2		2		2		2		2	
						380V	3		3		3		3		3	
						460V	4		4		4		4		4	
117	—	—	75	100	—	3RW4055-6BB35	73AS35BFA		73AS35DFA		73AS350FA		73AS35EFA		73AS35WFA	
145	—	—	100	150	—	3RW4056-6BB35	73BS35BFA		73BS35DFA		73BS350FA		73BS35EFA		73BS35WFA	
205	—	—	150	200	—	3RW4073-6BB35	73CS35BFA		73CS35DFA		73CS350FA		73CS35EFA		73CS35WFA	
248	—	—	200	250	—	3RW4074-6BB35	73DS35BFA		73DS35DFA		73DS350FA		73DS35EFA		73DS35WFA	
315	—	—	250	300	—	3RW4075-6BB35	73ES35BFA		73ES35DFA		73ES350FA		73ES35EFA		73ES35WFA	
385	—	—	300	400	—	3RW4076-6BB35	73FS35BFA		73FS35DFA		73FS350FA		73FS35EFA		73FS35WFA	

Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP ^①				kW	Class 20 Severe Duty (350% * Ie for 20s) ^②										
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
112	30	40	75	—	56	3RW4055-6BB34	73AS3_BFA		73AS3_DFA		73AS3_OFA		73AS3_EFA		73AS3_WFA	
132	40	50	100	—	75	3RW4056-6BB34	73BS3_BFA		73BS3_DFA		73BS3_OFA		73BS3_EFA		73BS3_WFA	
185	60	60	125	—	93	3RW4073-6BB34	73CS3_BFA		73CS3_DFA		73CS3_OFA		73CS3_EFA		73CS3_WFA	
205	60	75	150	—	112	3RW4074-6BB34	73DS3_BFA		73DS3_DFA		73DS3_OFA		73DS3_EFA		73DS3_WFA	
280	75	100	200	—	149	3RW4075-6BB34	73ES3_BFA		73ES3_DFA		73ES3_OFA		73ES3_EFA		73ES3_WFA	
340	100	125	250	—	186	3RW4076-6BB34	73FS3_BFA		73FS3_DFA		73FS3_OFA		73FS3_EFA		73FS3_WFA	
						200V	6		6		6		6		6	
						230V	2		2		2		2		2	
						380V	3		3		3		3		3	
						460V	4		4		4		4		4	
112	—	—	75	75	—	3RW4055-6BB35	73AS35BFA		73AS35DFA		73AS350FA		73AS35EFA		73AS35WFA	
132	—	—	100	125	—	3RW4056-6BB35	73BS35BFA		73BS35DFA		73BS350FA		73BS35EFA		73BS35WFA	
185	—	—	125	150	—	3RW4073-6BB35	73CS35BFA		73CS35DFA		73CS350FA		73CS35EFA		73CS35WFA	
205	—	—	150	200	—	3RW4074-6BB35	73DS35BFA		73DS35DFA		73DS350FA		73DS35EFA		73DS35WFA	
280	—	—	200	250	—	3RW4075-6BB35	73ES35BFA		73ES35DFA		73ES350FA		73ES35EFA		73ES35WFA	
340	—	—	250	300	—	3RW4076-6BB35	73FS35BFA		73FS35DFA		73FS350FA		73FS35EFA		73FS35WFA	


① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.

For Operation in the Control Cabinet

3RW Soft Starters

3RW40 Size S0-S3 Circuit Breaker

 <p>3RW40 Enclosed features:</p> <ul style="list-style-type: none"> Available in NEMA 1, 12, 3R, 4, and 4 stainless steel Compact size Built-in Bypass contactor Voltage ramp up and ramp down Current limit adjustment of 125 - 550% Internal overload class 10, 15, or 20 Internal self protection Fault monitoring Isolation Contactor 	<h3>Ordering Information</h3> <ul style="list-style-type: none"> Enclosed devices should be ordered by the FLA of the motor. The 3RW40 is designed for normal starting applications. For factory modifications see page 17-237. For complete derating and application info see page 17-253 For dimensional drawings see page 17-289. <p>Class 74 non-combination starters include:</p> <ul style="list-style-type: none"> NEMA rated enclosure Circuit Breaker disconnect with shunt trip 3RW40 Sirius softstarter with built-in OL and bypass Control Circuit Transformer Isolation Contactor 		<p>Ideal applications for 3RW40 enclosed softstarters</p> <ul style="list-style-type: none"> Fans Pumps Easy starting loads starting in less than 10 seconds <p>Class 74 starters are built to UL and CSA standards</p>
	<p>Class 74 non-combination starters include:</p> <ul style="list-style-type: none"> NEMA rated enclosure Circuit Breaker disconnect with shunt trip 3RW40 Sirius softstarter with built-in OL and bypass Control Circuit Transformer Isolation Contactor 		

3RW40 for Standard Applications

Enclosed Circuit Breaker Combination (Starter With Circuit Breaker Disconnect)

Rated Operating Current	MAX HP ^①				KW	Class 10 Light Duty (350% * Ie for 10s) ^②										
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
11	3	3	7.5	—	6	3RW4024-1BB14	74AR3_BFAP		74AR3_DFAP		74AR3_OFAP		74AR3_EFAP		74AR3_WFAP	
23	5	7.5	15	—	13	3RW4026-1BB14	74BR3_BFAP		74BR3_DFAP		74BR3_OFAP		74BR3_EFAP		74BR3_WFAP	
29	7.5	10	20	—	16	3RW4027-1BB14	74CR3_BFAP		74CR3_DFAP		74CR3_OFAP		74CR3_EFAP		74CR3_WFAP	
34	10	10	25	—	18	3RW4028-1BB14	74DR3_BFAP		74DR3_DFAP		74DR3_OFAP		74DR3_EFAP		74DR3_WFAP	
42	10	15	30	—	23	3RW4036-1BB14	74ER3_BFAP		74ER3_DFAP		74ER3_OFAP		74ER3_EFAP		74ER3_WFAP	
58	15	20	40	—	31	3RW4037-1BB14	74FR3_BFAP		74FR3_DFAP		74FR3_OFAP		74FR3_EFAP		74FR3_WFAP	
62	20	20	40	—	33	3RW4038-1BB14	74GR3_BFAP		74GR3_DFAP		74GR3_OFAP		74GR3_EFAP		74GR3_WFAP	
73	20	25	50	—	39	3RW4046-1BB14	74HR3_BFAP		74HR3_DFAP		74HR3_OFAP		74HR3_EFAP		74HR3_WFAP	
98	30	30	75	—	52	3RW4047-1BB14	74JR3_BFAP		74JR3_DFAP		74JR3_OFAP		74JR3_EFAP		74JR3_WFAP	
							200V	6		6		6		6		6
							230V	2		2		2		2		2
							380V	3		3		3		3		3
							460V	4		4		4		4		4

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C

② Starter selection is dependent on type of application. Ie = FLA rating of motor



3RW40 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Voltage ramp up and ramp down
- Current limit adjustment of 125 - 550%
- Internal overload class 10, 15, or 20
- Internal self protection
- Fault monitoring

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW40 is designed for normal starting applications (Class 10 applications).
- For factory modifications see page 17-237.
- For complete derating and application info see page 17-264.
- For dimensional drawings see page 17-289.

Class 74 non-combination starters include:

- NEMA rated enclosure
- Circuit breaker disconnect with shunt trip
- 3RW40 Sirius softstarter with built-in OL and bypass
- Control circuit transformer

Ideal applications for 3RW40 enclosed softstarters:

- Fans
- Pumps
- Building/construction machines
- Presses
- Escalators
- Transport systems
- Air conditioning systems
- Ventilators
- Assembly lines

Class 74 starters are built to UL and CSA standards.

For all technical information, please consult the 2006 Industrial Controls Catalog or contact your local sales support center.

3RW40 for Standard Applications

Enclosed Circuit Breaker Combination (Starter with Circuit Breaker Disconnect)

Rated Operating Current	MAX HP ^①				KW	Class 10 Light Duty (350% * Im for 10s) ^②											
	200V	230V	460V	575V		OPEN Style (Starter Only)		List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel	List Price \$	
						380V	460V										
117	30	40	75	—	56	3RW4055-6BB34	74AS3_BFAP	74AS3_DFAP	74AS3_OFAP	74AS3_EFAP	74AS3_WFAP						
145	40	50	100	—	75	3RW4056-6BB34	74BS3_BFAP	74BS3_DFAP	74BS3_OFAP	74BS3_EFAP	74BS3_WFAP						
205	60	75	150	—	112	3RW4073-6BB34	74CS3_BFAP	74CS3_DFAP	74CS3_OFAP	74CS3_EFAP							
248	75	100	200	—	149	3RW4074-6BB34	74DS3_BFAP	74DS3_DFAP	74DS3_OFAP	74DS3_EFAP							
315	100	125	250	—	186	3RW4075-6BB34	74ES3_BFAP	74ES3_DFAP	74ES3_OFAP	74ES3_EFAP							
385	125	150	300	—	224	3RW4076-6BB34	74FS3_BFAP	74FS3_DFAP	74FS3_OFAP	74FS3_EFAP							
						200V	6	6	6	6	6						
						230V	2	2	2	2	2						
						380V	3	3	3	3	3						
						460V	4	4	4	4	4						
117	—	—	75	100	—	3RW4055-6BB35	74AS35BFAP	74AS35DFAP	74AS35OFAP	74AS35EFAP	74AS35WFAP						
145	—	—	100	150	—	3RW4056-6BB35	74BS35BFAP	74BS35DFAP	74BS35OFAP	74BS35EFAP	74BS35WFAP						
205	—	—	150	200	—	3RW4073-6BB35	74CS35BFAP	74CS35DFAP	74CS35OFAP	74CS35EFAP							
248	—	—	200	250	—	3RW4074-6BB35	74DS35BFAP	74DS35DFAP	74DS35OFAP	74DS35EFAP							
315	—	—	250	300	—	3RW4075-6BB35	74ES35BFAP	74ES35DFAP	74ES35OFAP	74ES35EFAP							
385	—	—	300	400	—	3RW4076-6BB35	74FS35BFAP	74FS35DFAP	74FS35OFAP	74FS35EFAP							

Enclosed Circuit Breaker Combination (Starter with Circuit Breaker Disconnect)

Rated Operating Current	MAX HP ^①				KW	Class 20 Severe Duty (350% * Ie for 20s) ^②											
	200V	230V	460V	575V		OPEN Style (Starter Only)		List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel	List Price \$	
						380V	460V										
112	30	40	75	—	56	3RW4055-6BB34	74AS3_BFAP	74AS3_DFAP	74AS3_OFAP	74AS3_EFAP	74AS3_WFAP						
132	40	50	100	—	75	3RW4056-6BB34	74BS3_BFAP	74BS3_DFAP	74BS3_OFAP	74BS3_EFAP	74BS3_WFAP						
185	60	60	125	—	93	3RW4073-6BB34	74CS3_BFAP	74CS3_DFAP	74CS3_OFAP	74CS3_EFAP							
205	60	75	150	—	112	3RW4074-6BB34	74DS3_BFAP	74DS3_DFAP	74DS3_OFAP	74DS3_EFAP							
280	75	100	200	—	149	3RW4075-6BB34	74ES3_BFAP	74ES3_DFAP	74ES3_OFAP	74ES3_EFAP							
340	100	125	250	—	186	3RW4076-6BB34	74FS3_BFAP	74FS3_DFAP	74FS3_OFAP	74FS3_EFAP							
						200V	6	6	6	6	6						
						230V	2	2	2	2	2						
						380V	3	3	3	3	3						
						460V	4	4	4	4	4						
112	—	—	75	75	—	3RW4055-6BB35	74AS35BFAP	74AS35DFAP	74AS35OFAP	74AS35EFAP	74AS35WFAP						
132	—	—	100	125	—	3RW4056-6BB35	74BS35BFAP	74BS35DFAP	74BS35OFAP	74BS35EFAP	74BS35WFAP						
185	—	—	125	150	—	3RW4073-6BB35	74CS35BFAP	74CS35DFAP	74CS35OFAP	74CS35EFAP							
205	—	—	150	200	—	3RW4074-6BB35	74DS35BFAP	74DS35DFAP	74DS35OFAP	74DS35EFAP							
280	—	—	200	250	—	3RW4075-6BB35	74ES35BFAP	74ES35DFAP	74ES35OFAP	74ES35EFAP							
340	—	—	250	300	—	3RW4076-6BB35	74FS35BFAP	74FS35DFAP	74FS35OFAP	74FS35EFAP							

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.

For Operation in the Control Cabinet

3RW Soft Starters

3RW40 Size S0-S3 Fusible



3RW40 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in Bypass contactor
- Voltage ramp up and ramp down
- Current limit adjustment of 125 - 550%
- Internal overload class 10,15, or 20
- Internal self protection
- Fault monitoring
- Isolation Contactor

Ordering Information

- ▶ Enclosed devices should be ordered by the FLA of the motor.
- ▶ The 3RW40 is designed for normal starting applications.
- ▶ For factory modifications see page 17-237.
- ▶ For complete derating and application info see page 17-253
- ▶ For dimensional drawings see page 17-289.

Class 73 non-combination starters include:

- NEMA rated enclosure
- Fusible Disconnect
- 3RW40 Sirius softstarter with built-in OL and bypass
- Control Circuit Transformer
- Isolation Contactor

Ideal applications for 3RW40 enclosed softstarters

- Fans
- Pumps
- Easy starting loads starting in less than 10 seconds

Class 74 starters are built to UL and CSA standards

3RW40 for Standard Applications

Enclosed Fusible Combination (Starter With Fusible Disconnect)

Rated Operating Current	MAX HP ^①				KW	Class 10 Light Duty (350% * Ie for 10s) ^②										
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
11	3	3	7.5	—	6	3RW4024-1BB14	74AR3_BFAF		74AR3_DFAF		74AR3_OFAF		74AR3_EFAF		74AR3_WFAF	
23	5	7.5	15	—	13	3RW4026-1BB14	74BR3_BFAF		74BR3_DFAF		74BR3_OFAF		74BR3_EFAF		74BR3_WFAF	
29	7.5	10	20	—	16	3RW4027-1BB14	74CR3_BFAF		74CR3_DFAF		74CR3_OFAF		74CR3_EFAF		74CR3_WFAF	
34	10	10	25	—	18	3RW4028-1BB14	74DR3_BFAF		74DR3_DFAF		74DR3_OFAF		74DR3_EFAF		74DR3_WFAF	
42	10	15	30	—	23	3RW4036-1BB14	74ER3_BFAF		74ER3_DFAF		74ER3_OFAF		74ER3_EFAF		74ER3_WFAF	
58	15	20	40	—	31	3RW4037-1BB14	74FR3_BFAF		74FR3_DFAF		74FR3_OFAF		74FR3_EFAF		74FR3_WFAF	
62	20	20	40	—	33	3RW4038-1BB14	74GR3_BFAF		74GR3_DFAF		74GR3_OFAF		74GR3_EFAF		74GR3_WFAF	
73	20	25	50	—	39	3RW4046-1BB14	74HR3_BFAF		74HR3_DFAF		74HR3_OFAF		74HR3_EFAF		74HR3_WFAF	
98	30	30	75	—	52	3RW4047-1BB14	74JR3_BFAF		74JR3_DFAF		74JR3_OFAF		74JR3_EFAF		74JR3_WFAF	
							200V	6		6		6		6		6
							230V	2		2		2		2		2
							380V	3		3		3		3		3
							460V	4		4		4		4		4

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C

② Starter selection is dependent on type of application. Ie = FLA rating of motor



- 3RW40 Enclosed features:**
- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
 - Compact size
 - Built-in bypass contactor
 - Voltage ramp up and ramp down
 - Current limit adjustment of 125 - 550%
 - Internal overload class 10, 15, or 20
 - Internal self protection
 - Fault monitoring

Ordering Information

- ▶ Enclosed devices should be ordered by the FLA of the motor.
- ▶ The 3RW40 is designed for normal starting applications (Class 10 applications).
- ▶ For factory modifications see page 17-237.
- ▶ For complete derating and application info see page 17-264.
- ▶ For dimensional drawings see page 17-289.

Class 74 combination starters include:

- NEMA rated enclosure
- Fusible disconnect
- 3RW40 Sirius softstarter with built-in OL and bypass
- Control circuit transformer

Ideal applications for 3RW40 enclosed softstarters:

- Fans
- Pumps
- Building/construction machines
- Presses
- Escalators
- Transport systems
- Air conditioning systems
- Ventilators
- Assembly lines

Class 74 starters are built to UL and CSA standards.

For all technical information, please consult the 2006 Industrial Controls Catalog or contact your local sales support center.

3RW40 for Standard Applications

Enclosed Fusible Combination (Starter with Fusible Disconnect)

Rated Operating Current	MAX HP ^①				KW	Class 10 Light Duty (350% * Im for 10s) ^②											
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)		List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel	List Price \$
117	30	40	75	—	56	3RW4055-6BB34	74AS3_BFAF		74AS3_DFAF		74AS3_0FAF		74AS3_EFAF		74AS3_WFAF		
145	40	50	100	—	75	3RW4056-6BB34	74BS3_BFAF		74BS3_DFAF		74BS3_0FAF		74BS3_EFAF		74BS3_WFAF		
205	60	75	150	—	112	3RW4073-6BB34	74CS3_BFAF		74CS3_DFAF		74CS3_0FAF		74CS3_EFAF				
248	75	100	200	—	149	3RW4074-6BB34	74DS3_BFAF		74DS3_DFAF		74DS3_0FAF		74DS3_EFAF				
315	100	125	250	—	186	3RW4075-6BB34	74ES3_BFAF		74ES3_DFAF		74ES3_0FAF		74ES3_EFAF				
385	125	150	300	—	224	3RW4076-6BB34	74FS3_BFAF		74FS3_DFAF		74FS3_0FAF		74FS3_EFAF				
						200V	6		6		6		6		6		
						230V	2		2		2		2		2		
						380V	3		3		3		3		3		
						460V	4		4		4		4		4		
117	—	—	75	100	—	3RW4055-6BB35	74AS35BFAF		74AS35DFAF		74AS350FAF		74AS35EFAF		74AS35WFAF		
145	—	—	100	150	—	3RW4056-6BB35	74BS35BFAF		74BS35DFAF		74BS350FAF		74BS35EFAF		74BS35WFAF		
205	—	—	150	200	—	3RW4073-6BB35	74CS35BFAF		74CS35DFAF		74CS350FAF		74CS35EFAF				
248	—	—	200	250	—	3RW4074-6BB35	74DS35BFAF		74DS35DFAF		74DS350FAF		74DS35EFAF				
315	—	—	250	300	—	3RW4075-6BB35	74ES35BFAF		74ES35DFAF		74ES350FAF		74ES35EFAF				
385	—	—	300	400	—	3RW4076-6BB35	74FS35BFAF		74FS35DFAF		74FS350FAF		74FS35EFAF				

Enclosed Fusible Combination (Starter with Fusible Disconnect)

Rated Operating Current	MAX HP ^①				KW	Class 20 Severe Duty (350% * Ie for 20s) ^②											
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)		List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel	List Price \$
112	30	40	75	—	56	3RW4055-6BB34	74AS3_BFAF		74AS3_DFAF		74AS3_0FAF		74AS3_EFAF		74AS3_WFAF		
132	40	50	100	—	75	3RW4056-6BB34	74BS3_BFAF		74BS3_DFAF		74BS3_0FAF		74BS3_EFAF		74BS3_WFAF		
185	60	60	125	—	93	3RW4073-6BB34	74CS3_BFAF		74CS3_DFAF		74CS3_0FAF		74CS3_EFAF				
205	60	75	150	—	112	3RW4074-6BB34	74DS3_BFAF		74DS3_DFAF		74DS3_0FAF		74DS3_EFAF				
280	75	100	200	—	149	3RW4075-6BB34	74ES3_BFAF		74ES3_DFAF		74ES3_0FAF		74ES3_EFAF				
340	100	125	250	—	186	3RW4076-6BB34	74FS3_BFAF		74FS3_DFAF		74FS3_0FAF		74FS3_EFAF				
						200V	6		6		6		6		6		
						230V	2		2		2		2		2		
						380V	3		3		3		3		3		
						460V	4		4		4		4		4		
112	—	—	75	75	—	3RW4055-6BB35	74AS35BFAF		74AS35DFAF		74AS350FAF		74AS35EFAF		74AS35WFAF		
132	—	—	100	125	—	3RW4056-6BB35	74BS35BFAF		74BS35DFAF		74BS350FAF		74BS35EFAF		74BS35WFAF		
185	—	—	125	150	—	3RW4073-6BB35	74CS35BFAF		74CS35DFAF		74CS350FAF		74CS35EFAF				
205	—	—	150	200	—	3RW4074-6BB35	74DS35BFAF		74DS35DFAF		74DS350FAF		74DS35EFAF				
280	—	—	200	250	—	3RW4075-6BB35	74ES35BFAF		74ES35DFAF		74ES350FAF		74ES35EFAF				
340	—	—	250	300	—	3RW4076-6BB35	74FS35BFAF		74FS35DFAF		74FS350FAF		74FS35EFAF				

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.



3RW44 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Multiple starting/stopping techniques including torque control
- Internal overload class 5, 10, 15, 20, or 30
- Built-in graphical LCD keypad
- Internal self protection
- Fault monitoring
- 3 parameter sets
- Communication capable via opt. Profibus module
- Programmable inputs and outputs
- External keypad available

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW44 is designed for normal starting applications.
- For factory modifications see page 17-237.
- For complete derating and application info see page 17-264.
- For dimensional drawings see page 17-289.

Ideal applications for 3RW44 enclosed softstarters:

- Fans
- Pumps
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills saws
- Crushers and grinders
- Mixers
- HVAC systems

Class 73 non-combination starters include:

- NEMA rated enclosure
- 3RW44 Sirius softstarter with built-in OL and bypass
- Control circuit transformer
- Reset button

The 3RW44 severe duty rating table should be applied for high inertia applications such rock crushers, chippers, screw compressors, ect.

Class 73 starters are built to UL and CSA standards.

3RW44 For High Feature Applications

Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP ^①				KW 380V	Class 10 Light Duty (350% * Im for 10s) ^②									
	200V	230V	460V	575V		OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
26	7.5	7.5	15	—	12	3RW4422-1BC34	73AT3_BFA	73AT3_DFA	73AT3_OFA	73AT3_EFA	73AT3_WFA				
32	10	10	20	—	15	3RW4423-1BC34	73BT3_BFA	73BT3_DFA	73BT3_OFA	73BT3_EFA	73BT3_WFA				
42	10	15	25	—	19	3RW4424-1BC34	73CT3_BFA	73CT3_DFA	73CT3_OFA	73CT3_EFA	73CT3_WFA				
51	15	15	30	—	22	3RW4425-1BC34	73DT3_BFA	73DT3_DFA	73DT3_OFA	73DT3_EFA	73DT3_WFA				
68	20	25	50	—	37	3RW4426-1BC34	73ET3_BFA	73ET3_DFA	73ET3_OFA	73ET3_EFA	73ET3_WFA				
82	25	30	60	—	45	3RW4427-1BC34	73FT3_BFA	73FT3_DFA	73FT3_OFA	73FT3_EFA	73FT3_WFA				
100	30	30	75	—	56	3RW4434-6BC34	73GT3_BFA	73GT3_DFA	73GT3_OFA	73GT3_EFA	73GT3_WFA				
117	30	40	75	—	56	3RW4435-6BC34	73HT3_BFA	73HT3_DFA	73HT3_OFA	73HT3_EFA	73HT3_WFA				
145	40	50	100	—	75	3RW4436-6BC34	73JT3_BFA	73JT3_DFA	73JT3_OFA	73JT3_EFA	73JT3_WFA				
180	60	60	125	—	93	3RW4443-6BC34	73KT3_BFA	73KT3_DFA	73KT3_OFA	73KT3_EFA	73KT3_WFA				
215	60	75	150	—	112	3RW4444-6BC34	73LT3_BFA	73LT3_DFA	73LT3_OFA	73LT3_EFA	73LT3_WFA				
280	75	100	200	—	149	3RW4445-6BC34	73MT3_BFA	73MT3_DFA	73MT3_OFA	73MT3_EFA	73MT3_WFA				
315	100	125	250	—	186	3RW4446-6BC34	73NT3_BFA	73NT3_DFA	73NT3_OFA	73NT3_EFA	73NT3_WFA				
385	125	150	300	—	224	3RW4447-6BC34	73PT3_BFA	73PT3_DFA	73PT3_OFA	73PT3_EFA	73PT3_WFA				
494	150	200	400	—	298	3RW4453-6BC34	73QT3_BFA	73QT3_DFA	73QT3_OFA	73QT3_EFA	73QT3_WFA				
551	150	200	450	—	336	3RW4454-6BC34	73RT3_BFA	73RT3_DFA	73RT3_OFA	73RT3_EFA	73RT3_WFA				
615	200	250	500	—	373	3RW4455-6BC34	73ST3_BFA	73ST3_DFA	73ST3_OFA	73ST3_EFA	73ST3_WFA				
693	200	250	550	—	410	3RW4456-6BC34	73TT3_BFA	73TT3_DFA	73TT3_OFA	73TT3_EFA	73TT3_WFA				
780	200	250	600	—	447	3RW4457-6BC34	73WT3_BFA	73WT3_DFA	73WT3_OFA	73WT3_EFA	73WT3_WFA				
970	350	350	800	—	597	3RW4465-6BC34	73YT3_BFA	73YT3_DFA	73YT3_OFA	73YT3_EFA	73YT3_WFA				
1076	350	400	900	—	972	3RW4466-6BC34	73ZT3_BFA	73ZT3_DFA	73ZT3_OFA	73ZT3_EFA	73ZT3_WFA				
						200V	6	6	6	6	6				
						230V	2	2	2	2	2				
						380V	3	3	3	3	3				
						460V	4	4	4	4	4				
26	—	—	15	20	—	3RW4422-1BC35	73AT35BFA	73AT35DFA	73AT35OFA	73AT35EFA	73AT35WFA				
32	—	—	20	25	—	3RW4423-1BC35	73BT35BFA	73BT35DFA	73BT35OFA	73BT35EFA	73BT35WFA				
42	—	—	25	30	—	3RW4424-1BC35	73CT35BFA	73CT35DFA	73CT35OFA	73CT35EFA	73CT35WFA				
51	—	—	30	40	—	3RW4425-1BC35	73DT35BFA	73DT35DFA	73DT35OFA	73DT35EFA	73DT35WFA				
68	—	—	50	50	—	3RW4426-1BC35	73ET35BFA	73ET35DFA	73ET35OFA	73ET35EFA	73ET35WFA				
82	—	—	60	75	—	3RW4427-1BC35	73FT35BFA	73FT35DFA	73FT35OFA	73FT35EFA	73FT35WFA				
100	—	—	75	75	—	3RW4434-6BC35	73GT35BFA	73GT35DFA	73GT35OFA	73GT35EFA	73GT35WFA				
117	—	—	75	100	—	3RW4435-6BC35	73HT35BFA	73HT35DFA	73HT35OFA	73HT35EFA	73HT35WFA				
145	—	—	100	125	—	3RW4436-6BC35	73JT35BFA	73JT35DFA	73JT35OFA	73JT35EFA	73JT35WFA				
180	—	—	125	150	—	3RW4443-6BC35	73KT35BFA	73KT35DFA	73KT35OFA	73KT35EFA	73KT35WFA				
215	—	—	150	200	—	3RW4444-6BC35	73LT35BFA	73LT35DFA	73LT35OFA	73LT35EFA	73LT35WFA				
280	—	—	200	250	—	3RW4445-6BC35	73MT35BFA	73MT35DFA	73MT35OFA	73MT35EFA	73MT35WFA				
315	—	—	250	300	—	3RW4446-6BC35	73NT35BFA	73NT35DFA	73NT35OFA	73NT35EFA	73NT35WFA				
385	—	—	300	400	—	3RW4447-6BC35	73PT35BFA	73PT35DFA	73PT35OFA	73PT35EFA	73PT35WFA				
494	—	—	400	500	—	3RW4453-6BC35	73QT35BFA	73QT35DFA	73QT35OFA	73QT35EFA	73QT35WFA				
551	—	—	450	600	—	3RW4454-6BC35	73RT35BFA	73RT35DFA	73RT35OFA	73RT35EFA	73RT35WFA				
615	—	—	500	700	—	3RW4455-6BC35	73ST35BFA	73ST35DFA	73ST35OFA	73ST35EFA	73ST35WFA				
693	—	—	550	750	—	3RW4456-6BC35	73TT35BFA	73TT35DFA	73TT35OFA	73TT35EFA	73TT35WFA				
780	—	—	600	850	—	3RW4457-6BC35	73WT35BFA	73WT35DFA	73WT35OFA	73WT35EFA	73WT35WFA				
970	—	—	800	1000	—	3RW4465-6BC35	73YT35BFA	73YT35DFA	73YT35OFA	73YT35EFA	73YT35WFA				
1076	—	—	900	1100	—	3RW4466-6BC35	73ZT35BFA	73ZT35DFA	73ZT35OFA	73ZT35EFA	73ZT35WFA				

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- Compact size
- Built-in bypass contactor
- Multiple starting/stopping techniques including torque control
- Internal overload class 10, 15, or 20
- Built-in graphical LCD keypad
- Internal self protection
- Fault monitoring
- 3 parameter sets
- Communication capable via opt. Profibus module
- Programmable inputs and outputs
- External keypad available

Ordering Information

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- ▶ For factory modifications see page 17-237.
- ▶ For complete derating and application info see page 17-264.
- ▶ For dimensional drawings see page 17-289.

Class 73 non-combination starters include:

- NEMA rated enclosure
- 3RW44 Sirius softstarter with built-in OL and bypass
- Control circuit transformer
- Line side power terminal block
- Reset button

Ideal applications for 3RW44 enclosed softstarters:

- Fans
- Pumps
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills saws
- Crushers and grinders
- Mixers
- HVAC systems

The 3RW44 severe duty rating table should be applied for high inertia applications such rock crushers, chippers, screw compressors, ect.

Class 73 starters are built to UL and CSA standards.

3RW44 For High Feature Applications

Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP ^①				KW	Class 20 Severe Duty (350% * Im for 20s) ^②										
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
26	7.5	7.5	15	—	12	3RW4422-1BC34	73AT3_BFA		73AT3_DFA		73AT3_OFA		73AT3_EFA		73AT3_WFA	
32	10	10	20	—	15	3RW4423-1BC34	73BT3_BFA		73BT3_DFA		73BT3_OFA		73BT3_EFA		73BT3_WFA	
42	10	15	25	—	19	3RW4424-1BC34	73CT3_BFA		73CT3_DFA		73CT3_OFA		73CT3_EFA		73CT3_WFA	
51	15	15	30	—	22	3RW4425-1BC34	73DT3_BFA		73DT3_DFA		73DT3_OFA		73DT3_EFA		73DT3_WFA	
68	20	25	50	—	37	3RW4426-1BC34	73ET3_BFA		73ET3_DFA		73ET3_OFA		73ET3_EFA		73ET3_WFA	
82	25	30	60	—	45	3RW4427-1BC34	73FT3_BFA		73FT3_DFA		73FT3_OFA		73FT3_EFA		73FT3_WFA	
97	30	30	60	—	45	3RW4434-6BC34	73GT3_BFA		73GT3_DFA		73GT3_OFA		73GT3_EFA		73GT3_WFA	
113	30	40	75	—	56	3RW4435-6BC34	73HT3_BFA		73HT3_DFA		73HT3_OFA		73HT3_EFA		73HT3_WFA	
134	40	50	75	—	56	3RW4436-6BC34	73JT3_BFA		73JT3_DFA		73JT3_OFA		73JT3_EFA		73JT3_WFA	
175	50	60	100	—	75	3RW4443-6BC34	73KT3_BFA		73KT3_DFA		73KT3_OFA		73KT3_EFA		73KT3_WFA	
195	60	75	125	—	93	3RW4444-6BC34	73LT3_BFA		73LT3_DFA		73LT3_OFA		73LT3_EFA		73LT3_WFA	
243	75	75	150	—	112	3RW4445-6BC34	73MT3_BFA		73MT3_DFA		73MT3_OFA		73MT3_EFA		73MT3_WFA	
263	75	100	200	—	149	3RW4446-6BC34	73NT3_BFA		73NT3_DFA		73NT3_OFA		73NT3_EFA		73NT3_WFA	
326	100	125	250	—	186	3RW4447-6BC34	73PT3_BFA		73PT3_DFA		73PT3_OFA		73PT3_EFA		73PT3_WFA	
494	150	150	400	—	224	3RW4453-6BC34	73QT3_BFA		73QT3_DFA		73QT3_OFA		73QT3_EFA		73QT3_WFA	
551	150	200	450	—	298	3RW4454-6BC34	73RT3_BFA		73RT3_DFA		73RT3_OFA		73RT3_EFA		73RT3_WFA	
615	200	200	500	—	336	3RW4455-6BC34	73ST3_BFA		73ST3_DFA		73ST3_OFA		73ST3_EFA		73ST3_WFA	
634	200	250	500	—	373	3RW4456-6BC34	73TT3_BFA		73TT3_DFA		73TT3_OFA		73TT3_EFA		73TT3_WFA	
650	200	250	550	—	410	3RW4457-6BC34	73WT3_BFA		73WT3_DFA		73WT3_OFA		73WT3_EFA		73WT3_WFA	
880	300	350	700	—	522	3RW4465-6BC34	73YT3_BFA		73YT3_DFA		73YT3_OFA		73YT3_EFA		73YT3_WFA	
940	300	350	750	—	559	3RW4466-6BC34	73ZT3_BFA		73ZT3_DFA		73ZT3_OFA		73ZT3_EFA		73ZT3_WFA	
						200V	6		6		6		6		6	
						230V	2		2		2		2		2	
						380V	3		3		3		3		3	
						460V	4		4		4		4		4	
26	—	—	15	20	—	3RW4422-1BC35	73AT35BFA		73AT35DFA		73AT35OFA		73AT35EFA		73AT35WFA	
32	—	—	20	25	—	3RW4423-1BC35	73BT35BFA		73BT35DFA		73BT35OFA		73BT35EFA		73BT35WFA	
42	—	—	25	30	—	3RW4424-1BC35	73CT35BFA		73CT35DFA		73CT35OFA		73CT35EFA		73CT35WFA	
51	—	—	30	40	—	3RW4425-1BC35	73DT35BFA		73DT35DFA		73DT35OFA		73DT35EFA		73DT35WFA	
68	—	—	50	50	—	3RW4426-1BC35	73ET35BFA		73ET35DFA		73ET35OFA		73ET35EFA		73ET35WFA	
82	—	—	60	75	—	3RW4427-1BC35	73FT35BFA		73FT35DFA		73FT35OFA		73FT35EFA		73FT35WFA	
97	—	—	60	75	—	3RW4434-6BC35	73GT35BFA		73GT35DFA		73GT35OFA		73GT35EFA		73GT35WFA	
113	—	—	75	100	—	3RW4435-6BC35	73HT35BFA		73HT35DFA		73HT35OFA		73HT35EFA		73HT35WFA	
134	—	—	75	125	—	3RW4436-6BC35	73JT35BFA		73JT35DFA		73JT35OFA		73JT35EFA		73JT35WFA	
175	—	—	100	150	—	3RW4443-6BC35	73KT35BFA		73KT35DFA		73KT35OFA		73KT35EFA		73KT35WFA	
195	—	—	125	200	—	3RW4444-6BC35	73LT35BFA		73LT35DFA		73LT35OFA		73LT35EFA		73LT35WFA	
243	—	—	150	200	—	3RW4445-6BC35	73MT35BFA		73MT35DFA		73MT35OFA		73MT35EFA		73MT35WFA	
263	—	—	200	250	—	3RW4446-6BC35	73NT35BFA		73NT35DFA		73NT35OFA		73NT35EFA		73NT35WFA	
326	—	—	250	300	—	3RW4447-6BC35	73PT35BFA		73PT35DFA		73PT35OFA		73PT35EFA		73PT35WFA	
494	—	—	400	500	—	3RW4453-6BC35	73QT35BFA		73QT35DFA		73QT35OFA		73QT35EFA		73QT35WFA	
551	—	—	450	550	—	3RW4454-6BC35	73RT35BFA		73RT35DFA		73RT35OFA		73RT35EFA		73RT35WFA	
615	—	—	500	600	—	3RW4455-6BC35	73ST35BFA		73ST35DFA		73ST35OFA		73ST35EFA		73ST35WFA	
693	—	—	500	650	—	3RW4456-6BC35	73TT35BFA		73TT35DFA		73TT35OFA		73TT35EFA		73TT35WFA	
780	—	—	550	700	—	3RW4457-6BC35	73WT35BFA		73WT35DFA		73WT35OFA		73WT35EFA		73WT35WFA	
880	—	—	700	850	—	3RW4465-6BC35	73YT35BFA		73YT35DFA		73YT35OFA		73YT35EFA		73YT35WFA	
940	—	—	750	900	—	3RW4466-6BC35	73ZT35BFA		73ZT35DFA		73ZT35OFA		73ZT35EFA		73ZT35WFA	

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.



3RW44 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Multiple starting/stopping techniques including torque control
- Internal overload class 5, 10, 15, 20, or 30
- Built-in graphical LCD keypad
- Internal self protection
- Fault monitoring
- 3 parameter sets
- Communication capable via opt. Profibus module
- Programmable inputs and outputs
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Ordering Information

- ▶ Enclosed devices should be ordered by the FLA of the motor.
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Class 74 non-combination starters include:

- NEMA rated enclosure
- 3RW44 Sirius softstarter with built-in OL and bypass
- Circuit breaker with disconnect
- Control circuit transformer
- Reset button

Ideal applications for 3RW44 enclosed softstarters:

- Fans
- Pumps
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills saws
- Crushers and grinders
- Mixers
- HVAC systems

The 3RW44 severe duty rating table should be applied for high inertia applications such rock crushers, chippers, screw compressors, ect.

Class 74 starters are built to UL and CSA standards.

3RW44 For High Feature Applications

Enclosed Combination with Circuit Breaker Disconnect

Rated Operating Current	MAX HP ^①				KW	Class 10 Light Duty (350% * Im for 10s) ^②											
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel	List Price \$
26	7.5	7.5	15	—	12	3RW4422-1BC34	74AT3_BFAP		74AT3_DFAP		74AT3_OFAP		74AT3_EFAP		74AT3_WFAP		
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAP		74BT3_DFAP		74BT3_OFAP		74BT3_EFAP		74BT3_WFAP		
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAP		74CT3_DFAP		74CT3_OFAP		74CT3_EFAP		74CT3_WFAP		
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAP		74DT3_DFAP		74DT3_OFAP		74DT3_EFAP		74DT3_WFAP		
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAP		74ET3_DFAP		74ET3_OFAP		74ET3_EFAP		74ET3_WFAP		
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAP		74FT3_DFAP		74FT3_OFAP		74FT3_EFAP		74FT3_WFAP		
100	30	30	75	—	56	3RW4434-6BC34	74GT3_BFAP		74GT3_DFAP		74GT3_OFAP		74GT3_EFAP		74GT3_WFAP		
117	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAP		74HT3_DFAP		74HT3_OFAP		74HT3_EFAP		74HT3_WFAP		
145	40	50	100	—	75	3RW4436-6BC34	74JT3_BFAP		74JT3_DFAP		74JT3_OFAP		74JT3_EFAP		74JT3_WFAP		
180	60	60	125	—	93	3RW4443-6BC34	74KT3_BFAP		74KT3_DFAP		74KT3_OFAP		74KT3_EFAP		74KT3_WFAP		
215	60	75	150	—	112	3RW4444-6BC34	74LT3_BFAP		74LT3_DFAP		74LT3_OFAP		74LT3_EFAP		74LT3_WFAP		
280	75	100	200	—	149	3RW4445-6BC34	74MT3_BFAP		74MT3_DFAP		74MT3_OFAP		74MT3_EFAP		74MT3_WFAP		
315	100	125	250	—	186	3RW4446-6BC34	74NT3_BFAP		74NT3_DFAP		74NT3_OFAP		74NT3_EFAP		74NT3_WFAP		
385	125	150	300	—	224	3RW4447-6BC34	74PT3_BFAP		74PT3_DFAP		74PT3_OFAP		74PT3_EFAP		74PT3_WFAP		
494	150	200	400	—	298	3RW4453-6BC34	74QT3_BFAT		74QT3_DFAT		74QT3_OFAT		74QT3_EFAT		74QT3_WFAT		
551	150	200	450	—	336	3RW4454-6BC34	74RT3_BFAT		74RT3_DFAT		74RT3_OFAT		74RT3_EFAT		74RT3_WFAT		
615	200	250	500	—	373	3RW4455-6BC34	74ST3_BFAT		74ST3_DFAT		74ST3_OFAT		74ST3_EFAT		74ST3_WFAT		
693	200	250	550	—	410	3RW4456-6BC34	74TT3_BFAT		74TT3_DFAT		74TT3_OFAT		74TT3_EFAT		74TT3_WFAT		
780	200	250	600	—	447	3RW4457-6BC34	74WT3_BFAT		74WT3_DFAT		74WT3_OFAT		74WT3_EFAT		74WT3_WFAT		
970	350	350	800	—	597	3RW4465-6BC34	74YT3_BFAT		74YT3_DFAT		74YT3_OFAT		74YT3_EFAT		74YT3_WFAT		
1076	350	400	900	—	672	3RW4466-6BC34	74ZT3_BFAT		74ZT3_DFAT		74ZT3_OFAT		74ZT3_EFAT		74ZT3_WFAT		
							200V	6		6		6		6		6	
							230V	2		2		2		2		2	
							380V	3		3		3		3		3	
							460V	4		4		4		4		4	
26	—	—	15	20	—	3RW4422-1BC35	74AT35BFAP		74AT35DFAP		74AT35OFAP		74AT35EFAP		74AT35WFAP		
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAP		74BT35DFAP		74BT35OFAP		74BT35EFAP		74BT35WFAP		
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAP		74CT35DFAP		74CT35OFAP		74CT35EFAP		74CT35WFAP		
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAP		74DT35DFAP		74DT35OFAP		74DT35EFAP		74DT35WFAP		
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAP		74ET35DFAP		74ET35OFAP		74ET35EFAP		74ET35WFAP		
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAP		74FT35DFAP		74FT35OFAP		74FT35EFAP		74FT35WFAP		
100	—	—	75	75	—	3RW4434-6BC35	74GT35BFAP		74GT35DFAP		74GT35OFAP		74GT35EFAP		74GT35WFAP		
117	—	—	75	100	—	3RW4435-6BC35	74HT35BFAP		74HT35DFAP		74HT35OFAP		74HT35EFAP		74HT35WFAP		
145	—	—	100	125	—	3RW4436-6BC35	74JT35BFAP		74JT35DFAP		74JT35OFAP		74JT35EFAP		74JT35WFAP		
180	—	—	125	150	—	3RW4443-6BC35	74KT35BFAP		74KT35DFAP		74KT35OFAP		74KT35EFAP		74KT35WFAP		
215	—	—	150	200	—	3RW4444-6BC35	74LT35BFAP		74LT35DFAP		74LT35OFAP		74LT35EFAP		74LT35WFAP		
280	—	—	200	250	—	3RW4445-6BC35	74MT35BFAP		74MT35DFAP		74MT35OFAP		74MT35EFAP		74MT35WFAP		
315	—	—	250	300	—	3RW4446-6BC35	74NT35BFAP		74NT35DFAP		74NT35OFAP		74NT35EFAP		74NT35WFAP		
385	—	—	300	400	—	3RW4447-6BC35	74PT35BFAP		74PT35DFAP		74PT35OFAP		74PT35EFAP		74PT35WFAP		
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAT		74QT35DFAT		74QT35OFAT		74QT35EFAT		74QT35WFAT		
551	—	—	450	600	—	3RW4454-6BC35	74RT35BFAT		74RT35DFAT		74RT35OFAT		74RT35EFAT		74RT35WFAT		
615	—	—	500	700	—	3RW4455-6BC35	74ST35BFAT		74ST35DFAT		74ST35OFAT		74ST35EFAT		74ST35WFAT		
693	—	—	550	750	—	3RW4456-6BC35	74TT35BFAT		74TT35DFAT		74TT35OFAT		74TT35EFAT		74TT35WFAT		
780	—	—	600	850	—	3RW4457-6BC35	74WT35BFAT		74WT35DFAT		74WT35OFAT		74WT35EFAT		74WT35WFAT		
970	—	—	800	1000	—	3RW4465-6BC35	74YT35BFAT		74YT35DFAT		74YT35OFAT		74YT35EFAT		74YT35WFAT		
1076	—	—	900	1100	—	3RW4466-6BC35	74ZT35BFAT		74ZT35DFAT		74ZT35OFAT		74ZT35EFAT		74ZT35WFAT		

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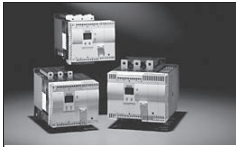
3RW44 For High Feature Applications

Enclosed Combination with Circuit Breaker Disconnect

Rated Operating Current	MAX HP ^①				KW	Class 20 Severe Duty (350% * Im for 20s) ^②											
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel	List Price \$
26	7.5	7.5	15	—	12	3RW4422-1BC34	74AT3_BFAP		74AT3_DFAP		74AT3_OFAP		74AT3_EFAP		74AT3_WFAP		
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAP		74BT3_DFAP		74BT3_OFAP		74BT3_EFAP		74BT3_WFAP		
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAP		74CT3_DFAP		74CT3_OFAP		74CT3_EFAP		74CT3_WFAP		
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAP		74DT3_DFAP		74DT3_OFAP		74DT3_EFAP		74DT3_WFAP		
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAP		74ET3_DFAP		74ET3_OFAP		74ET3_EFAP		74ET3_WFAP		
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAP		74FT3_DFAP		74FT3_OFAP		74FT3_EFAP		74FT3_WFAP		
97	30	30	60	—	45	3RW4434-6BC34	74GT3_BFAP		74GT3_DFAP		74GT3_OFAP		74GT3_EFAP		74GT3_WFAP		
113	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAP		74HT3_DFAP		74HT3_OFAP		74HT3_EFAP		74HT3_WFAP		
134	40	50	75	—	56	3RW4436-6BC34	74JT3_BFAP		74JT3_DFAP		74JT3_OFAP		74JT3_EFAP		74JT3_WFAP		
175	50	60	100	—	75	3RW4443-6BC34	74KT3_BFAP		74KT3_DFAP		74KT3_OFAP		74KT3_EFAP		74KT3_WFAP		
195	60	75	125	—	93	3RW4444-6BC34	74LT3_BFAP		74LT3_DFAP		74LT3_OFAP		74LT3_EFAP		74LT3_WFAP		
243	75	75	150	—	112	3RW4445-6BC34	74MT3_BFAP		74MT3_DFAP		74MT3_OFAP		74MT3_EFAP		74MT3_WFAP		
263	75	100	200	—	149	3RW4446-6BC34	74NT3_BFAP		74NT3_DFAP		74NT3_OFAP		74NT3_EFAP		74NT3_WFAP		
326	100	125	250	—	186	3RW4447-6BC34	74PT3_BFAP		74PT3_DFAP		74PT3_OFAP		74PT3_EFAP		74PT3_WFAP		
494	150	150	400	—	224	3RW4453-6BC34	74QT3_BFAT		74QT3_DFAT		74QT3_OFAT		74QT3_EFAT		74QT3_WFAT		
551	150	200	450	—	298	3RW4454-6BC34	74RT3_BFAT		74RT3_DFAT		74RT3_OFAT		74RT3_EFAT		74RT3_WFAT		
615	200	200	500	—	336	3RW4455-6BC34	74ST3_BFAT		74ST3_DFAT		74ST3_OFAT		74ST3_EFAT		74ST3_WFAT		
634	200	250	500	—	373	3RW4456-6BC34	74TT3_BFAT		74TT3_DFAT		74TT3_OFAT		74TT3_EFAT		74TT3_WFAT		
650	200	250	550	—	410	3RW4457-6BC34	74WT3_BFAT		74WT3_DFAT		74WT3_OFAT		74WT3_EFAT		74WT3_WFAT		
880	300	350	700	—	522	3RW4465-6BC34	74YT3_BFAT		74YT3_DFAT		74YT3_OFAT		74YT3_EFAT		74YT3_WFAT		
940	300	350	750	—	559	3RW4466-6BC34	74ZT3_BFAT		74ZT3_DFAT		74ZT3_OFAT		74ZT3_EFAT		74ZT3_WFAT		
						200V	6		6		6		6		6		
						230V	2		2		2		2		2		
						380V	3		3		3		3		3		
						460V	4		4		4		4		4		
26	—	—	15	20	—	3RW4422-1BC35	74AT35BFAP		74AT35DFAP		74AT35OFAP		74AT35EFAP		74AT35WFAP		
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAP		74BT35DFAP		74BT35OFAP		74BT35EFAP		74BT35WFAP		
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAP		74CT35DFAP		74CT35OFAP		74CT35EFAP		74CT35WFAP		
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAP		74DT35DFAP		74DT35OFAP		74DT35EFAP		74DT35WFAP		
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAP		74ET35DFAP		74ET35OFAP		74ET35EFAP		74ET35WFAP		
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAP		74FT35DFAP		74FT35OFAP		74FT35EFAP		74FT35WFAP		
97	—	—	60	75	—	3RW4434-6BC35	74GT35BFAP		74GT35DFAP		74GT35OFAP		74GT35EFAP		74GT35WFAP		
113	—	—	75	100	—	3RW4435-6BC35	74HT35BFAP		74HT35DFAP		74HT35OFAP		74HT35EFAP		74HT35WFAP		
134	—	—	75	125	—	3RW4436-6BC35	74JT35BFAP		74JT35DFAP		74JT35OFAP		74JT35EFAP		74JT35WFAP		
175	—	—	100	150	—	3RW4443-6BC35	74KT35BFAP		74KT35DFAP		74KT35OFAP		74KT35EFAP		74KT35WFAP		
195	—	—	125	200	—	3RW4444-6BC35	74LT35BFAP		74LT35DFAP		74LT35OFAP		74LT35EFAP		74LT35WFAP		
243	—	—	150	200	—	3RW4445-6BC35	74MT35BFAP		74MT35DFAP		74MT35OFAP		74MT35EFAP		74MT35WFAP		
263	—	—	200	250	—	3RW4446-6BC35	74NT35BFAP		74NT35DFAP		74NT35OFAP		74NT35EFAP		74NT35WFAP		
326	—	—	250	300	—	3RW4447-6BC35	74PT35BFAP		74PT35DFAP		74PT35OFAP		74PT35EFAP		74PT35WFAP		
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAT		74QT35DFAT		74QT35OFAT		74QT35EFAT		74QT35WFAT		
551	—	—	450	550	—	3RW4454-6BC35	74RT35BFAT		74RT35DFAT		74RT35OFAT		74RT35EFAT		74RT35WFAT		
615	—	—	500	600	—	3RW4455-6BC35	74ST35BFAT		74ST35DFAT		74ST35OFAT		74ST35EFAT		74ST35WFAT		
693	—	—	500	650	—	3RW4456-6BC35	74TT35BFAT		74TT35DFAT		74TT35OFAT		74TT35EFAT		74TT35WFAT		
780	—	—	550	700	—	3RW4457-6BC35	74WT35BFAT		74WT35DFAT		74WT35OFAT		74WT35EFAT		74WT35WFAT		
880	—	—	700	850	—	3RW4465-6BC35	74YT35BFAT		74YT35DFAT		74YT35OFAT		74YT35EFAT		74YT35WFAT		
940	—	—	750	900	—	3RW4466-6BC35	74ZT35BFAT		74ZT35DFAT		74ZT35OFAT		74ZT35EFAT		74ZT35WFAT		

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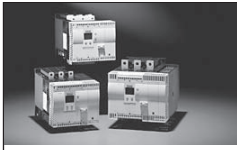
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32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAF		74BT3_DFAF		74BT3_OFAF		74BT3_EFAF		74BT3_WFAF	
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAF		74CT3_DFAF		74CT3_OFAF		74CT3_EFAF		74CT3_WFAF	
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAF		74DT3_DFAF		74DT3_OFAF		74DT3_EFAF		74DT3_WFAF	
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAF		74ET3_DFAF		74ET3_OFAF		74ET3_EFAF		74ET3_WFAF	
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAF		74FT3_DFAF		74FT3_OFAF		74FT3_EFAF		74FT3_WFAF	
100	30	30	75	—	56	3RW4434-6BC34	74GT3_BFAF		74GT3_DFAF		74GT3_OFAF		74GT3_EFAF		74GT3_WFAF	
117	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAF		74HT3_DFAF		74HT3_OFAF		74HT3_EFAF		74HT3_WFAF	
145	40	50	100	—	75	3RW4436-6BC34	74JT3_BFAF		74JT3_DFAF		74JT3_OFAF		74JT3_EFAF		74JT3_WFAF	
180	60	60	125	—	93	3RW4443-6BC34	74KT3_BFAF		74KT3_DFAF		74KT3_OFAF		74KT3_EFAF		74KT3_WFAF	
215	60	75	150	—	112	3RW4444-6BC34	74LT3_BFAF		74LT3_DFAF		74LT3_OFAF		74LT3_EFAF		74LT3_WFAF	
280	75	100	200	—	149	3RW4445-6BC34	74MT3_BFAF		74MT3_DFAF		74MT3_OFAF		74MT3_EFAF		74MT3_WFAF	
315	100	125	250	—	186	3RW4446-6BC34	74NT3_BFAF		74NT3_DFAF		74NT3_OFAF		74NT3_EFAF		74NT3_WFAF	
385	125	150	300	—	224	3RW4447-6BC34	74PT3_BFAF		74PT3_DFAF		74PT3_OFAF		74PT3_EFAF		74PT3_WFAF	
494	150	200	400	—	298	3RW4453-6BC34	74QT3_BFAF				74QT3_OFAF					
551	150	200	450	—	336	3RW4454-6BC34	74RT3_BFAF				74RT3_OFAF					
615	200	250	500	—	373	3RW4455-6BC34	74ST3_BFAF				74ST3_OFAF					
693	200	250	550	—	—	3RW4456-6BC34	74TT3_BFAF				74TT3_OFAF					
780	200	250	600	—	447	3RW4457-6BC34	74WT3_BFAF				74WT3_OFAF					
							200V	6		6		6		6		6
							230V	2		2		2		2		2
							380V	3		3		3		3		3
							460V	4		4		4		4		4
26	—	—	15	20	—	3RW4422-1BC35	74AT35BFAF		74AT35DFAF		74AT35OFAF		74AT35EFAF		74AT35WFAF	
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAF		74BT35DFAF		74BT35OFAF		74BT35EFAF		74BT35WFAF	
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAF		74CT35DFAF		74CT35OFAF		74CT35EFAF		74CT35WFAF	
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAF		74DT35DFAF		74DT35OFAF		74DT35EFAF		74DT35WFAF	
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAF		74ET35DFAF		74ET35OFAF		74ET35EFAF		74ET35WFAF	
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAF		74FT35DFAF		74FT35OFAF		74FT35EFAF		74FT35WFAF	
100	—	—	75	75	—	3RW4434-6BC35	74GT35BFAF		74GT35DFAF		74GT35OFAF		74GT35EFAF		74GT35WFAF	
117	—	—	75	100	—	3RW4435-6BC35	74HT35BFAF		74HT35DFAF		74HT35OFAF		74HT35EFAF		74HT35WFAF	
145	—	—	100	125	—	3RW4436-6BC35	74JT35BFAF		74JT35DFAF		74JT35OFAF		74JT35EFAF		74JT35WFAF	
180	—	—	125	150	—	3RW4443-6BC35	74KT35BFAF		74KT35DFAF		74KT35OFAF		74KT35EFAF		74KT35WFAF	
215	—	—	150	200	—	3RW4444-6BC35	74LT35BFAF		74LT35DFAF		74LT35OFAF		74LT35EFAF		74LT35WFAF	
280	—	—	200	250	—	3RW4445-6BC35	74MT35BFAF		74MT35DFAF		74MT35OFAF		74MT35EFAF		74MT35WFAF	
315	—	—	250	300	—	3RW4446-6BC35	74NT35BFAF		74NT35DFAF		74NT35OFAF		74NT35EFAF		74NT35WFAF	
385	—	—	300	400	—	3RW4447-6BC35	74PT35BFAF		74PT35DFAF		74PT35OFAF		74PT35EFAF		74PT35WFAF	
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAF				74QT35OFAF					
551	—	—	450	600	—	3RW4454-6BC35	74RT35BFAF				74RT35OFAF					
615	—	—	500	700	—	3RW4455-6BC35	74ST35BFAF				74ST35OFAF					
693	—	—	550	750	—	3RW4456-6BC35	74TT35BFAF				74TT35OFAF					
780	—	—	600	850	—	3RW4457-6BC35	74WT35BFAF				74WT35OFAF					

[Ⓛ] Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

[Ⓜ] Starter selection is dependent on type of application. Im = FLA rating of motor.



3RW44 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Multiple starting/stopping techniques including torque control
- Internal overload class 5, 10, 15, 20, or 30
- Built-in graphical LCD keypad
- Internal self protection
- Fault monitoring
- 3 parameter sets
- Communication capable via opt. Profibus module
- Programmable inputs and outputs
- External keypad available

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW44 is designed for normal starting applications.
- For factory modifications see page 17-237.
- For complete derating and application info see page 17-264.
- For dimensional drawings see page 17-289.

Class 74 non-combination starters include:

- NEMA rated enclosure
- 3RW44 Sirius softstarter with built-in OL and bypass
- Fusible disconnect
- Control circuit transformer
- Reset button

Ideal applications for 3RW44 enclosed softstarters:

- Fans
- Pumps
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills saws
- Crushers and grinders
- Mixers
- HVAC systems

The 3RW44 severe duty rating table should be applied for high inertia applications such rock crushers, chippers, screw compressors, ect.

Class 74 starters are built to UL and CSA standards.

For all technical information, please consult the 2006 Industrial Controls Catalog or contact your local sales support center.

**3RW44 For High Feature Applications
Enclosed Combination with Fusible Disconnect**

Rated Operating Current	MAX HP ^①				KW 380V	Class 20 Severe Duty (350% * Im for 20s) ^②									
	200V	230V	460V	575V		OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
26	7.5	7.5	15	—	12	3RW4422-1BC34	74AT3_BFAF	74AT3_DFAF	74AT3_OFAF	74AT3_EFAF	74AT3_WFAF				
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAF	74BT3_DFAF	74BT3_OFAF	74BT3_EFAF	74BT3_WFAF				
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAF	74CT3_DFAF	74CT3_OFAF	74CT3_EFAF	74CT3_WFAF				
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAF	74DT3_DFAF	74DT3_OFAF	74DT3_EFAF	74DT3_WFAF				
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAF	74ET3_DFAF	74ET3_OFAF	74ET3_EFAF	74ET3_WFAF				
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAF	74FT3_DFAF	74FT3_OFAF	74FT3_EFAF	74FT3_WFAF				
97	30	30	60	—	45	3RW4434-6BC34	74GT3_BFAF	74GT3_DFAF	74GT3_OFAF	74GT3_EFAF	74GT3_WFAF				
113	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAF	74HT3_DFAF	74HT3_OFAF	74HT3_EFAF	74HT3_WFAF				
134	40	50	75	—	56	3RW4436-6BC34	74JT3_BFAF	74JT3_DFAF	74JT3_OFAF	74JT3_EFAF	74JT3_WFAF				
175	50	60	100	—	75	3RW4443-6BC34	74KT3_BFAF	74KT3_DFAF	74KT3_OFAF	74KT3_EFAF	74KT3_WFAF				
195	60	75	125	—	93	3RW4444-6BC34	74LT3_BFAF	74LT3_DFAF	74LT3_OFAF	74LT3_EFAF	74LT3_WFAF				
243	75	75	150	—	112	3RW4445-6BC34	74MT3_BFAF	74MT3_DFAF	74MT3_OFAF	74MT3_EFAF	74MT3_WFAF				
263	75	100	200	—	149	3RW4446-6BC34	74NT3_BFAF	74NT3_DFAF	74NT3_OFAF	74NT3_EFAF	74NT3_WFAF				
326	100	125	250	—	186	3RW4447-6BC34	74PT3_BFAF	74PT3_DFAF	74PT3_OFAF	74PT3_EFAF	74PT3_WFAF				
494	150	150	400	—	298	3RW4453-6BC34	74QT3_BFAF	74QT3_DFAF	74QT3_OFAF	74QT3_EFAF	74QT3_WFAF				
551	150	200	450	—	336	3RW4454-6BC34	74RT3_BFAF	74RT3_DFAF	74RT3_OFAF	74RT3_EFAF	74RT3_WFAF				
615	200	200	500	—	373	3RW4455-6BC34	74ST3_BFAF	74ST3_DFAF	74ST3_OFAF	74ST3_EFAF	74ST3_WFAF				
634	200	250	500	—	373	3RW4456-6BC34	74TT3_BFAF	74TT3_DFAF	74TT3_OFAF	74TT3_EFAF	74TT3_WFAF				
650	200	250	550	—	373	3RW4457-6BC34	74WT3_BFAF	74WT3_DFAF	74WT3_OFAF	74WT3_EFAF	74WT3_WFAF				
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4
26	—	—	15	20	—	3RW4422-1BC35	74AT35BFAF	74AT35DFAF	74AT35OFAF	74AT35EFAF	74AT35WFAF				
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAF	74BT35DFAF	74BT35OFAF	74BT35EFAF	74BT35WFAF				
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAF	74CT35DFAF	74CT35OFAF	74CT35EFAF	74CT35WFAF				
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAF	74DT35DFAF	74DT35OFAF	74DT35EFAF	74DT35WFAF				
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAF	74ET35DFAF	74ET35OFAF	74ET35EFAF	74ET35WFAF				
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAF	74FT35DFAF	74FT35OFAF	74FT35EFAF	74FT35WFAF				
97	—	—	60	75	—	3RW4434-6BC35	74GT35BFAF	74GT35DFAF	74GT35OFAF	74GT35EFAF	74GT35WFAF				
113	—	—	75	100	—	3RW4435-6BC35	74HT35BFAF	74HT35DFAF	74HT35OFAF	74HT35EFAF	74HT35WFAF				
134	—	—	75	125	—	3RW4436-6BC35	74JT35BFAF	74JT35DFAF	74JT35OFAF	74JT35EFAF	74JT35WFAF				
175	—	—	100	150	—	3RW4443-6BC35	74KT35BFAF	74KT35DFAF	74KT35OFAF	74KT35EFAF	74KT35WFAF				
195	—	—	125	200	—	3RW4444-6BC35	74LT35BFAF	74LT35DFAF	74LT35OFAF	74LT35EFAF	74LT35WFAF				
243	—	—	150	200	—	3RW4445-6BC35	74MT35BFAF	74MT35DFAF	74MT35OFAF	74MT35EFAF	74MT35WFAF				
263	—	—	200	250	—	3RW4446-6BC35	74NT35BFAF	74NT35DFAF	74NT35OFAF	74NT35EFAF	74NT35WFAF				
326	—	—	250	300	—	3RW4447-6BC35	74PT35BFAF	74PT35DFAF	74PT35OFAF	74PT35EFAF	74PT35WFAF				
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAF	74QT35DFAF	74QT35OFAF	74QT35EFAF	74QT35WFAF				
551	—	—	450	550	—	3RW4454-6BC35	74RT35BFAF	74RT35DFAF	74RT35OFAF	74RT35EFAF	74RT35WFAF				
615	—	—	500	600	—	3RW4455-6BC35	74ST35BFAF	74ST35DFAF	74ST35OFAF	74ST35EFAF	74ST35WFAF				
693	—	—	550	650	—	3RW4456-6BC35	74TT35BFAF	74TT35DFAF	74TT35OFAF	74TT35EFAF	74TT35WFAF				
780	—	—	600	700	—	3RW4457-6BC35	74WT35BFAF	74WT35DFAF	74WT35OFAF	74WT35EFAF	74WT35WFAF				

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.

Modification Available modifications in STANDARD enclosure	3RW Version	Enclosed Style	Enclosure NEMA Type	Mod Suffix	List Price Adder \$
Push Buttons					
Start/Stop	3RW40/44	73/74	ALL	A1	
Emergency Stop	3RW40/44	73/74	ALL	ES	
Selector Switches					
Hand-Off-Auto	3RW40/44	73/74	ALL	A3	
Hand-Off-Auto w/ start pushbutton	3RW40/44	73/74	ALL	S3	
Off-On	3RW40/44	73/74	ALL	A4	
Pilot Light					
Red 'On'	3RW40/44	73/74	ALL	FA	
Green 'On'	3RW40/44	73/74	ALL	FB	
Red 'Run'	3RW40/44	73/74	ALL	FC	
Green 'Run'	3RW40/44	73/74	ALL	FD	
LED Bulb Upgrade ③	3RW40/44	73/74	ALL	FE	
Red 'Off'	3RW40/44	73/74	ALL	FJ	
Green 'Off'	3RW40/44	73/74	ALL	FK	
Amber 'Fault'	3RW40/44	73/74	ALL	FL	
White 'Control Power On'	3RW40/44	73/74	ALL	FW	
Red, 'On' Push-to-Test	3RW40/44	73/74	ALL	FS	
Green 'On' Push-to-Test	3RW40/44	73/74	ALL	FT	
Green 'Off' Push-to-Test	3RW40/44	73/74	ALL	FU	
Custom pilot light (state color and nameplate text)	3RW40/44	73/74	ALL	FZ	
Through the Door Metering					
External keypad for 3RW44	3RW44	73/74	1,12	K1	
EIapse time meter	3RW40/44	73/74	1,12 (120V)	M5	
Control Options					
Profibus Communication Module (installed-connection cable not supplied)	3RW44	73/74	ALL	P1	
Profinet Communication Module (installed-connection cable not supplied)	3RW44	73/74	ALL	P2	
Ground Lug - 1 Conductor	3RW40/44	73/74	ALL	L10	
Alarm Package (horn, light, relay & push button)	3RW40/44	73/74	1,3R,12	M7	
Electronic 8 function timing relay (.05s - 100h) 24V/100-127V supplied mounted and unwired	3RW40/44	73/74	ALL	TR	
Control Relay supplied mounted and unwired (4 pole max)	3RW40/44	73/74	ALL	R04 R22 R40	
Circuit Breaker Shunt Trip (included std in 3RW40 versions)	3RW44	74	ALL	L6	
Function identification plate w/ marking as specified	3RW40/44	73/74	ALL	N1	
Service Entrance Labeled	3RW40/44	74	ALL	N3	
Terminal Block 3 point	3RW40/44	73/74	ALL	TC3	
Terminal Block 6 point	3RW40/44	73/74	ALL	TC6	
Terminal Block 9 point	3RW40/44	73/74	ALL	TC9	
Terminal Block 12 point	3RW40/44	73/74	ALL	TC12	

Emergency HP Rated Bypass Starter	3RW Version	Class	Enclosure NEMA Type	Mod Suffix	Amp Rating (3rd character of catalog number)										
					List price Adder \$										
3RW40 new	73/74	1/12/3R/4	A12	A,B	C,D,E	FGH	J	—	—	—	—	—	—	—	—
				—	—	A	B,C	D	E,F	—	—	—	—		
	73	1/12/3R/4	A12	A,B,C ④	D,E ④	F,G,H	J,K,L	M	N,P	Q	R,S,T,W	Y,Z ①	—	—	
				—	—	—	—	—	—	—	—	—	—	—	
3RW44	74	1/12/3R/4	A12	A,B,C	D,E	F,G,H	J,K,L	M	N,P	Q	R,S,T,W	Y,Z ①	—	—	

Available Modifications Requiring the MODIFIED OPTIONS Box Size (to be used with the selections ending in GA*)	3RW Version	Class	Enclosure NEMA Type	Mod Suffix	Amp Rating (3rd character of catalog number)									
					List price Adder \$									
Isolation Contactor ③	3RW40				—	—	A	B,C	D	E,F	—	—	—	—
	3RW44				A,B,C	D,E	F,G,H	J,K,L	M	N,P	Q	R,S,T,W	Y,Z ①	
100 VA Extra CPT Capacity	3RW40/44	73/74	ALL	CA										
Space Heater (120V separate control)	3RW40/44	73/74	ALL	SH										
Space Heater w/ T-stat (120V separate control)	3RW40/44	73/74	ALL	ST										
Lightning Arrestor	3RW40/44	73/74	ALL	L										

① (A) For sizes 73YT & 73ZT, mods IC & A12 are available and can have both either individually or both at the same time; (B) For sizes 74YT & 74ZT (combination w/ICB), mods IC & A12 are only available individually (NOT both at the same time); (C) For sizes 74YT & 74ZT (combination w/ fusible disc), mods IC & A12 are NOT available individually or both.
② An isolation contactor is included for 3RW40 version with bypass.

③ An isolation contactor is standard on all 3RW40 new styles
④ Includes mod box price, change 8th character to G.

⑤ Pilot lights are transformer type as standard. For LED type bulbs, order suffix FE in addition to the standard device suffix(es). For example, to order red "ON" and green "OFF" pilot lights with LED bulbs, order FA, FK and FE.

Overview

The SIRIUS 3RW30 soft starters reduce the motor voltage through variable phase control and increase it in ramp-like mode from a selectable starting voltage up to mains voltage. During starting, these devices limit the torque as well as the current and prevent the shocks which arise during direct starts or wye-delta starts. In this way, mechanical loads and mains voltage dips can be reliably reduced.

Soft starting reduces the stress on the connected equipment and results in lower wear and therefore longer periods of trouble-free production. The selectable start value means that the soft starters can be adjusted individually to the requirements of the application in question and unlike wye-delta starters are not restricted to two-stage starting with fixed voltage ratios.

The SIRIUS 3RW30 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that no power loss has to be taken into the bargain at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

Various versions of the SIRIUS 3RW30 soft starters are available:

- Standard version for fixed-speed three-phase motors, sizes S00, S0, S2 and S3, with integrated bypass contact system
- Version for fixed-speed three-phase motors in a 22.5 mm enclosure without bypass

Soft starters rated up to 75Hp (at 460 V) for standard applications in three-phase networks are available. Extremely small sizes, low power losses and simple commissioning are just three of the many advantages of this soft starter.

Function

The space required by the compact SIRIUS 3RW30 soft starter is often only about one third of that required by a contactor assembly for wye-delta starting of comparable rating. This not only saves space in the control cabinet and on the standard mounting rail but also does away completely with the wiring work needed for wye-delta starters. This is notable in particular for higher motor ratings which are only rarely available as fully wired solutions.

At the same time the number of cables from the starter to the motor is reduced from six to three. Compact dimensions, short start-up times, easy wiring and fast commissioning make themselves felt as clear-cut cost advantages.

The bypass contacts of these soft starters are protected during operation by an integrated solid-state arc quenching system. This prevents damage to the bypass contacts in the event of a fault, e. g. brief disconnection of the control voltage, mechanical shocks or life-related component defects on the coil operating mechanism or main contact spring.

The new series of devices comes with the "polarity balancing" control method, which is designed to prevent direct current components in two-phase controlled soft starters. On two-phase controlled soft starters the current resulting from superimposition of the two controlled phases flows in the uncontrolled phase. This results for physical reasons in an asymmetric distribution of the three phase currents during the motor ramp-up. This phenomenon cannot be influenced, but in most applications it is non-critical.

Controlling the power semiconductors results not only in this unbalance, however, but also in the previously mentioned direct current components which can cause severe noise generation on the motor at starting voltages of less than 50 %. The control method used for these soft starters eliminates these direct current components during the ramp-up phase and prevents the braking torque which they can cause.

It creates a motor ramp-up that is uniform in speed, torque and current rise, thus permitting a particularly gentle, two-phase starting of the motors. At the same time the acoustic quality of the starting operation comes close to the quality of a three-phase controlled soft starter. This is made possible by the on-going dynamic harmonizing and balancing of current half-waves of different polarity during the motor ramp-up. Hence the name "polarity balancing".

- Soft starting with voltage ramp; the starting voltage setting range U_s is 40 % to 100 % and the ramp time t_R can be set from 0 s to 20 s
- Integrated bypass contact system to minimize power loss
- Setting with two potentiometers
- Simple mounting and commissioning
- Mains voltages at 50/60 Hz, 200 to 480 V
- Two control voltage versions 24 V AC/DC and 110 to 230 V AC/DC
- Wide temperature range from -25 °C to +60 °C
- The built-in auxiliary contact ensures user-friendly control and possible further processing within the system ([for status graphs see page 17-248](#))

For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

Soft Starter
Control

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CONTROL
PRODUCTS

Technical specifications

Type	3RW30 1., 3RW30 2.		3RW30 3., 3RW30 4.			
Control electronics						
Rated values	Terminal A1/A2	V	24 ±20	110 ... 230 -15/+10	24 ±20	110 ... 230 -15/+10
Rated control supply voltage • Tolerance		%				
Rated control supply current • STANDBY • During pick-up • ON		mA	< 50 < 100 < 100	6 15 15	< 20 < 4000 20	< 50 < 500 < 50
Rated frequency • Tolerance		Hz	50/60 ±10			
Control input						
IN			ON/OFF			
Power consumption with version • 24 V DC • 110/230 V AC		mA	Approx. 12 AC: 3/6; DC: 1.5/3			
Relay outputs						
Output 1	ON	13/14	Operating indication (NO)			
Rated operational current		A	3 AC-15/AC-14 at 230 V, 1 DC-13 at 24 V			
Protection against overvoltages Short-circuit protection			Protection by means of varistor through contact 4 A gL/gG operational class; 6 A quick (fuse is not included in scope of supply)			
Operating indications						
		LEDs	DEVICE	STATE/BYPASSED/ FAILURE	DEVICE	STATE/BYPASSED/ FAILURE
Off			Green	Off	Green	Off
Start			Green	Green flashing	Green	Green flashing
Bypass			Green	Green	Green	Green
Error signals						
• 24 V DC: $U < 0.75 \times U_s$ or $U > 1.25 \times U_s$ • 110 ... 230 V AC: $U < 0.75 \times U_s$ or $U > 1.15 \times U_s$			Off	Red	Off	Red
Electrical overloading of bypass (reset by removing IN command)			Off	Red	Off	Red
Missing mains voltage, phase failure, missing load			Yellow	Red	--	--
Device fault			Green	Red	Green	Red
			Red	Red	Red	Red
Factory default						
Control times and parameters						
Control times						
Closing time (with connected control voltage)		ms	< 50			
Closing time (automatic/mains contactor mode)		ms	< 300			
Mains failure bridging time						
Control supply voltage		ms	50			
Mains failure response time¹⁾						
Load circuit		ms	500			
Starting parameters						
• Starting time		s	0 ... 20			
• Starting voltage		%	40 ... 100			
Start-up detection						
No						
Operating mode output 13/14						
Rising edge at	Start command		ON			
Falling edge at	Off command					

¹⁾ Mains failure detection only in standby state, not during operation.

For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

Soft Starter
Control

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CONTROL
PRODUCTS

Type	3RW30 1.-.BB.4 ... 3RW30 4.-.BB.4		
Power electronics			
Rated operational voltage	V AC	200 ... 480	
Tolerance	%	-15/+10	
Rated frequency	Hz	50/60	
Tolerance	%	±10	
Uninterrupted duty at 40 °C (% of I_{θ})	%	115	
Minimum load (% of I_{θ})	%	10 (at least 2 A)	
Maximum cable length between soft starter and motor	m	300	
Permissible installation height	m	5000 (derating from 1000, see characteristic curves); higher on request	
Permissible mounting position (auxiliary fan not available)			
Permissible ambient temperature	°C	-25 ... +60; (derating from +40)	
Operation	°C	-40 ... +80	
Storage	°C		
Degree of protection	IP20 for 3RW30 1. and 3RW30 2.; IP00 for 3RW30 3. and 3RW30 4.		

Type	3RW30 13 3RW30 14 3RW30 16 3RW30 17 3RW30 18					
Power electronics						
40 °C/50 °C/60 °C						
Load rating with rated operational current I_{θ}						
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	3.6/ 3.3 /3	6.5/ 6 /5.5	9/ 8 /7	12.5/ 12 /11	17.6/ 17 /14
Power loss						
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	0.25	0.5	1	2	4
• During starting with 300 % I_M (40 °C)	W	6	13	20	20	29
Permissible rated motor current and starts per hour for normal starting (Class 10)						
- Rated motor current $I_M^{(2)}$, starting time 10 s	A	3.6/ 3.3 /3	6.5/ 6 /5.5	9/ 8 /7	12.5/ 12 /11	17.6/ 17 /14
- Starts per hour ³⁾	1/h	200/ 150 /70	87/ 60 /50	50	85/ 70 /60	62/ 46 /60
- Rated motor current $I_M^{(2)}$, starting time 20 s	A	3.6/ 3.3 /3	6.5/ 6 /5.5	9/ 8 /7	12.5/ 12 /11	17.6/ 17 /14
- Starts per hour ³⁾	1/h	150/ 100 /50	64/ 46 /28	35	62/ 47 /37	45/ 32 /43

¹⁾ Measurement at 60 °C according to UL/CSA not required.

²⁾ With 300 % I_M .

³⁾ For intermittent duty S4 with ON period = 30 %, $T_U = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

Type	3RW30 26 3RW30 27 3RW30 28			
Power electronics				
40 °C/50 °C/60 °C				
Load rating with rated operational current I_{θ}				
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	25.3/ 23 /21	32.2/ 29 /26	38/ 34 /31
Power loss				
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	8	13	19
• During starting with 300 % I_M (40 °C)	W	47	55	64
Permissible rated motor current and starts per hour for normal starting (Class 10)				
- Rated motor current $I_M^{(2)}$, starting time 10 s	A	25/ 23 /21	32/ 29 /26	38/ 34 /31
- Starts per hour ³⁾	1/h	23	23	19
- Rated motor current $I_M^{(2)}$, starting time 20 s	A	25/ 23 /21	32/ 29 /26	38/ 34 /31
- Starts per hour ³⁾	1/h	15	16	12

¹⁾ Measurement at 60 °C according to UL/CSA not required.

²⁾ With 300 % I_M .

³⁾ For intermittent duty S4 with ON period = 30 %, $T_U = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

Type		3RW30 36	3RW30 37	3RW30 38	3RW30 46	3RW30 47
Power electronics		40 °C/50 °C/60 °C				
Load rating with rated operational current I_e						
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a						
	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
Power loss						
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.						
	W	6	12	15	12	21
• During starting with 300 % I_M (40 °C)						
	W	79	111	125	144	192
Permissible rated motor current and starts per hour for normal starting (Class 10)						
- Rated motor current $I_M^{(2)}$, starting time 10 s						
	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
- Starts per hour ³⁾						
	1/h	38	23	22	22	15
- Rated motor current $I_M^{(2)}$, starting time 20 s						
	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
- Starts per hour ³⁾						
	1/h	26	15	15	15	10

¹⁾ Measurement at 60 °C according to UL/CSA not required.

²⁾ With 300 % I_M .

³⁾ For intermittent duty S4 with ON period = 30 %, $T_U = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

Soft Starter
Control

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For Operation in the Control Cabinet




3RW Soft Starters

3RW30 for standard applications

Soft Starter
Control

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Soft starters	Type		3RW30 1.	3RW30 2.	3RW30 3.	3RW30 4.
Conductor cross-sections						
Screw terminals						
Front clamping point connected						
	• Solid	mm ²	2 x (1 ... 2.5); 2 x (2.5 ... 6) acc. to IEC 60947	2 x (1 ... 2.5); 2 x (2.5 ... 6) acc. to IEC 60947; max. 1 x 10	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• Finely stranded with end sleeve	mm ²	2 x (1.5 ... 2.5); 2 x (2.5 ... 6)	2 x (1 ... 2.5); 2 x (2.5 ... 6)	1 x (0.75 ... 25)	1 x (2.5 ... 35)
	• Stranded	mm ²	--	--	1 x (0.75 ... 35)	1 x (4 ... 70)
	• AWG cables - Solid - Solid or stranded - Stranded	AWG AWG AWG	2 x (16 ... 12) 2 x (14 ... 10) 1 x 8	2 x (16 ... 12) 2 x (14 ... 10) 1 x 8	1 x (18 ... 2) --	1 x (10 ... 2/0) --
Rear clamping point connected						
	• Solid	mm ²	--	--	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• Finely stranded with end sleeve	mm ²	--	--	1 x (1.5 ... 25)	1 x (2.5 ... 50)
	• Stranded	mm ²	--	--	1 x (1.5 ... 35)	1 x (10 ... 70)
	• AWG cables - Solid or stranded	AWG	--	--	1 x (16 ... 2)	1 x (10 ... 2/0)
Both clamping points connected						
	• Solid	mm ²	--	--	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• Stranded	mm ²	--	--	2 x (1.5 ... 25)	2 x (10 ... 50)
	• Finely stranded with end sleeve	mm ²	--	--	2 x (1.5 ... 16)	2 x (2.5 ... 35)
	• AWG cables - Solid or stranded	AWG	--	--	2 x (16 ... 2)	2 x (10 ... 1/0)
	• Tightening torque	NM lb.in	2 ... 2.5 18 ... 22	2 ... 2.5 18 ... 22	4.5 40	6.5 58
	Tools		PZ 2	PZ 2	PZ 2	Allen screw 4 mm
	Degree of protection		IP20	IP20	IP20 (IP00 terminal compartment)	IP20 (IP00 terminal compartment)
Spring-type terminals						
Main conductors						
	• Solid	mm ²	1 ... 4	1 ... 10	--	--
	• Finely stranded with end sleeve	mm ²	1 ... 2.5	1 ... 6, end sleeves without plastic collar	--	--
	• AWG cables - Solid or stranded (finely stranded) - Stranded	AWG AWG	16 ... 14 16 ... 12	16 ... 10 1 x 8	-- --	-- --
	Tools		DIN ISO 2380-1A0; 5 x 3	DIN ISO 2380-1A0; 5 x 3	--	--
	Degree of protection		IP20	IP20	--	--
Busbar connections						
Main conductors						
	• With cable lug acc. to DIN 46234 or max. 20 mm wide		--	--	--	2 x (10 ... 70)
	- Stranded	mm ²	--	--	--	2 x (10 ... 50)
	- Finely stranded	mm ²	--	--	--	2 x (7 ... 1/0)
	• AWG cables, solid or stranded	AWG	--	--	--	2 x (7 ... 1/0)

Soft starters	Type		3RW30 1. ... 3RW30 4.			
Conductor cross-sections						
Auxiliary conductors (1 or 2 conductors can be connected):						
Screw terminals						
	• Solid	mm ²	2 x (0.5 ... 2.5)			
	• Finely stranded with end sleeve	mm ²	2 x (0.5 ... 1.5)			
	• AWG cables - Solid or stranded - Finely stranded with end sleeve	AWG AWG	2 x (20 ... 14) 2 x (20 ... 16)			
	• Terminal screws - Tightening torque	NM lb.in	0.8 ... 1.2 7 ... 10.3			
Spring-type terminals						
	• Solid	mm ²	2 x (0.25 ... 2.5)			
	• Finely stranded with end sleeve	mm ²	2 x (0.25 ... 1.5)			
	• AWG cables, solid or stranded	AWG	2 x (24 ... 14)			

For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

Type	3RW30 03	
Control electronics		
Rated values		
Rated control supply voltage	V	24 ... 230 AC/DC
• Tolerance	%	± 10
Rated control supply current	mA	25 ... 4
Rated frequency at AC	Hz	50/60
• Tolerance	%	± 10
Starting time	s	0.1 ... 20 (adjustable)
Starting voltage	%	40 ... 100 (adjustable)
Ramp-down time	s	0 ... 20 (adjustable)
Power electronics		
Rated operational voltage	V AC	200 ... 400
Tolerance	%	± 10
Rated frequency	Hz	50/60
Tolerance	%	± 10
Uninterrupted duty (% of I_e)	%	100
Minimum load¹⁾ (% of I_e); at 40 °C	%	9
Maximum conductor length between soft starter and motor	m	100 ²⁾
Degree of protection acc. to IEC 60529	IP20 (IP00 terminal compartment)	
Permissible installation height	m	5000 (derating from 1000, see characteristic curves); higher on request
Permissible mounting position		
Permissible ambient temperature	°C	-25 ... +60; (derating from +40)
Operation	°C	-40 ... +80
Storage	°C	-40 ... +80
Load rating with rated operational current I_e		
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting, AC-53a		
- At 40 °C	A	3
- At 50 °C	A	2.6
- At 60 °C	A	2.2
• Acc. to IEC and UL/CSA ¹⁾ , for butt-mounting, AC-53a		
- At 40 °C	A	2.6
- At 50 °C	A	2.2
- At 60 °C	A	1.8
Power loss		
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	6.5
• At utilization of max. switching frequency	W	3
Permissible starts per hour		
• For intermittent duty S4, $T_u = 40$ °C, stand-alone installation vertical	1/h	1500
• ON period = 70 %	% I_e /s	300/0.2
Conductor cross-sections		
Screw terminals (1 or 2 conductors connectable) For standard screwdriver size 2 and Pozidriv 2	• Main conductors	
	- Solid	mm ² 1 x (0.5 ... 4); 2 x (0.5 ... 2.5)
	- Finely stranded with end sleeve	mm ² 1 x (0.5 ... 2.5); 2 x (0.5 ... 1.5)
	- Stranded	mm ² -
	- AWG cables, solid or stranded	AWG 2 x (20 ... 14)
	- Terminal screws	M3, PZ2
	- Tightening torque	NM 0.8 ... 1.2 lb.in 7.1 ... 8.9
	• Auxiliary conductors	
	- Solid	mm ² 1 x (0.5 ... 4); 2 x (0.5 ... 2.5)
	- Finely stranded with end sleeve	mm ² 1 x (0.5 ... 2.5); 2 x (0.5 ... 1.5)
	- AWG cables, solid or stranded	AWG 2 x (20 ... 14)
	- Terminal screws	M3, PZ2
	- Tightening torque	NM 0.8 ... 1.2 lb.in 7 ... 8.9
Spring-type terminals	Main and auxiliary conductors	
	• Solid	mm ² 2 x (0.25 ... 1.5)
	• Finely stranded with end sleeve	mm ² 2 x (0.25 ... 1)
	• AWG cables, solid or stranded	mm ² 2 x (24 ... 16)

¹⁾ The rated motor current (specified on the motor's name plate) should at least amount to the specified percentage of the SIRIUS soft starter unit's rated operational current I_e .

²⁾ If this value is exceeded, problems with line capacities may arise, which can result in false firing.

For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

	Standard	Parameters
Electromagnetic compatibility Acc. to EN 60947-4-2		
<i>EMC interference immunity</i>		
Electrostatic discharge (ESD)	EN 61000-4-2	±4 kV contact discharge, ±8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Frequency range: 80 ... 2000 MHz with 80 % at 1 kHz Degree of severity 3: 10 V/m
Conducted RF interference	EN 61000-4-6	Frequency range: 150 kHz ... 80 MHz with 80 % at 1 kHz Interference 10 V
RF voltages and RF currents on cables		
• Burst	EN 61000-4-4	±2 kV/5 kHz
• Surge	EN 61000-4-5	±1 kV line to line ±2 kV line to earth
<i>EMC interference emission</i>		
EMC interference field strength	EN 55011	Limit value of Class A at 30 ... 1000 MHz, limit value of Class B for 3RW30 2.; 24 V AC/DC
Radio interference voltage	EN 55011	Limit value of Class A at 0.15 ... 30 MHz, limit value of Class B for 3RW30 2.; 24 V AC/DC
<i>Radio interference suppression filters</i>		
Degree of noise suppression A (industrial applications)	Not required	
Degree of noise suppression B (applications for residential areas)	Not available ¹⁾ Not required for 3RW30 1. and 3RW30 2.; required for 3RW30 3. and 3RW30 4. (see Table)	
Control voltage		
• 230 V AC/DC		
• 24 V AC/DC		

¹⁾ Degree of noise suppression B cannot be obtained through the use of filters as the strength of the electromagnetic field is not attenuated by the filter.

Soft starter type	Rated current Soft starters A	Recommended filters ¹⁾		
		Voltage range 200 ... 480 V		
		Filter type	Rated current filters A	Terminals mm ²
3RW30 36	45	4EF1512-1AA10	50	16
3RW30 37	63	4EF1512-2AA10	66	25
3RW30 38	72	4EF1512-3AA10	90	25
3RW30 46	80	4EF1512-3AA10	90	25
3RW30 47	106	4EF1512-4AA10	120	50

¹⁾ The radio interference suppression filter is used to remove the conducted interference from the main circuit. The field-related emissions comply with degree of noise suppression B. Filter selection applies under standard conditions: 10 starts per hour, start time 4 s at 300 % I_N .

Type Number	Max. Fuse Class K5, RK5, RK1	Max. Fuse Class J	Short Voltage Circuit	Voltage
<i>Standard short circuit ratings 3RW30</i>				
3RW30 13	--	15 A	5 kA	480 V
3RW30 14	--	25 A	5 kA	480 V
3RW30 16	--	36 A	5 kA	480 V
3RW30 17	--	50 A	5 kA	480 V
3RW30 18	--	60 A	5 kA	480 V
3RW30 26	100 A	100 A	5 kA	480 V
3RW30 27	125 A	125 A	5 kA	480 V
3RW30 28	125 A	125 A	5 kA	480 V
3RW30 36	175 A	175 A	10 kA	480 V
3RW30 37	250 A	250 A	10 kA	480 V
3RW30 38	250 A	250 A	10 kA	480 V
3RW30 46	--	300 A	10 kA	480 V
3RW30 47	--	350 A	10 kA	480 V

High capacity short circuit ratings 3RW30

3RW30 13	--	15 A	42 kA	480 V
3RW30 14	--	25 A	42 kA	480 V
3RW30 16	--	25 A	42 kA	480 V
3RW30 17	--	25 A	42 kA	480 V
3RW30 18	--	25 A	42 kA	480 V
3RW30 26	60 A	100 A	42 kA	480 V
3RW30 27	60 A	125 A	42 kA	480 V
3RW30 28	60 A	125 A	42 kA	480 V
3RW30 36	100 A	175 A	30 kA	480 V
3RW30 37	100 A	200 A	30 kA	480 V
3RW30 38	100 A	200 A	30 kA	480 V
3RW30 46	110 A	200 A	42 kA	480 V
3RW30 47	110 A	200 A	42 kA	480 V

For solid-state motor controller, Type 3RW301: Applicable in an enclosure with minimum overall dimensions of 200 by 120 by 200 mm.

For solid-state motor controller, Type 3RW302: Applicable in an enclosure with minimum overall dimensions of 370 by 175 by 195 mm.

For solid-state motor controller, Type 3RW303: Applicable in an enclosure with minimum overall dimensions of 450 by 220 by 235 mm.

For solid-state motor controller, Type 3RW304: Applicable in an enclosure with minimum overall dimensions of 450 by 220 by 235 mm.

Soft Starter
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For Operation in the Control Cabinet

3RW Soft Starters

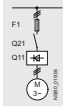
3RW30 for standard applications

Fuse assignment

The type of coordination to which the motor feeder with soft starter is mounted depends on the application-specific requirements. Normally, fuseless mounting (combination of motor starter protector/circuit breaker and soft starter) is sufficient.

If type of coordination "2" is to be fulfilled, semiconductor fuses must be fitted in the motor feeder.

Fused version (line protection only)



Soft starters TOC 1 Q11 Type	Rated current A	Line protection, maximum		Size	Line contactors (optional) Q21
		F1 Type	Rated current A		
Type of coordination "1"¹⁾: $I_q = 65 \text{ kA at } 480 \text{ V } 10 \%$					
3RW30 03 ²⁾	3	3NA3 805 ³⁾	20	000	3RT10 15
3RW30 13	3.6	3NA3 803-6	10	000	3RT10 15
3RW30 14	6.5	3NA3 805-6	16	000	3RT10 15
3RW30 16	9	3NA3 807-6	20	000	3RT10 16
3RW30 17	12.5	3NA3 810-6	25	000	3RT10 24
3RW30 18	17.6	3NA3 814-6	35	000	3RT10 26
3RW30 26	25	3NA3 822-6	63	00	3RT10 26
3RW30 27	32	3NA3 824-6	80	00	3RT10 34
3RW30 28	38	3NA3 824-6	80	00	3RT10 35
3RW30 36	45	3NA3 130-6	100	1	3RT10 36
3RW30 37	63	3NA3 132-6	125	1	3RT10 44
3RW30 38	72	3NA3 132-6	125	1	3RT10 45
3RW30 46	80	3NA3 136-6	160	1	3RT10 45
3RW30 47	106	3NA3 136-6	160	1	3RT10 46

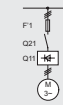
¹⁾ The types of coordination are explained in more detail under "3RA1 Fuseless Load Feeders".

The type of coordination "1" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

²⁾ $I_q = 50 \text{ kA at } 400 \text{ V}$.

³⁾ 3NA3 805-1 (LV HRC00), 5SB2 61 (DIAZED), 5SE2 201-6 (NEOZED)

Fused version with 3NE1 SITOR fuses (semiconductor and line protection)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" —> "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" —> "SITOR Semiconductor Fuses" or go to www.siemens.com/sitor —> "Products" —> "BETA Protecting" —> "SITOR"

Soft starters TOC 2 Q11 Type	Rated current A	All-range fuses		Size	Line contactors (optional) Q21
		F1 Type	Rated current A		
Type of coordination "2"¹⁾: $I_q = 65 \text{ kA at } 480 \text{ V } 10 \%$					
3RW30 03 ²⁾	3	3NE1 813-0 ³⁾	16	000	3RT10 15
3RW30 13	3.6	3NE1 813-0	16	000	3RT10 15
3RW30 14	6.5	3NE1 813-0	16	000	3RT10 15
3RW30 16	9	3NE1 813-0	16	000	3RT10 16
3RW30 17	12.5	3NE1 813-0	16	000	3RT10 24
3RW30 18	17.6	3NE1 814-0	20	000	3RT10 26
3RW30 26	25	3NE1 803-0	35	000	3RT10 26
3RW30 27	32	3NE1 020-2	80	00	3RT10 34
3RW30 28	38	3NE1 020-2	80	00	3RT10 35
3RW30 36	45	3NE1 020-2	80	00	3RT10 36
3RW30 37	63	3NE1 820-0	80	000	3RT10 44
3RW30 38	72	3NE1 820-0	80	000	3RT10 45
3RW30 46	80	3NE1 021-0	100	00	3RT10 45
3RW30 47	106	3NE1 022-0	125	00	3RT10 46

¹⁾ The types of coordination are explained in more detail under "3RA1 Fuseless Load Feeders".

The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

²⁾ $I_q = 50 \text{ kA at } 400 \text{ V}$.

³⁾ No SITOR fuse required!
Alternatively: 3NA3 803 (LV HRC00), 5SB2 21 (DIAZED), 5SE2 206 (NEOZED).

TOC 1	Type of coordination "1"
TOC 2	Type of coordination "2"
The types of coordination are explained in more detail under "3RA1 Fuseless Load Feeders".	
These types of coordination are indicated in the Technical specifications by gray backgrounds.	

Soft Starter
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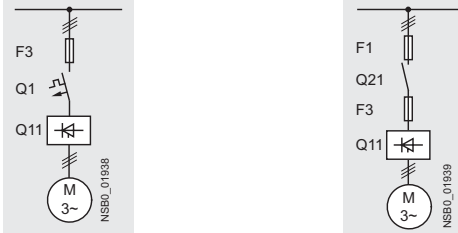
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For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

Fused version with 3NE3 SITOR fuses (semiconductor protection by fuse, line and overload protection by motor starter protector; alternatively, installation with contactor and overload relay possible)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" → "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" → "SITOR Semiconductor Fuses" or go to www.siemens.com/sitor → "Products" → "BETA Protecting" → "SITOR"

Soft starters Q11 Type	Rated current A	Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses, minimum		
		F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size
Type of coordination "2"¹⁾: I_q = 65 kA at 480 V 10 %										
3RW30 03 ²⁾	3	--	--	--	--	--	--	--	--	--
3RW30 13	3.6	--	--	--	--	--	--	3NE4 101	32	0
3RW30 14	6.5	--	--	--	--	--	--	3NE4 101	32	0
3RW30 16	9	--	--	--	--	--	--	3NE4 101	32	0
3RW30 17	12.5	--	--	--	--	--	--	3NE4 101	32	0
3RW30 18	17.6	--	--	--	3NE3 221	100	1	3NE4 101	32	0
3RW30 26	25	--	--	--	3NE3 221	100	1	3NE4 102	40	0
3RW30 27	32	--	--	--	3NE3 222	125	1	3NE4 118	63	0
3RW30 28	38	--	--	--	3NE3 222	125	1	3NE4 118	63	0
3RW30 36	45	--	--	--	3NE3 224	160	1	3NE4 120	80	0
3RW30 37	63	--	--	--	3NE3 225	200	1	3NE4 121	100	0
3RW30 38	72	3NE3 221	100	1	3NE3 227	250	1	--	--	--
3RW30 46	80	3NE3 222	125	1	3NE3 225	200	1	--	--	--
3RW30 47	106	3NE3 224	160	1	3NE3 231	350	1	--	--	--

Soft starters Q11 Type	Rated current A	Semiconductor fuses max.			Semiconductor fuses min.			Semiconductor fuses max.			Cylindrical fuses	
		F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A
Type of coordination "2"¹⁾: I_q = 65 kA at 480 V 10 %												
3RW30 03 ²⁾	3	--	--	--	3NE8 015-1	25	00	3NE8 015-1	25	00	3NC1 010	10
3RW30 13	3.6	--	--	--	3NE8 015-1	25	00	3NE8 015-1	25	00	3NC2 220	20
3RW30 14	6.5	--	--	--	3NE8 015-1	25	00	3NE8 015-1	25	00	3NC2 220	20
3RW30 16	9	--	--	--	3NE8 015-1	25	00	3NE8 015-1	25	00	3NC2 220	20
3RW30 17	12.5	--	--	--	3NE8 015-1	25	00	3NE8 018-1	63	00	3NC2 250	50
3RW30 18	17.6	--	--	--	3NE8 003-1	35	00	3NE8 021-1	100	00	3NC2 263	63
3RW30 26	25	3NE4 117	50	0	3NE8 017-1	50	00	3NE8 021-1	100	00	3NC2 263	63
3RW30 27	32	3NE4 118	63	0	3NE8 018-1	63	00	3NE8 022-1	125	00	3NC2 280	80
3RW30 28	38	3NE4 118	63	0	3NE8 020-1	80	00	3NE8 022-1	125	00	3NC2 280	80
3RW30 36	45	3NE4 120	80	0	3NE8 020-1	80	00	3NE8 024-1	160	00	3NC2 280	80
3RW30 37	63	3NE4 121	100	0	3NE8 021-1	100	00	3NE8 024-1	160	00	--	--
3RW30 38	72	--	--	--	3NE8 022-1	125	00	3NE8 024-1	160	00	--	--
3RW30 46	80	--	--	--	3NE8 022-1	125	00	3NE8 024-1	160	00	--	--
3RW30 47	106	--	--	--	3NE8 024-1	160	00	3NE8 024-1	160	00	--	--

Soft starters Q11 Type	Rated current A	Line contactors (optional)		Motor starter protectors 400 V +10 %		Line protection, maximum		
		Q21	Q1	Type	Rated current A	F1 Type	Rated current A	Size
Type of coordination "2"¹⁾: I_q = 65 kA at 480 V 10 %								
3RW30 03 ²⁾	3	3RT10 15	3RT10 15	3RV10 11-1EA10	4	3NA3 805 ³⁾	20	000
3RW30 13	3.6	3RT10 15	3RT10 15	3RV10 21-1FA10	5	3NA3 803-6	16	000
3RW30 14	6.5	3RT10 15	3RT10 15	3RV10 21-1HA10	8	3NA3 805-6	16	000
3RW30 16	9	3RT10 16	3RT10 16	3RV10 21-1JA10	10	3NA3 807-6	20	000
3RW30 17	12.5	3RT10 24	3RT10 24	3RV10 21-1KA10	12.5	3NA3 810-6	25	000
3RW30 18	17.6	3RT10 26	3RT10 26	3RV10 21-1BA10	20	3NA3 814-6	35	000
3RW30 26	25	3RT10 26	3RT10 26	3RV10 31-4DA10	25	3NA3 822-6	63	00
3RW30 27	32	3RT10 34	3RT10 34	3RV10 31-4EA10	32	3NA3 824-6	80	00
3RW30 28	38	3RT10 35	3RT10 35	3RV10 31-4FA10	40	3NA3 824-6	80	00
3RW30 36	45	3RT10 36	3RT10 36	3RV10 31-4GA10	45	3NA3 130-6	100	1
3RW30 37	63	3RT10 44	3RT10 44	3RV10 41-4JA10	63	3NA3 132-6	125	1
3RW30 38	72	3RT10 45	3RT10 45	3RV10 41-4KA10	75	3NA3 132-6	125	1
3RW30 46	80	3RT10 45	3RT10 45	3RV10 41-4LA10	90	3NA3 136-6	160	1
3RW30 47	106	3RT10 46	3RT10 46	3RV10 41-4MA10	100	3NA3 136-6	160	1

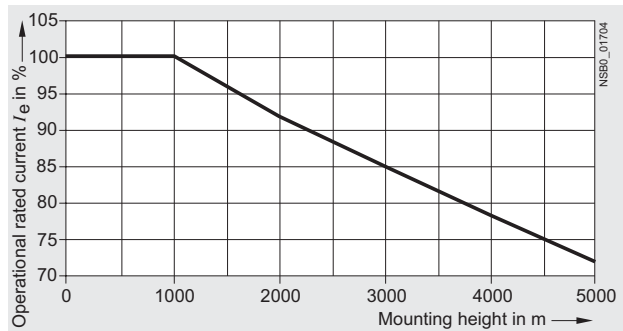
¹⁾ The types of coordination are explained under "3RA1 Fuseless Load Feeders". The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.
²⁾ I_q = 50 kA at 400 V.
³⁾ 3NA3 805-1 (LV HRC00), 5SB2 61 (DIAZED).

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Characteristic curves

Permissible installation height



At an installation height above 2000 m, the max. permissible operational voltage is reduced to 460 V.

More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 300 % $I_{n \text{ motor}}$).
The soft starter rating can be selected to be as high as the rating of the motor used

Application	Conveyor belt	Roller conveyor	Compressor	Small fan	Pump	Hydraulic pump
Starting parameters						
• Voltage ramp and current limiting						
- Starting voltage	% 70	60	50	40	40	40
- Starting time	s 10	10	20	20	10	10

Note:
These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during commissioning. The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

Configuration

The 3RW solid-state motor controllers are designed for easy starting conditions. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. For accurate dimensioning, use the Win-Soft Starter selection and simulation program.

If necessary, an overload relay for heavy starting must be selected where long starting times are involved. PTC sensors are recommended.

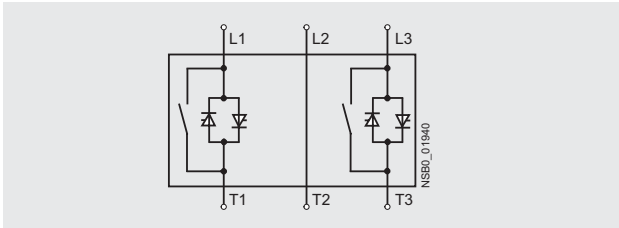
In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses, controls and overload relays) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

Note:

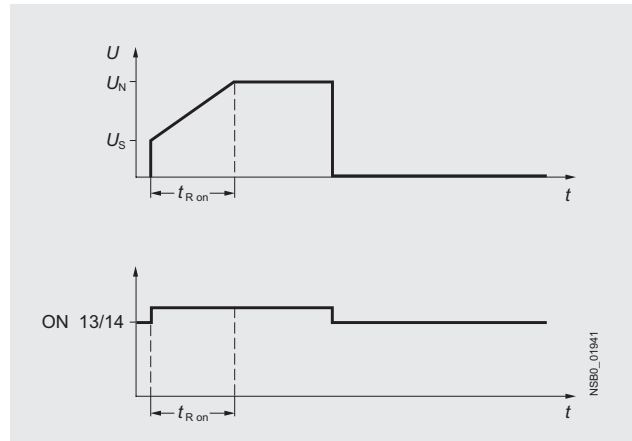
When induction motors are switched on, voltage drops occur as a rule on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

Schematic circuit diagram



A bypass contact system is already integrated in the 3RW30 soft starter and therefore does not have to be ordered separately.

Status graphs



Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded from:

www.usa.siemens.com/softstarters > Software

More information can be found on the Internet at:

www.usa.siemens.com/softstarters

Overview

SIRIUS 3RW40 soft starters have all the same advantages as the 3RW30 soft starters.

The SIRIUS 3RW40 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that no power loss has to be taken into the bargain at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

At the same time this soft starter comes with additional integrated functions such as adjustable current limiting, motor overload and intrinsic device protection, and optional thermistor motor protection. The higher the motor rating, the more important these functions become because they make it unnecessary to purchase and install protection equipment such as overload relays.

Internal intrinsic device protection prevents the thermal overloading of the thyristors and the power section defects this can cause. As an option the thyristors can also be protected by semiconductor fuses from short-circuiting.

Thanks to integrated status monitoring and fault monitoring, this compact soft starter offers many different diagnostics options. Up to four LEDs and relay outputs permit differentiated monitoring and diagnostics of the operating mechanism by indicating the operating state as well as for example mains or phase failure, missing load, non-permissible tripping time/class setting, thermal overloading or device faults.

Soft starters rated up to 300 Hp (at 460 V) for standard applications in three-phase networks are available. Extremely small sizes, low power losses and simple start-up are just three of the many advantages of the SIRIUS 3RW40 soft starters.

"Increased safety" type of protection EEx e according to ATEX directive 94/9/EC

The 3RW40 soft starter sizes S0 to S12 are suitable for the starting of explosion-proof motors with "increased safety" type of protection EEx e.

See "Appendix" -> "Standards and approvals" -> "Type overview of approved devices for potentially explosive areas (ATEX explosion protection)".

Function

The space required by the compact SIRIUS 3RW40 soft starter is often only about one third of that required by a contactor assembly for wye-delta starting of comparable rating. This not only saves space in the control cabinet and on the standard mounting rail but also does away completely with the wiring work needed for wye-delta starters. This is notable in particular for higher motor ratings which are only rarely available as fully wired solutions.

At the same time the number of cables from the starter to the motor is reduced from six to three. Compact dimensions, short start-up times, easy wiring and fast commissioning make themselves felt as clear-cut cost advantages.

The bypass contacts of these soft starters are protected during operation by an integrated solid-state arc quenching system. This prevents damage to the bypass contacts in the event of a fault, e. g. brief disconnection of the control voltage, mechanical shocks or life-related component defects on the coil operating mechanism or main contact spring.

The starting current of particularly powerful operating mechanisms can place an unjustifiable load on the local supply system. Soft starters reduce this starting current by means of their voltage ramp. Thanks to the adjustable current limiting, the SIRIUS 3RW40 soft starter takes even more pressure off the supply system. It leaves the set start ramp during the ramp-up – the ramp gradient is fixed by the starting voltage and the ramp time – as soon as the selected current limit is reached. From this moment the voltage of the soft starter is controlled so that the current supplied to the motor remains constant. This process is ended either by completion of the motor ramp-up or by tripping by the intrinsic device protection or the motor overload protection. As the result of this function the actual motor ramp-up can well take longer than the ramp time selected on the soft starter.

Thanks to the integrated motor overload protection according to IEC 60947-4-2 there is no need of an additional overload relay on the new soft starters. The rated motor current, the setting of the overload tripping time (Class times) and the reset of the motor overload protection function can be adjusted easily and quickly. Using a 4-step rotary potentiometer it is possible to set different overload tripping times on the soft starter. In addition to Class 10, 15 and 20 it is also possible to switch off the motor overload protection if a different motor management control device is to be used for this function, e. g. with connection to PROFIBUS.

Device versions with thermistor motor protection evaluation are available up to a rating of 55 kW (at 400 V). A "Thermoclick" measuring probe can be connected directly, as can a PTC of type A. Thermal overloading of the motor, open circuits and short-circuits in the sensor circuit all result in the direct disconnection of the soft starter. And if ever the soft starter trips, various reset options are available the same as with intrinsic device protection and motor load protection: manually with the reset button, automatically or remotely through brief disconnection of the control voltage.

The new series of devices comes with the "polarity balancing" control method, which is designed to prevent direct current components in two-phase controlled soft starters. On two-phase controlled soft starters the current resulting from superimposition of the two controlled phases flows in the uncontrolled phase. This results for physical reasons in an asymmetric distribution of the three phase currents during the motor ramp-up. This phenomenon cannot be influenced, but in most applications it is non-critical.

Controlling the power semiconductors results not only in this unbalance, however, but also in the previously mentioned direct current components which can cause severe noise generation on the motor at starting voltages of less than 50 %.

The control method used for these soft starters eliminates these direct current components during the ramp-up phase and prevents the braking torque which they can cause. It creates a motor ramp-up that is uniform in speed, torque and current rise, thus permitting a particularly gentle, two-phase starting of the motors. At the same time the acoustic quality of the starting operation comes close to the quality of a three-phase controlled soft starter. This is made possible by the on-going dynamic harmonizing and balancing of current half-waves of different polarity during the motor ramp-up. Hence the name "polarity balancing".

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3RW Soft Starters

3RW40 for standard applications

As an option the thyristors can also be protected by SITOR semiconductor fuses from short-circuiting so that the soft starter is still functional after a short-circuit (type of coordination 2). Three LEDs are used to indicate the operating state as well as possible errors, e. g. non-permissible tripping time (CLASS setting), mains or phase failure, missing load, thermal overloading or device faults.

- Soft starting with voltage ramp; the starting voltage setting range U_s is 40 to 100 % and the ramp time t_R can be set from 0 to 20 s.³⁾
- Smooth ramp-down with voltage ramp; the running down time t_{off} can be set between 0 s to 20 s.³⁾
- Solid-state motor overload and intrinsic device protection
- Optional thermistor motor protection (up to size S3)
- Remote reset (integrated up to size S3, optional for size S6 and larger)
- Adjustable current limiting

- Integrated bypass contact system to minimize power loss
- Setting with potentiometers
- Simple mounting and commissioning
- Integrated status monitoring and fault monitoring
- Mains voltages 50/60 Hz, 200 to 600 V
- Various control voltage versions
 - Sizes S0 to S3: 24 V AC/DC and 110 to 230 V AC/DC
 - Sizes S6 to S12: 115 V AC and 230 V AC.
 Control by way of the internal 24 V DC supply and direct control by means of PLC are possible.
- Wide temperature range from -25 to +60 °C
- Built-in auxiliary contacts ensure user-friendly control and possible further processing within the system (for status graphs see page 17-263)

Technical specifications

Type	3RW40 2.		3RW40 3., 3RW40 4.			
Control electronics						
Rated values	Terminal A1/A2	V				
Rated control supply voltage			24	110 ... 230	24	110 ... 230
• Tolerance		%	±20	-15/+10	±20	-15/+10
Rated control supply current		mA				
• STANDBY		mA	< 150	< 50	< 200	< 50
• During pick-up		mA	< 200	< 100	< 5000	< 1500
• ON without fan		mA	< 250	< 50	< 200	< 50
• ON with fan		mA	< 300	< 70	< 250	< 70
Rated frequency		Hz	50/60			
• Tolerance		%	±10			
Control inputs						
IN			ON/OFF			
Rated operational current		mA				
• AC		mA	Approx. 12	3/6	Approx. 12	3/6
• DC		mA	Approx. 12	1.5/3	Approx. 12	1.5/3
Relay outputs						
Output 1	ON/RUN mode ¹⁾	13/14	Operating indication (NO)			
Output 2	BYPASSED	23/24	Bypass indication (NO)			
Output 3	OVERLOAD/FAILURE	95/96/98	Overload/error indication (NC/NO)			
Rated operational current		A	3 AC-15/AC-14 at 230 V, 1 DC-13 at 24 V			
Protection against overvoltages			Protection by means of varistor through contact			
Short-circuit protection			4 A gL/gG operational class; 6 A quick (fuse is not included in scope of supply)			

¹⁾ Factory default: ON mode.

Type	3RW40 5.		3RW40 7.			
Control electronics						
Rated values	Terminal A1/A2	V AC				
Rated control supply voltage			115	230	115	230
• Tolerance		%	-15/+10		-15/+10	
Rated control supply current STANDBY		mA	15		15	
Rated control supply current ON ¹⁾		mA	440	200	660	360
Rated frequency		Hz	50/60		50/60	
• Tolerance		%	±10		±10	
Control inputs						
IN			ON/OFF			
Rated operational current		mA	Approx. 10 acc. to DIN 19240			
Rated operational voltage		V DC	24 from internal supply dc+ or external DC supply (acc. to DIN 19240) through terminals and IN			
Relay outputs						
Output 1	ON/RUN mode ²⁾	13/14	Operating indication (NO)			
Output 2	BYPASSED	23/24	Bypass indication (NO)			
Output 3	OVERLOAD/FAILURE	95/96/98	Overload/error indication (NC/NO)			
Rated operational current		A	3 AC-15/AC-14 at 230 V, 1 DC-13 at 24 V			
Protection against overvoltages			Protection by means of varistor through contact			
Short-circuit protection			4 A gL/gG operational class; 6 A quick (fuse is not included in scope of supply)			

¹⁾ Values for the coil power consumption at +10 % U_n , 50 Hz.

²⁾ Factory default: ON mode.

³⁾ Actual motor start times are load dependent.

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3RW Soft Starters

3RW40 for standard applications

Type	3RW40 2., 3RW40 3., 3RW40 4.				
Control electronics					
Operating indications	LEDs	DEVICE	STATE/BYPASSED/FAILURE	OVERLOAD	
Off		Green	Off	Off	
Start		Green	Green flashing	Off	
Bypass		Green	Green	Off	
Ramp-down		Green	Green flashing	Off	
Alarm signals					
I_e /Class setting not permissible		Green	Not relevant	Red flashing	
Start inhibited/thyristors too hot		Yellow flashing	Not relevant	Off	
Error signals					
• 24 V: $U < 0.75 \times U_s$ or $U > 1.25 \times U_s$		Off	Red	Off	
• 110 ... 230 V: $U < 0.75 \times U_s$ or $U > 1.15 \times U_s$		Off	Red	Off	
Non-permissible I_e /Class setting for edge 0 → 1 on input IN		Green	Red	Red flashing	
Motor protection shut-down (overload thermistor)		Green	Off	Red	
Thermistor defective (open circuit, short-circuit)		Green	Off	Red flickering	
Thermal overloading of the thyristors		Yellow	Red	Off	
Missing mains voltage, phase failure, missing load		Green	Red	Off	
Device fault		Red	Red	Off	
Type	3RW40 5. and 3RW40 7.				
Control electronics					
Operating indications	LEDs	DEVICE	STATE/BYPASSED	FAILURE	OVERLOAD
Off		Green	Off	Off	Off
Start		Green	Green flashing	Off	Off
Bypass		Green	Green	Off	Off
Ramp-down		Green	Green flashing	Off	Off
Alarm signals					
I_e /Class setting not permissible		Green	Not relevant	Not relevant	Red flashing
Start inhibited/thyristors too hot		Yellow flashing	Not relevant	Not relevant	Off
Error signals					
$U < 0.75 \times U_s$ or $U > 1.15 \times U_s$		Off	Off	Red	Off
Non-permissible I_e /Class setting for edge 0 → 1 on input IN		Green	Off	Red	Red flashing
Motor protection shut-down		Green	Off	Off	Red
Thermal overloading of the thyristors		Yellow	Off	Red	Off
Missing mains voltage, phase failure, missing load		Green	Off	Red	Off
Device fault		Red	Off	Red	Off

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3RW Soft Starters

Type	3RW40 ..			Factory default
Protection functions				
Motor protection functions				
Trips in the event of		Thermal overloading of the motor		
Trip class to IEC 60947-4-1	Class	10/15/20		10
Phase failure sensitivity	%	> 40		
Overload warning		No		
Thermistor protection acc. to IEC 60947-8, type A/IEC 60947-5-1		Yes ¹⁾		
Reset option after tripping		Manual/automatic/remote reset ²⁾		
		(MAN/AUTO/REMOTE ²⁾)		
Recovery time	min	5		
Device protection functions				
Trips in the event of		Thermal overloading of the thyristors or bypass ³⁾		
Reset option after tripping		Manual/automatic/remote reset ²⁾		
		(MAN/AUTO/REMOTE ²⁾)		
Recovery time				
• During overloading of the thyristors	s	30		
• During overloading of the bypass	s	60		
Control times and parameters				
Control times				
Closing time (with connected control voltage)	ms	< 50		
Closing time (automatic/mains contactor mode)	ms	<300		
Recovery time (closing command in active ramp-down)	ms	100		
Mains failure bridging time				
Control supply voltage	ms	50		
Mains failure response time				
Load circuit	ms	500		
Reclosing lockout after overload trip				
Motor protection trip	min	5		
Device protection trip				
• During overloading of the thyristors	s	30		
• During overloading of the bypass	s	60		
Starting parameters				
Starting time	s	0 ... 20		7.5
Starting voltage	%	40 ... 100		40
Starting current limit		1.3 ... 5 x I _e		5 x I _e
Ramp-down parameters				
Ramp-down time	s	0 ... 20		0
Reset mode parameters (for motor/device protection shut-down)				
Manual reset	LEDs	Off		Off
Automatic reset	LEDs	Yellow		
Remote reset (REMOTE) ²⁾	LEDs	Green		
Start-up detection				
		Yes		
Operating mode output 13/14				
Rising edge at	Start command			
Falling edge at	Off command			
	Ramp-down end	ON		ON
		RUN		

¹⁾ Optional up to size S3 (device variant).

²⁾ Integrated remote reset (REMOTE) available only for 3RW40 2. to 3RW40 4.; remote reset with 3RU19 accessory module available for 3RW40 5. and 3RW40 7..

³⁾ Bypass protection up to size S3.

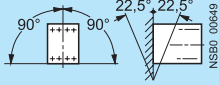
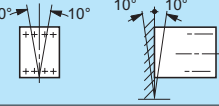
For Operation in the Control Cabinet

3RW Soft Starters

3RW40 for standard applications

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Type		3RW40 2.-..B.4, 3RW40 3.-..B.4, 3RW40 4.-..B.4	3RW40 2.-..B.5, 3RW40 3.-..B.5, 3RW40 4.-..B.5	3RW40 5.-..BB.4, 3RW40 7.-..BB.4	3RW40 5.-..BB.5, 3RW40 7.-..BB.5
Power electronics					
Rated operational voltage	V AC	200 ... 480	400 ... 600	200 ... 460	400 ... 600
Tolerance	%	-15/+10	-15/+10	-15/+10	-15/+10
Maximum blocking voltage (thyristor)	V AC	1600		1400	1800
Rated frequency	Hz	50/60			
Tolerance	%	±10			
Uninterrupted duty at 40 °C (% of I_e)	%	115			
Minimum load (% of minimum selectable rated motor current I_M)	%	20 (at least 2 A)			
Maximum cable length between soft starter and motor	m	300			
Permissible installation height	m	5000 (derating from 1000, see characteristic curves); higher on request			
Permissible mounting position		<ul style="list-style-type: none"> With auxiliary fan (for 3RW40 2. ... 3RW40 4.)  <ul style="list-style-type: none"> Without auxiliary fan (for 3RW40 2. ... 3RW40 4.)  <p>-- (fan integrated in the soft starter)</p>			
Permissible ambient temperature					
Operation	°C	-25 ... +60; (derating from +40)			
Storage	°C	-40 ... +80			
Degree of protection		IP20 for 3RW40 2.; IP00 for 3RW40 3. and 3RW40 4.		IP00	

Type		3RW40 24	3RW40 26	3RW40 27	3RW40 28
Power electronics					
40 °C/50 °C/60 °C					
Load rating with rated operational current I_e					
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	12.5/11/10	25.3/23/21	32.2/29/26	38/34/31
Smallest adjustable rated motor current I_M					
For the motor overload protection	A	5	10	17	23
Power loss					
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	2	8	13	19
• During starting with 300 % I_M (40°C)	W	17	47	55	64
Permissible rated motor current and starts per hour					
• Normal starting (Class 10)					
- Rated motor current $I_M^{(2)}$, starting time 3 s	A	12.5/11/10	25.3/23/21	32.2/29/26	38/34/31
- Starts per hour ³⁾	1/h	50	23	23	19
- Rated motor current $I_M^{(2)4)}$, starting time 4 s	A	12.5/11/10	25.3/23/21	32.2/29/26	38/34/31
- Starts per hour ³⁾	1/h	36	15	16	12
• Normal starting (Class 15)					
- Rated motor current $I_M^{(2)}$, starting time 4.5 s	A	11/10/9	25.3/23/21	32.2/29/26	38/34/31
- Starts per hour ³⁾	1/h	49	21	18	18
- Rated motor current $I_M^{(2)4)}$, starting time 6 s	A	11/10/9	25.3/23/21	32.2/29/26	38/34/31
- Starts per hour ³⁾	1/h	36	14	13	13
• Normal starting (Class 20)					
- Rated motor current $I_M^{(2)}$, starting time 6 s	A	10/9/8	21/19/17	27/24/21	31/28/25
- Starts per hour ³⁾	1/h	47	21	20	18
- Rated motor current $I_M^{(2)4)}$, starting time 8 s	A	10/9/8	21/19/17	27/24/21	31/28/25
- Starts per hour ³⁾	1/h	34	15	14	13

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 % I_M .

3) For intermittent duty S4 with ON period = 30 %, $T_U = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

4) Maximum adjustable rated motor current I_M , dependent on CLASS setting.

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3RW Soft Starters

3RW40 for standard applications

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Type		3RW40 36	3RW40 37	3RW40 38	3RW40 46	3RW40 47
Power electronics		40 °C/50 °C/60 °C				
Load rating with rated operational current I_e						
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
Smallest adjustable rated motor current I_M						
For the motor overload protection	A	23	26	35	43	46
Power loss						
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	6	12	15	12	21
• During starting with 300 % I_M (40°C)	W	79	111	125	144	192
Permissible rated motor current and starts per hour						
• Normal starting (Class 10)						
- Rated motor current $I_M^{(2)}$, starting time 3 s	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
- Starts per hour ³⁾	1/h	38	23	22	22	15
- Rated motor current $I_M^{(2,4)}$, starting time 4 s	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
- Starts per hour ³⁾	1/h	26	15	15	15	10
• Normal starting (Class 15)						
- Rated motor current $I_M^{(2)}$, starting time 4.5 s	A	42/38/34	50/46/42	56/52/46	70/64/58	84/77/70
- Starts per hour ³⁾	1/h	30	34	34	24	23
- Rated motor current $I_M^{(2,4)}$, starting time 6 s	A	42/38/34	50/46/42	56/52/46	70/64/58	84/77/70
- Starts per hour ³⁾	1/h	21	24	24	16	17
• Normal starting (Class 20)						
- Rated motor current $I_M^{(2)}$, starting time 6 s	A	38/34/30	46/42/38	50/46/42	64/58/52	77/70/63
- Starts per hour ³⁾	1/h	30	31	34	23	23
- Rated motor current $I_M^{(2,4)}$, starting time 8 s	A	38/34/30	46/42/38	50/46/42	64/58/52	77/70/63
- Starts per hour ³⁾	1/h	21	22	24	16	16

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 % I_M .

3) For intermittent duty S4 with ON period = 30 %, $T_U = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

4) Maximum adjustable rated motor current I_M , dependent on CLASS setting.

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Type		3RW40 55	3RW40 56	3RW40 73	3RW40 74	3RW40 75	3RW40 76
Power electronics		40 °C/50 °C/60 °C					
Load rating with rated operational current I_e							
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	134/117/100	162/145/125	230/205/180	280/248/215	356/315/280	432/385/335
Smallest adjustable rated motor current I_M							
For the motor overload protection	A	59	87	80	130	131	207
Power loss							
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	60	75	75	90	125	165
• During starting with 300 % I_M (40°C)	W	1043	1355	2448	3257	3277	3600
Permissible rated motor current and starts per hour							
• Normal starting (Class 10)							
- Rated motor current $I_M^{(2)}$, starting time 10 s	A	134/117/100	162/145/125	230/205/180	280/248/215	356/315/280	432/385/335
- Starts per hour ³⁾	1/h	20	8	20	20	16	17
- Rated motor current $I_M^{(2,4)}$, starting time 20 s	A	134/117/100	162/145/125	230/205/180	280/248/215	356/315/280	432/385/335
- Starts per hour ³⁾	1/h	7	1.4	9	8	5	5
• Normal starting (Class 15)							
- Rated motor current $I_M^{(2)}$, starting time 15 s	A	134/117/100	152/140/125	210/200/180	250/220/190	341/315/280	402/385/335
- Starts per hour ³⁾	1/h	11	8	11	13	11	12
- Rated motor current $I_M^{(2,4)}$, starting time 30 s	A	134/117/100	152/140/125	210/200/180	250/220/190	341/315/280	402/385/335
- Starts per hour ³⁾	1/h	1.2	1.7	1	6	2	2
• Normal starting (Class 20)							
- Rated motor current $I_M^{(2)}$, starting time 20 s	A	124/112/100	142/132/120	200/185/168	230/205/180	311/280/250	372/340/305
- Starts per hour ³⁾	1/h	12	9	10	10	10	10
- Rated motor current $I_M^{(2,4)}$, starting time 40 s	A	124/112/100	142/132/120	200/185/168	230/205/180	311/280/250	372/340/305
- Starts per hour ³⁾	1/h	3	3	1	5	1	1

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 % I_M .



3) For intermittent duty S4 with ON period = 30 %, $T_U = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

4) Maximum adjustable rated motor current I_M , dependent on CLASS setting.

For Operation in the Control Cabinet

3RW Soft Starters

3RW40 for standard applications

Soft starters	Type		3RW40 2.	3RW40 3.	3RW40 4.
Conductor cross-sections					
Screw terminals	Main conductors				
Front clamping point connected	• Solid	mm ²	2 x (1.5 ... 2.5); 2 x (2.5 ... 6) acc. to IEC 60947; max. 1 x 10	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• With end sleeve	mm ²	2 x (1.5 ... 2.5); 2 x (2.5 ... 6)	1 x (0.75 ... 25)	1 x (2.5 ... 35)
	• Stranded	mm ²	--	1 x (0.75 ... 35)	1 x (4 ... 70)
	• AWG cables				
	- Solid	AWG	2 x (16 ... 12)		
	- Solid or stranded	AWG	2 x (14 ... 10)	1 x (18 ... 2)	2 x (10 ... 1/0)
	- Stranded	AWG	1 x 8	--	--
Rear clamping point connected	• Solid	mm ²	--	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• With end sleeve	mm ²	--	1 x (1.5 ... 25)	1 x (2.5 ... 50)
	• Stranded	mm ²	--	1 x (1.5 ... 35)	1 x (10 ... 70)
	• AWG cables				
	- Solid or stranded	AWG	--	1 x (16 ... 2)	2 x (10 ... 1/0)
	• Solid	mm ²	--	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• With end sleeve	mm ²	--	2 x (1.5 ... 16)	2 x (2.5 ... 35)
Both clamping points connected	• Stranded	mm ²	--	2 x (1.5 ... 25)	2 x (10 ... 50)
	• AWG cables				
	- Solid or stranded	AWG	--	2 x (16 ... 2)	1 x (10 ... 2/0)
	• Tightening torque	NM lb.in	2 ... 2.5 18 ... 22	4.5 40	6.5 58
Tools			PZ 2	Allen screw 4 mm	
Degree of protection			IP20	IP20 (IP00 terminal compartment)	IP20 (IP00 terminal compartment)
Spring-type terminals	Main conductors				
	• Solid	mm ²	1 ... 10	--	
	• Finely stranded with end sleeve	mm ²	1 ... 6 end sleeves without plastic collar	--	
	• AWG cables				
	- Solid or stranded (finely stranded)	AWG	16 ... 10	--	
	- Stranded	AWG	1 x 8	--	
Tools			DIN ISO 2380-1A0; 5 x 3	--	
Degree of protection			IP20	--	
Busbar connections	Main conductors				
	• With cable lug acc. to DIN 46234 or max. 20 mm wide				
	- Stranded	mm ²	--		2 x (10 ... 70)
	- Finely stranded	mm ²	--		2 x (10 ... 50)
	• AWG cables, solid or stranded	AWG	--		2 x (7 ... 1/0)

Soft Starter
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CONTROL
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


For Operation in the Control Cabinet

3RW Soft Starters

3RW40 for standard applications

Soft Starter
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Soft starters	Type		3RW40 5.	3RW40 7.
Conductor cross-sections				
Screw terminals	Main conductors			
With box terminal			3RT19 55-4G (55 kW)	3RT19 66-4G
Front clamping point connected	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded 	mm ² mm ² mm ² mm AWG	16 ... 70 16 ... 70 16 ... 70 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 2/0	70 ... 240 70 ... 240 95 ... 300 Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5 3/0 ... 600 kcmil
				
Rear clamping point connected	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded 	mm ² mm ² mm ² mm AWG	16 ... 70 16 ... 70 16 ... 70 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 2/0	120 ... 185 120 ... 185 120 ... 240 Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5 250 ... 500 kcmil
				
Both clamping points connected	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded Terminal screws - Tightening torque 	mm ² mm ² mm ² mm AWG NM lb.in	Max. 1 x 50, 1 x 70 Max. 1 x 50, 1 x 70 Max. 2 x 70 Max. 2 x (6 x 15.5 x 0.8) Max. 2 x 1/0 M10 (hexagon socket, A/F4) 10 ... 12 90 ... 110	Min. 2 x 50; max. 2 x 185 Min. 2 x 50; max. 2 x 185 Max. 2 x 70; max. 2 x 240 Max. 2 x (20 x 24 x 0.5) Min. 2 x 2/0 Max. 2 x 500 kcmil M12 (hexagon socket, A/F5) 20 ... 22 180 ... 195
				
Screw terminals	Main conductors			
With box terminal			3RT19 56-4G	
Front or rear clamping point connected	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded 	mm ² mm ² mm ² mm AWG	16 ... 120 16 ... 120 16 ... 120 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 250 kcmil	
				
Both clamping points connected	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded 	mm ² mm ² mm ² mm AWG	Max. 1 x 95, 1 x 120 Max. 1 x 95, 1 x 120 Max. 2 x 120 Max. 2 x (10 x 15.5 x 0.8) Max. 2 x 3/0	
				
Screw terminals	Main conductors			
	<u>Without box terminal/busbar connection</u>			
	<ul style="list-style-type: none"> Finely stranded with cable lug Stranded with cable lug AWG cables, solid or stranded Connecting bar (max. width) Terminal screws - Tightening torque 	mm ² mm ² AWG mm NM lb.in	16 ... 95 ¹⁾ 25 ... 120 ¹⁾ 4 ... 250 kcmil 17 M8 x 25 (A/F13) 10 ... 14 89 ... 124	50 ... 240 ²⁾ 70 ... 240 ²⁾ 2/0 ... 500 kcmil 25 M10 x 30 (A/F17) 14 ... 24 124 ... 210

¹⁾ When connecting cable lugs to DIN 46235, use 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm² to ensure phase spacing.

²⁾ When connecting cable lugs to DIN 46234, the 3RT19 66-4EA1 terminal cover must be used for cond. cross-sections of 240 mm² and more as well as DIN 46235 for cond. cross-sections of 185 mm² and more to keep the phase clearance.

Soft starters	Type		3RW40 ..
Conductor cross-sections			
Auxiliary conductors (1 or 2 conductors can be connected):			
	Screw terminals		
	<ul style="list-style-type: none"> Solid Finely stranded with end sleeve AWG cables - Solid or stranded - Finely stranded with end sleeve Terminal screws - Tightening torque 	mm ² mm ² AWG AWG NM lb.in	2 x (0.5 ... 2.5) 2 x (0.5 ... 1.5) 2 x (20 ... 14) 2 x (20 ... 16) 0.8 ... 1.2 7 ... 10.3
	Spring-type terminals		
	<ul style="list-style-type: none"> Solid - 3RW40 2. ... 3RW40 4. - 3RW40 5., 3RW40 7. Finely stranded with end sleeve AWG cables, solid or stranded 	mm ² mm ² mm ² AWG	2 x (0.25 ... 2.5) 2 x (0.25 ... 1.5) 2 x (0.25 ... 1.5) 2 x (24 ... 14) for 3RW40 2. ... 3RW40 4.; 2 x (24 ... 16) for 3RW40 5. and 3RW40 7.

For Operation in the Control Cabinet

3RW Soft Starters

	Standard	Parameters
Electromagnetic compatibility acc. to EN 60947-4-2		
EMC interference immunity		
Electrostatic discharge (ESD)	EN 61000-4-2	±4 kV contact discharge, ±8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Frequency range: 80 ... 1000 MHz with 80 % at 1 kHz Degree of severity 3: 10 V/m
Conducted RF interference	EN 61000-4-6	Frequency range: 150 kHz ... 80 MHz with 80 % at 1 kHz Interference 10 V
RF voltages and RF currents on cables		
• Burst	EN 61000-4-4	±2 kV/5 kHz
• Surge	EN 61000-4-5	±1 kV line to line ±2 kV line to earth
EMC interference emission		
EMC interference field strength	EN 55011	Limit value of Class A at 30 ... 1000 MHz, limit value of Class B with 3RW40 2, 24 V AC/DC
Radio interference voltage	EN 55011	Limit value of Class A at 0.15 ... 30 MHz, limit value of Class B with 3RW40 2, 24 V AC/DC
Radio interference suppression filters		
Degree of noise suppression A (industrial applications)	Not required	
Degree of noise suppression B (applications for residential areas)		
Control voltage	Not available ¹⁾	
• 110 ... 230 V AC/DC	Not available ¹⁾	
• 115/230 V AC	Not required for 3RW40 2. ;	
• 24 V AC/DC	required for 3RW40 3. and 3RW40 4. (see table)	

¹⁾ Degree of noise suppression B cannot be obtained through the use of filters as the strength of the electromagnetic field is not attenuated by the filter.

Soft starter type	Rated current Soft starters A	Recommended filters ¹⁾		
		Voltage range 200 ... 480 V		
		Filter type	Rated current filters A	Terminals mm ²
3RW40 36	45	4EF1512-1AA10	50	16
3RW40 37	63	4EF1512-2AA10	66	25
3RW40 38	72	4EF1512-3AA10	90	25
3RW40 46	80	4EF1512-3AA10	90	25
3RW40 47	106	4EF1512-4AA10	120	50

¹⁾ The radio interference suppression filter is used to remove the conducted interference from the main circuit. The field-related emissions comply with degree of noise suppression B. Filter selection applies under standard conditions: 10 starts per hour, start time 4 s at 300 % I_n .

Type Number	Max. Fuse Class K5, RK5, RK1	Max. Fuse Class J	Short Voltage Circuit	Voltage
Standard short circuit ratings 3RW40				
3RW40 24	50 A	60 A	5 kA	600 V
3RW40 26	100 A	100 A	5 kA	600 V
3RW40 27	125 A	125 A	5 kA	600 V
3RW40 28	125 A	125 A	5 kA	600 V
3RW40 36	175 A	175 A	10 kA	600 V
3RW40 37	250 A	250 A	10 kA	600 V
3RW40 38	250 A	250 A	10 kA	600 V
3RW40 46	450 A ¹⁾	300 A	10 kA	600 V
3RW40 47	450 A ¹⁾	350 A	10 kA	600 V

¹⁾ Special purpose fuse Type 3N81333-2 manufactured by Siemens covered in File E167357.

High capacity short circuit ratings 3RW40

3RW40 24	50 A	50 A	42 kA	600 V
3RW40 26	60 A	100 A	42 kA	600 V
3RW40 27	60 A	125 A	42 kA	600 V
3RW40 28	60 A	125 A	42 kA	600 V
3RW40 36	100 A	175 A	30 kA	600 V
3RW40 37	100 A	200 A	30 kA	600 V
3RW40 38	100 A	200 A	30 kA	600 V
3RW40 46	110 A	200 A	42 kA	600 V
3RW40 47	110 A	200 A	42 kA	600 V

For solid-state motor controller, Type 3RW402: Applicable in an enclosure with minimum overall dimensions of 370 by 190 by 190 mm.

For solid-state motor controller, Type 3RW403: Applicable in an enclosure with minimum overall dimensions of 450 by 210 by 225 mm.

For solid-state motor controller, Type 3RW404: Applicable in an enclosure with minimum overall dimensions of 450 by 220 by 235 mm.

For Operation in the Control Cabinet

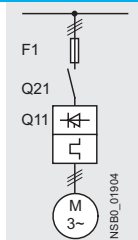
3RW Soft Starters

3RW40 for standard applications

Circuit Breaker SCCR

TOC 1 Q11 Type	Rated current	Circuit Breakers														
		Thermal Magnetic						Instantaneous Trip						Fuse		
		480 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A	480 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A
3RW40 24	11															
3RW40 26	23															
3RW40 27	29															
3RW40 28	34															
3RW40 36	42															
3RW40 37	58															
3RW40 38	62															
3RW40 46	73															
3RW40 47	98															
3RW40 55	117	FD63B	100	150	FD63B	50	150	FXD63A	100	150	FXD63A	50	150	RK5	100	200
3RW40 56	145	JD63B	100	200	JD63B	50	250	FXD63A	100	250	FXD63A	50	250	RK5	100	250
3RW40 73	205	JD63B	100	300	JD63B	50	300	JXD63A	100	300	JXD63A	50	300	RK5	100	250
3RW40 74	248	JD63B	100	400	JD63B	50	400	JXD63A	100	400	JXD63A	50	400	RK5	100	450
3RW40 75	315	LD63B	100	500	LD63B	50	450	JXD63A	100	400	JXD63A	50	400	RK5	100	600
3RW40 76	385	LD63B	100	600	LD63B	50	600	LXD63H	100	600	LXD63H	50	600	L	100	700

Fused version (line protection only)



TOC 1 Q11 Type	Rated current A	Line protection, maximum			Line contactors (optional) Q21
		F1 Type	Rated current A	Size	
Type of coordination "1"¹⁾: I_q = 65 kA at 600 V +5 %					
3RW40 24	12.5	3NA3 820-6	50	00	3RT10 24
3RW40 26	25	3NA3 822-6	63	00	3RT10 26
3RW40 27	32	3NA3 824-6	80	00	3RT10 34
3RW40 28	38	3NA3 824-6	80	00	3RT10 35
3RW40 36	45	3NA3 130-6	100	1	3RT10 36
3RW40 37	63	3NA3 132-6	125	1	3RT10 44
3RW40 38	72	3NA3 132-6	125	1	3RT10 45
3RW40 46	80	3NA3 136-6	160	1	3RT10 45
3RW40 47	106	3NA3 136-6	160	1	3RT10 46
3RW40 55	134	3NA3 244-6	250	2	3RT10 55-6A.36
3RW40 56	162	3NA3 244-6	250	2	3RT10 56-6A.36
3RW40 73	230	2 x 3NA3 354-6	2 x 355	3	3RT10 65-6A.36
3RW40 74	280	2 x 3NA3 354-6	2 x 355	3	3RT10 66-6A.36
3RW40 75	356	2 x 3NA3 365-6	2 x 500	3	3RT10 75-6A.36
3RW40 76	432	2 x 3NA3 365-6	2 x 500	3	3RT10 76-6A.36

¹⁾ The types of coordination are explained under "3RA1 Fuseless Load Feeders". The type of coordination "1" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

Soft Starter Control

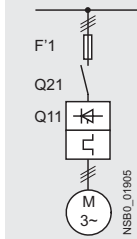
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For Operation in the Control Cabinet

3RW Soft Starters

3RW40 for standard applications

Fused version with 3NE1 SITOR fuses (semiconductor and line protection)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" → "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" → "SITOR Semiconductor Fuses" or go to www.siemens.com/sitor → "Products" → "BETA Protecting" → "SITOR"

Soft starters ToC 2	Rated current	All-range fuses			Line contactors (optional)	
		F'1 Type	Rated current A	Size	Q21	
Q11 Type	A	F'1 Type	A		Q21	
Type of coordination "2"¹⁾: $I_q = 65 \text{ kA at } 600 \text{ V } +5 \%$						
3RW40 24	12.5	3NE1 814-0	20	000	3RT10 24	
3RW40 26	25	3NE1 803-0	35	000	3RT10 26	
3RW40 27	32	3NE1 020-2	80	00	3RT10 34	
3RW40 28	38	3NE1 020-2	80	00	3RT10 35	
3RW40 36	45	3NE1 020-2	80	00	3RT10 36	
3RW40 37	63	3NE1 820-0	80	000	3RT10 44	
3RW40 38	72	3NE1 820-0	80	000	3RT10 45	
3RW40 46	80	3NE1 021-0	100	00	3RT10 45	
3RW40 47	106	3NE1 022-0	125	00	3RT10 46	
3RW40 55	134	3NE1 227-2	250	1	3RT10 55-6A.36	
3RW40 56	162	3NE1 227-2	250	1	3RT10 56-6A.36	
3RW40 73	230	3NE1 331-2	350	2	3RT10 65-6A.36	
3RW40 74	280	3NE1 333-2	450	2	3RT10 66-6A.36	
3RW40 75	356	3NE1 334-2	500	2	3RT10 75-6A.36	
3RW40 76	432	3NE1 435-2	560	3	3RT10 76-6A.36	

¹⁾ The types of coordination are explained in more detail under "3RA1 Fuseless Load Feeders".
The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (circuit breaker/fuse), not to any additional components in the feeder.

ToC 1 Type of coordination "1"

ToC 2 Type of coordination "2"

The types of coordination are explained in more detail under "3RA1 Fuseless Load Feeders".

These types of coordination are indicated in the Technical specifications by gray backgrounds.

Soft Starter
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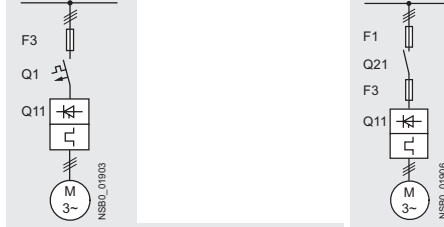
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PRODUCTS

For Operation in the Control Cabinet

3RW Soft Starters

3RW40 for standard applications

Fused version with 3NE3 SITOR fuses (semiconductor protection by fuse, line and overload protection by motor starter protector; alternatively, installation with contactor and overload relay possible)



For matching fuse bases see Catalog LV 1 under "SETRON Switching and Protection Devices for Power Distribution" —> "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" —> "SITOR Semiconductor Fuses" or go to www.siemens.com/sitor —> "Products" —> "BETA Protecting" —> "SITOR"

Soft starters Q11 Type	Rated current A	Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses, minimum		
		F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size

Type of coordination "2" ¹⁾ : I _q = 65 kA at 600 V +5 %										
3RW40 24	12.5	--	--	--	--	--	--	3NE4 101	32	0
3RW40 26	25	--	--	--	3NE3 221	100	1	3NE4 102	40	0
3RW40 27	32	--	--	--	3NE3 224	160	1	3NE4 118	63	0
3RW40 28	38	--	--	--	3NE3 224	160	1	3NE4 118	63	0
3RW40 36	45	--	--	--	3NE3 224	160	1	3NE4 120	80	0
3RW40 37	63	--	--	--	3NE3 225	200	1	3NE4 121	100	0
3RW40 38	72	3NE3 221	100	1	3NE3 227	250	1	--	--	--
3RW40 46	80	3NE3 222	125	1	3NE3 225	200	1	--	--	--
3RW40 47	106	3NE3 224	160	1	3NE3 231	350	1	--	--	--
3RW40 55	134	3NE3 227	250	1	3NE3 335	560	2	--	--	--
3RW40 56	162	3NE3 227	250	1	3NE3 335	560	2	--	--	--
3RW40 73	230	3NE3 232-0B	400	1	3NE3 333	450	2	--	--	--
3RW40 74	280	3NE3 233	450	1	3NE3 336	630	2	--	--	--
3RW40 75	356	3NE3 335	560	2	3NE3 336	630	2	--	--	--
3RW40 76	432	3NE3 337-8	710	2	3NE3 340-8	900	2	--	--	--

Soft starters Q11 Type	Rated current A	Semiconductor fuses max.			Semiconductor fuses min.			Semiconductor fuses max.			Cylindrical fuses	
		F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A

Type of coordination "2" ¹⁾ : I _q = 65 kA at 600 V +5 %												
3RW40 24	12.5	3NE4 117	50	0	3NE8 015-1	25	00	3NE8 017-1	50	00	3NC2 240	40
3RW40 26	25	3NE4 117	50	0	3NE8 017-1	50	00	3NE8 021-1	100	00	3NC2 263	63
3RW40 27	32	3NE4 118	63	0	3NE8 018-1	63	00	3NE8 022-1	125	00	3NC2 280	80
3RW40 28	38	3NE4 118	63	0	3NE8 020-1	80	00	3NE8 024-1	160	00	3NC2 280	80
3RW40 36	45	3NE4 120	80	0	3NE8 020-1	80	00	3NE8 024-1	160	00	3NC2 280	80
3RW40 37	63	3NE4 121	100	0	3NE8 021-1	100	00	3NE8 024-1	160	00	--	--
3RW40 38	72	--	--	--	3NE8 022-1	125	00	3NE8 024-1	160	00	--	--
3RW40 46	80	--	--	--	3NE8 022-1	125	00	3NE8 024-1	160	00	--	--
3RW40 47	106	--	--	--	3NE8 024-1	160	00	3NE8 024-1	160	00	--	--
3RW40 55	134	--	--	--	--	--	--	--	--	--	--	--
3RW40 56	162	--	--	--	--	--	--	--	--	--	--	--
3RW40 73	230	--	--	--	--	--	--	--	--	--	--	--
3RW40 74	280	--	--	--	--	--	--	--	--	--	--	--
3RW40 75	356	--	--	--	--	--	--	--	--	--	--	--
3RW40 76	432	--	--	--	--	--	--	--	--	--	--	--

Soft starters Q11 Type	Rated current A	Line contactors (optional) Q21	Motor starter protectors/circuit breakers				Line protection, maximum		
			400 V +10 % Q1 Type	Rated current A	575 V +10 % Q1 Type	Rated current A	F1 Type	Rated current A	Size

Type of coordination "2" ¹⁾ : I _q = 65 kA at 600 V +5 %										
3RW40 24	12.5	3RT10 24	3RV1 021-4KA10	55	--	--	--	3NA3 820-6	50	00
3RW40 26	25	3RT10 26	3RV1 021-4DA10	55	--	--	--	3NA3 822-6	63	00
3RW40 27	32	3RT10 34	3RV1 031-4EA10	55	--	--	--	3NA3 824-6	80	00
3RW40 28	38	3RT10 35	3RV1 031-4FA10	55	--	--	--	3NA3 824-6	80	00
3RW40 36	45	3RT10 36	3RV1 031-4GA10	20	--	--	--	3NA3 130-6	100	1
3RW40 37	63	3RT10 44	3RV1 041-4JA10	20	--	--	--	3NA3 132-6	125	1
3RW40 38	72	3RT10 45	3RV1 041-4KA10	20	--	--	--	3NA3 132-6	125	1
3RW40 46	80	3RT10 45	3RV1 041-4LA10	11	--	--	--	3NA3 136-6	160	1
3RW40 47	106	3RT10 46	3RV1 041-4MA10	11	--	--	--	3NA3 136-6	160	1
3RW40 55	134	3RT10 55-6A.36	3VL3 720	200	3VL3 720	200	3NA3 244-6	250	2	
3RW40 56	162	3RT10 56-6A.36	3VL3 720	200	3VL3 720	200	3NA3 244-6	250	2	
3RW40 73	230	3RT10 65-6A.36	3VL4 731	315	3VL5 731	315	2 x 3NA3 354-6	2 x 355	3	
3RW40 74	280	3RT10 66-6A.36	3VL4 731	315	3VL5 731	315	2 x 3NA3 354-6	2 x 355	3	
3RW40 75	356	3RT10 75-6A.36	3VL4 740	400	3VL5 740	400	2 x 3NA3 365-6	2 x 500	3	
3RW40 76	432	3RT10 76-6A.36	3VL5 750	500	3VL5 750	500	2 x 3NA3 365-6	2 x 500	3	

¹⁾ The types of coordination are explained under "3RA1 Fuseless Load Feeders". The type of coordination "2" refers only to soft starters in combination

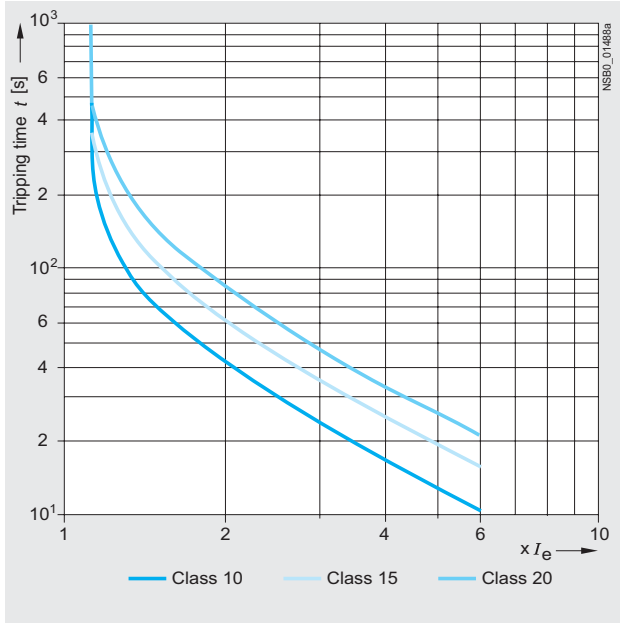
with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

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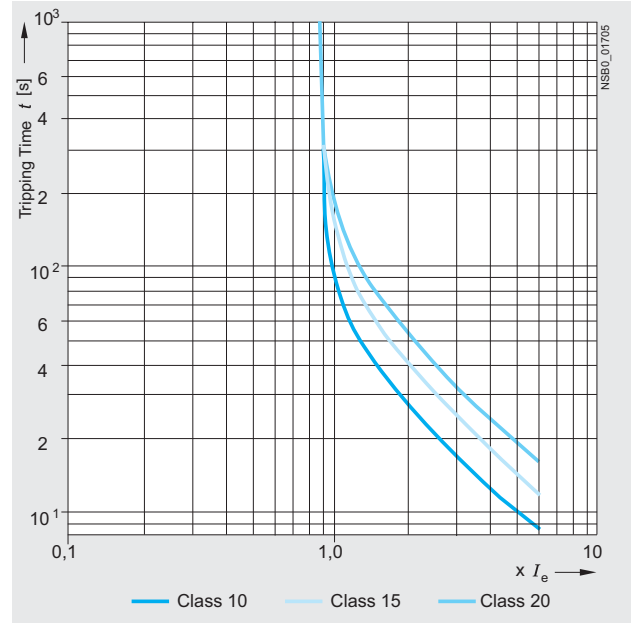
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Characteristic curves

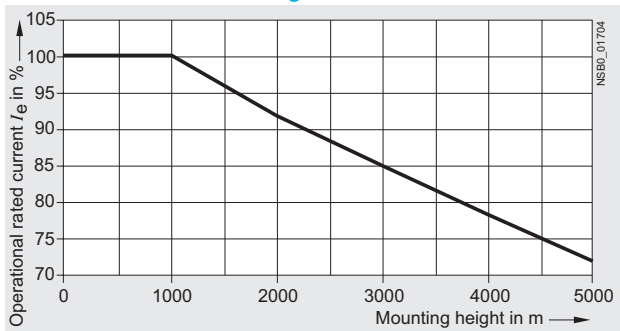
Motor protection tripping characteristics for 3RW40 (with symmetry)



Motor protection tripping characteristics for 3RW40 (with asymmetry)



Permissible installation height



At an installation height above 2000 m, the max. permissible operational voltage is reduced to 460 V.

For Operation in the Control Cabinet

3RW Soft Starters

3RW40 for standard applications

More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 350 % $I_{n, motor}$).

The soft starter rating can be selected to be as high as the rating of the motor used.

Application		Conveyor belt	Roller conveyor	Small fan	Pump	Hydraulic pump
Starting parameters						
• Voltage ramp and current limiting						
- Starting voltage	%	70	60	40	40	40
- Starting time	s	10	10	10	10	10
- Current limit value		$5 \times I_M$	$5 \times I_M$	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
Ramp-down time	s	5	5	0	10	0

Application examples for heavy starting (Class 20)

Heavy starting Class 20 (up to 40 s with 350 % $I_{n, motor}$).

The soft starter has to be selected at least one performance class higher than the motor used.

Application		Stirrer	Compressor	Centrifuge
Starting parameters				
• Voltage ramp and current limiting				
- Starting voltage	%	40	50	40
- Starting time	s	20	10	20
- Current limit value		$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
Ramp-down time		0	0	0

Note:

These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during commissioning.

The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

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3RW Soft Starters

3RW40 for standard applications

Configuration

The 3RW solid-state soft starters are designed for easy starting conditions. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. For accurate dimensioning, use the Win-Soft Starter selection and simulation program.

Where long starting times are involved, the integrated solid-state overload relay for heavy starting should not be disconnected. PTC sensors are recommended. This also applies for the smooth ramp-down because during the ramp-down time an additional current loading applies in contrast to free ramp-down.

In the case of high switching frequencies in S4 mode, Siemens recommends the use of PTC sensors. For corresponding device versions with integrated thermistor motor protection or separate thermistor evaluation devices see Catalog LV 1.

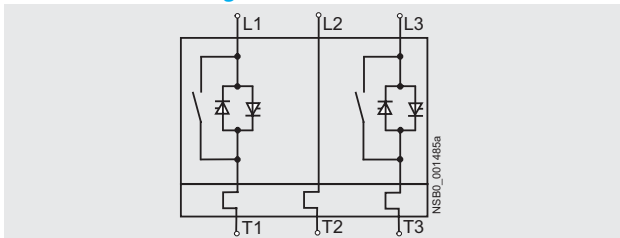
In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses and controls) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

Note:

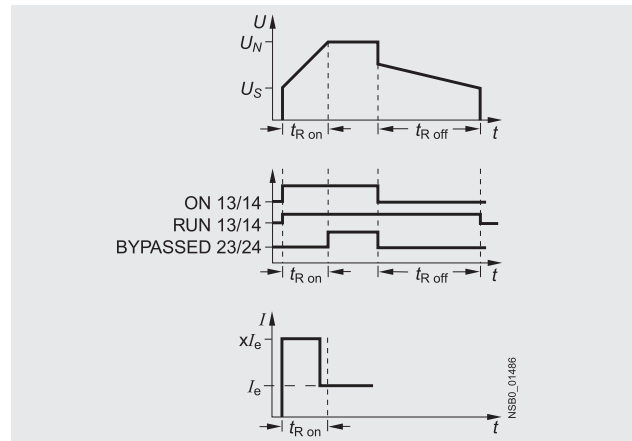
When induction motors are switched on, voltage drops occur as a rule on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

Schematic circuit diagram



A bypass contact system and solid-state overload relay are already integrated in the 3RW40 soft starter and therefore do not have to be ordered separately.

Status graphs



Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded from:

www.usa.siemens.com > Software

More information can be found on the Internet at:

www.usa.siemens.com.

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Overview

In addition to soft starting and soft ramp-down, the solid-state SIRIUS 3RW44 soft starters provide numerous functions for higher-level requirements. They cover a performance range up to 900 Hp (at 460 V) in the inline circuit and up to 1600 Hp (at 460 V) in the inside-delta circuit.

The SIRIUS 3RW44 soft starters are characterized by a compact design for space-saving and clearly arranged control cabinet layouts. For optimized motor starting and stopping the innovative SIRIUS 3RW44 soft starters are an attractive alternative with considerable savings potential compared to applications with a frequency converter. The new torque control and adjustable current limiting enable the High-Feature soft starters to be used in nearly every conceivable task. They reliably mitigate the sudden torque applications and current peaks during motor starting and stopping. This creates savings potential when calculating the size of the controlgear and when servicing the machinery installed. Be it for inline circuits or inside-delta circuits – the SIRIUS 3RW44 soft starter offers savings especially in terms of size and equipment costs.

The bypass contacts already integrated in the soft starter bypass the thyristors after a motor ramp-up is detected. This results in a further great reduction in the heat loss occurring during operation of the soft starter at rated value.

Combinations of various starting, operating and ramp-down possibilities ensure an optimum adaptation to the application-specific requirements. Operation and commissioning can be performed with the menu-controlled keypad and a menu-prompted, multi-line graphic display with background lighting. The optimized motor ramp-up and ramp-down can be effected quickly, easily and reliably by means of just a few settings with a previously selected language. Four-key operation and plain-text displays for each menu point guarantee full clarity at every moment of the parameterization and operation.

Applicable standards

- IEC 60947-4-2
- UL/CSA

Soft Starter ES parameterization software

Soft Starter ES software is used for the parameterization, monitoring and service diagnostics of SIRIUS 3RW44 High Feature soft starters.

See Catalog LV 1, Chapter 12 "Planning and Configuration with SIRIUS".

Function

Equipped with modern, ergonomic user prompting the SIRIUS 3RW44 soft starters can be commissioned quickly and easily using a keypad and a menu-prompted, multi-line graphic display with background lighting. The optimized motor ramp-up and ramp-down can be effected quickly, easily and reliably by means of just a few settings with a selectable language. Four-key operation and plain-text displays for each menu point guarantee full clarity at every moment of the parameterization and operation. During operation and when control voltage is applied, the display field continuously presents measured values and operating values as well as warnings and fault messages. An external display and operator module can be connected by means of a connection cable to the soft starter, thus enabling active indications and the like to be read directly from the control cabinet door.

The SIRIUS 3RW44 soft starters are equipped with optimum functionality. An integral bypass contact system reduces the power loss of the soft starter during operation. This reliably prevents heating of the switchgear environment. The SIRIUS 3RW44 soft starters have internal intrinsic device protection. This prevents thermal overloading of the power section's thyristors, e. g. due to unacceptably high closing operations.

Wiring outlay for installing an additional motor overload relay is no longer needed as the SIRIUS 3RW44 soft starters perform this function too. In addition they offer adjustable trip classes and a thermistor motor protection function. As an option the thyristors can also be protected by SITOR semiconductor fuses from short-circuiting so that the soft starter is still functional after a short-circuit (type of coordination 2). And even inrush current peaks are reliably avoided thanks to adjustable current limiting.

As a further option the SIRIUS 3RW44 soft starters can be upgraded with a PROFIBUS DP module. Thanks to their communication capability and their programmable control inputs and relay outputs the SIRIUS 3RW44 soft starters can be very easily and quickly integrated in higher-level controllers.

In addition a creep speed function is available for positioning and setting jobs. With this function the motor can be controlled in both directions of rotation with reduced torque and an adjustable, low speed.

On the other hand the SIRIUS 3RW44 soft starters offer a new, combined DC braking function for the fast stopping of driving loads.

Highlights

- Soft starting with breakaway pulse, torque control or voltage ramp, adjustable torque or current limiting as well as any combination of these, depending on load type
- Integrated bypass contact system to minimize power loss
- Various setting options for the starting parameters such as starting torque, starting voltage, ramp-up and ramp-down time, and much more in three separate parameter sets
- Start-up detection
- Inside-delta circuit for savings in terms of size and equipment costs
- Various ramp-down modes selectable: free ramp-down, torque-controlled pump ramp-down, combined DC braking
- Solid-state motor overload and intrinsic device protection
- Thermistor motor protection
- Keypad with a menu-prompted, multi-line graphic display with background lighting
- Interface for communication with the PC for more accurate setting of the parameters as well as for control and monitoring
- Simple adaptation to the motor feeder
- Simple mounting and commissioning
- Display of operating states and fault messages
- Connection to PROFIBUS with optional PROFIBUS DP module
- External display and operator module
- Mains voltages from 200 to 690 V, 50 to 60 Hz
- Applicable up to 60 °C (derating from 40 °C)

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

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Type		3RW44 ...BC.4	3RW44 ...BC.5	3RW44 ...BC.6
Power electronics				
Rated operational voltage for inline circuit	V AC	200 ... 460	400 ... 600	400 ... 690
Tolerance	%	-15/+10	-15/+10	-15/+10
Maximum blocking voltage (thyristor)	V AC	1400	1800	1800
Rated operational voltage for inside-delta circuit	V AC	200 ... 460	400 ... 600	400 ... 600
Tolerance	%	-15/+10	-15/+10	-15/+10
Rated frequency	Hz	50 ... 60		
Tolerance	%	±10		
Uninterrupted duty at 40 °C (% of I_e)	%	115		
Minimum load (% of set motor current I_M)	%	8		
Maximum cable length between soft starter and motor	m	500 ¹⁾		
Permissible installation height	m	5000 (derating from 1000, see characteristic curves); higher on request		
Permissible mounting position				
Installation type		Stand-alone installation		
Permissible ambient temperature		Operation °C: 0 ... +60; (derating from +40) Storage °C: -25 ... +80		
Degree of protection		IP00		

¹⁾ At the project configuration stage, it is important to make allowance for the voltage drop on the motor cable up to the motor connection. If necessary,

higher values for the rated operational voltage or current must be calculated accordingly for the soft starter.

Type		3RW44 22	3RW44 23	3RW44 24	3RW44 25	3RW44 26	3RW44 27
Power electronics							
40 °C/50 °C/60 °C							
Load rating with rated operational current I_e							
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
Smallest adjustable rated motor current I_M	A	5	7	9	11	15	18
For the motor overload protection							
Power loss							
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	8	10	32	36	45	55
• During starting with 300 % I _M (40 °C)	W	400	470	600	725	940	1160
Permissible rated motor current and starts per hour							
• Normal starting (Class 5)							
- Rated motor current I _M ²⁾ , starting time 5 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour ³⁾	1/h	41	34	41	42	43	44
- Rated motor current I _M ²⁾⁴⁾ , starting time 10 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour ³⁾	1/h	20	15	20	20	20	20
• Normal starting (Class 10)							
- Rated motor current I _M ²⁾ , starting time 10 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour ³⁾	1/h	20	15	20	20	20	20
- Rated motor current I _M ²⁾⁴⁾ , starting time 20 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour ³⁾	1/h	10	6	10	10	8	8
• Normal starting (Class 15)							
- Rated motor current I _M ²⁾ , starting time 15 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour ³⁾	1/h	13	9	13	13	13	13
- Rated motor current I _M ²⁾⁴⁾ , starting time 30 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour ³⁾	1/h	6	4	6	6	6	6
• Normal starting (Class 20)							
- Rated motor current I _M ²⁾ , starting time 20 s	A	29/26/23	36/33/29	47/42/37	57/51/45	73/66/59	88/80/72
- Starts per hour ³⁾	1/h	10	6	10	10	10	10
- Rated motor current I _M ²⁾⁴⁾ , starting time 30 s	A	29/26/23	36/33/29	47/42/37	57/51/45	73/66/59	88/80/72
- Starts per hour ³⁾	1/h	4	2	4	5	1.8	0.8
• For very heavy starting (Class 30)							
- Rated motor current I _M ²⁾ , starting time 30 s	A	29/26/23	36/33/29	44/42/37	57/51/45	65/60/54	77/70/63
- Starts per hour ³⁾	1/h	6	4	6	6	6	6
- Rated motor current I _M ²⁾³⁾ , starting time 60 s	A	29/26/23	36/33/29	44/42/37	57/51/45	65/60/54	77/70/63
- Starts per hour ³⁾	1/h	1.8	0.8	3.3	1.5	2	1

¹⁾ Measurement at 60 °C according to UL/CSA not required.

²⁾ With 300 % I_M.

³⁾ For intermittent duty S4 with ON period = 30 %, T₀ = 40 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

⁴⁾ Maximum adjustable rated motor current I_M, dependent on CLASS setting.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Type		3RW44 34	3RW44 35	3RW44 36
Power electronics		40 °C/50 °C/60 °C		
Load rating with rated operational current I_e				
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	113/100/88	134/117/100	162/145/125
Smallest adjustable rated motor current I_M				
For the motor overload protection	A	22	26	32
Power loss				
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	64	76	95
• During starting with 300 % I_M (40 °C)	W	1350	1700	2460
Permissible rated motor current and starts per hour				
• Normal starting (Class 5)				
- Rated motor current $I_M^{(2)}$, starting time 5 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour ³⁾	1/h	41	39	41
- Rated motor current $I_M^{(2)(4)}$, starting time 10 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour ³⁾	1/h	20	15	20
• Normal starting (Class 10)				
- Rated motor current $I_M^{(2)}$, starting time 10 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour ³⁾	1/h	20	15	20
- Rated motor current $I_M^{(2)(4)}$, starting time 20 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour ³⁾	1/h	9	6	7
• Normal starting (Class 15)				
- Rated motor current $I_M^{(2)}$, starting time 15 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour ³⁾	1/h	13	9	12
- Rated motor current $I_M^{(2)(4)}$, starting time 30 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour ³⁾	1/h	6	6	1
• Normal starting (Class 20)				
- Rated motor current $I_M^{(2)}$, starting time 20 s	A	106/97/88	125/113/100	147/134/122
- Starts per hour ³⁾	1/h	9	9	10
- Rated motor current $I_M^{(2)(4)}$, starting time 30 s	A	106/97/88	125/113/100	147/134/122
- Starts per hour ³⁾	1/h	1.5	2	1
• For very heavy starting (Class 30)				
- Rated motor current $I_M^{(2)}$, starting time 30 s	A	91/84/76	110/100/90	120/110/100
- Starts per hour ³⁾	1/h	6	6	6
- Rated motor current $I_M^{(2)(4)}$, starting time 60 s	A	91/84/76	110/100/90	120/110/100
- Starts per hour ³⁾	1/h	2	2	2

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 % I_M .

3) For intermittent duty S4 with ON period = 30 %, $T_u = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

4) Maximum adjustable rated motor current I_M , dependent on CLASS setting.

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3RW Soft Starters

3RW44 for high-feature applications

Type		3RW44 43	3RW44 44	3RW44 45	3RW44 46	3RW44 47
Power electronics		40 °C/50 °C/60 °C				
Load rating with rated operational current I_o • Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
Smallest adjustable rated motor current I_M For the motor overload protection	A	40	50	62	71	86
Power loss • In operation after completed starting with uninterrupted rated operational current (40 °C) approx. • During starting with 300 % I_M (40 °C)	W W	89 3350	110 4000	145 4470	174 5350	232 5860
Permissible rated motor current and starts per hour						
• Normal starting (Class 5)						
- Rated motor current $I_M^{(2)}$, starting time 5 s	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
- Starts per hour ³⁾	1/h	41	41	41	41	39
- Rated motor current $I_M^{(2/4)}$, starting time 10 s	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
- Starts per hour ³⁾	1/h	20	20	19	17	16
• Normal starting (Class 10)						
- Rated motor current $I_M^{(2)}$, starting time 10 s	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
- Starts per hour ³⁾	1/h	20	20	19	17	16
- Rated motor current $I_M^{(2/4)}$, starting time 20 s	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
- Starts per hour ³⁾	1/h	9	10	6	4	5
• Normal starting (Class 15)						
- Rated motor current $I_M^{(2)}$, starting time 15 s	A	203/180/156	240/215/185	313/280/250	325/295/265	402/385/335
- Starts per hour ³⁾	1/h	13	13	10	13	11
- Rated motor current $I_M^{(2/4)}$, starting time 30 s	A	203/180/156	240/215/185	313/280/250	325/295/265	402/385/335
- Starts per hour ³⁾	1/h	3	6	1	2	1
• Normal starting (Class 20)						
- Rated motor current $I_M^{(2)}$, starting time 20 s	A	195/175/155	215/195/180	275/243/221	285/263/240	356/326/295
- Starts per hour ³⁾	1/h	10	10	10	10	10
- Rated motor current $I_M^{(2/4)}$, starting time 30 s	A	195/175/155	215/195/180	275/243/221	285/263/240	356/326/295
- Starts per hour ³⁾	1/h	1	5	1	3	1
• For very heavy starting (Class 30)						
- Rated motor current $I_M^{(2)}$, starting time 30 s	A	162/148/134	180/165/150	220/201/182	240/223/202	285/260/235
- Starts per hour ³⁾	1/h	6	6	6	6	6
- Rated motor current $I_M^{(2/4)}$, starting time 60 s	A	162/148/134	180/165/150	220/201/182	240/223/202	285/260/235
- Starts per hour ³⁾	1/h	3	3	3	2	1

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 % I_M .

3) For intermittent duty S4 with ON period = 30 %, $T_u = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

4) Maximum adjustable rated motor current I_M , dependent on CLASS setting.

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3RW Soft Starters

3RW44 for high-feature applications

Type		3RW44 53	3RW44 54	3RW44 55	3RW44 56	3RW44 57	3RW44 58
Power electronics		40 °C/50 °C/60 °C					
Load rating with rated operational current I_e							
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760
Smallest adjustable rated motor current I_M	A	110	123	138	156	176	194
For the motor overload protection							
Power loss							
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	159	186	220	214	250	270
• During starting with 300 % I_M (40 °C)	W	7020	8100	9500	11100	13100	15000
Permissible rated motor current and starts per hour							
• Normal starting (Class 5)							
- Rated motor current $I_M^{(2)}$, starting time 5 s	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760
- Starts per hour ³⁾	1/h	41	41	37	33	22	17
- Rated motor current $I_M^{(2/4)}$, starting time 10 s	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760
- Starts per hour ³⁾	1/h	20	20	16	13	8	5
• Normal starting (Class 10)							
- Rated motor current $I_M^{(2)}$, starting time 10 s	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760
- Starts per hour ³⁾	1/h	20	20	16	13	8	5
- Rated motor current $I_M^{(2/4)}$, starting time 20 s	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760
- Starts per hour ³⁾	1/h	10	9	6	4	0.3	0.3
• Normal starting (Class 15)							
- Rated motor current $I_M^{(2)}$, starting time 15 s	A	551/494/438	615/551/489	666/615/551	723/693/615	780/710/650	821/755/693
- Starts per hour ³⁾	1/h	13	13	11	9	8	8
- Rated motor current $I_M^{(2/4)}$, starting time 30 s	A	551/494/438	615/551/489	666/615/551	723/693/615	780/710/650	821/755/693
- Starts per hour ³⁾	1/h	6	4	3	1	0.4	0.5
• Normal starting (Class 20)							
- Rated motor current $I_M^{(2)}$, starting time 20 s	A	551/494/438	591/551/489	633/615/551	670/634/576	710/650/590	740/685/630
- Starts per hour ³⁾	1/h	10	10	7	8	8	9
- Rated motor current $I_M^{(2/4)}$, starting time 30 s	A	551/494/438	591/551/489	633/615/551	670/634/576	710/650/590	740/685/630
- Starts per hour ³⁾	1/h	4	2	1	1	0.4	1
• For very heavy starting (Class 30)							
- Rated motor current $I_M^{(2)}$, starting time 30 s	A	500/480/438	525/489/455	551/520/480	575/540/490	600/550/500	630/580/530
- Starts per hour ³⁾	1/h	6	6	6	6	6	6
- Rated motor current $I_M^{(2/4)}$, starting time 60 s	A	500/480/438	525/489/455	551/520/480	575/540/490	600/550/500	630/580/530
- Starts per hour ³⁾	1/h	2	1	1	1	1.5	1

¹⁾ Measurement at 60 °C according to UL/CSA not required.

²⁾ With 300 % I_M .

³⁾ For intermittent duty S4 with ON period = 30 %, $T_U = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

⁴⁾ Maximum adjustable rated motor current I_M , dependent on CLASS setting.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Soft Starter
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Type		3RW44 65	3RW44 66
Power electronics		40 °C/50 °C/60 °C	
Load rating with rated operational current I_e			
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	1076/970/880	1214/1076/970
Smallest adjustable rated motor current I_M	A	215	242
For the motor overload protection			
Power loss			
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	510	630
• During starting with 300 % I_M (40 °C)	W	15000	17500
Permissible rated motor current and starts per hour			
• Normal starting (Class 5)			
- Rated motor current $I_M^{(2)}$, starting time 5 s	A	1076/970/880	1214/1076/970
- Starts per hour ³⁾	1/h	30	20
- Rated motor current $I_M^{(2)4)}$, starting time 10 s	A	1076/970/880	1214/1076/970
- Starts per hour ³⁾	1/h	10	6
• Normal starting (Class 10)			
- Rated motor current $I_M^{(2)}$, starting time 10 s	A	1076/970/880	1214/1076/970
- Starts per hour ³⁾	1/h	11	6
- Rated motor current $I_M^{(2)4)}$, starting time 20 s	A	1076/970/880	1214/1076/970
- Starts per hour ³⁾	1/h	3	0.5
• Normal starting (Class 15)			
- Rated motor current $I_M^{(2)}$, starting time 15 s	A	1020/950/850	1090/1000/920
- Starts per hour ³⁾	1/h	7	5
- Rated motor current $I_M^{(2)4)}$, starting time 30 s	A	1020/950/850	1090/1000/920
- Starts per hour ³⁾	1/h	1	1
• Normal starting (Class 20)			
- Rated motor current $I_M^{(2)}$, starting time 20 s	A	970/880/810	1030/940/860
- Starts per hour ³⁾	1/h	7	5
- Rated motor current $I_M^{(2)4)}$, starting time 30 s	A	970/880/810	1030/940/860
- Starts per hour ³⁾	1/h	1	1
• For very heavy starting (Class 30)			
- Rated motor current $I_M^{(2)}$, starting time 30 s	A	880/810/740	920/850/780
- Starts per hour ³⁾	1/h	6	6
- Rated motor current $I_M^{(2)4)}$, starting time 60 s	A	880/810/740	920/850/780
- Starts per hour ³⁾	1/h	1	1

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 % I_M .

3) For intermittent duty S4 with ON period = 30 %, $T_u = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

4) Maximum adjustable rated motor current I_M , dependent on CLASS setting.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications



3RW44 27-1BC44

3RW44 36-6BC44

3RW44 47-6BC44

3RW44 58-6BC44

3RW44 66-6BC44

Ambient temperature 40 °C					Ambient temperature 50 °C					DT	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg	
Rated operational current $I_e^{1)}$	Rated power of induction motors for rated operational voltage U_e					Rated operational current I_e	Rated power of induction motors for rated operational voltage U_e										
A	230 V	400 V	500 V	690 V	1000 V	A	200 V	230 V	460 V	575 V							
	kW	kW	kW	kW	kW		hp	hp	hp	hp							
Inside-delta circuits, rated operational voltage 200 ... 460 V²⁾																	
50	15	22	--	--	--	45	10	15	30	--	▶	3RW44 22-□BC□4		1	1 unit	131	6.500
62	18.5	30	--	--	--	55	15	20	40	--	▶	3RW44 23-□BC□4		1	1 unit	131	6.500
81	22	45	--	--	--	73	20	25	50	--	▶	3RW44 24-□BC□4		1	1 unit	131	6.500
99	30	55	--	--	--	88	25	30	60	--	▶	3RW44 25-□BC□4		1	1 unit	131	6.500
133	37	75	--	--	--	118	30	40	75	--	▶	3RW44 26-□BC□4		1	1 unit	131	6.500
161	45	90	--	--	--	142	40	50	100	--	▶	3RW44 27-□BC□4		1	1 unit	131	6.500
Order No. supplement for connection types																	
<ul style="list-style-type: none"> • With spring-type terminals • With screw terminals 																	
196	55	110	--	--	--	173	50	60	125	--	B	3RW44 34-□BC□4		1	1 unit	131	7.900
232	75	132	--	--	--	203	60	75	150	--	B	3RW44 35-□BC□4		1	1 unit	131	7.900
281	90	160	--	--	--	251	75	100	200	--	B	3RW44 36-□BC□4		1	1 unit	131	7.900
352	110	200	--	--	--	312	100	125	250	--	B	3RW44 43-□BC□4		1	1 unit	131	11.500
433	132	250	--	--	--	372	125	150	300	--	B	3RW44 44-□BC□4		1	1 unit	131	11.500
542	160	315	--	--	--	485	150	200	400	--	B	3RW44 45-□BC□4		1	1 unit	131	11.500
617	200	355	--	--	--	546	150	200	450	--	B	3RW44 46-□BC□4		1	1 unit	131	11.500
748	250	400	--	--	--	667	200	250	600	--	B	3RW44 47-□BC□4		1	1 unit	131	11.500
954	315	560	--	--	--	856	300	350	750	--	C	3RW44 53-□BC□4		1	1 unit	131	50.000
1065	355	630	--	--	--	954	350	400	850	--	C	3RW44 54-□BC□4		1	1 unit	131	50.000
1200	400	710	--	--	--	1065	350	450	950	--	C	3RW44 55-□BC□4		1	1 unit	131	50.000
1351	450	800	--	--	--	1200	450	500	1050	--	C	3RW44 56-□BC□4		1	1 unit	131	50.000
1524	500	900	--	--	--	1351	450	600	1200	--	C	3RW44 57-□BC□4		1	1 unit	131	50.000
1680	560	1000	--	--	--	1472	550	650	1300	--	C	3RW44 58-□BC□4		1	1 unit	131	50.000
1864	630	1100	--	--	--	1680	650	750	1500	--	C	3RW44 65-□BC□4		1	1 unit	131	78.000
2103	710	1200	--	--	--	1864	700	850	1700	--	C	3RW44 66-□BC□4		1	1 unit	131	78.000
Order No. supplement for connection types																	
<ul style="list-style-type: none"> • With spring-type terminals • With screw terminals 																	
Order No. supplement for the rated control supply voltage $U_s^{3)}$																	
<ul style="list-style-type: none"> • 115 V AC • 230 V AC 																	

3
1

2
6

3
4

1) In the selection table, the unit rated current I_e refers to the induction motor's rated operational current in the inside-delta circuit. The actual current of the device is approx. 58 % of this value.

2) 3RW44 2 ... 3RW44 4. soft starters with screw terminals: delivery times ▶ (preferred type).

3) Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

Note:
Soft starter selection depends on the rated motor current.

The 3RW44 solid-state soft starters are designed for normal starting (Class 10). (Inertia load of the overall operating mechanism $J_{Load} < 10 \times J_{Motor}$; starting current $350 \% \times I_e$ for 20 s similar load). For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical specifications for information about rated currents for ambient temperatures $> 40 \text{ °C}$ and switching frequency.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Ambient temperature 40 °C						Ambient temperature 50 °C					DT	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg		
Rated operational current $I_e^{1)}$	Rated power of induction motors for rated operational voltage U_e					Rated operational current I_e	Rated power of induction motors for rated operational voltage U_e												
		230 V	400 V	500 V	690 V		1000 V		200 V	230 V	460 V	575 V							
A	kW	kW	kW	kW	kW	A	hp	hp	hp	hp									
Inside-delta circuits, rated operational voltage 400 ... 600 V²⁾																			
50	--	22	30	--	--	45	--	--	30	40	A	3RW44 22-□BC□5		1	1 unit	131	6.500		
62	--	30	37	--	--	55	--	--	40	50	A	3RW44 23-□BC□5		1	1 unit	131	6.500		
81	--	45	45	--	--	73	--	--	50	60	A	3RW44 24-□BC□5		1	1 unit	131	6.500		
99	--	55	55	--	--	88	--	--	60	75	A	3RW44 25-□BC□5		1	1 unit	131	6.500		
133	--	75	90	--	--	118	--	--	75	100	A	3RW44 26-□BC□5		1	1 unit	131	6.500		
161	--	90	110	--	--	142	--	--	100	125	A	3RW44 27-□BC□5		1	1 unit	131	6.500		
Order No. supplement for connection types																			
<ul style="list-style-type: none"> • With spring-type terminals • With screw terminals 																			
196	--	110	132	--	--	173	--	--	125	150	B	3RW44 34-□BC□5		1	1 unit	131	7.900		
232	--	132	160	--	--	203	--	--	150	200	B	3RW44 35-□BC□5		1	1 unit	131	7.900		
281	--	160	200	--	--	251	--	--	200	250	B	3RW44 36-□BC□5		1	1 unit	131	7.900		
352	--	200	250	--	--	312	--	--	250	300	B	3RW44 43-□BC□5		1	1 unit	131	11.500		
433	--	250	315	--	--	372	--	--	300	350	B	3RW44 44-□BC□5		1	1 unit	131	11.500		
542	--	315	355	--	--	485	--	--	400	500	B	3RW44 45-□BC□5		1	1 unit	131	11.500		
617	--	355	450	--	--	546	--	--	450	600	B	3RW44 46-□BC□5		1	1 unit	131	11.500		
748	--	400	500	--	--	667	--	--	600	750	B	3RW44 47-□BC□5		1	1 unit	131	11.500		
954	--	560	630	--	--	856	--	--	750	950	C	3RW44 53-□BC□5		1	1 unit	131	50.000		
1065	--	630	710	--	--	954	--	--	850	1050	C	3RW44 54-□BC□5		1	1 unit	131	50.000		
1200	--	710	800	--	--	1065	--	--	950	1200	C	3RW44 55-□BC□5		1	1 unit	131	50.000		
1351	--	800	900	--	--	1200	--	--	1050	1350	C	3RW44 56-□BC□5		1	1 unit	131	50.000		
1524	--	900	1000	--	--	1351	--	--	1200	1500	C	3RW44 57-□BC□5		1	1 unit	131	50.000		
1680	--	1000	1200	--	--	1472	--	--	1300	1650	C	3RW44 58-□BC□5		1	1 unit	131	50.000		
1864	--	1100	1350	--	--	1680	--	--	1500	1900	C	3RW44 65-□BC□5		1	1 unit	131	78.000		
2103	--	1200	1500	--	--	1864	--	--	1700	2100	C	3RW44 66-□BC□5		1	1 unit	131	78.000		

Order No. supplement for connection types

- With spring-type terminals
- With screw terminals

Order No. supplement for the rated control supply voltage $U_s^{3)}$

- 115 V AC
- 230 V AC

¹⁾ In the selection table, the unit rated current I_e refers to the induction motor's rated operational current in the inside-delta circuit. The actual current of the device is approx. 58 % of this value.

²⁾ Soft starter with screw terminals:
3RW44 2... 3RW44 4. Delivery time A
3RW44 5... 3RW44 6. Delivery time B.

³⁾ Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

Note:

Soft starter selection depends on the rated motor current.

The 3RW44 solid-state soft starters are designed for normal starting (Class 10). (Inertia load of the overall operating mechanism $J_{Load} < 10 \times J_{Motor}$; starting current 350 % $\times I_e$ for 20 s similar load). For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical specifications for information about rated currents for ambient temperatures > 40 °C and switching frequency.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Technical specifications

Type	Terminal		3RW44 ...-BC3.	3RW44 ...-BC4.
Control electronics				
Rated values				
Rated control supply voltage	A1/A2/PE	V	115 AC	230 AC
• Tolerance		%	-15/+10	-15/+10
Rated control supply current STANDBY		mA	30	20
Rated control supply current ON				
• 3RW44 2.		mA	300	170
• 3RW44 3.		mA	500	250
• 3RW44 4.		mA	750	400
• 3RW44 5.		mA	450	200
• 3RW44 6.		mA	650	300
Maximum current (pickup bypass)				
• 3RW44 2.		mA	1000	500
• 3RW44 3.		mA	2500	1250
• 3RW44 4.		mA	6000	3000
• 3RW44 5.		mA	4500	2500
• 3RW44 6.		mA	4500	2500
Rated frequency		Hz	50 ... 60	50 ... 60
• Tolerance		%	±10	±10

Type	Terminal		3RW44 ..	Factory default
Control electronics				
Control inputs				
Input 1	IN1			Start motor right parameter set 1
Input 2	IN2			No action
Input 3	IN3			No action
Input 4	IN4			Trip reset
Supply	L+/L-			
• Rated operational current	L+	mA	Approx. 10 per input to DIN 19240	
• Rated operational voltage	L-		Internal voltage: 24 V DC from internal supply through terminal L+ to IN1 ... IN4. Maximum load at L+ approx. 55 mA	
			External voltage: DC external voltage (acc. to DIN 19240) through terminals L- and IN1 ... IN4 (min. 12 V DC, max. 30 V DC)	
Thermistor motor protection input				
Input	T1/T2		PTC type A or Thermoclick	Deactivated
Relay outputs (floating auxiliary contacts)				
Output 1	13/14			ON period
Output 2	23/24			No action
Output 3	33/34			No action
Output 4	95/96/98			Group fault
Switching capacity of the relay outputs (auxiliary contacts)				
230 V/AC-15		A	3 at 240 V	
24 V/DC-13		A	1 at 24 V	
Protection against overvoltages			Protection by means of varistor through relay contact	
Short-circuit protection			4 A gL/gG operational class; 6 A quick (fuse is not included in scope of supply)	
Protection functions				
Motor protection functions				
Trips in the event of			Thermal overloading of the motor	
Trip class acc. to IEC 60947-4-1		Class	5/10/15/20/30	10
Phase failure sensitivity		%	>40	
Overload warning			Yes	
Reset and recovery			Manual/Automatic	Manual
Reset option after tripping			Manual/Automatic	Manual
Recovery time		min.	1 ... 30	1
Device protection functions				
Trips in the event of			Thermal overloading of the thyristors	
Reset option after tripping			Manual/Automatic	Manual
Recovery time		min.	0.5	
Bypass protection functions				
Trips in the event of			Thermal overloading of the bypass contacts	
Reset option after tripping			Manual	
Recovery time		min.	1	

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3RW Soft Starters

3RW44 for high-feature applications

Type	3RW44..	Factory default
Control times and parameters		
Control times		
Closing time (with connected control voltage)	ms	<50
Closing time (automatic mode)	ms	<4000
Recovery time (closing command in active ramp-down)	ms	<100
Mains failure bridging time		
Control supply voltage	ms	100
Mains failure response time		
Load circuit	ms	100
Reclosing lockout after overload trip		
Motor protection trip	min.	1 ... 30
Device protection trip	s	30
Setting options for starting		
Voltage ramp for starting voltage	%	20 ... 100
Torque control for starting torque	%	10 ... 100
Torque control for limit torque	%	20 ... 200
Starting time	s	0 ... 360 ³⁾
Maximum starting time	s	1 ... 1000
Current limit value	%	125 ... 550 ¹⁾
Breakaway voltage	%	40 ... 100
Breakaway time	s	0 ... 2
Motor heat output	%	1 ... 100
Creep mode Left/Right running		
Speed factor as function of rated speed ($n = n_{rated}/factor$)	%	3 ... 21
Creep torque ²⁾	%	20 ... 100
Setting options for ramp-down		
Torque control for stopping torque	%	10 ... 100
Ramp-down time	s	0 ... 360 ³⁾
Dynamic braking torque	%	20 ... 100
DC braking torque	%	20 ... 100
Operating indications		
		Test voltage Test mains phases Ready to start Start active Motor running Ramp-down active Emergency start active
Warnings/error signals		
		Mains voltage missing Leading-edge phase error Phase failure • L1 • L2 • L3 Missing load phase • T1 • T2 • T3 Failure • Contact element 1 (thyristor) • Contact element 2 (thyristor) • Contact element 3 (thyristor) Flash memory faulty Supply voltage • Below 75 % • Below 85 % • Over 110 % Current unbalance exceeded Thermal motor model overload Prewarning limit exceeded • Motor heating • Time-related trip reserve Bypass element defective Mains voltage too high Device not named Wrong naming version Current measuring range exceeded Bypass element protection disconnection Power section • Overheated • Overheating

¹⁾ Max. current limit value for 3RW44 53 ... 3RW44 57: 500 % and for 3RW44 58 ... 3RW44 66: 450 %.

²⁾ Reference variable depends on the motor used but is always smaller than the rated torque of the motor.

³⁾ Actual motor start times are load dependent.

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3RW Soft Starters

3RW44 for high-feature applications







Type	3RW44 ..	Factory default
Control times and parameters		
Warnings/error signals (continued)	<ul style="list-style-type: none"> Temperature sensor <ul style="list-style-type: none"> • Overload • Open circuit • Short-circuit Ground fault <ul style="list-style-type: none"> • Detected Connection abort in manual operating mode Max. number of starts exceeded I_g limit value overshoot/undershoot Heat sink sensor <ul style="list-style-type: none"> • Open circuit • Short-circuit Quick-stop active Switching block defective I_g/class setting not permissible No external start-up parameters received PAA fault 	
Control inputs Input 1 Input 2 Input 3 Input 4 Parameterizing options for control inputs 1 ... 4	<ul style="list-style-type: none"> No action Local manual mode Emergency start Creep speed Quick-stop Trip reset Motor right parameter set 1 Motor left parameter set 1¹⁾ Motor right parameter set 2 Motor left parameter set 2¹⁾ Motor right parameter set 3 Motor left parameter set 3¹⁾ 	<ul style="list-style-type: none"> Motor right parameter set 1 No action No action Trip reset
Relay outputs Output 1 Output 2 Output 3 Output 4 Parameterizing options for relay outputs 1 ... 3	<ul style="list-style-type: none"> No action PAA output 1 PAA output 2 Input 1 Input 2 Input 3 Input 4 Starting Operation/Bypass Ramp-down ON period Command motor on DC braking contactor Group warning Group fault Bus fault Device fault Power on Ready to start 	<ul style="list-style-type: none"> ON period No action No action Group fault
Motor temperature sensor	<ul style="list-style-type: none"> Deactivated Thermoclick PTC type A 	

¹⁾ Parameter motor left possible only in conjunction with creep mode.

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3RW Soft Starters

3RW44 for high-feature applications

Type		3RW44 2.	3RW44 3.	3RW44 4.	3RW44 5. 3RW44 6.
Conductor cross-sections					
Screw terminals	Main conductors				
With box terminal			3RT19 55-4G (55 kW)	3RT19 66-4G	--
Front clamping point connected	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Solid Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded 	mm ² 2.5 ... 35 mm ² 4 ... 50 mm ² 2.5 ... 16 mm ² 4 ... 70 mm 6 x 9 x 0.8 AWG 10 ... 2/0	16 ... 70 16 ... 70 -- 16 ... 70 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 2/0	70 ... 240 70 ... 240 -- 95 ... 300 Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5 3/0 ... 600 kcmil	--
					
Rear clamping point connected	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Solid Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded 	mm ² 2.5 ... 50 mm ² 10 ... 50 mm ² 2.5 ... 16 mm ² 10 ... 70 mm 6 x 9 x 0.8 AWG 10 ... 2/0	16 ... 70 16 ... 70 -- 16 ... 70 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 2/0	120 ... 185 120 ... 185 -- 120 ... 240 Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5 250 ... 500 kcmil	--
					
Both clamping points connected	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Solid Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded Terminal screws - Tightening torque 	mm ² 2 x (2.5 ... 35) mm ² 2 x (4 ... 35) mm ² 2 x (2.5 ... 16) mm ² 2 x (4 ... 50) mm 2 x (6 x 9 x 0.8) AWG 2 x (10 ... 1/0) M6 (hexagon socket, A/F4) 4 ... 6 36 ... 53 NM lb.in	Max. 1 x 50, 1 x 70 Max. 1 x 50, 1 x 70 -- Max. 2 x 70 Max. 2 x (6 x 15.5 x 0.8) Max. 2 x 1/0 M10 (hexagon socket, A/F4) 10 ... 12 90 ... 110	Min. 2 x 50 Max. 2 x 185 Min. 2 x 50 Max. 2 x 185 -- Max. 2 x 70 Max. 2 x 240 Max. 2 x (20 x 24 x 0.5) Min. 2 x 2/0 Max. 2 x 500 kcmil M12 (hexagon socket, A/F4) 20 ... 22 180 ... 195	--
					
Screw terminals	Main conductors				
With box terminal		--	3RT19 56-4G	--	--
Front or rear clamping point connected	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded 	mm ² -- mm ² -- mm ² -- mm -- AWG --	16 ... 120 16 ... 120 16 ... 120 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 250 kcmil	--	--
					
Both clamping points connected	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded 	mm ² -- mm ² -- mm ² -- mm -- AWG --	Max. 1 x 95, 1 x 120 Max. 1 x 95, 1 x 120 Max. 2 x 120 Max. 2 x (10 x 15.5 x 0.8) Max. 2 x 3/0	--	--
					
Screw terminals	Main conductors				
	<u>Without box terminal/busbar connection</u>				
	<ul style="list-style-type: none"> Finely stranded with cable lug Stranded with cable lug AWG cables, solid or stranded Connecting bar (max. width) Terminal screws - Tightening torque 	mm ² -- mm ² -- AWG -- mm -- -- NM -- lb.in --	16 ... 95 ¹⁾ 25 ... 120 ¹⁾ 4 ... 250 kcmil 17 M8 x 25 (A/F13) 10 ... 14 89 ... 124	50 ... 240 ²⁾ 70 ... 240 ²⁾ 2/0 ... 500 kcmil 25 M10 x 30 (A/F17) 14 ... 24 124 ... 210	50 ... 240 ²⁾ 70 ... 240 ²⁾ 2/0 ... 500 kcmil 60 M12 x 40 20 ... 35 177 ... 310

¹⁾ When connecting cable lugs to DIN 46235, use 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm² to ensure phase spacing.

²⁾ When connecting cable lugs to DIN 46234, the 3RT19 66-4EA1 terminal cover must be used for conductor cross-sections of 240 mm² and more as well as DIN 46235 for conductor cross-sections of 185 mm² and more to keep the phase clearance.

Soft Starter
Control

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CONTROL
PRODUCTS

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Soft starters	Type	3RW44..	
Conductor cross-sections			
Auxiliary conductors (1 or 2 conductors can be connected):			
Screw terminals			
• Solid	mm ²	2 x (0.5 ... 2.5)	
• Finely stranded with end sleeve	mm ²	2 x (0.5 ... 1.5)	
• AWG cables			
- Solid or stranded	AWG	2 x (20 ... 14)	
- Finely stranded with end sleeve	AWG	2 x (20 ... 16)	
• Terminal screws			
- Tightening torque	NM lb.in	0.8 ... 1.2 7 ... 10.3	
Spring-type terminals			
• Solid	mm ²	2 x (0.25 ... 1.5)	
• Finely stranded with end sleeve	mm ²	2 x (0.25 ... 1.5)	
• AWG cables, solid or stranded	AWG	2 x (24 ... 16)	
		Standard	Parameters
Electromagnetic compatibility acc. to EN 60947-4-2			
EMC interference immunity			
Electrostatic discharge (ESD)	EN 61000-4-2	±4 kV contact discharge, ±8 kV air discharge	
Electromagnetic RF fields	EN 61000-4-3	Frequency range: 80 ... 1000 MHz with 80 % at 1 kHz Degree of severity 3, 10 V/m	
Conducted RF interference	EN 61000-4-6	Frequency range: 150 kHz ... 80 MHz with 80 % at 1 kHz Interference 10 V	
RF voltages and RF currents on cables			
• Burst	EN 61000-4-4	±2 kV/5 kHz	
• Surge	EN 61000-4-5	±1 kV line to line ±2 kV line to ground	
EMC interference emission			
EMC interference field strength	EN 55011	Limit value of Class A at 30 ... 1000 MHz	
Radio interference voltage	EN 55011	Limit value of Class A at 0.15 ... 30 MHz	
Is an RI suppression filter necessary?			
Degree of noise suppression A (industrial applications)		No	

Soft Starter
Control

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CONTROL
PRODUCTS

For Operation in the Control Cabinet

3RW Soft Starters

Circuit Breaker SCCR

Soft starters ToC 1	Rated current	Circuit Breakers																	
		Thermal Magnetic						Instantaneous Trip						Fuse					
Q11 Type		480 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A	480 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A
3RW44 22	11	ED63B, HEG3G	100	40				ED63A, HEM3M	100	40	ED63A, HEM3M	50	40	RK5	100	50	J	100	100
3RW44 23	23	ED63B, HEG3G	100	50				ED63A, HEM3M	100	50	ED63A, HEM3M	50	50	RK5	100	60	J	100	120
3RW44 24	29	ED63B, HEG3G	100	70				ED63A, HEM3M	100	100	ED63A, HEM3M	50	50	RK5	100	80	J	100	160
3RW44 25	29	ED63B, HEG3G	100	70				ED63A, HEM3M	100	50	ED63A, HEM3M	50	50	RK5	100	80			
3RW44 26	29	ED63B, HEG3G	100	100				ED63A, HEM3M	100	100	ED63A, HEM3M	50	100	RK5	100	125	J	100	250
3RW44 27	34	ED63B, HEG3G, FD63B	100	150				ED63A, HEM3M	100	100	ED63A, HEM3M	50	125	RK5	100	150	J	100	300
3RW44 34	42	FD63B	100	150	FD63B	50	150	ED63A, HEM3M	100	125	FXD63A	50	150	RK5	100	200	J	100	400
3RW44 35	58	FD63B	100	150	FD63B	50	150	FXD63A	100	150	FXD63A	50	150	RK5	100	200	J	100	400
3RW44 36	62	JD63B	100	200	JD63B	50	250	FXD63A	100	250	FXD63A	50	250	RK5	100	250	J	100	500
3RW44 43	73	JD63B	100	300	JD63B	50	250	FXD63A	100	250	JXD63A	50	300	RK5	100	300	J	100	600
3RW44 44	98	JD63B	100	300	JD63B	50	300	JXD63A	100	300	JXD63A	50	300	RK5	100	350			
3RW44 45	98	JD63B	100	400	JD63B	50	400	JXD63A	100	400	JXD63A	50	400	RK5	100	450			
3RW44 46	98	LD63B	100	500	LD63B	50	450	LXD63H	100	400	JXD63A	50	400	RK5	100	600			
3RW44 47	98	LD63B	100	600	LD63B	50	600	LXD63H	100	600	LXD63H	50	600	L	100	700			
3RW44 53	117	HMD6	65	800/800	HMD6	50	800/800							L	100	1000			
3RW44 54	145	HND6	100	1200/900	HND6	50	1200/900							L	100	1000			
3RW44 55	145	HND6	100	1200/900	HND6	50	1200/900							L	100	1000			
3RW44 56	145	HND6	100	1200/1000	HND6	50	1200/1000							L	100	1000			
3RW44 57	145	HND6	100	1200/1000	HND6	50	1200/1000							L	100	1000			
3RW44 58	145	CND6	65	1200	CND6	65	1200												
3RW44 65	205	CND6	42	1600	CND6	42	1600												
3RW44 66	248	CND6	42	1600	CND6	42	1600												

Specified Type

ED63A
FXD63A
JXD63A
ED63B
FD63B
JD63B
HND6

Others permitted

HED63A, HHED63A or CED63A
HFXD63A or CFD63A
HJXD63A or CJD63A
HED63B, HHED63B or CED63B
HFD63B, HHFD63B or CFD63B
HJ63B, HHJD63B or CJD63B
HNXD6 or CND6

Soft Starter
Control

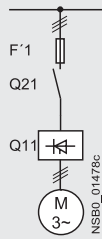
CONTROL
PRODUCTS

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Inline circuit fused version with 3NE1 SITOR all-range fuse (semiconductor and line protection)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" → "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" → "SITOR Semiconductor Fuses" or go to www.siemens.com/sitor → "Products" → "BETA Protecting" → "SITOR"

Soft starters Q11 Type	Rated current A	All-range fuses F'1 Type			Voltage V	Size	Line contactors up to 400 V (optional) Q21 Type	Braking contactors ¹⁾²⁾ (for example circuit see page 17-264) Q91 Type		Q92 Type
		Rated current A	Voltage V	Size				Q91 Type	Q92 Type	
Type of coordination "2"ⁿ³⁾; $I_q = 65 \text{ kA}$										
3RW44 22	29	3NE1 020-2	80	690 +5 %	00	3RT10 34	3RT15 26	--		
3RW44 23	36	3NE1 020-2	80	690 +5 %	00	3RT10 35	3RT15 26	--		
3RW44 24	47	3NE1 021-2	100	690 +5 %	00	3RT10 36	3RT15 35	--		
3RW44 25	57	3NE1 022-2	125	690 +5 %	00	3RT10 44	3RT15 35	--		
3RW44 26	77	3NE1 022-2	125	690 +5 %	00	3RT10 45	3RT10 24			3RT10 35
3RW44 27	93	3NE1 024-2	160	690 +5 %	1	3RT10 46	3RT10 25			3RT10 36
3RW44 34	113	3NE1 225-2	200	690 +5 %	1	3RT10 54	3RT10 34			3RT10 44
3RW44 35	134	3NE1 227-2	250	690 +5 %	1	3RT10 55	3RT10 36			3RT10 45
3RW44 36	162	3NE1 227-2	250	690 +5 %	1	3RT10 56	3RT10 44			3RT10 45
3RW44 43	203	3NE1 230-2	315	600 +10 %	1	3RT10 64	3RT10 44			3RT10 54
3RW44 44	250	3NE1 331-2	350	460 +10 %	2	3RT10 65	3RT10 44			3RT10 55
3RW44 45	313	3NE1 333-2	450	690 +5 %	2	3RT10 75	3RT10 54			3RT10 56
3RW44 46	356	3NE1 334-2	500	690 +5 %	2	3RT10 75	3RT10 54			3RT10 56
3RW44 47	432	3NE1 435-2	560	690 +5 %	3	3RT10 76	3RT10 55			3RT10 64
3RW44 53	551	2 x 3NE1 334-2	500	690 +10 %	2	3TF68	3RT10 64			3RT10 66
3RW44 54	615	2 x 3NE1 334-2	500	690 +10 %	2	3TF68	3RT10 64			3RT10 75
3RW44 55	693	2 x 3NE1 334-2	500	690 +10 %	2	3TF69	3RT10 65			3RT10 75
3RW44 56	780	2 x 3NE1 435-2	560	690 +10 %	3	3TF69	3RT10 65			3RT10 75
3RW44 57	880	2 x 3NE1 435-2	560	690 +10 %	3		3RT10 75			3RT10 76
3RW44 58	970	2 x 3NE1 435-2	560	690 +10 %	3		3RT10 75			3RT10 76
3RW44 65	1076	3 x 3NE1 334-2	500	690 +10 %	2		3RT10 75			3TF68
3RW44 66	1214	3 x 3NE1 435-2	560	690 +10 %	3		3RT10 76			3TF68

1) If the ramp-down function "Combined braking" is selected, no braking contactor is required.
If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition (see table for type).
For applications with large centrifugal masses ($J_{Load} > J_{Motor}$) we recommend the function "DC braking".

2) Additional auxiliary relay K4:
LZX:RT4A4T30
(3RW44 soft starter with rated control supply voltage 230 V AC),
LZX:RT4A4S15
(3RW44 soft starter with rated control supply voltage 115 V AC).

3) The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.
[The types of coordination are explained under "3RA1 Fuseless Load Feeders".](#)

Soft Starter
Control

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CONTROL
PRODUCTS

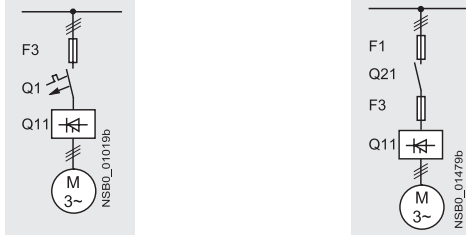
For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Inline circuit fused version with 3NE or 3NC SITOR semiconductor fuse

(semiconductor protection by fuse, line and overload protection by motor starter protector/circuit breaker)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" → "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" → "SITOR Semiconductor Fuses" or go to www.siemens.com/sitor → "Products" → "BETA Protecting" → "SITOR"

Soft starters Q11 Type	Rated current A	Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses (cylinder)		
		F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size
Type of coordination "2"³⁾: I_q = 65 kA										
3RW44 22	29	3NE4 120	80	0	3NE4 121	100	0	3NC2 280	80	22 x 58
3RW44 23	36	3NE4 121	100	0	3NE4 121	100	0	3NC2 200	100	22 x 58
3RW44 24	47	3NE4 121	100	0	3NE4 122	125	0	3NC2 200	100	22 x 58
3RW44 25	57	3NE4 122	125	0	3NE4 124	160	0			
3RW44 26	77	3NE4 124	160	0	3NE4 124	160	0			
3RW44 27	93	3NE3 224	160	1	3NE3 332-0B	400	2			
3RW44 34	113	3NE3 225	200	1	3NE3 335	560	2			
3RW44 35	134	3NE3 225	200	1	3NE3 335	560	2			
3RW44 36	162	3NE3 227	250	1	3NE3 333	450	2			
3RW44 43	203	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 44	250	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 45	313	3NE3 233	450	1	3NE3 336	630	2			
3RW44 46	356	3NE3 333	450	2	3NE3 336	630	2			
3RW44 47	432	3NE3 335	560	2	3NE3 338-8	800	2			
3RW44 53	551	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 54	615	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 55	693	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 56	780	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 57	880	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 58	970	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 65	1076	2 x 3NE3 340-8	900	2	3 x 3NE3 338-8	800	2			
3RW44 66	1214	2 x 3NE3 340-8	900	2	3 x 3NE3 338-8	800	2			

Soft starters Q11 Type	Rated current A	Line contactors up to 400 V (optional) Q21 Type	Braking contactors ¹⁾²⁾ (for example circuit see page 17-258) Q91 Type		Motor starter protectors/ circuit breakers Q1 Type	Line protection, maximum			
			Q92 Type	Rated current A		F1 Type	Rated current A	Size	
Type of coordination "2"³⁾: I_q = 65 kA									
3RW44 22	29	3RT10 34	3RT15 26	--	3RV10 41-4HA10	50	3NA3 820-6	50	00
3RW44 23	36	3RT10 35	3RT15 26	--	3RV10 41-4JA10	63	3NA3 822-6	63	00
3RW44 24	47	3RT10 36	3RT15 35	--	3RV10 41-4KA10	75	3NA3 824-6	80	00
3RW44 25	57	3RT10 44	3RT15 35	--	3RV10 41-4LA10	90	3NA3 830-6	100	00
3RW44 26	77	3RT10 45	3RT10 24	3RT10 35	3RV10 41-4MA10	100	3NA3 132-6	125	1
3RW44 27	93	3RT10 46	3RT10 25	3RT10 36	3RV10 41-4MA10	100	3NA3 136-6	160	1
3RW44 34	113	3RT10 54	3RT10 34	3RT10 44	3VL17 16	160	3NA3 244-6	250	2
3RW44 35	134	3RT10 55	3RT10 36	3RT10 45	3VL17 16	160	3NA3 244-6	250	2
3RW44 36	162	3RT10 56	3RT10 44	3RT10 45	3VL37 25	250	3NA3 365-6	500	3
3RW44 43	203	3RT10 64	3RT10 44	3RT10 54	3VL47 31	315	2 x 3NA3 354-6	2 x 355	3
3RW44 44	250	3RT10 65	3RT10 44	3RT10 55	3VL47 31	315	2 x 3NA3 354-6	2 x 355	3
3RW44 45	313	3RT10 75	3RT10 54	3RT10 56	3VL47 40	400	2 x 3NA3 365-6	2 x 500	3
3RW44 46	356	3RT10 75	3RT10 54	3RT10 56	3VL47 40	400	2 x 3NA3 365-6	2 x 500	3
3RW44 47	432	3RT10 76	3RT10 55	3RT10 64	3VL57 50	500	2 x 3NA3 365-6	2 x 500	3
3RW44 53	551	3TF68	3RT10 64	3RT10 66	3VL67 80	800	2 x 3NA3 365-6	2 x 500	3
3RW44 54	615	3TF68	3RT10 64	3RT10 75	3VL67 80	800	2 x 3NA3 365-6	2 x 500	3
3RW44 55	693	3TF69	3RT10 65	3RT10 75	3VL67 80	800	2 x 3NA3 365-6	2 x 500	3
3RW44 56	780	3TF69	3RT10 65	3RT10 75	3VL77 10	1000	2 x 3NA3 365-6	2 x 500	3
3RW44 57	880		3RT10 75	3RT10 76	3VL77 10	1000	2 x 3NA3 365-6	2 x 500	3
3RW44 58	970		3RT10 75	3RT10 76	3VL77 12	1250	3 x 3NA3 365-6	3 x 500	3
3RW44 65	1076		3RT10 75	3TF68	3VL77 12	1250	3 x 3NA3 365-6	3 x 500	3
3RW44 66	1214		3RT10 76	3TF68	3VL77 12	1250	3 x 3NA3 365-6	3 x 500	3

¹⁾ If the ramp-down function "Combined braking" is selected, no braking contactor is required. If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition (see table for type). For applications with large centrifugal masses ($J_{Load} > J_{Motor}$) we recommend the function "DC braking".

²⁾ Additional auxiliary relay K4:
LZX:RT4A4T30
(3RW44 soft starter with rated control supply voltage 230 V AC),
LZX:RT4A4S15
(3RW44 soft starter with rated control supply voltage 115 V AC).

³⁾ The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder. The types of coordination are explained under "3RA1 Fuseless Load Feeders".

Soft Starter
Control

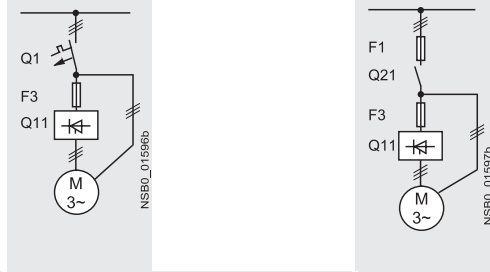
CONTROL
PRODUCTS

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Inside-delta circuit fused version with 3NE or 3NC SITOR fuses
(semiconductor protection by fuse, lead and overload protection by motor starter protector/circuit breaker)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" → "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" → "SITOR Semiconductor Fuses" or go to www.siemens.com/sitor → "Products" → "BETA Protecting" → "SITOR"

Soft starters TOC 2	Rated current Q11 Type	Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses (cylinder)		
		F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size
Type of coordination "2"¹⁾										
3RW44 22	50	3NE4 120	80	0	3NE4 121	100	0	3NC2 280	80	22 x 58
3RW44 23	62	3NE4 121	100	0	3NE4 121	100	0	3NC2 200	100	22 x 58
3RW44 24	81	3NE4 121	100	0	3NE4 122	125	0	3NC2 200	100	22 x 58
3RW44 25	99	3NE4 122	125	0	3NE4 124	160	0			
3RW44 26	133	3NE4 124	160	0	3NE4 124	160	0			
3RW44 27	161	3NE3 224	160	1	3NE3 332-0B	400	2			
3RW44 34	196	3NE3 225	200	1	3NE3 335	560	2			
3RW44 35	232	3NE3 225	200	1	3NE3 335	560	2			
3RW44 36	281	3NE3 227	250	1	3NE3 333	450	2			
3RW44 43	352	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 44	433	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 45	542	3NE3 233	450	1	3NE3 336	630	2			
3RW44 46	617	3NE3 333	450	2	3NE3 336	630	2			
3RW44 47	748	3NE3 335	560	2	3NE3 338-8	800	2			
3RW44 53	954	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 54	1065	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 55	1200	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 56	1351	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 57	1524	2 x 3NE3 336	630	2	3 x 3NE3 340-8	900	2			
3RW44 58	1680	2 x 3NE3 336	630	2	3 x 3NE3 340-8	900	2			
3RW44 65	1864	2 x 3NE3 340-8	900	2	3 x 3NE3 338-8	800	2			
3RW44 66	2103	2 x 3NE3 340-8	900	2	3 x 3NE3 338-8	800	2			

Soft starters TOC 2	Rated current Q11 Type	Line contactors up to 400 V (optional) Q21 Type	Motor starter protectors/ circuit breakers		Line protection, maximum		
			440 V +10 % Q1 Type	Rated current A	690 V +5 % F1 Type	Rated current A	Size
Type of coordination "2"¹⁾							
3RW44 22	50	3RT10 36-1AP04	3RV10 42-4KA10	75	3NA3 824-6	80	00
3RW44 23	62	3RT10 44-1AP04	3RV10 42-4LA10	90	3NA3 830-6	100	00
3RW44 24	81	3RT10 46-1AP04	3RV10 42-4MA10	100	3NA3 132-6	125	1
3RW44 25	99	3RT10 54-1AP36	3VL27 16	160	3NA3 136-6	160	1
3RW44 26	133	3RT10 55-6AP36	3VL27 16	160	3NA3 240-6	200	2
3RW44 27	161	3RT10 56-6AP36	3VL37 20	200	3NA3 244-6	250	2
3RW44 34	196	3RT10 64-6AP36	3VL37 25	250	3NA3 360-6	400	3
3RW44 35	232	3RT10 65-6AP36	3VL47 31	315	3NA3 360-6	400	3
3RW44 36	281	3RT10 66-6AP36	3VL47 40	400	2 x 3NA3 360-6	2 x 400	3
3RW44 43	352	3RT10 75-6AP36	3VL47 40	400	2 x 3NA3 365-6	2 x 500	3
3RW44 44	433	3RT10 76-6AP36	3VL57 50	500	2 x 3NA3 365-6	2 x 500	3
3RW44 45	542	3TF68 44-OCM7	3VL57 63	800	3 x 3NA3 365-6	3 x 500	3
3RW44 46	617	3TF68 44-OCM7	3VL67 80	800	3 x 3NA3 365-6	3 x 500	3
3RW44 47	748	3TF69	3VL67 80	800	3 x 3NA3 365-6	3 x 500	3
3RW44 53	954		3VL77 10	1000	3 x 3NA3 365-6	3 x 500	3
3RW44 54	1065		3VL77 12	1250	3 x 3NA3 365-6	3 x 500	3
3RW44 55	1200		3VL87 16	1600	3 x 3NA3 365-6	3 x 500	3
3RW44 56	1351		3VL87 16	1600	3 x 3NA3 372	3 x 630	3
3RW44 57	1524		3VL87 16	1600	3 x 3NA3 372	3 x 630	3
3RW44 58	1680		3WL12 20	2000	2 x 3NA3 480	2 x 1000	4
3RW44 65	1864		3WL12 25	2500	2 x 3NA3 482	2 x 1250	4
3RW44 66	2103		3WL12 25	2500	2 x 3NA3 482	2 x 1250	4

¹⁾ The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

The types of coordination are explained under "3RA1 Fuseless Load Feeders".

Soft Starter
Control

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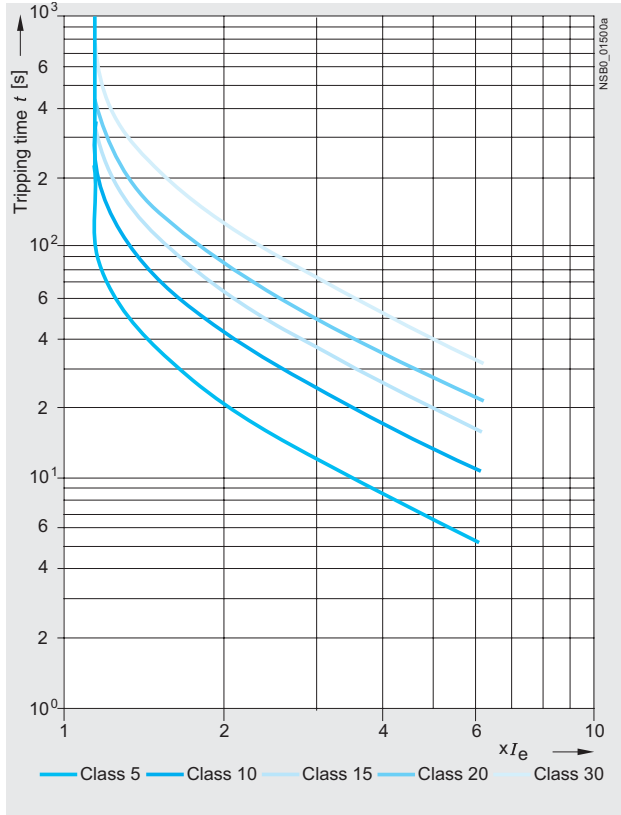
For Operation in the Control Cabinet

3RW Soft Starters

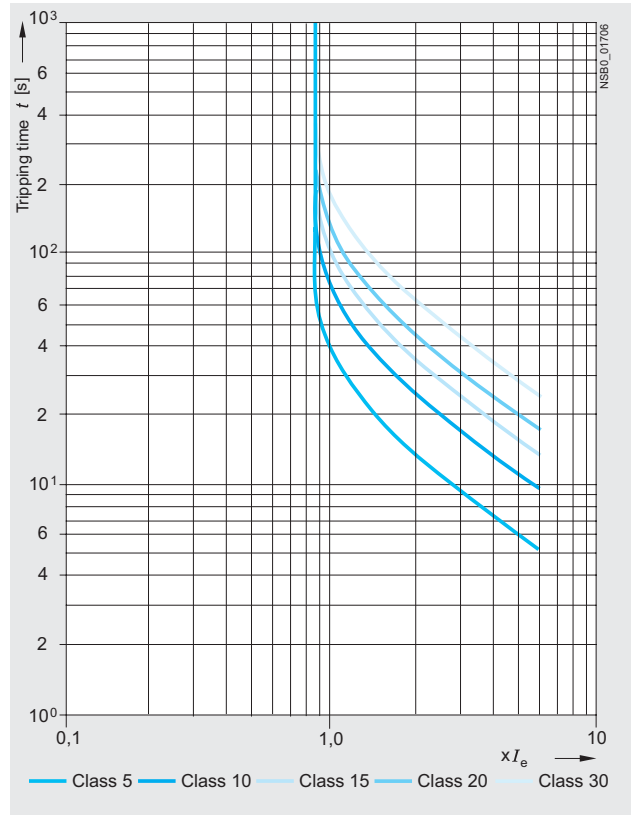
3RW44 for high-feature applications

Characteristic curves

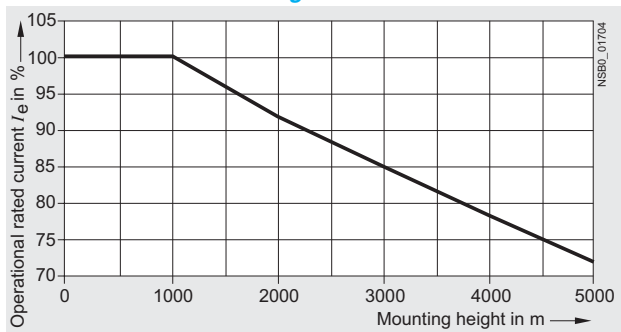
Motor protection tripping characteristics for 3RW44 (with symmetry)



Motor protection tripping characteristics for 3RW44 (with asymmetry)



Permissible installation height



At an installation height above 2000 m, the max. permissible operational voltage is reduced to 460 V.

Soft Starter
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For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 350 % $I_{n \text{ motor}}$).
The soft starter rating can be selected to be as high as the rating of the motor used

Application	Conveyor belt	Roller conveyor	Compressor	Small fan	Pump	Hydraulic pump
Starting parameters						
• Voltage ramp and current limiting						
- Starting voltage	% 70	60	50	30	30	30
- Starting time	s 10	10	10	10	10	10
- Current limit value	Deactivated	Deactivated	$4 \times I_M$	$4 \times I_M$	Deactivated	Deactivated
• Torque ramp						
- Starting torque	60	50	40	20	10	10
- End torque	150	150	150	150	150	150
- Starting time	10	10	10	10	10	10
• Breakaway pulse						
	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)
Ramp-down mode						
	Smooth ramp-down	Smooth ramp-down	Free ramp-down	Free ramp-down	Pump ramp-down	Free ramp-down

Application examples for heavy starting (Class 20)

Heavy starting Class 20 (up to 40 s with 350 % $I_{n \text{ motor}}$).
The soft starter has to be selected one performance class higher than the motor used

Application	Stirrer	Centrifuge	Milling machine
Starting parameters			
• Voltage ramp and current limiting			
- Starting voltage	% 30	30	30
- Starting time	s 30	30	30
- Current limit value	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
• Torque ramp			
- Starting torque	30	30	30
- End torque	150	150	150
- Starting time	30	30	30
• Breakaway pulse			
	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)
Ramp-down mode			
	Free ramp-down	Free ramp-down	Free ramp-down or DC braking

Application examples for very heavy starting (Class 30)

Very heavy starting Class 30 (up to 60 s with 350 % $I_{n \text{ motor}}$).
The soft starter has to be selected two performance classes higher than the motor used

Application	Large fan	Mill	Crusher	Circular saw/bandsaw
Starting parameters				
• Voltage ramp and current limiting				
- Starting voltage	% 30	50	50	30
- Starting time	s 60	60	60	60
- Current limit value	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
• Torque ramp				
- Starting torque	20	50	50	20
- End torque	150	150	150	150
- Starting time	60	60	60	60
• Breakaway pulse				
	Deactivated (0 ms)	80 %, 300 ms	80 %, 300 ms	Deactivated (0 ms)
Ramp-down mode				
	Free ramp-down	Free ramp-down	Free ramp-down	Free ramp-down

Note:

These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during commissioning. The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

For Operation in the Control Cabinet

3RW Soft Starters

Circuit concept

The SIRIUS 3RW44 soft starters can be operated in two different types of circuit.

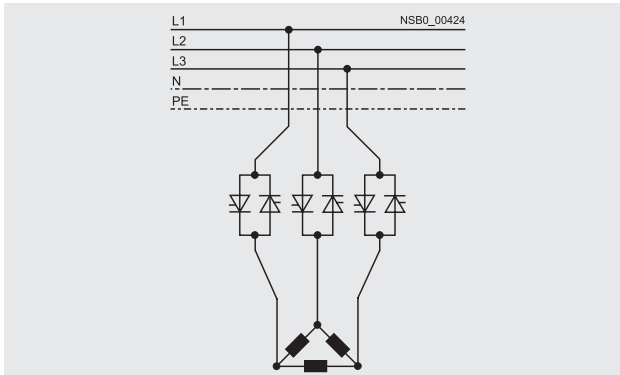
- **Inline circuit**

The controls for isolating and protecting the motor are simply connected in series with the soft starter. The motor is connected to the soft starter with three cables.

- **Inside-delta circuit**

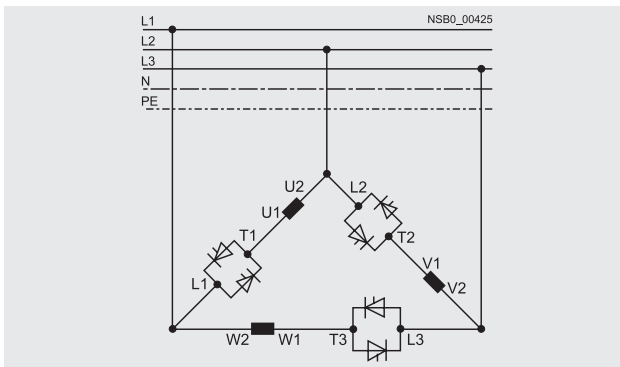
The wiring is similar to that of wye-delta starters. The phases of the soft starter are connected in series with the individual motor windings. The soft starter then only has to carry the phase current, amounting to about 58 % of the rated motor current (conductor current).

Comparison of the types of circuit



Inline circuit:

Rated current I_g corresponds to the rated motor current I_n , 3 cables to the motor



Inside-delta circuit:

Rated current I_g corresponds to approx. 58 % of the rated motor current I_n , 6 cables to the motor (as with wye-delta starters)

Which circuit?

Using the inline circuit involves the lowest wiring outlay. If the soft starter to motor connections are long, this circuit is preferable.

With the inside-delta circuit there is double the wiring complexity but a smaller size of device can be used at the same rating.

Thanks to the choice of operating mode between the inline circuit and inside-delta circuit, it is always possible to select the most favorable solution.

The braking function is possible only in the inline circuit.

Configuration

The 3RW44 solid-state soft starters are designed for normal starting. In case of heavy starting or increased starting frequency, a larger device must be selected.

For long starting times it is recommended to have a PTC sensor in the motor. This also applies for the ramp-down modes smooth ramp-down, pump ramp-down and DC braking, because during the ramp-down time in these modes, an additional current load applies in contrast to free ramp-down.

In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses and controls) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately.

A bypass contact system and solid-state overload relay are already integrated in the 3RW44 soft starter and therefore do not have to be ordered separately.

The harmonic component load for starting currents must be taken into consideration for the selection of motor starter protectors (selection of release).

Note:

When induction motors are switched on, voltage drops occur as a rule on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

Device interface, PROFIBUS DP communication module, Soft Starter ES parameterizing and operating software

The 3RW44 electronic soft starters have a PC interface for communicating with the Soft Starter ES software or for connecting the external display and operator module. If the optional PROFIBUS communication module is used, the 3RW44 soft starter can be integrated in the PROFIBUS network and communicate using the GSD file or Soft Starter ES Premium software.

The Soft Starter ES parameterizing and operating software can be downloaded from www.usa.siemens.com > *Software* with a 14-day trial license.

More information about Soft Starter ES can be found in Chapter 12 of Catalog LV 1.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Manual for SIRIUS 3RW44

Besides containing all important information on configuring, commissioning and servicing, the manual also contains example circuits and the technical specifications for all devices.

Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded from: www.usa.siemens.com > Software

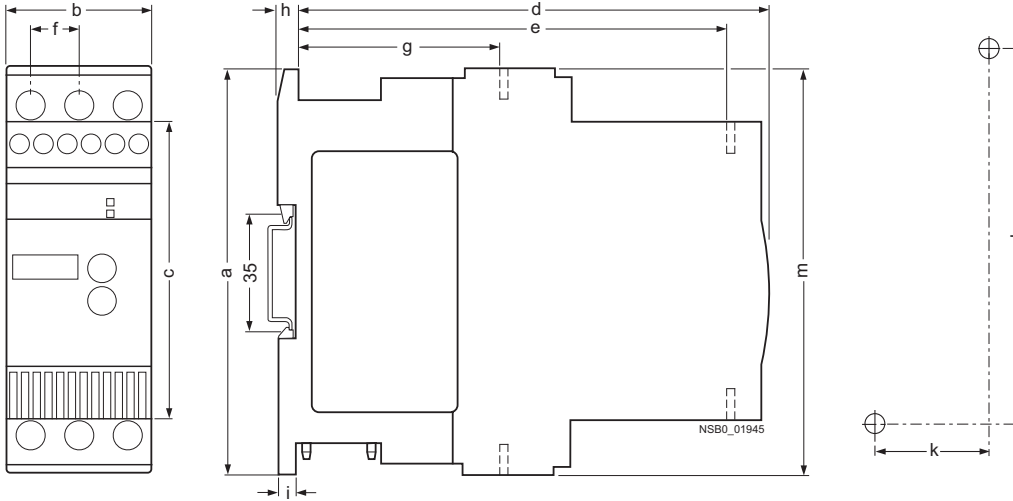
More information can be found on the Internet at: www.usa.siemens.com

For Operation in the Control Cabinet

Dimensional drawings

3RW30 for standard applications

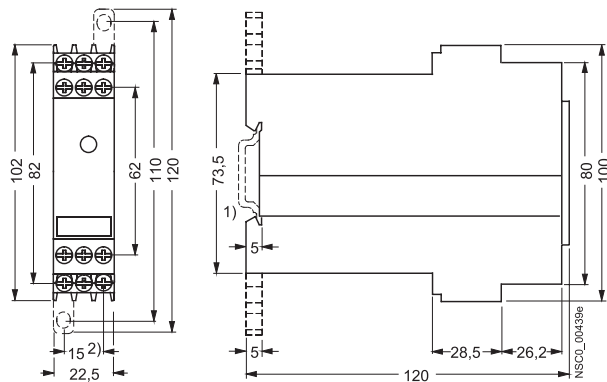
3RW30 1. ... 3RW30 4.



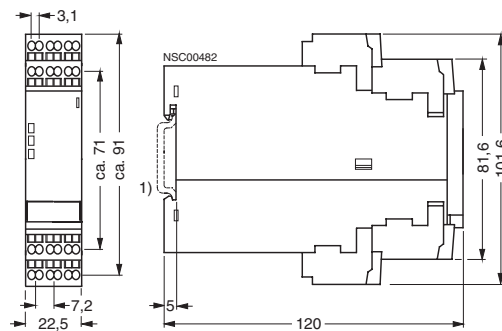
Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m
3RW30 1.-1.	95	45	62	146	126	14.4	63	5	6.5	35	85	95
3RW30 1.-2.	95	45	62	146	126	14.4	63	5	6.5	35	85	117.2
3RW30 2.-1.	125	45	92	146	126	14.4	63	5	6.5	35	115	125
3RW30 2.-2.	125	45	92	146	126	14.4	63	5	6.5	35	115	150
3RW30 3.	160	55	110	163	140	18	63	5	6.5	30	150	144
3RW30 4.	170	70	110	181	158	22.5	85	5	10	60	160	160

Clearances to grounded parts (mm)	Lateral	Top	Bottom	Fixing screws	Tightening torques (Nm)
3RW30 1.	5	60	40	M4	1
3RW30 2.	5	60	40	M4	1
3RW30 3.	30	60	40	M4	1
3RW30 4.	30	60	40	M4	2

3RW30 03-1. (screw terminals)



3RW30 03-2. (spring-type terminals)



1) For mounting onto standard mounting rail TH 35 according to EN 60715.

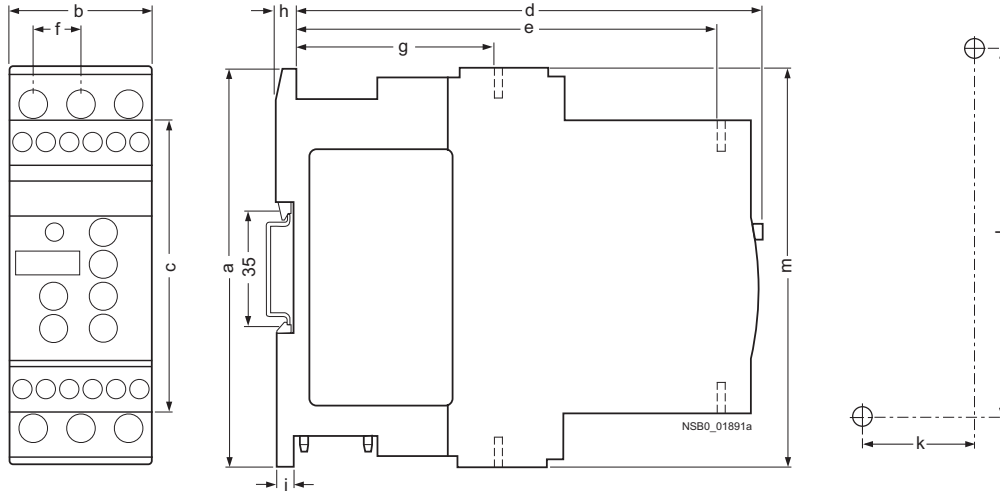
2) Dimension for screw fixing.
Screw fixing with two 3RP1 903 push-in lugs per 3RW30 03 device.

For Operation in the Control Cabinet

3RW Soft Starters

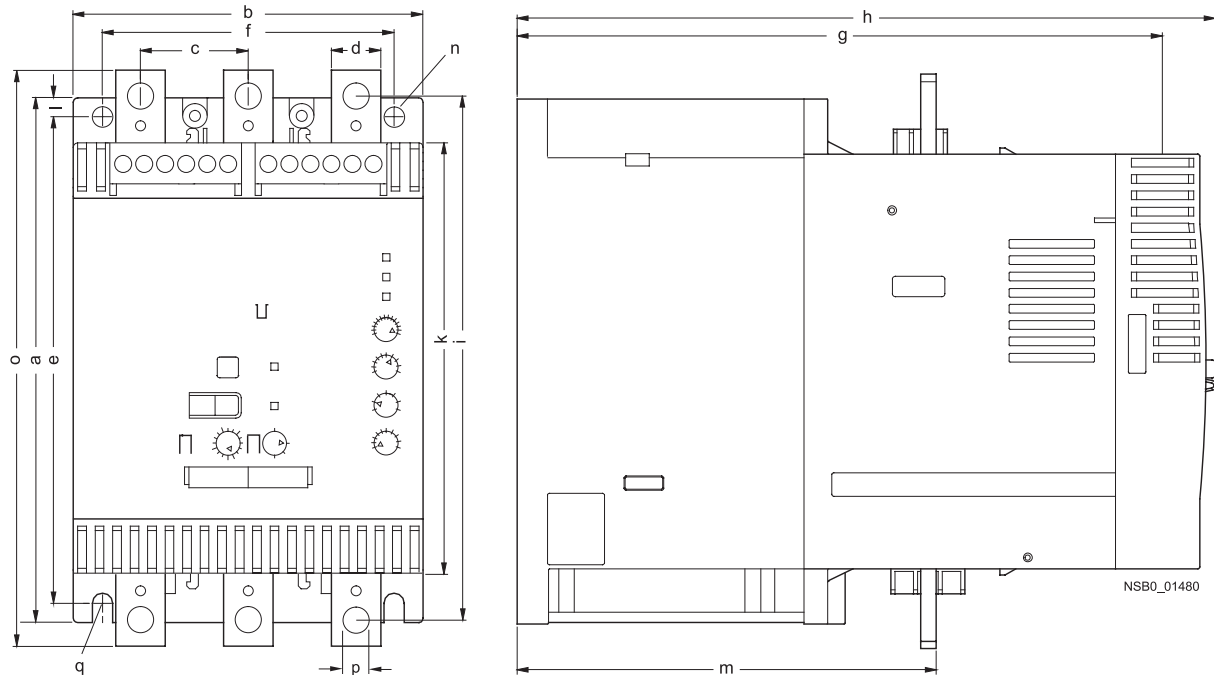
Project Planning aids

3RW40 for standard applications



Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m
3RW40 2.-1.	125	45	92	149	126	14.4	63	5	6.5	35	115	125
3RW40 2.-2.	125	45	92	149	126	14.4	63	5	6.5	35	115	150
3RW40 3.	170	55	110	165	140	18	63	5	6.5	30	150	144
3RW40 4.	170	70	110	183	158	22.5	85	5	10	60	160	160

Clearances to grounded parts (mm)	Lateral	Top	Bottom	Fixing screws	Tightening torques (Nm)
3RW40 2.	5	60	40	M4	1
3RW40 3.	30	60	40	M4	1
3RW40 4.	30	60	40	M4	2



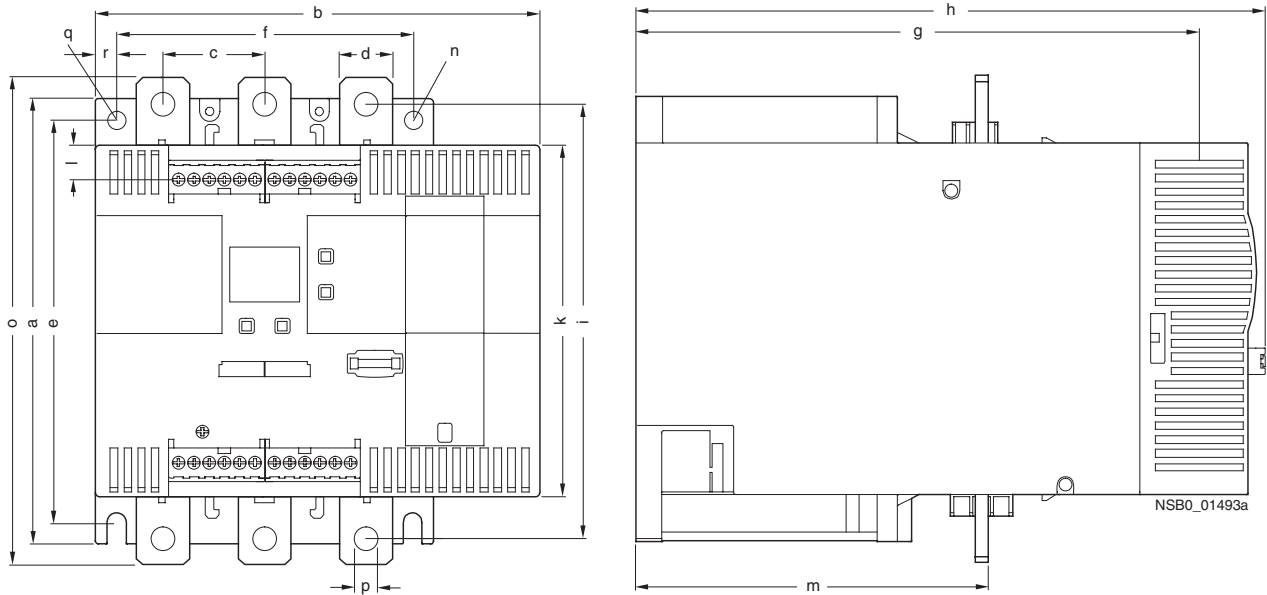
Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q
3RW40 5.	180	120	37	17	167	100	223	250	180	148	6.5	153	7	198	9	M6, 10 Nm
3RW40 7.	210	160	48	25	190	140	240	278	205	166	10	166	9	230	11	M8, 15 Nm

For Operation in the Control Cabinet

3RW Soft Starters

Project Planning aids

3RW44 2., 3RW44 3. and 3RW44 4. for High-Feature applications



Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r
3RW44 2.	180	170	37	11	167	100	240	270	174	148	7.5	153	7	184	6.6	M6, 10 Nm	10
3RW44 3.	180	170	37	17	167	100	240	270	174	148	7.5	153	7	198	9	M6, 10 Nm	10
3RW44 4.	210	210	48	25	190	140	269	298	205	166	16	166	9	230	11	M8, 15 Nm	10

Soft Starter
Control

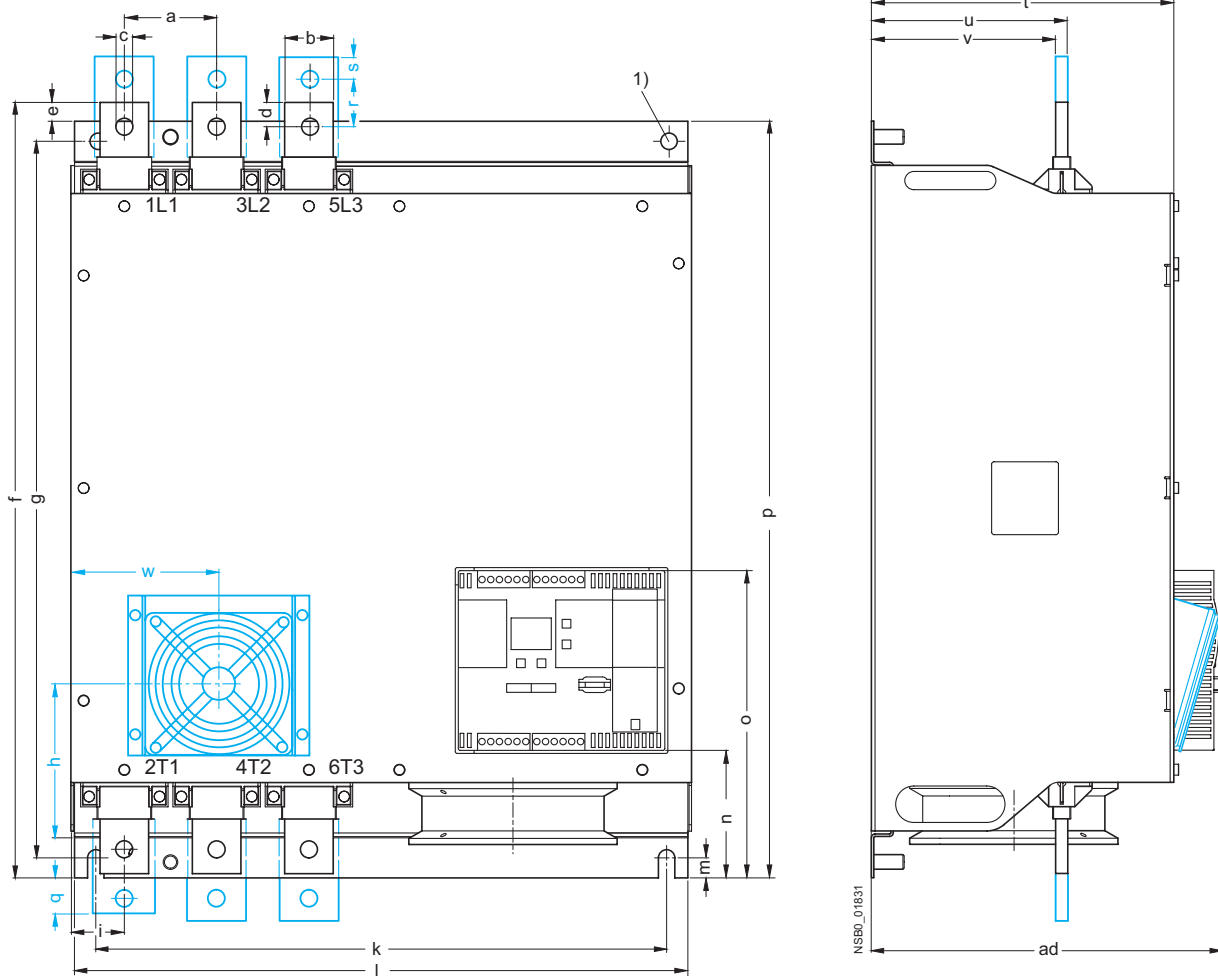
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For Operation in the Control Cabinet

3RW Soft Starters

Project Planning aids

3RW44 5. and 3RW44 6. for High-Feature applications



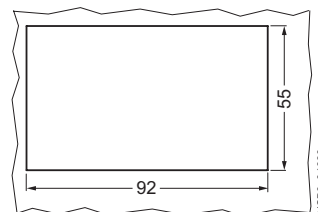
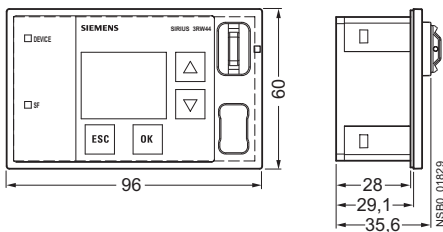
1) For M12 screw, tightening torque max. 35 Nm (310 lb.in).

Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m
3RW44 5.	76	40	14	20	15.5	638.5	590	--	44	470	510	16.5
3RW44 6.	85	50	14	--	--	667	660	160	37.5	535	576	16.5

Type/Dimension (mm)	n	o	p	q	r	s	t	u	v	W	ad
3RW44 5.	105	253	623	--	--	--	249	162	152	--	290
3RW44 6.	103	251	693	43.5	40	20	249	162	151.4	123	290

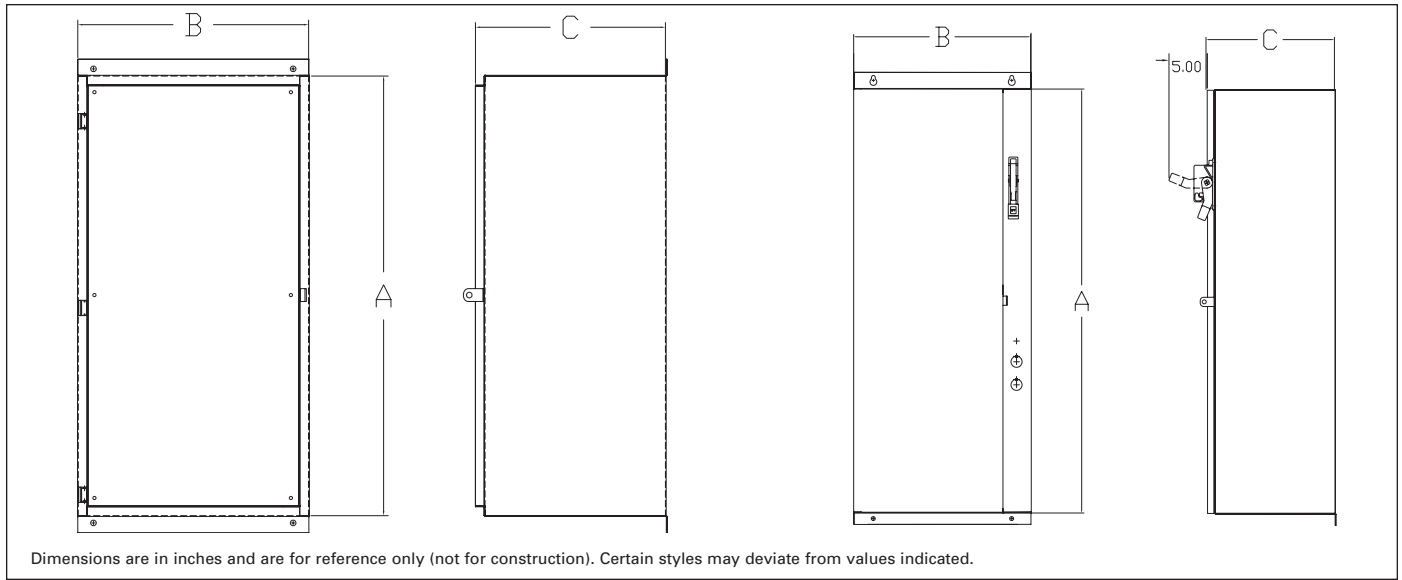
3RW49 00-0AC00 external display and operator module

Installation cutout for 3RW49 00-0AC00 external display and operator module



For Operation in the Control Cabinet

Class 73, 74



Non-Combination Class 73

N1, N3R, N12, N4 Standard Enclosure

	Amps	A	B	C
3RW40new	11 - 73	25	18	13
	98	36	23	10
3RW40	117-145	36	18	15
	205-315	36	22	20
	385	54	36	20
3RW44	26 - 68	26	12.5	15
	82 - 117	36	18	15
	145 - 215	36	22	20
	280 - 385	54	36	20
	494 - 780	90	40	20
	970 - 1076	90	50	20

N4X Stainless Steel Standard Enclosure

	Amps	A	B	C
3RW40new	11- 98	55	29	11
3RW40	117	36	18	15
	145 - 205A	36	22	20
	248 - 385	54	36	20
3RW44	26 - 51	26	12.5	15
	68 - 82	36	18	15
	100 - 117	36	22	20
	145 - 385	54	36	20

N1, N3R, N12, N4 Modified Enclosure

	Amps	A	B	C
3RW40	117-385	56	36	20
3RW44	26-51	36	22	20
	68-385	54	36	20

N4X Stainless Steel Modified Enclosure

	Amps	A	B	C
3RW40	117-385	54	36	20
3RW44	26-51	36	22	20
	68-385	54	36	20

Combination Type Class 74

N1, N3R, N12, N4 Standard Enclosure

	Amps	A	B	C
3RW40new	11 - 73	36	20	11
	98	46	20	10
3RW40	117	50	25	20
	145 - 205	66	25	20
	248 - 315	90	30	20
	385	90	40	20
3RW44	26 - 68	36	23	15
	82 - 117	50	25	20
	145 - 215	66	25	20
	280	90	30	20
	315 - 384	90	40	20
	494	90	40	20
	551 - 780	90	40 [Ⓞ]	20
	970 - 1076	90	50	20

N1, N12 Fusible

	Amps	A	B	C
3RW44	494-780	90	50	20

N4X Stainless Steel Standard Enclosure

	Amps	A	B	C
3RW40new	11- 98	55	29	11
3RW40	117 - 145	54	36	20
	205 - 300	90	40	20
3RW44	26 - 42	36	23	15
	51 - 100	50	25	20
	117 - 145	54	36	20
	180 - 385	90	40	20

N1, N3R, N12, N4 Modified Enclosure

	Amps	A	B	C
3RW40	117 - 248	76	30	20
	315	90	30	20
	385	90	40	20
3RW44	26 - 215	76	30	20
	280	90	30	20
	315 - 385	90	40	20

N4X Stainless Steel Modified Enclosure

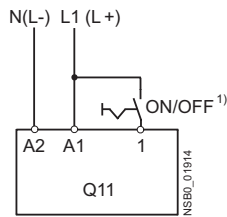
	Amps	A	B	C
3RW40	117-145	76	30	20
3RW44	26-145	76	30	20

Ⓞ Add 4" for N4.

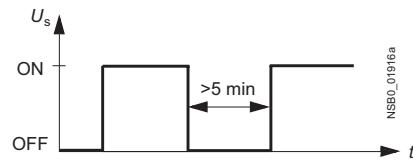
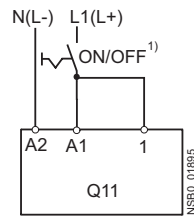
Schematics

3RW30 .. connection examples for control circuit

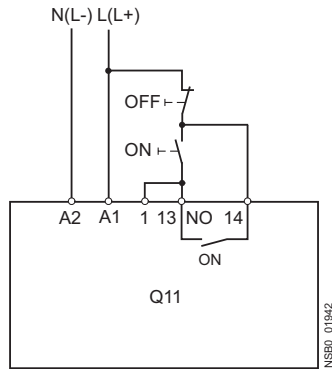
Control using switches



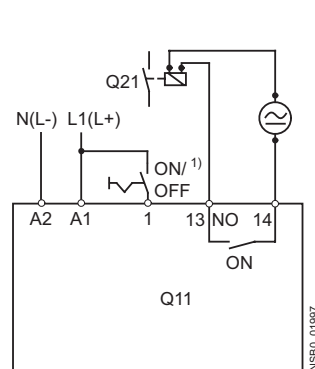
Automatic mode



Control by pushbutton

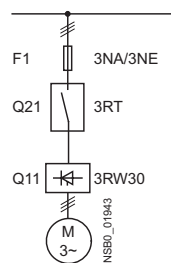


Control of a main contactor

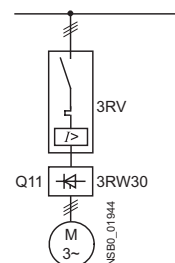


3RW30 connection examples for main circuit²⁾

3RW30 – 3-phase motor with 3NA/3NE fuse



3RV motor starter protector



1) Caution: Risk of restarting!

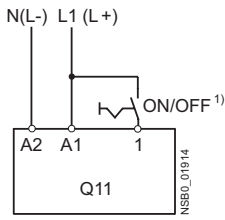
When operating with a switch (ON/OFF) a new, automatic restart will take place automatically if the start command is still active at terminal 1.

2) As an alternative, the motor feeder can also be installed as a fuseless or as a fused version. For fuse and switching device coordination, see "Technical specifications".

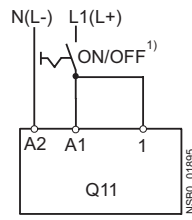
The wiring diagrams are provided only as examples.

3RW40 2. ... 3RW40 4. connection examples for control circuit

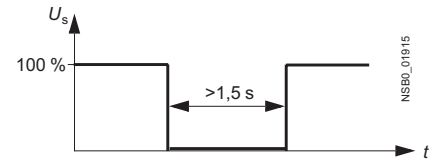
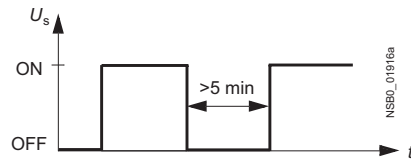
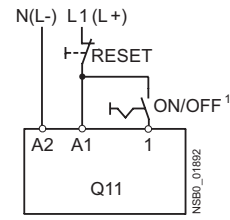
Control using switches



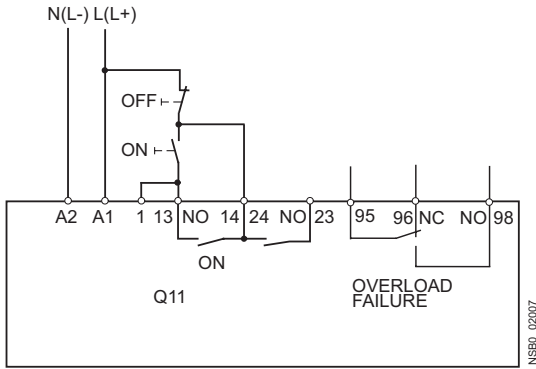
Automatic mode



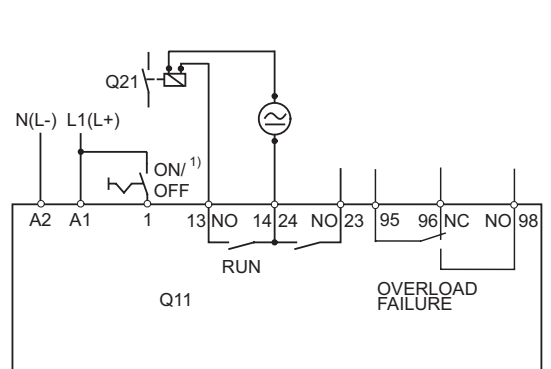
Control with remote reset



Control of 3RW40 2. ... 3RW40 4. by pushbutton

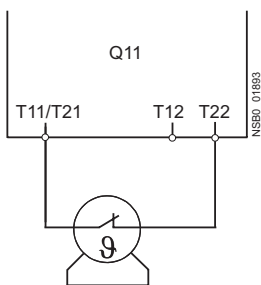


Control of a main contactor

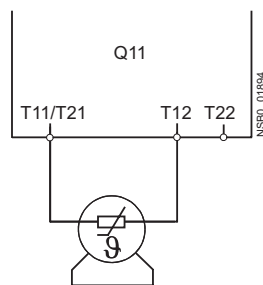


Connection example of 3RW40 2. ... 3RW40 4. for PTC sensors (thermistor motor protection)

Thermoclick



PTC type A



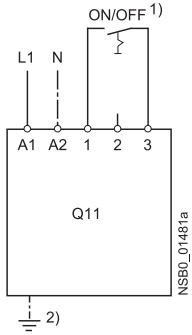
1) Caution: Risk of restarting!

When operating with a switch (ON/OFF) a new, automatic restart will take place automatically if the start command is still active at terminal 1.

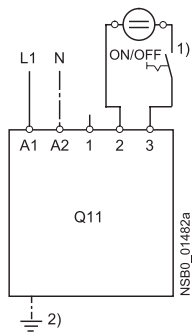
For Operation in the Control Cabinet

3RW40 5. and 3RW40 7. connection examples for control circuit

Control by switch using internal 24 V DC supply

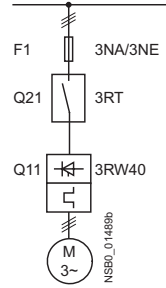


external power supply

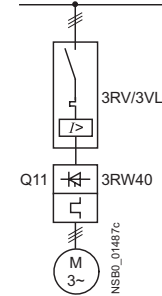


3RW40 connection examples for main circuit³⁾

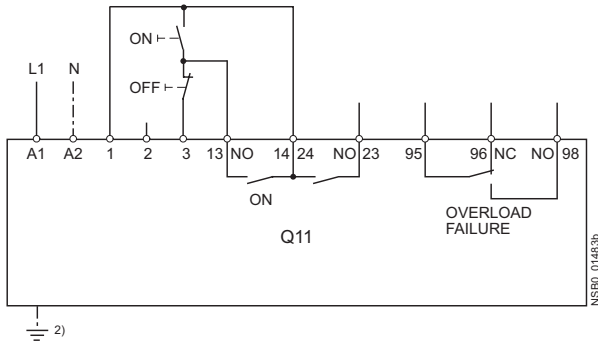
3RW40 – 3-phase motor with 3NA/3NE fuse



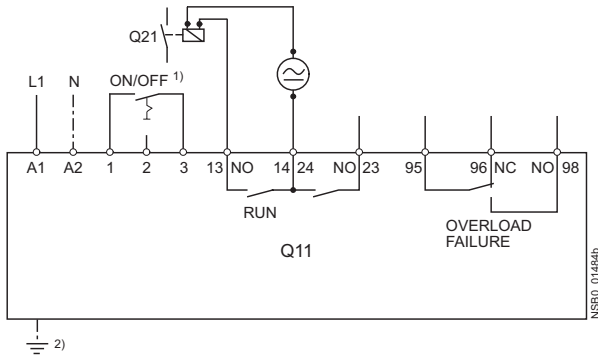
3RV motor starter protector/ 3VL circuit breaker



Control by pushbutton



Control of a main contactor



¹⁾ **Caution: Risk of restarting!**

When operating with a switch (ON/OFF) a new, automatic restart will take place automatically if the start command is still active at terminal 3.

²⁾ Grounding necessary for fan connection to 3RW40 5...

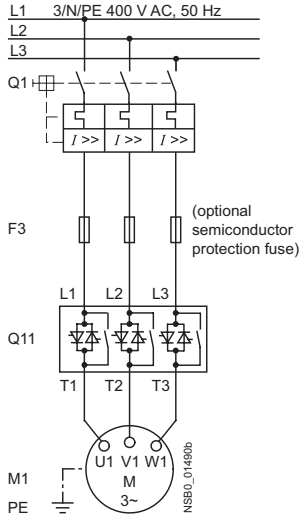
³⁾ As an alternative, the motor feeder can also be installed as a fuseless or as a fused version. [For fuse and switching device coordination, see "Technical specifications"](#).

The wiring diagrams are provided only as examples.

3RW44 connection examples for main and control circuits

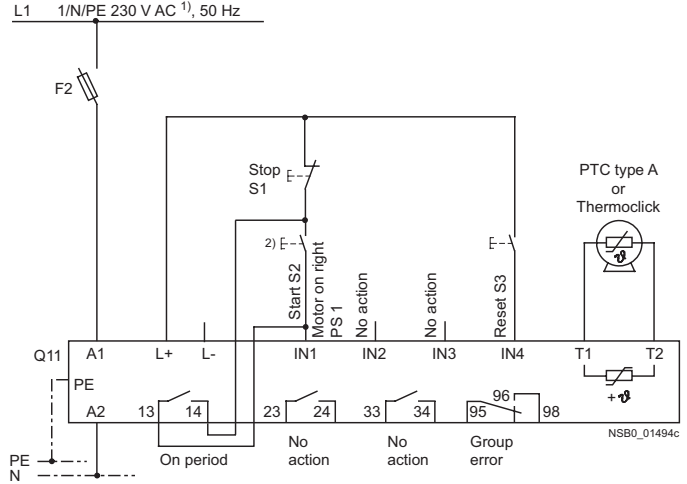
Main circuit

Possibility 1a:
Inline circuit with motor starter protector and SITOR fuse
(semiconductor protection only)



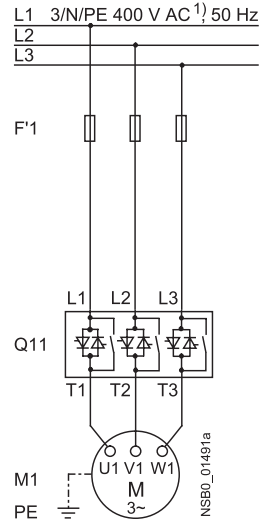
Control circuit

Possibility 1:
Control by pushbutton

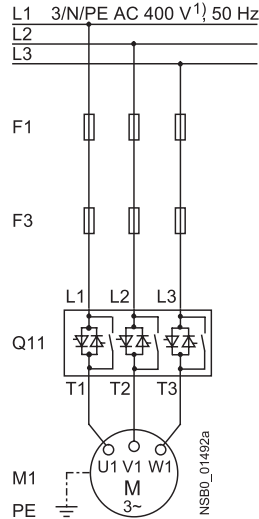


Main circuit

Possibility 1b:
Inline circuit with all-range
protection
(line and semiconductor protection)



Possibility 1c:
Inline circuit with line and
SITOR fuse
(semiconductor protection only)



¹⁾ Permissible values for main and control voltage, see "Technical specifications".

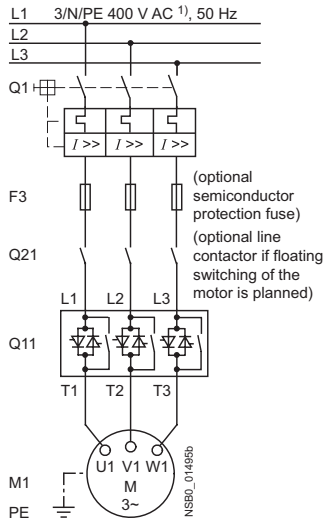
²⁾ **Caution: Risk of restarting!**

Because the output is parameterized to "Motor ON", the start command is automatically active after the reset command and a new, automatic restart will take place. This applies especially in case of motor protection tripping. For safety reasons we recommend connecting the group error output (terminals 95/96) in series with the output parameterized to "Motor ON".

For Operation in the Control Cabinet

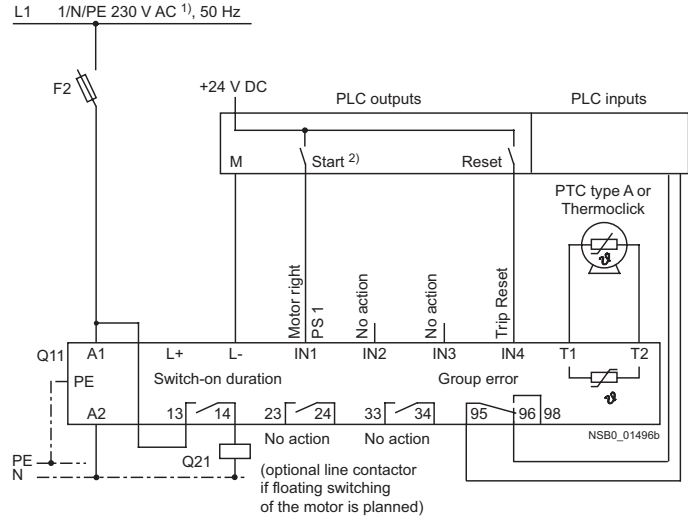
Main circuit

Possibility 2:
Inline circuit with main contactor



Control circuit

Possibility 2:
Control of a main contactor and control by means of PLC



1) Permissible values for main and control voltage, see "Technical specifications".

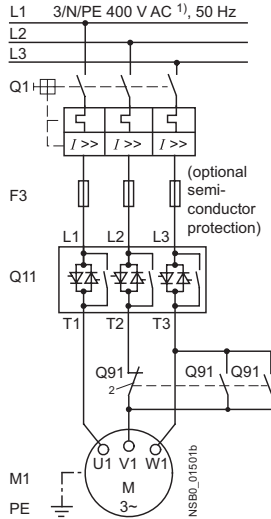
2) **Caution: Risk of restarting!**

The start command (e. g. from the PLC) must be reset prior to a reset command because a new, automatic restart will take place automatically if a start command is active after the reset command. This applies especially in case of motor protection tripping. For safety reasons we recommend incorporating the group error output (terminals 95 and 96) in the controller.

For Operation in the Control Cabinet

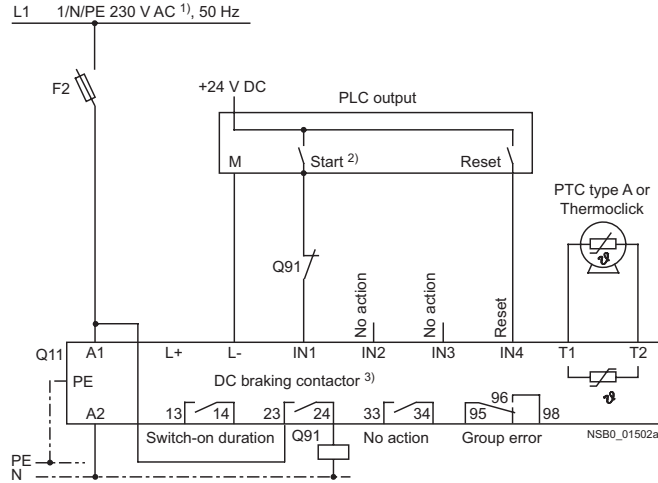
Main circuit

Possibility 3a:
Inline circuit with ramp-down function DC braking³⁾
(for device types 3RW44 22 to 3RW44 25)



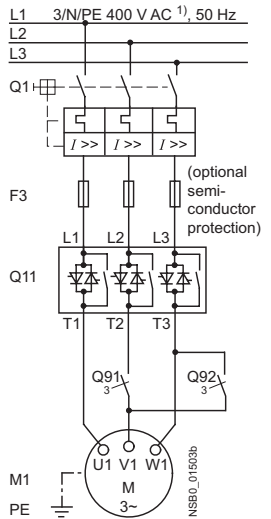
Control circuit

Possibility 3a:
Control of the DC braking contactor³⁾



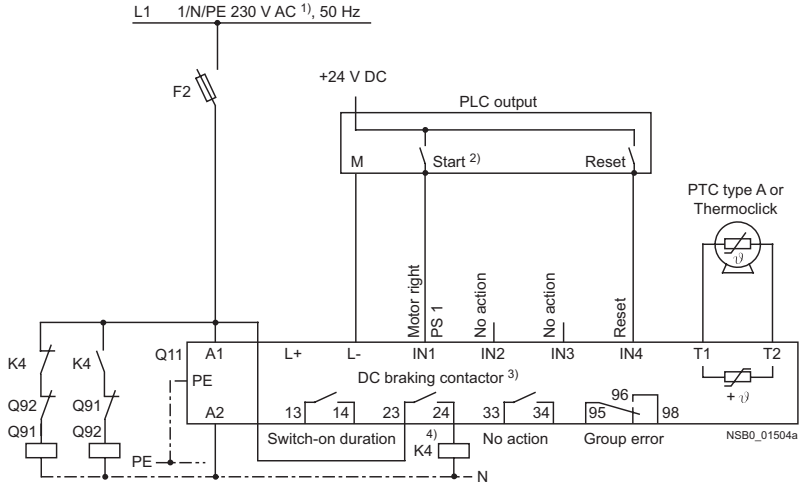
Main circuit

Possibility 3b:
Inline circuit with ramp-down function DC braking³⁾
(for device types 3RW44 26 to 3RW44 47)



Control circuit

Possibility 3b:
Control of the DC braking contactor³⁾



¹⁾ Permissible values for main and control voltage, see "Technical specifications".

2) Caution: Risk of restarting!

The start command (e. g. from the PLC) must be reset prior to a reset command because a new, automatic restart will take place automatically if a start command is active after the reset command. This applies especially in case of motor protection tripping. For safety reasons we recommend incorporating the group error output (terminals 95 and 96) in the controller.

³⁾ If the ramp-down function "Combined braking" is selected, no braking contactor is required.

If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition. For type see "Fuse Assignment (Inline Circuit)" on pages 17-241 to 17-243.

For applications with large centrifugal masses ($J_{Load} > J_{Motor}$) we recommend the function "DC braking". The output 2 must be switched over to "DC braking contactor".

⁴⁾ Auxiliary relay K4, e. g.:

LZX:RT4A4T30 (230 V AC rated control supply voltage),
LZX:RT4A4S15 (115 V AC rated control supply voltage).

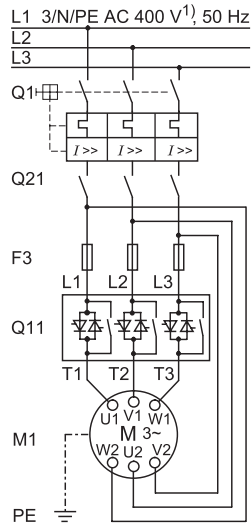
For Operation in the Control Cabinet

3RW Soft Starters

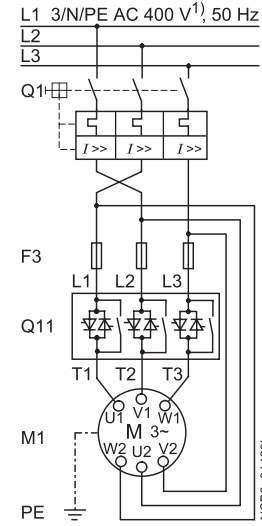
Project Planning aids

Main circuit

Possibility 4a:
Inside-delta circuit

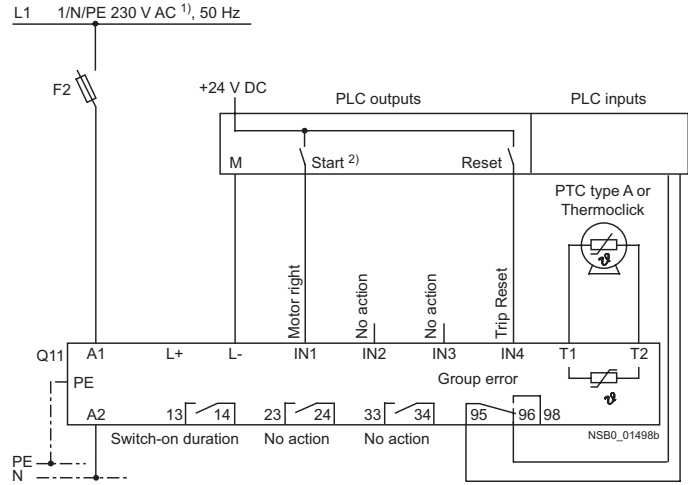


Possibility 4b:
Change of direction of rotation for
inside-delta circuit



Control circuit

Possibility 4:
Control by means of PLC



1) Permissible values for main and control voltage, see "Technical specifications".

2) **Caution: Risk of restarting!**

The start command (e. g. from the PLC) must be reset prior to a reset command because a new, automatic restart will take place automatically if a start command is active after the reset command. This applies especially in case of motor protection tripping. For safety reasons we recommend incorporating the group error output (terminals 95 and 96) in the controller.

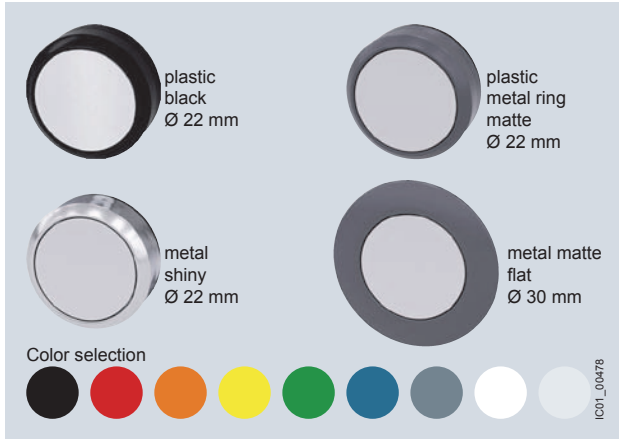
Push Button Units and Indicator Lights

SIRIUS ACT 3SU Series

Overview

Benefits

Design



SIRIUS ACT is available in four design lines.

Ruggedness



- Degree of protection IP66, IP67, IP69 (IP69K)

IP66

6 = Protection against the ingress of dust

6 = Protection against powerful splash-water

IP67

6 = Protection against the ingress of dust

7 = Protection against temporary immersion

IP69 (IP69K)

6 = Protection against the ingress of dust

9/9K = Protection against water in high-pressure cleaning (approx. 80 bar) and high water jet temperatures (approx. 80 °C)

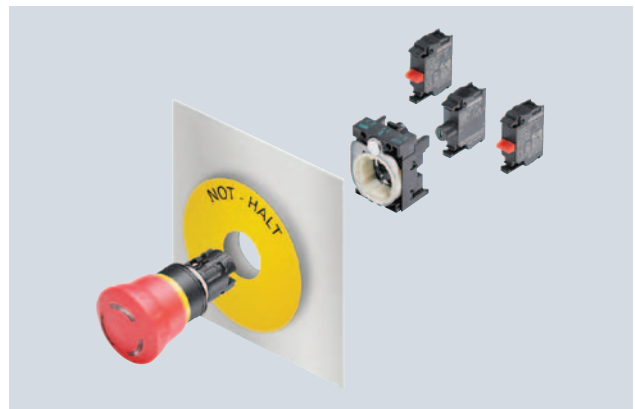
- Service life of 100 000 hours thanks to use of LEDs
- Media resistance (chemicals) thanks to solid stainless steel and high-grade plastics
- Mechanical endurance of 10×10^6 switching cycles
- Suitable for use in extreme environments
- Reliable, friction-locked fixing with just one screw
- Design stability according to use
- Simple geometry for mounting holes

Communication



- Direct connection of the enclosure to AS-Interface or IO-Link
- Direct connection in the control cabinet to PROFINET, IO-Link or AS-Interface
- Can be integrated easily via the TIA Portal

Easy handling



- Self-holding function of the actuator when mounting
- Twist prevention integrated into patented holder design
- Stackable contact modules
- Self-explanatory and fast installation using one hand
- Components can be mounted with holder removed
- No special tools required, simple size 2 screwdriver (cross-tip DIN ISO 87641PZD1, flat-head DIN ISO 2380-1 A/B 1x4.5) is sufficient

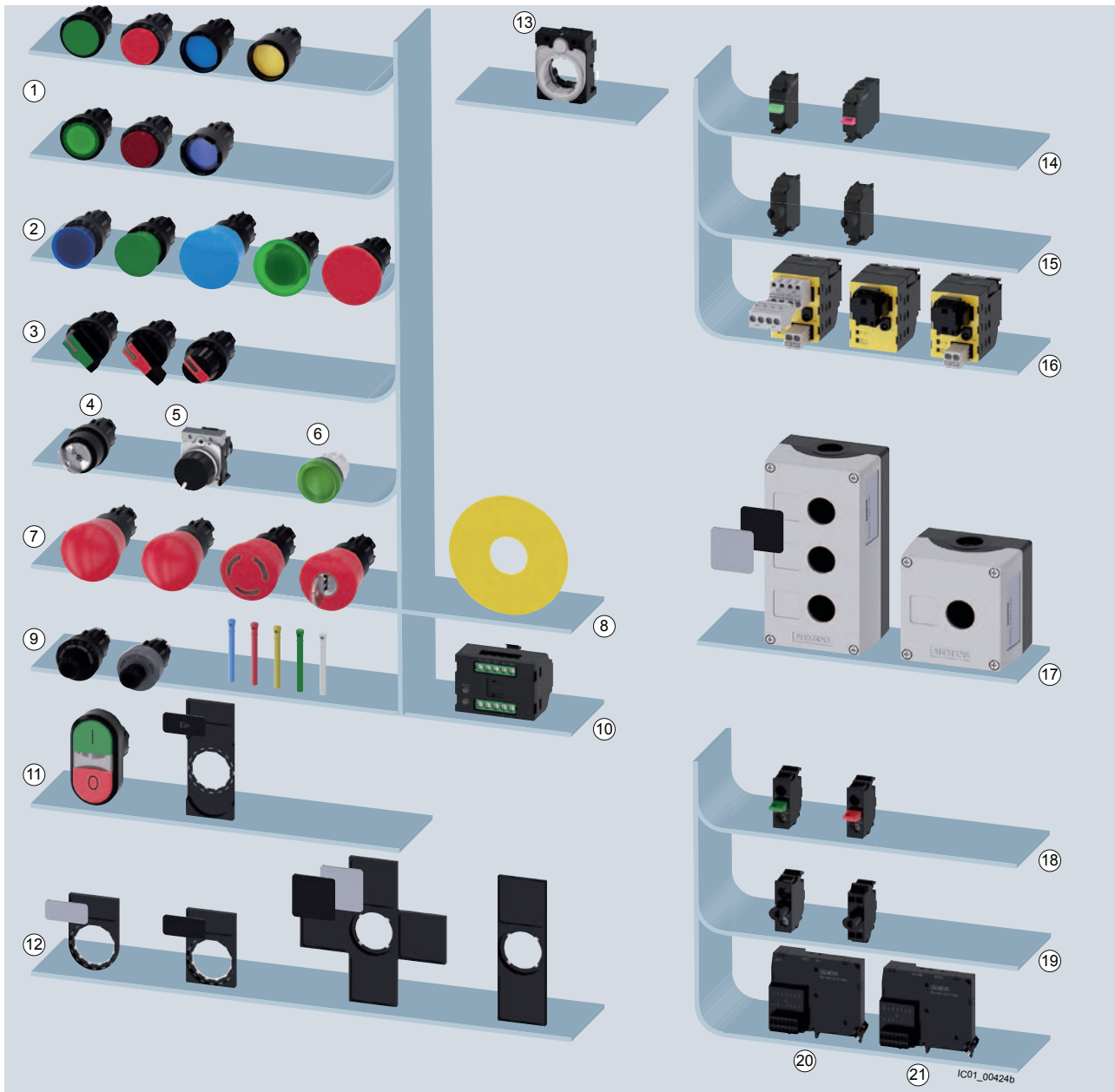
These two pages are a brief overview of the SIRIUS ACT 3SU Series. Please consult the Siemens Industrial Control products catalog for a complete listing of products or look for info online at usa.siemens.com/sirius-act

Push Button Units and Indicator Lights

SIRIUS ACT 3SU Series

Overview

Actuating and signaling elements



Pilot Devices

CONTROL PRODUCTS

Actuating and signaling elements		Pages	Modules for front plate mounting		Pages
①	Pushbuttons, illuminated pushbuttons	10/38	⑭	Contact modules	10/107
②	Mushroom pushbuttons	10/40	⑮	LED modules	10/111
③	Selector switches	10/41	⑯	AS-Interface modules	10/113
④⑤⑥	Key-operated switches, potentiometers, indicator lights	10/42	Enclosures		Pages
⑦⑧	EMERGENCY STOP mushroom pushbuttons, backing plates	10/40	⑰	Enclosures	10/117
⑨⑩	ID key-operated switches, ID keys, electronic modules	10/57	Modules for base mounting		Pages
⑪	Twin pushbuttons, label holders, labeling plates	10/49	⑱	Contact modules	10/125
⑫	Label holders, labeling plates	10/130	⑲	LED modules	10/125
Holders and labels		Pages	⑳	IO-Link modules	10/128
⑬	Holders	10/130	㉑	AS-Interface modules	10/128

System overview of SIRIUS ACT pushbuttons and indicator lights from the plastic design line. Pushbuttons and indicator lights available in 4 design lines.

Page links above reference the U.S. Industrial Controls catalog available online

Pushbutton Units and Indicator Lights

Class 50 Standard Duty Pushbutton Stations

General

Features

- Snap In Legend Inserts
- Flush and Surface Mounted Types
- Convertible Selector
- Double Break Contacts
- Dual Voltage Pilot Light with Snap In Lens
- Conversion Kits
- UL Listed File #E22655
- CSA Certified File #LR6535

Application

Standard duty control stations are used with magnetic controllers to control the starting, stopping, reversing or speed of applicable motors.

Stations are assembled of one, two or three push button, selector switch or pilot light units in a variety of combinations to provide compact control units for remote control of magnetic starters and contactors.

Station enclosures are available in Type 1 surface mounted, 1B flush plate mounted and 4 watertight.

Features

Type 1 surface mounted bases are constructed of 14 gauge sheet steel, primed and finished in baked gray enamel. The base is predrilled to receive a variety of contact blocks, pilot lights and accessory devices. Covers are of 20 gauge sheet steel, wrap-around construction, primed and finished in baked gray enamel. Siemens Type 4 watertight heavy duty push button stations are supplied with a provision to padlock the stop button in the depressed position. Enclosures are predrilled and tapped for 3/4" conduit.

Contact blocks have double break, fine silver contacts with a NEMA B600 rating. Type 4 stations have a NEMA A600 rating.

The pilot light assembly is dual voltage with clearly marked pressure type terminals for 120 volt or 240 volt connection.

The lens of the pilot light snaps into the cover and is available in both red and green.

Push buttons are equipped with an operator into which a selected legend insert is snapped. Legend inserts are molded thermoplastic and come in a wide variety of legends and colors.

The selector switch operator can be instantly set for two or three positions at any time.

Mushroom Head

50ZMH mounts on any standard push button operator. The Mushroom Head is red molded thermoplastic, 1 1/2" in diameter, and provides a large operator for emergency stop or similar applications.

Mechanical Interlock

50ZAM is a base mounted zinc plate, dichromate dipped, steel assembly. When mounted in conjunction with Duplex Contact Block 50ZAC3 (one NO and one NO) the interlock prevents one contact from being closed while the other contact is closed.

Padlock Attachment Kit

50ZAL can be mounted to any Type 1 surface mounted station by the lower screw which fastens the cover to the station base. Made of heavy steel, chrome plated, the attachment provides for the padlocking of a push button in the depressed position or a selector switch in any position. When used with a push button operator, raised Legend Insert D53493003 (Red Stop) must be used.

Electrical Ratings

NEMA AC Ratings 50/60Hz

Nema B600 5 Continuous Amps

Volts	Make	Break
120	30	3
240	15	1.5
480	7.5	0.75
600	6	0.6
VA	3600	360

Ordering Information

- Legend Inserts [see page 17-307](#).
- Accessories [see page 17-307](#).



**2 Push Buttons
Surface Mounting, NEMA 1**



**2 Push Buttons
Flush Mounting, NEMA 1B**



**1 Push Button
Surface Mounting**



**1 Selector Switch
Flush Mounting**



**2 Push Buttons
1 Selector Switch**






**1 Pilot Light
2 Push Buttons**

Pushbutton Units and Indicator Lights

Class 50 Standard Duty Pushbutton Stations

5A 600V AC NEMA B600

Selection and ordering data

	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
						Unit
 <p>1 unit surface mount-momentary pushbutton</p>	A = Momentary flush pushbutton green, surface, label "START"	NEMA 1	1NO - 1NC with common jumper (50ZAC1)	1	50AA3D	1
	A = Momentary flush pushbutton red, surface, label "STOP"	NEMA 1	1NO - 1NC with common jumper (50ZAC1)	1	50AA3E	1
	A = Momentary raised pushbutton red, surface, label "STOP"	NEMA 1	1NO - 1NC with common jumper (50ZAC1)	1	50AA3F	1
	A = Momentary mushroom head red, surface, label "STOP"	NEMA 1	1NO - 1NC with common jumper (50ZAC1)	1	50AA3G	1
	A = Momentary flush pushbutton less insert, surface	NEMA 1	1NO - 1NC with common jumper (50ZAC1)	1	50AA3A	1
	A = 3 position selector switch, surface, label "HAND-OFF-AUTO"	NEMA 1	2 NO 2SPST (50ZAC8)	1	50AA3C3	1
	A = 2 position selector switch, surface, label "Off-On"	NEMA 1	2 NO 2SPST (50ZAC8)	1	50AA3C6	1
	A = 2/3 selector switch, surface, multiple legends	NEMA 1	2 NO 2SPST (50ZAC8)	1	50AA3B9	1
	A = Indicator light, red, surface	NEMA 1	120/240V dual voltage 120PSB lamp	1	50BA3Y	1
	A = Indicator light, green, surface	NEMA 1	120/240V dual voltage 120PSB lamp	1	50BA3Z	1
A = Indicator light, less lens, surface	NEMA 1	120/240V dual voltage 120PSB lamp	1	50BA32	1	
 <p>1 unit flush mount-momentary pushbutton</p>	A = Momentary flush pushbutton green, flush, label "START"	NEMA 1B	1NO - 1NC with common jumper (50ZAC1)	1	50AA2D	1
	A = Momentary flush pushbutton red, flush, label "STOP"	NEMA 1B	1NO - 1NC with common jumper (50ZAC1)	1	50AA2E	1
	A = Momentary raised pushbutton red, flush, label "STOP"	NEMA 1B	1NO - 1NC with common jumper (50ZAC1)	1	50AA2F	1
	A = Momentary flush pushbutton less insert, flush	NEMA 1B	1NO - 1NC with common jumper (50ZAC1)	1	50AA2A	1
	A = Momentary flush pushbutton less insert, flush, chrome plate	NEMA 1B	1NO - 1NC with common jumper (50ZAC1)	1	50AA6A	1
	A = 3 position selector switch, flush, label "HAND-OFF-AUTO"	NEMA 1B	2 NO 2SPST (50ZAC8)	1	50AA2C3	1
	A = 3 position selector switch, flush, label "Off-On"	NEMA 1B	2 NO 2SPST (50ZAC8)	1	50AA2C6	1
	A = 2/3 selector switch, multiple legends, flush	NEMA 1B	2 NO 2SPST (50ZAC8)	1	50AA2B9	1
	A = 2/3 selector switch, multiple legends, chrome plate, flush	NEMA 1B	2 NO 2SPST (50ZAC8)	1	50AA6B9	1
	A = Indicator light, red, flush	NEMA 1B	120/240V dual voltage	1	50BA2Y	1
A = Indicator light, green, flush	NEMA 1B	120/240V dual voltage	1	50BA2Z	1	
A = Indicator light, less lens, flush	NEMA 1B	120/240V dual voltage	1	50BA22	1	
A = Indicator light, less lens, chrome plate, flush	NEMA 1B	120PSB lamp	1	50BA62	1	
 <p>2 unit surface mount-momentary pushbutton</p>	B = Momentary pushbutton green, surface, label "START"	NEMA 1	1NO, 1NC (50ZAC2)	2	50CA3DE	1
	A = Momentary pushbutton red, surface, label "STOP"					
	B = Momentary pushbutton green, surface, label "START"	NEMA 1	1NO, 1NC (50ZAC2)	2	50CA3DF	1
	A = Momentary raised pushbutton red, surface, label "STOP"					
	B = Momentary pushbutton green, surface, label "START"	NEMA 1	1NO, 1NC (50ZAC2)	2	50CA3DG	1
	A = Momentary mushroom head pushbutton red, surface, label "STOP"					
	B = Momentary pushbutton, less insert, surface	NEMA 1	1NO, 1NC (50ZAC2)	2	50CA3AA	1
	A = Momentary pushbutton, less insert, surface					
B = Momentary pushbutton, surface, label "FORWARD"	NEMA 1	2 NO (50ZAC3)	2	50DA3KL	1	
A = Momentary pushbutton, surface, label "REVERSE"						

Pilot Devices



17 CONTROL PRODUCTS

Pushbutton Units and Indicator Lights

Class 50 Standard Duty Pushbutton Stations

5A 600V AC NEMA B600

Selection and ordering data

	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
						Unit
<p>2 unit surface mount-momentary pushbutton</p> 	B = Momentary pushbutton, surface, label "OPEN" A = Momentary pushbutton, surface, label "CLOSE"	NEMA 1	2 NO (50ZAC3)	2	50DA3HJ	1
	B = Momentary pushbutton, surface, label "UP" A = Momentary pushbutton, surface, label "DOWN"	NEMA 1	2 NO (50ZAC3)	2	50DA3NP	1
	B = Momentary pushbutton, surface, less insert A = Momentary pushbutton, surface, less insert	NEMA 1	2 NO (50ZAC3)	2	50DA3AA	1
	B = Momentary pushbutton, surface, label "FORWARD" A = Momentary pushbutton, surface, label "REVERSE"	NEMA 1	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA3KL	1
	B = Momentary pushbutton, surface, label "OPEN" A = Momentary pushbutton, surface, label "CLOSE"	NEMA 1	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA3HJ	1
	B = Momentary pushbutton, surface, label "UP" A = Momentary pushbutton, surface, label "DOWN"	NEMA 1	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA3NP	1
	B = Momentary pushbutton, surface, label "ON" A = Momentary pushbutton, surface, label "OFF"	NEMA 1	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA334	1
	B = Momentary pushbutton, less insert surface A = Momentary pushbutton, less insert, surface	NEMA 1	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA3AA	1
	B = Momentary pushbutton, surface, label "FORWARD" A = Momentary pushbutton, surface, label "REVERSE"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	2	50EA3KL	1
	B = Momentary pushbutton, surface, label "OPEN" A = Momentary pushbutton, surface, label "CLOSE"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	2	50EA3HJ	1
<p>2 unit flush mount-momentary pushbutton</p> 	B = Momentary pushbutton green, flush, label "START" A = Momentary pushbutton red, flush, label "STOP"	NEMA 1B	1NO, 1NC (50ZAC2)	2	50CA2DE	1
	B = Momentary pushbutton, less insert, flush A = Momentary pushbutton, less insert, flush	NEMA 1B	1NO, 1NC (50ZAC2)	2	50CA2AA	1
	B = Momentary pushbutton green, flush, label "START" A = Momentary raised pushbutton red, flush, label "STOP"	NEMA 1B	1NO, 1NC (50ZAC2)	2	50CA2DF	1
	B = Momentary pushbutton green, flush, label "START" A = Momentary mushroom head pushbutton red, flush, label "STOP"	NEMA 1B	1NO, 1NC (50ZAC2)	2	50CA2DG	1
	B = Momentary pushbutton, less insert, flush A = Momentary pushbutton, less insert, flush	NEMA 1B	1NO, 1NC (50ZAC2)	2	50CA6AA	1

Pilot Devices

CONTROL PRODUCTS 17

Pushbutton Units and Indicator Lights

Class 50 Standard Duty Pushbutton Stations

5A 600V AC NEMA A600

Selection and ordering data

	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
						Unit
2 unit flush mount-momentary pushbutton	B = Momentary pushbutton, flush, label "FORWARD" A = Momentary pushbutton, flush, label "REVERSE"	NEMA 1B	2 NO (50ZAC3)	2	50DA2KL	1
	B = Momentary pushbutton, flush, label "OPEN" A = Momentary pushbutton, flush, label "CLOSE"	NEMA 1B	2 NO (50ZAC3)	2	50DA2HJ	1
	B = Momentary pushbutton, flush, label "UP" A = Momentary pushbutton, flush, label "DOWN"	NEMA 1B	2 NO (50ZAC3)	2	50DA2NP	1
	B = Momentary pushbutton, less insert, flush A = Momentary pushbutton, less insert, flush	NEMA 1B	2 NO (50ZAC3)	2	50DA2AA	1
	B = Momentary pushbutton, less insert, chrome plate, flush A = Momentary pushbutton, less insert, chrome plate, flush	NEMA 1B	2 NO (50ZAC3)	2	50DA6AA	1
	B = Momentary pushbutton, flush, label "FORWARD" A = Momentary pushbutton, flush, label "REVERSE"	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA2KL	1
	B = Momentary pushbutton, flush, label "OPEN" A = Momentary pushbutton, flush, label "CLOSE"	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA2HJ	1
	B = Momentary pushbutton, flush, label "UP" A = Momentary pushbutton, flush, label "DOWN"	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA2NP	1
	B = Momentary pushbutton, flush, label "ON" A = Momentary pushbutton, flush, label "OFF"	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA234	1
	B = Momentary pushbutton, less insert, flush A = Momentary pushbutton, less insert, flush	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA2AA	1
	B = Momentary pushbutton, less insert, chrome plate, flush A = Momentary pushbutton, less insert, chrome plate, flush	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA6AA	1
	B = Momentary pushbutton, flush, label "FORWARD" A = Momentary pushbutton, flush, label "REVERSE"	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	50EA2KL	1
	B = Momentary pushbutton, flush, label "OPEN" A = Momentary pushbutton, flush, label "CLOSE"	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	50EA2HJ	1
	B = Momentary pushbutton, flush, label "UP" A = Momentary pushbutton, flush, label "DOWN"	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	50EA2NP	1
	B = Momentary pushbutton, flush, label "ON" A = Momentary pushbutton, flush, label "OFF"	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	50EA234	1
	B = Momentary pushbutton, less insert, flush A = Momentary pushbutton, less insert, flush	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	50EA2AA	1
	B = Momentary pushbutton, less insert, chrome plate, flush A = Momentary pushbutton, less insert, chrome plate, flush	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	50EA6AA	1

Pilot Devices

17 CONTROL PRODUCTS

Pushbutton Units and Indicator Lights

Class 50 Standard Duty Pushbutton Stations

5A 600V AC NEMA B600

Selection and ordering data

	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
						Unit
2 unit surface mount-momentary pushbutton and selector switch	B = Momentary pushbutton green, surface, label "START"	NEMA 1	1NO, 1NC (50ZAC1)	2	50FA3DC3	1
	A = Maintained selector switch, surface, label "HAND-OFF-AUTO"		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Momentary pushbutton less insert, surface	NEMA 1	1NO, 1NC (50ZAC1)	2	50FA3AB9	1
	A = Maintained selector switch, multiple legends, surface		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Indicator light, red, surface	NEMA 1	120/240V dual voltage (120PSB lamp)	2	50HA3YC3	1
	A = Maintained selector switch, surface, label "HAND-OFF-AUTO"		2 NO 2SPDT w/ common jumper (50ZAC8)			
2 unit surface mount-momentary pushbutton and indicator light	B = Indicator light, red, surface	NEMA 1	120/240V dual voltage (120PSB lamp)	2	50HA32B9	1
	A = Maintained selector switch, multiple legends, surface		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Indicator light, green, surface	NEMA 1	120/240V dual voltage (120PSB lamp)	2	50GA3ZY	1
	A = Indicator light, red, surface					
	B = Indicator light, less lens, surface	NEMA 1	120/240V dual voltage (120PSB lamp)	2	50GA322	1
	A = Indicator light, less lens, surface					
2 unit flush mount-momentary pushbutton and selector switch	B = Momentary pushbutton green, flush, label "START"	NEMA 1B	1NO, 1NC (50ZAC1)	2	50FA2DC3	1
	A = Maintained selector switch, flush, label "HAND-OFF-AUTO"		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Momentary pushbutton less insert, flush	NEMA 1B	1NO, 1NC (50ZAC1)	2	50FA2AB9	1
	A = Maintained selector switch, multiple legends, flush		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Momentary pushbutton less insert chrome plate, flush	NEMA 1B	1NO, 1NC (50ZAC1)	2	50FA6AB9	1
	A = Maintained selector switch, multiple legends, flush		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Indicator light, red, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	50HA2YC3	1
	A = Maintained selector switch, flush, label "HAND-OFF-AUTO"		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Indicator light, less lens, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	50HA22B9	1
	A = Maintained selector switch, multiple legends, flush		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Indicator light, less lens, chrome plate, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	50HA62B9	1
	A = Maintained selector switch, multiple legends, flush		2 NO 2SPDT w/ common jumper (50ZAC8)			
2 unit flush mount-momentary pushbutton and indicator light	B = Indicator light, green, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	50GA2ZY	1
	A = Indicator light, red, flush					
	B = Indicator light, less lens, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	50GA222	1
	A = Indicator light, less lens, flush					
	B = Indicator light, less lens, chrome plate, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	50GA622	1
	A = Indicator light, less lens, chrome plate, flush					
3 unit surface mount-momentary pushbutton	C = Momentary pushbutton, surface, label "FORWARD"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	3	50MA3KLE	1
	B = Momentary pushbutton, surface, label "REVERSE"		1NO - 1NC with common jumper (50ZAC1)			
	A = Momentary pushbutton, surface, label "STOP"					
	C = Momentary pushbutton, surface, label "UP"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	3	50MA3NPE	1
	B = Momentary pushbutton, surface, label "DOWN"		1NO - 1NC with common jumper (50ZAC1)			
	A = Momentary pushbutton, surface, label "STOP"					
	C = Momentary pushbutton, surface, label "OPEN"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	3	50MA3HJE	1
	B = Momentary pushbutton, surface, label "CLOSE"		1NO - 1NC with common jumper (50ZAC1)			
	A = Momentary pushbutton, surface, label "STOP"					

Pushbutton Units and Indicator Lights

Class 50 Standard Duty Pushbutton Stations

5A 600V AC NEMA B600

Selection and ordering data

	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
						Unit
3 unit surface mount-momentary pushbutton	C = Momentary pushbutton, surface, label "FAST"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2) 1NO - 1NC with common jumper (50ZAC1)	3	50MA3TUE	1
	B = Momentary pushbutton, surface, label "SLOW"					
	A = Momentary pushbutton, surface, label "STOP"					
3 unit surface mount-momentary pushbutton and selector switch	C = Momentary pushbutton, surface, label "START"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2) 1NO - 1NC with common jumper (50ZAC1)	3	50MA3DME	1
	B = Momentary pushbutton, surface, label "JOG"					
	A = Momentary pushbutton, surface, label "STOP"					
3 unit surface mount-momentary pushbutton and indicator light	C = Momentary pushbutton, surface, label less insert	NEMA 1	2 NO, 2 NC (2 - 50ZAC2) 1NO - 1NC with common jumper (50ZAC1)	3	50MA3AAA	1
	B = Momentary pushbutton, surface, label less insert					
	A = Momentary pushbutton, surface, label less insert					
3 unit surface mount-momentary pushbutton and indicator light	C = Momentary pushbutton, surface, label "START"	NEMA 1	1 NO, 1 NC (50ZAC2) 2 NO, 2 SPST with common jumper (50ZAC8)	3	50LA3DEC3	1
	B = Momentary pushbutton, surface, label "STOP"					
	A = Maintained selector switch, surface, label "HAND-OFF-AUTO"					
3 unit surface mount-momentary pushbutton and indicator light	C = Momentary pushbutton, less insert, surface	NEMA 1	1 NO, 1 NC (50ZAC2) 2 NO, 2 SPST with common jumper (50ZAC8)	3	50LA3AAB9	1
	B = Momentary pushbutton, less insert, surface					
	A = Maintained selector switch, multiple legends, surface					
3 unit surface mount-momentary pushbutton and indicator light	C = Indicator light, red, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 1 NO, 1 NC (50ZAC2)	3	50JA3YDE	1
	B = Momentary pushbutton, surface, label "START"					
	A = Momentary pushbutton, surface, label "STOP"					
3 unit surface mount-momentary pushbutton and indicator light	C = Indicator light, green, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 1 NO, 1 NC (50ZAC2)	3	50JA3ZDE	1
	B = Momentary pushbutton, surface, label "START"					
	A = Momentary pushbutton, surface, label "STOP"					
3 unit surface mount-momentary pushbutton and indicator light	C = Indicator light, less lens, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 1 NO, 1 NC (50ZAC2)	3	50JA32AA	1
	B = Momentary pushbutton, less insert, surface					
	A = Momentary pushbutton, less insert, surface					
3 unit surface mount-momentary pushbutton and indicator light	C = Indicator light, green, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 2 NO, 2 SPST with common jumper (50ZAC8)	3	50NA3ZYC3	1
	B = Indicator light, red, surface					
	A = Maintained selector switch, surface, label "HAND-OFF-AUTO"					
3 unit surface mount-momentary pushbutton and indicator light	C = Indicator light, less lens, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 2 NO, 2 SPST with common jumper (50ZAC8)	3	50NA322B9	1
	B = Indicator light, less lens, surface					
	A = Maintained selector switch, multiple legends, surface					



Pilot Devices




17 CONTROL PRODUCTS

Pushbutton Units and Indicator Lights

Class 50 Standard Duty Pushbutton Stations

Heavy duty - 10A 600V AC NEMA A600

Selection and ordering data

	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs	
						Unit	
	A = Momentary pushbutton green, surface, label "START"	NEMA 4	1NO - 1NC	1	50HA1E1	1	
	A = Momentary pushbutton red, surface, label "STOP"	NEMA 4	1NO - 1NC	1	50HA1E2	1	
	A = Momentary pushbutton green, surface, label "RESET"	NEMA 4	1NO - 1NC	1	50HA1E4	1	
	A = Momentary pushbutton green, surface, label "JOG"	NEMA 4	1NO - 1NC	1	50HA1E5	1	
	A = Maintained selector switch, surface, label "SAFE-RUN"	NEMA 4	1NO - 1NC	1	50HA1E6	1	
	A = Maintained selector switch, surface, label "OFF-ON"	NEMA 4	1NO - 1NC	1	50HA1E7	1	
	A = Maintained selector switch, surface, label "JOG-RUN"	NEMA 4	1NO - 1NC	1	50HA1E8	1	
	A = Maintained selector switch, surface, label "HAND-OFF-AUTO"	NEMA 4	1NO - 1NC	1	50HA1E9	1	
		B = Momentary pushbutton green, surface, label "START"	NEMA 4	1NO - 1NC	2	50HA2E1	1
A = Momentary pushbutton red, surface, label "STOP"			1NO - 1NC				
B = Momentary pushbutton green, surface, label "FORWARD"		NEMA 4	1NO - 1NC	2	50HA2E2	1	
A = Momentary pushbutton red, surface, label "REVERSE"			1NO - 1NC				
B = Momentary pushbutton green, surface, label "UP"		NEMA 4	1NO - 1NC	2	50HA2E3	1	
A = Momentary pushbutton red, surface, label "DOWN"			1NO - 1NC				
B = Momentary pushbutton green, surface, label "OPEN"		NEMA 4	1NO - 1NC	2	50HA2E4	1	
A = Momentary pushbutton red, surface, label "CLOSE"			1NO - 1NC				
B = Momentary pushbutton green, surface, label "FAST"		NEMA 4	1NO - 1NC	2	50HA2E5	1	
A = Momentary pushbutton red, surface, label "SLOW"			1NO - 1NC				
		C = Momentary pushbutton green, surface, label "FORWARD"	NEMA 4	1NO - 1NC	3	50HA3E1	1
		B = Momentary pushbutton green, surface, label "REVERSE"		1NO - 1NC			
	A = Momentary pushbutton red, surface, label "STOP"		1NO - 1NC				
	C = Momentary pushbutton green, surface, label "UP"	NEMA 4	1NO - 1NC	3	50HA3E2	1	
	B = Momentary pushbutton green, surface, label "DOWN"		1NO - 1NC				
	A = Momentary pushbutton red, surface, label "STOP"		1NO - 1NC				
	C = Momentary pushbutton green, surface, label "OPEN"	NEMA 4	1NO - 1NC	3	50HA3E3	1	
	B = Momentary pushbutton green, surface, label "CLOSE"		1NO - 1NC				
	A = Momentary pushbutton red, surface, label "STOP"		1NO - 1NC				
	C = Momentary pushbutton green, surface, label "START"	NEMA 4	1NO - 1NC	3	50HA3E9	1	
	B = Momentary pushbutton green, surface, label "JOG"		1NO - 1NC				
	A = Momentary pushbutton red, surface, label "STOP"		1NO - 1NC				
	C = Momentary pushbutton green, surface, label "FAST"	NEMA 4	1NO - 1NC	3	50HA3E4	1	
	B = Momentary pushbutton green, surface, label "SLOW"		1NO - 1NC				
	A = Momentary pushbutton red, surface, label "STOP"		1NO - 1NC				

Pushbutton Units and Indicator Lights





Class 50 Standard Duty Pushbutton Stations

Standard duty station accessories

Selection and ordering data

Legend inscription insert for snap-on mounting

Inscription	Color	Order No.	Pack
			Unit
Close	Orange	50D53493005	1
Down	Orange	50D53493010	1
Fast	Black	50D53493013	1
Forward	Green	50D53493006	1
High	Black	50D53493015	1
Hoist	Green	50D53493011	1
Jog	Black	50D53493008	1
Low	Black	50D53493016	1
Lower	Orange	50D53493012	1
Off	Red	50D53493018	1
On	Green	50D53493017	1
Open	Green	50D53493004	1
Reverse	Orange	50D53493007	1
Slow	Black	50D53493014	1
Start	Green	50D53493001	1
Stop	Red	50D53493002	1
Stop (raised)	Red	50D53493003	1
Up	Green	50D53493009	1

Version	Suitable for	Color	Order No.	Pack
				Unit
 50ZAC1	Mushroom head	Red	50ZMH	1
 50ZAC2	Padlock attachment	Used only for raised buttons	50ZAL	1
	Mechanical interlock kit		50ZAM	1
 50ZAC8	Contact blocks			
 50ZAC3	1NO, 1NC	Single button	50ZAC1	1
	2NO, 2SPST	Selector switch	50ZAC8	1
	1NO, 1NC	Two button	50ZAC2	1
	1NO, 1NO	Two button	50ZAC3	1
	Pilot light	120/240V Dual Voltage, no lens	50ZAC6	1
	Pilot light lens	Red	50ZPL01	1
		Green	50ZPL02	1
	Replacement lamps	Class 50 type 1, 1B 120V	50D21983001	1
	Slide base, lamp type 120PSB			

Heavy duty station accessories

Version	Suitable for	Color	Order No.	Pack
				Unit
	Pushbutton caps			
	NEMA 4 control stations	Red	BHP15X	1
	NEMA 4 control stations	Black	BHP16X	1

Pilot Devices

CONTROL PRODUCTS

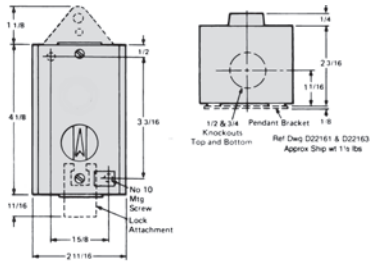
Pushbutton Units and Indicator Lights

Class 50 Standard Duty Pushbutton Stations

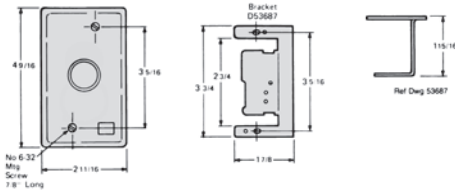
Standard duty - 5A 600V AC NEMA B60

Pilot Devices

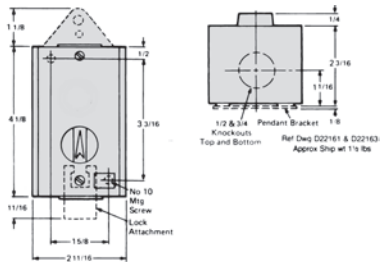
1 Unit Station Surface Mounting—Type 1



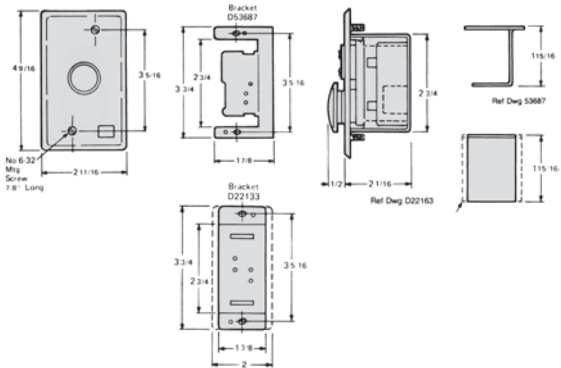
1 Unit Station Flush Mounting—Type 1B



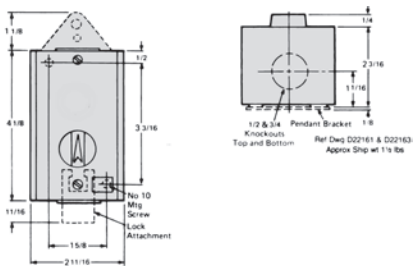
2 Pushbutton Stations Surface Mounting—Type 1



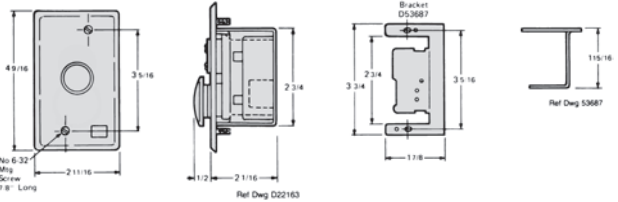
2 Pushbutton Stations Flush Mounting—Type 1B



2 Unit Stations Surface Mounting—Type 1

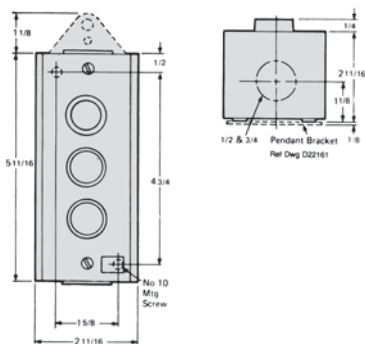


2 Unit Station Flush Mounting—Type 1B

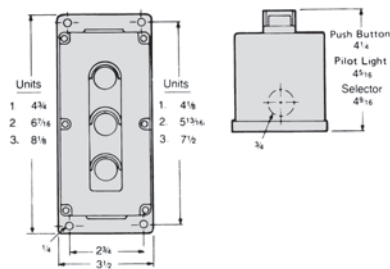


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CONTROL PRODUCTS

3 Unit Stations Surface Mounting



1 Unit Stations—Type 4




Pushbutton Units and Indicator Lights

Class 51 Pilot Devices

Hazardous location

Features

- UL Listed and cUL Listed for Class I, Groups C & D and Class II, Groups E, F & G
- Short or Long Bushing Lengths
- Mount into 3/4-14 NPSM Threaded Hole
- Sealing Lock Nut
- Similar in Appearance to Class 52 Oil Tight Pilot Devices
- Double Break Bifurcated Contacts Rated AC NEMA A600, DC NEMA P600
-  Positively Driven Contacts
- Touchsafe Terminals
- UL Listed File # E39935
- CSA File No: 023889_0_000

Application

When properly installed in a Type 7 & 9 enclosure, these components meet the National Electrical Code's requirements for Class I, Division 1 & 2, Groups C and D hazardous gases, Class II, Division 1, Groups E, F and G hazardous dust, and Class III, hazardous fibers and flyings. Class 51 pilot devices may be used in a location where the presence of flammable gases, vapors or finely pulverized dusts in the atmosphere are sufficient to create a threat of explosion or fire. They may also be required where easily ignitable fibers or flyings are present. Short bushing units are used in most standard Type 7 & 9 enclosures. Long bushings are used when an additional front panel is required or in enclosures up to 2 1/8 inches thick. Class 51 devices also meet Type 4 applications.

Rugged

Hazardous location control units are durable one piece castings of a corrosion resistant copper free aluminum alloy with stainless steel springs and type 316 stainless steel shafts to provide a long dependable life. The "O" ring ensures the longest seal life available. Contact blocks have double break bifurcated contacts for increased reliability.

Flexible

Control units mount into industry standard 3/4-14 NPSM threaded holes. Both short bushings for enclosure mounting and long bushings for panel mounting are available.

Pilot light bulbs are removable from the front for ease of maintenance. Many common parts between the Class 51 hazardous location pilot devices and the Class 52 oil tight pilot devices allow for increased serviceability with fewer parts.

Industrial Appearance

Hazardous location control units add luster to panels. They are uniform in appearance and match 52 Class oil tight pilot devices.

Typical Applications

Class I

Class II

Class III

Electrical Ratings

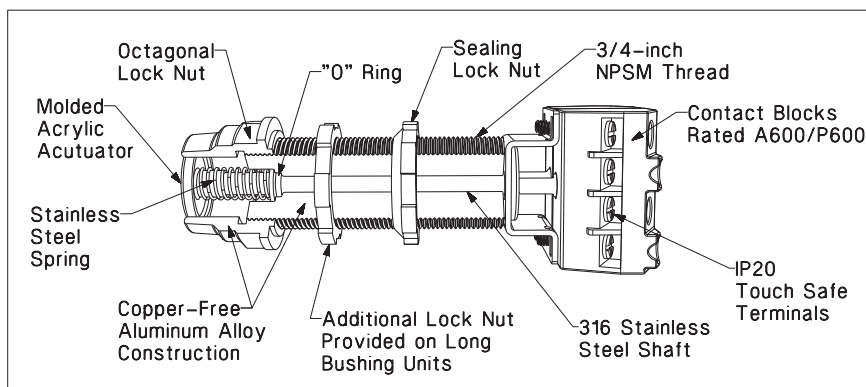
NEMA AC Ratings 50/60Hz

Nema A600 10 Continuous Amps

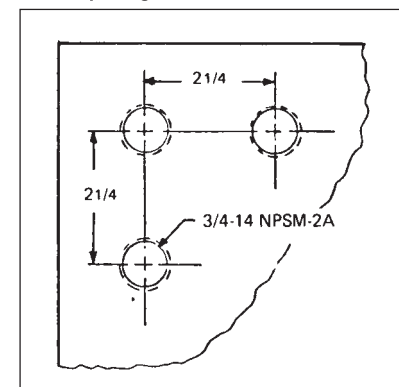
Volts	Make	Break
120	60	6
240	30	3
480	15	1.5
600	12	1.2
VA	7200	720

Ordering Information

- Accessories [see page 17-317-17-318.](#)
- Selector Operating Position and Contact Operation [page 17-315.](#)
- Legend Plates [see page 17-355.](#)
- Enclosures [see page 17-316.](#)
- Technical Specifications: [page 17-359.](#)



Panel Spacing








Pushbutton Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Operators only

Selection and ordering data



	Version	Color of operator	Contacts	Short bushing Order No.	Long bushing Order No.	Pack Unit
 <p>Pushbutton with flat cap</p>	Pushbutton with flush cap	Black		51PA8A1	51PA8A1LB	1
		Red		51PA8A2	51PA8A2LB	1
		Green		51PA8A3	51PA8A3LB	1
 <p>Pushbutton with extended cap</p>	Pushbutton with extended cap	Black		51PA8B1	51PA8B1LB	1
		Red		51PA8B2	51PA8B2LB	1
		Green		51PA8B3	51PA8B3LB	1
 <p>Dual pushbutton</p>	Dual Pushbutton	Flush Black		51PD8A1B2	51PD8A1B2LB	1
		Raised Red				
	Pushbutton with mushroom cap 1 5/8"(41.3mm)	Black		51PA9D1	51PA9D1LB	1
		Red		51PA9D2	51PA9D2LB	1
		Green		51PA9D3	51PA9D3LB	1
	Pushbutton with mushroom cap 2 1/2"(63.5mm)	Black		51PA9E1	51PA9E1LB	1
		Red		51PA9E2	51PA9E2LB	1
		Green		51PA9E3	51PA9E3LB	1
		Less head		51PA9	51PA9LB	1
 <p>2 position push-pull</p>	2 Position Push Pull Maintained, Non Illuminated Small Plastic Mushroom Head, 1 5/8" (41.3 mm)	Black		51PA2D1	51PA2D1LB	1
		Red		51PA2D2	51PA2D2LB	1
		Green		51PA2D3	51PA2D3LB	1
	Large Plastic Mushroom Head, 2 1/4" (57.2 mm)	Black		51PA2E1	51PA2E1LB	1
		Red		51PA2E2	51PA2E2LB	1
		Green		51PA2E3	51PA2E3LB	1
		Less head		51PA2	51PA2LB	1
	2 Position Push Pull Maintained, Non Illuminated Small Mushroom Head, 1 5/8"(41.3mm)	Black	1NC + 1NO	51PA2D1A	51PA2D1LBA	1
		Red	1NC + 1NO	51PA2D2A	51PA2D2LBA	1
		Green	1NC + 1NO	51PA2D3A	51PA2D3LBA	1
	Large Mushroom Head, 2 1/2"(63.5mm)	Black	1NC + 1NO	51PA2E1A	51PA2E1LBA	1
		Red	1NC + 1NO	51PA2E2A	51PA2E2LBA	1
		Green	1NC + 1NO	51PA2E3A	51PA2E3LBA	1
 <p>3 position push-pull</p>	3 Position Push Pull Momentary, Non Illuminated Small Mushroom Head, 1 5/8"(41.3mm)	Black	1NC + 1NO	51PA3A1U	51PA3A1ULB	1
		Red	1NC + 1NO	51PA3A2U	51PA3A2ULB	1
		Green	1NC + 1NO	51PA3A3U	51PA3A3ULB	1

Pushbutton Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Indicator light

Selection and ordering data

Version	Color of operator	Contacts	Short bushing Order No.	Long bushing Order No.	Pack Unit		
 <p>Indicator light- full voltage</p>	Indicator light with glass lens - Full voltage type AC/DC (with 6" pigtail leads) ^{1) 3)}						
	Operators with Incandescent Lamp 6-8V with 755 type	Red Green Amber Less lens		51PC5B2 51PC5B3 51PC5B9 51PC5BN	51PC5B2LB 51PC5B3LB 51PC5B9LB 51PC5BNLB	1	
	12V with 756 type	Red Green Amber Less lens		51PC5C2 51PC5C3 51PC5C9 51PC5CN	51PC5C2LB 51PC5C3LB 51PC5C9LB 51PC5CNLB	1	
	24V with 757 type	Red Green Amber Less lens		51PC5D2 51PC5D3 51PC5D9 51PC5DN	51PC5D2LB 51PC5D3LB 51PC5D9LB 51PC5DNLB	1	
	Operators with LED Lamp ²⁾ 6-8V with BA9 type LED	Red Green Amber		51PE5B2 51PE5B3 51PE5B9	51PE5B2LB 51PE5B3LB 51PE5B9LB	1	
	24V with BA9 type LED	Red Green Amber		51PE5D2 51PE5D3 51PE5D9	51PE5D2LB 51PE5D3LB 51PE5D9LB	1	
	 <p>Indicator light- transformer type</p>	Indicator light with glass lens - Transformer type AC/DC ^{1) 3)}					
		Operators with Incandescent Lamp 120V with 6V 755 type lamp	Red Green Amber Less lens		51PC5G2 51PC5G3 51PC5G9 51PC5GN	51PC5G2LB 51PC5G3LB 51PC5G9LB 51PC5GNLB	1
		240V with 6V 755 type lamp	Red Green Amber Less lens		51PC5H2 51PC5H3 51PC5H9 51PC5HN	51PC5H2LB 51PC5H3LB 51PC5H9LB 51PC5HNLB	1
		480V with 6V 755 type lamp	Red Green Amber Less lens		51PC5J2 51PC5J3 51PC5J9 51PC5JN	51PC5J2LB 51PC5J3LB 51PC5J9LB 51PC5JNLB	1
		600V with 6V 755 type lamp	Red Green Amber Less lens		51PC5K2 51PC5K3 51PC5K9 51PC5KN	51PC5K2LB 51PC5K3LB 51PC5K9LB 51PC5KNLB	1
		Operators with LED Lamp ²⁾ 120V with 6V BA9 type LED	Red Green Amber Less lens		51PE5G2 51PE5G3 51PE5G9 —	51PE5G2LB 51PE5G3LB 51PE5G9LB —	1
240V with 6V BA9 type LED		Red Green Amber Less lens		51PE5H2 51PE5H3 51PE5H9 —	51PE5H2LB 51PE5H3LB 51PE5H9LB —	1	
480V with 6V BA9 type LED		Red Green Amber Less lens		51PE5J2 51PE5J3 51PE5J9 —	51PE5J3LB 51PE5J3LB 51PE5J9LB —	1	
600V with 6V BA9 type LED		Red Green Amber Less lens		51PE5K2 51PE5K3 51PE5K9 —	51PE5K2LB 51PE5K3LB 51PE5K9LB —	1	

Pilot Devices



CONTROL PRODUCTS

1) For other colors not listed, order operator less lens and separate lens from page 10/127.

2) LED color must match lens color.



3) All illuminated devices come with std. Touch-safe shield per UL stds.

Pushbutton Units and Indicator Lights



Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Push to test complete units

Selection and ordering data

Version	Color of operator	Contacts	Short bushing Order No.	Long bushing Order No.	Pack Unit	
 <p>Push to test full voltage</p> <p>Push to test/Illuminated pushbutton with glass lens - Full voltage type AC/DC^{1) 3)} Operators with Incandescent Lamp 6V with 755 type lamp</p>	Red	1NO + 1NC	51PC6B2A	51PC6B2ALB	1	
	Green	1NO + 1NC	51PC6B3A	51PC6B3ALB	1	
	Amber	1NO + 1NC	51PC6B9A	51PC6B9ALB	1	
	Less lens	1NO + 1NC	51PC6BNA	51PC6BNALB	1	
	24V with 757 type lamp	Red	1NO + 1NC	51PC6D2A	51PC6D2ALB	1
	Amber	1NO + 1NC	51PC6D3A	51PC6D3ALB	1	
	Green	1NO + 1NC	51PC6D9A	51PC6D9ALB	1	
	Less lens	1NO + 1NC	51PC6DNA	51PC6DNALB	1	
	Operators with LED Lamp ²⁾ 6-8V with BA9 type LED	Red	1NO + 1NC	51PE6B2A	51PE6B2ALB	1
	Green	1NO + 1NC	51PE6B3A	51PE6B3ALB	1	
	Amber	1NO + 1NC	51PE6B9A	51PE6B9ALB	1	
	24V with BA9 type LED	Red	1NO + 1NC	51PE6D2A	51PE6D2ALB	1
Green	1NO + 1NC	51PE6D3A	51PE6D3ALB	1		
Amber	1NO + 1NC	51PE6D9A	51PE6D9ALB	1		
 <p>Push to test transformer type</p> <p>Push to test/Illuminated pushbutton with glass lens - Transformer type (50/60 Hz)^{1) 3)} Operators with Incandescent Lamp 120V with 6V 755 type lamp</p>	Red	1NO + 1NC	51PC6G2A	51PC6G2ALB	1	
	Green	1NO + 1NC	51PC6G3A	51PC6G3ALB	1	
	Amber	1NO + 1NC	51PC6G9A	51PC6G9ALB	1	
	Less lens	1NO + 1NC	51PC6GNA	51PC6GNALB	1	
	240V with 6V 755 type lamp	Red	1NO + 1NC	51PC6H2A	51PC6H2ALB	1
	Green	1NO + 1NC	51PC6H3A	51PC6H3ALB	1	
	Amber	1NO + 1NC	51PC6H9A	51PC6H9ALB	1	
	Less lens	1NO + 1NC	51PC6HNA	51PC6HNALB	1	
	480V with 6V 755 type lamp	Red	1NO + 1NC	51PC6J2A	51PC6J2ALB	1
	Green	1NO + 1NC	51PC6J3A	51PC6J3ALB	1	
	Amber	1NO + 1NC	51PC6J9A	51PC6J9ALB	1	
	Less lens	1NO + 1NC	51PC6JNA	51PC6JNALB	1	
600V with 6V 755 type lamp	Red	1NO + 1NC	51PC6K2A	51PC6K2ALB	1	
Green	1NO + 1NC	51PC6K3A	51PC6K3ALB	1		
Amber	1NO + 1NC	51PC6K9A	51PC6K9ALB	1		
Less lens	1NO + 1NC	51PC6KNA	51PC6KNALB	1		
Operators with LED Lamp ²⁾ 120V with 6V BA9 type LED	Red	1NO + 1NC	51PE6G2A	51PE6G2ALB	1	
Green	1NO + 1NC	51PE6G3A	51PE6G3ALB	1		
Amber	1NO + 1NC	51PE6G9A	51PE6G9ALB	1		
240V with 6V BA9 type LED	Red	1NO + 1NC	51PE6H2A	51PE6H2ALB	1	
Green	1NO + 1NC	51PE6H3A	51PE6H3ALB	1		
Amber	1NO + 1NC	51PE6H9A	51PE6H9ALB	1		
480V with 6V BA9 type LED	Red	1NO + 1NC	51PE6J2A	51PE6J2ALB	1	
Green	1NO + 1NC	51PE6J3A	51PE6J3ALB	1		
Amber	1NO + 1NC	51PE6J9A	51PE6J9ALB	1		
600V with 6V BA9 type LED	Red	1NO + 1NC	51PE6K2A	51PE6K2ALB	1	
Green	1NO + 1NC	51PE6K3A	51PE6K3ALB	1		
Amber	1NO + 1NC	51PE6K9A	51PE6K9ALB	1		

Overload reset operators with reset legend plate

Version	Color	Legend Inscription	Order No.
 <p>Single unit 7/8" diameter reset pad, 10" shaft can be cut to length.</p>	Red	Reset	51AAS
 <p>Multi unit For use with multi push operation requirements.</p>	Red	Reset	51AAM

1) For other colors not listed, order operator less lens and separate lens from page 10/127.

2) LED color must match lens color.



3) All illuminated devices come with std. Touch-safe shield per UL stds.

Pushbutton Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Selector switch operators

Selection and ordering data

Version	Lever type	Color of insert	Cam Code 1) 2)	Short bushing Order No.	Long bushing Order No.	Pack Unit
	Short lever, non-Illuminated	White	A	51SA2AA	51SA2AALB	1
	Long lever, non-Illuminated	White	A	51SB2AA	51SB2AALB	
	Short lever, non-Illuminated	White	A	51SA2AC	51SA2ACLB	1
	Long lever, non-Illuminated	White	A	51SB2AC	51SB2ACLB	
Selector switches with 2 switching positions Maintained operation	Short lever, non-Illuminated	White	B	51SA2BA	51SA2BALB	1
	Long lever, non-Illuminated	White	B	51SB2BA	51SB2BALB	
	Short lever, non-Illuminated	White	C	51SA2CA	51SA2CALB	
	Long lever, non-Illuminated	White	C	51SB2CA	51SB2CALB	
	Short lever, non-Illuminated	White	D	51SA2DA	51SA2DALB	
	Long lever, non-Illuminated	White	D	51SB2DA	51SB2DALB	
	Short lever, non-Illuminated	White	E	51SA2EA	51SA2EALB	
	Long lever, non-Illuminated	White	E	51SB2EA	51SB2EALB	
	Short lever, non-Illuminated	White	G	51SA2GA	51SA2GALB	
	Long lever, non-Illuminated	White	G	51SB2GA	51SB2GALB	
Spring return from right operation	Short lever, non-Illuminated	White	B	51SA2BC	51SA2BCLB	1
	Long lever, non-Illuminated	White	B	51SB2BC	51SB2BCLB	
	Short lever, non-Illuminated	White	C	51SA2CC	51SA2CCLB	
	Long lever, non-Illuminated	White	C	51SB2CC	51SB2CCLB	
	Short lever, non-Illuminated	White	D	51SA2DC	51SA2DCLB	
	Long lever, non-Illuminated	White	D	51SB2DC	51SB2DCLB	
	Short lever, non-Illuminated	White	E	51SA2EC	51SA2ECLB	
	Long lever, non-Illuminated	White	E	51SB2EC	51SB2ECLB	
Spring return from left operation	Short lever, non-Illuminated	White	G	51SA2GC	51SA2GCLB	1
	Long lever, non-Illuminated	White	G	51SB2GC	51SB2GCLB	
	Short lever, non-Illuminated	White	B	51SA2BB	51SA2BBLB	
	Long lever, non-Illuminated	White	B	51SB2BB	51SB2BBLB	
	Short lever, non-Illuminated	White	C	51SA2CB	51SA2CBLB	
	Long lever, non-Illuminated	White	C	51SB2CB	51SB2CBLB	
	Short lever, non-Illuminated	White	D	51SA2DB	51SA2DBLB	
	Long lever, non-Illuminated	White	D	51SB2DB	51SB2DBLB	
	Short lever, non-Illuminated	White	E	51SA2EB	51SA2EBLB	
	Long lever, non-Illuminated	White	E	51SB2EB	51SB2EBLB	
Spring return from left and right operation	Short lever, non-Illuminated	White	G	51SA2GB	51SA2GBLB	1
	Long lever, non-Illuminated	White	G	51SB2GB	51SB2GBLB	
	Short lever, non-Illuminated	White	B	51SA2BD	51SA2BDLB	
	Long lever, non-Illuminated	White	B	51SB2BD	51SB2BDLB	
	Short lever, non-Illuminated	White	C	51SA2CD	51SA2CDLB	
	Long lever, non-Illuminated	White	C	51SB2CD	51SB2CDLB	
	Short lever, non-Illuminated	White	D	51SA2DD	51SA2DDLb	
	Long lever, non-Illuminated	White	D	51SB2DD	51SB2DDLb	
	Short lever, non-Illuminated	White	E	51SA2ED	51SA2EDLB	
	Long lever, non-Illuminated	White	E	51SB2ED	51SB2EDLB	
Spring return from left and right operation	Short lever, non-Illuminated	White	G	51SA2GD	51SA2GDLB	1
	Long lever, non-Illuminated	White	G	51SB2GD	51SB2GDLB	

1)C CAM limited to 4 single or double pole blocks on spring return operators.

2)For contact operation, see CAM selection chart on [page 17-315](#).

Pilot Devices

17 CONTROL PRODUCTS

Pushbutton Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Selector switch operators

Selection and ordering data



Version	Key removal position	Lock number	CAM Code 1) 2)	Short bushing Order No.	Long bushing Order No.	Pack Unit
Key-operated selector switches with 2 switching positions	Both	550CH	A	51SA6AE	51SA6AELB	1
	Left	550CH	A	51SA6AF	51SA6AFLB	
	Right	550CH	A	51SA6AG	51SA6AGLB	
Maintained operation	Right	550CH	A	51SA6AC	51SA6ACLB	1
Spring return from right operation	Left	550CH	A	51SA6AC	51SA6ACLB	1
Key-operated selector switches with 3 switching positions	All	550CH	B	51SA6BE	51SA6BELB	1
			C	51SA6CE	51SA6CELB	
			D	51SA6DE	51SA6DELB	
			E	51SA6EE	51SA6EELB	
			G	51SA6GE	51SA6GELB	
	Left	550CH	B	51SA6BF	51SA6BFLB	1
			C	51SA6CF	51SA6CFLB	
			D	51SA6DF	51SA6DFLB	
			E	51SA6EF	51SA6EFLB	
			G	51SA6GF	51SA6GFLB	
	Right	550CH	B	51SA6BG	51SA6BGLB	1
			C	51SA6CG	51SA6CGLB	
			D	51SA6DG	51SA6DGLB	
			E	51SA6EG	51SA6EGLB	
			G	51SA6GG	51SA6GGLB	
Center	550CH	B	51SA6BH	51SA6BHLB	1	
		C	51SA6CH	51SA6CHLB		
		D	51SA6DH	51SA6DHLB		
		E	51SA6EH	51SA6EHLB		
		G	51SA6GH	51SA6GHLB		
Left and Center	550CH	B	51SA6BK	51SA6BKLB	1	
		C	51SA6CK	51SA6CKLB		
		D	51SA6DK	51SA6DKLB		
		E	51SA6EK	51SA6EKLb		
		G	51SA6GK	51SA6GKLB		
Spring return from right operation	Center	550CH	B	51SA6BU	51SA6BULB	1
			C	51SA6CU	51SA6CULB	
			D	51SA6DU	51SA6DULB	
			E	51SA6EU	51SA6EULB	
			G	51SA6GU	51SA6GULB	
Spring return from left operation	Center	550CH	B	51SA6BT	51SA6BTLB	1
			C	51SA6CT	51SA6CTLB	
			D	51SA6DT	51SA6DTLB	
			E	51SA6ET	51SA6ETLB	
			G	51SA6GT	51SA6GTLB	
Spring return from left and right operation	Center	550CH	B	51SA6BV	51SA6BVLB	1
			C	51SA6CV	51SA6CVLB	
			D	51SA6DV	51SA6DVLB	
			E	51SA6EV	51SA6EVLB	
			G	51SA6GV	51SA6GVLB	

See page 17-339 for replacement keys, and up-to 15 additional uniquely keyed M - Series Lock Options available for use with the 51SA6 key-operated selector switches.

5

5

To order special locks for keyed selector switches, append corresponding 'X' suffix to part number

Ordering example:

51SA6AEX298

#549CH	X639		1
#548CH	X640		1
#547CH	X641		1
#501CH	X642		1
#506CH	X643		1

1) CAM limited to 4 single or double pole blocks on spring return operators.

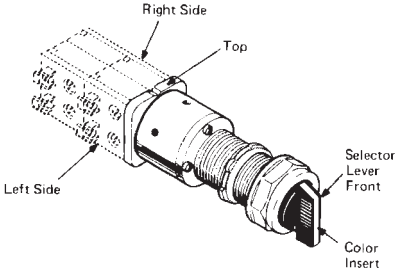
2) For contact operation, see CAM selection chart on page 17-315.

Pushbutton Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Cam selection

Selection and ordering data

Design	Ordering Information
	<ul style="list-style-type: none"> Contact blocks are ordered separately, see page 17-318. Determine which table to use based upon the type of selector (non-illuminated & keyed on top, illuminated on bottom). Find the correct number of selector positions (2, 3 or 4 positions). Select the contact operation required for each selector position. X indicates the contacts are closed, while O indicates the contacts are open. (For the selector pushbutton, N=normal and D=depressed). Contact block must be assembled in position shown for each circuit application. Identify the CAM letter required for the chosen contact operation (only 1 CAM can be used per selector switch or selector pushbutton). Contact blocks must be assembled in the position shown for each circuit application. The mounting position is viewed from the front of the device. <p>Ordering CAMs D, E or G</p> <ul style="list-style-type: none"> CAM D, E or G may be ordered at the same price by changing the 6th character of the selector catalog number. Example: Selector with D cam 51SA2DA. <p>Size Requirements</p> <ul style="list-style-type: none"> C CAM on spring return selectors is limited to 4 contact blocks. Standard push buttons accept 4 contact blocks on each side, for a maximum of 8 contact blocks. Selector operators in enclosures are limited to depth of 1 contact block. (2 blocks wide).

Non-illuminated and keyed selector switches (viewed from front)

2 Selector Positions			Contact Blocks	CAM	Mounting	
Left	Right				Left	Right
X	O		52BAJ (NC)	A	L	R
O	X		52BAK (NO)	A	L	R
3 Selector Positions			Contact Blocks	CAM	Mounting	
Left	Center	Right			Left	Right
X	O	O	52BAK (NO)	B		R
O	O	X	52BAK (NO)	B	L	
X	X	O	52BAJ (NC)	B	L	
O	X	X	52BAJ (NC)	B	R	
O	O	X	52BAK (NO)	C	L	R
X	O	O	52BAJ (NC)	C	L	R
O	O	X	52BAK (NO)	D	L	R
O	X	O	52BAJ (NC)	D	L	R
X	O	O	52BAK (NO)	E	L	R
O	X	O	52BAJ (NC)	E	L	R
X	O	O	52BAJ (NC)	G	L	
O	X	O	52BAJ (NC)	G		R
O	O	X	52BAK (NO)	G	L	R

Illuminated selector switches

2 Selector Positions			Contact Blocks	CAM	Mounting	
Left	Right				Left	Right
X	O		52BAJ (NC)	A	L	
O	X		52BAK (NO)	A	L	




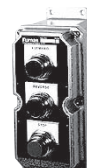

1) Wired in parallel.

Pushbutton Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Control stations

Selection and ordering data

	Operator Identification ¹⁾	Degree of operator	Contacts/voltage	Number of command points	Order No.	Pack Unit
	A = Momentary flush pushbutton black, label "START"	NEMA 7/9	1NO - 1NC	1	51C101H	1
	A = Momentary raised pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC	1	51C103H	1
	A = Momentary 1 5/8" mushroom head red label "STOP"	NEMA 7/9	1NO - 1NC	1	51C104H	1
	A = Momentary dual pushbutton red label "START, STOP"	NEMA 7/9	1NO - 1NC	1	51C105H	1
	A = 2 position selector switch label "Off-On"	NEMA 7/9	1NO - 1NC	1	51C159H	1
	A = 3 position selector switch label "HAND-OFF-AUTO"	NEMA 7/9	1NO - 1NC	1	51C156H	1
	A = Indicator light, green, 120 V	NEMA 7/9		1	51C131H	1
	A = Indicator light, red, 120 V	NEMA 7/9		1	51C135H	1
	B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC 1NO - 1NC	2	51C201H	1
	B = Momentary flush pushbutton black, label "FORWARD" A = Momentary flush pushbutton red, label "REV"	NEMA 7/9	1NO - 1NC 1NO - 1NC	2	51C204H	1
	B = Momentary flush pushbutton black, label "START" A = Momentary 1 5/8" mushroom head pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC 1NO - 1NC	2	51C202H	1
	B = Indicator light, red, 120 V A = Indicator light, green, 120 V	NEMA 7/9	1NO - 1NC 1NO - 1NC	2	51C230H	1
	C = Momentary flush pushbutton black, label "FORWARD" B = Momentary flush pushbutton black, label "REVERSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC 1NO - 1NC 1NO - 1NC	3	51C301H	1
	C = Momentary flush pushbutton black, label "OPEN" B = Momentary flush pushbutton black, label "CLOSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC 1NO - 1NC 1NO - 1NC	3	51C303H	1
	C = Indicator light, green, 120 V B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC 1NO - 1NC	3	51C307H	1
	Enclosures only ²⁾			1	51EA1H	1
	For field assembly of Type 7 & 9 UL listed and cUL listed control stations. Devices may be installed for either horizontal or vertical mounting using a standard legend. Limited to depth of 1 contact block.			2	51EA2H	1
				3	51EA3H	1

1) All enclosures come standard with one conduit entry on top. To get two conduit entries, append X-311 to the end of the order number.

2) For legend plates see page 17-355.

Pushbutton Units and Indicator Lights













Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Accessories and spare parts

Pilot Devices

CONTROL PRODUCTS

Selection and ordering data

Version	Suitable for	Conduit size (in.)	Color	Order No.	Pack Unit
	For small 1 5/8" (41.3mm) type, non-illuminated mushroom push-buttons		Black	52RB3D1	1
			Red	52RB3D2	
			Green	52RB3D3	
			Yellow	52RB3D4	
			Blue	52RB3D5	
			Gray	52RB3D6	
			Orange	52RB3D8	
			1 kit of each	52RB3DN	
				For large 2 1/2" (63.5mm) type, non-illuminated mushroom push-buttons	
Red	52RB3E2				
Green	52RB3E3				
Yellow	52RB3E4				
Blue	52RB3E5				
Gray	52RB3E6				
Orange	52RB3E8				
1 kit of each	52RB3EN				
	Replacement lens for pilot lights				Red
			Green	51RC4G3	
			Blue	51RC4G5	
			Amber	51RC4G9	
			Clear	51RC4GA	
	Replacement lens for push to test/illuminated pushbuttons		Red	51RC5G2	1
			Green	51RC5G3	
			Amber	51RC5G9	
	Guards		Chrome	51AAGM	1
	Prevents accidental operation	Non-illuminated Pushbuttons & Push Pull Operators with Mushroom Head Caps 1 5/8" to 1 3/4" in diameter.			
	Lever inserts		Red	52RA2A2	1
			Green	52RA2A3	
			Blue	52RA2A4	
			Amber	52RA2A5	
			Gray	52RA2A6	
			Orange	52RA2A8	
			White	52RA2AB	
			Long lever		
	Long lever		Red	52RA2B2	1
			Green	52RA2B3	
			Blue	52RA2B4	
			Amber	52RA2B5	
			Gray	52RA2B6	
			Orange	52RA2B8	
			White	52RA2BB	
				Padlock attachment	
	Breather/drain (Stainless Steel)	Installs in bottom as a drain or in the top as a breather. Suitable for Class 1 groups C & D and for Class 2 groups F & G applications only. Fits 1/2" NPT.		51AADB	1
	Lock nut wrench	All devices		52MAWB	1
	Spare keys	550CH (1 key)		52KEY-550CH	1

Pushbutton Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Accessories and spare parts

Selection and ordering data

Version	Suitable for	Conduit size (in.)	Color	Order No.	Pack Unit
Reducer bushings	Cast aluminum, UL recognized and CSA certified. Used to reduce existing tapered NPT conduit opening when required.	3/4 - 1/2		51AARBA	1
		1 - 1/2		51AARCA	
		1 1/2 - 3/4		51AARDB	
		1 1/2 - 1		51AARDC	
		2 1/2 - 3/4		51AARFB	
		2 1/2 - 1		51AARFC	
		2 1/2 - 1 1/2		51AARFD	
		2 1/2 - 2		51AARFE	
		3 - 1		51AARGC	
		3 - 1 1/2		51AARGD	
		3 - 2		51AARGE	
		3 - 2 1/2		51AARGF	
		Lamps with screw connection, miniature bayonet incandescent lamps			
Flashing, type 267 lamp (replaces 755 lamp)	51, 52	6V		52AABNF	1
6V Full voltage, transformer type 755 lamp	51, 52	6V		52AABN	1
12V full voltage, type 756	51, 52	12V		52AACN	1
24V full voltage, 120/240V resistor push-to-test type 757	51, 52	24V		52AADN	1
Neon (uses resistors) type B2A (NE-51H)	51, 52	120V		52AAPN	1
120V, full voltage type 3S6/5	51, 52	120V		52AAENC	1
LEDs, Single element	51, 52	6V	Red	52AEB2	1
	51, 52	6V	Green	52AEB3	
	51, 52	6V	Yellow	52AEB4	
	51, 52	6V	White	52AEBB	
	51, 52	6V	Blue	52AEB5	
	51, 52	24V	Red	52AED2	
	51, 52	24V	Green	52AED3	
	51, 52	24V	Yellow	52AED4	
	51, 52	24V	White	52AEDB	
	51, 52	24V	Blue	52AED5	
	51, 52	120V	Red	52AEE2	
	51, 52	120V	Green	52AEE3	
	51, 52	120V	Yellow	52AEE4	
	51, 52	120V	White	52AEEB	
	51, 52	120V	Blue	52AEE5	






Pushbutton Units and Indicator Lights


Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Accessories and spare parts

Selection and ordering data

	Version	Suitable for	Conduit size (in.)	Color	Order No.	Pack Unit
	52BAJ					
	52BAK					
	52BAR					
	Touchsafe contact blocks with gold flashing					
	1 NO				52BAK	1
	1 NC				52BAJ ^②	
	1 NO - 1 NC				52BJK ^②	
	1 NO early make	closes before 52BAK			52BAH	
	1 NC late break	opens after 52BAJ			52BAE	
	1 NO - 1 NC	Reed switch			52BAR ^①	
		UL listed for class 1 division 2				
		.25A Max, 200V AC, 10 Watt max				
		.5A Max, 200V DC, 10 Watt max				
	1 NC extra late break				52BAU	

① Hermetically sealed.

②  Positive opening according to IEC 60947-5-1, Appendix K.

Pilot Devices


17
CONTROL
PRODUCTS

Pushbutton Units and Indicator Lights

30 mm Heavy Duty, Watertight/Oiltight, Class 52

Pushbutton complete units

Features

- Octagonal Mounting Nuts
- Meets Type 1, 3, 3R, 4, 4X, 12, 13 and Automotive Standards
- Heavy Duty Rated NEMA A600/P600 Contacts
-  Positively Driven Contacts
- Positive Indexing Selectors
- Bifurcated Movable Contacts
- Attractive Chrome Plating
- Boots Not Required for Type 4
- UL Listed File # E22655
- CSA Certified File # LR6535
- Touchsafe Terminals

Application

Oil tight pilot controls and accessories are designed to provide long, trouble free service in the most demanding industrial applications. These controls are oil and dust tight and meet Type 3, 4, 4X, 12 and 13 specifications.

Rugged

Industrial control operators are durable one piece castings. Heavy duty plastic buttons resist oils and corrosion. Silver contacts carry heavy duty ratings.

Flexible

Accessories modify standard push buttons, selector switches and pilot lights. Building block construction of contact blocks makes possible many circuitry combinations.

Industrial Appearance

Pilot controls add luster to panels. Chrome plating covers exposed metal parts.

Push Button Operators


The Operator Base consists of a durable, one piece casting equipped with a heavy duty actuator with a stainless steel spring, a neoprene actuator sealing ring to prevent oil and dust from penetrating to the contact blocks, a neoprene gasket to seal operator mounting hole and a chrome plated lock nut.

Mushroom Head Push Button Operators

The Mushroom Head base construction is identical to the push button base. The actuator is molded of high impact material for either a 1 5/8 inch or 2 1/2 inch diameter molded head.

E-STOP Mushroom Head Operators according to EN 60947-5-5 Cat. No. 52BP, 52BR, 52PP, and 52PR, 2 Position, Twist-To-Release & 2 Position, Push Pull Maintained operators provided with red operating heads and 52BJK contact blocks meet the requirements of EN 60947-5-5 for Electrical Emergency Stop Device With Mechanical Latching Function (e-stop).

Contact Blocks

Contact Blocks have double break bifurcated silver contacts, with gold flashing as standard, which improves contact reliability. Contact blocks are heavy duty rated NEMA A600 and suitable for applications down to 5V/1MA solid state outputs. 52BJK offers  Positive Opening Contacts according to IEC 60947-5-1, Appendix K. Molded bodies and pushers resist arcing and tracking. All units have stainless steel springs that resist corrosion and provide strong contact pressure. Captive mounting screws speed panel assembly.

Push Pull Operators

Push Pull Operators combine two or three functions in one unit. The maintained operator has two positions, typically pull to start, push to stop. The momentary operator with three positions provides spring return from both pull and push positions. In addition, a three position push maintained, pull momentary operator is available. The actuator come is 1 3/4 inch or 2 1/2 inch diameter and is available in an illuminated version.

2 Button Maintained Operator

Maintained Push Buttons consist of two push buttons and a latching assembly. When actuated the button remains depressed and is freed only by the release operator to which it is linked. The button assembly adjusts for mounting from a 1 13/16 inch to a 2 5/8 inch center.

Transformer Type Pilot Lights

Transformer Type Pilot Lights are available with a 120, 240, 480 or 600 Volt primary (50/60 Hertz) and a separate secondary winding which supplies reduced voltage to a miniature bayonet base 6 Volt lamp. These units are suitable for applications where vibration is present and long bulb life is desirable.

Full Voltage Type Pilot Lights

Full Voltage Pilot Lights are available for 6, 12, 24 and 120 Volt AC and DC applications.

Electrical Ratings

NEMA AC Ratings 50/60Hz

NEMA A600 10 Continuous Amps

Volts	Make	Break
120	60	6
240	30	3
480	15	1.5
600	12	1.2
VA	7200	720

Ordering Information

- Accessories: [pages 17-344 – 17-347](#)
- Selector Position and Contact Operation: [page 17-342 – 17-343](#).
- Legend Plates: [page 17-355](#).
- Enclosures: [page 17-356](#).
- Technical Specifications: [page 17-359](#).

Resistor Type Pilot Lights

Resistor Type Pilot Lights are available for 240 Volt AC and DC applications. The 240 Volt pilot light is supplied with a 120 Volt lamp and a voltage dropping resistor.

LED Type Pilot Lights

LED's (light emitting diodes) can be used in pilot lights instead of incandescent bulbs because of their long life (up to 10 years), resistance to vibration and ambient sensitivity. Clusted LED options are available for standard pilot lights only. Cluster LED options are not available on Push to test Pilot Lights, Illuminated Pushbuttons, Push-pull, or Twist-to-Release Operators.

Integrated LED Module Type Pilot Lights

The integrated LED module is available for 24, 120, and 240 V. LED modules are vibration resistant and have a long life (up to 10 years). The integrated LED module is available for 24, 120, and 240 V. LED modules are vibration resistant and have a long life (up to 10 yrs.).

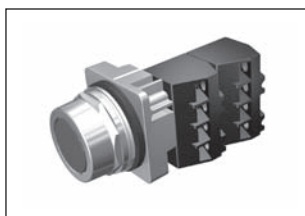
Selector Operators

Selector Operators have positive action indexing. Operators are available with either a short or long lever. The molded black lever is designed to accept a color insert. A white insert is provided as standard. Each operator is equipped with a cam to actuate plungers of contact blocks assembled behind the operator. Two, three and four position operators are available with seven different cams.

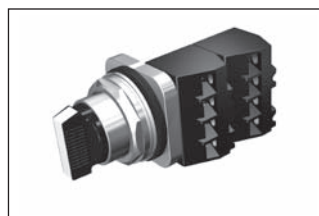
Lever color inserts are available in 8 colors.



Indicator Light



Push Button



Selector Switch



Selector Push Button

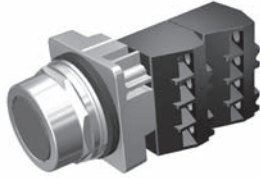
Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Push Button

Selection Guide

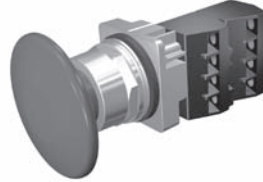
Momentary Push Button - Non-Illuminated



Flush Head



Extended Head



Large Mushroom Head 2 1/2"



Small Mushroom Head 1 3/4"

Part Number	52	a	M	c	d	e¹
--------------------	-----------	----------	----------	----------	----------	----------------------

a	Code	Finish
	P	Chrome - Command 52
	B	Epoxy Coated - Black Max

b	Code	Type
	M	Momentary Push Button

c	Code	Style / Head Type
	Flush / Extended Cap²	
	8A	Flush
	8B	Extended
	Mushroom Head Metal	
	9A	Small Mushroom Head 1 3/4" (44.5mm)
	Mushroom Head Plastic	
	9W	Small Mushroom Head 1 3/4" (44.5mm)
	9V	Large Mushroom Head 2 1/2" (63.5mm)

d	Code	Plastic	Metal
	1	Black	—
	2	Red	Red
	3	Green	Green
	4	Yellow	—
	5	Blue	—
	6	Gray	—
	7	All Color Caps	—
	8	Orange	—
C	—	Chrome	

e ¹	Code	Contact Blocks
	A	1 NO + 1 NC
	B	2 NO + 2 NC
	C	3 NO + 3 NC
	D	4 NO + 4 NC
	E	1 NC (LB)
	F	2 NO
	G	2 NC
	H	1NO (EM)
	J	1 NC
	K	1 NO

¹ For operator without contact blocks leave position e blank.

² Products available fall 2014. For current product offer please refer to the 2010 Industrial Control Catalog.

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Push Buttons

Selection Tables

Momentary Push Button - Non-Illuminated

Head Style	Contacts	Color	Finish	
			Chrome	Black Max
Flush	—	Less cap	52PM8	52BM8
		Black	52PM8A1	52BM8A1
		Red	52PM8A2	52BM8A2
		Green	52PM8A3	52BM8A3
		Yellow	52PM8A4	52BM8A4
	1 NO - 1 NC	Black	52PM8A1A	52BM8A1A
		Red	52PM8A2A	52BM8A2A
		Green	52PM8A3A	52BM8A3A
	1 NO	Black	52PM8A1K	52BM8A1K
		Red	52PM8A2K	52BM8A2K
	1 NC	Green	52PM8A3K	52BM8A3K
		Red	52PM8A2J	52BM8A2J
Extended	—	Black	52PM8B1	52BM8B1
		Red	52PM8B2	52BM8B2
		Green	52PM8B3	52BM8B3
	1 NO	Black	52PM8B1K	52BM8B1K
		Red	52PM8B2K	52BM8B2K
	1 NC	Red	52PM8B2J	52BM8B2J
Mushroom Head Plastic Ø 1 3/4"	—	Less cap	52PM9	52BM9
		Red	52PM9W2	52BM9W2
	1 NO	Green	52PM9W3K	52BM9W3K
		Black	52PM9W1A	52BM9W1A
	1 NO - 1 NC	Red	52PM9W2A	52BM9W2A
		Green	52PM9W3A	52BM9W3A
Mushroom Head Plastic Ø 2 1/2"	—	Red	52PM9V2	52BM9V2
		Black	52PM9V1A	52BM9V1A
	1 NO - 1 NC	Red	52PM9V2A	52BM9V2A
		Green	52PM9V3A	52BM9V3A

Readily available items are in **bold**.
This is a small representation of stocked items.

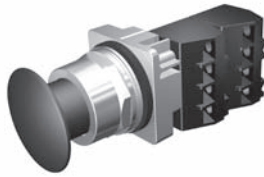
Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Non-Illuminated Push Pull

Selection Guide

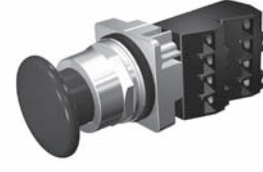
2 & 3 Position Push-Pull Mushroom Head Devices - Non-Illuminated



Mushroom Head Metal Ø 1 3/4"



Mushroom Head Plastic Ø 2 1/2"



Mushroom Head Plastic Ø 1 3/4"

Part Number	52	<u> </u>	P	<u> </u>	<u> </u>	<u> </u>	<u> </u>
		a	b	c	d	e	f³

a	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

b	Code	Type
	P	Push Pull

c	Code	Function
	2	2 positions - maintained ¹
	3	3 positions - momentary in - momentary out
	7	3 positions - maintained in - momentary out

d	Code	Style
	A	Small metal 1-3/4" (44.5 mm)
	W	Small plastic 1-3/4" (44.5 mm)
	V	Large plastic 2-1/2" (63.5 mm)

e	Code	Color	
		Plastic	Metal
	1	Black	—
	2	Red ¹	Red ¹
	3	Green	Green
	4	Yellow	—
	5	Blue	—
	6	Gray	—
	8	Orange	—
	C	—	Chrome
		No Operating Head	
	Z	No head	

f³	Code	Contact Blocks
		2 Position
	A	1 NO + 1 NC ¹
	B	2 NO + 2 NC ¹
	C	3 NO + 3 NC ¹
	D	4 NO + 4 NC ¹
	E	1 NC (LB)
	F	2 NO
	G	2 NC ¹
	H	1 NO (EM)
	J	1 NC ¹
	K	1 NO
	Q	1 NO - 1 NC (ELB)
		3 Position
	U	1 NO - 1 NC extra late break ²

¹ EMERGENCY-STOP control devices according to IEC 60947-5-5 when provided with red operating head and positively driven NC contact blocks. Positive opening contacts according to IEC 60947-5-1, Appendix K.

² Blocks cannot be interchanged (stop-start circuit - pull to start, push to stop).

³ For operator without contact blocks leave position f blank.

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Non-Illuminated Push Pull

Selection Tables

2 & 3 Position Push-Pull Mushroom Head Devices - Non-Illuminated

Pilot Devices

		2 pos - maintained					
		Metal Ø 1 3/4"		Plastic Ø 1 3/4"		Plastic Ø 2 1/2"	
Contacts	Color	Chrome	Black Max	Chrome	Black Max	Chrome	Black Max
—	Black	—	—	52PP2W1	52BP2W1	52PP2V1	2BP2V1
	Red	52PP2A2	52BP2A2	52PP2W2	52BP2W2	52PP2V2	52BP2V2
	Green	52PP2A3	52BP2A3	52PP2W3	52BP2W3	52PP2V3	52BP2V3
	Yellow	—	—	52PP2W4	52BP2W4	52PP2V4	52BP2V4
1 NO - 1 NC	Red	52PP2A2A¹	52BP2A2A¹	52PP2W2A¹	52BP2W2A¹	52PP2V2A¹	52BP2V2A ¹
	Green	52PP2A3A	52BP2A3A	52PP2W3A	52BP2W3A	52PP2V3A	—
	Yellow	—	—	52PP2W4A	52BP2W4A	52BP2V4A	52BP2V4A
	Chrome	52PP2ACA	52BP2ACA	—	—	—	—

		3 pos - momentary in - momentary out					
		Metal Ø 1 3/4"		Plastic Ø 1 3/4"		Plastic Ø 2 1/2"	
Contacts	Color	Chrome	Black Max	Chrome	Black Max	Chrome	Black Max
—	Black	—	—	52PP3W1	52BP3W1	52PP3V1	52BP3V1
	Red	52PP3A2	52BP3A2	52PP3W2	52BP3W2	52PP3V2	52BP3V2
	Green	52PP3A3	52BP3A3	52PP3W3	52BP3W3	52PP3V3	2BP3V3
	Chrome	52PP3AC	52BP3AC	—	—	—	—
1 NO - 1 NCELB	Red	52PP3A2U	52BP3A2U	52PP3W2U	52BP3W2U	52PP3V2U	52BP3V2U
	Green	52PP3A3U	52BP3A3U	52PP3W3U	52BP3W3U	52PP3V3U	52BP3V3U

		3 pos - maintained in - momentary out					
		Metal Ø 1 3/4"		Plastic Ø 1 3/4"		Plastic Ø 2 1/2"	
Contacts	Color	Chrome	Black Max	Chrome	Black Max	Chrome	Black Max
—	Black	—	—	52PP7W1	52BP7W1	52PP7V1	52BP7V1
	Red	52PP7A2	52BP7A2	52PP7W2	52BP7W2	52PP7V2	52BP7V2
	Green	52PP7A3	52BP7A3	52PP7W3	52BP7W3	52PP7V3	52BP7V3
	Chrome	52PP7AC	52BP7AC	—	—	—	—
1 NO - 1 NCELB	Red	52PP7A2U1	52BP7A2U	52PP7W2U	52BP7W2U	52PP7V2U	52BP7V2U
	Green	52PP7A3U	52BP7A3U	52PP7W3U	52BP7W3U	52PP7V3U	52BP7V3U

Readily available items are in **bold**.
This is a small representation of stocked items.

¹ EMERGENCY-STOP control devices according to IEC 60947-5-5

17
CONTROL
PRODUCTS

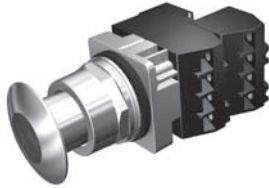
Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Illuminated Push Pull & Push Button

Selection Guide

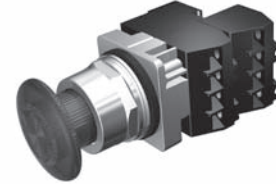
2 & 3 Position Push-Pull Mushroom Head Devices - Illuminated



Mushroom Head Metal Ø 1 3/4"



Mushroom Head Plastic Ø 2 1/2"



Mushroom Head Plastic Ø 1 3/4"

Part Number	52	a	P	c	d	e	f	g
-------------	-----------	----------	----------	----------	----------	----------	----------	----------

a	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

b	Code	Type
	P	Push Pull Operator

c	Code	Function
	2	2 positions - maintained ¹
	3	3 positions - momentary in - momentary out ²
	7	3 positions - maintained in - momentary out ²

d	Code	Operation	
		Full Voltage ³ (AC/DC)	
		Incandescent	LED ⁴
	B	6-8V	6V
	C	12-13V	—
	D	24-28V	24-28V
	E	120V	120V
	F	—	240V
		Transformer ³	
	G	120V AC	
	H	240V AC	
	J	480V AC	
	K	600V AC	

e	Code	Style / Color
		Mushroom Head Metal Ø 1 3/4" (44.5mm)
	2	Red ¹
	3	Green
	5	Blue
	9	Amber
	A	Clear
	B	White
		Mushroom Head Plastic Ø 1 3/4" (44.5 mm)
	R	Red ¹
	S	Green
	T	Amber
		Mushroom Head Plastic Ø 2 1/2" (63.5mm)
	D	Red ¹
	E	Green
	F	Amber
		No Head (full voltage & transformer only)
	Z	No head

f	Code	Contact Blocks
		2 Position
	A	1 NO + 1 NC ¹
	B	2 NO - 2 NC ¹
	F	2 NO
	G	2 NC ¹
	J	1 NC ¹
	K	1 NO
	Q	1 NO - 1 NC (ELB)
		3 Position
	U	1 NO - 1 NC extra late break ²

g	Code	Bulb Type
	Blank	Incandescent
	B	LED
	Y	Super-Bright LED ⁵

¹ EMERGENCY-STOP control devices according to IEC 60947-5-5 when provided with red operating head and positively driven NC contact blocks.

Positive opening contacts according to IEC 60947-5-1, Appendix K,

² Blocks cannot be interchanged (stop-start circuit - pull to start, push to stop).

³ Default bulb type is incandescent. For LED options, append field g. LED option not available on units sold "no head".

⁴ LED voltages apply to table g option code B and Y. 6V and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.

⁵ Not available in 240V.

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Illuminated Push Pull

Selection Tables

Pilot Devices

Type	Lamp Type	Voltage	Color	Contacts
Full Voltage (AC/DC)	LED	24V	Red	1 NO - 1 NC
			Green	1 NO - 1 NC
	Incandescent	24V	Red	1 NO - 1 NC
			Green	1 NO - 1 NC
		120V	Red	1 NO - 1 NC
			—	—
Transformer (AC)	LED	120V	Red	1 NO - 1 NC
			Green	1 NO - 1 NC
	Incandescent	120V	Red	1 NO - 1 NC
			Green	1 NO - 1 NC

Operator Type			
2 pos - maintained			
Metal Ø 1 3/4"		Plastic Ø 1 3/4"	
Chrome	Black Max	Chrome	Black Max
52PP2D2AB¹	52BP2D2AB¹	52PP2DRAB¹	52BP2DRAB ¹
52PP2D3AB	52BP2D3AB	52PP2DSAB	52BP2DSAB
52PP2D2A¹	52BP2D2A ¹	52PP2DRA¹	52BP2DRA ¹
52PP2D3A	52BP2D3A	52PP2DSA	52BP2DSA
52PP2E2A ¹	52BP2E2A ¹	52PP2ERA ¹	52BP2ERA ¹
52PP2E2	52BP2E2	52PP2ER	52BP2ER
52PP2G2AB¹	52BP2G2AB ¹	52PP2GRAB ¹	52BP2GRAB ¹
52PP2G3AB	52BP2G3AB	52PP2GSAB	52BP2GSAB
52PP2G2A¹	52BP2G2A ¹	52PP2GRA¹	52BP2GRA ¹
52PP2G3A	52BP2G3A	52PP2GSA	52BP2GSA

Type	Lamp Type	Voltage	Color	Contacts
Full Voltage (AC/DC)	LED	24V	Green	1 NO - 1 NCELB
			Green	1 NO - 1 NCELB
	Incandescent	24V	Red	1 NO - 1 NCELB
			Red	—
		120V	Red	—
			—	—
Transformer (AC)	LED	120V	Red	1 NO - 1 NCELB
			Green	1 NO - 1 NCELB
	Incandescent	120V	Red	1 NO - 1 NCELB
			Green	1 NO - 1 NCELB

Operator Type			
3 pos - momentary in - momentary out			
Metal Ø 1 3/4"		Plastic Ø 1 3/4"	
Chrome	Black Max	Chrome	Black Max
52PP3D3UB	52BP3D3UB	52PP3DRUB	52BP3DRUB
52PP3D3U	52BP3D3U	52PP3DSU	52BP3DSU
52PP3D2U	52BP3D2U	52PP3DRU	52BP3DRU
52PP3E2	52BP3E2	52PP3ER	52BP3ER
52PP3G2UB	52BP3G2UB	52PP3GRUB	52BP3GRUB
52PP3G3UB	52BP3G3UB	52PP3GSUB	52BP3GSUB
52PP3G2U	52BP3G2U	52PP3GRU	52BP3GRU
52PP3G3U	52BP3G3U	52PP3GRU	52BP3GRU

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CONTROL PRODUCTS

Type	Lamp Type	Voltage	Color	Contacts
Full Voltage (AC/DC)	LED	24V	Green	1 NO - 1 NCELB
			Green	1 NO - 1 NCELB
	Incandescent	24V	Red	1 NO - 1 NCELB
			Red	—
		120V	Red	—
			—	—
Transformer (AC)	LED	120V	Red	1 NO - 1 NCELB
			Green	1 NO - 1 NCELB
	Incandescent	120V	Red	1 NO - 1 NCELB
			Green	1 NO - 1 NCELB

Operator Type			
3 pos - maintained in - momentary out			
Metal Ø 1 3/4"		Plastic Ø 1 3/4"	
Chrome	Black Max	Chrome	Black Max
52PP7D3UB	52BP7D3UB	52PP7DSUB	52BP7DSUB
52PP7D3U	52BP7D3U	52PP7DSU	52BP7DSU
52PP7D2U	52BP7D2U	52PP7DRU	52BP7DRU
52PP7E2	52BP7E2	52PP7ER	52BP7ER
52PP7G2UB	52BP7G2UB	52PP7GRUB	52BP7GRUB
52PP7G3UB	52BP7G3UB	52PP7GSUB	52BP7GSUB
52PP7G2U	52BP7G2U	52PP7GRU	52BP7GRU
52PP7G3U	52BP7G3U	52PP7GRU	52BP7GRU

Readily available items are in **bold**.
This is a small representation of stocked items.

¹ EMERGENCY-STOP control devices according to IEC 60947-5-5

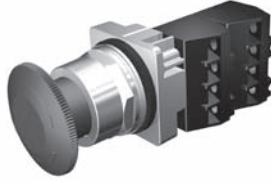
Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Non-Illuminated Twist-to-Release

Selection Guide

2 Position Twist-to-Release Devices Mushroom Head - Non-Illuminated



Plastic 1 3/4" Mushroom Head - Chrome



Plastic 1 3/4" Mushroom Head - Black Max

Part Number	52	<u> </u> a	<u> </u> R b	<u> </u> 8 c	<u> </u> W d	<u> </u> e	<u> </u> f²
--------------------	-----------	-------------------------	-------------------------------------	-------------------------------------	-------------------------------------	-------------------------	-------------------------------------

Finish	Function	Style	Color	Contacts	Part Number
Chrome	2 Position Twist-to-Release	Plastic 1 3/4" Mushroom Head	Red	1 NO - 1 NC	52PR8W2A
Black Max	2 Position Twist-to-Release	Plastic 1 3/4" Mushroom Head	Red	1 NO - 1 NC	52BR8W2A
Chrome	2 Position Twist-to-Release	Plastic 1 3/4" Mushroom Head	Red	None	52PR8W2

Readily available items are in **bold**.
This is a small representation of stocked items.

a	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max
b	Code	Function
	R	2 Position Twist-to-Release, Maintained ¹
c	Code	Style
	8	Plastic 1 3/4" Mushroom Head
d	Code	Lamp Type
	W	Non-Illuminated

e	Code	Color
	2	Red ¹
	3	Green
	4	Yellow
	Z	No head
f²	Code	Contact Blocks
	A	1 NO + 1 NC ¹
	B	2 NO + 2 NC ¹
	C	3 NO + 3 NC ¹
	D	4 NO + 4 NC ¹
	E	1 NC (LB)
	F	2 NO
	G	2NC ¹
	H	1NO (EM)
	J	1 NC ¹
	K	1 NO

¹ EMERGENCY-STOP control devices according to IEC 60947-5-5 when provided with red operating head and positively driven NC contact blocks. Positive opening contacts according to IEC 60947-5-1, Appendix K.

² For operator without contact blocks leave position f blank.

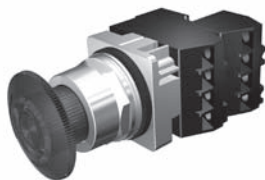
Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Illuminated Twist-to-Release

Selection Guide

2 Position Twist-to-Release Mushroom Head Devices - Illuminated



Plastic 1 3/4" Mushroom Head - Chrome



Plastic 1 3/4" Mushroom Head - Black Max

Part Number	52	a	R	8	d	e	f	g
-------------	-----------	----------	----------	----------	----------	----------	----------	----------

Finish	Style	Voltage	Bulb Type	Color	Contacts	Part Number
Chrome	Plastic 1 3/4" Mushroom Head	24V	LED	Red	1 NO - 1 NC	52PR8DRAB
Chrome	Plastic 1 3/4" Mushroom Head	120V	Incandescent	Red	1 NO - 1 NC	52PR8ERA
Chrome	Plastic 1 3/4" Mushroom Head	120V	LED	Red	1 NO - 1 NC	52PR8GRAB

Readily available items are in **bold**.
This is a small representation of stocked items.

a	Code	Finish
	P	Chrome-Command 52
B	Epoxy Coated-Black Max	

b	Code	Function
	R	2 Position Twist-to-Release, Maintained

c	Code	Style
	8	Plastic 1 3/4" Mushroom Head

d	Code	Operation	
		Incandescent	LED ³
Full Voltage² (AC/DC)			
B		6-8V	6V
C		12-13V	—
D		24-28V	24-28V
E		120V	120V
F		—	240V
Transformer²			
G		120V AC	
H		240V AC	
J		480V AC	
K		600V AC	

e	Code	Color
	R	Red ¹
	S	Green
	T	Amber
Z	No head	

f	Code	Contact Blocks
	A	1 NO + 1 NC ¹
	B	2 NO + 2 NC ¹
	C	3 NO + 3 NC ¹
	D	4 NO + 4 NC ¹
	E	1 NC (LB)
	F	2 NO
	G	2NC ¹
H	1NO (EM)	
J	1 NC ¹	
K	1 NO	

g	Code	Bulb Type
	Blank	Incandescent
	B	LED
Y	Super-Bright LED ⁴	

1 EMERGENCY-STOP control devices according to IEC 60947-5-5 when provided with red operating head and positively driven NC contact blocks. Positive opening contacts according to IEC 60947-5-1, Appendix K, Molded bodies.

2 Default bulb type is incandescent. For LED options, append field g. LED option not available on units sold "no head."

3 LED voltages apply to table g option code B and Y. 6V and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.

4 Not available in 240V.

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Indicator Light

Selection Guide

Indicator Light



Plastic Lens



Glass Lens

Part Number	52	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
		a	L b	c	d	e	f

a	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

b	Code	Type
	L	Indicator Light

c	Code	Style
	4	Plastic Lens
	5	Glass Lens

d	Code	Operation	
		Full Voltage ¹ (AC/DC)	
		Incandescent	LED ²
	B	6-8V	6V
	C	12-13V	—
	D	24-28V	24-28V
	E	120V	120V
	F	—	240V
		Transformer ¹	
	G	120V AC	
	H	240V AC	
	J	480V AC	
	K	600V AC	

e	Code	Color
	2	Red
	3	Green
	5	Blue
	7	All Colors
	9	Amber
	A	Clear
	B	White
N	No Lens	

f	Code	Bulb Type
	Blank	Incandescent
	XB	LED
	XY	Super-Bright LED ³

¹ Default bulb type is incandescent. For LED options, append field f. LED option not available on units sold "No Lens".

² LED voltages apply to table f option code XB and XY. 6V, 24V (Super Bright only) and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.

³ Not available in 240V.

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Indicator Lights

Selection Tables

Indicator Light

Type	Lamp Type	Voltage	Color	Plastic Lens	
				Chrome	Black Max
Full Voltage (AC/DC)	LED	24V	Red	52PL4D2XB	52BL4D2XB
			Green	52PL4D3XB	52BL4D3XB
			Blue	52PL4D5XB	52BL4D5XB
			Amber	52PL4D9XB	52BL4D9XB
			White	52PL4DBXB	52BL4DBXB
		120V	Red	52PL4E2XB	52BL4E2XB
			Green	52PL4E3XB	52BL4E3XB
			Amber	52PL4E9XB	52BL4E9XB
			Clear	52PL4EAXB	52BL4EAXB
			White	52PL4EBXB	52BL4EBXB
	Incandescent	24V	Red	52PL4D2	52BL4D2
			Green	52PL4D3	52BL4D3
			Blue	52PL4D5	52BL4D5
			Amber	52PL4D9	52BL4D9
			White	52PL4DB	52BL4DB
		No Lens	52PL4DN	52BL4DN	
		120V	Red	52PL4E2	52BL4E2
			Green	52PL4E3	52BL4E3
Amber	52PL4E9		52BL4E9		
No Lens	52PL4EN	52BL4EN			
Transformer (AC)	LED	120V	Red	52PL4G2XB	52BL4G2XB
			Green	52PL4G3XB	52BL4G3XB
			Amber	52PL4G9XB	52BL4G9XB
			White	52PL4GBXB	52BL4GBXB
		480V	Red	52PL4J2XB	52BL4J2XB
			Green	52PL4J3XB	52BL4J3XB
	Incandescent	120V	Red	52PL4G2	52BL4G2
			Green	52PL4G3	52BL4G3
			Amber	52PL4G9	52BL4G9
			White	52PL4GB	52BL4GB
			No Lens	52PL4GN	52BL4GN
			240V	Red	52PL4H2
		Green	52PL4H3	52BL4H3	
		480V	Red	52PL4J2	52BL4J2
			Green	52PL4J3	52BL4J3
			Amber	52PL4J9	52BL4J9
			Amber	52PL4J9	52BL4J9

Readily available items are in **bold**.
This is a small representation of stocked items.

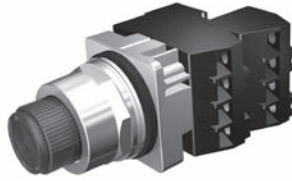
Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Illuminated Push Button & Push-to-Test

Selection Guide

Push Button & Push-to-Test - Illuminated



Extended Lens



Flush Lens

Part Number	52	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
		a	T	c	d	e	f	g

a	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

b	Code	Function
	T	Illuminated Push Button / Push-to-Test ¹

c	Code	Style
	6	Extended Lens
	8	Flush Lens ²

d	Code	Operation	
		Full Voltage ³ (AC/DC)	
		Incandescent	LED ⁴
	B	6-8V	6V
	C	12-13V	—
	D	24-28V	24-28V
	E	120V	120V
	F	—	240V
		Transformer ³	
	G	120V AC	
H	240V AC		
J	480V AC		
K	600V AC		

e	Code	Color
	2	Red
	3	Green
	5	Blue
	7	All Colors
	9	Amber
	A	Clear
	B	White
N	No Lens	

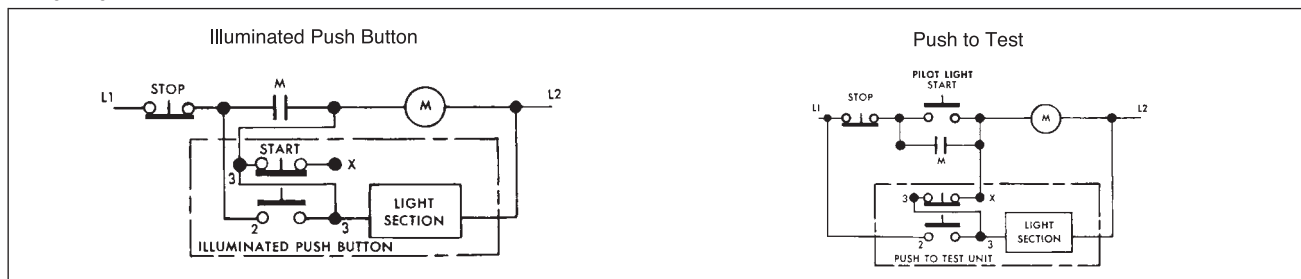
f	Code	Contact Blocks
	A	1 NO - 1 NC
	B	2 NO + 2 NC
	C	3 NO + 3 NC
	D	4 NO + 4 NC
	E	1 NC (LB)
	F	2 NO
	G	2 NC
	H	1NO (EM)
	J	1 NC
	K	1 NO

g	Code	Bulb Type
	Blank	Incandescent
	B	LED
	Y	Super-Bright LED ⁵

1 For push-to-test functionality, wire according to wiring diagram below.
2 Products available fall 2014.

3 Default bulb type is incandescent. For LED options, append field g.
LED option not available on units sold "No Lens".
4 LED voltages apply to table g option code B and Y.
6V and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.
5 Not available in 240V.

Wiring Diagrams



Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Illuminated Push Buttons & Push-to-Test

Selection Tables

Push Button & Push-to-Test - Illuminated

Type	Lamp Type	Voltage	Color	Contacts	Extended Lens	
					Chrome	Black Max
Full Voltage (AC/DC)	LED	24V	Red	1 NO - 1 NC	52PT6D2AB	52BT6D2AB
			Green	1 NO - 1 NC	52PT6D3AB	52BT6D3AB
			Blue	1 NO - 1 NC	52PT6D5AB	52BT6D5AB
			Amber	1 NO - 1 NC	52PT6D9AB	52BT6D9AB
			White	1 NO - 1 NC	52PT6DBAB	52BT6DBAB
	Incandescent	24V	Red	1 NO - 1 NC	52PT6E2AB	52BT6E2AB
			Green	1 NO - 1 NC	52PT6E3AB	52BT6E3AB
			Red	1 NO - 1 NC	52PT6D2A	52BT6D2A
			Green	1 NO - 1 NC	52PT6D3A	52BT6D3A
			Blue	1 NO - 1 NC	52PT6D5A	52BT6D5A
	Incandescent	120V	Amber	1 NO - 1 NC	52PT6D9A	52BT6D9A
			White	1 NO - 1 NC	52PT6DBA	52BT6DBA
			Red	1 NO - 1 NC	52PT6E2A	52BT6E2A
			Green	1 NO - 1 NC	52PT6E3A	52BT6E3A
			Red	1 NO - 1 NC	52PT6G2AB	52BT6G2AB
Transformer (AC)	LED	120V	Green	1 NO - 1 NC	52PT6G3AB	52BT6G3AB
			Amber	1 NO - 1 NC	52PT6G9AB	52BT6G9AB
			White	1 NO - 1 NC	52PT6GBAB	52BT6GBAB
			Red	1 NO - 1 NC	52PT6H2AB	52BT6H2AB
			Green	1 NO - 1 NC	52PT6H3AB	52BT6H3AB
	Incandescent	120V	Red	1 NO - 1 NC	52PT6G2A	52BT6G2A
			Green	1 NO - 1 NC	52PT6G3A	52BT6G3A
			Amber	1 NO - 1 NC	52PT6G9A	52BT6G9A
			White	1 NO - 1 NC	52PT6GBA	52BT6GBA
			No Lens	1 NO - 1 NC	52PT6GNA	52BT6GNA
	Incandescent	240V	Green	1 NO - 1 NC	52PT6H3A	52BT6H3A
			Clear	1 NO - 1 NC	52PT6JAA	52BT6JAA

Readily available items are in **bold**.
This is a small representation of stocked items.

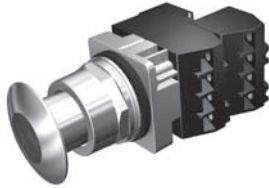
Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Illuminated Push Button

Selection Guide

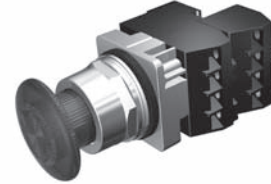
Push Button Mushroom Head Devices – Illuminated⁴



Mushroom Head Metal Ø 1 3/4"



Mushroom Head Plastic Ø 2 1/2"



Mushroom Head Plastic Ø 1 3/4"

Part Number	52	a	T	9	d	e	f	g
-------------	-----------	----------	----------	----------	----------	----------	----------	----------

a	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

b	Code	Type
	T	Push Button Operator

c	Code	Function
	9	2 positions – momentary in

d	Code	Operation
		Full Voltage² (AC/DC)
		Incandescent LED³
	B	6-8V 6V
	C	12-13V —
	D	24-28V 24-28V
	E	120V 120V
	F	— 240V
		Transformer²
	G	120V AC
	H	240V AC
	J	480V AC
	K	600V AC

e	Code	Style / Color
		Mushroom Head Metal Ø 1 3/4" (44.5mm)
	2	Red ¹
	3	Green
	5	Blue
	9	Amber
	A	Clear
	B	White
		Mushroom Head Plastic Ø 1 3/4" (44.5 mm)
	R	Red
	S	Green
	T	Amber
		Mushroom Head Plastic Ø 2 1/2" (63.5mm)
	D	Red ¹
	E	Green
	F	Amber
		No Head (full voltage & transformer only)
	Z	No head

f	Code	Contact Blocks
	A	1 NO + 1 NC
	B	2 NO + 2 NC
	C	3 NO + 3 NC
	D	4 NO + 4 NC
	E	1 NC (LB)
	F	2 NO
	G	2 NC
	H	1NO (EM)
	J	1 NC
	K	1 NO

g	Code	Bulb Type
	Blank	Incandescent
	B	LED
	Y	Super-Bright LED ⁵

1 Positive opening according to IEC 60947-5-1, Appendix K.
 2 Default bulb type is incandescent. For LED options, append field g. LED option not available on units sold "no head".
 3 LED voltages apply to table g option code B and Y. 6V and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.
 4 Products available fall 2014.
 5 Not available in 240V.

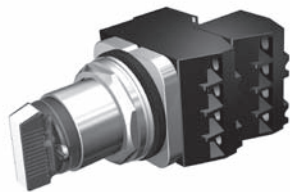
Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Illuminated Selector Switches

Selection Guide

Selector Switches – Illuminated



Short Lever – Chrome



Short Lever – Black Max

Part Number	52	S	7						
		a	b	c	d	e	f	g	h

Finish	Style	Cam Type	Function	Color	Contacts	Part Number
Chrome	Maintained	2 Position: CAM A	24-28V AC/DC	No Insert	None	52SA7ADN
Chrome	Maintained	2 Position: CAM A	120V AC (Transformer)	No Insert	None	52SA7AGN
Chrome	Maintained	3 Position: CAM C	120V AC	No Insert	None	52SA7CGN

Readily available items are in **bold**.
This is a small representation of stocked items.

a	Code	Type
	S	Selector Switch

b	Code	Finish
	A	Chrome - Command 52
	X	Epoxy Coated - Black Max

c	Code	Style
	7	Maintained

d	Code	Function
	A	2 Position: CAM A
	B	3 Position: CAM B
	C	3 Position: CAM C

e	Code	Operation	
		Full Voltage ¹ (AC/DC)	
		Incandescent	LED ²
	B	6-8V	6V
	C	12-13V	—
	D	24-28V	24-28V
	E	120V	120V
	F	—	240V
		Transformer ¹	
	G	120V AC	
	H	240V AC	
	J	480V AC	
	K	600V AC	

f	Code	Color
	2	Red
	3	Green
	5	Blue
	9	Amber
	A	Clear
	N	No Insert

g	Code	Contact Blocks
	A	1 NO - 1 NC
	E	1 NC (LB)
	H	1 NO (EM)
	J	1 NC
	K	1 NO

h	Code	Contact Quantity & Location	
		A CAM & C CAM Left	B CAM Right
	0	1	—
	1	—	1
	3	2	—
	4	—	2

i	Code	Bulb Type
	Blank	Incandescent
	B	LED
	Y	Super-Bright LED ³

¹ Default bulb type is incandescent. For LED options, append field i.
LED option not available on units sold "no head".

² LED voltages apply to table i option code B and Y.
6V and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.

³ Not available in 240V.

For CAM selection see page 17-342.

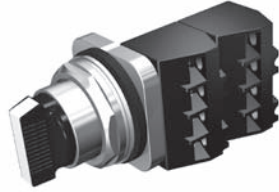
Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Non-Illuminated Selector Switch

Selection Guide

Selector Switch – Non-Illuminated



Short Lever



Long Lever

Part Number	52	S	b	2	d	e	f	g²	h²
		a	b	c	d	e	f	g²	h²

a	Code	Type
	S	Selector Switch

b	Code	Finish
	A	Chrome - Short Lever
	B	Chrome - Long Lever
	X	BlackMax - Short Lever
	W	BlackMax - Long Lever

c	Code	Style
	2	Non-Illuminated

d	Code	Function
	A	2 Position: CAM A
	B	3 Position: CAM B
	C	3 Position: CAM C ¹
	D	3 Position: CAM D
	E	3 Position: CAM E
	G	3 Position: CAM G
	H	4 Position: CAM H

e	Code	Type	
		2 Position	
		Maintained	Spring Return
	A	All	—
	C	Left	Right
		3 Position	
		Maintained	Spring Return
	A	All	—
	B	Center, Right	Left
	C	Center, Left	Right
	D	Center	Left, Right
		4 Position	
		Maintained Position	Spring Return
	A	All	—

f	Code	Color
	2	Red
	3	Green
	4	Yellow
	5	Blue
	6	Gray
	8	Orange
	B	White
N	No Insert (Black)	

g²	Code	Contact Blocks
	A	1 NO - 1 NC
	E	1 NC (LB)
	H	1 NO (EM)
	J	1 NC
K	1 NO	

h²	Code	Contact Quantity & Location	
		Left	Right
	0	1	—
	1	—	1
	2	1	1
	3	2	—
	4	—	2
	5	2	1
	6	1	2
	7	2	2
	8	3	—
9	—	3	

¹ C CAM on spring return selectors is limited to 4 contact blocks.
For CAM selection see page 17-342.

² For operator without contact blocks leave positions g and h blank.

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Non-Illuminated Selector Switch

Selector Switch, Non-Illuminated¹⁾

Contact Type	Contact	Switch Position		Type M = Maintained S = Spring Return	Chrome		Black Max	
		Left	Right		Short Lever	Long Lever	Short Lever	Long Lever
					2-Position Operator			
No Contacts	—	—	—	M M	52SA2AAB	52SB2AAB	52SX2AAB	52SW2AAB
				M<---S	52SA2ACB	52SB2ACB	52SX2ACB	52SW2ACB
1 N.O.	A	O	X	M M	52SA2AABK1	52SB2AABK1	52SX2AABK1	52SW2AABK1
				M<---S	52SA2ACBK1	52SB2ACBK1	52SX2ACBK1	52SW2ACBK1
1 N.O.	A	O	X	M M	52SA2AABA1	52SB2AABA1	52SX2AABA1	52SW2AABA1
1 N.C.	B	X	O	M<---S	52SA2ACBA1	52SB2ACBA1	52SX2ACBA1	52SW2ACBA1

Contact Type	Contact	Switch Position			Type M = Maintained S = Spring Return	Chrome		Black Max	
		Left	Center	Right		Short Lever	Long Lever	Short Lever	Long Lever
						3-Position Operator			
No Contacts	—	—	—	—	M M M	52SA2CAB	52SB2CAB	52SX2CAB	52SW2CAB
					M M M	52SA2BAB	52SB2BAB	52SX2BAB	52SW2BAB
					S--->M M	52SA2BBB	52SB2BBB	52SX2BBB	52SW2BBB
					M M<---S	52SA2BCB	52SB2BCB	52SX2BCB	52SW2BCB
					S--->M<---S	52SA2BDB	52SB2BDB	52SX2BDB	52SW2BDB
1 N.O.	A	O	O	X	M M M	52SA2CABA1	52SB2CABA1	52SX2CABA1	52SW2CABA1
					S--->M M	52SA2CBBA1	52SB2CBBA1	52SX2CBBA1	52SW2CBBA1
1 N.C.	B	X	O	O	M M<---S	52SA2CCBA1	52SB2CCBA1	52SX2CCBA1	52SW2CCBA1
					S--->M<---S	52SA2CDBA1	52SB2CDBA1	52SX2CDBA1	52SW2CDBA1
1 N.O.	A	O	O	X	M M M	52SA2CABA2	52SB2CABA2	52SX2CABA2	52SW2CABA2
1 N.C.	B	X	O	O	S--->M M	52SA2CBBA2	52SB2CBBA2	52SX2CBBA2	52SW2CBBA2
1 N.O.	C	O	O	X	M M<---S	52SA2CCBA2	52SB2CCBA2	52SX2CCBA2	52SW2CCBA2
1 N.C.	D	X	O	O	S--->M<---S	52SA2CDBA2	52SB2CDBA2	52SX2CDBA2	52SW2CDBA2
1 N.O.	A	O	O	X	M M M	52SA2GABJ2K1	52SB2GABJ2K1	52SX2GABJ2K1	52SW2GABJ2K1
1 N.C.	B	X	O	O	M M M	52SA2GABJ2K1	52SB2GABJ2K1	52SX2GABJ2K1	52SW2GABJ2K1
1 N.C.	C	O	X	O	M M M	52SA2GABJ2K2	52SB2GABJ2K2	52SX2GABJ2K2	52SW2GABJ2K2

Contact Type	Contact	Switch Position				Type M = Maintained S = Spring Return	Chrome		Black Max	
		Left	Center	Right	Center		Short Lever	Long Lever	Short Lever	Long Lever
							4-Position Operator			
No Contacts	—	—	—	—	—	M M M M	52SA2HAB	52SB2HAB	52SX2HAB	52SW2HAB
1 N.O.	A	X	O	O	O	M M M M	52SA2HABJ2K1	52SB2HABJ2K1	52SX2HABJ2K1	52SW2HABJ2K1
1 N.C.	B	O	X	O	O	M M M M	52SA2HABJ2K1	52SB2HABJ2K1	52SX2HABJ2K1	52SW2HABJ2K1
1 N.C.	C	O	O	X	O	M M M M	52SA2HABJ2K1	52SB2HABJ2K1	52SX2HABJ2K1	52SW2HABJ2K1
1 N.O.	A	O	O	O	X	M M M M	52SA2HABJ2K2	52SB2HABJ2K2	52SX2HABJ2K2	52SW2HABJ2K2
1 N.O.	B	X	O	O	O	M M M M	52SA2HABJ2K2	52SB2HABJ2K2	52SX2HABJ2K2	52SW2HABJ2K2
1 N.C.	C	O	X	O	O	M M M M	52SA2HABJ2K2	52SB2HABJ2K2	52SX2HABJ2K2	52SW2HABJ2K2
1 N.C.	D	O	O	X	O	M M M M	52SA2HABJ2K2	52SB2HABJ2K2	52SX2HABJ2K2	52SW2HABJ2K2

Note: X = Closed / O = Open

1) Readily available items are in **bold**.

This is a small representation of stocked items.

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Keyed Selector Switch

Selection Guide

Keyed Selector Switch

Part Number	52	S	C						
		a	b	c	d	e	f³	g³	h

a	Code	Type
	S	Selector Switch

b	Code	Finish
	C	Chrome – Command 52

c	Code	Style
	5	Non-Standard Lock/Key ^{1a}
	6	Standard Lock/Key

d	Code	Function
	A	2 Position: CAM A
	B	3 Position: CAM B
	C	3 Position: CAM C ²
	D	3 Position: CAM D
	E	3 Position: CAM E
	G	3 Position: CAM G
	H	4 Position: CAM H

e	Code	Lock Type		
		2 Position		
		Maintained / Spring Return	Key Removal	
			Left	Right
	E	All Maintained	X	X
	F	All Maintained	X	—
	G	All Maintained	—	X
	X	Spring from Right	X	—

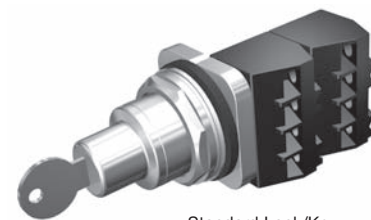
e		3 Position				
		Maintained Position	Spring Return	Key Removal		
				Left	Center	Right
	E	All	—	X	X	X
	F	All	—	X	—	—
	G	All	—	—	—	X
	H	All	—	—	X	—
	J	All	—	X	—	X
	K	All	—	X	X	—
	M	All	—	—	X	X
	T	Center, Right	Left	—	X	—
	U	Left, Center	Right	—	X	—
	V	Center	Left, Right	—	X	—
	W	Center, Right	Left	—	—	X
Y	Center, Right	Left	—	X	X	
Z	Left, Center	Right	X	X	X	

e		4 Position				
		Maintained Position	Key Removal			
			Left	Left Center	Right Center	Right
	E	All	X	X	X	X
	F	All	X	—	—	—
G	All	—	—	—	X	

f³	Code	Contact Blocks
	A	1 NO - 1 NC
	J	1 NC
	K	1 NO
	E	1 NC (LB)
H	1 NO (EM)	

g³	Code	Contact Quantity & Location	
		Left	Right
	0	1	—
	1	—	1
	2	1	1
	3	2	—
	4	—	2
	5	2	1
	6	1	2
	7	2	2
8	3	—	
9	—	3	

h	Code	Key Type^{1b}
	Blank	501CH
	X298	550CH
	X299	549CH
	X300	548CH
	X301	547CH
X302	506CH	



Standard Lock/Key

1a. See page 17-339 for replacement keys, and up-to 15 additional uniquely keyed M - Series Lock Options available for use with the 52SC6 key-operated selector switches.

1b. To order the specific lock types shown in table h, simply append the corresponding "X" suffix to a standard part number (Ordering Example: 52SC6AEX298).

Note: Same list price applies as standard keyed locks.

2. C CAM on spring return selectors is limited to 4 contact blocks. For CAM selection see page 17-342.

3 For operator without contact blocks leave positions f and g blank.

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Keyed Selector Switch

Key-operated Selector Switch, Non-Illuminated¹⁾

Pilot Devices

Contact Type	Contact	Switch Position		Type	Key Removal	
		Left	Right	M = Maintained S = Spring Return	Left	Both
					2-Position Operator	
No Contacts	—	—	—	M M	52SC6AF	52SC6AE
				M<---S	52SC6AX	—
1 N.O.	A	O	X	M M	52SC6AFK1	52SC6AEK1
				M<---S	52SC6AXK1	—
1 N.O.	A	O	X	M M	52SC6AFA1	52SC6AEA1
1 N.C.	B	X	O	M<---S	52SC6AXA1	—

Contact Type	Contact	Switch Position			Type	Key Removal						
		Left	Center	Right	M = Maintained S = Spring Return	Left	Right	Center	Left & Center	Left & Right	Center & Right	All Positions
						3-Position Operator						
No Contacts	—	—	—	—	M M M	52SC6CF	52SC6CG	52SC6CH	52SC6CK	52SC6CJ	52SC6CM	52SC6CE
					M M M	52SC6BF	52SC6BG	52SC6BH	52SC6BK	52SC6BJ	52SC6BM	52SC6BE
					S--->M M	—	52SC6BW	52SC6BT	—	—	52SC6BY	—
					M M<----S	—	—	52SC6BU	52SC6BZ	—	—	—
					S--->M<---S	—	—	52SC6BV	—	—	—	—
1 N.O.	A	O	O	X	M M M	52SC6CFA1	52SC6CGA1	52SC6CHA1	52SC6CKA1	52SC6CJA1	52SC6CMA1	52SC6CEA1
					S--->M M	—	52SC6CWA1	52SC6CTA1	—	—	52SC6CYA1	—
					M M<----S	—	—	52SC6CUA1	52SC6CZA1	—	—	—
1 N.C.	B	X	O	O	S--->M<---S	—	—	52SC6CVA1	—	—	—	—
					M M M	52SC6CFA2	52SC6CGA2	52SC6CHA2	52SC6CKA2	52SC6CJA2	52SC6CMA2	52SC6CEA2
1 N.C.	B	X	O	O	S--->M M	—	52SC6CWA2	52SC6CTA2	—	—	52SC6CYA2	—
1 N.O.	C	O	O	X	M M<----S	—	—	52SC6CUA2	52SC6CZA2	—	—	—
1 N.C.	D	X	O	O	S--->M<---S	—	—	52SC6CVA2	—	—	—	—
1 N.O.	A	O	O	X	M M M	52SC6GFJ2K1	52SC6GGJ2K1	52SC6GHJ2K1	52SC6GKJ2K1	52SC6GJJ2K1	52SC6GMJ2K1	52SC6GEJ2K1
1 N.C.	B	X	O	O	M M M	52SC6GFJ2K1	52SC6GGJ2K1	52SC6GHJ2K1	52SC6GKJ2K1	52SC6GJJ2K1	52SC6GMJ2K1	52SC6GEJ2K1
1 N.C.	C	O	X	O	M M M	52SC6GFJ2K1	52SC6GGJ2K1	52SC6GHJ2K1	52SC6GKJ2K1	52SC6GJJ2K1	52SC6GMJ2K1	52SC6GEJ2K1

Contact Type	Contact	Switch Position				Type	Key Removal	
		Left	Left Center	Right Center	Right	M = Maintained S = Spring Return	Right	All Positions
							4-Position Operator	
No Contacts	—	—	—	—	—	M M M M	52SC6HG	52SC6HE
1 N.O.	A	X	O	O	O	M M M M	52SC6HGJ2K1	52SC6HEJ2K1
1 N.C.	B	O	X	O	O	M M M M	52SC6HGJ2K1	52SC6HEJ2K1
1 N.C.	C	O	O	X	O	M M M M	52SC6HGJ2K1	52SC6HEJ2K1
1 N.O.	A	O	O	O	X	M M M M	52SC6HGJ2K2	52SC6HEJ2K2
1 N.O.	B	X	O	O	O	M M M M	52SC6HGJ2K2	52SC6HEJ2K2
1 N.C.	C	O	X	O	O	M M M M	52SC6HGJ2K2	52SC6HEJ2K2
1 N.C.	D	O	O	X	O	M M M M	52SC6HGJ2K2	52SC6HEJ2K2

Note: X = Closed / O = Open

1) Readily available items are in bold.

All Operators listed above are furnished with Lock No. 501CH

This is a small representation of stocked items.

CONTROL PRODUCTS 17

Push Buttons & Signaling Devices

Actuators and Indicators, Customized Designs

Special locks Switch

Options

Special locks for key-operated switches

Siemens Key-Operated Selector Switches beginning with 51SA6 or 52SC6 can be optionally ordered with the 15 uniquely keyed M-Series Locks by appending the corresponding "X" suffixes from the table below to the catalog number. (Ordering Example for Lock Number M705: 52SC6CEX705).

Note: Pricing for M - Series Locks on this page are slightly higher than standard lock types.

Suffix Code	Lock Number
X705	M705
X709	M709
X713	M713
X714	M714
X715	M715
X723	M723
X725	M725
X738	M738
X749	M749
X750	M750
X757	M757
X766	M766
X779	M779
X782	M782
X795	M795

Spare Keys for Key-Operated Selector Switches

Spare Key	Part Number
550CH (1 Key)	52KEY-550CH
549CH (1 Key)	52KEY-549CH
548CH (1 Key)	52KEY-548CH
547CH (1 Key)	52KEY-547CH
501CH (1 Key)	52KEY-501CH
506CH (1 Key)	52KEY-506CH
M703 (1 Key)	52KEY-M703
M705 (1 Key)	52KEY-M705
M706 (1 Key)	52KEY-M706
M709 (1 Key)	52KEY-M709
M712 (1 Key)	52KEY-M712
M713 (1 Key)	52KEY-M713
M714 (1 Key)	52KEY-M714
M715 (1 Key)	52KEY-M715
M716 (1 Key)	52KEY-M716
M717 (1 Key)	52KEY-M717
M723 (1 Key)	52KEY-M723
M725 (1 Key)	52KEY-M725
M728 (1 Key)	52KEY-M728
M730 (1 Key)	52KEY-M730
M735 (1 Key)	52KEY-M735
M736 (1 Key)	52KEY-M736
M738 (1 Key)	52KEY-M738
M747 (1 Key)	52KEY-M747
M749 (1 Key)	52KEY-M749
M750 (1 Key)	52KEY-M750
M752 (1 Key)	52KEY-M752
M753 (1 Key)	52KEY-M753
M756 (1 Key)	52KEY-M756
M757 (1 Key)	52KEY-M757
M759 (1 Key)	52KEY-M759
M766 (1 Key)	52KEY-M766
M769 (1 Key)	52KEY-M769
M771 (1 Key)	52KEY-M771
M779 (1 Key)	52KEY-M779
M784 (1 Key)	52KEY-M784
M790 (1 Key)	52KEY-M790
M795 (1 Key)	52KEY-M795
M700 (1 Key)	52KEY-M700
M701 (1 Key)	52KEY-M701
M702 (1 Key)	52KEY-M702
M704 (1 Key)	52KEY-M704
M705 (1 Key)	52KEY-M705
M707 (1 Key)	52KEY-M707
M711 (1 Key)	52KEY-M711
M713 (1 Key)	52KEY-M713
M715 (1 Key)	52KEY-M715
M782 (1 Key)	52KEY-M782
M795 (1 Key)	52KEY-M795

Push Buttons & Signaling Devices

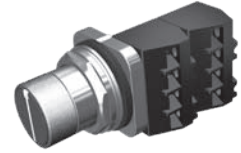
30mm Water, Oil Tight & Corrosion Resistant – Class 52

Selector Push Button

Selection Guide

Selector Push Button

Part Number	52	S a	A b	c	d	e	f ¹
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Selector Push Buttons

Finish	Style	Function	Color	Contacts	Part Number
Chrome	Flush Selector Push Button	2 Position CAM Q	Black	None	52SA3Q1
Chrome	Flush Selector Push Button	2 Position CAM R	Black	None	52SA3R1
Chrome	Flush Selector Push Button	2 Position CAM P	Black	None	52SA3P1

Readily available items are in **bold**.
This is a small representation of stocked items.

a	Code	Type
	S	Selector Push Buttons
b	Code	Finish
	A	Chrome - Command 52
c	Code	Style
	3	Flush Button
	4	Extended Button - 1/2"

d	Code	Function
	P	2 Position: CAM P
	Q	2 Position: CAM Q
	R	2 Position: CAM R
	S	3 Position: CAM S

e	Code	Color
	1	Black
	2	Red

f ¹	Code		Contact Blocks						Contact Blocks	Mounting Position
			CAM P (2 Selector Position)							
			Left		Center		Right			
			N	D	N/A	N/A	N	D		
	J0		X	O	—	—	O	O	NC	Left
	K0		O	X	—	—	X	X	NO	Left
			CAM Q (2 Selector Position)							
			N	D	N/A	N/A	N	D		
	J0		X	X	—	—	O	O	NC	Left
	J1		X	O	—	—	O	O	NC	Right
	K0		O	O	—	—	O	X	NO	Left
	K1		O	X	—	—	O	X	NO	Right
			CAM R (2 Selector Position)							
			N	D	N/A	N/A	N	D		
	J0		X	X	—	—	X	O	NC	Left
	J1		X	O	—	—	X	X	NC	Left
	K0		O	O	—	—	O	X	NO	Right
	K1		O	X	—	—	O	O	NO	Right
			CAM S (3 Selector Position)							
			N	D	N	D	N	D		
	J0		X	O	O	O	O	O	NC	Left
	J1		X	O	X	X	O	O	NC	Right
	K0		O	O	O	X	O	X	NO	Left
	K1		O	X	O	O	O	X	NO	Right





Note: X = Closed / O = Open 1 For operator without contact blocks leave position f blank

Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Special devices

Selection and ordering data

	Version	Ohms / color	Order no.	Pack			
	Potentiometer operator 2 Watts, 500 V AC/DC (NEMA Type 4)	50 150 250 500 750 1 K 2.5 K 5 K 10 K 15 K 25 K 50 K 100 K 150 K 250 K 500 K 1 M 1.5 M 2 M 5 M	52MA3B01 52MA3B03 52MA3B04 52MA3B06 52MA3B07 52MA3B08 52MA3B10 52MA3B12 52MA3B14 52MA3B15 52MA3B16 52MA3B18 52MA3B20 52MA3B21 52MA3B22 52MA3B24 52MA3B26 52MA3B27 52MA3B28 52MA3B31	1 Unit			
		2 Button maintained operator	black (flush) / red (flush) black (flush) / red (extended) black (flush) / yellow (mushroom) green (flush) / red (flush) green (flush) / red (extended) green (flush) / red (mushroom) green (flush) / green (mushroom)	52MP2A1A2 52MP2A1B2 52MP2A1W4 52MP2A3A2 52MP2A3B2 52MP2A3W2 52MP2A3W3	1		
		Button remains depressed when pushed	less caps	52MP2			
			Wobble stick 2.5" operator For use with 52BAJ (NC) contact block	red green grey	52ABW2 ^① 52ABW3 ^① 52ABW6 ^①	1	
				Maintained toggle operator		52ABT	1

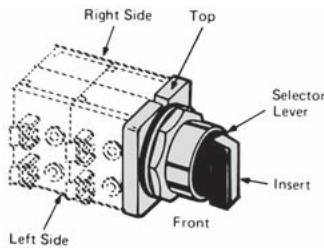
① For use with 52BAJ (NC) contact block

Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Cam selection

Selection and ordering data



Ordering Information

- Contact blocks are ordered separately, [see page 17-342](#)
- Determine which table to use based upon the type of selector (non-illum selector switch-top, illum selector switch-middle, and selector pushbutton-bottom).
- Find the correct number of selector positions (2, 3 or 4 positions).
- Select the contact operation required for each selector position. X indicates the contacts are closed, while O indicates the contacts are open. (For the selector pushbutton, N=normal and D=depressed).
- Contact block must be assembled in position shown for each circuit application.
- Identify the CAM letter required for the chosen contact operation (only 1 CAM can be used per selector switch or selector pushbutton).
- Contact blocks must be assembled in the position shown for each circuit application. The mounting position is viewed from the front of the device.

Ordering CAMs D, E or G

- CAM D, E or G may be ordered at the same price by changing the 6th character of the selector catalog number. Example: Selector with D cam **52SX2DAB**.

Size Requirements

- C CAM on spring return selectors is limited to 4 contact blocks.
- Selector operators in enclosures are limited to depth of 1 contact block. (2 blocks wide).

Non-illuminated and keyed selector switches (viewed from front)

2 Selector Positions				Contact Blocks	CAM	Mounting		
Left		Right	Left			Right		
X		O		NC (52BAJ)	A	L	or R	
O		X		NO (52BAK)	A	L	or R	
3 Selector Positions				Contact Blocks	CAM	Mounting		
Left	Center	Right	Left			Right		
X		O		NO (52BAK)	B		R	
O		X		NO (52BAK)	B	L		
X	X	O		NC (52BAJ)	B	L		
O	X	X		NC (52BAJ)	B		R	
X	O	X		2NO (2-52BAK)	B	L	and R	
X	O	O		NC (52BAJ)	C	L	or R	
O	O	X		NO (52BAK)	C	L	or R	
O	X	O		NC (52BAJ)	D	L	or R	
O	O	X		NO (52BAK)	D	L	or R	
X	O	O		NO (52BAK)	E	L	or R	
O	X	O		NC (52BAJ)	E	L	or R	
X	O	O		NC (52BAJ)	G	L		
O	X	O		NC (52BAJ)	G		R	
O	O	X		NO (52BAK)	G	L	or R	
4 Selector Positions					Contact Blocks	CAM	Mounting	
Left	Left Center	Right Center	Right	Left			Right	
X	O	O	O	NO (52BAK)	H		R	
O	X	O	O	NC (52BAJ)	H	L		
O	O	X	O	NC (52BAJ)	H		R	
O	O	O	X	NO (52BAK)	H	L		

Illuminated selector switches (viewed from front)

2 Selector Positions				Contact Blocks	CAM	Mounting	
Left		Right	Left			Right	
X		O		NC (52BAJ)	A	L	
O		X		NO (52BAK)	A	L	
3 Selector Positions				Contact Blocks	CAM	Mounting	
Left	Center	Right	Left			Right	
O	O	X		NC (52BAJ)	B		R
O	X	O		NO (52BAK)	B		R
X	O	O		NC (52BAJ)	C	L	
O	O	X		NO (52BAK)	C	L	

Selector Pushbuttons (viewed from front)

2 Selector Positions						Contact Blocks	CAM	Mounting	
Left			Right		Left			Right	
N	D		N	D					
X	O		O	O		NC (52BAJ)	Q		R
X	X		O	O		NC (52BAJ)	Q	L	
O	X		O	X		NO (52BAK)	Q		R
O	O		O	X		NO (52BAK)	Q	L	
X	O		O	O		NC (52BAJ)	P	L	or R
O	X		X	X		NO (52BAK)	P	L	or R
X	X		X	O		NC (52BAJ)	R	L	
X	O		X	X		NC (52BAJ)	R		R
O	X		O	O		NO (52BAK)	R		R
O	O		O	X		NO (52BAK)	R	L	
3 Selector Positions						Contact Blocks	CAM	Mounting	
Left		Center	Right		Left			Right	
N	D	N	D	N	D				
X	O	O	O	O	O	NC (52BAJ)	S	L	
X	O	X	X	O	O	NC (52BAJ)	S		R
O	X	O	O	O	X	NO (52BAK)	S		R
O	O	O	X	O	X	NO (52BAK)	S	L	

Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Custom selector switch designs

Selection and ordering data

Assembled Non-illuminated Selector Switches

- Determine contact block and location from above.
- Select block suffix. Ex: **J = 52BAJ**.
- Now select position suffix.
- **1-52BAJ** block mounted on right side, suffix will be **J 1**.
- Additional suffixes allow for multiple quantities and locations.
- Repeat process for next block if required.
- Add list price of blocks to operator list price.
- Consult factory for delivery.

Example 1: X O O
 O O X
 HAND-OFF-AUTO Maintained Switch
 Catalog No **52SA2CAB A 1 = 52A2CABA1**
 (**52BJK** block mounted on right side)

Example 2: X O O **52BAJ (L)**
 O X O **52BAJ (R)**
 O O X **52BAK (L or R))K1**
 G Cam required
 Catalog No **52SA2GAB J2 K1 = 52SA2GABJ2K1**

Block Suffix	Position Suffix	
	Suffix	Quantity and Location
		Left Right
A = 1 NO - 1 NC, 52BJK	0	1 —
E = NC Late Break, 52BAE	1	— 1
H = NO Early Make, 52BAH	2	1 1
J = NC, 52BAJ	3	2 —
K = NO, 52BAK	4	— 2
	5	2 1
	6	1 2
	7	2 2
	8	3 —
	9	— 3

Pilot Devices







17 CONTROL PRODUCTS

Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Accessories and spare parts

Selection and ordering data

Version	Suitable for	Color	Order no.
 <p>Flush actuator lens cap The 52RC1 Screw-on style caps shown are used on the new 52BM8 & 52PM8 Pushbutton Operators. To order Snap-on style replacement caps for the old style 52PA8 & 52PX8 Pushbutton Operators change the 4th character from "C" to "A" (i.e. 52RA1A1).</p>	For flush type, non-illuminated pushbuttons bag of 5 caps	black red green yellow blue gray orange kit- all colors	52RC1A1 52RC1A2 52RC1A3 52RC1A4 52RC1A5 52RC1A6 52RC1A8 52RC1AN
 <p>Extended actuator lens cap The 52RC1 Screw-on style caps shown are used on the new 52BM8 & 52PM8 Pushbutton Operators. To order Snap-on style replacement caps for the old style 52PA8 & 52PX8 Pushbutton Operators change the 4th character from "C" to "A" (i.e. 52RA1B1).</p>	For extended type, non-illuminated pushbuttons bag of 5 caps	black red green yellow blue gray orange 1 of each color cap	52RC1B1 52RC1B2 52RC1B3 52RC1B4 52RC1B5 52RC1B6 52RC1B8 52RC1BN
 <p>Mushroom head cap - Plastic set-screw type replacement caps are for discontinued 52PB9 and 52PX9 operators only</p>	For large 2 1/2"(63.5mm) type, set screw non-illuminated mushroom pushbuttons	black red green yellow blue gray orange 1 kit of each color cap	52RB3E1 52RB3E2 52RB3E3 52RB3E4 52RB3E5 52RB3E6 52RB3E8 52RB3EN
	For small 1 5/8"(41.3mm) type, non-illuminated mushroom pushbuttons	black red green yellow blue gray orange 1 of each color cap	52RB3D1 52RB3D2 52RB3D3 52RB3D4 52RB3D5 52RB3D6 52RB3D8 52RB3DN
 <p>Mushroom head cap - Metal set-screw type</p>	For small 1 5/8"(41.3mm) type, set screw non-illuminated mushroom pushbuttons	chrome red green	52RB3FC 52RB3F2 52RB3F3
 <p>Replacement Lens for Indicator Lights</p>	For catalog numbers starting with 52PL or 52BL ^{①②}		
	Plastic	red green blue amber clear white 1 of each color	52RA4S2 52RA4S3 52RA4S5 52RA4S9 52RA4SA 52RA4SB 52RA4SN
	Glass	red green blue amber clear white 1 of each color	52RA4T2 52RA4T3 52RA4T5 52RA4T9 52RA4TA 52RA4TB 52RA4TN
 <p>Replacement Lens for Push to Test/Illuminated Pushbuttons The 52RA5S Raised lens caps shown are used on the 52BT6 & 52PT6 PTT/Illuminated Pushbutton Operators. To order Flush lens caps for the new style 52BT8 & 52PT8 PTT/Illuminated Pushbutton Operators change the 52RA5S prefix to 52RC5P (i.e. 52RC5P2).</p>	For catalog numbers starting with 52PT or 52BT ^③		
	Plastic	red green blue amber clear white	52RA5S2 52RA5S3 52RA5S5 52RA5S9 52RA5SA 52RA5SB

① To order replacement lens for indicator lights starting with 52PA, 52PE, or 52PX, change the 6th digit to P for plastic and G for glass.

② It is possible to retrofit catalog numbers starting with 52PA, 52PE and 52PX with the replacement lens. The new lens have concentric ribs for improved light distribution.








③ To order replacement lens for push to test / illuminated pushbuttons starting with 52PA, 52PE, or 52PX, change the 6th digit to a P.

Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Accessories and spare parts

Selection and ordering data

Version	Suitable for	Color	Order no.
Mushroom head push pull illuminated plastic screw-on type	For small 1 3/4" type, push-pull units	red green amber	52RC3JR 52RC3JS 52RC3JT
	For large 2 1/2" type, push-pull units	red green amber	52RC3KR 52RC3KS 52RC3KT
 Mushroom head push pull illuminated metal screw-on type	Chrome, for small 1 3/4" type, push-pull units	red green amber white	52RB3H2 52RB3H3 52RB3H9 52RB3HB
	BlackMax, for small 1 3/4" type, push-pull units	red green amber white	52RX3H2 52RX3H3 52RX3H9 52RX3HB
 Mushroom head push pull non-illuminated plastic screw-on type	For small 1 3/4" type, push-pull units (catalog numbers starting with 52PP, 52BP, 52PM9 or 52BM9) ^①	black red green yellow blue gray orange 1 of each color	52RC3D1 52RC3D2 52RC3D3 52RC3D4 52RC3D5 52RC3D6 52RC3D8 52RC3DN
	For large 2 1/2" type, push-pull units (catalog numbers starting with 52PP, 52BP, 52PM9 or 52BM9) ^①	black red green yellow blue gray orange 1 of each color	52RC3E1 52RC3E2 52RC3E3 52RC3E4 52RC3E5 52RC3E6 52RC3E8 52RC3EN
 Mushroom head push pull non-illuminated metal screw-on type	For small 1 3/4" type, push-pull units (catalog numbers starting with 52PP or 52BP) ^①	red green chrome	52RC3F2 52RC3F3 52RC3FC
 Twist to release head illuminated plastic screw-on type	For small twist to release units	red green amber	52RC3RR 52RC3RS 52RC3RT
 Twist to release head non-illuminated plastic screw-on type	For small twist to release units	red green yellow	52RC3R2 52RC3R3 52RC3R4
 Replacement lens kit for illuminated selector switches (Knob with Insert)		red green blue amber clear white	52RA6P2 52RA6P3 52RA6P5 52RA6P9 52RA6PA 52RA6PB
 Lever inserts	Short lever	red green yellow blue gray orange white	52RA2A2 52RA2A3 52RA2A4 52RA2A5 52RA2A6 52RA2A8 52RA2AB
	Long lever	red green yellow blue gray orange white	52RA2B2 52RA2B3 52RA2B4 52RA2B5 52RA2B6 52RA2B8 52RA2BB









① For push-pull units whose catalog numbers that start with 52PX, 52PA or 52PE, replacement heads are available. Order from the 52RB type "Mushroom head pushbutton cap" section on page 17-342.

Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Accessories and spare parts

Selection and ordering data

Version	Suitable for	Color	Order no.
 Protective boot Offers protection from ice and foreign substances from interfering with button operation	Flush pushbutton operations	clear black	52AABA 52AAB1
 Guards Prevents accidental operation	Non-illuminated basic pushbuttons 1 5/8" mushroom pushbuttons, 1 3/4" push-pull units ^① , and twist to release units Push to test/illuminated pushbutton and indicator lights	chrome blackmax chrome blackmax chrome blackmax	52AAGP 52AXGP 52AAGM 52AXGM 52AAGL 52AXGL
 EMERGENCY-STOP Lock Out EMERGENCY-STOP Backing Ring	Class 52 Illuminated Mushroom Head Pushbuttons; 304 Stainless Steel Yellow 90mm E-STOP Backing Ring	chrome (304 SS)	52AALE 52AAR
 Locknuts Replacement front ring	Non-illuminated basic pushbuttons Non-illuminated mushroom pushbuttons Push-pull and twist-to-release units (only for push-pull units starting with 52PP or 52BP) ^② Indicator Lights Selector switches	chrome blackmax chrome blackmax chrome blackmax blue amber chrome blackmax	52AANP 52AXNP 52AANL 52AXNL 52CANP 52CXNP 52AANL 52AXNL 52AANS 52AXNS
Mounting Accessories	Class 52 Trim Washer Kit (Set of 10 pcs) Class 52 Washer Kit (Include 2-Neoprene Gaskets, 1-Trim Washer, 1-Index Locking Ring (chrome))	chrome	52AAQ 52AAD
Padlock attachments	Non-illuminated basic pushbuttons	flush extended	52AALA 52AALB
 Padlock cover Lock devices in off position	Pushbuttons, selector switches, and non-illuminated mushroom heads		52AALS
 Lock nut wrench	All devices		52MAWB
 Hole plugs		corrosion resistant steel, grey stainless steel	52AAH6 52ABH6 52ABHS
Spare keys (Kit includes 1 Key)	Class 52 Standard Keyed Selector Switch. Keyed Selector Switch ordered with Suffix X302. Keyed Selector Switch ordered with Suffix X301. Keyed Selector Switch ordered with Suffix X300. Keyed Selector Switch ordered with Suffix X299. Keyed Selector Switch ordered with Suffix X298.	501CH 506CH 547CH 548CH 549CH 550CH	52KEY-501CH 52KEY-506CH 52KEY-547CH 52KEY-548CH 52KEY-549CH 52KEY-550CH
Grounding kit	All devices		52AL109145
 Touchsafe contact blocks with gold flashing 52 BAJ 52 BAK 52 BAR	 1 NO 1 NC 1 NO - 1 NC 1 NO early make 1 NC late break 1 NO - 1 NC 1 NC extra late break	 closes before 52BAK opens after 52BAJ Reed switch; UL listed for class 1 division 2; .25A Max, 200V AC, 10 Watt max .5A Max, 200V DC, 10 Watt max	 52BAK 52BAJ ^④ 52BJK ^④ 52BAH 52BAE 52BAR ^④ 52BAU

① These can also be used with the 1 5/8" push-pull devices.

② For push-pull units starting with part numbers 52PA, 52PE or 52PX, replacement locknuts can be ordered using 52AANL (Chrome) and 52AXNL (BlackMax).

③ Hermetically Sealed

④ ⊕ Positive opening according to IEC 60947-5-1, Appendix K.

Pushbutton Units and Indicator Lights


30mm Water, Oil Tight & Corrosion Resistant – Class 52

Accessories and spare parts

Pilot Devices

17 CONTROL PRODUCTS

Selection and ordering data

Version	Suitable for	Lamp voltage	Color	Order no.
Lamps with screw connection, miniature bayonet (BA 9s style)				
Incandescent lamps,				
	Flashing, type 267 lamp (replaces 755 lamp)	51, 52	6 V	52AABNF
	6V type 755 lamp (Rated 150 mA)	51, 52	6 V	52AABN
	12V type 756 (Rated 80 mA)	51, 52	12 V	52AACN
	24V type 757 (Rated 80 mA)	51, 52	24 V	52AADN
	48V, 2W	52	48 V	3SB1902-1AP
	60V, 2W	52	60 V	3SR9424
	120V, 2.5W, type #120MB (Rated 250 mA)	52	120 V	52AAENC1
Neon (uses resistors) type B2A (NE-51H)	52	120 V	52AAPN	
Candelabra, 120V, 3W, Full voltage type 3S6/5	52 older revision styles	120 V		52AAENC
LED bulbs^①				
LED, BA9s type ^②	Class 52	6 V AC/DC 24 V AC/DC 120 V AC/DC		52AEB□ 52AED□ 52AEE□
Super-Bright LED ^②	Class 52	6 V AC/DC 24 V AC/DC 120 V AC/DC 120 V DC		52AEB□7 52AED□7 52AEE□7 52AEV□7
LED lighting module with integrated LED.				
Single LED (Rated 35 mA Maximum)	Class 52	24 V AC/DC 120 V AC 240 V AC		52AAIL□ 52AAIM□ 52AAIN□
Full voltage lighting module accessory with BA9s type lamp^①				
LED ^②	Class 52	6 V AC/DC 24 V AC/DC 120 V AC/DC		52AAF□B 52AAF□D 52AAF□E
Super-Bright LED ^②	Class 52	6 V AC/DC 24 V AC/DC 120 V AC/DC		52AAF□Y 52AAF□D□Y 52AAF□E□Y
Incandescent bulb	Class 52	6 V AC/DC 24 V AC/DC 120 V AC/DC		52AAFB 52AAFD 52AAFE
Transformer lighting module accessory with BA9s type lamp^①				
LED	Class 52	120 V AC 240 V AC 480 V AC 600 V AC		52AAT□B 52AATH□B 52AAT□J□B 52AAT□K□B
Super-Bright LED	Class 52	120 V AC 240 V AC 480 V AC 600 V AC		52AAT□Y 52AATH□Y 52AAT□J□Y 52AAT□K□Y
Incandescent bulb	Class 52	120 V AC 240 V AC 480 V AC 600 V AC		52AATGN 52AATHN 52AATJN 52AATKN

Color options:

red
green
yellow/amber
blue
white/clear

2
3
4
5
B

① Standard LED lamps are recommended for indoor applications, Super-Bright LED Lamps are recommended for outdoor applications.

② 6V, 24V (Super Bright only) and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.

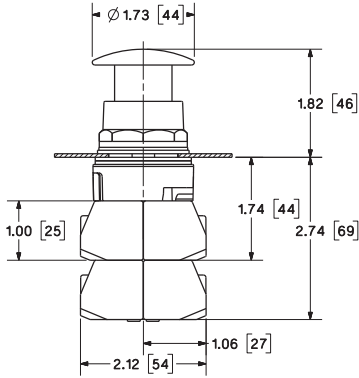
Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

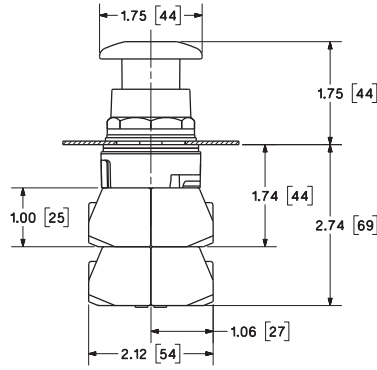
Dimensional drawings

Pilot Devices

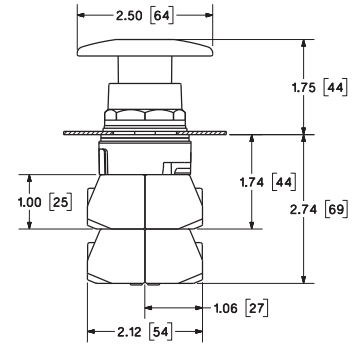
Non-Illuminated Push-Pull
Metal Mushroom Head



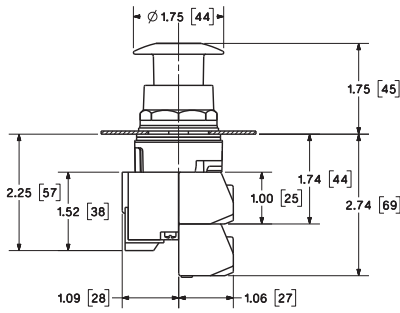
Non-Illuminated Push-Pull
Small Plastic Mushroom Head



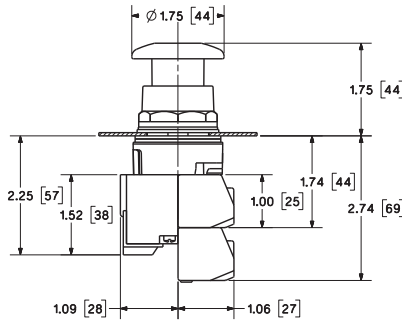
Non-Illuminated Push-Pull
Large Plastic Mushroom Head



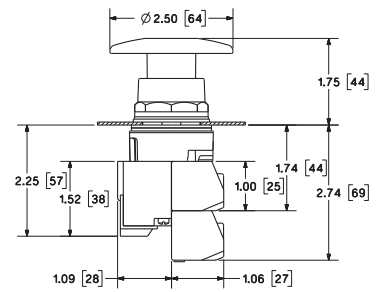
Illuminated Push-Pull
Metal Mushroom Head



Fully Illuminated Push-Pull
Small Plastic Mushroom Head

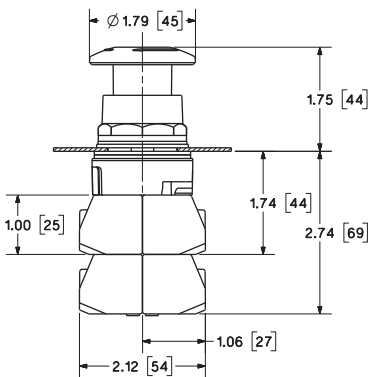


Illuminated Push-Pull
Large Plastic Mushroom Head

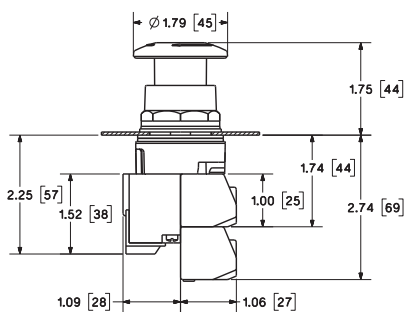


17
CONTROL
PRODUCTS

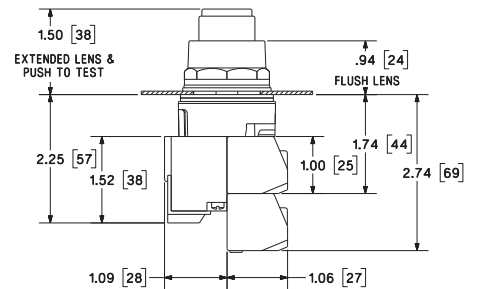
Non-Illuminated Twist Release
Plastic Mushroom Head



Illuminated Twist Release
Plastic Mushroom Head



Illuminated Pushbutton Flush Lens
Illuminated Pushbutton Extended Lens
Illuminated Push to Test

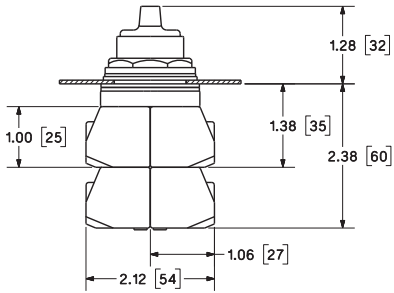


Pushbutton Units and Indicator Lights

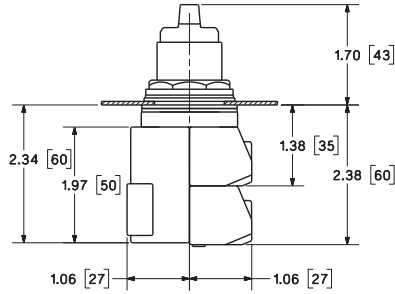
30mm Water, Oil Tight & Corrosion Resistant – Class 52

Dimensional drawings

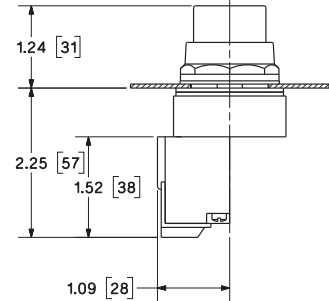
Selector Switch
Non-Illuminated



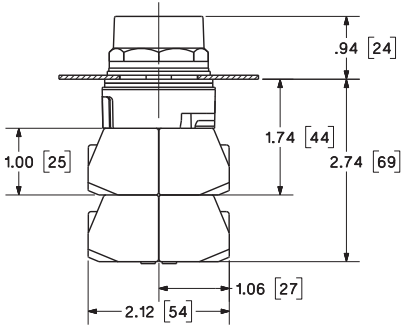
Selector Switch
Illuminated



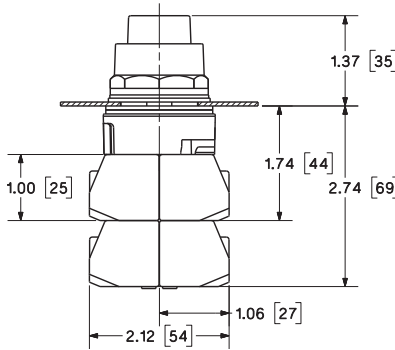
Indicator Light
Plastic Lens



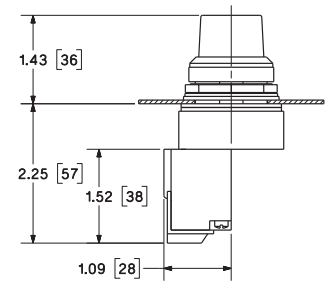
Momentary Pushbutton
Non-Illuminated Flush Cap



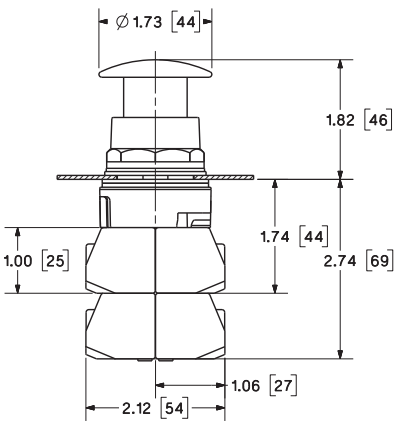
Momentary Pushbutton
Non-Illuminated Raised Cap



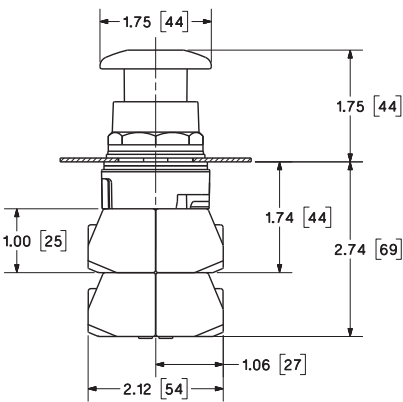
Indicator Light
Glass Lens



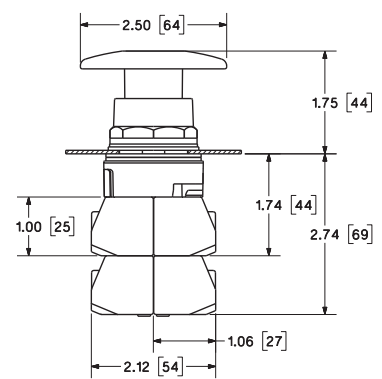
Momentary Pushbutton
Metal Mushroom Head



Momentary Pushbutton
Small Plastic Mushroom Head



Momentary Pushbutton
Large Plastic Mushroom Head



Pilot Devices

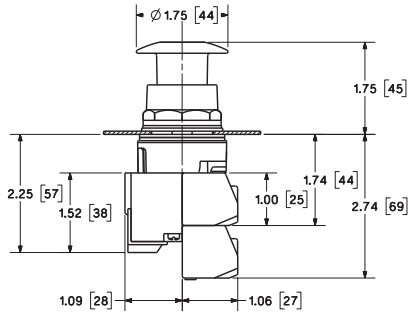
17
CONTROL
PRODUCTS

Pushbutton Units and Indicator Lights

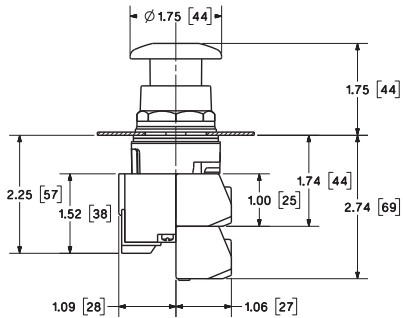
30mm Water, Oil Tight & Corrosion Resistant – Class 52

Dimensional drawings

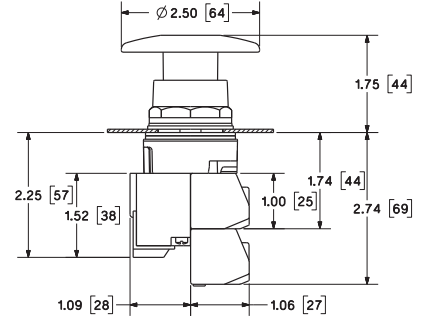
Illuminated Momentary Pushbutton
Metal Mushroom Head



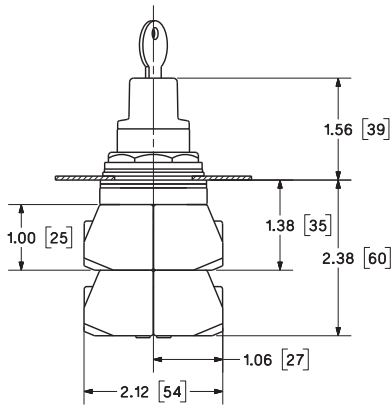
Illuminated Momentary Pushbutton
Small Plastic Mushroom Head



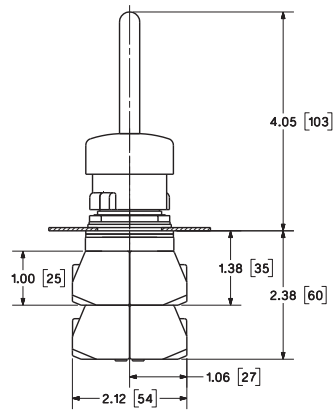
Illuminated Momentary Pushbutton
Large Plastic Mushroom Head



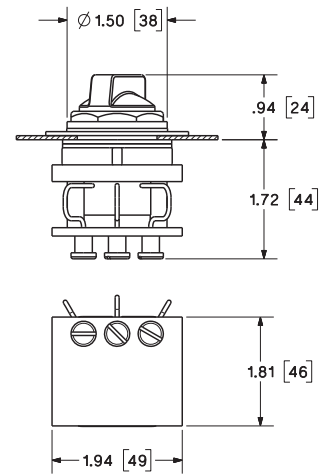
Selector Switch
Keyed



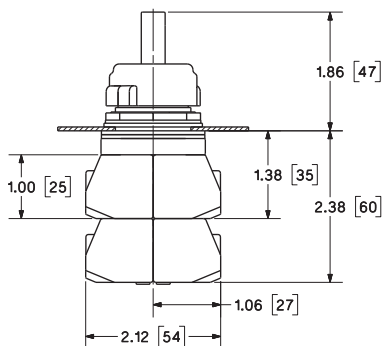
Wobble Switch



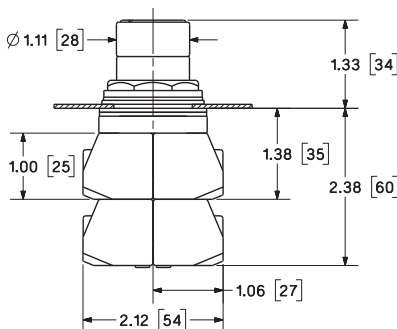
Potentiometer Switch



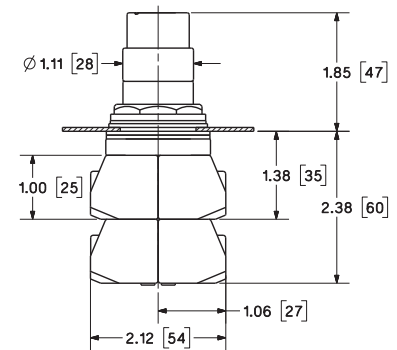
Toggle Switch



Selector Pushbutton Switch
Flush Cap



Selector Pushbutton Switch
Raised Cap

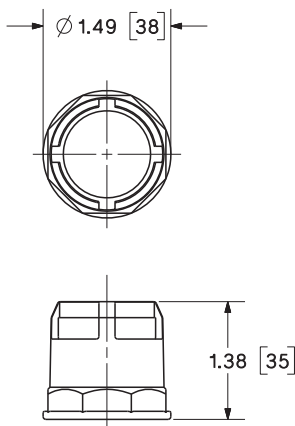


Pushbutton Units and Indicator Lights

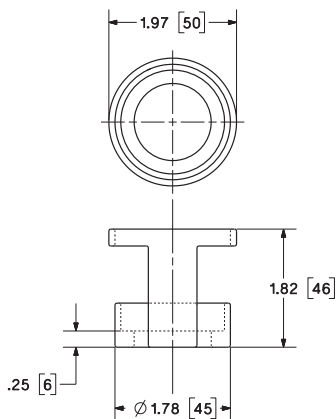
30mm Water, Oil Tight & Corrosion Resistant – Class 52

Dimensional drawings

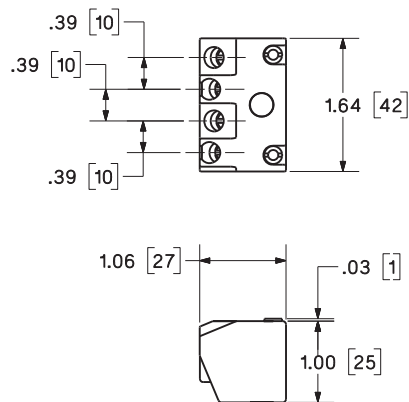
Momentary Pushbutton Guard
Illuminated Push to Test Guard



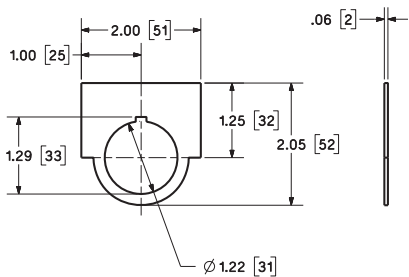
Mushroom Head Guard



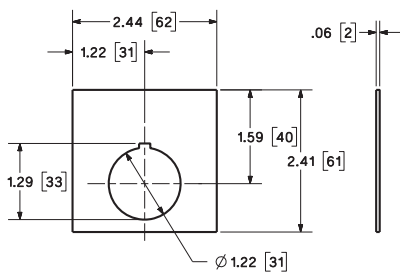
Contact Block



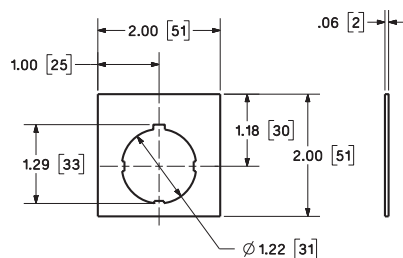
Large Metal Legend Plate



Automotive Metal Legend Plate



Large Plastic Legend Plate



Pilot Devices

17 CONTROL PRODUCTS

Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant - Class 52

Class 52 oiltight pushbutton stations

Selection and ordering data

	Actuator identification C = top device in station B = middle device in station A = bottom device in station	Degree of protection ^①	Contact / voltage	No. of command points	Order no.	Pack Unit
1 unit control station	A = Momentary flush pushbutton black, label "START"	NEMA 12	1NO - 1NC	1	52C101A	
	A = Momentary raised pushbutton red, label "STOP"	NEMA 12	1NO - 1NC	1	52C103A	
	A = Momentary mushroom head red, label "STOP"	NEMA 12	1NO - 1NC	1	52C104A	
	A = Maintained metal mushroom head red, label "EMERGENCY STOP"	NEMA 12	1NO - 1NC	1	52C117A	
	A = 2 position selector switch "OFF-ON"	NEMA 12	1NO - 1NC	1	52C159A	
	A = 3 position selector switch "HAND-OFF-AUTO"	NEMA 12	1NO - 1NC	1	52C156A	
	A = Indicator light, red	NEMA 12	120V Transformer type	1	52C131A	
	A = Indicator light, green	NEMA 12	120V Transformer type	1	52C135A	
	A = Momentary flush pushbutton black, label "START"	NEMA 4X Stainless Steel	1NO - 1NC	1	52C101S	
	A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Stainless Steel	1NO - 1NC	1	52C103S	
	A = Momentary mushroom head red, label "STOP"	NEMA 4X Stainless Steel	1NO - 1NC	1	52C104S	
	A = Maintained plastic mushroom head red, label "EMERGENCY STOP"	NEMA 4X Stainless Steel	1NO - 1NC	1	52C116S	
	A = 2 position selector switch "OFF-ON"	NEMA 4X Stainless Steel	1NO - 1NC	1	52C159S	
	A = 3 position selector switch "HAND-OFF-AUTO"	NEMA 4X Stainless Steel	1NO - 1NC	1	52C156S	
	A = Momentary flush pushbutton black, label "START"	NEMA 4X Fiberglass	1NO - 1NC	1	52C101X	
	A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Fiberglass	1NO - 1NC	1	52C103X	
	A = Momentary mushroom head red, label "STOP"	NEMA 4X Fiberglass	1NO - 1NC	1	52C104X	
	A = Maintained plastic mushroom head red, label "EMERGENCY STOP"	NEMA 4X Fiberglass	1NO - 1NC	1	52C116X	
	A = 2 position selector switch "OFF-ON"	NEMA 4X Fiberglass	1NO - 1NC	1	52C159X	
	A = 3 position selector switch "HAND-OFF-AUTO"	NEMA 4X Fiberglass	1NO - 1NC	1	52C156X	
2 unit control station	B = Momentary flush pushbutton black, label "START"	NEMA 12	1NO, 1NC	2	52C201A	
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			
	B = Momentary flush pushbutton black, label "START"	NEMA 12	1NO, 1NC	2	52C202A	
	A = Momentary Mushroom head pushbutton red, label "STOP"		1NO, 1NC			
	B = Momentary flush pushbutton, label "FORWARD"	NEMA 12	1NO, 1NC	2	52C204A	
	A = Momentary flush pushbutton, label "REVERSE"		1NO, 1NC			
	B = Momentary flush pushbutton, label "UP"	NEMA 12	1NO, 1NC	2	52C223A	
	A = Momentary flush pushbutton, label "DOWN"		1NO, 1NC			
	B = Indicator light, red, label "RUN"	NEMA 12	120V Transformer type	2	52C224A	
	A = Maintained selector switch, label "HAND-OFF-AUTO"					
	B = Indicator light, red	NEMA 12	120V Transformer type	2	52C230A	
	A = Indicator light, green					
	B = Momentary flush pushbutton black, label "START"	NEMA 4X Stainless Steel	1NO, 1NC	2	52C201S	
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			
	B = Momentary flush pushbutton black, label "START"	NEMA 4X Stainless Steel	1NO, 1NC	2	52C202S	
	A = Momentary Mushroom head pushbutton red, label "STOP"		1NO, 1NC			
	B = Momentary flush pushbutton, label "UP"	NEMA 4X Stainless Steel	1NO, 1NC	2	52C223S	
	A = Momentary flush pushbutton, label "DOWN"		1NO, 1NC			
	B = Indicator light, red, label "RUN"	NEMA 4X Stainless Steel	120V Transformer type	2	52C224S	
	A = Maintained selector switch, label "HAND-OFF-AUTO"					
B = Momentary flush pushbutton black, label "START"	NEMA 4X Fiberglass	1NO, 1NC	2	52C201X		
A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC				
B = Momentary flush pushbutton black, label "START"	NEMA 4X Fiberglass	1NO, 1NC	2	52C202X		
A = Momentary Mushroom head pushbutton red, label "STOP"		1NO, 1NC				
B = Momentary flush pushbutton, label "UP"	NEMA 4X Fiberglass	1NO, 1NC	2	52C223X		
A = Momentary flush pushbutton, label "DOWN"		1NO, 1NC				
B = Indicator light, red, label "RUN"	NEMA 4X Fiberglass	120V Transformer type	2	52C224X		
A = Maintained selector switch, label "HAND-OFF-AUTO"						


① NEMA 4X Stainless Steel Enclosure is 304 SS.

Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant - Class 52

Class 52 oiltight pushbutton stations

Selection and ordering data

Actuator identification	Degree of protection ^①	Contact / voltage	No. of command points	Order no.	Pack
					Unit
3 unit control station 	C = Indicator light, red	NEMA 12	120V 1NO, 1NC	3	52C307A
	B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC 1NO, 1NC		
	C = Momentary flush pushbutton black, label "FORWARD" B = Momentary flush pushbutton black, label "REVERSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 12	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	52C301A
	C = Momentary flush pushbutton black, label "UP" B = Momentary flush pushbutton black, label "DOWN" A = Momentary raised pushbutton red, label "STOP"	NEMA 12	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	52C332A
	C = Momentary flush pushbutton black, label "OPEN" B = Momentary flush pushbutton black, label "CLOSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 12	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	52C333A
	C = Momentary flush pushbutton black, label "HI" B = Momentary flush pushbutton, black label "LOW" A = Momentary raised pushbutton red, label "STOP"	NEMA 12	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	52C334A
	C = Indicator light, red	NEMA 4X Stainless Steel	120V 1NO, 1NC 1NO, 1NC	3	52C307S
	B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC 1NO, 1NC		
	C = Momentary flush pushbutton black, label "FORWARD" B = Momentary flush pushbutton black, label "REVERSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	52C301S
	C = Momentary flush pushbutton black, label "UP" B = Momentary flush pushbutton black, label "DOWN" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	52C332S
	C = Momentary flush pushbutton black, label "OPEN" B = Momentary flush pushbutton black, label "CLOSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	52C333S
	C = Momentary flush pushbutton black, label "HI" B = Momentary flush pushbutton, black label "LOW" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	52C334S
	C = Indicator light, red	NEMA 4X Fiberglass	120V 1NO, 1NC 1NO, 1NC	3	52C307X
	B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC 1NO, 1NC		
	C = Momentary flush pushbutton black, label "FORWARD" B = Momentary flush pushbutton black, label "REVERSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	52C301X
	C = Momentary flush pushbutton black, label "UP" B = Momentary flush pushbutton black, label "DOWN" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	52C332X
	C = Momentary flush pushbutton black, label "OPEN" B = Momentary flush pushbutton black, label "CLOSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	52C333X
	C = Momentary flush pushbutton black, label "HI" B = Momentary flush pushbutton, black label "LOW" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	52C334X

① NEMA 4X Stainless Steel Enclosure is 304 SS.

Pushbutton Units and Indicator Lights

30 mm Heavy Duty, Watertight/Oiltight, Class 52

Legend plates for Class 51 and 52

Pilot Devices

17 CONTROL PRODUCTS

Design

The 30 mm legend plates are approved for the use with both Class 51 and Class 52 devices. Automotive legend plates require 2 1/2" mounting centers. Plastic legend plates will have white letters engraved.

When ordering custom engraved legend plates, specify the required inscription text.

Selection and ordering data

Inscription	Large (1 1/4" x 2")	Automotive ^① (2 7/16" x 2 7/16")	Large Plastic ^② (2 1/16" x 2")	Automotive Plastic ^{②②} (2 7/16" x 2 7/16")
	Order No.	Order No.	Order No.	Order No.
"Blank (brushed aluminum)"	52NL02	52NA02	—	—
"Blank (red)"	52NL02R	52NA02R	52ND02R	52NE02R
"Blank (Black)"	52NL02B	52NA02B	52ND02B	52NE02B
Inscribed legend plates with large brushed aluminum background				
Close	52NL18	52NA18	—	—
Down	52NL10	52NA10	—	—
Emerg Stop	52NL16	52NA16	—	—
Emerg Stop (red)	52NL16R	52NA16R	—	—
Fast-Slow	52NL33	52NA33	—	—
Forward	52NL05	52NA05	—	—
For-Off-Rev	52NL38	52NA38	—	—
For-Rev	52NL31	52NA31	—	—
Hand-Off-Auto	52NL37	52NA37	—	—
High	52NL07	52NA07	—	—
High-Low	52NL30	52NA30	—	—
High-Off-Low	52NL44	52NA44	—	—
In	52NL21	52NA21	—	—
Jog	52NL13	52NA13	—	—
Jog-Forward	52NL24	52NA24	—	—
Jog-Reverse	52NL25	52NA25	—	—
Low	52NL08	52NA08	—	—
Lower	52NL20	52NA20	—	—
Man-Auto	52NL35	52NA35	—	—
Off	52NL12	52NA12	—	—
Off-On	52NL26	52NA26	—	—
On	52NL11	52NA11	—	—
On-Off-Auto	52NL40	52NA40	—	—
Open	52NL17	52NA17	—	—
Open-Close	52NL34	52NA34	—	—
Open-Off-Close	52NL41	52NA41	—	—
Out	52NL22	52NA22	—	—
Pull to Start Push to Stop	52NL47	52NA47	—	—
Raise	52NL19	52NA19	—	—
Raise-Lower	52NL36	52NA36	—	—
Reset	52NL14	52NA14	—	—
Reverse	52NL06	52NA06	—	—
Run	52NL23	52NA23	—	—
Run-Jog	52NL29	52NA29	—	—
Safe-Run	52NL27	52NA27	—	—
Slow-Off-Fast	52NL39	52NA39	—	—
Start	52NL03	52NA03	—	—
Start-Jog	52NL28	52NA28	—	—
Start-Stop	52NL32	52NA32	—	—
Stop	52NL04	52NA04	—	—
Stop (red)	52NL04R	52NA04R	—	—
Up	52NL09	52NA09	—	—
Up-Down	52NL49	52NA49	—	—
Up-Off-Down	52NL42	52NA42	—	—
Inscription plates with custom engraving				
"Custom engraved (brushed aluminum)"	52NL02E	52NA02E	—	—
"Custom engraved (red)"	52NL02RE	52NA02RE	52ND02RE	52NE02RE
"Custom engraved (Black)"	52NL02BE	52NA02BE	52ND02BE	52NE02BE
Max. number of rows	2	2	2	2
Letter height	5/32"	1/4"	5/32"	1/4"
Characters per row	14	16	14	16

① Automotive requires 2 1/2" mounting centers

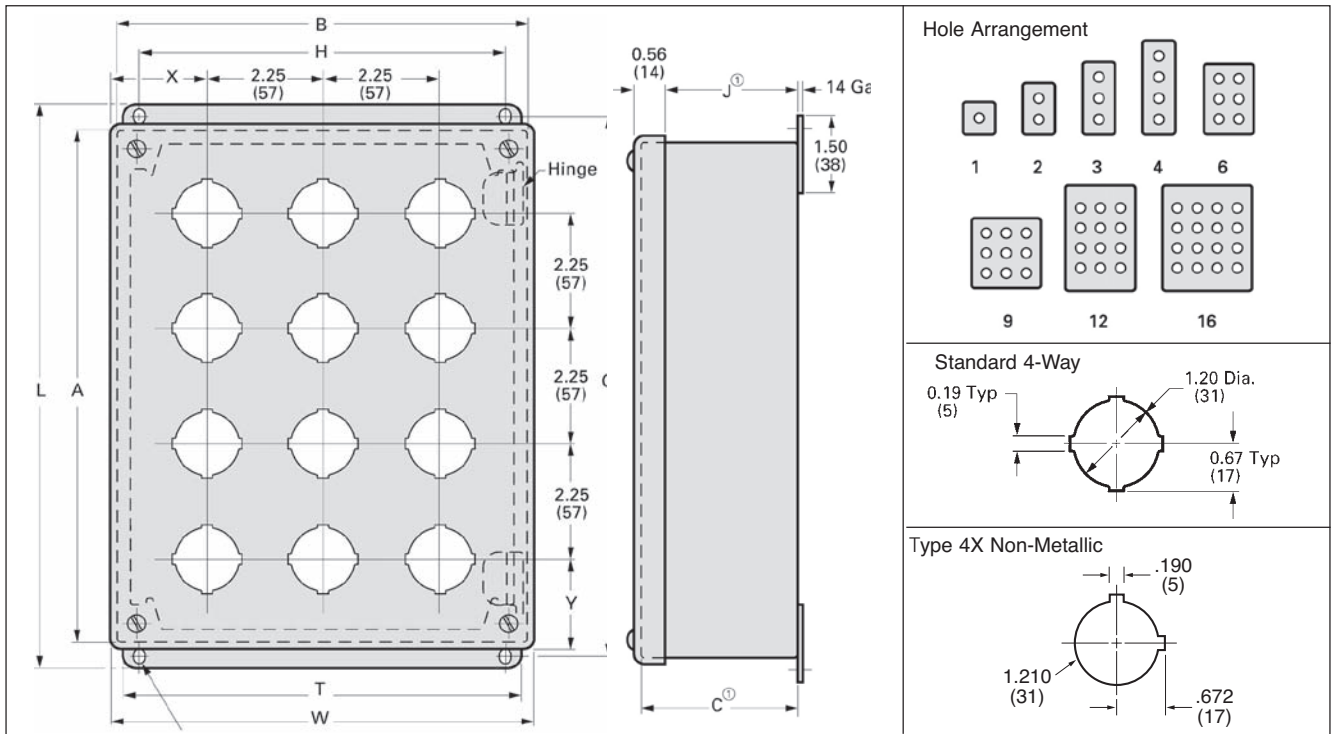
② White letters on plastic nameplate.

Pushbutton Units and Indicator Lights

30mm Heavy Duty, Watertight/Oiltight, Class 52

Dimensional drawings

Pilot Devices



Type 12/13 and 4X Stainless Steel

Units	Enclosure Size			Mounting		Overall					
	A	B	C	G	H	L	W	J	T	X	Y
1	3.50 (89)	3.25 (83)	2.75 (70)	4.00 (102)	2.38 (60)	4.50 (114)	3.47 (88)	2.31 (59)	3.00 (76)	1.73 (44)	1.86 (47)
2	5.75 (146)	3.25 (83)	2.75 (70)	6.25 (159)	2.38 (60)	6.75 (171)	3.47 (88)	2.31 (59)	3.00 (76)	1.73 (44)	1.86 (47)
3	8.00 (203)	3.25 (83)	2.75 (70)	8.50 (216)	2.38 (60)	9.00 (229)	3.47 (88)	2.31 (59)	3.00 (76)	1.73 (44)	1.86 (47)
4	10.25 (260)	3.25 (83)	2.75 (70)	10.75 (273)	2.38 (60)	11.25 (286)	3.47 (88)	2.31 (59)	3.00 (76)	1.73 (44)	1.86 (47)
6	9.50 (241)	6.25 (159)	3.00 (76)	10.00 (254)	5.38 (137)	10.50 (267)	6.47 (164)	2.56 (65)	6.00 (152)	2.11 (54)	2.61 (66)
9	9.50 (241)	8.50 (216)	3.00 (76)	10.00 (254)	7.62 (194)	10.50 (267)	8.72 (221)	2.56 (65)	8.25 (210)	2.11 (54)	2.61 (66)
12	11.75 (298)	8.50 (216)	3.00 (76)	12.25 (311)	7.62 (194)	12.75 (324)	8.72 (221)	2.56 (65)	8.25 (210)	2.11 (54)	2.61 (66)
16 ²⁾	11.75 (298)	10.75 (273)	3.00 (76)	12.25 (311)	9.88 (251)	12.75 (324)	10.97 (279)	2.56 (65) ²⁾	10.50 (267)	2.11 (54)	2.61 (66)

Type 12/13 Extra Deep Enclosures

Units	Enclosure Size			Mounting		Overall					
	A	B	C	G	H	L	W	J	T	X	Y
1	4.00	4.00	4.75	4.50	3.12	5.00	4.22	4.31	3.75	2.11	2.11
2	6.00	4.00	4.75	6.50	3.12	7.00	4.22	4.31	3.75	2.11	1.98
3	8.00	4.00	4.75	8.50	3.12	9.00	4.22	4.31	3.75	2.11	1.86
4	10.00	4.00	4.75	10.50	3.12	11.00	4.22	4.31	3.75	2.11	1.73
6	9.50	6.25	4.75	10.00	5.38	10.50	6.47	4.31	6.00	2.11	2.61
9	9.50	8.50	4.75	10.00	7.62	10.50	8.72	4.31	8.25	2.11	2.61
12	11.75	8.50	4.75	12.25	7.62	12.75	8.72	4.31	8.25	2.11	2.61
16 ²⁾	11.75	10.75	4.75	12.25	9.88	12.75	10.97	4.31	10.50	2.11	2.61

Type 4X Non-Metallic

Units	Enclosure Size		Mounting		Overall		
	A	B	C	G	H	L	W
1	6.00	3.19	3.63	4.88	2.94	6.63	3.81
2	6.00	3.19	3.63	4.88	2.94	6.63	3.81
3	8.26	3.19	3.63	7.13	2.94	8.88	3.81
4	10.51	3.19	3.63	9.37	2.94	11.13	3.81

All dimensions shown in inches and (millimeters). For reference purposes only. Not to be used for design or construction purposes.

- 1) Grounding stud in body of enclosure.
- 2) For stainless steel add 1.75 (45) to depth.

Push Button Units and Indicator Lights

30.5mm Pilot Device

Class 52 convenience center

Complete convenience center

Catalog number: POP2017

Complete point-of-purchase convenience center

This starter kit features all of the devices and stand required for you to start selling Siemens.

Includes point-of-purchase components:

- | | |
|------------------------------------------------------------|-------------|
| (8) Pilot light: Red, SB LED, 120V transformer | 52PL4G2XYP |
| (4) Pilot light: Red, SB LED, 24V full voltage | 52PL4D2XYP |
| (4) Pilot light: Red, SB LED, 120V full voltage | 52PL4E2XYP |
| (8) Basic pushbutton: Red extended, 1NC | 52PM8B2JP |
| (4) Basic pushbutton: Green flat, 1NO | 52PM8A3KP |
| (4) Push-Pull E-STOP: Red mushroom head | 52PP2W2AP |
| (4) Twist-to-Release E-STOP: Red Mushroom Head | 52PR8W2AP |
| (4) Selector switch: 3-pos, maintained | 52SA2CABA1P |
| (4) Selector switch: 2-pos, maintained | 52SA2AABA1P |
| (4) Illuminated pushbutton: Red, SB LED, 24V full voltage | 52PT6D2AYP |
| (4) Illuminated pushbutton: Red, SB LED, 120V full voltage | 52PT6G2AYP |
| (4) 30mm pushbutton station: 1 hole | P30EMS01P |
| (2) 30mm pushbutton station: 2 hole | P30EMS02P |
| (2) 30mm pushbutton station: 3 hole | P30EMS03P |
| (1) Point-of-purchase display stand | 52STANDPOP |



Pilot Devices

Pilot lights

Catalog number:
52PL4D2XYP



Pilot light: Red, 24V full voltage with Super-Bright LED and two extra lenses in green and amber; and two legend plates: "On" and "Stop."

Includes components:

- | | |
|----------------------------------------------------------|----------|
| (1) Red, 24V Full Voltage, Pilot light, Super-Bright LED | 52PL4DXY |
| (1) Green lens | 52RA4S3 |
| (1) Amber lens | 52RA4S9 |
| (1) "On" legend | 52NL11 |
| (1) "Stop" legend | 52NL04 |

Catalog number:
52PL4E2XYP



Pilot light: Red, 120V full voltage with Super-Bright LED; two extra lenses in green and amber; and two legend plates: "On" and "Stop."

Includes components:

- | | |
|----------------------------------------------------------|-----------|
| (1) Red, 120V Full Voltage Pilot Light, Super-Bright LED | 52PL4E2XY |
| (1) Green lens | 52RA4S3 |
| (1) Amber lens | 52RA4S9 |
| (1) "On" legend | 52NL11 |
| (1) "Stop" legend | 52NL04 |

Catalog number:
52PL4G2XYP



Pilot light: Red, 120V transformer with Super-Bright LED; two extra lenses in green and amber; and two legend plates: "On" and "Stop."

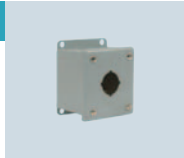
Includes components:

- | | |
|---------------------------------------------------------|-----------|
| (1) Red, 120V Transformer Pilot Light, Super-Bright LED | 52PL4G2XY |
| (1) Green lens | 52RA4S3 |
| (1) Amber lens | 52RA4S9 |
| (1) "On" legend | 52NL11 |
| (1) "Stop" legend | 52NL04 |

17 CONTROL PRODUCTS

Enclosures

Catalog number:
P30EMS01P



30mm pushbutton station: 1 hole
NEMA 12/13 (IP52/54) standard enclosure

Catalog number:
P30EMS02P



30mm pushbutton station: 2 hole
NEMA 12/13 (IP52/54) standard enclosure

Catalog number:
P30EMS03P



30mm pushbutton station: 3 hole
NEMA 12/13 (IP52/54) standard enclosure

Push Button Units and Indicator Lights

30.5mm Pilot Device

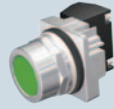
Class 52 convenience center

Pilot Devices

CONTROL PRODUCTS 17

Pushbuttons

Catalog number:
52PM8A3KP

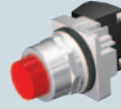


Basic pushbutton: Green flat
momentary with 1NO. Includes extra caps in black, red, yellow and blue and two legend plates: "On" and "Start."

Includes components:
(1) Green, momentary pushbutton with 1NO
(1) Black cap
(1) Red cap
(1) Yellow cap
(1) Blue cap
(1) "On" legend
(1) "Start" legend

52PM8A3K
52RC1A1
52RC1A2
52RC1A4
52RC1A5
52NL11
52NL03

Catalog number:
52PM8B2JP



Basic pushbutton: Red extended
momentary with 1NC. Includes extra caps in black and green and two legend plates: "Stop" and "Off."

Includes components:
(1) Red, momentary extended head pushbutton with 1NC
(1) Black cap
(1) Green cap
(1) "Stop" legend, red
(1) "Off" legend

52PM8B2J
52RC1B1
52RC1B3
52NL04R
52NL12

Emergency stop

Catalog number:
52PP2W2AP



Push-pull: Red mushroom head
2-Pos, maintained, 1 3/4" mushroom head, 1NO-1NC, includes extra 2 1/2" mushroom head, two "Stop" legends, and a 90mm ring inscribed with "Emergency Stop."

Includes components:
(1) Red, E-STOP with 1 3/4" mushroom head, 2-pos, mntd, 1NO-1NC
(1) 2 1/2" mushroom head
(1) "Stop" legend, red
(1) "Stop" legend
(1) E-STOP ring legend

52PP2W2A
52RC3E2
52NL04R
52NL04
52AAR

Pushbuttons

Catalog number:
52PT6D2AYP



Illuminated pushbutton: Red
24V full voltage, Super-Bright LED, 1NC-1NO includes extra lenses in green and amber, and two blank legend plates.

Includes components:
(1) Red, illuminated pushbutton, 24 full voltage, Super-Bright LED with 1NC-1NO
(1) Green lens
(1) Amber lens
(2) Blank legend

52PT6D2AY
52RA5S3
52RA5S9
52NL02

Catalog number:
52PT6G2AYP



Illuminated pushbutton: Red
120V transformer, Super-Bright LED, 1NC-1NO includes extra lenses in green and amber, and two blank legend plates.

Includes components:
(1) Red, illuminated Pushbutton, 120V transformer, Super-Bright LED with 1NC-1NO
(1) Green lens
(1) Amber lens
(2) Blank legend

52PT6G2AY
52RA5S3
52RA5S9
52NL02

Emergency stop

Catalog number:
52PR8W2AP



Twist-to-release: Red mushroom head
2-Pos, maintained, 1 3/4" mushroom head, 1NO-1NC, two "Stop" legends, and a 90mm ring inscribed with "Emergency Stop."

Includes components:
(1) Red, E-STOP with 1 3/4" mushroom mushroom head, 2pos, mntd, 1NO-1NC
(1) "Stop" legend, red
(1) "Stop" legend
(1) E-STOP ring legend

52PR8W2A
52NL04R
52NL04
52AAR

Selector switch

Catalog number:
52SA2CABA1P



Selector switch:
3 Position maintained, short lever, 1NO-1NC, with two legend plates: "Hand-Off-Auto" and "For-Off-Rev."

Includes components:
(1) 3-Position maintained short lever selector switch with 1NO-1NC
(1) "Hand-Off-Auto" legend
(1) "For-Off-Rev" legend

52SA2CABA1
52NL37
52NL38

Catalog Number:
52SA2AABA1P



Selector switch:
2 Position maintained, short lever, 1NO-1NC, with two legend plates: "Forward-Reversing" and "Off-On."

Includes components:
(1) 2-Position maintained short lever selector switch with 1NO-1NC
(1) "Forward-Reversing" legend
(1) "Off-On" legend

52SA2AABA1
52NL31
52NL26

Display stand

Catalog number:
52STANDPOP

Point-of-purchase display stand
Two side swivel display stand.

POP Stand 52STANDPOP

Pushbutton Units and Indicator Lights

30 mm Pilot Devices


Technical Specifications

Standards	UL Listed File # E22655	CSA Certified File # LR6535
Utilization	Category NEMA	A600/P600
Degree of Protection	52B, 52P-, 52S-, 52M- Operators	NEMA: 1, 3, 3R, 4, 4X, 12 and 13 IEC 529; IP10, IP11, IP14, IP52, IP54, IP56 and IP66

Rated Operational Current

NEMA A600 – 10 Continuous Amps			NEMA P600 – Rating Codes for DC Control Circuit Application	
Voltage AC	Make Amps	Break Amps	Thermal Continuous Test Current Amps	
120V	60	6	Maximum Make or Break; Current / Amps	5.0
240V	30	3	125V	1.10
480V	15	1.5	250V	0.55
600V	12	1.2	301-600V	0.20
Total VA	7200	720	Maximum Make or Break Volt amperes at 300V or Less	138

Contact Blocks	52BAK, -BAJ [Ⓞ] , -BAH, -BAU, -BJK [Ⓞ] 52BAR	600VAC Maximum, Heavy Duty 200VAC .25 Amp, 10 Watt Maximum 200VDC .50 Amp, 10 Watt Maximum
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[Ⓞ]  Positively driven contacts. Contact blocks are suitable for applications down to 5V/1MA low voltage applications as found in PLCs. 52BAR are Class 1; Division 2 Compliant

Pilot Light	Full Voltage LED Module Transformer Type	52PL4/52PL5 or 52BL4/52BL5	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V) -L (24V), -M (120V) -N (240V) -G (120V), -H (240V), -J (480V), -K (600V)	240V AC/DC Max. 240V AC Max. 600V AC Max., 50/60 Hz
Push-to-Test	Full Voltage LED Module Transformer Type	52PT6 or 52BT6	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V) -L (24V), -M (120V), -N (240V) -G (120V), -H (240V), -J (480V), -K (600V)	240V AC/DC Max. 240V AC Max. 600VAC Max., 50/60 Hz
Illuminated Push-Pull	Full Voltage LED Module Transformer	52PP2(3,7) or 52BP2(3,7)	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V) -L (24V), -M (120V), -N (240V) -G (120V), -H (240V), -J (480V), -K (600V)	240V AC/DC Max. 240V AC Max. 600VAC Max., 50/60 Hz
Twist-to-Release	Full Voltage LED Module Transformer	52BR8 or 52PR8	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V) -L (24V), -M (120V), -N (240V) -G (120V), -H (240V), -J (480V), -K (600V)	240V AC/DC Max. 240V AC Max. 600VAC Max., 50/60 Hz
Illuminated Selector Switch	Full Voltage Transformer	52SA7(A,B,C) or 52SX7(A,B,C)	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V) -G (120V), -H (240V), -J (480V), -K (600V)	240V AC/DC Max. 600V AC Max., 50/60 Hz

Dielectric Strength 2200V for one minute

Mechanical Design Life Cycles

Vibration	Frequency 5 - 60Hz.; Disp. .030 inches, sweep 5 minutes for a duration of 30 minutes on each axis. Not to exceed 5.5 G's for maximum of 1 minute.	
Pushbuttons	Momentary, Non-illuminated	5,000,000 Operating Cycles
	Momentary, Illuminated	300,000 Operating Cycles
Push-Pull	Maintained	300,000 Operating Cycles
	Momentary	2,000,000 Operating Cycles
Twist-to-Release		300,000 Operating Cycles
Selector Switches	Non-illuminated	2,000,000 Operating Cycles
	Illuminated, Key-operated	2,000,000 Operating Cycles
Contact Operation	Standard Contact Black Logic Reed	
Wire Gauge	#18-12 AWG	
Terminal Screw Torque	2-10 lb-in / 20 lb-in max; 8 lb-in recommended	
Locknut Torque	15 ft. lbs. max	
Temperature Range	Operating	31F to +158F (-35C to +70C)
	Storage	40F to +185F (-40C to +85C)

All parts are designed and manufactured of corrosion resistant material or are plated or painted as corrosion protection. All contact block contacts are gold flashed as a standard offering. Internal return spring mechanisms of operators and contact blocks of stainless steel. RoHS Compliant.

Declaration of Conformity — The products listed below, to which this declaration relates, are in conformity with the following standards, following the provisions of the Low Voltage Directive (LVD) (73/23/EEC), and the Electromagnetic Compatibility Directive (89/336/EEC.)

Products: Contact Blocks: Cat Nos. 52BAE, 52BAH, 52BAJ, 52BAK, 52BAR, 52BAU and 52BJK, with suffixes. Pilot Lights: Cat Nos 52P, with suffixes. Operators: Cat Nos 52S or 52P, with suffixes.

Applicable Standards: EN 60947-5-1 Low-Voltage Switchgear and controlgear. Enclosed devices meet the requirements of environmental ratings of IP10, IP11, IP14, IP52, IP54, and IP56. Open devices, when mounted as instructed, in environmental type IP10, IP11, IP14, IP52, IP54 or IP56 enclosures, maintain the environmental requirements for those enclosure types. Cat. No. 52BP, 52BR, 52PP, and 52PR, 2 Position, Twist-To-Release and 2 Position, Push Pull Maintained operators provided with red operating heads and 52BJK contact blocks meet the requirements of EN 60947-5-5 for Electrical Emergency Stop Device With Mechanical Latching Function (e-stop).

