Power Supplies and System Modules

NEW
PRO 2
POWER SUPPLIES

Contents

POWER SUPPLIES

FEATURES OVERVIEW

We understand power supplies are not a one size fits all proposition. As such, WAGO offers a family of power supplies that can be scaled to best fit your application needs. Select the best solution for your demands using the charts on the following pages.

PRO 2 — up to 960 W

Performance power supply with high requirements for reliability, efficiency and size. Advanced features such as a built-in electronic circuit breaker, intelligent load management, configuration options and communication capabilities – plus hazardous locations approvals.

CLASSIC — up to 960 W

Versatile power supply with standard functionality and optional integrated TopBoost.

ECO — up to 960 W

The economical power supply for standard applications with basic functionality – plus hazardous locations approvals.

COMPACT — up to 144 W

The low-profile power supply for standard applications – DIN-Rail or chassis mount options available.




	ECO	COMPACT	CLASSIC	PRO 2
UL Approval	x	x	x	x
Marine Approvals		x	x	x
Hazardous Locations Approvals	x			x
MTBF > 1,000,000 hrs		x		x
Parallel Operation Permitted	x	x	x	x
Temperature Rating of -25 - +70 °C	x	x	x	x
Type Tested for -40 °C Cold Start			x	x
TopBoost			x	x
PowerBoost		x	x	x
Single Phase Available	x		x	x
Three Phase Available	x		x	x
Internal ECB		x	x	x
Pluggable CAGE CLAMP® Connectors				x
Configuration Options			x	x
Communication Protocols Available				x
DC Okay Contact	x		x	x
DIN Rail Mount	x	x	x	x
Chassis Mount	x	x		
Marking Options Available	x	x	x	x

POWER SUPPLIES PRO 2

POWER

Communicates Now!

Class-Leading Features of PRO 2 Power Supplies

Power supplies are the heart of a control cabinet and must meet high requirements for reliability, efficiency and size. In addition, advanced features such as a built-in electronic circuit breaker, configuration options and communication capabilities make the PRO 2 power supplies ready for the ever increasing networking and digitalization demands, all while maximizing up-time.

- **Intelligent load management** that supplies 150% power for 5 s (TopBoost), and up to 600% output current for 15 ms (PowerBoost)
- **Extreme reliability** even in adverse conditions. Heat, cold and altitude have little impact on performance
- **Communication capabilities** that keep you informed about all important status information and data – ready for IIoT applications
- **Easy planning and installation** thanks to compact dimensions and a “digital twin” – 2D/3D data are available in the most important formats.

UP TO **96%** EFFICIENCY

Communication

Connecting the PRO 2 power supply to a fieldbus network is a snap... simply plug in the communication module to monitor and share important data like output current and voltage. This modular approach makes the PRO 2 power supplies fieldbus independent and adaptable to popular protocols like Modbus RTU, I/O Link, Modbus TCP/IP and coming soon EtherNet/IP.

IIoT Ready

Continuous monitoring of all data and values of your system's power supply

Predictive maintenance for greater system up-time

Configuration

Our free interface configuration software offers local and remote parameter setting. Easily tailor your power supply to meet your system requirements.

Customizable parameters and configuration options provide application **flexibility**

Connect to PLCs with *e!*COCKPIT function blocks

Load Management

PowerBoost allows for easy switching of capacitive loads and high start-up currents thanks to 150% output power for 5 seconds. TopBoost allows for reliable tripping of circuit breakers by providing 600% power reserves for 15 ms.

Fast and reliable tripping of secondary-side circuit breakers

Power reserve **eliminates expensive oversizing**

Built-in single channel, **configurable** Electronic Circuit Breaker

600 %

150 % **Temporary Power-Boost in the event of load peaks**

100 % **Normal power consumption**

75 %

50 %

25 %

Efficiency

Save cabinet space and increase energy savings with up to 96.3% efficiency. Highly efficient power supplies provide a smaller footprint, produce less heat, and reduce energy waste resulting in:

Lower CO2 emissions - Just a 5% increase in efficiency saves 1 ton of CO2 (over 5 years)

Put your PLC into standby mode via your PRO 2 power supply to **save energy costs**

Save cabinet space

96.3 %

*measured on 2787-2448

Challenging Environments

PRO 2 power supplies can be used in extreme temperature ranges from -40 °C ... +70 °C with minimal derating starting at +60 °C. Expect reliable operation in high-vibration and shock-prone areas, as well as altitudes up to 5000 m.

Wide temperature range offers application flexibility

Tested according to applicable **shock, vibration, and altitude standards**

Overvoltage **category III** provides greater operational reliability

–40 … +70 °C

Design

Slim design and less spacing required between devices saves valuable cabinet space. 2D/3D data is available in all relevant formats. The pluggable connectors are labeled in accordance with EN 81346-2 to eliminate wiring errors

Compact design improves control cabinet **cooling and reduces panel size**

E-CAD drawings **reduce time and save costs** during implementation

Connections labeled according to **EN 81346-2**

ePLAN® data portal

***smart* DESIGNER**

Reliability

An MTBF > 1,000,000 hours and long service life of the components mean lower costs compared to other power supplies.

Reliable operation of **more than 114 years**

Reduce maintenance and replacement costs

MTBF:
1,000,000 h

Installation

CAGE CLAMP® spring pressure connection technology provides fast, vibration-proof and maintenance –free termination of solid, fine-stranded or ferruled conductors. Pluggable connectors offer pre-assembled wiring and ease of installation.
Saving time in commissioning, the front panel interface allows for fast and easy configuration, while an LED bar chart intuitively indicates the current load.

Push-In CAGE CLAMP® connectors **save both wiring and installation time**

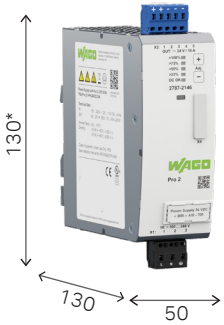
Pluggable connectors allow for **pre-wiring**

Both LED bar chart and connection point labeling **simplify** system commissioning

Power Supplies

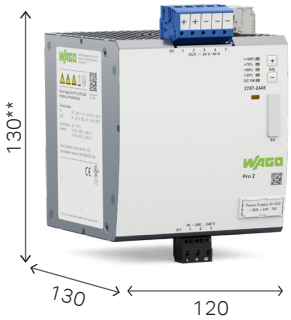
1-Phase; Input: 90 … 264 VAC
24 VDC

2787-2144
5 A



2787-2146
10 A

2787-2147
20 A

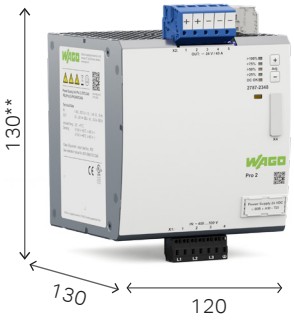


2787-2448[1)]
40 A

3-Phase; Input: 340 … 550 VAC
24 VDC

2787-2346
10 A

2787-2347
20 A



2787-2348
40 A

1-Phase; Input: 90 … 264 VAC
12 VDC

2787-2134
10 A

2787-2135
15 A

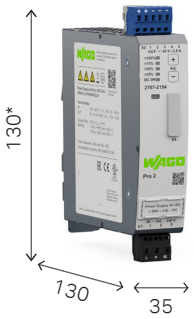
Variants

Available as .../000-070 with protective coating
Available as .../000-030 with DNVGL
Available as .../000-040 with ATEX / IEC Ex
[1)]180 … 264 VAC

Approvals

CE, EN 610160-1; EN 61010-2-201; EN 61204-3; UL 61010-1; UL 61010-2-201; ANSI/ISA UL C1, D2

1-Phase; Input: 85 … 264 VAC
48 VDC

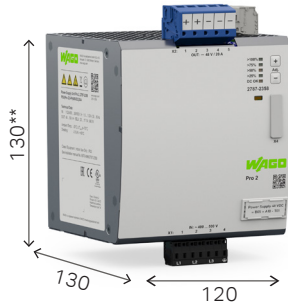


2787-2154
2.5 A

2787-2157
10 A

3-Phase; Input: 340 … 550 VAC
48 VDC

2787-2357
10 A



2787-2358
20 A

* 166 mm including female connectors
** 169 mm including female connectors

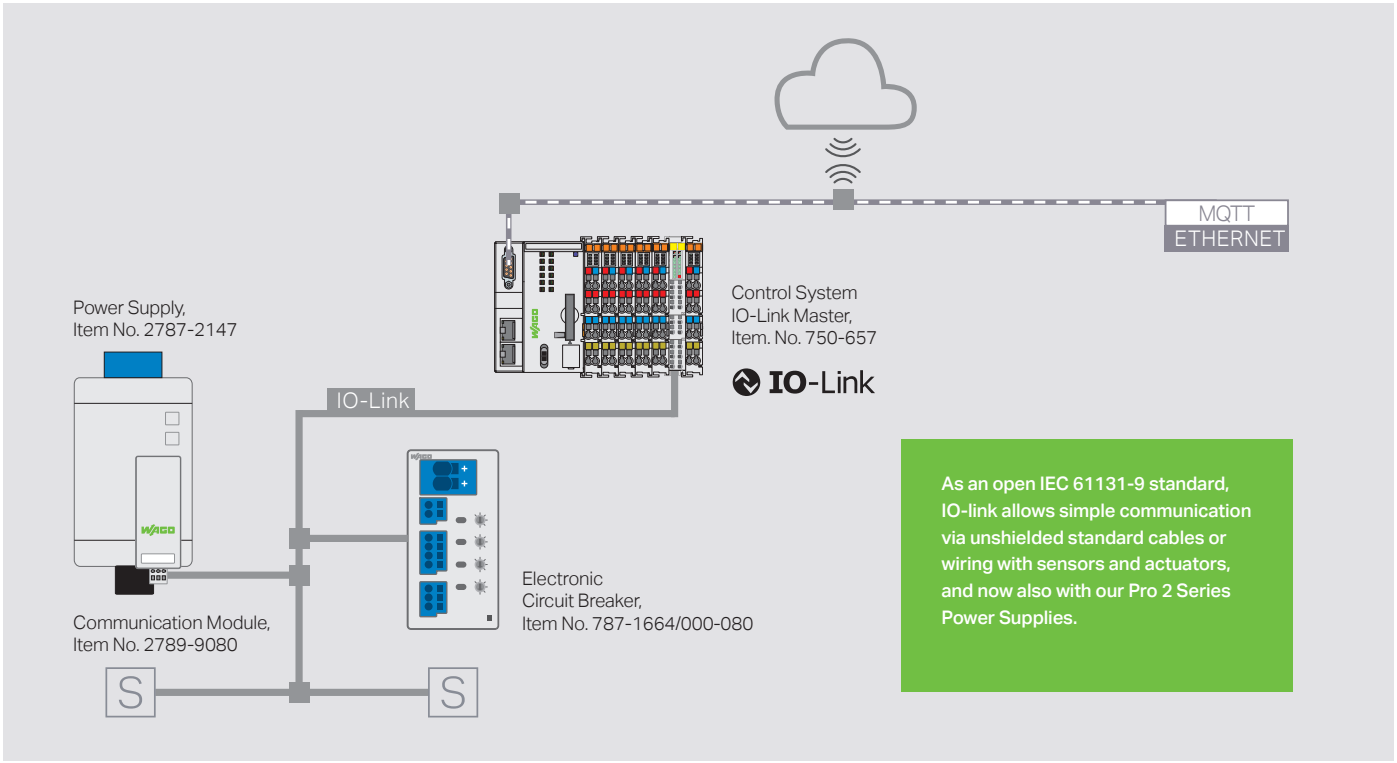
Variants

Available as .../000-070 with protective coating
Available as .../000-030 with DNVGL
Available as .../000-040 with ATEX / IEC Ex

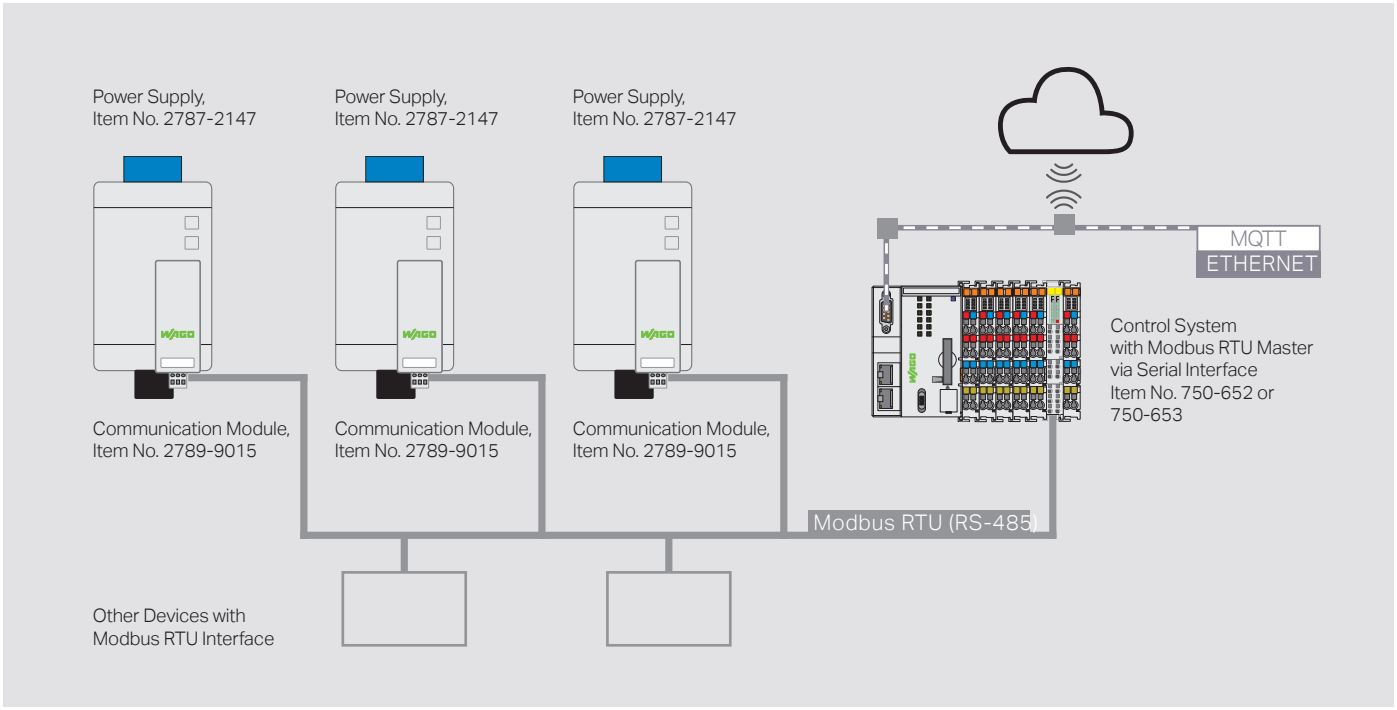
Approvals

CE, EN 610160-1; EN 61010-2-201; EN 61204-3;
UL 61010-1; UL 61010-2-201; ANSI/ISA UL C1, D2

Pro 2 - Solutions



As an open IEC 61131-9 standard, IO-link allows simple communication via unshielded standard cables or wiring with sensors and actuators, and now also with our Pro 2 Series Power Supplies.



IIoT-Ready via Communication Module

In today's age, communication is key. It is essential in our relationships, it is vital in our commerce and it is certainly a cornerstone in enhancing efficiency, safety and profitability in the installation, commissioning and maintenance of the various components that comprise the Industrial Internet of Things (IIoT). Networking via standardized fieldbus protocols such as Modbus (RTU and TCP/UDP), EtherNet/IP and more, has solidified Programmable Logic Controllers (PLCs) as the core brains within control systems.

Aside from the simplicity of collecting and sharing of live and legacy service and operating data, an IIoT-ready power supply with an integrated communication interface can also offer a variety of on-the-fly configuration options. For example, configuration could be adapted to conform to the constantly changing operational needs of a specific application as required by the parameters of the task.

Perhaps an output voltage might be adjusted in the event of increased load or automatically switch off the system in the event of repeated overload conditions.

It is not only voltage that could be dynamically configured with a smart power supply communication strategy, but also signal outputs could be constructed to send maintenance, error messages or group texts based on a number of user-defined conditions such as DC OK, overcurrent, switch-off, etc.

With our Pro 2 pluggable communication modules, which are available for standard protocols such as IO-Link, Modbus RTU, Modbus TCP, EtherNet/IP and with IIoT protocols like MQTT and Profinet on the horizon, we hope to bring exciting new capabilities through which users can embrace the coming digital age right now.

2789-9080
IO-Link

2789-9015
Modbus® RTU

2789-9052
Modbus TCP

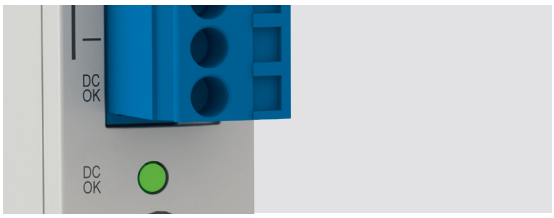
POWER SUPPLIES

CLASSIC

Versatile Power Supply with optional TopBoost

Monitoring

- Green LED indicates output voltage availability
- Remote monitoring via DC OK signal or potential-free DC OK contact
- Easy installation and maintenance
- Quickly provide system information or machine status



Integrated TopBoost*

- Multiplies the nominal current
- Fast and reliable triggering of the secondary-side fusing via circuit breakers or fuses in the event of a short circuit and overload

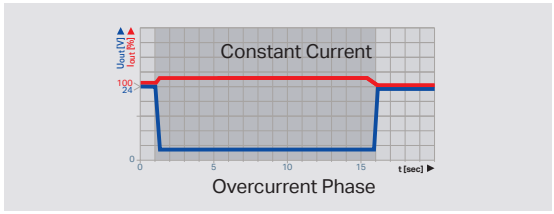
*only for 787-1622,-1628, -1631 ... -1638, -1640 ... -1644

Device Marking

- Marking field for device identification
- Support WMB Multi Marking System (5 mm pin spacing)
- Support Marking Strips (11 mm wide)

High Load-Carrying Capacity

- Constant current characteristic under overload conditions
- 110% output current with a lowered output voltage – even during a short circuit
- High capacitive loads can be reliably started

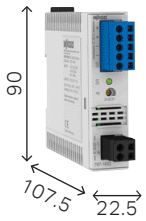


Constant current
Overcurrent phase

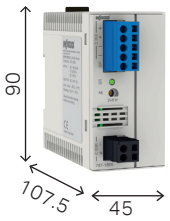
Power Supplies Classic

Versatile Power Supply with Optional TopBoost

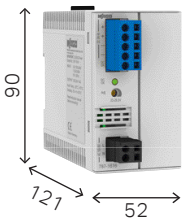
1-Phase; Input: 85 … 264 VAC
24 VDC



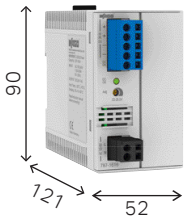
787-1602
1 A



787-1606
2 A



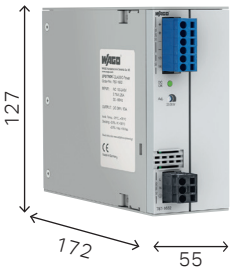
787-1616/000-1000
3.8 A NEC Cl. 2



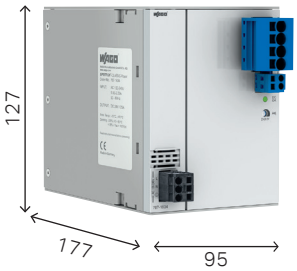
787-1616*
4 A

1-Phase; Input: 85 … 264 VAC
24 VDC

787-1622
5 A

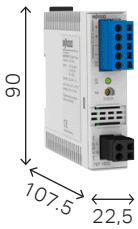


787-1632*
10 A

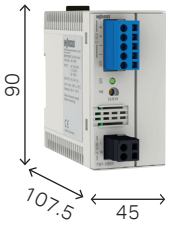


787-1634*
20 A

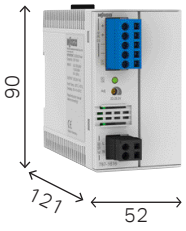
1-Phase; Input: 85 … 264 VAC
12 VDC



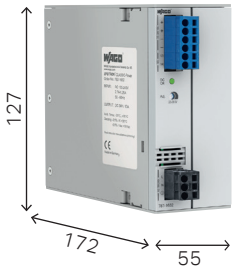
787-1601
2 A



787-1611
4 A



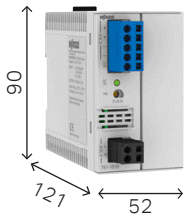
787-1621
7 A



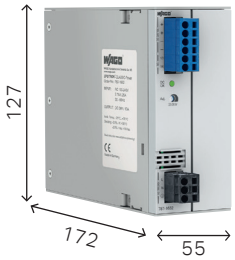
787-1631
15 A

* optionally available as …/000-070 with protective coating

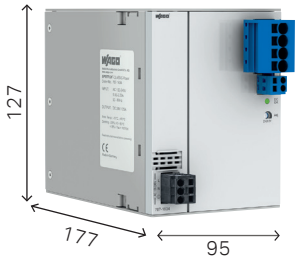
1-Phase; Input: 85 … 264 VAC
48 VDC



787-1623
2 A

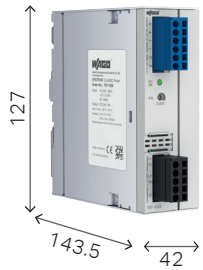


787-1633
5 A

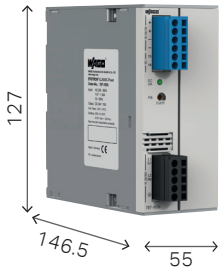


787-1635*
10 A

2-Phase; Input: 180 … 550 VAC
24 VDC

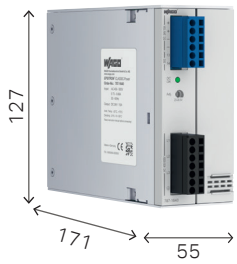


787-1628
5 A

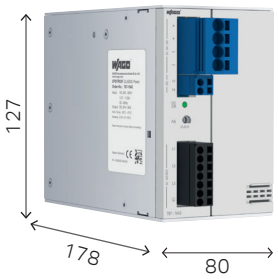


787-1638
10 A

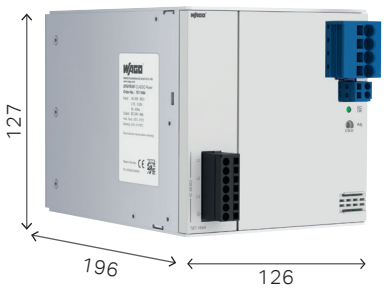
3-Phase; Input: 320 … 575 VAC
24 VDC



787-1640
10 A



787-1642
20 A



787-1644
40 A

POWER SUPPLIES

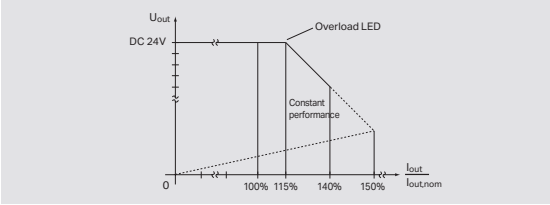
ECO

Economical Power Supplies for Standard Applications - Plus Hazardous Location Approvals

High Load-Carrying Capacity

- Overload warning from 1.15 times the nominal output current*
- Overload of up to 1.4 times the nominal current with a lowered output voltage (constant power)*
- Output shutdown in case of a low-resistance short circuit; also includes automatic restart

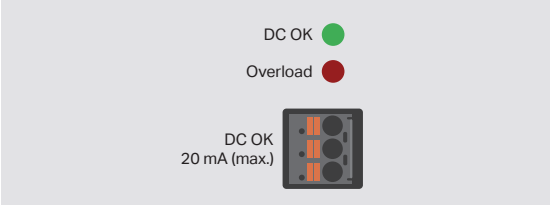
*except for 787-17xx



Status Monitoring

- Potential-isolated NO contact signal, via bounce-free optocoupler* or PhotoMOS**
- Indicates whether an output voltage or an overload is present
- Ideal for remote monitoring

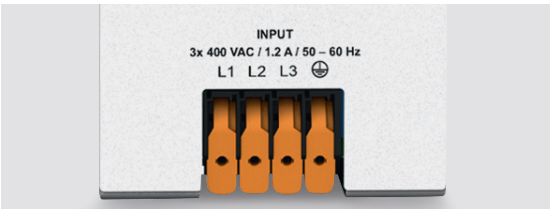
*only for 787-734 ... -740
**only for 787-2742, -2744



Fast Wiring

- Convenient, tool-free wiring thanks to lever-actuated terminal strips*
- Integrated test slot simplifies testing by eliminating conductor removal

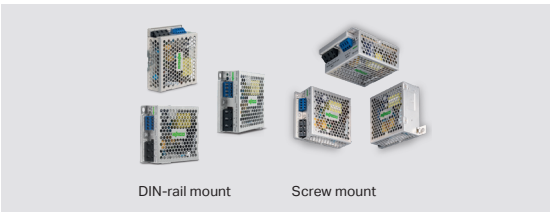
*only for 787-734 ... -740, -2742, -2744



Versatile Mounting Options

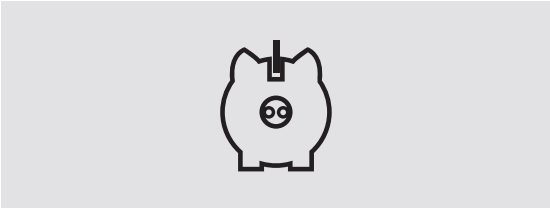
- Flexible mounting via DIN-rail adapter*
- Flexible installation via chassis-mount clips*

*only for 787-17xx



Highly Economical

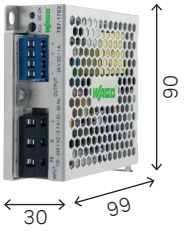
- Ease of installation and reliable connections save time and money by measuring up-time
- Budget friendly without sacrificing reliability or field of application



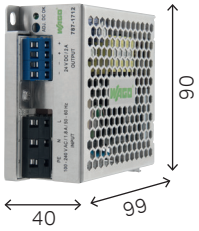
Power Supplies Eco

Economical Power Supplies for Standard Applications

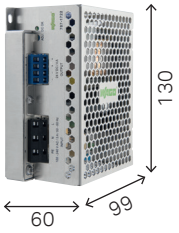
1-Phase; Input: 85 … 264 VAC
24 VDC



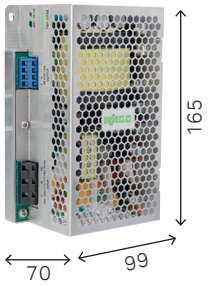
787-1702
1.25 A



787-1712
2.5 A



787-1722
5 A

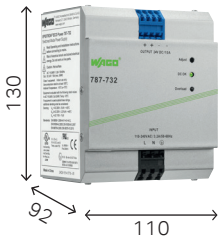


787-1732
10 A

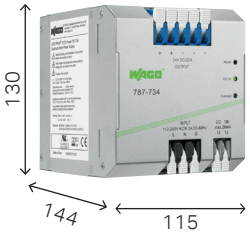
1-Phase; Input: 85 … 264 VAC
24 VDC

787-712*
2.5 A

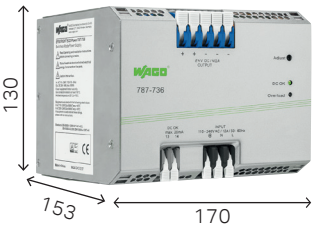
787-722*
5 A



787-732*
10 A

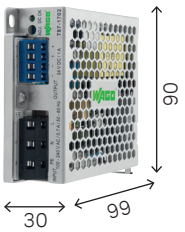


787-734
20 A

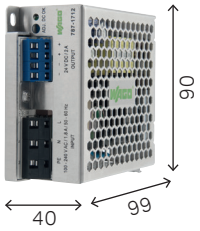


787-736
40 A

1-Phase; Input: 85 … 264 VAC
12 VDC



787-1701
2 A



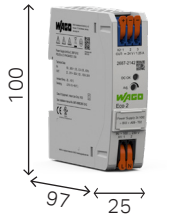
787-1711
4 A

787-1721
8 A

Approvals: CE EN 61204-3; EN 60335-1; EN 61558-2-6; EN 62368-1

* Approved for Hazardous Location

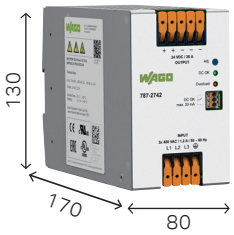
1-Phase; Input: 85 … 264 VAC
24 VDC



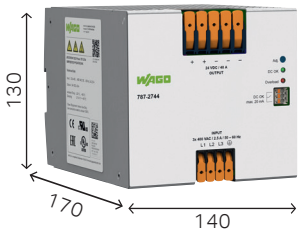
2687-2142
1.25 A

2687-2144
5 A

3-Phase; Input 340 … 575 VAC
24 VDC



787-2742
20 A



787-2744
40 A

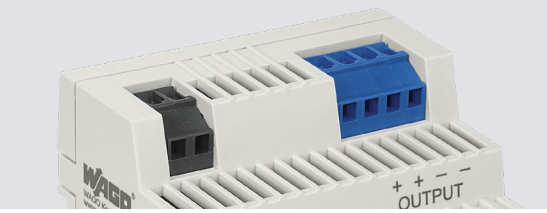
POWER SUPPLIES

COMPACT

The Low-Profile Power Supply

Easy to Connect

- CAGE CLAMP® Connection Technology - Vibration-proof, fast, maintenance-free
- Pre-assembly via pluggable *picoMAX*® Connection Technology*



DIN-Rail Built-In Installation

- Housing design per EN 43880 for installation in small distribution boards or meter panels

Versatile Mounting Options

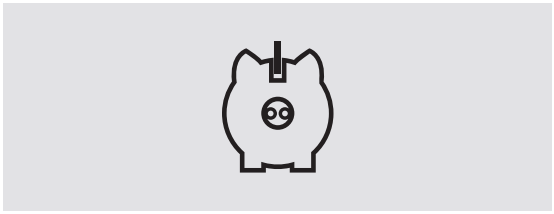
- Easy mounting on DIN-rail
- Flexible installation via screw-mount clips also possible*

Overhead Mounting

- Any type of mounting position is possible at reduced output power
- Units can even be mounted overhead (e.g., in ceiling-mounted distribution boxes)
- Improved cooling due to removable front plate*

Highly Economical

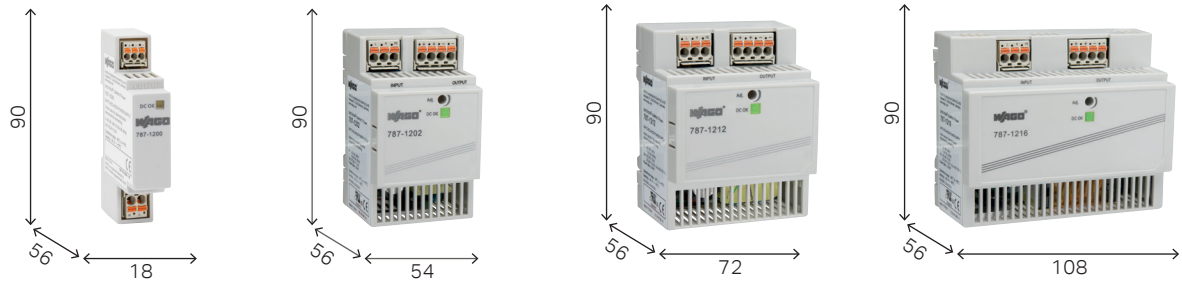
- Triple the savings thanks to low purchase cost, easy installation and maintenance-free operation
- Budget-friendly for basic applications



Power Supplies Compact

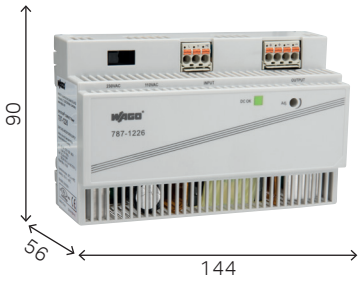
The Low-Profile Power Supply

1-Phase; Input: 90 … 264 VAC
24 VDC; with *picoMAX*®



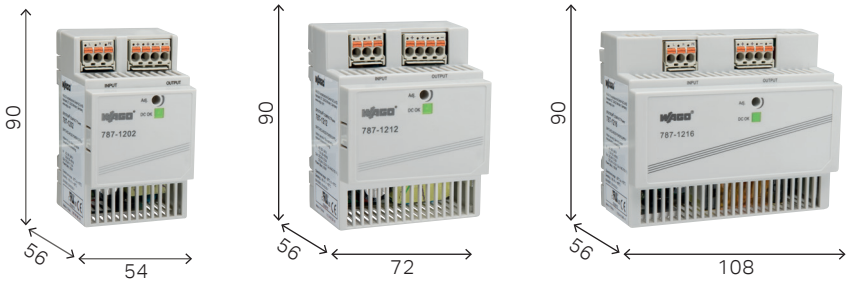
787-1200	787-1202	787-1212	787-1216
0.5 A	1.3 A	2.5 A	4.2 A

1-Phase; Input: 90 … 264 VAC
24 VDC; with *picoMAX*®



787-1226
6 A

1-Phase; Input: 85 … 264 VAC
12 VDC

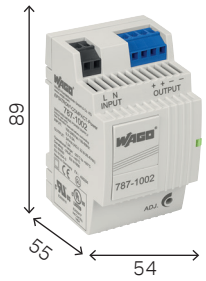


787-1201	787-1211	787-1221
2.5 A	5 A	8 A

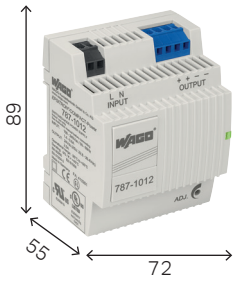
Power Supplies Compact

The Low-Profile Power Supply

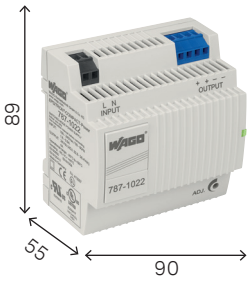
1-Phase; Input: 85 … 264 VAC
24 VDC



787-1002
1.3 A

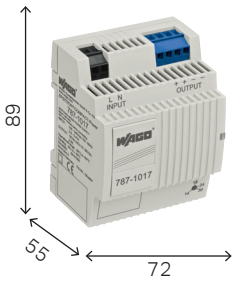


787-1012
2.5 A



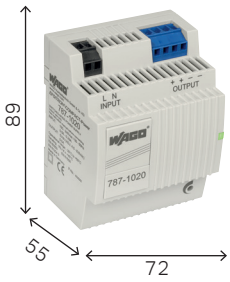
787-1022
4 A

1-Phase; Input: 85 … 264 VAC
18 VDC



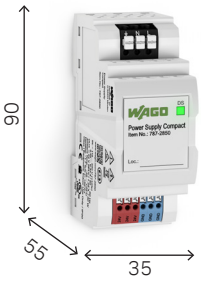
787-1017
2.5 A

1-Phase; Input: 85 … 264 VAC
5 VDC



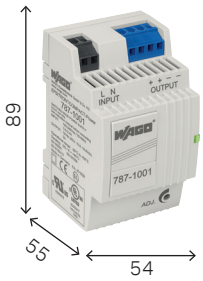
787-1020
5.5 A

1-Phase; Input 100 … 264 VAC
24 VDC; with tool-free Push-in CAGE CLAMP® termination

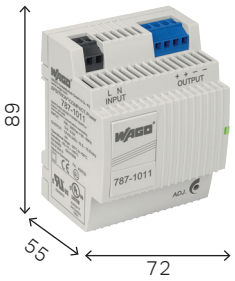


787-2850
1.25 A

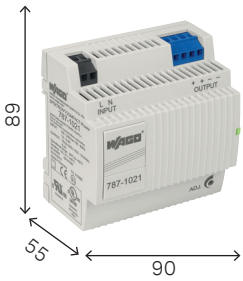
1-Phase; Input: 85 … 264 VAC
12 VDC



787-1001
2 A



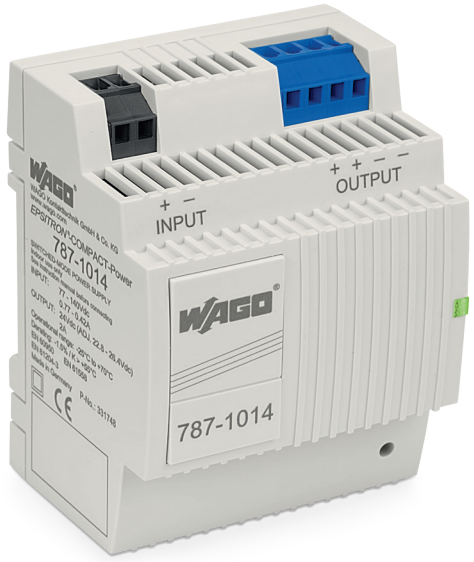
787-1011
4 A

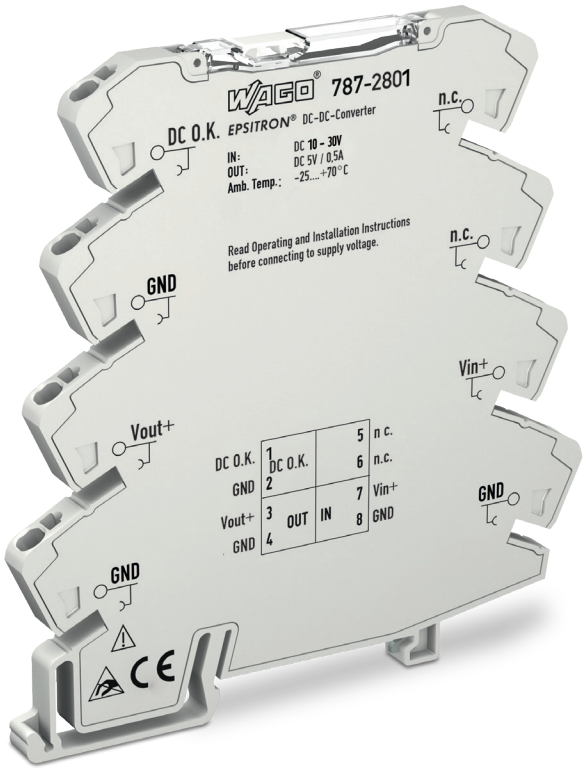


787-1021
6.5 A

DC/DC CONVERTERS

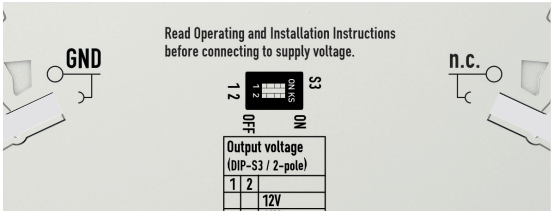
Dependable Power Supply for Different Voltages





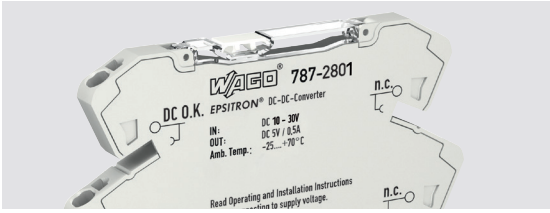
One Device for a Wide Variety of Applications

- Output voltage of the DC/DC Converter (787-2810) set via built-in DIP switch



Monitoring

- Green LED indicates output voltage availability
- Remote monitoring via DC OK
- Easy installation and maintenance



Jumpering with 857/2857 Series

- A shared profile between the 787-28xx DC/DC Converters and the 857/2857 Series Relays and Signal Conditioners enables full jumpering of the supply voltage

The Industry's Most Compact

- "True" 6.0 mm (0.23 inch) width maximizes panel space

Suitable for Railway Applications per EN 50155

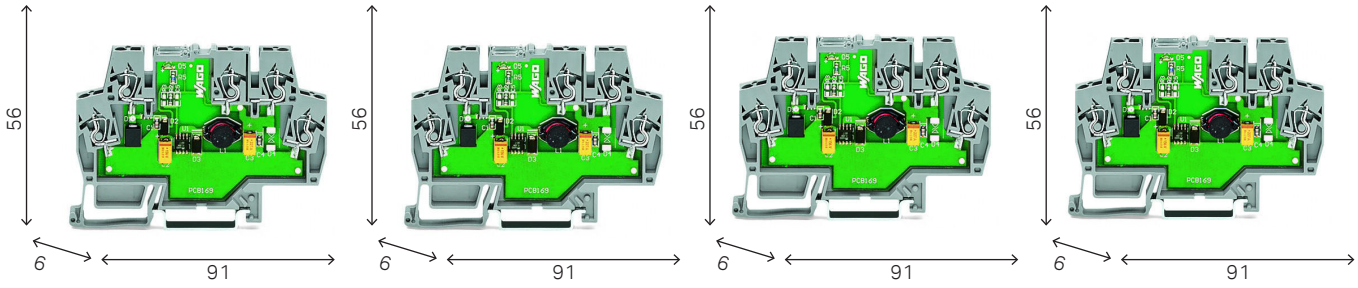
- Wide DC input voltage range
- Wide temperature range
- Protective coating

*only for 787-1014 & 787-101x/0072-0000

DC/DC Converters

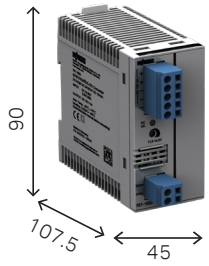
Dependable Power Supply for Specialty Voltages

Input: 24 VDC



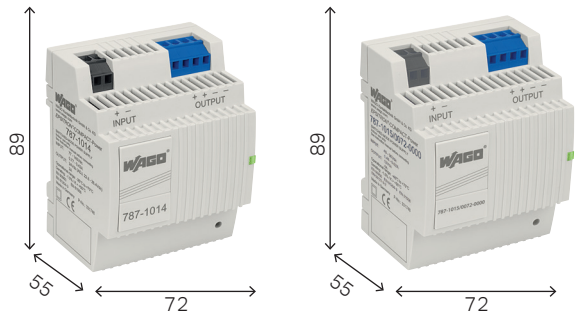
859-801 5 VDC 500 mA	859-802 10 VDC 500 mA	859-805 12 VDC 500 mA	859-804 24 VDC 250 mA

Input: 24/48 VDC



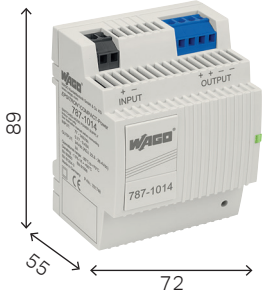
787-1650 12 VDC 4 A

Input: 72 VDC



787-1014/072-000 24 VDC 2 A	787-1015/072-000 12 VDC 4 A

Input: 110 VDC

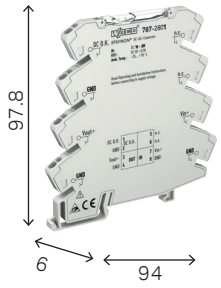


787-1014 24 VDC 2 A

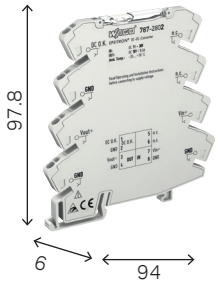
DC/DC Converters

Dependable Power Supply for Specialty Voltages

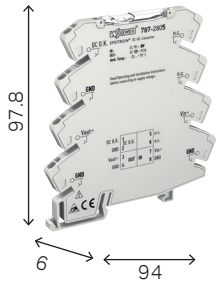
Input: 24 VDC



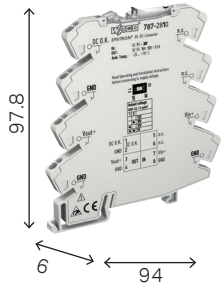
787-2801
5 VDC
0.5 A



787-2802
10 VDC
0.5 A

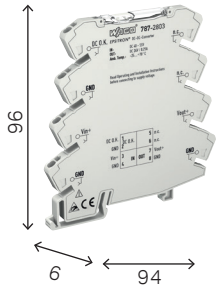


787-2805
12 VDC
0.5 A



787-2810
5/10/12 VDC; adjustable
0.5 A

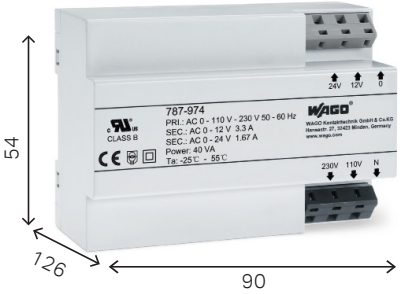
Input: 48 VDC



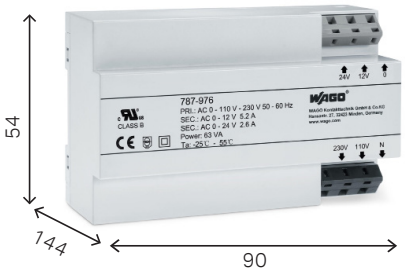
787-2803
24 VDC
0.5 A

DIN Rail Mount AC Transformers

Input: 0 ... 230 VAC



787-974
110 / 230 VAC
3.3 / 1.67 A



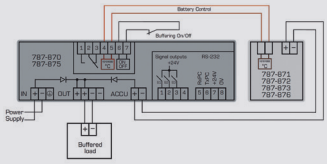
787-976
110 / 230 VAC
5.2 / 2.6 A

UNINTERRUPTIBLE POWER SUPPLIES

Reliable Back Up Power – Even for Longer Power Outages

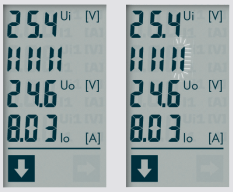
Battery Control Technology

- Allows continuous data exchange between intelligent Battery Modules (787-87x) and a UPS Charger/Controller
- Automatically detects a connected battery module (787-87x)
- Maximized battery life via temperature-controlled battery management



Display with Charge Status Indication

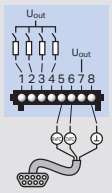
- Indicates actual current and voltage values
- Bar graph displays the charge level of connected batteries
- Integrated fault memory



RS-232 Serial Interface

- Free download* of the Configuration and Visualization Software (759-870)
- Free download of function blocks for visualization on standard PLC systems
- Serial Communication Cable (787-890 or -892) available as an accessory

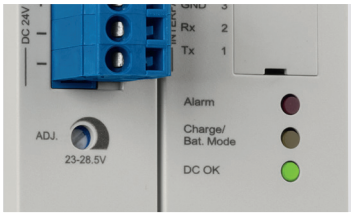
***www.wago.com**



787-890

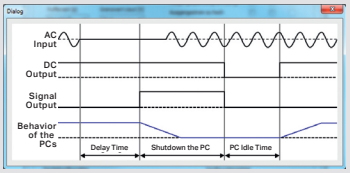
Diagnostics, Monitoring, Configuration

- LEDs display operating status, warnings and errors
- Signal outputs can be processed as a digital signal in a PLC
- Potential-free signal contacts
- Parameter setting via on-unit buttons or rotary switch
- Visualization or configuration via RS-232 serial interface



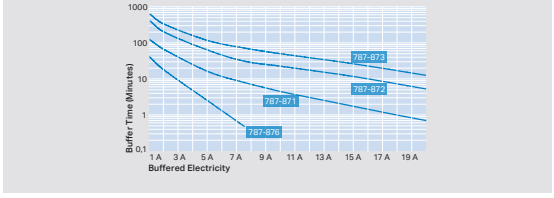
Shutdown Mode

- Function for the controlled shutdown of controllers and PCs
- Shutdown signal transmitted to controller through UPS
- Adjustable on/off times



Buffer Time

- Based on battery capacity and discharge current
- Several battery modules available with capacities from 0.8–12 Ah (up to 26 Ah upon request)
- Parallel connection of up to three battery modules of the same type increases buffer time – any lead battery modules can be connected (see pages 42/43)



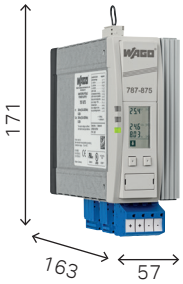
Buffer time (minutes)
Buffered current

Uninterruptible Power Supplies (UPS)

Reliable Back Up Power - Even for Longer Power Outages

UPS Chargers and Controllers 24 VDC

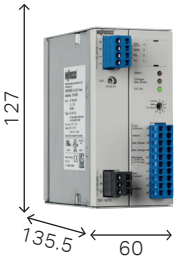
787-870
10 A



787-875
20 A

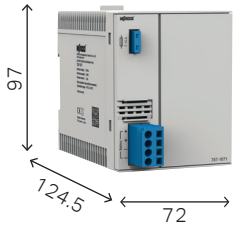
787-915
40 A

Power Supply with Integrated UPS Charger and Controller 24 VDC



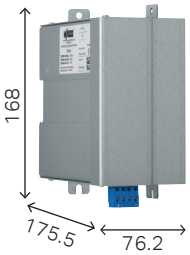
787-1675
5 A

Lead-Acid AGM Battery Modules 24 VDC

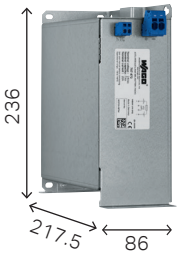


787-1671
0.8 Ah

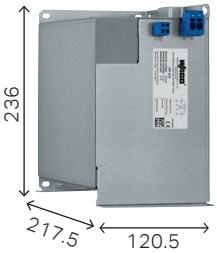
787-876
1.2 Ah



787-871
3.2 Ah

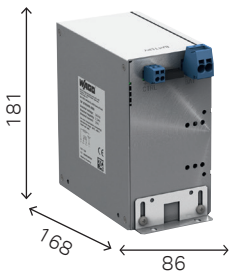


787-872
7 Ah

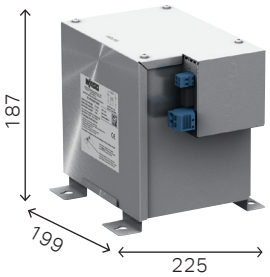


787-873
12 Ah

Pure Lead Battery Modules 24 VDC



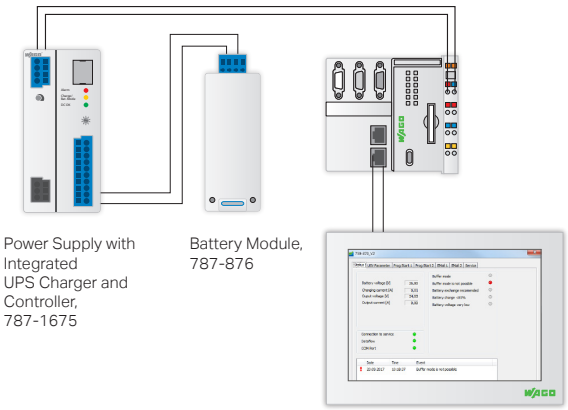
787-878/0000-2500
2.5 Ah



787-878/0001-3000
13 Ah

Solutions

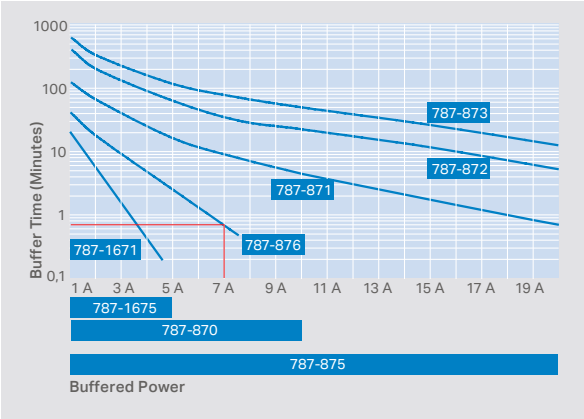
Reliable Back Up Power - Even for Longer Power Outages



Power Supply with Integrated UPS Charger and Controller, 787-1675

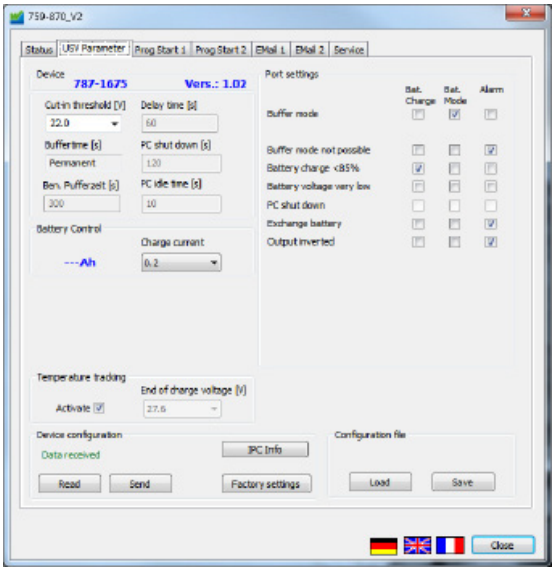
Battery Module, 787-876

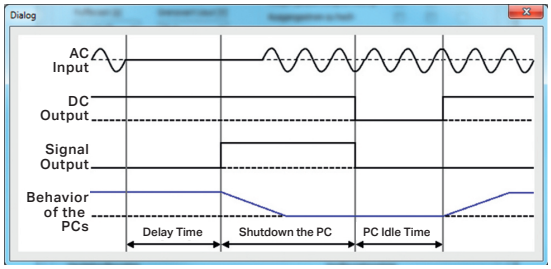
Buffer Time vs. Load Current



Different buffer times/currents can be achieved depending on the battery module selected. The example above shows a 7 A load current provided for approximately 30 seconds by a 787-870 UPS Charger/Controller (10 A) and 787-876 Battery Module.

Controlled System Shutdown via UPS Shutdown Function





UPS units can be conveniently configured using the free 759-870 Configuration Software. Values for the input voltage, battery data, output voltage and current, as well as error statuses, are displayed in the software.

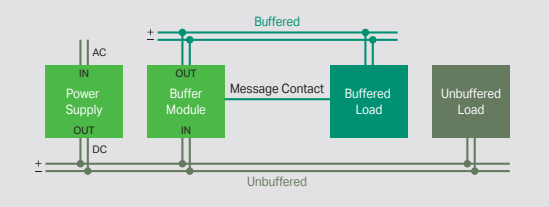
In addition to easily connecting to a PC, the UPS units can be connected to the WAGO I/O System or another control system via RS-232 serial interface. Free function blocks allow easy monitoring of the UPS input and output data.

CAPACITIVE BUFFER MODULES

Short-Term Power Reserves for Power Failure and Load Change

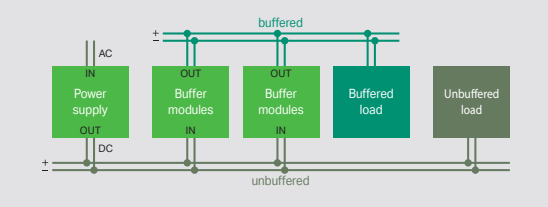
Decoupled Output

- Integrated diode
- Buffered and unbuffered loads can be decoupled



Parallel Connection Possible

- Multiple buffer modules can be parallel-connected to increase buffer time or load current

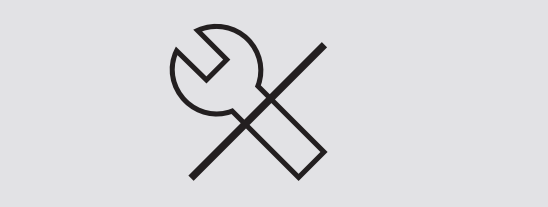


Indication

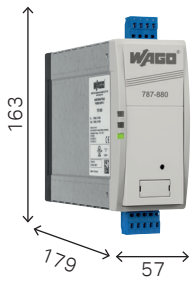
- Three LEDs (green/yellow/red) indicate the current operating status
- An Isolated-free signal contact indicates the charge level

Maintenance-Free

- Regular replacement of the modules is not necessary thanks to the long life of the integrated gold caps



Capacitive Buffer Modules
24 VDC



787-880
10 A/0.06 ... 7.2 s

787-881
20 A/0.17 ... 16.5 s

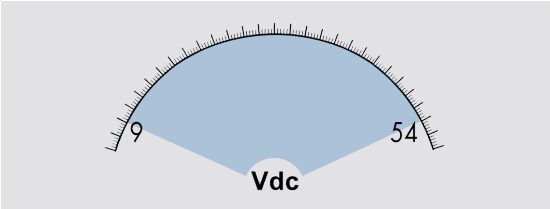
787-916
40 A/0.3 ... 6.6 s

REDUNDANCY MODULES

Reliably Increasing Power Supply Availability

Highly Versatile

- Diode Redundancy Modules (787-783 and -785) can be used for 12 V, 15 V, 24 V or 48 V power supplies thanks to their wide voltage range



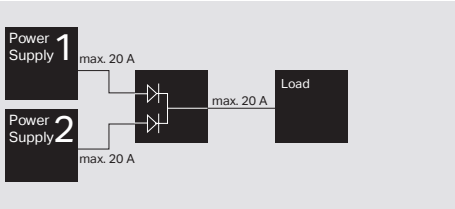
Indication

- Three LEDs indicate the presence of an input or output voltage
- Optional isolated signal contact indicates a power outage at the input

(only for 787-885 and -886)

High Overload Capability

- Power diodes in each input path feature a high overload capability and are also suitable for power supplies with TopBoost or PowerBoost.
- Output currents up to 76 A thanks to parallel connection of the input paths



Low Power Loss

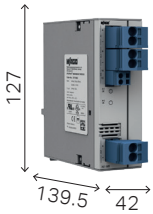
- Low power loss due to active-switching MOSFETs*
- Includes MOSFET function monitoring*

* only for 787-1685

Redundancy Modules

Input: 2 x 24 VDC / 2 x 20 A

787-885
24 VDC / 20/40 A (max.)



787-1685* (MOSFET Redundancy Module)
24 VDC / 40 A (max.)

Input: 2 x 48 VDC / 2 x 20 A

787-886
48 VDC / 20/40 A (max.)

* optionally available as .../000-070 with protective coating

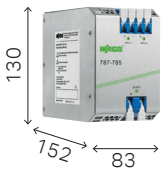
Input: 2 x 9 ... 54 VDC / 2 x 12.5 A (max.)

787-783
9 ... 54 VDC /
12.5/25 A (max.)

787-783/000-040*
9 ... 54 VDC /
12.5/25 A (max.)

Input: 2 x 9 ... 54 VDC / 2 x 40 A (max.)

787-785
9 ... 54 VDC /
40/76 A (max.)



787-785/000-040*
9 ... 54 VDC /
40/76 A (max.)

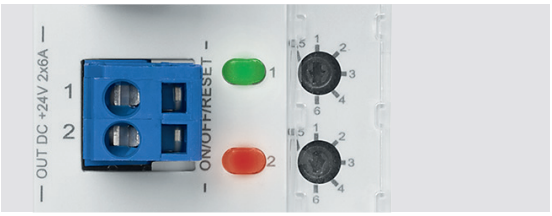
* /000-040 variant with ATEX, IECEx and UL-12.12.01 approval

ELECTRONIC CIRCUIT BREAKERS

Precise, space saving protection for DC Circuits

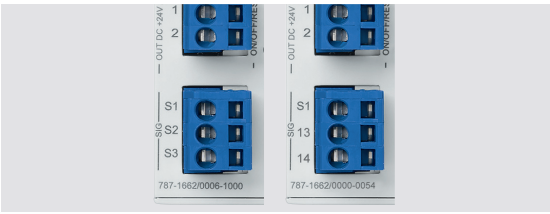
Intuitive Status Indication

- Each output channel has backlit buttons for switching on/off, as well as status acknowledgement.
- Integrated, multi-color LEDs indicate the operating status of each channel.



Communication 1.0

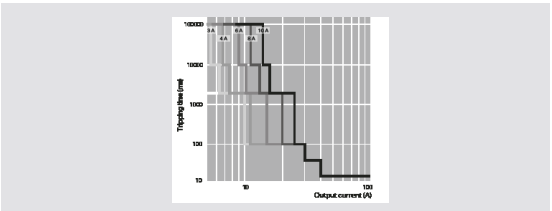
- Remote digital input S1 resets all tripped channels.
- Digital output S3 transmits a simple group message indicating whether one of the channels was tripped by an overcurrent.
- Optional isolated signal contact 13/14 as group signal



Trip Characteristics

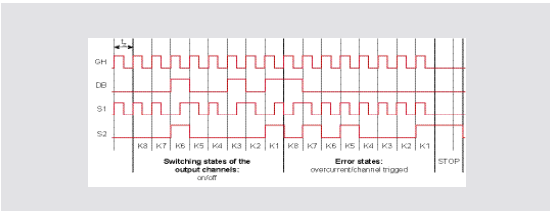
- Reliable and precise disconnection in case of overcurrent or short circuit
- Nominal currents can be set separately for each channel in 1 A increments.
- Tripping time can be configured in defined increments.
- Optional, active short circuit current limitation to 1.7 times the nominal current prevents a voltage drop in other current paths.

*only for 787-166x/xxxx-1xxx



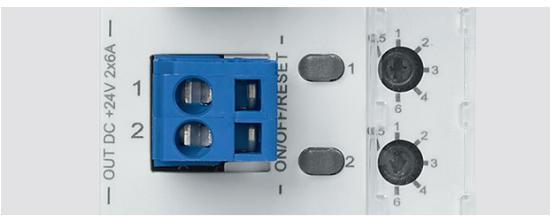
Communication 2.0

- Remote digital input (S1) switches certain channels on and off via pulse sequence.
- Digital output S2 transmits the current status (on/off/tripped/overcurrent) of each individual channel.
- Optional transmission of input voltage and output/nominal current value for each channel



Rotary Switch

- Nominal current can be individually adjusted for each channel.
- The setting is visible, even when no voltage is applied.
- Transparent cover can be sealed and marked.



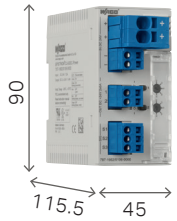
Communication 3.0

- IO-Link interface
- Read both the status and nominal current setting, as well as actual voltage/current values per channel.
- Set the nominal current, as well as switch on/off and reset individual channels.

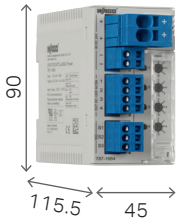
IO-Link

Electronic Circuit Breakers (ECBs)

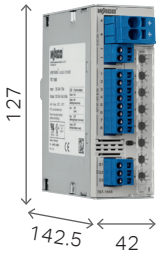
Product Overview



2 channels



4 channels



8 channels

Nominal Voltage [V] DC	Number of Channels	Adjustable Nominal Current	Communication	Active Current Limitation	Special Configuration	Item Number
24	2	2 … 10	Manchester protocol			787-1662
		2 … 10	Potential-free signal		■	787-1662/000-054
		3.8 LPS	Manchester protocol	■		787-1662/004-1000
		0.5 … 6	Manchester protocol	■		787-1662/006-1000
		1 … 6	Manchester protocol			787-1662/106-000
24	4	2 … 10	Manchester protocol			787-1664
		2 … 10	Manchester protocol		■	787-1664/000-004
		2 … 10	Potential-free signal		■	787-1664/000-054
		1 … 10	IO-Link protocol			787-1664/000-080
		3.8 LPS	Manchester protocol	■		787-1664/004-1000
		0.5 … 6	Manchester protocol	■		787-1664/006-1000
		1 … 6	Manchester protocol			787-1664/106-000
		2 … 12	Manchester protocol	■		787-1664/212-1000
		0.5 … 6	Potential-free signal	■	■	787-1664/006-1054
24	8	2 … 10	Manchester protocol			787-1668
		2 … 10	Manchester protocol		■	787-1668/000-004
		2 … 10	Potential-free signal		■	787-1668/000-054
		1 … 10	IO-Link protocol			787-1668/000-080
		0.5 … 6	Manchester protocol	■		787-1668/006-1000
		1 … 6	Manchester protocol			787-1668/106-000
		0.5 … 6	Potential-free signal	■	■	787-1668/006-1054
12	4	2 … 10	Manchester protocol			787-1664/000-100
48		2 … 10	Potential-free signal			787-1662/000-250
	4	2 … 10	Manchester protocol			787-1664/000-200
		2 … 10	Potential-free signal			787-1664/000-250
	8	2 … 10	Manchester protocol			787-1668/000-200
		2 … 10	Potential-free signal			787-1668/000-250

Additional information on ECBs' communication options can be found on pages 46/47.

Model Code Key:

787-xx6a/bbcc-defg

Series

Version

Electronic Circuit Breaker

Number of Channels

Lower Nominal Current (00: 0.5 A; 01: 1 A; 02: 2 A)

Upper Nominal Current (04: 3.8 A; 06: 6 A; 08: 8 A; 12: 12 A)

With (1) or without (0) active current limitation

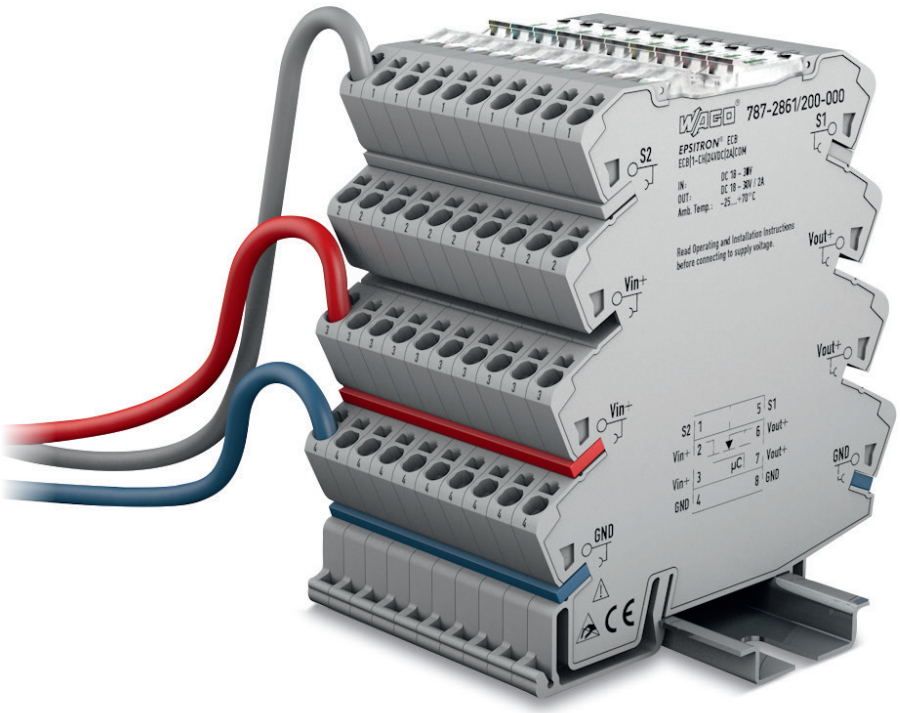
Nominal Voltage (0: 24 VDC; 1: 12 VDC; 2: 48 VDC)

With (5) or without (0) potential-free contact;
(2) Settable single-channel variant;
(5) Communication; (8) IO-Link

Configuration (0: Standard; 4: with group message “tripped” and “switched off;” 5, 6: Customer specification)

ELECTRONIC CIRCUIT BREAKERS

Space-Saving Protection for DC Circuits

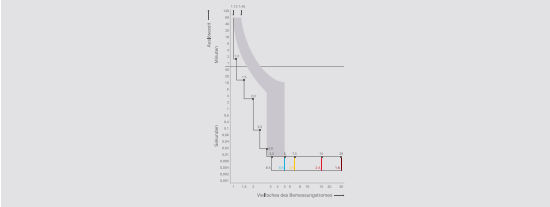


Intuitive Status Indication

- Integrated multi-color LEDs indicate the operating status of each channel
- Push/slide switch for switching on/off and acknowledgment

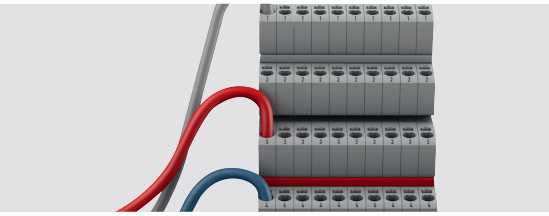
Trip Characteristics

- Reliable, fast and precise disconnection in case of overcurrent or short circuit
- High switch-on capacities > 50,000 µF



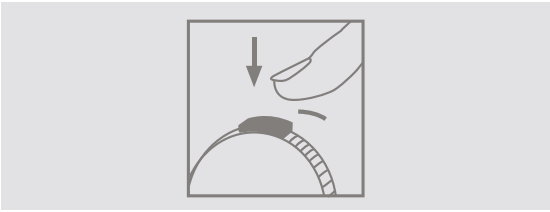
Easy Wiring

- Input potential up to 40 A via double connection
- Signal output can be commoned for up to 30 devices.
- Total reset by commoning the signal inputs

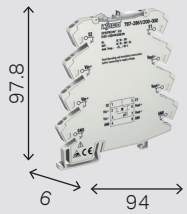


Versatile Configuration Options

- Optional nominal current setting 1 ... 8 A, in 1 A increments
- Seven different configuration options for the digital measurement output



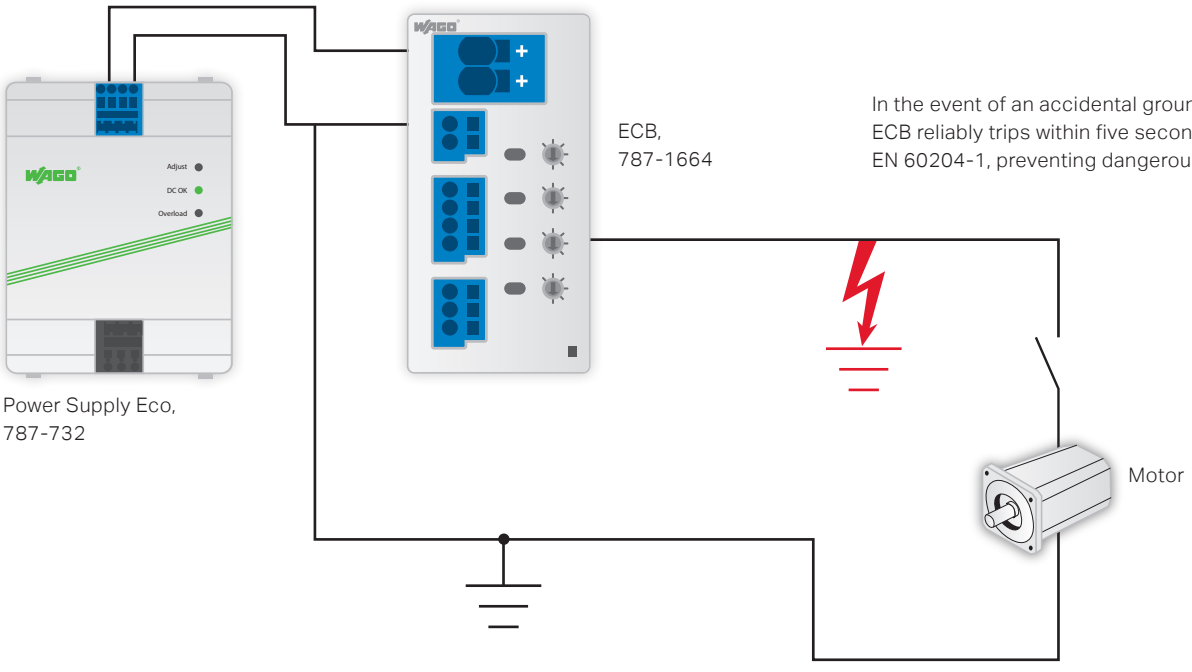
24 VDC – 1-Channel

Electronic Circuit Breaker	Item Number	Nominal Current	Communication	Color Coding
	787-2861/050-000	0.5 A	Signal contact	
	787-2861/100-000	1 A	Signal contact	
	787-2861/200-000	2 A	Signal contact	
	787-2861/400-000	4 A	Signal contact	
	787-2861/600-000	6 A	Signal contact	
	787-2861/800-000	8 A	Signal contact	
	787-2861/108-020	1 ... 8 A	Signal contact	

Additional information on ECBs' communication options can be found on pages 46/47.

Solutions

ECBs Prevent Accidental Restart

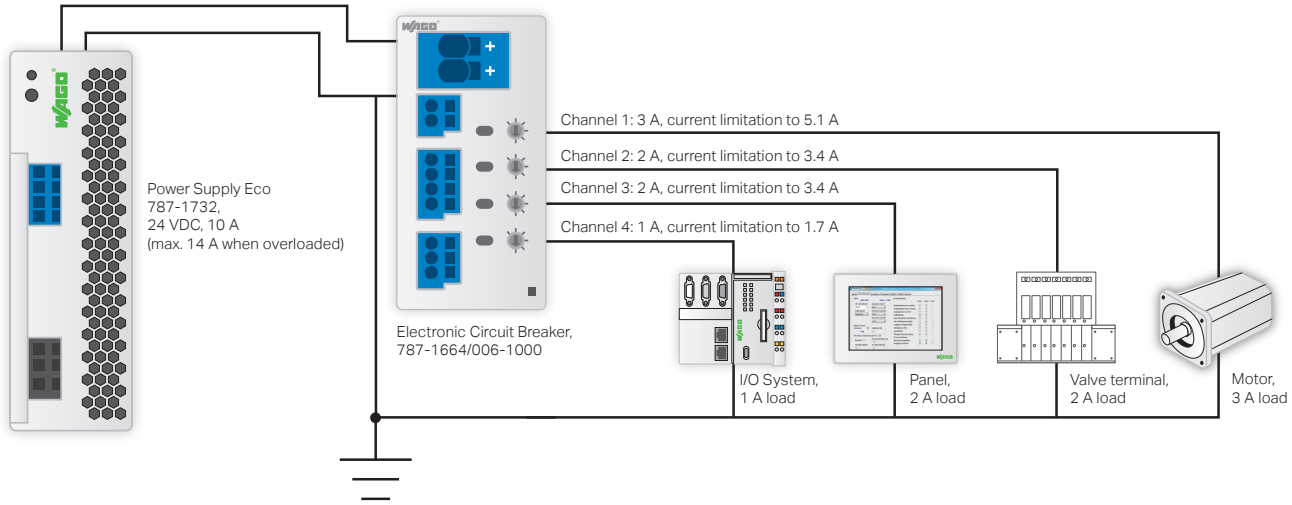


Power Supply Eco,
787-732

ECB,
787-1664

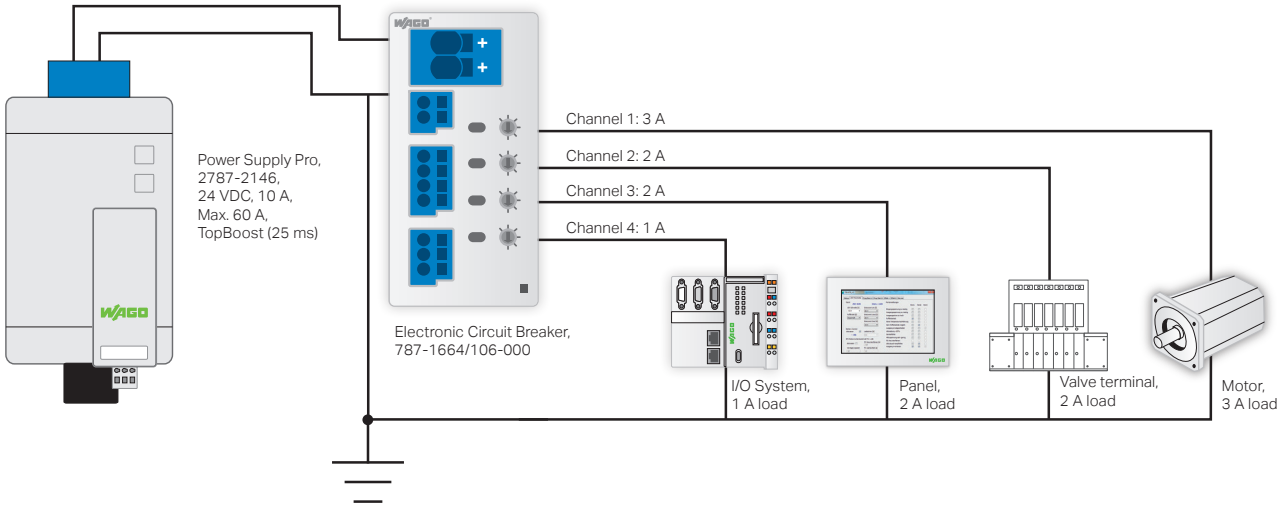
In the event of an accidental ground fault, the ECB reliably trips within five seconds based on EN 60204-1, preventing dangerous conditions.

Power Supply Selection for ECBs with Active Current Limitation



	Channel 1	Channel 2	Channel 3	Channel 4	Σ	Effects
Max. continuous current (no error)	3 A	2 A	2 A	1 A	8 A	• Normal operation
Max. continuous current (error: channel 1)	5.1 A	2 A	2 A	1 A	10.1 A	• The current on channel 1 is limited to 1.7 times the nominal current • Impedance of error loop not significant • No voltage drop on channels 2, 3 and 4
Max. continuous current (error: all channels)	5.1 A	3.4 A	3.4 A	1.7 A	13.6 A	• The current per channel is limited to 1.7 times the nominal current • Impedance of error loop not significant • Voltage drop on all channels because power supply is overloaded • Circuit breaker switched off due to undervoltage detection

Power Supply Selection for ECBs without Current Limitation

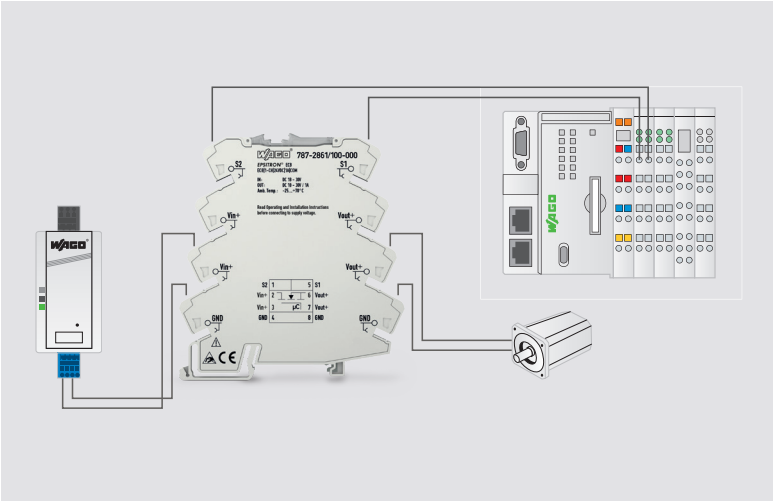


	Channel 1	Channel 2	Channel 3	Channel 4	Σ	Effects
Max. continuous current (no error)	3 A	2 A	2 A	1 A	8 A	• Normal operation
Max. continuous current (error: channel 1)	Max. 55 A available*	2 A	2 A	1 A	60 A (Top-Boost)	• Depends on error loop impedance • Short voltage drop possible; trigger time according to characteristic
Max. continuous current (error: all channels)	Current values depend on error loop impedance.				60 A (Top-Boost)	• Current is limited by error loop impedance • Voltage drop on all channels very probable because power supply is overloaded

* (60 A −2 A −2 A −1 A)

Communication

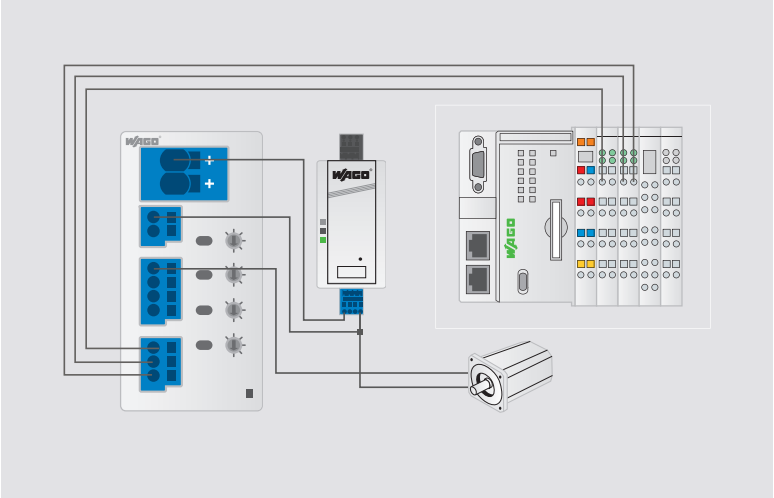
Electronic Circuit Breakers (ECBs)



Communication 1.0
Digital Signaling (S/P)

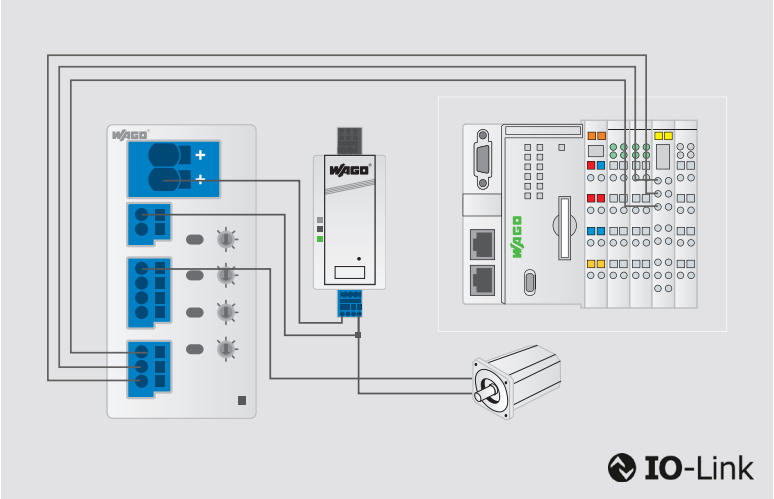
ECBs can be reset via digital control signal. The 787-2861 ECB can also be switched on and off with this control signal.

A digital output signal indicates the status of the channel or the sum of the channels for 787-166x ECBs. For some devices, this signal is potential-free (P).



Communication 2.0
Manchester Protocol (M)

The PLC transmits a coded pulse pattern to control input S1. The ECB synchronizes itself automatically. The current status of all output channels is transmitted back simultaneously via signal output S2. The edge change is interpreted as high or low. For each channel, both status and voltage/current values can be transmitted individually.



Communication 3.0
IO-Link (I)

For each channel, both status and voltage/current values can be transmitted individually via IO-Link COM3 interface. The nominal output current can also be configured via this interface if the device's rotary switch is set accordingly.

The IO-Link cyclic communication is much faster than the Manchester protocol.

S = Signal
P = Potential-free signal
I = IO-Link protocol
M = Manchester protocol

Function blocks for ECB monitoring that use the WAGO I/O System, or different control systems, are available for free.

ECBs have digital inputs and outputs that communicate via the Manchester protocol.

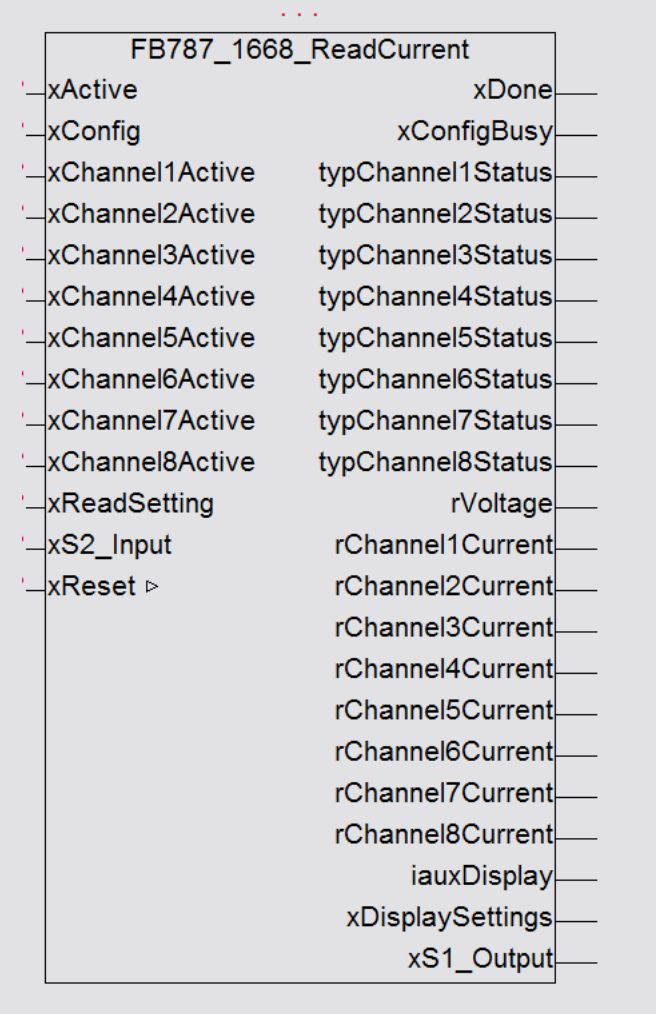
All channels can be diagnosed and switched remotely independently of each other.

Transmission of:

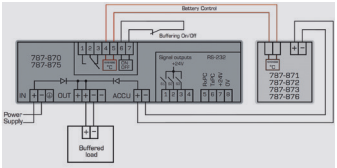
- State per channel
- Current output current (only for 787-166x/xxxx-1xxx and 787-166x/xxxx-xx8x)
- Nominal current setting per channel
- Input voltage
- Power on/off and reset per channel
- Nominal current setting (only for 787-166x/xxxx-xx8x)

Available Function Blocks:

- WAGO-I/O-SYSTEM
- CODESYS
- Siemens S7/TIA-Portal
- Schneider
- Rockwell
- Mitsubishi (pending)



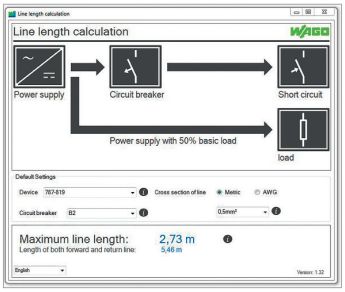
Glossary



Battery Control

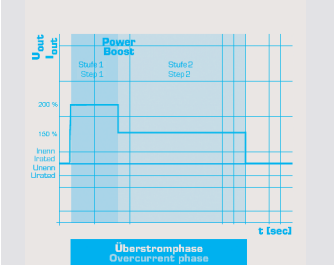
The battery control technology allows data exchange between intelligent battery modules and a UPS charger/controller.

In addition to temperature values, information on type and service life of the connected battery modules is also transmitted to the UPS charger and controller.



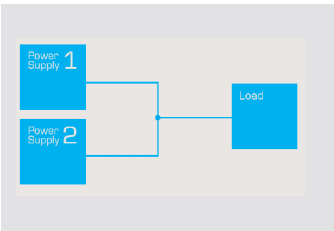
TopBoost

In order for high-speed magnetic circuit breakers to trip, currents that are significantly higher than the rated current are required for 10–12 milliseconds. Both Pro and Pro 2 Power Supplies deliver a multiple of their nominal current for a short time – the faulty circuit can be shut off within milliseconds during a short circuit. This increases uptime of the entire power supply while fulfilling EN 60204-1 requirements regarding grounding in control circuits. Using the free line length calculator available from www.wago.com/epsitron, the designer or planner can check in advance the layout of the line protection based on cable lengths, cable cross-section, characteristics of the protective device and the type of power supply.



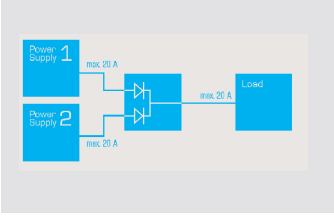
PowerBoost

During start-up or switching of capacitive loads (valve clusters, motors, etc.), there is an increased need for current. However, using conventional power supplies used to always require using a much larger power supply to avoid switching to overload operation or short circuit limitation.
For these cases, WAGO's Pro and Pro 2 Power Supplies offer power reserves and provide significantly higher output current above the nominal current for a few seconds. The availability of the higher output power for a short time ensures reliable operation and eliminates the expensive oversizing of power supplies. This also saves space in the control cabinet and reduces power losses while ensuring optimum efficiency.



Parallel Connection of Power Supplies – for Extra Power

Most WAGO Power Supplies can be connected in parallel on the output side to provide extra power. To achieve load distribution that is as uniform as possible for parallel-connected devices, the output voltage without load must be set as precisely as possible to the same value. Star wiring using external rail-mount terminal blocks is required to ensure that the levels for all power supplies are as similar as possible to the load. Do not connect the power supplies directly via their female connectors. Pro and Pro 2 Power Supplies with differing output power levels may also be connected in parallel. Otherwise, only connect power supplies of the same type in parallel.



Parallel Connection of Power Supplies – for Increased Power Availability

Parallel connection using decoupling diodes in the respective current path can increase both system uptime and reliability. In normal operation, both units supply the load. If a power supply fails, the intact power supply becomes responsible for completely supplying the load. Of course, the nominal current of each power supply must be higher than the maximum load current that occurs. The redundancy modules feature powerful decoupling diodes that reliably prevent reverse currents. The decoupling diodes ensure 100% redundancy, i.e., even for the rare case of an internal secondary short circuit in the power supply.

Accessories

RS-232 Communication Cable (787-890); 1.8 m long
This communication cable is used for configuration and visualization via PC, notebook or PLC. It is suitable for all 787-8xx Series devices equipped with a serial interface.

Connectors: 8-pole female connector (733-108) with strain relief (787-8xx module side) and 9-pole D-sub female connector (PC/PLC side)
RS-232 Communication Cable (787-892); 1.8 m long (not pictured)
Similar to 787-890, but carries a 4-pole female connector (734-104) compatible with 787-1675

Operating Tools; with a partially insulated shaft; ideal for operating terminal blocks
210-719: Operating Tool; with a partially insulated shaft; Type 1; (2.5 x 0.4) mm blade; suitable for 733 and 734 Series Female Connectors
210-720: Operating Tool; with a partially insulated shaft; Type 2; (3.5 x 0.5) mm blade; suitable for 231, 236 and 721 Series Female Connectors

210-721: Operating Tool; with a partially insulated shaft; Type 3; (5.5 x 0.8) mm blade; suitable for 831 Series Female Connectors

210-769: Phillips PH0 Operating Tool; Type 1; PH0 blade; for setting the voltage of the Power Supplies Compact (787-10xx 787-17xx, 787-7xx)

USB Configuration Cable (750-923); 2.5 m long
This USB configuration cable is used for configuring the Pro 2 Power Supply from a PC with G2 Interface Configuration Software, but can also be used for configuring Signal Conditioners or the WAGO I/O System 750/753. Connection configuration: 4-pole male connector on USB plug (type A), galvanic isolation

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Marking Strip (2009-110); on reel; not stretchable; plain; snap-on type; white
50 m long, 11 mm wide; can be marked, e.g., with Smart Printer thermal transfer printer and Smart Designer marking software; suitable for all Pro 2 Power Supplies, Classic Power Supplies and ECBs that are provided with a market slot. Also suitable for TOPJOB® S Rail-Mount Terminal Blocks and 285 Series on type A USB plug; galvanic isolation

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