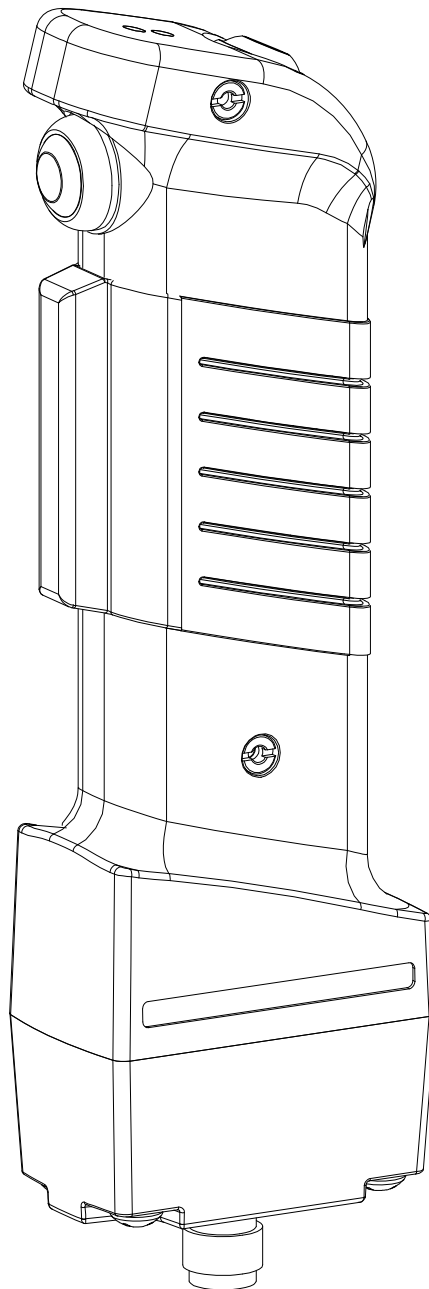


Original Instructions

# JSHD4

3-position device



## Please read and understand the contents of this User Manual

Please read and understand this manual before using the products. Please consult your ABB JOKAB SAFETY representative if you have any questions or comments.

### **WARRANTY**

ABB JOKAB SAFETY guarantees that the products are free from defects in materials and workmanship for a period of one (1) year (or other period if specified) from the date of sale by ABB JOKAB SAFETY.

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In no event shall responsibility of ABB JOKAB SAFETY for any act exceed the individual price of the product on which liability is asserted.

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The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this manual.

Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, and installations subject to separate industry or government regulations.

Systems, machines, and equipment that could present a risk to life or property.

Determine and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE ABB JOKAB SAFETY PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

### **PERFORMANCE DATA**

While every effort has been taken to ensure the accuracy of the information contained in this manual, ABB JOKAB SAFETY cannot accept responsibility for errors or omissions and reserves the right to make changes and improvements without notice. Performance data given in this document are provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of ABB JOKAB SAFETY'S test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the ABB JOKAB SAFETY Warranty and Limitations of Liability.

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# 1 Introduction

## Scope

The purpose of these instructions is to describe the 3-position device JSHD4 and to provide the necessary information required for installation, operation and maintenance. These instructions also contain the information necessary to connect JSHD4 to a safety loop. Please note that JSHD4 can connect to both relays in the RT-series and to safety PLC Pluto.

Special AS-i data and instructions for actuators with AS-i-nodes are omitted and can be found in the user manual for JSHD4 AS-i.

## Readers

This document is intended for authorised installation staff.


## Prior knowledge

It is assumed that the reader of this document has knowledge of the following:

- Basic knowledge of products from ABB Jokab Safety.
- General knowledge of safety devices.
- General knowledge of machine safety.

## Special notes

Pay attention to the following special notes throughout the whole document:

 **Warning!** Risk of severe personal injury!  
An instruction, directive or procedure which, if not performed correctly, could result in injury to the operator or other staff.

**Caution!** Risk of damage to the equipment!  
An instruction, directive or procedure which, if not performed correctly, could result in damage to the equipment.

**Note!** Notes are used to provide important or explanatory information.

## 2 Overview

### General description


JSHD4 is a two channel actuator with 3-position push buttons designed for use in hazardous areas where alternative protective devices are not possible or practical. As an independent unit, the device is inadequate for this task and must therefore be connected to a suitable control device (safety relay or safety PLC) with inputs for dual-channels and short circuit protection. Additionally, the machinery or the equipment causing the potential danger needs to be put in jog position or otherwise restricted in movement, speed, temperature, etc.

Two 3-position push buttons that are simultaneously enabled by a common surface allow for a high level of safety, both when the push buttons are released or pressed in to their third and final position. The safety connectors are only closed in the button's midpoint position, but open when pressed in further and are held open when the button is released to its top position (sleep position).

The anti-cheat protection consists of a capacitance sensor and an accelerometer, and the combination of these is used to determine if there is an operator holding the 3-position device. This is useful if there is a risk that the device could be used improperly.

JSHD4 is based on a modular system which makes it possible to assemble a complete three-position device with different top parts (handle) and bottom parts (which may have different cables or connectors, AS-i nodes, emergency stops, etc. integrated). There are also a number of accessories available, such as mounting plates for interlock switches, anti-cheat-boards, cables and brackets. For more information, see the *Overview of models* chapter.

For more information about JSHD4 in operation, see the *Operation* chapter.

 **Warning!** The anti-cheat protection is not a safety function as safety is based on the operator using the 3-position button.

### Safety instructions

 **Warning!**

Carefully read through the entire user manual before using the unit.

The units must be installed by a trained electrician who observes the safety regulations, the specified standards and the Machinery Directive.

Failure to comply with these instructions, any operation that is not in accordance with what is stated in these instructions, and the improper installation or handling of the unit can all impact on the safety of people and equipment.

For installation and the prescribed use of the product, the special notes indicated must be carefully observed and the technical standards relevant to the application must be complied with.

Failure to comply with the instructions or standards, especially when tampering with and/or modifying the product, voids all liability.

## Functional description

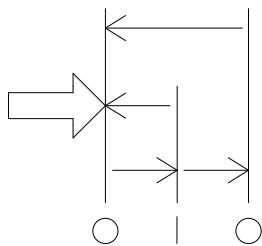
### 3-position principle

A 3-position switch provide signals that:

- when enabled, allow a machine or other device to start from a separate start controller, and
- when disabled, initiates a stop function and prevents the machine or equipment from starting.

A 3-position switch can also be used as a “hold-to-run” device. When it is used in this way, a machine can be run at the same time as a protected area can be accessed. One way of achieving this is by pressing in the 3-position button to the midpoint position (ON) and remove it from the holder with a proximity sensor, which in turn causes another safety device (light guard, interlock switch etc.) to be bypassed which means the protected area can be accessed without stopping the machine. Certain limitations of times, speeds, etc. may be necessary to achieve an acceptable level of safety.

Two 3-position switches are used and controlled simultaneously to create a two-channel safety system.



The symbol for the 3-position switch shows the three positions (OFF, ON, OFF) with O and I, actuating force from left to right, and possible paths for the switch (IEC 60947-5-8:2006).

An important feature of a 3-position switch is that when it returns from position 3, the ON position is never reached – the connectors are kept open.

The three positions are indicated as follows:

Position 1: The connector is in the OFF position (the button is not pressed)

Position 2: The connector is in the ON position (the button is pressed to normal operating position)

Position 3: The connector is in the OFF position (button is fully depressed)

When you release the button, it will always return to position 1, regardless of whether it was in position 2 or 3. The connectors are kept open during the entire movement.

In addition to the safety function that is enabled by the 3-position buttons, JSHD4 can also be fitted with other extensions such as push buttons for selectable functions (start, stop, grippers, etc.), emergency stop or an anti-cheat-board.

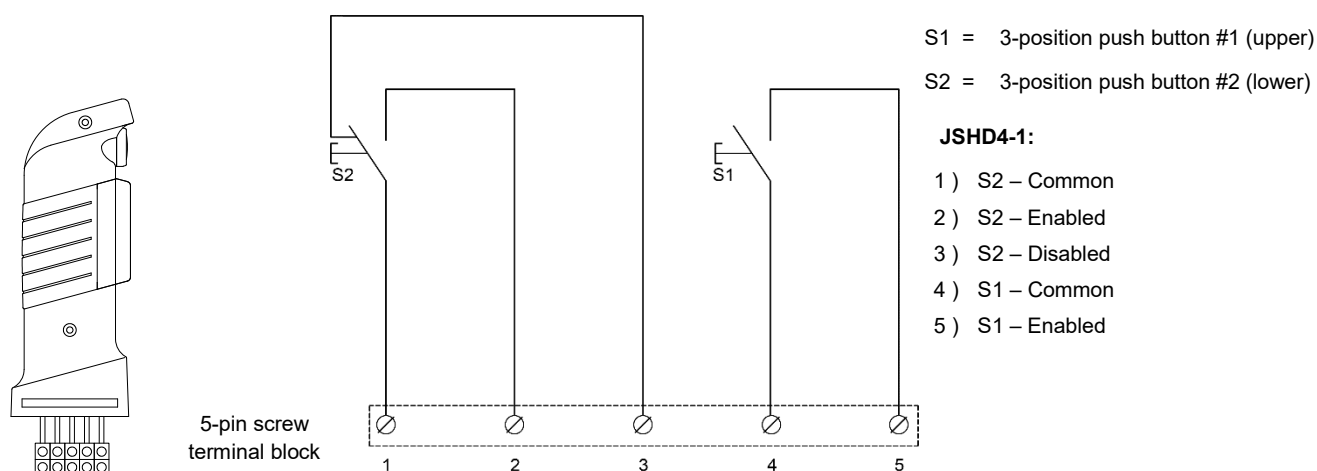
### The anti-cheat unit

Many variants of JSHD4 can be fitted with a sensor that prevents improper use of the actuator (e.g., by keeping the 3-position buttons in the ON position using a rubber band or similar). The sensor detects a human hand and the small movements/vibrations that are natural when a handle is being held in one hand. As long as both of these requirements are met (detected) a connector will close. With a proper connection, the connector can be used to break the safety circuit and consequently prevent misuse.

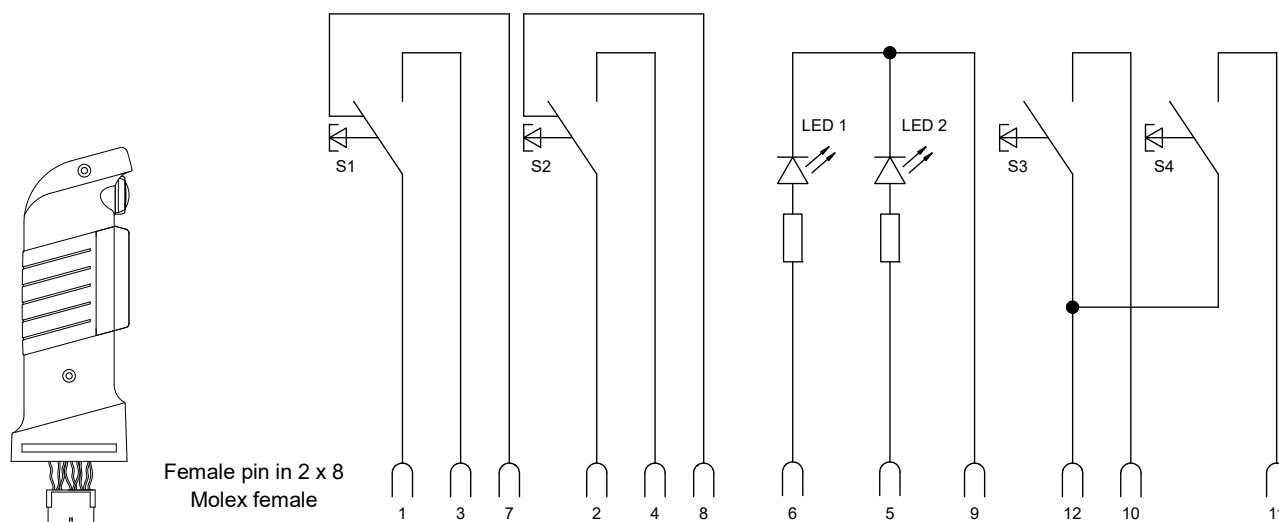
### 3 Connections

#### Top parts

#### Electrical connections – JSHD4-1



#### Electrical connections – JSHD4-2, -3, -4, -5



Note: 2 x 8 Molex females on the top parts JSHD4-2...5 fit into the corresponding connector on the bottom parts.

- S1 = 3-position push button #1 (upper)
- S2 = 3-position push button #2 (lower)
- S3 = Top push button
- S4 = Front push button
- LED 1 = Red LED
- LED 2 = Green LED

| #   | Description          | JSHD4-2 | JSHD4-3 | JSHD4-4 | JSHD4-5 |
|-----|----------------------|---------|---------|---------|---------|
| 1)  | S1 – Common          | x       | x       | x       | x       |
| 2)  | S2 – Common          | x       | x       | x       | x       |
| 3)  | S1 - Enabled         | x       | x       | x       | x       |
| 4)  | S2 - Enabled         | x       | x       | x       | x       |
| 5)  | +24 VDC (LED 2)      | x       | x       | x       | x       |
| 6)  | +24 VDC (LED 1)      | x       | x       | x       | x       |
| 7)  | S1 – Disabled        | x       | x       | x       | x       |
| 8)  | S2 - Disabled        | x       | x       | x       | x       |
| 9)  | 0 VDC (LED 1, LED 2) | x       | x       | x       | x       |
| 10) | S3 – Enabled         | x       | -       | -       | x       |
| 11) | S4 – Enabled         | x       | -       | x       | -       |
| 12) | S3, S4 – Common      | x       | -       | x       | x       |

## Anti-cheat-board

The anti-cheat-board (optional) can be connected individually or in series by one of the 3-position buttons (S1 or S2).

### Warning!

When the anti-cheat-board is connected **in series** with a 3-position push button, one of the following two options are implemented to ensure the 3-position push button functions correctly:

1. Concurrent control of the two channels when enabling the two switches.
2. Monitored reset of the 3-position button connected in series with the anti-cheat-board.

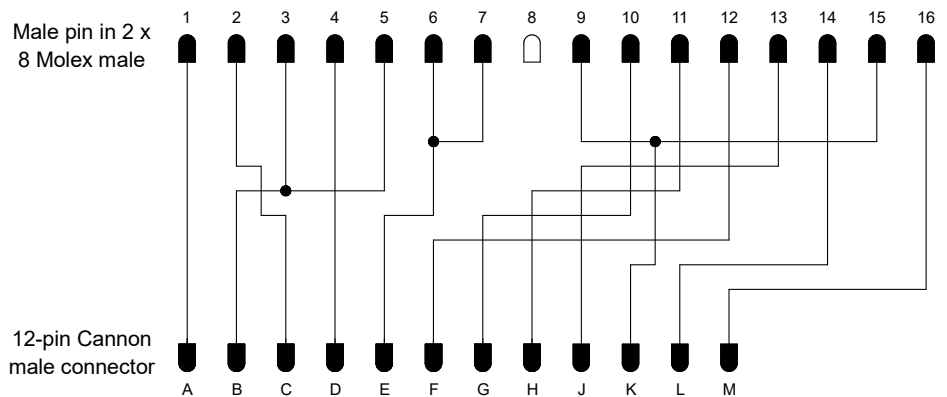
## Bottom parts

### Electrical connections – AB

#### Bottom part – AB:

12-pin Cannon male connector

- A ) S1 – Common\*
- B ) S1 – Enabled
- C ) S2 – Common
- D ) S2 – Enabled
- E ) S1 – Disabled
- F ) S3, S4 – Common
- G ) S3 – Enabled
- H ) S4 – Enabled
- J ) +24 VDC (anti-cheat)
- K ) 0 VDC (anti-cheat, LED 1, LED 2)
- L ) Anti-cheat – Common
- M ) Anti-cheat – Operator detected



\* Note: The COM signal must be +24 VDC to allow the LEDs and anti-cheat-board to function properly.

Note: 12-pin Cannon connector, connected internally to fit the regular monitoring unit. Anti-cheat-board is an option.

### Electrical connections – AC

#### Bottom part – AC:

5-pin M12 male connector

- 1 ) Brown: S2 – Common
- 2 ) White: S1 – Common
- 3 ) Blue: S2 – Enabled
- 4 ) Black: S1 – Enabled
- 5 ) Grey: S1 – Disabled

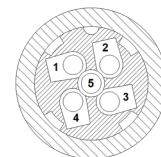
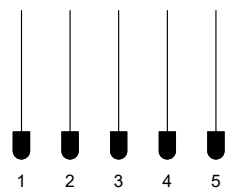
Note:

Connections in compliance with factory-made units.

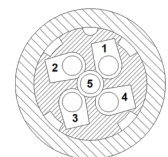
Proposed use following manual assembly. Cable colours for each pin as per list.

5 x individual wires

5-pin M12 male connector



M12 5-pin male connector seen from the cable side



M12 5-pin male connector seen from the cable side

Note: 5-pin M12 male connector. Designed exclusively for top part JSHD4-1. Internally connected for adapting to safety relays in the RT series and Pluto safety PLC. Anti-cheat-board is not an option.

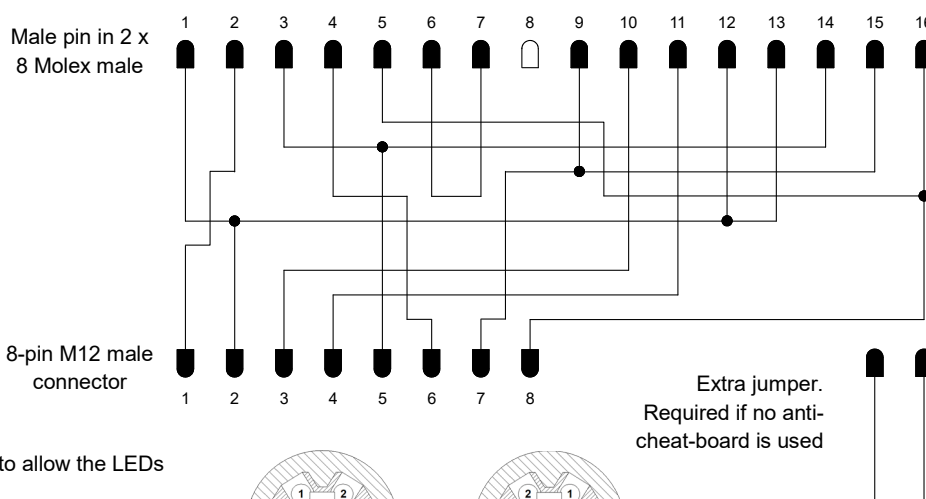


## Electrical connections – AD

### Bottom part – AD:

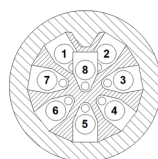
8-pin M12 male connector

- 1) S2 – Common
- 2) S1, S3, S4 – Common\*
- 3) S3 – Enabled
- 4) S4 – Enabled
- 5) S1 – Enabled  
Anti-cheat – Common
- 6) S2 – Enabled
- 7) 0 VDC (anti-cheat, LED 1, LED 2)
- 8) Anti-cheat – Operator detected

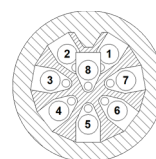


Extra jumper.  
Required if no anti-cheat-board is used

\* Note: The COM signal must be +24 VDC to allow the LEDs and anti-cheat-board to function properly.



M12 8-pin male connector seen from the cable side



M12 8-pin male connector seen from the cable side

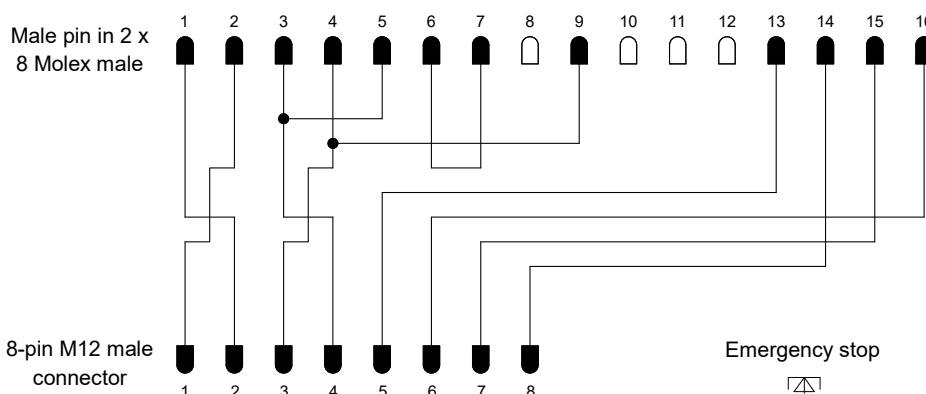
Note: 8-pin M12 male connector with internal connection suitable for safety relays in the RT series and Pluto safety PLC. A jumper must be connected between pins 14-16 on 2 x 8 Molex connectors if no anti-cheat-board is used.

## Electrical connections – AE

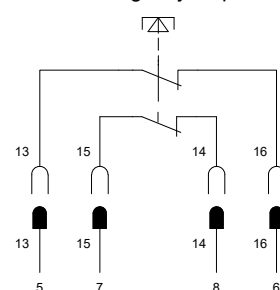
### Bottom part – AE:

8-pin M12 male connector

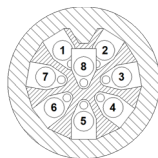
- 1) S2 – Common
- 2) S1 – Common\*
- 3) S2 – Enabled  
0 VDC (LED 1, LED 2)
- 4) S1 – Enabled
- 5) E1 (Emergency stop, channel 1)
- 6) E1 (Emergency stop, channel 1)
- 7) E2 (Emergency stop, channel 2)
- 8) E2 (Emergency stop, channel 2)



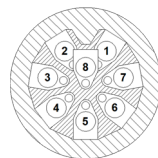
Emergency stop



\* Note: The COM signal must be +24 VDC to allow the LEDs to function properly.



M12 8-pin male connector seen from the cable side



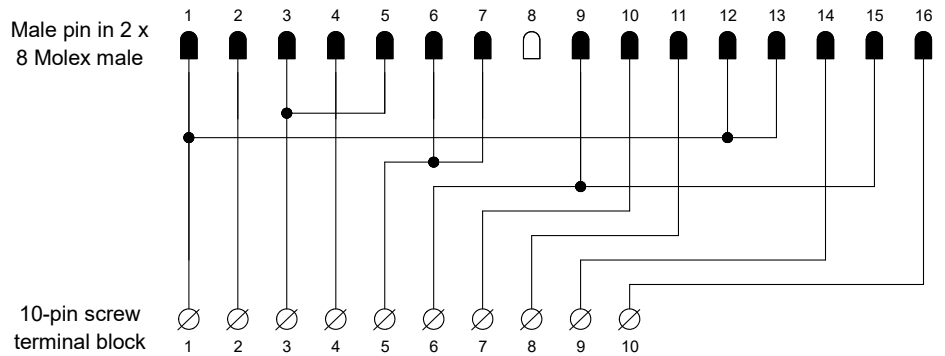
M12 8-pin male connector seen from the cable side

Note: Connect the cables from the emergency stop to the connector on the top part.

Note: 8-pin M12 male connector with internal connection suitable for safety relays in the RT series and Pluto safety PLC. An emergency stop is located on the bottom part, and is connected to pins 13-16 on the 2 x 8 Molex connectors. Anti-cheat-board or extra push buttons are not possible on this unit.

### Electrical connections – AH

- Bottom part – AH:**  
10-pin screw connection
- 1) S1, S3, S4 – Common\*
  - 2) S2 – Common
  - 3) S1 – Enabled
  - 4) S2 – Enabled
  - 5) S1 – Disabled
  - 6) 0 VDC (anti-cheat, LED 1, LED 2)
  - 7) S3 – Enabled
  - 8) S4 – Enabled
  - 9) Anti-cheat – Common
  - 10) Anti-cheat – Operator detected

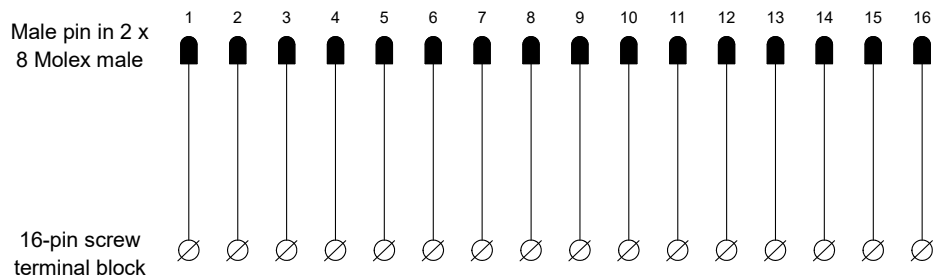


\* Note: The COM signal must be +24 VDC to allow the LEDs and anti-cheat-board to function properly.

Note: 10-pin screw terminal block with internal connection suitable for safety relays in the RT series and Pluto safety PLC. Designed for a manually connected cable. Anti-cheat-board is an option.

### Electrical connections – AJ

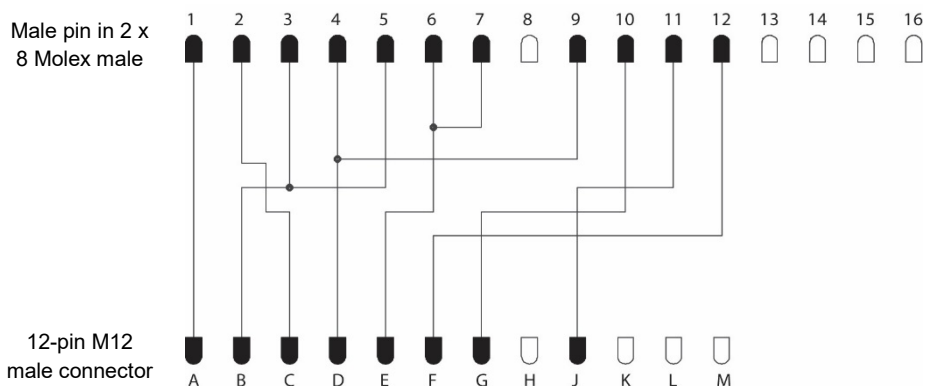
- Bottom part – AJ:**  
16-pin screw connection  
In line with top part.



Note: 16-pin screw terminal block with internal connection adapted for a common monitoring unit. Designed for a manually connected cable. Anti-cheat-board is an option.

### Electrical connections – AK

- Bottom part – AK:**  
12-pin Cannon male connector
- A) S1 – Common\*
  - B) S1 – Enabled
  - C) S2 – Common
  - D) S2 – Enabled
  - E) S1 – Disabled
  - F) S3, S4 – Common
  - G) S3 – Enabled
  - J) S4 – Enabled



\* Note: The COM signal must be +24 VDC to allow the LEDs to function properly.

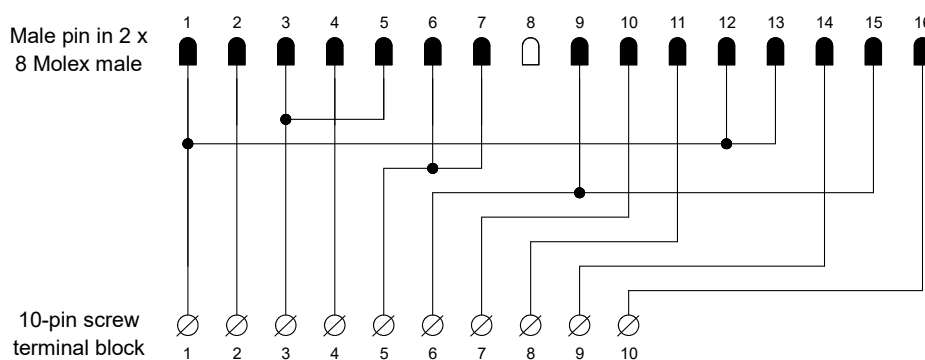
Note: Bottom part AK is designed to replace the old JSHD4, but requires that the two extra buttons S3 and S4 are fed from the common pin F. The anti-cheat-board is not an option.

## Electrical connections – AL

### Bottom part – AL:

10-pin screw connection

- 1) S1, S3, S4 – Common\*
- 2) S2 – Common
- 3) S1 – Enabled
- 4) S2 – Enabled
- 5) S1 – Disabled
- 6) 0 VDC (anti-cheat, LED 1, LED 2)
- 7) S3 – Enabled
- 8) S4 – Enabled
- 9) Anti-cheat – Common
- 10) Anti-cheat – Operator detected

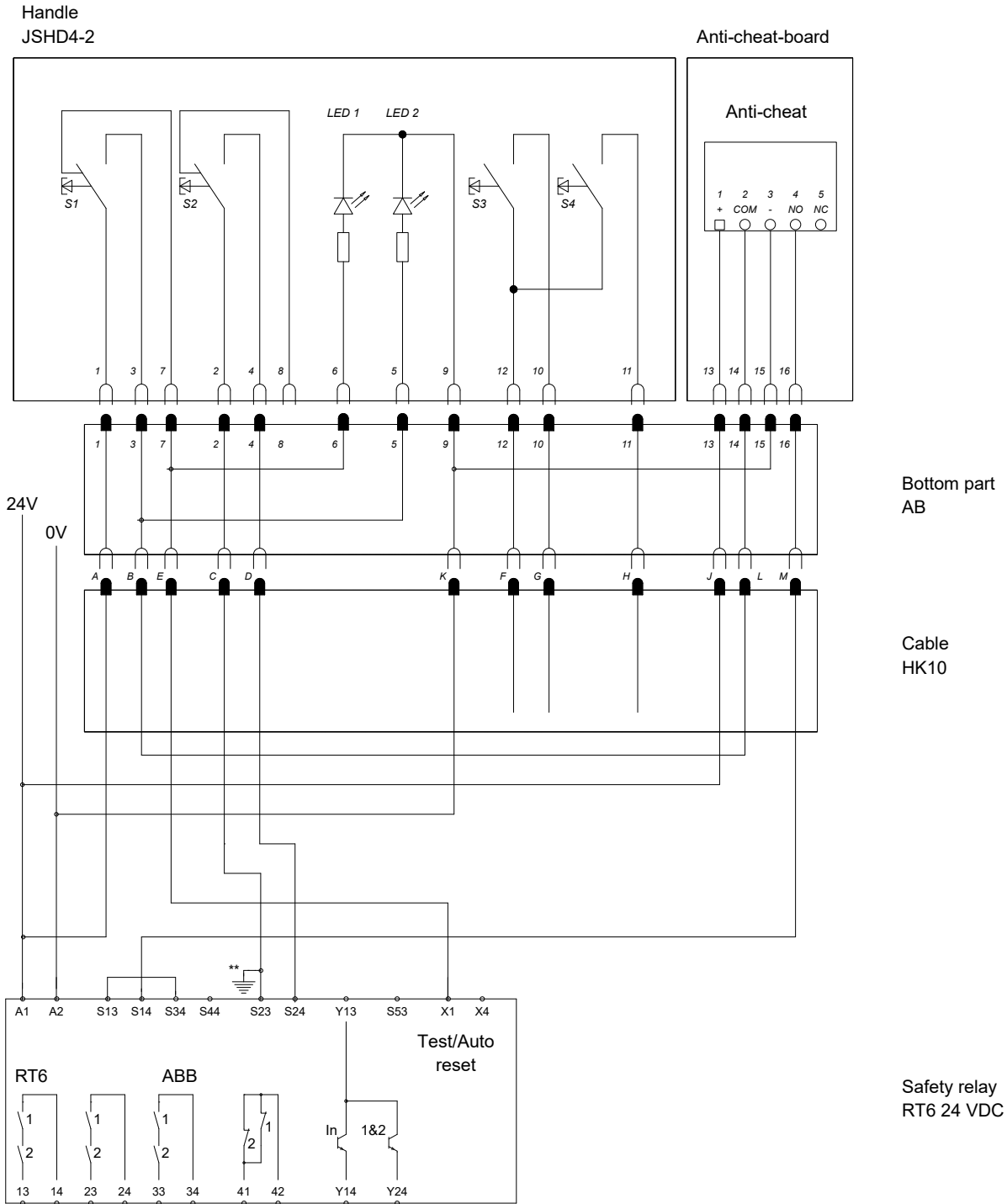


\* Note: The COM signal must be +24 VDC to allow the LEDs and anti-cheat-board to function properly.

Note: 10-pin screw terminal block with internal connection designed for safety relays in the RT series and Pluto safety PLC. Designed for manually connected cable, and holder for Eden sensor (Eva). Anti-cheat-board is an option.

## Connection example

### Connection example – JSHD4-2-AB-A connected to RT6 safety relay via the 12-pin cable HK10

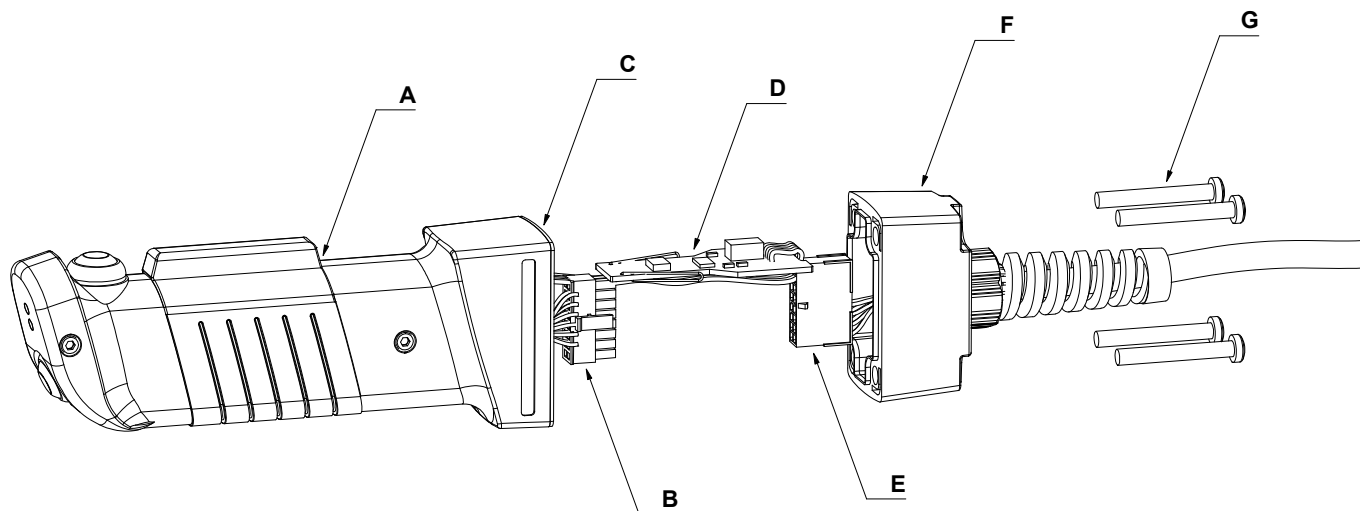


Note: The anti-cheat-board is connected in series with the first 3-position button (S1). The monitored reset (input X1) is required to maintain the highest level of safety. The top and front buttons are not connected in the figure, but can be connected in line with user needs.

## 4 Installation and maintenance

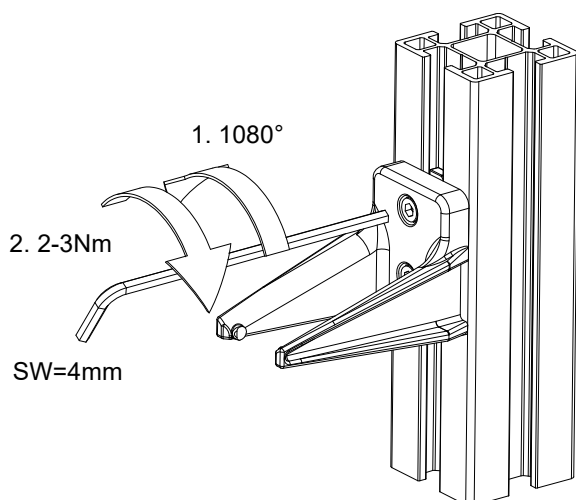
### Installation instructions

If the unit is ready-built at the factory, it is sufficient to connect the cable to the control device and connect the actuator to the cable. In other cases, the top and bottom parts and, if available, anti-cheat-board (PCB) are installed as set out in the instructions below.



1. If available, connect the pins from the anti-cheat-board (D) to connector (B) on handle (A).  
13: Red 14: Black 15: Blue 16: Pink
2. Insert the board (PCB) as shown in the figure, with the components facing forwards. Push the board in all the way.
3. If no anti-cheat-board is used, you may need to connect a jumper between pins 14 and 16 on connector (B), depending on which bottom part is used.
4. Remove the protective backing from the gasket (C) on the handle.
5. Connect connectors (B) and (E).
6. Press the bottom part (F) towards the handle and tighten the screws (G).


### Installation of JSM55




JSM 55 is designed to fit ABB Jokab Safety Quick-Guard aluminium profiles, but can be used on any flat surface.


If the two pre-assembled nuts are used, start by placing them in the slot in the profile. Now loosen the screws three turns before tightening in order to attach them to the profile.

## Installation instructions

 **Warning!** All the safety functions must be tested prior to the system being started.

## Maintenance

 **Warning!** The safety functions and mechanism must be tested regularly, at least annually, to ensure that all the safety functions work properly.

 **Warning!** In the event of a functional stop or damage to the product contact your nearest ABB Jokab Safety representative/distributor. Do not try to repair the product yourself since it may cause permanent damage to the product and impair product safety with the risk of serious personal injury.

**Caution!** ABB Jokab Safety assumes no responsibility for malfunctioning of the emergency stop if the installation and maintenance requirements described in this manual are not followed. These requirements are included in the product warranty.

## 5 Operation

### 3-position button

The three different positions of the push button correspond to three different positions as shown in the figure below.

#### Position 1 – “Standby position”:

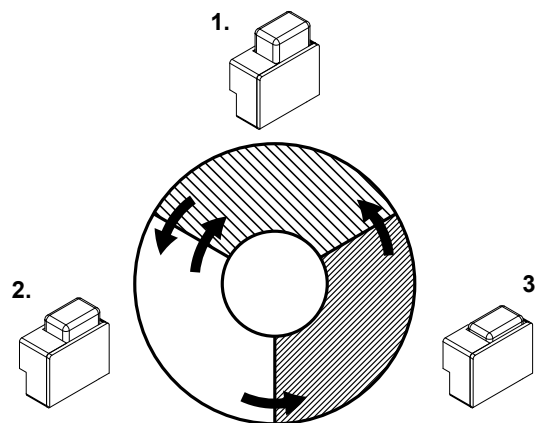
- Button free, i.e. not pressed in.
- The process can not be run.
- Waiting to be pressed to its midpoint position (“running position”).

#### Position 2 – “Running position”:

- The push button is pressed to its midpoint position.
- The process can be run.
- The process will stop if the button is released or is pushed to its end position (“stopped”).

#### Position 3 – “Stop position”:

- The push button is pressed to its end point.
- The process is stopped by the control device.
- Starting the process requires that the button is fully released (“standby”), and then pressed to midpoint position (“driving mode”).



### Front and top buttons

The front and top buttons are user defined and can be applied, for example for start/stop of individual movements, etc. The buttons are not safe and may only be used for subordinate functions.

### Anti-cheat-protection

The anti-cheat protection has two requirements that must be met in order to determine whether JSKD4 is being used properly.

- 1 ) A capacitance sensor determines whether the device is being held by hand.
- 2 ) An accelerometer determines whether the device is in motion.

Misuse will be reported if the unit is not held in one hand or if 20 seconds have passed with no movement registered.

NOTE! Not all models are with optional front and/or top buttons, or anti-cheat protection (see “Overview of models” below).

**Warning!** The front and/or top buttons, as well as the anti-cheat protection are connected to a non-safe node and must **never** be used for any safety function. They can enhance safety, but must never be used alone, and always in combination with other safety functions.

## LED display

*This section does not apply to JSKD4-1.*

### LEDs on the top side of the device:

| Red | Green | Description  |
|-----|-------|--|
| OFF | OFF   | A) No power, or LEDs not connected, <b>OR</b><br>B) Power available, safety switch 1 in OK position (position 2) but anti-cheat-board not OK |
| ON  | OFF   | Power available, safety switch 1 not in OK position (position 1 or 3)  |
| ON  | ON    | Power available, unit defective, bypassed, or improperly connected.  |
| OFF | ON    | Power available, safety switch 1 in OK position (position 2), as well as anti-cheat-board OK (if available)                                  |



## 6 Overview of models

A complete 3-position device consists of one top part and one bottom part. It is also possible to add an anti-cheat-board to the majority of combinations of top and bottom parts. These three parts can be ordered as a factory ready built unit or as separate components for assembly of users with the necessary training and expertise in machine safety. A complete list of all parts with a description and possible combinations are available on [www.abb.com/jokabsafety](http://www.abb.com/jokabsafety).

### Individual parts, installed by the user

| Type             | Part number     | Description  |
|------------------|-----------------|--|
| JSHD4-1          | 2TLA020006R2100 | Top part, no extra buttons, no LEDs, anti-cheat-board is not an option.                  |
| JSHD4-2          | 2TLA020006R2200 | Top part, top and front buttons, LEDs, anti-cheat-board is an option.                    |
| JSHD4-3          | 2TLA020006R2300 | Top part, no extra buttons with LEDs, anti-cheat-board is an option.                     |
| JSHD4-4          | 2TLA020006R2400 | Top part, front button, LEDs, anti-cheat-board is an option.                             |
| JSHD4-5          | 2TLA020006R2500 | Top part, top button, LEDs, anti-cheat-board is an option.                               |
| Anti-cheat-board | 2TLA020005R0900 | Anti-cheat-board (PCB).  |
| AA               | 2TLA020005R1000 | Bottom part, cable entry.  |
| AB               | 2TLA020005R1100 | Bottom part, 12-pin connector.   |
| AC               | 2TLA020005R1200 | Bottom part, 5-pin M12 connector.  |
| AD               | 2TLA020005R1300 | Bottom part, 8-pin M12 connector.  |
| AE               | 2TLA020005R1400 | Bottom part, 8-pin M12 connector, with emergency stop.                                   |
| AF               | 2TLA020005R1500 | Bottom part, 4-pin M12 connector, 2 AS-i nodes (1 safety + 1 standard node).             |
| AG               | 2TLA020005R1600 | Bottom part, 4-pin M12 connector, 1 AS-i nodes (safety node).                            |
| AH               | 2TLA020005R1700 | Bottom part, 10-pin screw terminal block connector, cable entry.                         |
| AJ               | 2TLA020005R1800 | Bottom part, 16-pin screw terminal block connector, cable entry.                         |
| AK               | 2TLA020005R1900 | Bottom part, 12-pin connector.   |
| AL               | 2TLA020005R2000 | Bottom part, 10-pole screw terminal block, cable entry, designed for Eva safety sensors. |

### Complete handles, ready for use

|      | JSHD4-1         | JSHD4-2         | JSHD4-3         | JSHD4-4         | JSHD4-5         |
|------|-----------------|-----------------|-----------------|-----------------|-----------------|
| AA   | 2TLA019995R0000 | -               | -               | -               | -               |
| AB   | -               | 2TLA019995R0200 | 2TLA019995R1200 | 2TLA019995R2400 | 2TLA019995R3400 |
| AB-A | -               | 2TLA019995R0300 | 2TLA019995R1300 | 2TLA019995R2500 | 2TLA019995R3500 |
| AC   | 2TLA019995R0100 | -               | -               | -               | -               |
| AD   | -               | 2TLA019995R0400 | 2TLA019995R1400 | 2TLA019995R2600 | 2TLA019995R3600 |
| AD-A | -               | 2TLA019995R0500 | 2TLA019995R1500 | 2TLA019995R2700 | 2TLA019995R3700 |
| AE   | -               | -               | 2TLA019995R1600 | -               | -               |
| AF   | -               | 2TLA019995R0600 | 2TLA019995R1700 | 2TLA019995R2800 | 2TLA019995R3800 |
| AF-A | -               | 2TLA019995R0700 | 2TLA019995R1800 | 2TLA019995R2900 | 2TLA019995R3900 |
| AG   | -               | -               | 2TLA019995R1900 | -               | -               |
| AH   | -               | 2TLA019995R0800 | 2TLA019995R2000 | 2TLA019995R3000 | 2TLA019995R4000 |
| AH-A | -               | 2TLA019995R0900 | 2TLA019995R2100 | 2TLA019995R3100 | 2TLA019995R4100 |
| AJ   | -               | 2TLA019995R1000 | 2TLA019995R2200 | 2TLA019995R3200 | 2TLA019995R4200 |
| AJ-A | -               | 2TLA019995R1100 | 2TLA019995R2300 | 2TLA019995R3300 | 2TLA019995R4300 |
| AK   | -               | 2TLA019995R4800 | 2TLA019995R5100 | 2TLA019995R5400 | 2TLA019995R5700 |

|      | JSHD4-1         | JSHD4-2         | JSHD4-3         | JSHD4-4         | JSHD4-5         |
|------|-----------------|-----------------|-----------------|-----------------|-----------------|
| AL   | 2TLA019995R4700 | 2TLA019995R4900 | 2TLA019995R5200 | 2TLA019995R5500 | 2TLA019995R5800 |
| AL-A |                 | 2TLA019995R5000 | 2TLA019995R5300 | 2TLA019995R5600 | 2TLA019995R5900 |

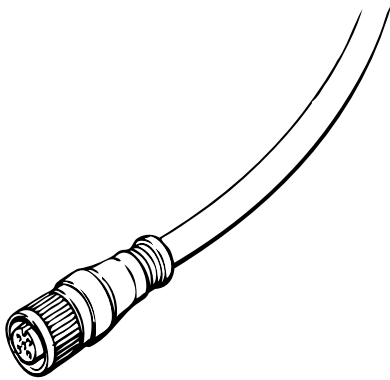
Note: A darker box in the table means that the anti-cheat-board is not an option for this particular combination.

Not all combinations of top and bottom parts are possible or useful. The table above shows the part number for the possible combinations. The combinations are stated according to JSHD4-X YY-Z, where X is the top part number, the YY letters are for the bottom part and Z (if available) A: anti-cheat-board included. An example of a complete order would be *2TLA019995R0000 JSHD4-1-AA* or *2TLA019995R0700 JSHD4-2-AF-A*.

## Accessories

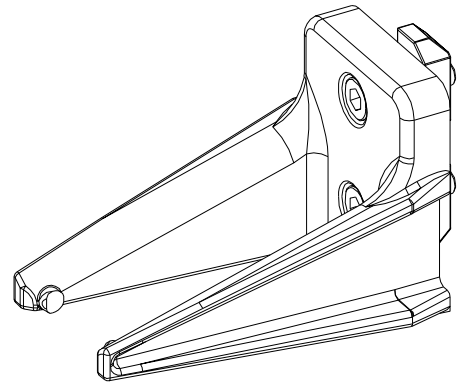
Accessories and spare parts are ordered separately and installed by the user. For a complete list, see [www.abb.com/jokabsafety](http://www.abb.com/jokabsafety).

| Type             | Part number     | Description   |
|------------------|-----------------|---|
| Anti-cheat-board | 2TLA020005R0900 | An anti-cheat-board (PCB) can be retrofitted but does not work in combination with any of the bottom parts and not with JSHD4-1. See table above. |
| HK10             | 2TLA020003R4800 | 10 m cable with 12-pin connector (for the bottom parts AB and AK).  |
| JSM55            | 2TLA040005R0500 | Wall bracket for 3-position device.   |
| JSM50H           | 2TLA020205R6400 | Mounting plate for Eden sensor (Eva unit).  |
| JSM50G           | 2TLA020205R6300 | Mounting plate for MKey5 switch.  |
| JSM54A           | 2TLA020205R2800 | Wall bracket for Eden sensor (Adam), designed for use with bottom part AL.  |
| M12-C101         | 2TLA020056R1000 | 10 m cable with 5-pin M12 connector (for the bottom part AC).   |
| M12-C103         | 2TLA020056R4000 | 10 m cable with 8-pin M12 connector (for the bottom part AD).   |
| Gasket           | 2TLA020200R1200 | Gasket between handle and bottom part (spare).  |
| Cable entry      | 2TLA020203R1700 | Cable entry with cable protection, M16 (spare).   |



10 m cable with M12 connector

Part number  
 2TLA020056R1000 (5-pin)  
 2TLA020056R4000 (8-pin)




JSM55  
 Wall bracket for 3-position device.

Part number:  
 2TLA040005R0500

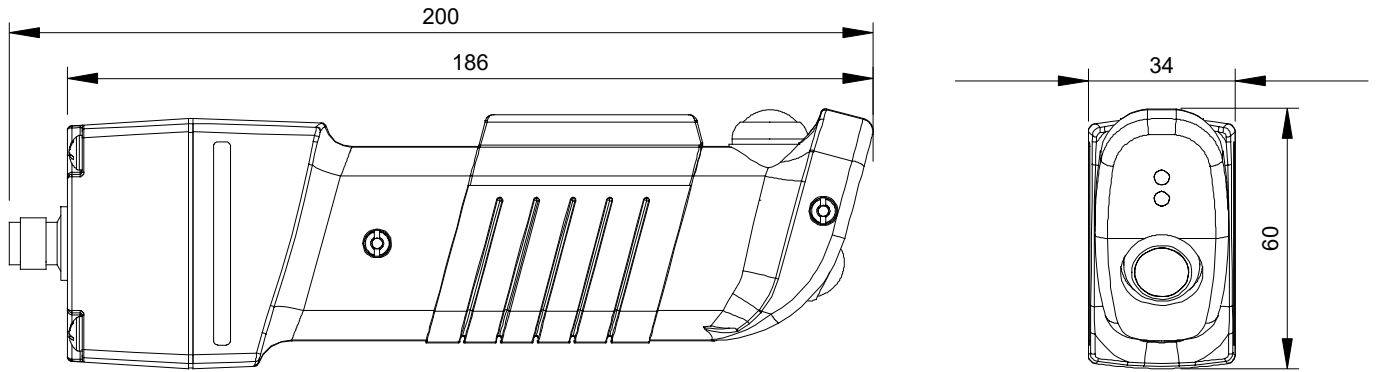
Products from Jokab Safety with part numbers starting with 2TLJ are fully compatible with ABB products that have a part number starting with 2TLA.

## 7 Technical data

| Manufacturer   |   |
|--|---|
| Address  | ABB JOKAB SAFETY<br>Varlabergsvägen 11<br>SE-434 39 Kungsbacka<br>Sweden  |
| Electrical rating  |   |
| Operating voltage  | 24 VDC $\pm$ 10% at +20 °C ambient temperature  |
| Current allowed  | Three-position push button per channel: Maximum 30 VDC, 20 mA, Minimum 10 VDC, 8 mA<br>Push button: 500 mA  |
| General  |   |
| Enclosure protection class   | IP65  |
| Ambient temperature  | -10...+50 °C  |
| Size   | See drawing   |
| Operating force  | Approx. 15 N for three-position push buttons (ON)<br>Approx. 45 N for three-position push buttons (OFF)<br>Approx. 2.5 N for top/front push buttons   |
| Weight   | About 0.2 kg without cable  |
| Material   | Handle: Polyamide and Noryl<br>Rubber: Neoprene   |
| Colour   | Yellow and black  |
| Connection   | Cable or connector depending on model   |
| Mechanical service life  | 10 <sup>6</sup> cycles, top to middle position<br>10 <sup>5</sup> cycles, middle to bottom position, and top/front push button  |
| Warning!<br>Perform a function check as soon as the actuator is connected to a control device to detect any short circuits or dual channel faults. |   |
| Safety / Harmonized Standards  |   |
| Conformity   | European Machinery Directive 2006/42/EC<br>EN ISO 12100-1:2010, EN ISO 13849-1:2015, EN 60204-1:2006+A1:2009<br> |
| EN ISO 13849-1   | Performance level: PL e, category 4   |
| Certifications   | Inspecta, cCSAus  |
| Safety data  |   |
| Mechanical reliability B <sub>10d</sub>  | B <sub>10d</sub> : 2,000,000 (to midpoint)<br>B <sub>10d</sub> : 968,000 (to end point)   |
| PFH <sub>D</sub>   |   |
| Proof test interval (life)   |   |
| MTTF <sub>d</sub>  |   |

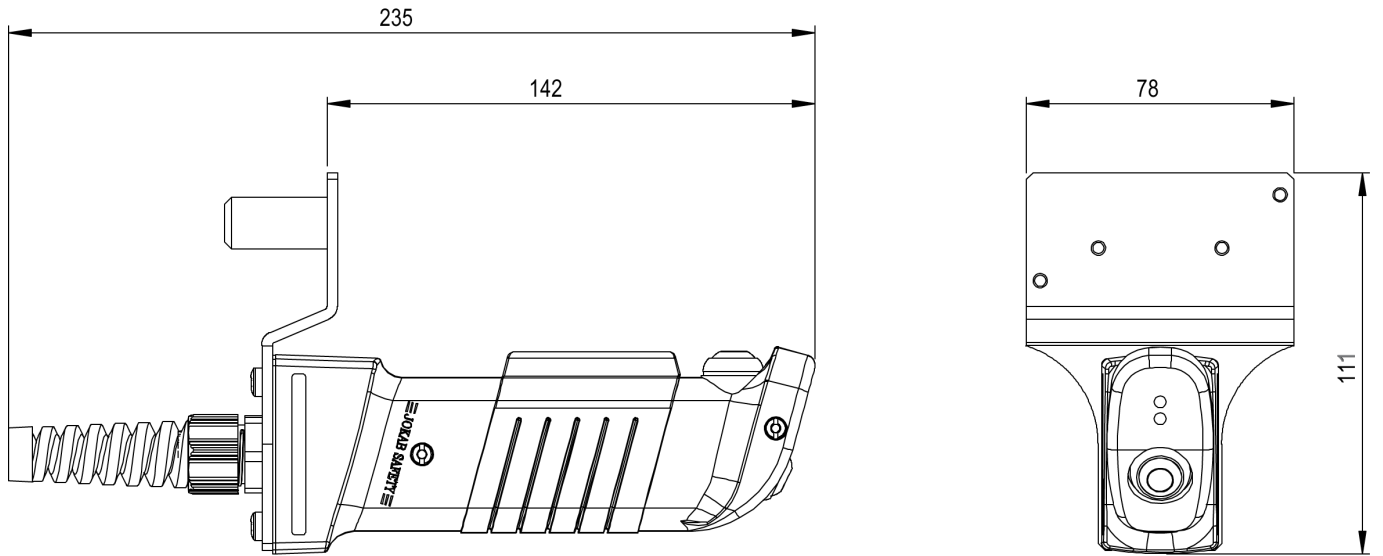
## Dimensions

### Dimensions for JSHD4



NOTE! All measurements in millimetres.

### Dimensions for JSHD4-2 with bottom part AL



NOTE! All measurements in millimetres.

## 8 EC Declaration of conformity



### EC Declaration of conformity

(according to 2006/42/EC, Annex 2A)

We ABB AB  
JOKAB SAFETY  
Varlabergsvägen 11  
SE-434 39 Kungsbacka  
Sweden

declare that the safety components of ABB AB manufacture with type designations and safety functions as listed below, are in conformity with the Directives

2006/42/EC - Machines  
2014/30/EU - EMC  
2011/65/EU - RoHS

Authorised to compile the technical file

ABB AB  
JOKAB SAFETY  
Varlabergsvägen 11  
SE-434 39 Kungsbacka  
Sweden

#### Product

Three position device, JSHD4  
Three position button, JSHD2C

#### Certificate

16-SKM-CM-0114

#### Certification body

Inspecta Sweden AB  
Box 30100  
SE-104 25 Stockholm  
Sweden

Used harmonized standards

EN ISO 12100-1:2010, EN ISO 13849-1:2015,  
EN ISO 13849-2:2012, EN 60204-1:2006+A1:2009,  
EN 61000-6-2:2005, EN 61000-6-3:2007



Tobias Gentzell  
Global R&D Manager  
Kungsbacka 2017-02-02

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[www.abb.com/jokabsafety](http://www.abb.com/jokabsafety)

Original

ABB JOKAB SAFETY Varlabergsvägen 11, SE-434 39 Kungsbacka, Sweden

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