

Three position device

JSHD4

Approvals:



Use:

- Troubleshooting
- Test running
- Programming

Advantages:

- Ergonomic
- LED information
- Adaptable
- Cheat Safe
- Adapted for AS-i



The safest solution during trouble shooting, programming and testing

Why three-positions?

An operator who is under pressure must be able to give a stop signal, whether in panic he/she pushes harder on the button or just lets go of it.

Three-position devices, hold-in and acceptance devices can be used for trouble shooting, programming and test running in situations where no other protection is available or feasible.

If the operator has to enter a risk area to trouble shoot or run a test, it is extremely important that he/she is able to stop the machinery without having to rely on someone else to stand by a stop button that is further away. In addition, no-one else should be able to start the machinery from the outside after it has been stopped by use of the three-position device.

Hold to run device or Acceptance device, what is the difference?

Hold to run device: The start signal is given when the button is pressed. The stop signal is given when the button is released or pushed fully in.

Acceptance device: The start signal for separate starting is given when the button is pressed. The stop signal is given when the button is released or pushed fully in. "Separate start" means, for example, that a program start signal is sent to the robot via a separate button in the acceptance device.

The three-position device is designed to be ergonomic

The device is ergonomic, both in respect of its shape, fitting to the hand, and the way the buttons are operated. It is easy to operate the three-position device using just the fingers, and the middle position provides a secure resting position. The device has LED indications that show the operational status, i.e. stop or ready signal. The two additional buttons can be used, for example, for start/stop, up/down or forward/back. Internally the device is duplicated. The three-position function itself is built up of two completely independent three-position buttons which are felt by the user to be one button.

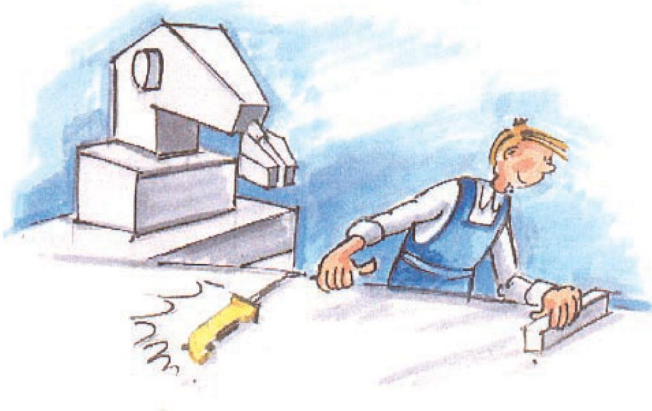
Cheat Safe three-position device with hand recognition

The three-position device JSHD4 has sensors which ensure that it is a human hand holding it. By using this, the safety level is increased, and the risk of manipulation or bypass of the safety function is reduced. It is no longer possible to expose the operator or odder to danger by trying to lock the three-position device in run mode.

Three-position device adapted for AS-i

The three-position device JSHD4 also comes in a version adapted for direct attachment to the AS-i bus

Highest safety level whether the button is pushed or released



When the three-position button is released you will obtain a dual stop. It is essential that the machine stops when you put aside the three-position device, for example during adjustment.



When the three position button is pushed all the way in you will obtain a dual stop. It is essential that the machine stops in an emergency situation.



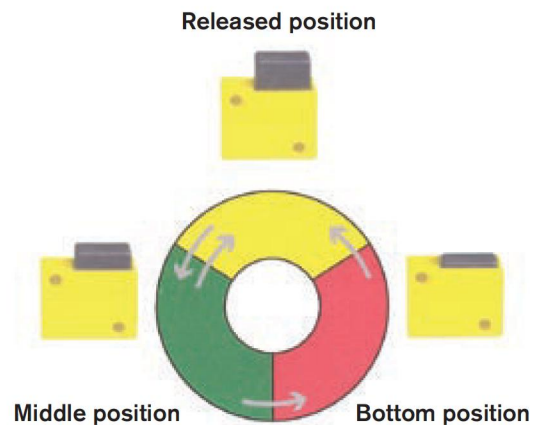
How does a a three-position device work?

Safety level

A safe Enabling or Hold to Run device should function as follows:

1. The Stop signal in released (top) and bottom position shall have the same safety level.
2. Provide a 'Start' or 'Ready' signal in a distinct middle position.
3. After a 'Stop' in the bottom position, a 'Start' signal or 'Ready' signal is not permitted until the three position push-buttons have been totally released and again pressed to the middle position. This function is achieved mechanically within the three position push-buttons in the device.
4. A Short or Open circuit in the connection cables shall not lead to a dangerous function e.g. 'Start' or 'Ready' signal.

In order to meet the above conditions, the three-position switch must be connected to a suitable safety relay with a two channel function, e.g. RT6, RT9 or JSBT4, which can monitor that both three-position buttons are working and



that there is no short or open circuit in the connection cable or the switch.

Regulations and standards

The JSHD4 is designed and approved in accordance with appropriate directives and standards. See technical data.

Three-position devices in different versions



Three-position device fitted to a machine control unit.



Panel assembly of JSHD4H2 on a programming unit for robots.



Design a three-position device for your needs

1. Choose between five different top units



JSHD4-1
2TLJ020006R2100



JSHD4-2
2TLJ020006R2200
▪ LEDs
▪ Front button
▪ Top button



JSHD4-3
2TLJ020006R2300
▪ LEDs



JSHD4-4
2TLJ020006R2400
▪ LEDs
▪ Front button



JSHD4-5
2TLJ020006R2500
▪ LEDs
▪ Top button

2. Choose a bottom part suitable for your assembly



AA, AH, AJ



AB



AC, AD



AF, AG

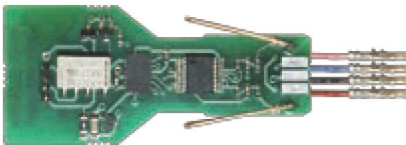


AE

AA – 2TLJ020005R1000 with cable gland
AB – 2TLJ020005R1100 with Cannon connection
AC – 2TLJ020005R1200 with M12 connection (5 poles)
AD – 2TLJ020005R1300 with M12 connection (8 poles)
AE – 2TLJ020005R1400 with M12 connection (8 poles) and emergency stop

AF – 2TLJ020005R1500 with M12 connection (4 poles) and 2 AS-i nodes (for front and top button)
AG – 2TLJ020005R1600 with M12 connection (4 poles) and 1 AS-i node (without front and top button)
AH – 2TLJ020005R1700 with cable gland and PCB with 10 screw connections
AJ – 2TLJ020005R1800 with cable gland and PCB with 16 screw connections

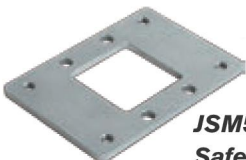
3. Choose hand recognition for making your three position device cheat protected (option)



Anti-tamper PCB – 2TLJ020005R0900

4. Check the table if your combination is available

5. Choose a bottom plate (option)



JSM50G, bottom plate for Safety Interlock switch JSNY5 – 2TLJ020205R6300



JSM50H, bottom plate for non-contact sensor Eden (Eva) – 2TLJ020205R6400

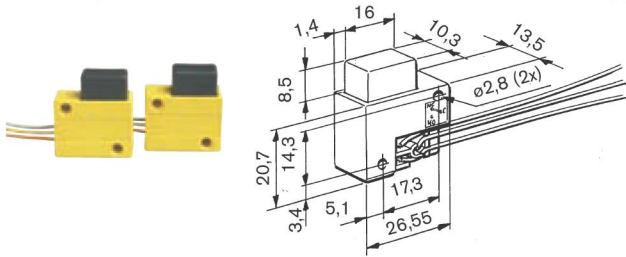
Available combinations of bottom- and top parts

	JSHD4-1	JSHD4-2	JSHD4-3	JSHD4-4	JSHD4-5
AA without Cheat Safe	JSHD4-1AA	-	-	-	-
AA with Cheat Safe	-	-	-	-	-
AB without Cheat Safe	-	JSHD4-2AB	JSHD4-3AB	JSHD4-4AB	JSHD4-5AB
AB with Cheat Safe	-	JSHD4-2AB-A	JSHD4-3AB-A	JSHD4-4AB-A	JSHD4-5AB-A
AC without Cheat Safe	JSHD4-1AC	-	-	-	-
AC with Cheat Safe	-	-	-	-	-
AD without Cheat Safe	-	JSHD4-2AD	JSHD4-3AD	JSHD4-4AD	JSHD4-5AD
AD with Cheat Safe	-	JSHD4-2AD-A	JSHD4-3AD-A	JSHD4-4AD-A	JSHD4-5AD-A
AE without Cheat Safe	-	-	JSHD4-3AE	-	-
AE with Cheat Safe	-	-	-	-	-
AF without Cheat Safe	-	JSHD4-2AF	JSHD4-3AF	JSHD4-4AF	JSHD4-5AF
AF with Cheat Safe	-	JSHD4-2AF-A	JSHD4-3AF-A	JSHD4-4AF-A	JSHD4-5AF-A
AG without Cheat Safe	-	-	JSHD4-3AG	-	-
AG with Cheat Safe	-	-	-	-	-
AH without Cheat Safe	-	JSHD4-2AH	JSHD4-3AH	JSHD4-4AH	JSHD4-5AH
AH with Cheat Safe	-	JSHD4-2AH-A	JSHD4-3AH-A	JSHD4-4AH-A	JSHD4-5AH-A

Order your pre-assembled three position device from ABB Jokab Safety

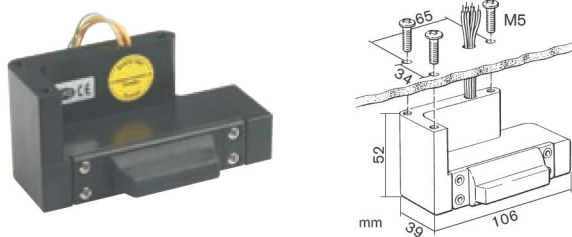
Pre-assembled three position devices	Accessories
2TLJ019995R0000	JSHD4-1AA
2TLJ019995R0100	JSHD4-1AC
2TLJ019995R0200	JSHD4-2AB
2TLJ019995R0300	JSHD4-2AB-A
2TLJ019995R0400	JSHD4-2AD
2TLJ019995R0500	JSHD4-2AD-A
2TLJ019995R0600	JSHD4-2AF
2TLJ019995R0700	JSHD4-2AF-A
2TLJ019995R0800	JSHD4-2AH
2TLJ019995R0900	JSHD4-2AH-A
2TLJ019995R1200	JSHD4-3AB
2TLJ019995R1300	JSHD4-3AB-A
2TLJ019995R1400	JSHD4-3AD
2TLJ019995R1500	JSHD4-3AD-A
2TLJ019995R1600	JSHD4-3AE
2TLJ019995R1700	JSHD4-3AF
2TLJ019995R1800	JSHD4-3AF-A
2TLJ019995R1900	JSHD4-3AG
2TLJ019995R2000	JSHD4-3AH
2TLJ019995R2100	JSHD4-3AH-A
2TLJ019995R2400	JSHD4-4AB
2TLJ019995R2500	JSHD4-4AB-A
2TLJ019995R2600	JSHD4-4AD
2TLJ019995R2700	JSHD4-4AD-A
2TLJ019995R2800	JSHD4-4AF
2TLJ019995R2900	JSHD4-4AF-A
2TLJ019995R3000	JSHD4-4AH
2TLJ019995R3100	JSHD4-4AH-A
2TLJ019995R3400	JSHD4-5AB
2TLJ019995R3500	JSHD4-5AB-A
2TLJ019995R3600	JSHD4-5AD
2TLJ019995R3700	JSHD4-5AD-A
2TLJ019995R3800	JSHD4-5AF
2TLJ019995R3900	JSHD4-5AF-A
2TLJ019995R4000	JSHD4-5AH
2TLJ019995R4100	JSHD4-5AH-A
2TLJ020055R1000	Connectors: M12-C01 M12 5-pole female, straight
2TLJ020055R1600	M12-C03 M12 8-pole female, straight
2TLJ020003R0300	JSHK0 12-pole connector for JSHD4
2TLJ020057R0000	Cable with 5 conductors: C5 Cable 5x0,34 cut to length
2TLJ020056R1000	M12-C101 10 m cable and connector
2TLJ020056R1400	M12-C201 20 m cable and connector
2TLJ020057R1000	Cable with 8 conductors: C8 Cable 8x0,34 cut to length
2TLJ020056R4000	M12-C103 10 m cable and connector
2TLJ020056R4100	M12-C203 20 m cable and connector
2TLJ020003R5500	Cable with 12 conductors: HKC12 Cable 12x0,25 cut to length
2TLJ020003R4700	HK5 Cable 5 m and connector
2TLJ020003R4800	HK10 Cable 10 m and connector
2TLJ020003R4900	HK20 Cable 20 m and connector
2TLJ020003R5000	JSHK16S4 spiral cable 1,6 m and connector
2TLJ020003R5100	JSHK20S4 spiral cable 2,0 m and connector
2TLJ020003R5200	JSHK32S4 spiral cable 3,2 m and connector
2TLJ020003R3500	JSHK40S4 spiral cable 4,0 m and connector
2TLJ020003R3600	JSHK3604 spiral cable 6,0 m and connector
2TLJ020003R5300	JSHK80S4 spiral cable 8,0 m and connector
2TLJ020003R5400	HK-T2 Cable drum and connector
2TLJ040005R0500	Brackets: JSM55 Wall bracket for three position device
2TLJ040005R0700	JSM5B Wall bracket for 2 JSNY5 (ordered separately)
2TLJ020200R4600	Others: JSHD4 protection coat

Three-position devices for different types of montage



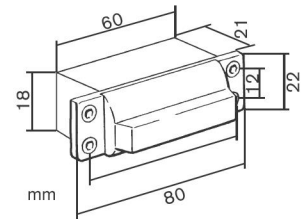
Three-position push button JSHD2C

The button is the main component in a safe three-position solution. To achieve the highest safety level two buttons are used in a two-channel system.



External assembly JSHD4H2A

The external assembly is similar to the panel assembly unit, although it is a 'handle' design making it suitable for assembly on the outside of a control box.



Panel assembly JSHD4H2

A panel assembly suitable for building into programming units or similar control boxes. Provides simultaneous activation of both of the three-position buttons.

Standard versions

2TLJ020002R0200	JSHD4H2A Three-position device for external panel assembly
2TLJ020002R0700	JSHD4S2 Three-position device, ABB upgrading kit
2TLJ020002R3100	JSHD4H2 Three-position device for internal panel assembly
2TLJ020001R1000	JSHD2C type E Three-position button
2TLJ020001R1300	JSHD2C type K Three-position button

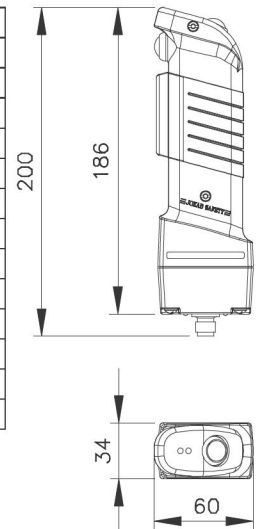
Complete JSHD4 with standard options are available to order separately

Technical data - JSHD4

Manufacturer	ABB AB/Jokab Safety, Sweden
Safety level EN ISO 13849-1	Category 4/PL e
Electrical contact ratings Three-position button:	30 VDC, max 0.5 A (min. 10 mA, 10V)
Extra button:	50 VAC/DC max 0.2 A
Protection class	IP 65
Operating temperature	-10 to +50° C
Function indication Three-position buttons ready signal:	'Yes', green LED 'No', red LED
Material	Polyamide 6.6
Insulation resistance	min 20 M Ohm
Operation force	approx. 15 N
Mechanical life	1 000 000 cycles to middle position
Conformity	AFS 1994:48, EN ISO 12100-1/-2, EN 954-1/EN ISO 13849-1

Pin	Color STD	Color JSHK-S
A	White	White
B	Brown	Brown
C	Green	Green
D	Yellow	Yellow
E	Grey	-
F	Pink	Grey
G	Blue	Pink
H	Red	Blue
I	Black	Red
J	Purple	-
K	-	-
L	-	-

STD: JSHK, JSHK-E, JSHK-T



Cable, available in different lengths.



JSHD4 protection coat



Spiral cable, available in different lengths.



JSHK0 12 pole connector for JSHD4.



JSM5B Wall bracket for interlock switches and three-position device.

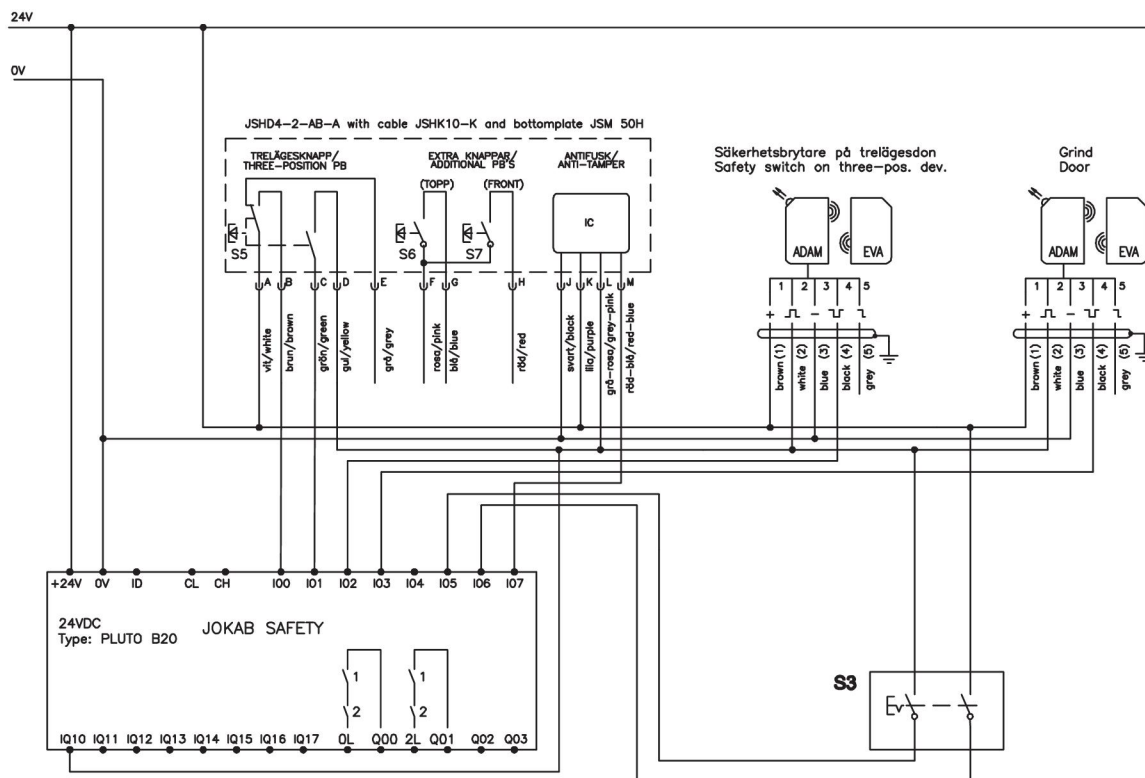


JSM55 Wall bracket for three-position device.



Cable drum

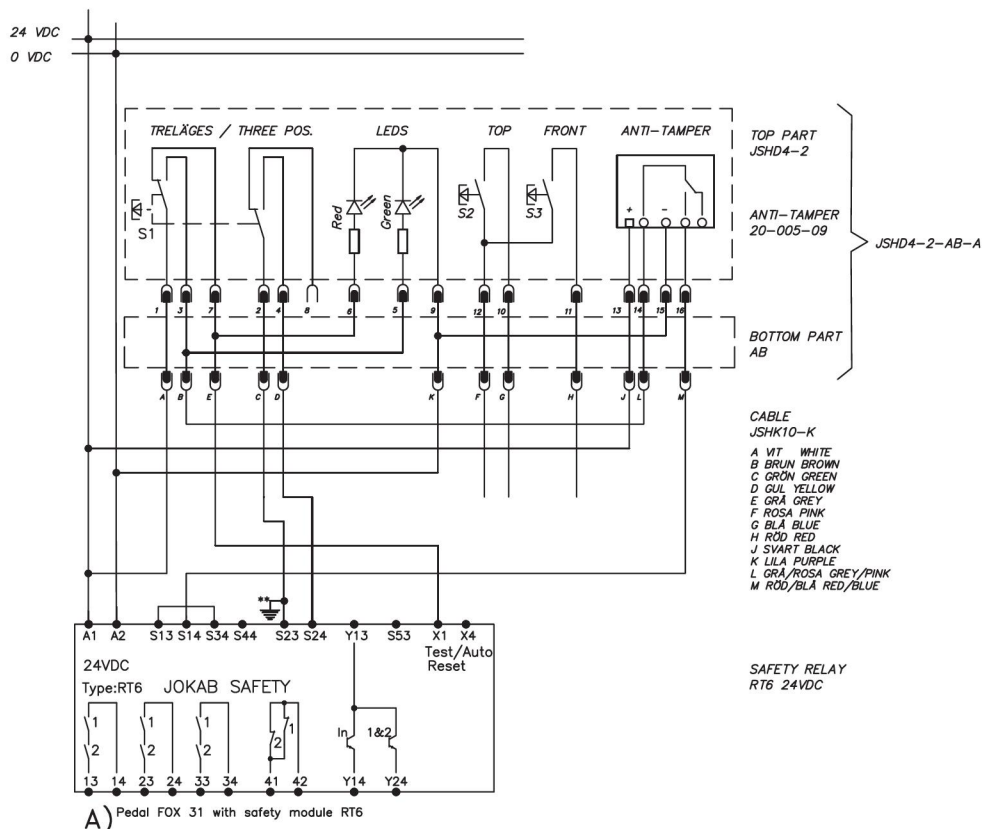
Connection example - Three-position device JSHD4 to Pluto



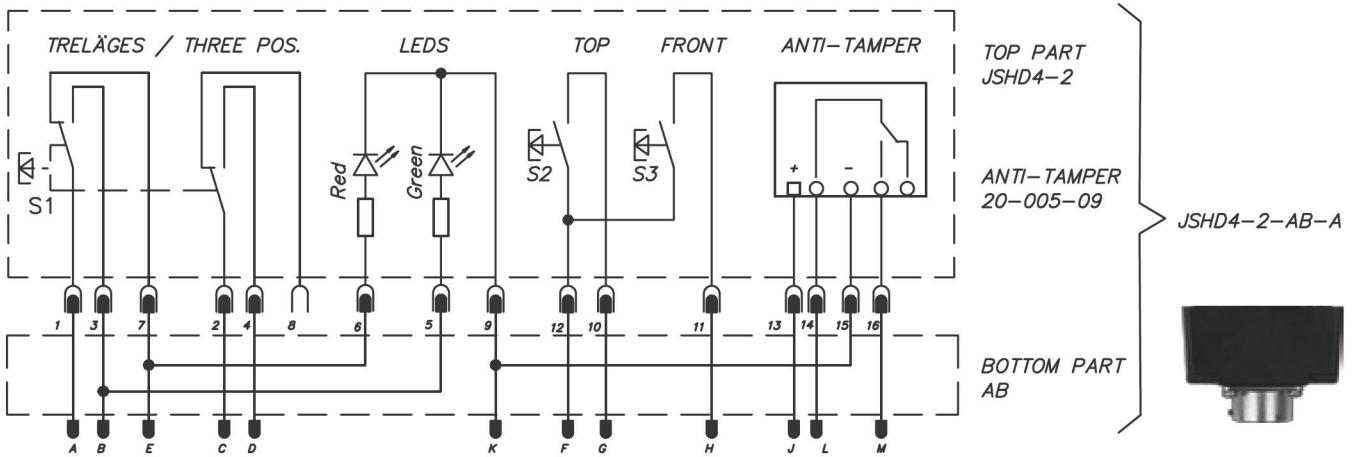
Time-limited entrance/exit

After lifting the three-position device out of its holder JSM54A, the interlocked gate can be passed for entrance into the risk area within x sec. The time limit is set in the Pluto program. The device detects the operators hand and prohibits tampering.

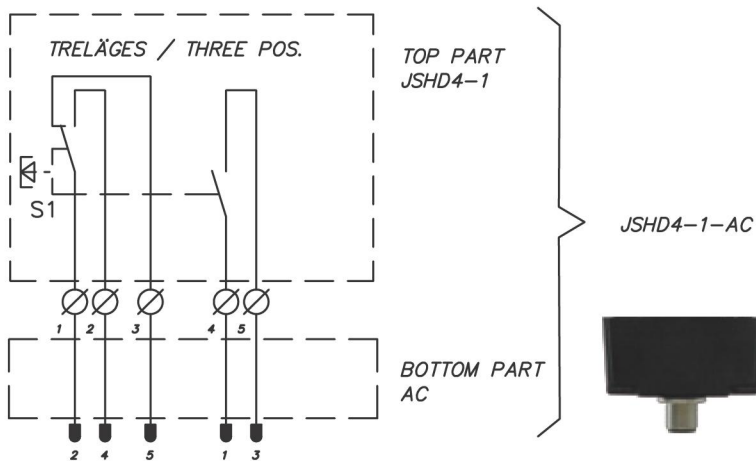
Connection examples - Three-position device JSHD4 with various safety controllers



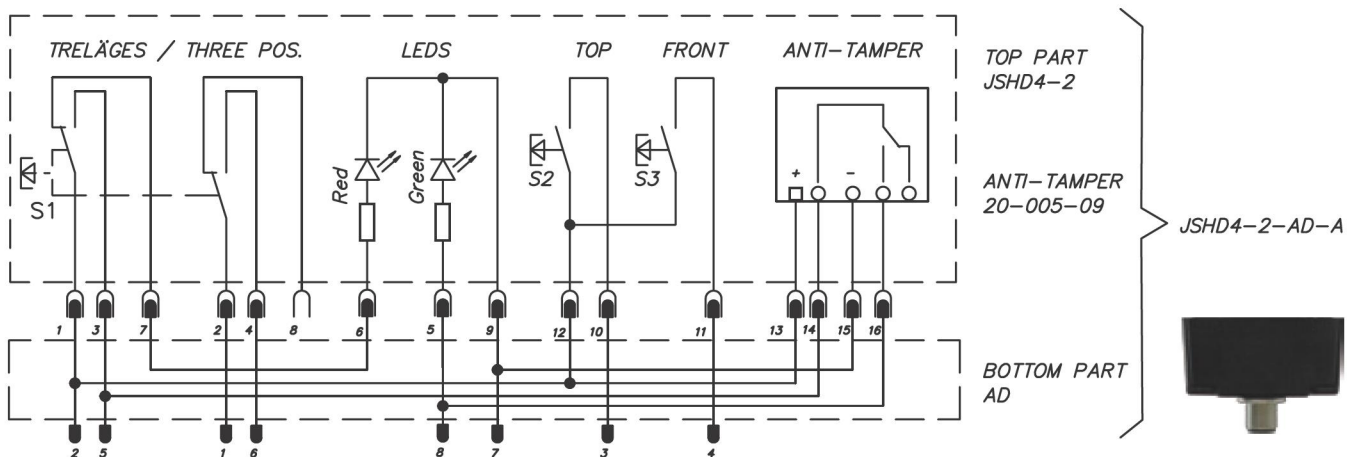
Connection with bottom parts AB



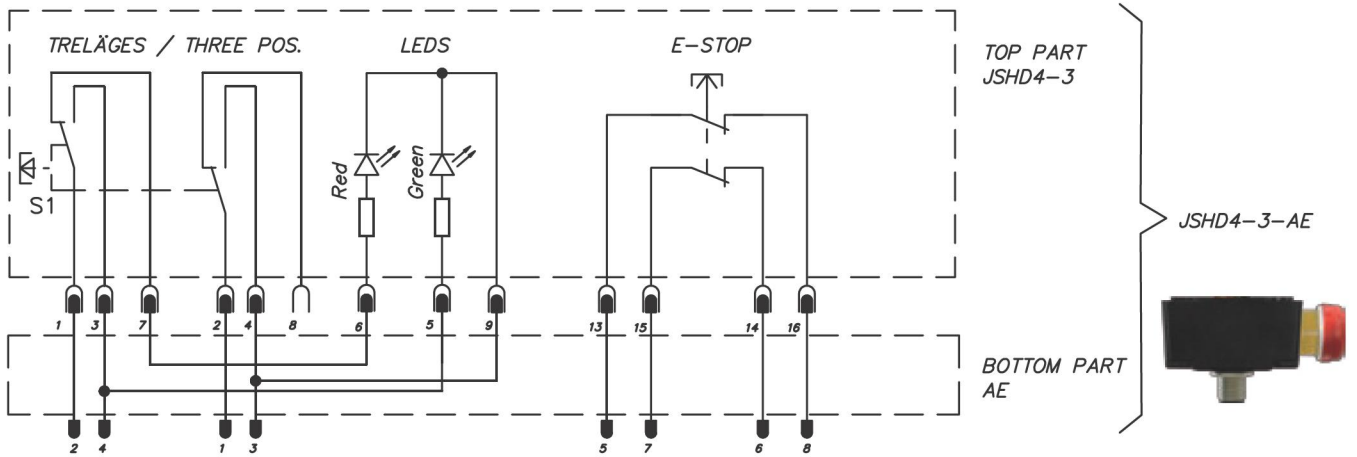
Connection with bottom parts AC



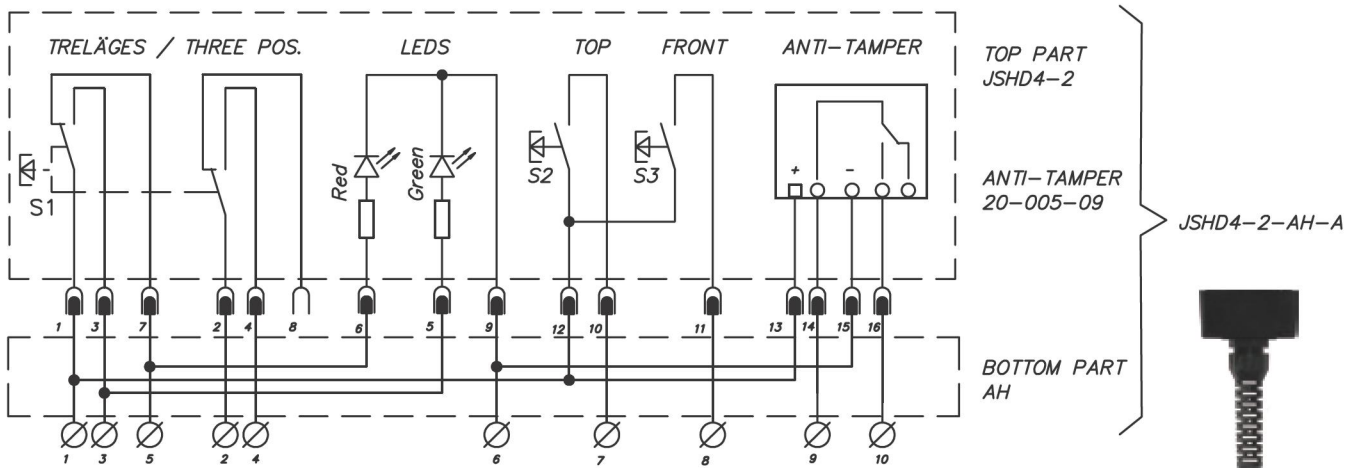
Connection with bottom parts AD



Connection with bottom parts AE



Connection with bottom parts AH



Connection with bottom parts AJ

