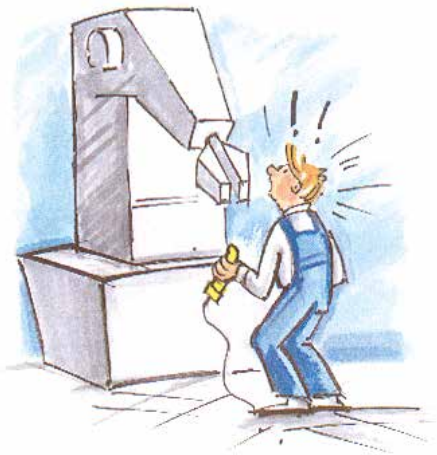

ABB
ABB JSHD4

Control devices

Why should Control Devices be used?

-for the machine operator to be able to directly start and stop dangerous machine movement.



Ergonomic three-position device, JSHD4 with double three-position button that gives a stop signal when released or fully pressed in.

In an emergency situation the operator can either press harder or release the three-position device to stop the machine.

Three-position device

Three-position devices, hold-to-run devices and enabling devices are used during trouble-shooting, programming and test running when no other safety components are possible or suitable. The device is held in the hand and the operator can in an emergency situation either press harder or entirely release the device to stop the machine.

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.

Two-hand control device

A two-hand control device is used when it is necessary to ensure that the operator's hands will be kept outside the risk area. If there is a risk that someone else other than the operator can reach into the machine without the operator seeing it, the safety device must be supplemented by something more, e.g. a light beam.

To be able to operate the machine with the two-hand device, all the buttons on the device have to be operated within 0.5 seconds of each other. This is called concurrence. All the buttons also have to be returned to their initial position before one can start again. If any button is released during the machine movement the machine will be stopped. Using the stopping time one can calculate the necessary safety distance. A safety distance of less than 100 mm must not be used.

The highest safety level is assured by connecting the buttons of the two-hand device to a safety relay. The safety relay checks for concurrence and that all the buttons have returned to their initial position before a new start can be made. The safety relay also gives a stop signal if any of the buttons are released.

The two-hand device protects against "after-grasp"; if the operator by reflex tries to enter or reach into a machine during the dangerous machine movement.

Two-channel all the way out to the hand
Safeball is an ergonomic two-hand control device with four built-in buttons.

Foot operated switches

A foot operated switch is used when the operator has to hold the material during processing. The pedal must have a safety cover to prevent unintentional start. For seated work one must also have a foot support to facilitate the operator holding his foot in the pedal´s off position.

The highest safety level is secured by monitoring the pedal with a safety relay.

The foot operated switch is used when the operator has to hold the material with both hands during processing.

Safety foot operated switch with three-position function.

Three position device
JSHD4

Approvals:

Use:

- Troubleshooting
- Test running
- Programming

Features:

- Ergonomic
- LED information
- Adaptable
- Cheat Safe (option)
- Available 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.

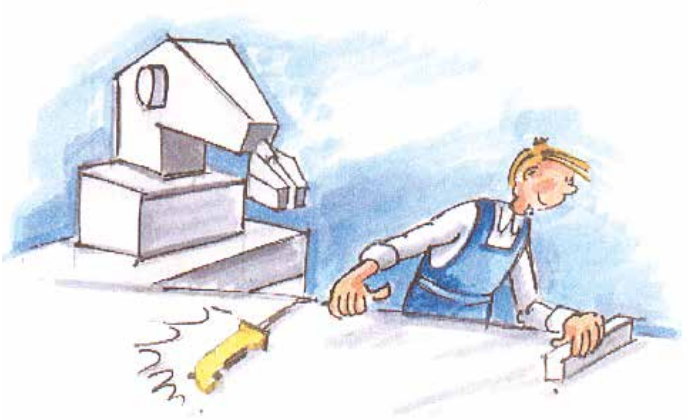
Cheat Safe three-position device with hand recognition

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 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:

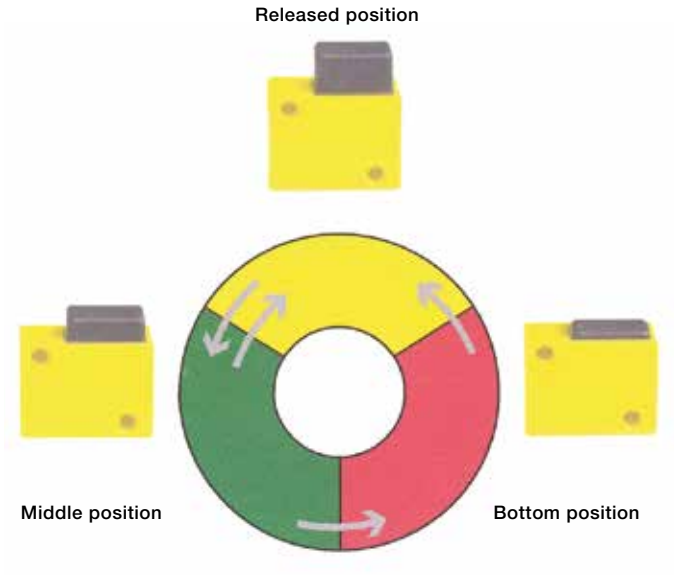
1.The Stop signal in released (top) and bottom position shall have the same safety level.

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, or Safety PLC, 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.

Design a three-position device for your needs

1. Choose between five different top units

JSHD4-1
2TLA020006R2100

JSHD4-2
2TLA020006R2200
– LEDs
– Front button
– Top button

JSHD4-3
2TLA020006R2300
– LEDs

JSHD4-4
2TLA020006R2400
– LEDs
– Front button

JSHD4-5
2TLA020006R2500
– LEDs
– Top button

2. Choose a bottom part suitable for your assembly

AA 2TLA020005R1000 with cable gland
AH 2TLA020005R1700 with cable gland and PCB with 10 screw connections
AJ 2TLA020005R1800 with cable gland and PCB with 16 screw connections

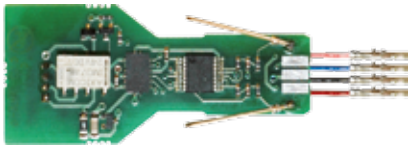
AB 2TLA020005R1100 with Cannon connection

AC 2TLA020005R1200 with M12 connection (5 poles)
AD 2TLA020005R1300 with M12 connection (8 poles)

AE 2TLA020005R1400 with M12 connection (8 poles) and emergency stop

AF 2TLA020005R1500 with M12 connection (4 poles) and 2 AS-i nodes (for front and top button)
AG 2TLA020005R1600 with M12 connection (4 poles) and 1 AS-i node (without front and top button)

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



Anti-tamper PCB
2TLA020005R0900

4. Check the table if your combination is available

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

5. Choose a bottom plate (option)

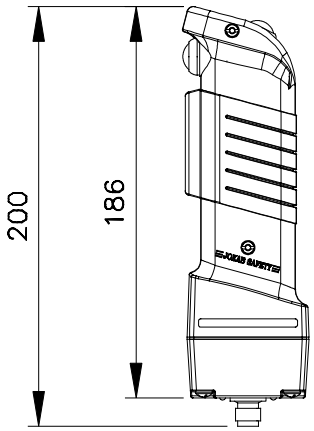
JSM50G, bottom plate for Safety Interlock switch MKey5/JSNY5
2TLA020205R6300

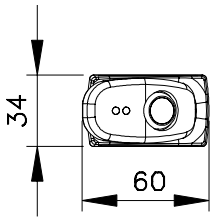
JSM50H, bottom plate for non-contact sensor Eden (Eva)
2TLA020205R6400

Technical data - JSHD4

Level of safety	
EN ISO 13849-1	PL e/Cat. 4
Electrical rating	
Three-position button	Maximum 30 VDC, 20mA
	(Minimum 10 VDC, 8mA)
Extra button	Maximum 50 VAC/VDC 0.2A
Protection class	IP65
Operating temperature	-10 to +50° C
Function indication	
Three-position buttons ready signal	`Yes´, green LED
	`No´, red LED
Material	
Handle	Polyamide and Noryl
Rubber	Neoprene
Operation force	Approx. 15 N for three-position buttons (ON)
	Approx. 45 N for three-position buttons (OFF)
	Approx. 25 N for top/front push button
Mechanical life	1 000 000 cycles to middle position
Conformity	EN ISO 1200-1:2010, EN ISO 13849-1:2008, EN 60204-1:2006+A1:2009

Cabel with Cannon connector		Cabel with M12 connector		
Pin	12 conductors	Pin	8 conductors	5 conductors
A	White	1	White	Brown
B	Brown	2	Brown	White
C	Green	3	Green	Blue
D	Yellow	4	Yellow	Black
E	Grey	5	Grey	Grey
F	Pink	6	Pink	-
G	Blue	7	Blue	-
H	Red	8	Red	-
J	Black			
K	Purple			
L	Grey and Pink			
M	Red and Blue			





Accessories

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

JSHD4
Models and accessories

Three position devices - JSHD4

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

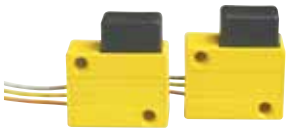
Accessories

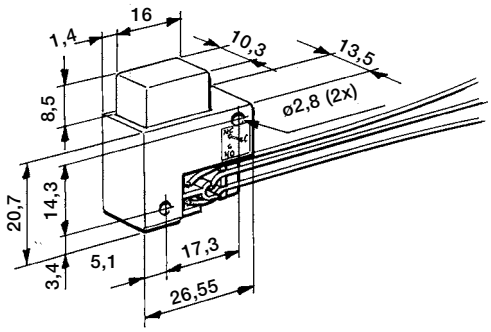
	Article number
Connectors:	
M12-C01 M12 5-pole female, straight	2TLA020055R1000
M12-C03 M12 8-pole female, straight	2TLA020055R1600
JSHK0 12-pole cannon female connector for JSHD4	2TLA020003R0300
Cable with 5 conductors:	
C5 Cable 5 x 0.34 cut to length (meters)	2TLA020057R0000
M12-C101 10 m cable and M12 female connector	2TLA020056R1000
M12-C201 20 m cable and cannon female connector	2TLA020056R1400
Cable with 8 conductors:	
C8 Cable 8 x 0.34 cut to length (meters)	2TLA020057R1000
M12-C103 10 m cable and M12 female connector	2TLA020056R4000
M12-C203 20 m cable and M12 female connector	2TLA020056R4100
Cable with 12 conductors:	
HKC12 Cable 12 x 0.25 cut to length (meters)	2TLA020003R5500
HK5 Cable 5 m and cannon female connector	2TLA020003R4700
HK10 Cable 10 m and connector	2TLA020003R4800
HK20 Cable 20 m and connector	2TLA020003R4900
HK16S4 spiral cable 1.6 m and cannon female connector	2TLA020003R5000
HK20S4 spiral cable 2.0 m and cannon female connector	2TLA020003R5100
HK32S4 spiral cable 3.2 m and cannon female connector	2TLA020003R5200
HK40S4 spiral cable 4.0 m and cannon female connector	2TLA020003R3500
HK60S4 spiral cable 6.0 m and cannon female connector	2TLA020003R3600
HK80S4 spiral cable 8.0 m and cannon female connector	2TLA020003R5300
HK-T2 Cable drum and connector	2TLA020003R5400
Brackets:	
JSM55 Wall bracket for three position device	2TLA040005R0500
JSM5B Wall bracket for 2 MKey5/JSNY5	2TLA040005R0700
Others:	
JSHD4 protection coat	2TLA020200R4600

Three-position devices for different types of assembly

Three-position push button JSHD2C

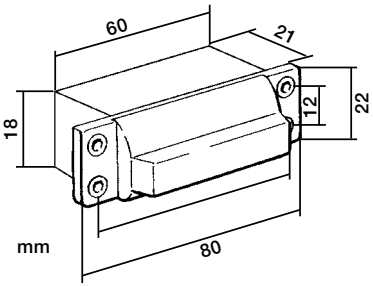
The button is the main component in a safe three-position solution. To achieve the highest safety level two buttons are used in a two-channel system.





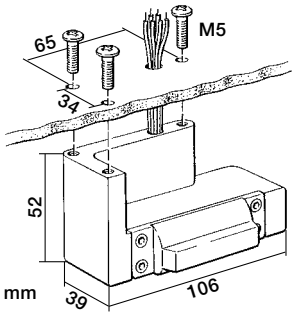
Panel assembly JSHD4H2

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



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.



Standard versions

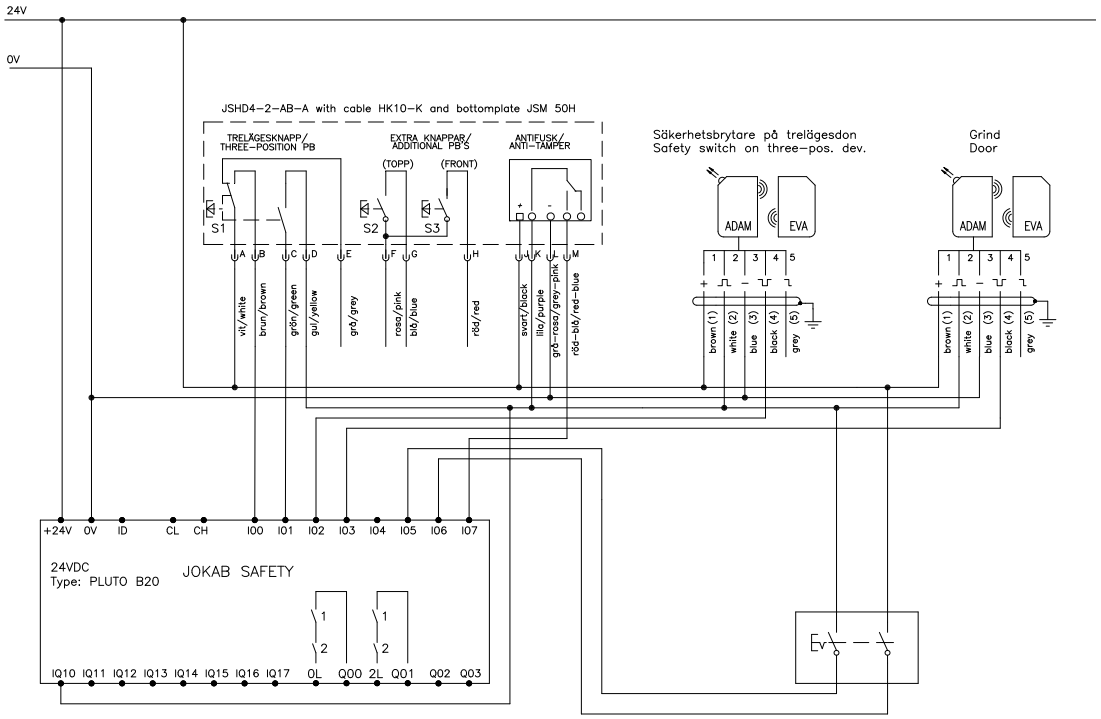
Article number	Model
2TLA020002R0200	JSHD4H2A Three-position device for external panel assembly
2TLA020002R3100	JSHD4H2 Three-position device for internal panel assembly
2TLA020001R1000	JSHD2C type E Three-position button
2TLA020001R1300	JSHD2C type K Three-position button
Complete JSHD4 with standard options are available to order separately	

JSHD4
Connection examples

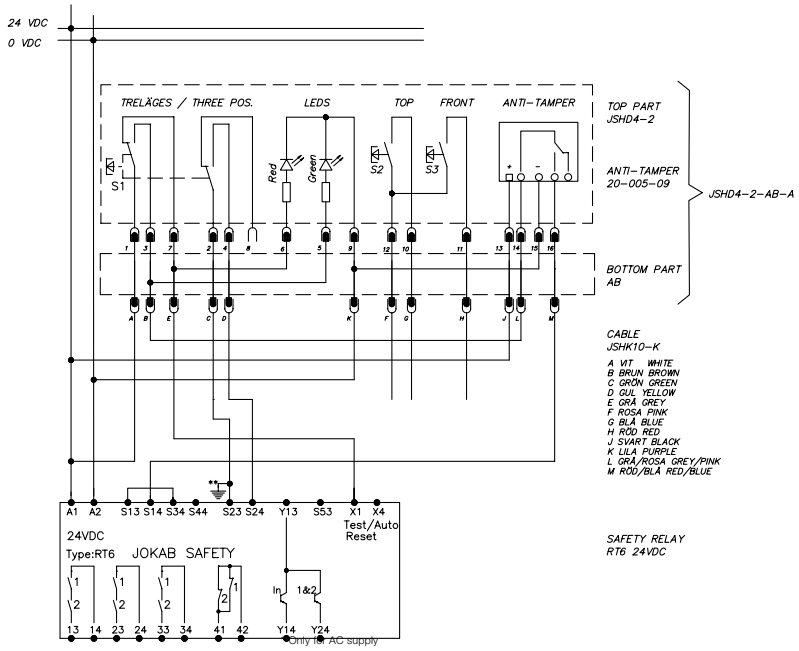
JSHD4 to Pluto

Time-limited entrance/exit

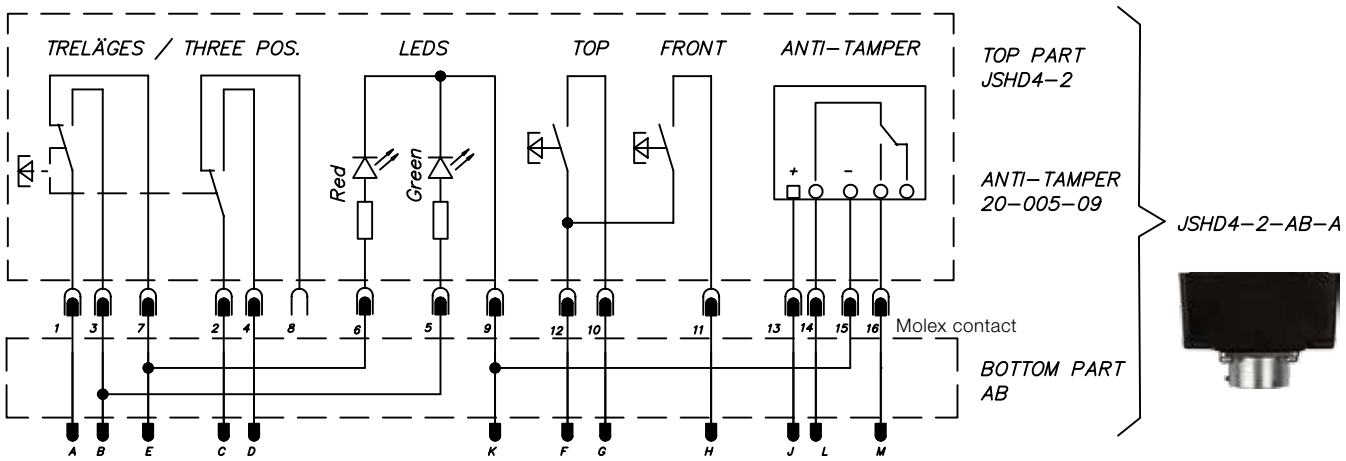
After lifting the three-position device out of it‘s holder the door can be opened and shut for entrance to the safety zone within X seconds. To exit zone press S3. The time is set in the Pluto programme. The device detects the operators hand and prohibits tampering.



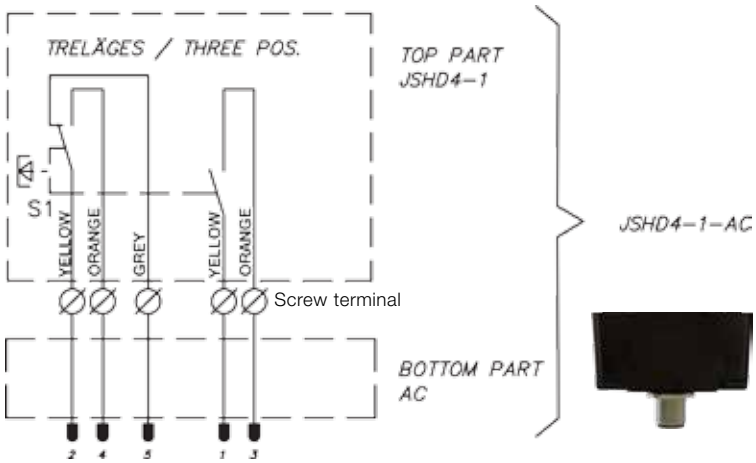
JSHD4 with various safety controllers



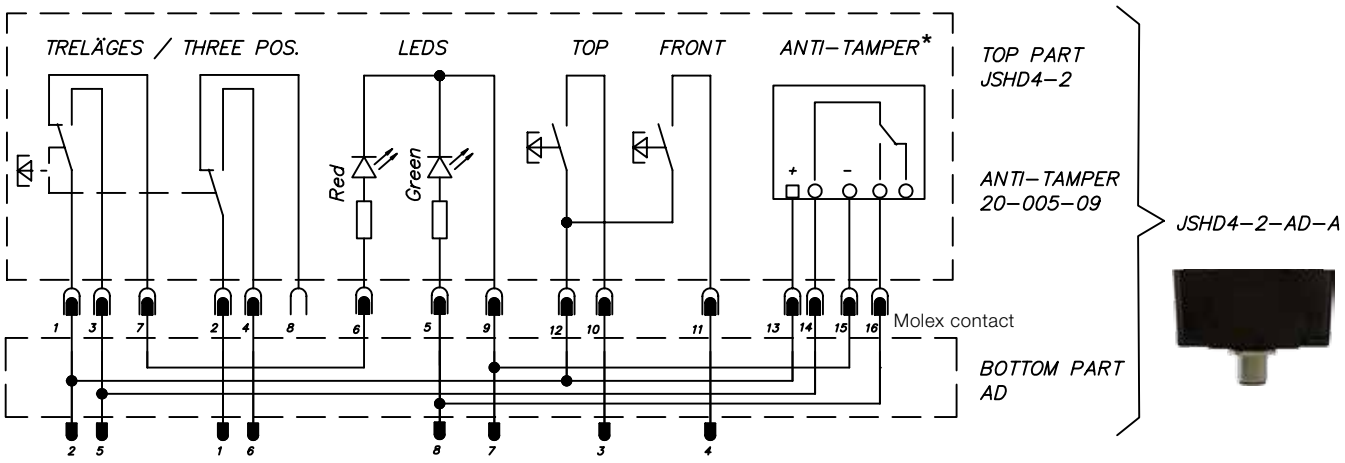
Connection with bottom parts AB



Connection with bottom parts AC

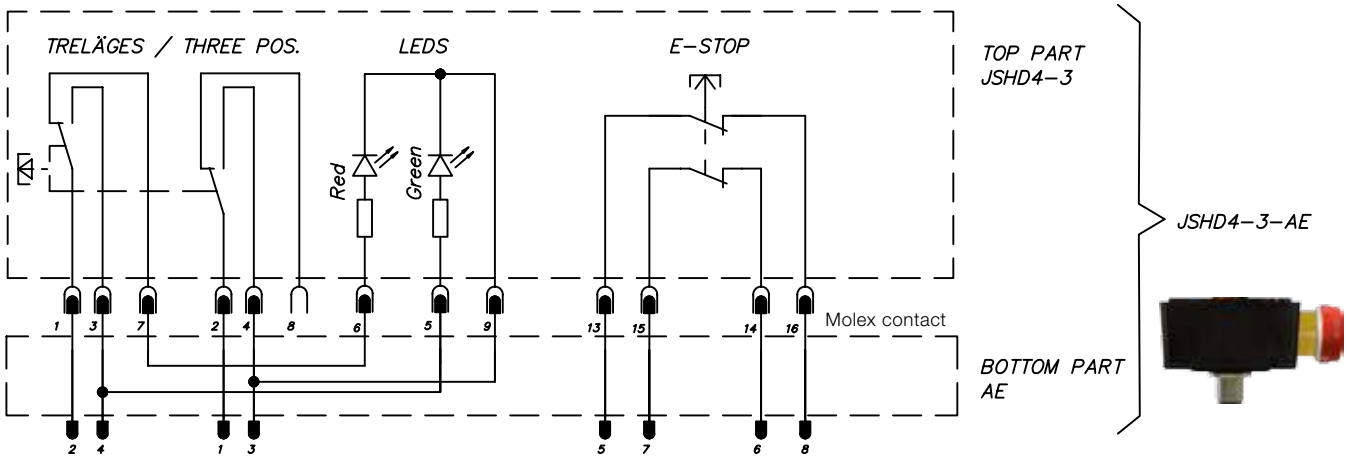


Connection with bottom parts AD

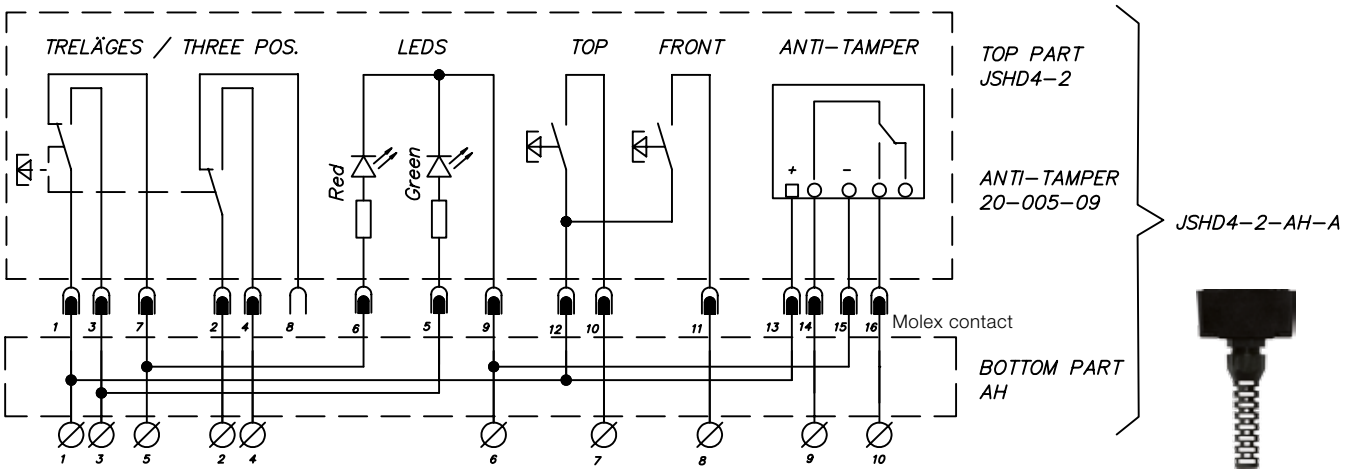


*A jump must be placed over pins 14-16 on the 2x8 Molex connector if an anti-tamper PCB is not used.

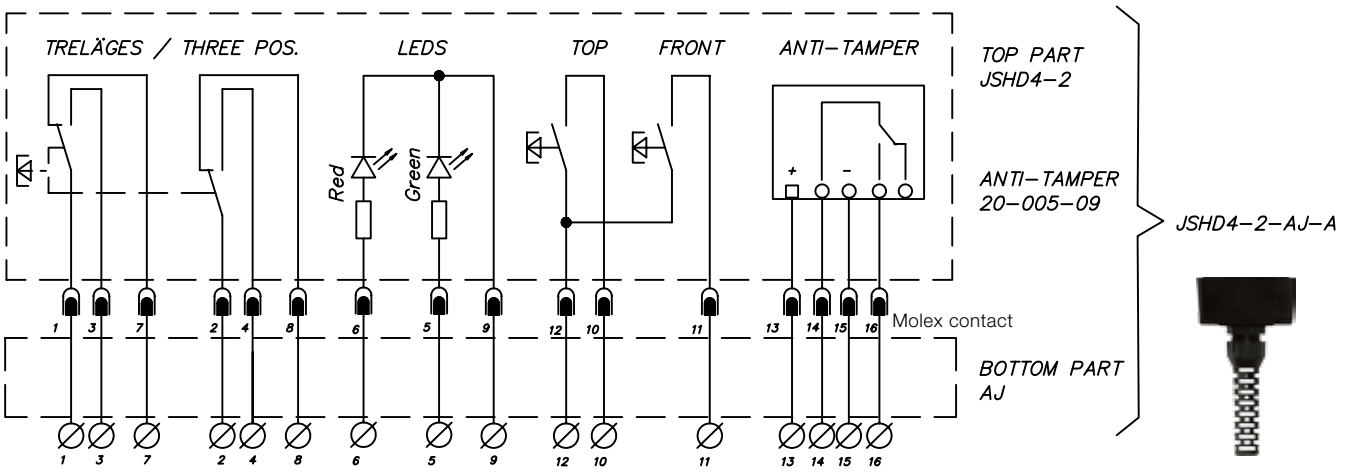
Connection with bottom parts AE



Connection with bottom parts AH



Connection with bottom parts AJ



One- and two-hand devices
Safeball™

A two-hand device which is comfortable and easy to use.

Approvals:

CE Inspecta cSAus

Safeball for:

- Presses
- Punches
- Fixtures
- Shearing machines

Features:

- Ergonomic
- Low activation force
- Flexible mounting
- Several grip possibilities
- Highest safety level
- Two channel switching in each hand
- Available for AS-i

Safeball™ Unique World Wide Two-hand device

Safeball™ consists of a spherical ball containing two embedded pushbutton switches, one on each side of the ball. By using this pushbutton configuration, the risk of unintentional activation is minimised and the device is simple and ergonomic to use.

Safeball™ can be utilised for either One-hand (one Safeball™) or Two-hand (two Safeballs™) applications. In either application, and in order to meet the required level of safety, the Safeball™ switches are monitored by specified/certified ABB Jokab Safety Safety relays (see electrical connection).

In the case where Two-hand control is used, both Safeballs™ i.e. all four pushbuttons have to be activated within 0.5 seconds. If one or more pushbuttons are released a Stop signal is given to the machine. In order to provide the highest level of safety the Safeball™ design provides the operator with a dual switching function and short-circuit supervision in each hand.

Each Safeball™ is ergonomically designed and has both its cover and actuator made of environmentally-friendly polypropylene. The design allows for comfort of use for all hand sizes and operation from numerous gripping positions. Mounting of the Safeball™ is also very flexible allowing the device to be mounted in the most ergonomic position for the operator.

When can a Two-hand or One-hand control be used?

A Two-hand control can be used when it is necessary to ensure that the operator is outside and must be prevented from reaching into the hazardous area. If the operator decides, after the start signal has been given to the machine, to make an ‘after-grasp’ i.e. try to adjust the part that has been placed into the machine, then a dual stop signal is given to the machine.

An One-hand control device can be used when the operator cannot reach the hazardous area with his/her free hand or on less dangerous machines.

Highest Safety Level

The Safeball™ is certified by Inspecta in Sweden for use as a Two-hand control device, when used with a JSBR4 ABB Jokab Safety Safety relay or Pluto Safety-PLC, in accordance with the highest safety level in standard EN 574 (type IIIc).

Safeball adapted for AS-i

Safeball also comes in a version adapted for direct attachmenent to the AS-i bus. For using the safeball AS-i as a Two-hand device the AS-i safety monitor needs to be able to handle simultaneous monitoring otf the channels.

Safeball
Function

Two-hand control device

The Two-hand control device is implemented by using two Safeballs™, each having two internal pushbuttons. The Safeballs™ must be mounted a minimum distance between each other (see Mounting description).

By utilising two pushbuttons in each device a double safety function is provided in each hand.

The highest safety level is achieved by connecting all four pushbuttons to the ABB Jokab Safety JSBR4 safety relay or Pluto Safety-PLC. The safety relay gives a dual and supervised safety function and requires input activation within 0.5 seconds in order to start the machine. It also checks that all four pushbuttons have returned to their deactivated positions before a new start is allowed. The JSBR4 safety relay also provides a stop signal if one or more pushbuttons are released.

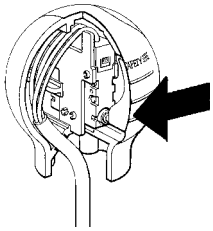
One-hand control device

Safeball™ is also a very practical method of providing a one-hand control device as it is very easy to find and activate by the machine operator. One-hand devices should only be used when the operator cannot reach into the hazardous area with his/her free hand or on less dangerous machines. Before fitting the necessary risk assessment must be made to determine suitability of this type of control. To achieve the highest safety level for One-hand control the Safeball™ must be connected to a safety control system (E.g. safety relay or safety PLC).

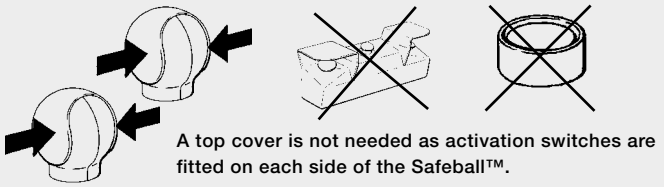
Versions

Safeball is available in several versions to meet different mounting requirements.

JSTD1-A - Safeball 1 NO + 1 NC with 2 m cable
JSTD1-B - Safeball 1 NO + 1 NC with 0.2 m cable
JSTD1-C - Safeball 1 NO + 1 NC with 10 m cable
JSTD1-E - Safeball 2 NO 0.2 m cable
JSTD1-G - AS-i Safeball



Activation of a pushbutton.

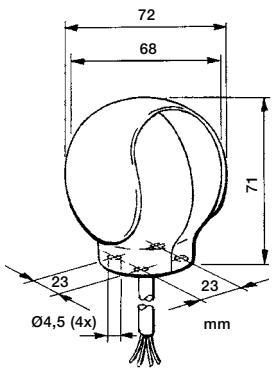


A top cover is not needed as activation switches are fitted on each side of the Safeball™.

Technical data - Safeball

Article number	
JSTD1-A	2TLA020007R3000
JSTD1-B	2TLA020007R3100
JSTD1-C	2TLA020007R3200
JSTD1-E	2TLA020007R3400
JSTD1-G AS-i	2TLA020007R3900
Material	Polypropylene
Colour	Yellow and black
Size	Height: approx. 71 mm Diameter, min.: 68 mm Diameter, max.: 72 mm Diameter, base: 42 mm
Weight	0.2 kg with 2 m cable 0.7 kg with 10 m cable 0.1 kg with 4x0.2 m wires
Level of Safety	
EN ISO 13849-1	Up to PL e/Cat. 4
Ambient temperature	-25°C to +50°C (operating)
Protection class	IP67. Not intended for use under water
Operating force	Approx. 2 N
Actuator travel	1.3 +/- 0.6 mm
Max switching load	30 V 2A DC, resistive load
Max current (resistive load)	2 A at 30 VDC (max) 20 mA at 24 VDC (recommended)
Min switching load	6V 10mA DC, resistive load
Contact resistance	100 mohm
Life, mechanical	> $1x10^6$ operations at max. 1 Hz
Life, electrical	Dependant upon electrical load characteristics
Connection cable	
JSTD1-A	2 m PVC-cable, 4 x 0.75mm^2
JSTD1-B, JSTD1-E	4 x 0.75 mm^2 wires, approx. 0.2 m
JSTD1-C	10 m PVC-cable, 4 x 0.75 mm^2
JSTD1-G AS-i	2 x 0.75 mm^2 wires, approx. 0.25 m
Conformity	EN ISO 12100:2010 EN 574+A1:2008

Chemical resistance at 20°C	
Chemical	Resistance
Alcohols	good
Paraffin oil	good
Milk	good
Silicon oil	good
Acetone	good
Please contact us for more information.	

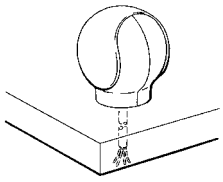


Safeball
Mounting

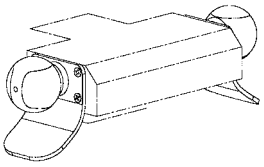
The Safeballs™ can be mounted in many different ways. They can be mounted on a table, a machine, on a support or wherever suitable for ergonomic reasons. The Safeball™ can be mounted in a fixed position or on a tilting and/or rotating support. This flexibility of mounting permits the Safeball™ to be fitted in the best ergonomic position for the ease of operation by the operator. The distance requirement between two Safeballs™ or between a Safeball™ and a wall or edge of a table depends on how the Safeball™ is mounted. Safeball™ can be mounted with four M5 screws or ST4.8 self-tapping screws.

NOTE! When Safeballs™ are mounted in such a way that the distance between them can be adjusted to less than the specified minimum, the mounting screws must be locked to ensure any changes in the distance between the two balls cannot be made.

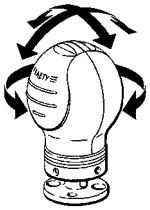
Alternative mounting methods



Mounting on a table.



Example of alternative mounting.



Mounting with ball joint, which can be rotated and angled.

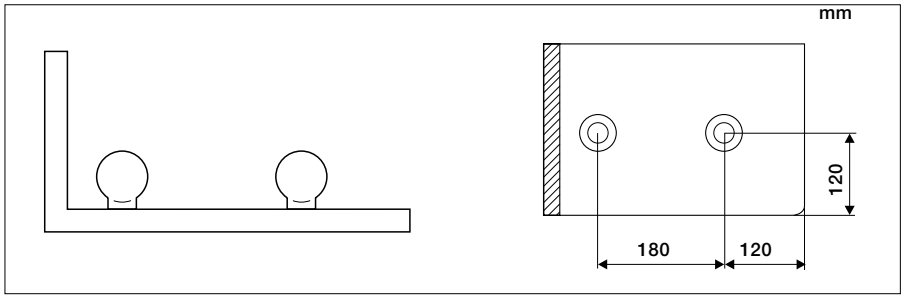
Approved Two-hand device

To be an approved Two-hand device, both Safeballs™ must be mounted a minimum distance apart in order to prevent operation of both balls with one hand. Safeballs™ must be fitted a minimum distance from the edges of tables or a wall. It is essential that Safeballs™ are correctly installed in order to prevent unintended activation of the devices with part of the body in combination for example with a wall.

Mounting distance -Safety distance - Safeball

Mounting distance

Table mounting of two Safeballs™.
In order to prevent cheating the distances shown are the minimum allowed.

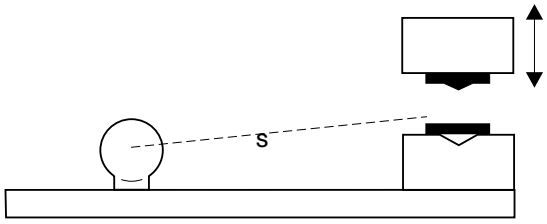


Safety distance

The Safety distance is the distance between the Safeballs™ and the dangerous machine movement. The safety distance requirement can be calculated using the following formula for Safeball™ in accordance with the approving authority and EN ISO 13855: S= KxT+C

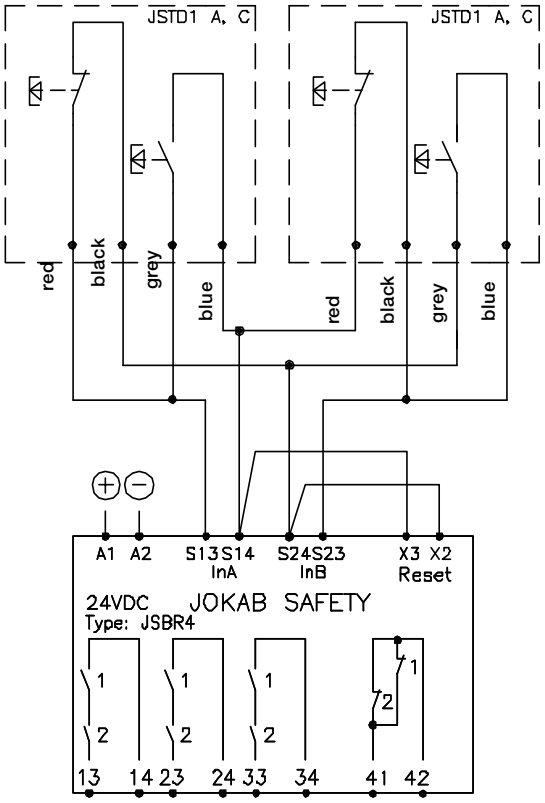
Where

S = safety distance in mm
K = hand speed, 1600 mm/s
T = total stopping time for the dangerous movement (including the response time of the safety relays in seconds)
C = Constant = 0 mm for Safeball.



The safety distance is the distance between the Safeballs™ and the dangerous machine movement. Note that S must never be less than 100 mm.

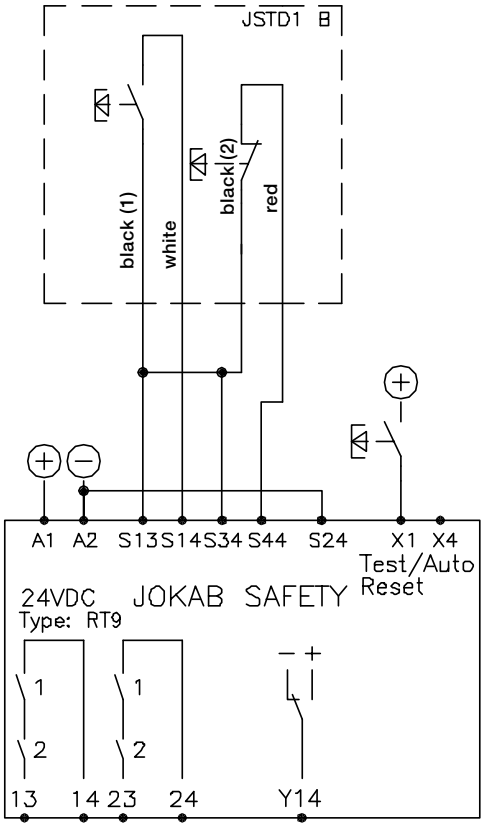
Safeball
Electrical connection



Two–hand device

Safeballs™ are designed to be connected to a ABB Jokab Safety JSBR4 Safety relay or Safety PLC to achieve the highest safety requirements for a Two-hand device.

Example of two devices connected to a ABB Jokab Safety JSBR4 safety relay. Response time on receiving a stop signal from JSTD1 < 15 ms.



One-hand device

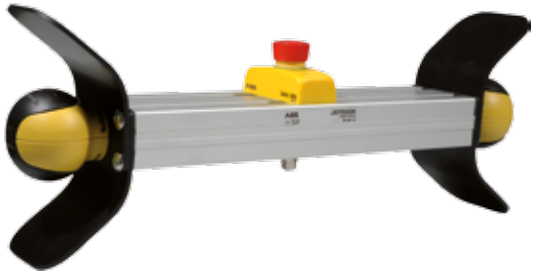
When used as a One-hand device the Safeball™ is designed to be connected to a ABB Jokab Safety RT6, RT7 or RT9 Safety relay in order to achieve the highest possible safety level for this type of control.

Example of a single Safeball™ connected to a ABB Jokab Safety relay RT9. The response time at ‘stop’ is < 20 ms.

Two-hand control station JSTD25 with Safeball

The JSTD25 replaces the traditional two-hand device. With the JSTD25 control station you have a prepared two-hand unit that is easy to install, while utilizing the good ergonomics of the Safeball. There are several versions to meet differing needs, all versions meet EN 574 and EN ISO 13849-1.

For mobile or fixed installation



JSTD25F/JSTD25H

Article number - 2TLA020007R6000/2TLA020007R6300
An ergonomic two-hand control unit with two Safeballs mounted on the ends of an aluminum profile. Both Safeball are protected with shields for unintended press of the Safeball buttons. The device can be easily mounted with the aid of grooves in the aluminum profile and an quick connection is made to the M12 connector underneath the device. For mobile applications with repositioning of the two hand device this unit is very suitable because of its low weight.

JSTD25F is equipped with a 5-pole M12 male connector and the JSHD25H is equipped with an 8-pole M12 male connector.

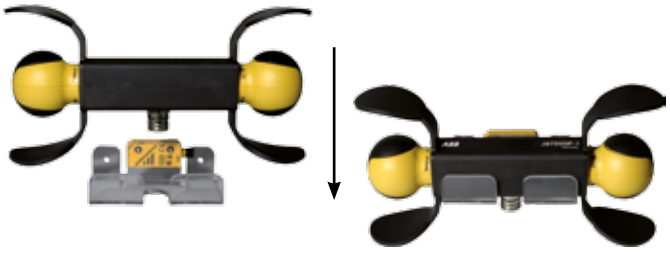
Both units can be equipped with an external emergency stop (Smile) and an Eden sensor for position control (ordered separately and assembled by the customer).

JSTD25K

Article number - 2TLA020007R6900
The JSTD25K is a fully equiped two-hand control device that is very similar and has all the advantages from the JSTD25F/JSTD25H.

JSTD25K has just as JSTD25F/H, two Safeballs mounted on the ends of an aluminum profile and the same length. The additional equipment is double protection shields protecting for unintended press from several directions and a Smile 10 EA emergency stop placed on the middle of the profile. Connection is made easily with a 8-pole M12 male connector underneath the device.

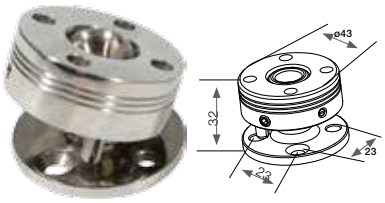
For mobile installation with a built-in Eden sensor



JSTD25P-1

Article number - 2TLA020007R6500
Two-hand control unit, portable. Two Safeballs mounted on the ends of an aluminium profile, shielded by over hand guards. With built-in Eva sensor for position control. Developed as a portable two-hand device, where the response of the machine to operation can vary at different operating stations, since each station can be connected separately. Connection via an 8+1 Zylin connector.

Accessories



JSM C5
Article number - 2TLA020007R0900
Angled ball joint for installation
of a Safeball on a table or a steel housing.

JSM C7
Article number - 2TLA020007R1200
Suspension shelf for JSTD25F/H/G/K

JSM C14
Article number - 2TLA020007R8000
Suspension shelf for JSTD25P-1

JSTK25S
Article number - 2TLA020007R6700
2.5 m long spiral cable for JSTD25P-1

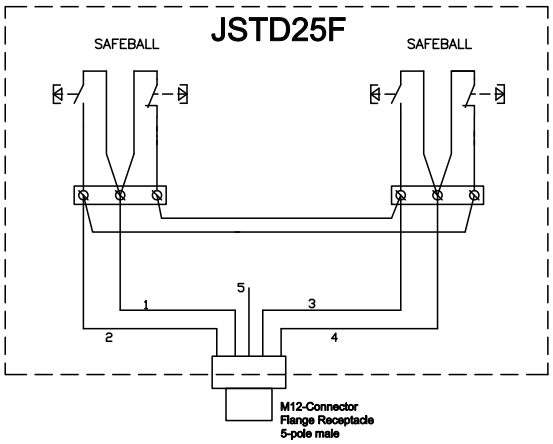
JSTK50S
Article number - 2TLA020007R6800
8 m long spiral cable for JSTD25P-1

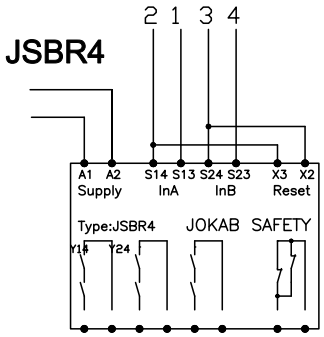
JSTK0-A
Article number - 2TLA020007R6600
Female connector for JSTD25P-1

Safeball protection coat
Article number - 2TLA020007R1900
Extra protection coat for Safeball.

Connection examples

JSTD25F

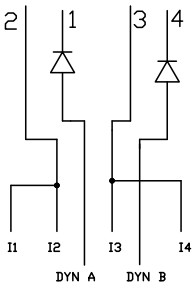




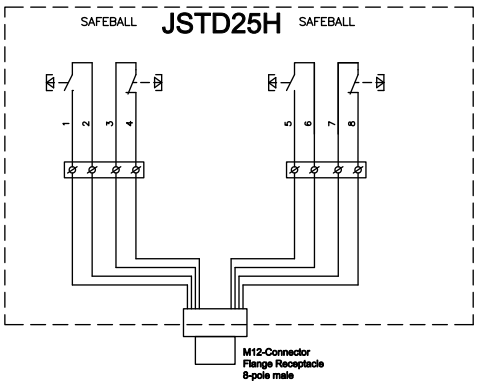
M12 5 Color-code
(not always used, verify!)
1 Brun Brown Braun Marron
2 Vit White Weiss Blanc
3 Blå Blue Blau Bleu
4 Svart Black Schwartz Noir
5 Not connected

1 Dyn A out
2 Pluto to evaluate A = OK, and test B (two inputs)
3 Pluto to evaluate B = OK, and test A (two inputs)
4 Dyn B out

According to standard Pluto Twohand1 block:
I1: Right_NO
I2: Left_NC
I3: Right_NC
I4: Left_NO

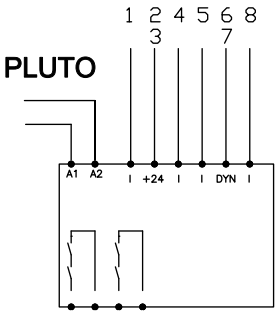


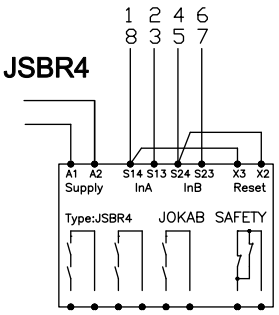
JSTD25H



M12-C03
Contact (plug) for self assembly. Female.
As seen from cable side (inside).
Ordered separately.

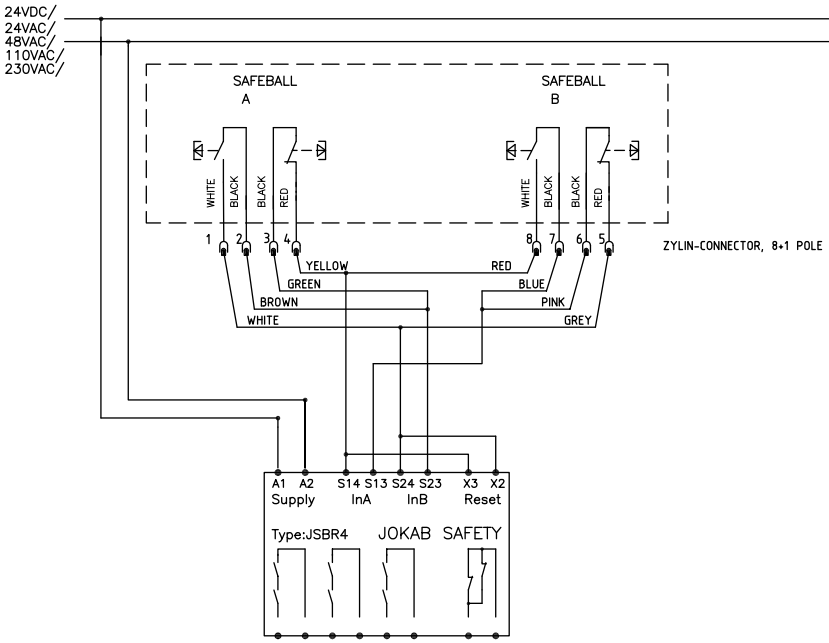
M12 8 Color-code
(not always used, verify!)
1 Vit White Weiss Blanc
2 Brun Brown Braun Marron
3 Grön Green Grün Vert
4 Gul Yellow Gelb Jaune
5 Grå Grey Grau Gris
6 Rosa Pink Rosa Rose
7 Blå Blue Blau Bleu
8 Röd Red Rot Rouge





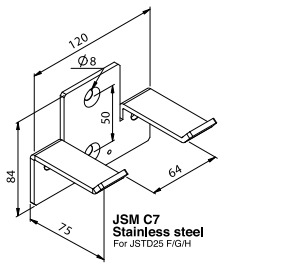
Connection examples

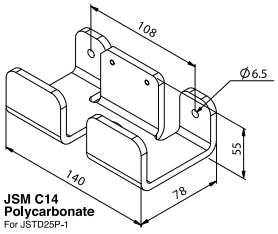
JSTD25P-1



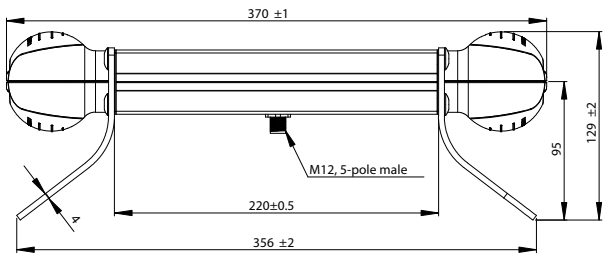
Dimensions

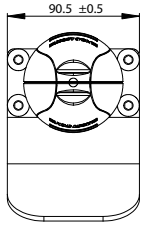
JSTD25

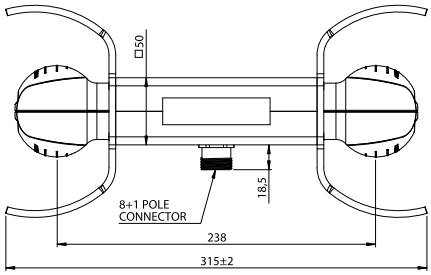


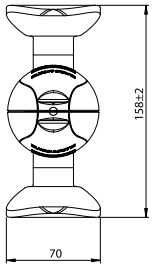


JSTD25F









JSTD25P-1

Two-hand device
JSTD20

Approvals:

CE Inspecta

Use:

- Presses
- Punching machines
- Cutting machines
- Fixtures

Features:

- Durable material
- With or without emergency stop pushbutton
- Fulfils requirements of EN 574
- Highest level of safety

Conventional Two-hand device

The conventional JSTD20 Two-hand device utilises a welded steel housing. Two operating pushbuttons are protected by over hand guards. Between these pushbuttons there is space for a emergency pushbutton and two extra controls or indication lamps. Below each of the operating pushbuttons is one normally open and one normally closed contact. To start and run the machine both pushbuttons must be activated within 0.5 seconds. If one or both pushbuttons are released a stop signal is given to the machine, and all contacts must return to their deactivated positions before a new start is allowed.

The design is robust and can withstand harsh environments and long use. The pushbuttons and contact blocks are simple to assemble for quick and easy installation. The device can be mounted directly on the machine, on the ABB Jokab Safety fencing system or on the JSTS30 floor mount. For use with portable Two-hand devices the JSTS31 floor mount, which is provided with a spacer ring to fulfil the requirements of EN 574, is recommended. The JSTD20 is available with or without an emergency stop pushbutton.

Highest level of safety

Correct connection to a ABB Jokab Safety JSBR4 safety relay or Pluto Safety PLC ensures the highest level of safety with dual and supervised safety function and requires input activation of both operating pushbuttons within 0.5 seconds (two hand device type III C in accordance with EN 574). If the emergency pushbutton is installed it should be provided with two normally closed contacts and be connected to a separate safety relay, e.g. from the RT series or Pluto.

Why use a Two-hand device?

A Two-hand device can be used when it is necessary to ensure that the operator is outside and must be prevented from reaching into the hazardous area. If the operator decides, after the start signal has been given to the machine, to make an 'after grasp' i.e. try to adjust the part that has been placed inside the machine, then a dual stop signal is given to the machine.

The JSTD20 is equipped with a type of large over hand guards in accordance with EN 574. These prevent unintended activation by for instance a knee or elbow.

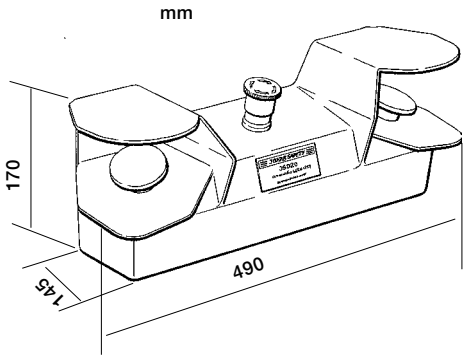
A Two-hand device only protects the operator using it. Large machines operated by several operators can be equipped with one control for each operator.

To calculate the correct safety distance, which depends on the machine's stopping time including the response time of the relay, the use of the ABB Jokab Safety Smart Stopping analyser is recommended.

Technical data - JSTD20

Article number	
JSTD20A	2TLA020007R2000
JSTD20B	2TLA020007R2100
JSTD20C	2TLA020007R2200
Weight	6.4 Kg
Colour	Black housing, Black pushbuttons, Black floor stand.
Temperature	-10°C…+70°C (Operating) -20°C to +70°C (storage)
Level of Safety	
EN ISO 13849-1	Up to PL e/Cat. 4
Material	Housing: 3mm Steel Gasket: Rubber Pushbuttons: Plastic
Operating pushbuttons	
Diameter	60 mm
Operating force	Approx. 9N
Operating distance	3.5±1mm
Mechanical life	10^6 operations
Emergency pushbutton	
(JSTD20B only)	
Diameter	40 mm
Operating force	40N
Mechanical life	3 x 10^5 operations
Contacts	Mechanically separated contact blocks
Operating pushbuttons	1 NO + 1 NC /button
Emergency pushbuttons	2 x NC
Isolation voltage	690V rms
Contact resistance	20 mohm
Rated current	10A

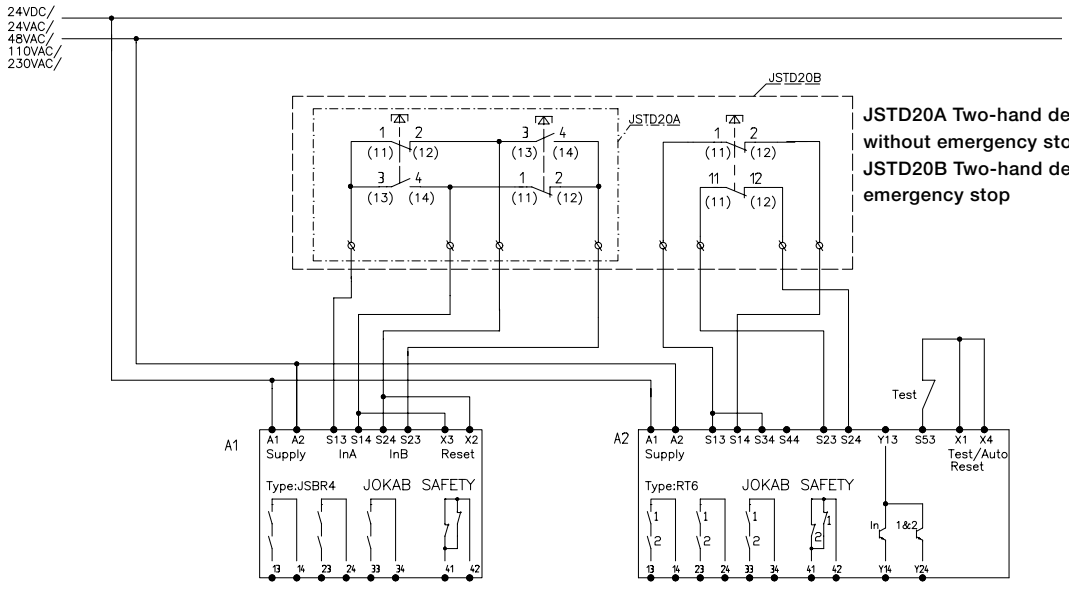
Utilisation categories	AC 15 240V 3A DC 13 240V 0.27A
Cabling	screw clamp terminals, 1 or 2 wires with max. cross-section 2.5 mm².
Contact material	silver alloy on brass
Protection class	IP65
Accessories	
JSTS30 floor stand	2TLA020007R4000
JSTS31 floor stand + distance ring	2TLA020007R4100
JSTS32 distance ring	2TLA020007R4200
Conformity	EN ISO 13850, EN IEC 60947-5-5, EN 574+A1:2008, EN 12100:2010, EN ISO 13849-1, EN 60947-1, EN 60947-5-1, EN ISO 12855



JSTD20A – Two-hand device, without emergency stop
JSTD20B – Two-hand device, with emergency stop
JSTD20C – Only housing, no buttons

Connection example - JSTD20

The Two-hand device is intended for use with ABB Jokab Safety's JSBR4 safety relay (or Pluto Safety PLC) to ensure the highest level of safety. The JSBR4 ensures that all contacts have returned to their deactivated positions before a new start is allowed. The safety relay also requires that all contacts are activated within 0.5 seconds. The JSBR4 gives a stop signal if one or both of the pushbuttons are released.



JSTD20A Two-hand device without emergency stop
JSTD20B Two-hand device with emergency stop