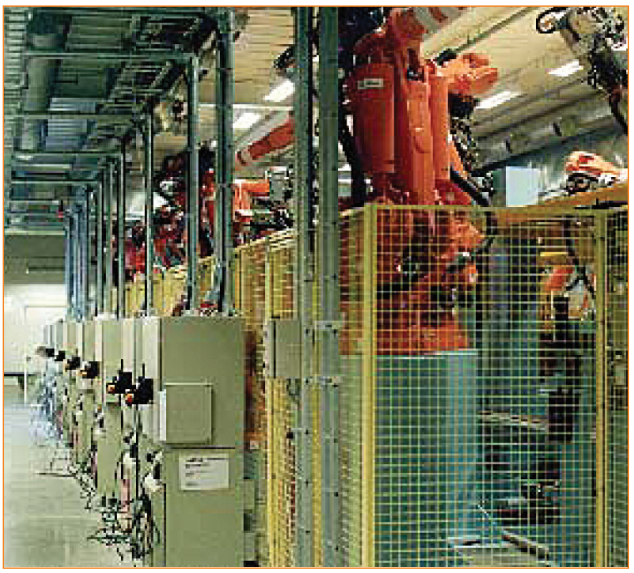
Safety Control Devices

Meet existing safety standards!
Keep hands outside of risk area!
Safe stops and reliable restarts!

Why should I use Control Devices?

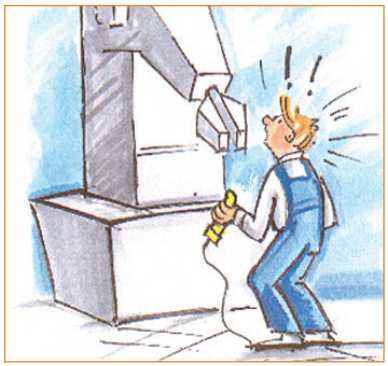
...for the machine operator to be able to directly start and stop dangerous machine movement!



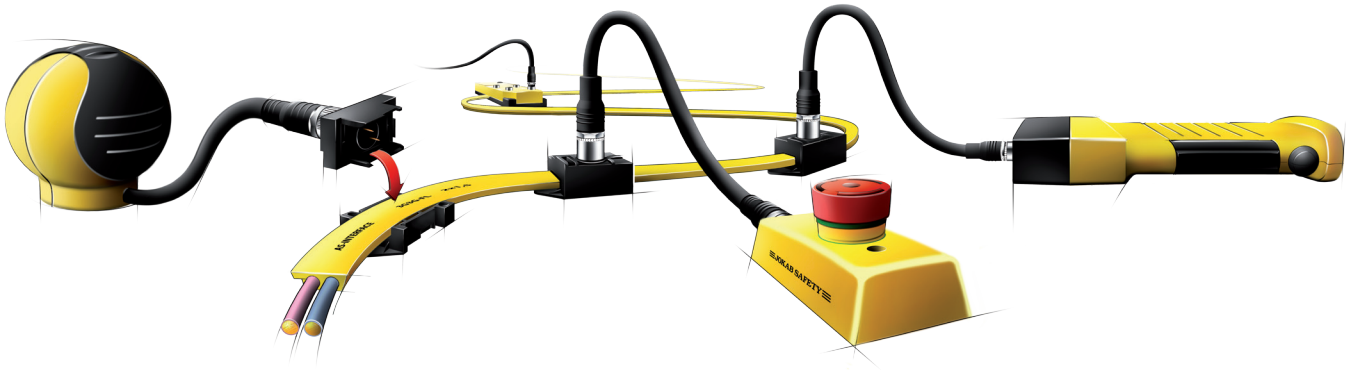
Three-Position Enabling Devices

Three-position devices, hold-to-run devices and enabling devices are used during troubleshooting, programming and test running when no other safety components are possible or suitable. The device is held in the hand and...

...the operator, in an emergency situation, can either press harder or entirely release the device to stop the machine.



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

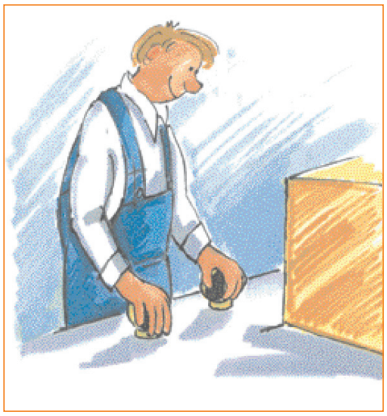


Two-Hand Control Devices

A two-hand control device is used when it must guarantee 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 r eturned 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 ess than 100 mm must not be used.

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.



JSTD1 Ergonomic Safeball is a two-hand control device with four built-in buttons.

JSHD4 Three-Position Enabling Devices: The Safest Solution during Troubleshooting, Programming and Testing

Why choose three-position devices?

An operator who is under pressure must be able to give a stop signal, whether in panic they push harder on the button or just lets go of it. Three-position devices, hold-in and acceptance devices can be used for troubleshooting, programming and test running in situations where no other protection is available or feasible.

If the operator has to enter a risk area to troubleshoot or run a test, it is extremely important that they are 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 vs Acceptance Device

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.

Ergonomic Design

The device is ergonomically designed—its shape, the way it fits 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 others to danger by trying to lock the three-position device in run mode.

Applications

- Troubleshooting
- Test Running
- Programming

Advantages

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

Regulations and Standards

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

Approvals

CERTIFIED BY inspecta

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.

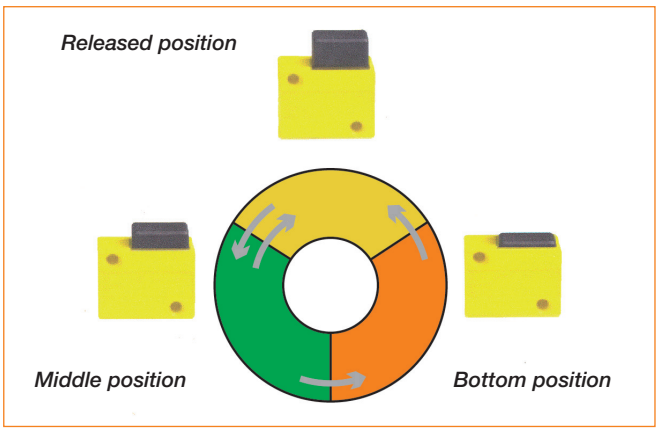
How does a three-position device work?

Safety Level

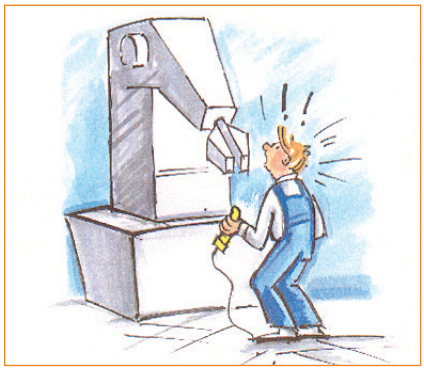
A safe Enabling or Hold to Run device should function as follows:

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.

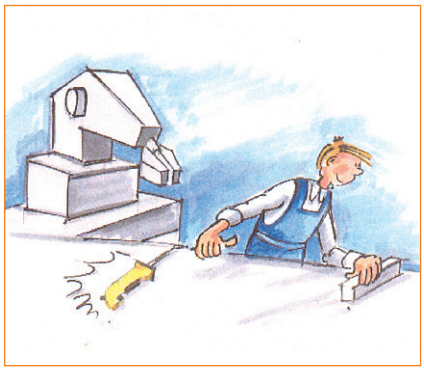
In order to meet the above conditions, the three-position switch must be connected to a suitable safety relay with a two channel function, e.g. RT6, RT9 or the Pluto Safety PLC, which can monitor that both three-position buttons are working and that there is no short or open circuit in the connection cable or the switch.



Highest Safety Level whether the Button is Pushed or Released



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.



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.

Three-Position Devices in Different Versions

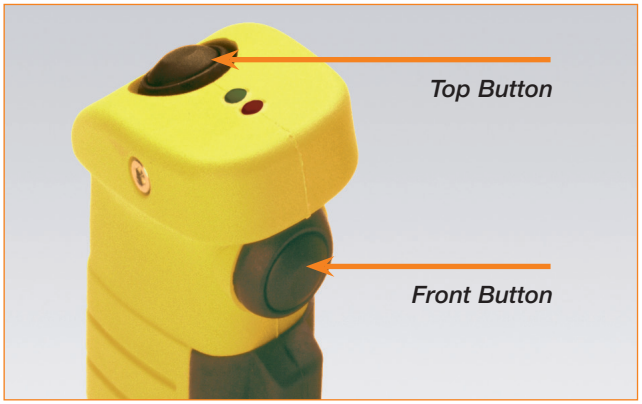
Three-position device fitted to a machine control unit.

Panel assembly of JSHD4H2 on a programming unit for robots.

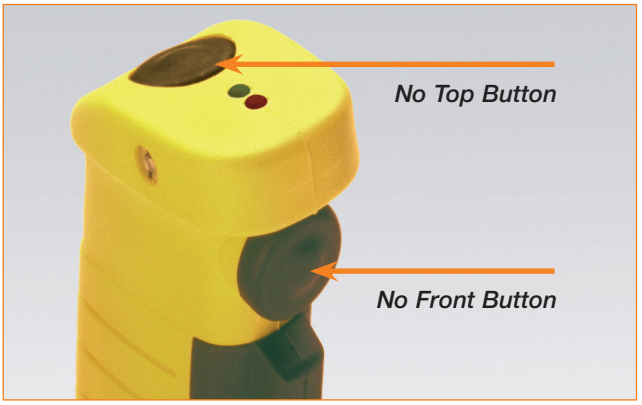
Standard Features and Options

Button Configurations

The 3-Position Enabling Device can have up to two auxiliary buttons on the front and top to be used for any functions the user desires. Common functions such as jogging, start/stop, up/down or safety relay reset are achievable with one hand while maintaining the safety function.



Enabling Device with Top and Front Buttons



Enabling Device with No Auxiliary Buttons

LED Options

One green LED and one red LED are standard as function indicators for the Enabling Device. When the Enabling Device is cycled to position 3, the start function in position 2 is not reinitiated when the enabling button returns from position 3 to position 1.

Position 1 (Red LED)
STOP Function
Enabling Button
Not Pressed or Released

Position 2 (Green LED)
START Function
Enabling Button
Pressed to the Middle Position

Position 3 (Red LED)
STOP Function
Enabling Button Pressed Down
Fully Past the Middle Position

Bottom Plate

The ABB Jokab Safety Enabling Device comes standard with a large bottom plate with provisions for mounting the actuators from the pendant holster JSNA-JSM-2A accessory. The large bottom plate accommodates both 5 pole and 8 pole connection types.

Connection Types and Special Applications

8 Poles Male Mini Series Size II Plug with Cable

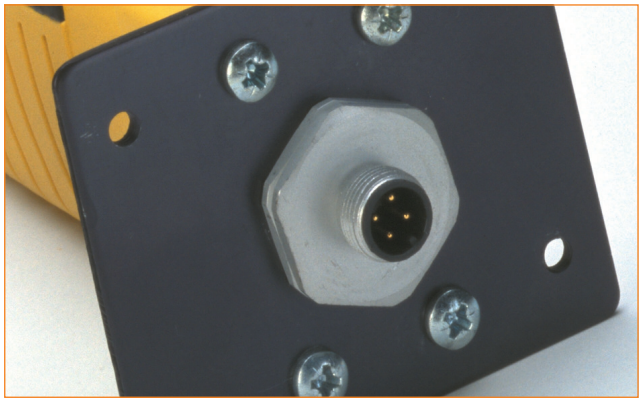
Standard cable lengths of 20, 30 or 40 feet in oil resistant PVC and 20 or 30 feet in PUR cable. (8MP Designator)

4 Poles Male Micro DC (M12) Plug with Cable

Standard cable lengths of 6, 10 or 15 meters in oil resistant PVC. (4MP Designator)

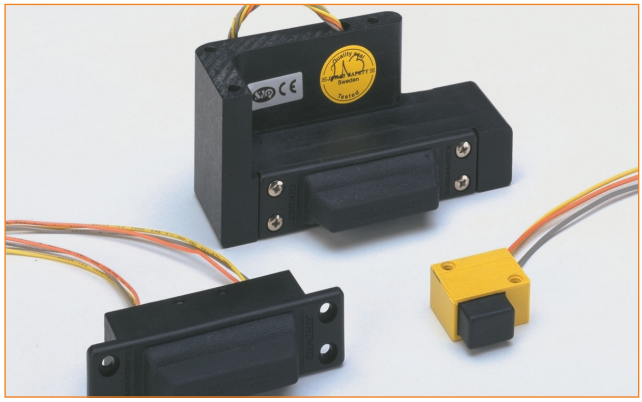
8 Poles Male Mini Series Size II Receptacle

(8MR Designator)



5 Poles Male Micro DC (M12) Receptacle

(5MR Designator)



3-Position Switches

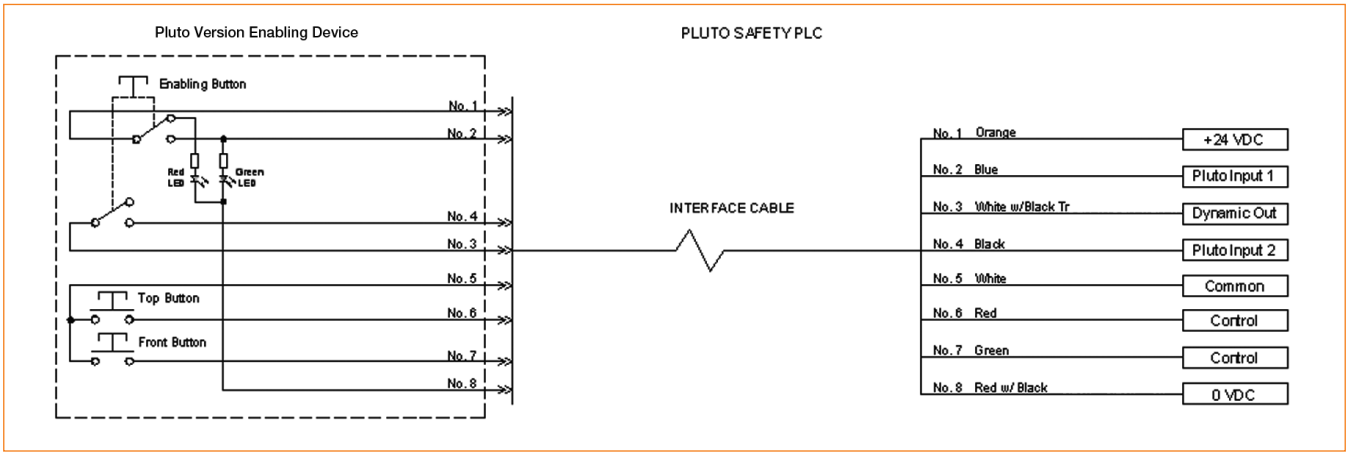
For customers who would like to retrofit or incorporate switches into existing robot teach pendants or other devices, ABB Jokab Safety offers three versions of our 3-Position Switches.

Note: Minimum order quantity is required.

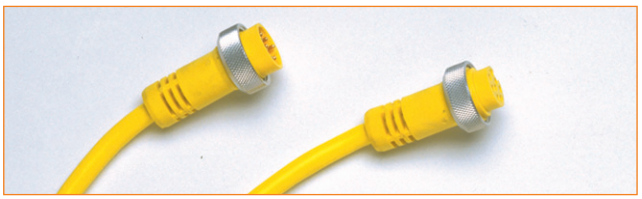
Custom 3-Position Enabling Devices for Many Special Applications

The 3-Position Enabling Device can be customized to accommodate many special applications, including special cables, connection type or wiring configurations that are necessary to meet certain application criteria.

Connection of Pluto Version Enabling Device to Pluto Safety PLC

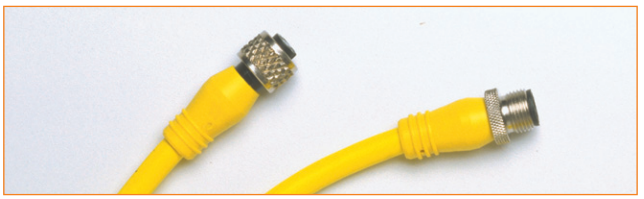


Accessories



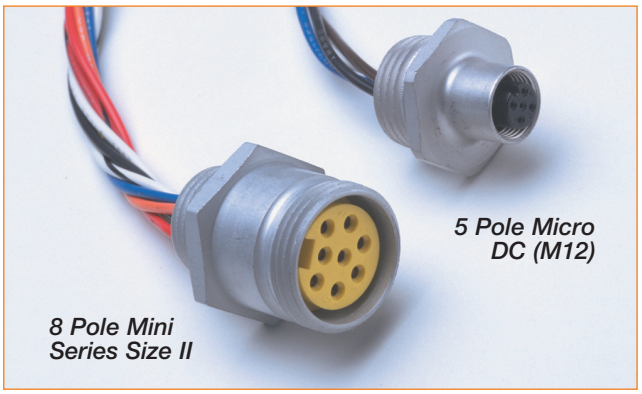
8 Pole Mini Series Size II

Available in standard cable lengths of 20, 30 or 40* feet with 18AWG wire. Custom lengths are available upon request and are subject to a minimum quantity requirement. (*only in PVC)



5 Pole Micro DC (M12)

Standard cable lengths of 10, 15 or 20 meters with 18AWG wire in PVC or 22AWG wire in PUR cable. Custom lengths are available upon request and are subject to a minimum quantity requirement.



Panel Mount Receptacles

Both 8 Pole Mini Series Size II and 5 Pole Micro DC (M12) style female versions available with 1/2" NPT mounting and 18AWG wire.

Standard wire lengths of 12, 36 or 72 inches for the 8 pole style and 0.3 or 1 meter for the 4 pole style. Custom lengths are available upon request and are subject to a minimum quantity requirement.

Terminating Plugs

Both 8 Pole Mini Series Size II and 4 Pole Micro DC (M12) style male versions available with pins 1-2 and 3-4 shorted.

Pendant Holster

The pendant holster can be used for a variety of applications, including:

- Disabling of robot hazardous motion
- Disabling of external reset buttons to prevent unintentional start-ups
- Disabling of input devices to allow access to the hazardous area of other equipment within a cell, such as transfer stations, while using the enabling device

The non-safety N.O. contact on the pendant holster safety interlock switches can be used to provide a software or visual signal to indicate that the enabling device has been removed from the pendant holster.

Interlock Switch Pendant Holster

The Enabling Device Pendant Holster consists of two safety interlock switches mounted to a U-channel wall mounting bracket. Each safety interlock switch contains two N.C. positive openings and one N.O. contact.

The actuator from each safety interlock switch is mounted to the standard large bottom plate of the enabling device. The enabling device is then inserted into the pendant holster. The safety interlock switches provide a very strong and secure holder for the enabling device while providing the customer user interface contact to perform various functions.

Eden Pendant Holster

The Eden Enabling Device Pendant Holster consists of a two-piece metal bracket and is designed for use with the Adam and Eva non-contact, non-magnetic safety switch and the JSHD4 Enabling Device.

The top bracket (JSM53A) is formed to step-up near the center of the bracket. The lower end of this bracket is pre-drilled with four holes to attach the enabler pendant handle with screws and a M16 threaded opening for enabling device cable or bulkhead connector. The stepped-up end of the top bracket is drilled and tapped with two 4 mm holes to attach the Eva or Eva E side of the Eden Safety Switch. A beveled guide pin is welded to the underside of the stepped-up end of the top bracket and will fit into a pre-drilled hole with metal tube welded to the underside of the lower bracket.

The lower bracket (JSM54) is formed with a 90° angle that has pre-drilled holes for attachment to walls, panels or fencing. The rest of the bracket has two drilled and tapped 4 mm holes to attach the Adam or Adam E side of the Eden Safety Switch and is shaped to mate with the top bracket. This allows for the insertion of the guide pin into the pre-drilled hole and properly positions the Adam and Eva Safety Switch. The Eden Pendant Holster comes assembled with Enabling Device or can be ordered without the Enabling Device to retrofit your current enabling device.

Design a Three-Position Device for your Needs

1. Choose between five different top units

- No LEDs
- No front button
- No top button

JSHD4-1
2TLA020006R2100

- LEDs
- Front button
- Top button

JSHD4-2
2TLA020006R2200

- LEDs
- No front button
- No top button

JSHD4-3
2TLA020006R2300

- LEDs
- Front button
- No top button

JSHD4-4
2TLA020006R2400

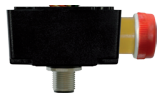
2. Choose a bottom part suitable for your assembly

AA, AH, AJ

AB

AC, AD

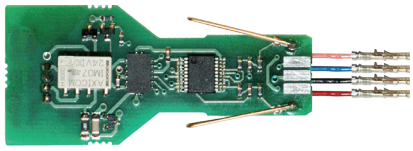
AF, AG



AE

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

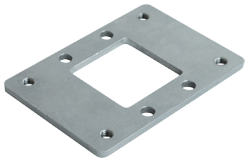
3. Choose hand recognition for making your three position device cheat protected (option)



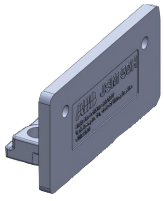
Anti-tamper PCB – 2TLA020005R0900

4. Check the chart (above right) to see if your combination is available

5. Choose a bottom plate (option)



JSM50G, bottom plate for Safety Interlock switch JSNY5
2TLA020205R6300



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

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

Three-Position Enabling Device Accessories

Cable, Available in Different Lengths

Spiral Cable, Available in Different Lengths

JSHK0 12 Pole Connector for JSHD4

JSHD4 Protection Coat

JSM55 Wall Bracket for Three-Position Device

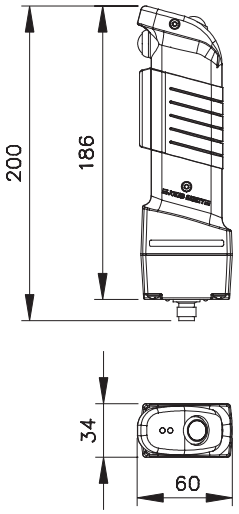
Cable Drum

JSM5B Wall Bracket for Interlock Switches and Three-Position Device

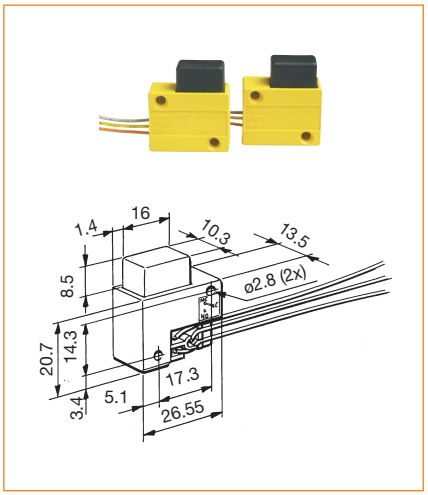
Technical Data - JSHD4 Enabling Device

Manufacturer	ABB AB/Jokab Safety, Sweden
Ordering information	see pages 9:27-9:32
Safety level EN ISO 13849-1	 Category 4/PL e
Electrical contact ratings Three-position button Extra button	 30 VDC, max 0.5 A (min. 10 mA, 10V) 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		

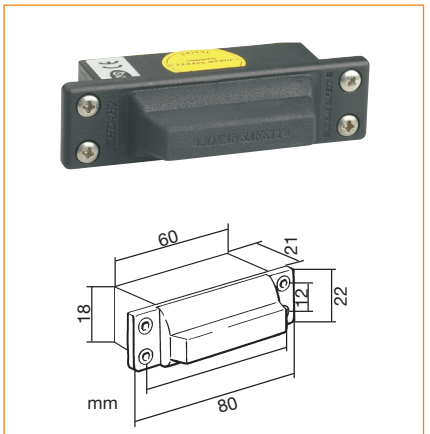


Three-Position Devices for Different Types of Mounting



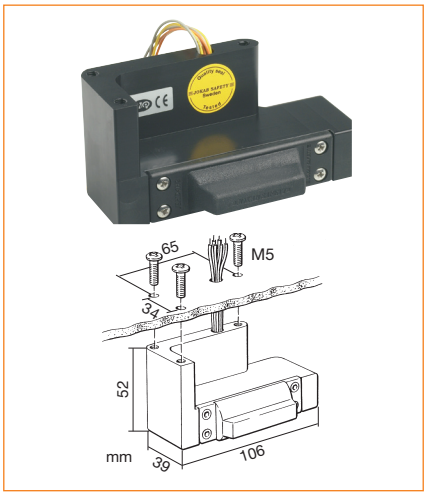
3-Position Push Button JSHD2C

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.

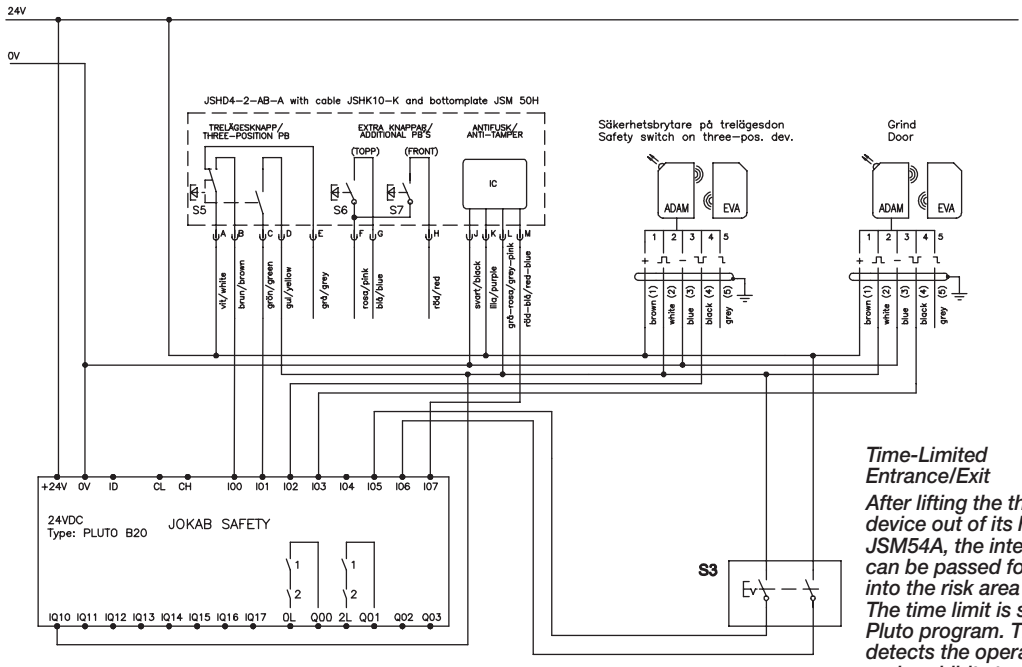


External Assembly JSHD4H2A

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.

JSHD4 Connection Example

Three-Position Device JSHD4 to Pluto



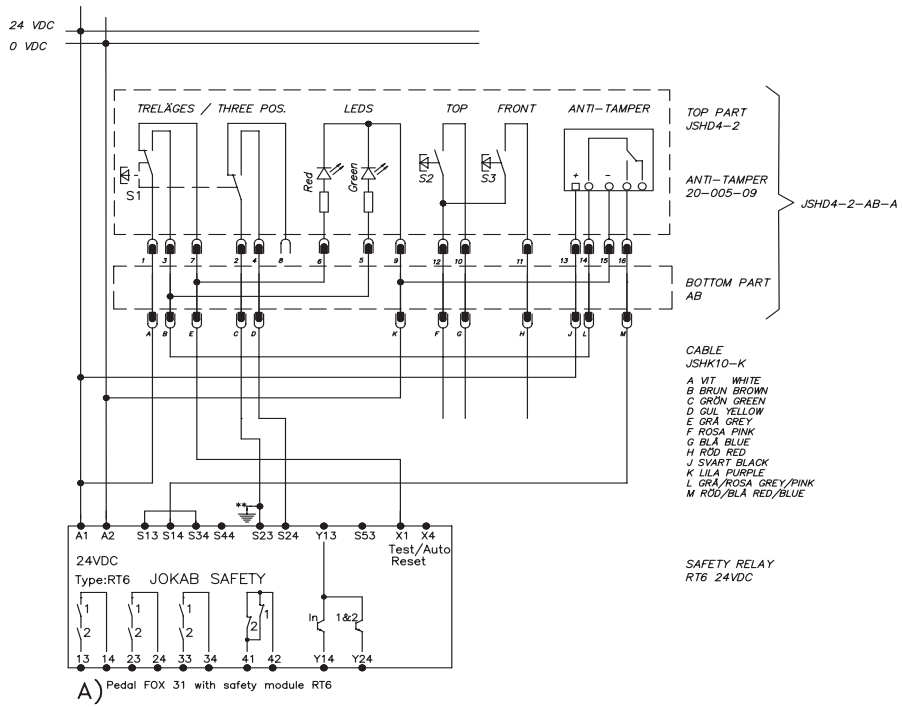
Time-Limited Entrance/Exit

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.

SEE DISCLAIMER ON PAGE 9:35

JSHD4 Connection Example

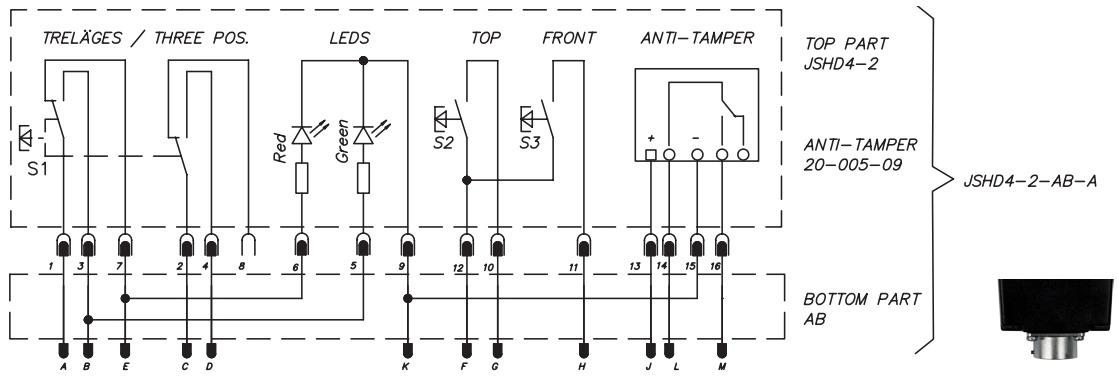
Three-Postion Device JSHD4 with Various Safety Controllers



SEE DISCLAIMER ON PAGE 9:35

JSHD4 Connection Example

Connection with bottom parts AB



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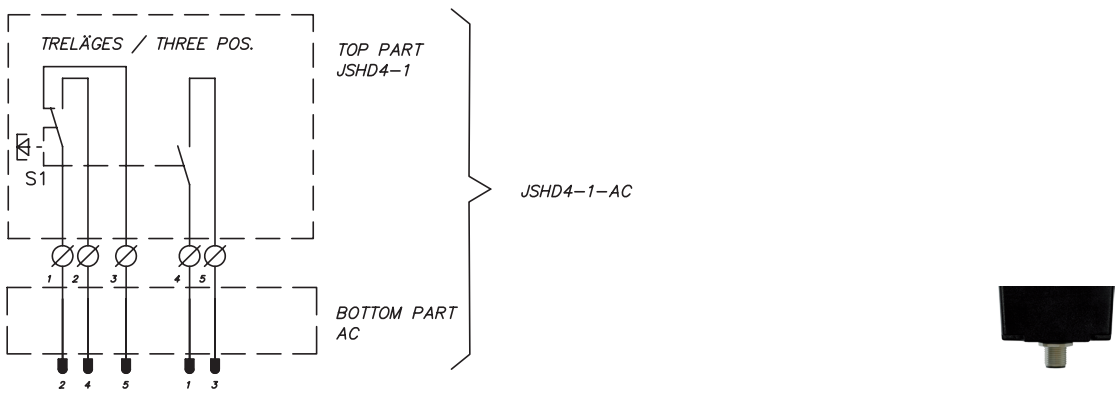
JSHD4 Connection Example

Connection with bottom parts AC



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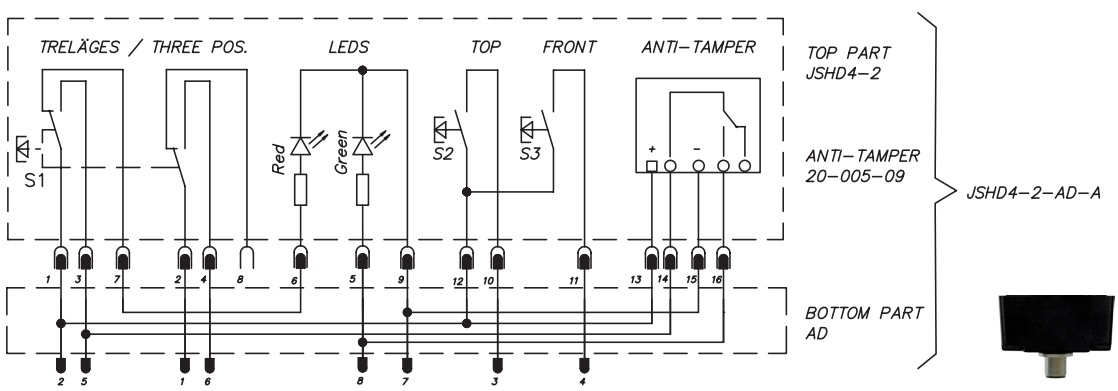
JSHD4 Connection Example

Connection with bottom parts AD



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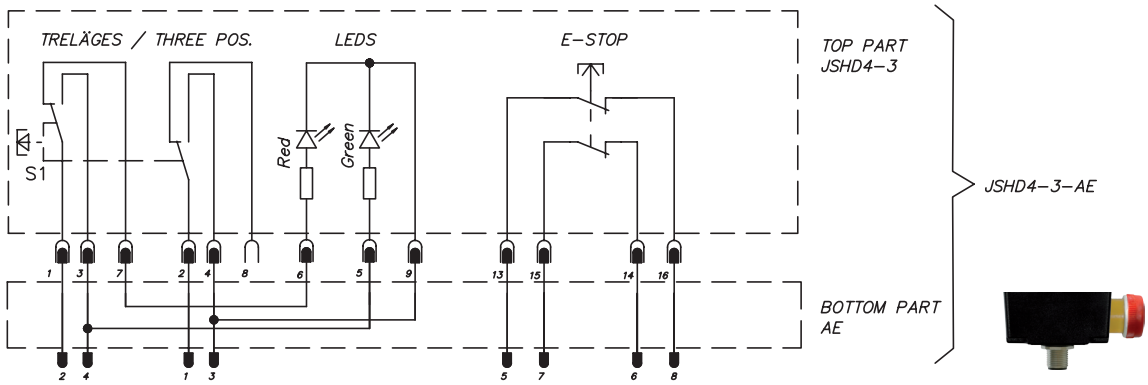
JSHD4 Connection Example

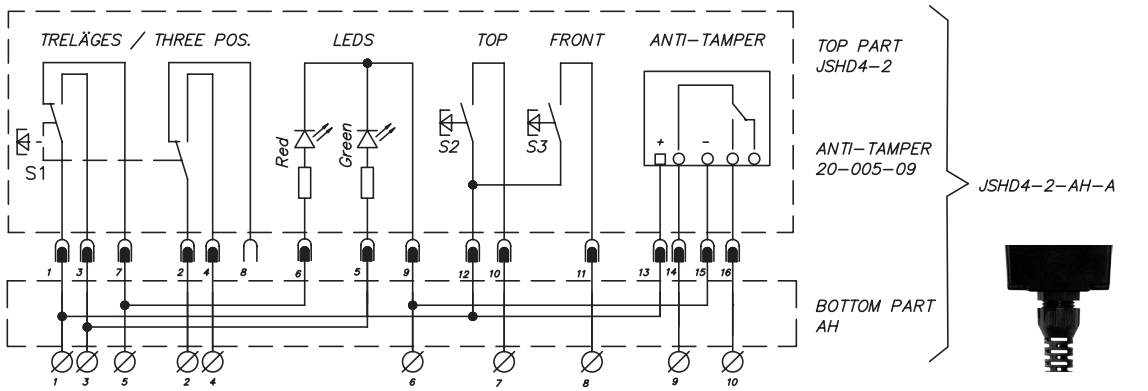
Connection with bottom parts AE



SEE DISCLAIMER ON PAGE 9:35

JSHD4 Connection Example

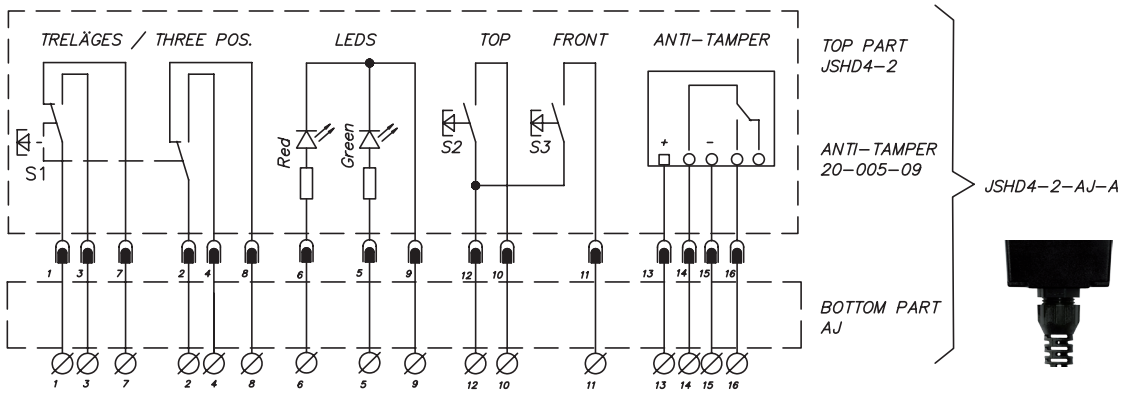
Connection with bottom parts AH



SEE DISCLAIMER ON PAGE 9:35

JSHD4 Connection Example

Connection with bottom parts AJ



SEE DISCLAIMER ON PAGE 9:35

JSTD1 Safeball™
A Unique New Category 4 Two-Hand Control Device

Safeball is a completely new approach to the design of one and two-hand safety devices. Instead of the conventional approach using ordinary push buttons and non-ergonomic protection for unintentional activation, a 'hands on' approach has been developed. Safeball consists of a spherical ball containing two embedded push button switches, one on each side of the ball. By using this push button configuration, the risk of unintentional activation is minimized and the device is simple and ergonomic to use.

Safeball can be utilized 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(s) switches are monitored by specified/certified ABB Jokab Safety safety relays or Pluto Safety PLCs.

In the case where two-hand control is used, both Safeballs i.e. all four push buttons have to be activated within 0.5 seconds. If one or more push buttons 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 environmental 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.

Two-Hand Controls vs One-Hand Controls

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.

A 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.

High 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).

Two-Hand Device Adapted for AS-i

The two hand device, Safeball also comes in a version adapted for direct attachment to the AS-i bus.

JSTD25A
Mounting Station

Applications

- Presses
- Punches
- Fixtures
- Shearing machines

Features

- Ergonomic design
- Low activation force
- Flexible mounting
- Several grip possibilities
- Highest safety level (category 4)
- Two-channel switching in each hand

Regulations and Standards

The JSTD1 Safeball is certified by DNV. approval numbers are 01-MAL-CM-0101 (two-hand device) and 01-NAL-CM-0100 (one-hand device).

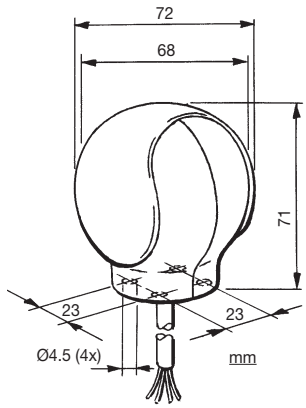
Approvals

CERTIFIED BY inspecta CE

JSTD1 Safeball Technical Data

Manufacturer	ABB AB/Jokab Safety, Sweden
Ordering information	see pages 9:32 - 9:34
Material	Polypropylene
Color	Yellow and black
Size Height Diameter, min. Diameter, max Diameter, base	 approx. 71 mm 68 mm 72 mm 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
Safety level EN ISO 13849-1 EN 954-1	 Up to category 4/PLe Up to category 4
Temperature Operating Storage	 0°C to +55°C -20°C to +70°C
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
Recommended load	24 V 10mA DC
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 JSTD1-B, JSTD1-E JSTD1-C	 2m PVC-cable, 4 x 0.75mm² 4 x 0.75mm² wires, approx. 0.2 m 10 m PVC-cable, 4x0.75 mm²
Conformity	EN ISO 12100-1:2003, EN ISO 12100-2:2003, EN 574+A1:2008

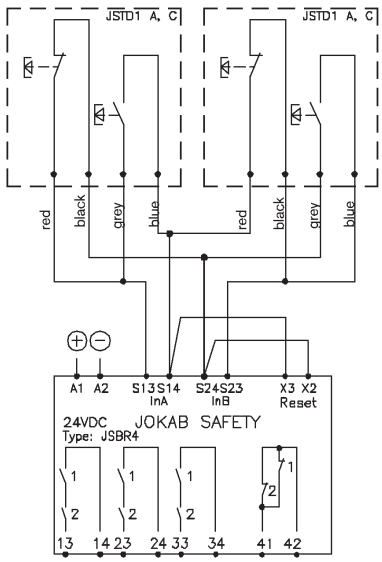


Chemical resistance at 20°C	
Chemical	Resistance
Alcohols	good
Paraffin oil	good
Milk	good
Silicon oil	good
Acetone	good
Please contact us for more information.	

JSTD1 Safeball Electrical Connections

Two-Hand Control Device

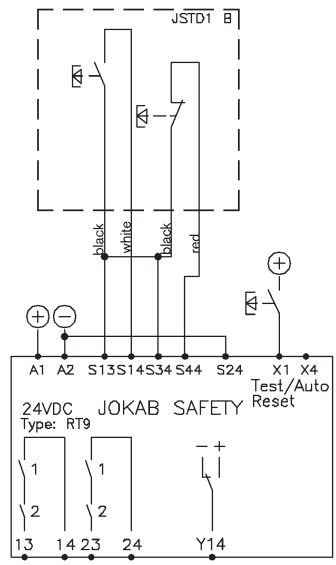
The Safeballs are designed to be connected to an ABB Jokab Safety JSBR4 safety relay or safety PLC to achieve the requirements for a two-hand device. By connecting the Safeballs in this electrical configuration Type IIIc, the highest safety level according to European standard EN 574 is achieved.



Example of two Safeballs connected to Jokab Safety relay JSBR4. The reaction time at 'stop' is < 15 ms.

One-Hand Control Device

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



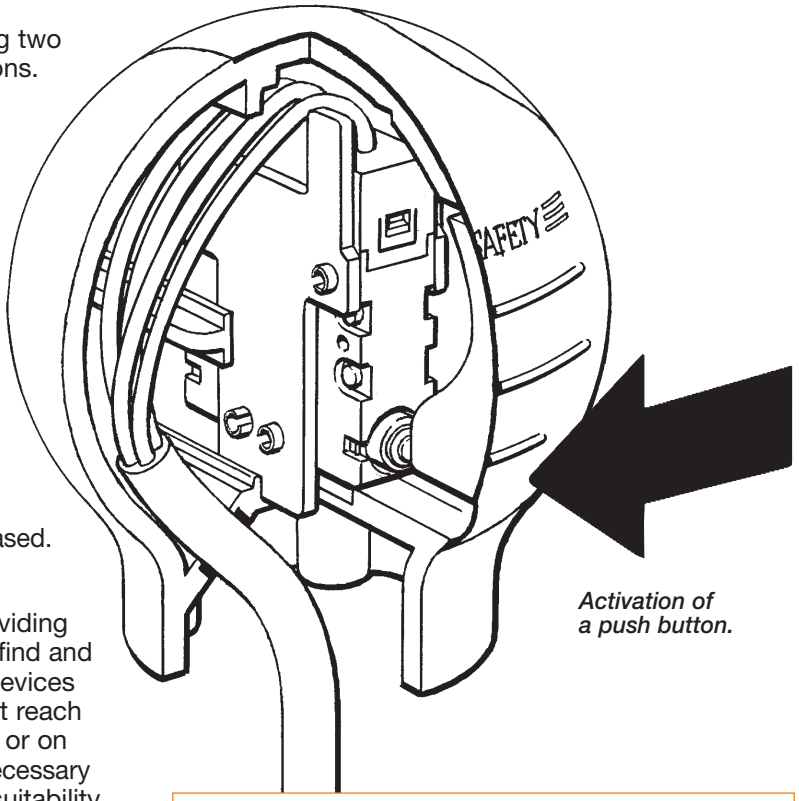
Example of a single Safeball connected to Jokab Safety relay RT6. The reaction time at 'stop' is < 20 ms.

JSTD1 Safeball Function

Two-Hand Control Device

The two-hand control device is made by using two Safeballs, each having two internal push buttons. The Safeballs must be mounted a minimum distance between each other (see mounting specifications on page 9:19). By utilizing two push buttons in each device a double safety function is provided in each hand.

The highest safety level is achieved by connecting all four push buttons to the ABB Jokab Safety JSBR4 safety relay or Pluto Safety PLC. The safety controller 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 push buttons have returned to their deactivated positions before a new start is allowed. The safety controller also provides a stop signal if one or more push buttons are released.



Activation of a push button.

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 installation 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 the ABB Jokab Safety RT6 safety relay.

Versions

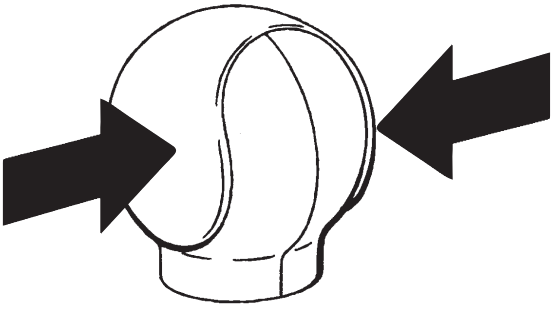
Safeball is available in several versions to meet different environmental conditions and mounting methods.

JSTD1-A The standard version with actuators made of plastic and 2 m cable.

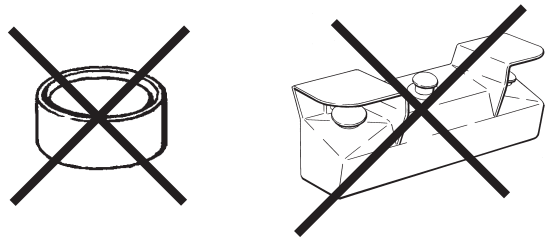
JSTD1-B Made as standard version but without cable. Instead it has four wires each 0.20m long.

JSTD1-C Same as JSTD1-A but with 10 m cable.

JSTD1-E Same as JSTD1-B but with 2 NO contacts.



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



JSTD1 Safeball Mounting

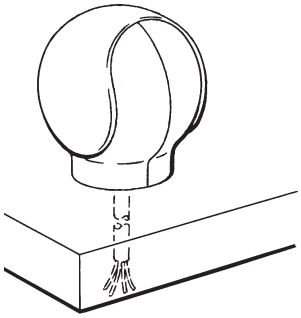
The Safeballs can be mounted in many different ways. They can be mounted on a table, a machine, on a support or wherever suitable for ergonomic reasons. The Safeball can be mounted in a fixed position or on a tilt and rotational support. This flexibility of mounting permits the Safeball to be fitted 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. If required, the connection cable can be taken out at the side of the lower part of the Safeball. There are two prepared outlets provided for this purpose.

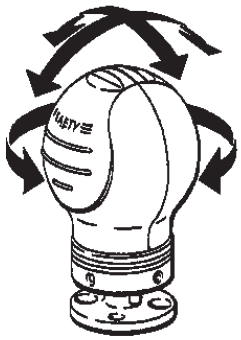
Mounting Methods

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 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.

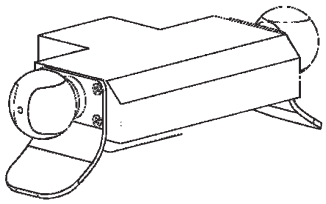


Mounting on a table.



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

Mounting with 22 or 30 mm threaded adapter

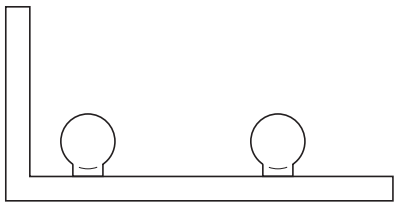


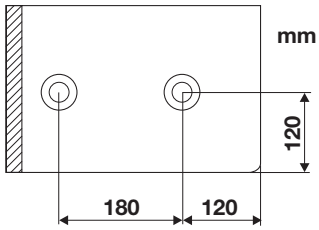
Example of alternative mounting method.

***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.*

Mounting Distance

Table mounting 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 according to approving authority and EN ISO 13855:

S = KxT+C where —

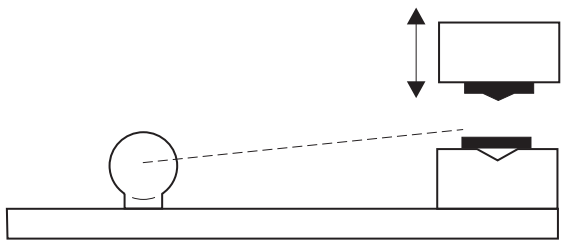
S = safety distance in mm

K = hand speed, 1600 mm/s

T = total stopping time for the dangerous movement *(including the response time of the safety controller in seconds)*

C = Constant = 0 mm for Safeball

***Note:** S must never be less than 100 mm.*



Safety distance is the distance between the Safeballs and the dangerous machine movement.

JSTD25 Two-Hand Control Station with S

With a JSTD25 you have a prepared two-hand station that is easy to install, while utilizing the good ergonomics of the Safeball. There are several variants to meet differing needs. All versions meet EN 574, EN954-1 and EN13849-1 and are supplied with the internal connections made to simplify installation.

JSTD25A/B/D/E for Fixed Installation

JSTD25A, B, D and E are supplied with two Safeballs mounted on steel housing and replaces a traditional two-hand device. It is available with an emergency stop button and ball joint fixtures for the Safeballs.

Three 22mm openings are prepared on the top for buttons or signal lamps. A hatch is supplied for wire routing in the base and securing holes for mounting on the rear. The Safeballs are connected to terminal blocks for the user to connect the external wiring through one of the two inlet alternatives (underneath

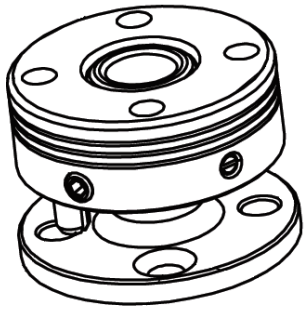
JSTD25A Two-Hand Control Unit with 2 Safeballs

JSTD25B Two-Hand Control Unit with 2 Safeballs and Emergency Stop Button

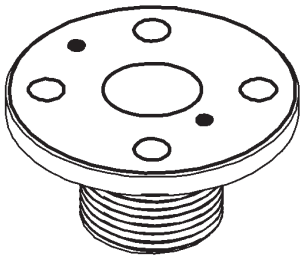
JSTD25D Two-Hand Control Unit with two Safeballs mounted with two JSM C5 Ball and Socket Table Mounts

JSTD25E Two-Hand Control Unit mounted with two JSM C5 Ball and Socket Table Mounted Safeballs and Emergency Stop Button

JSTD25A/B/D/E Accessories



JSM C5 Angled Ball Joint for installation of a Safeball on a table or a steel housing. Included on JSTD25D and JSTD25E (see above).



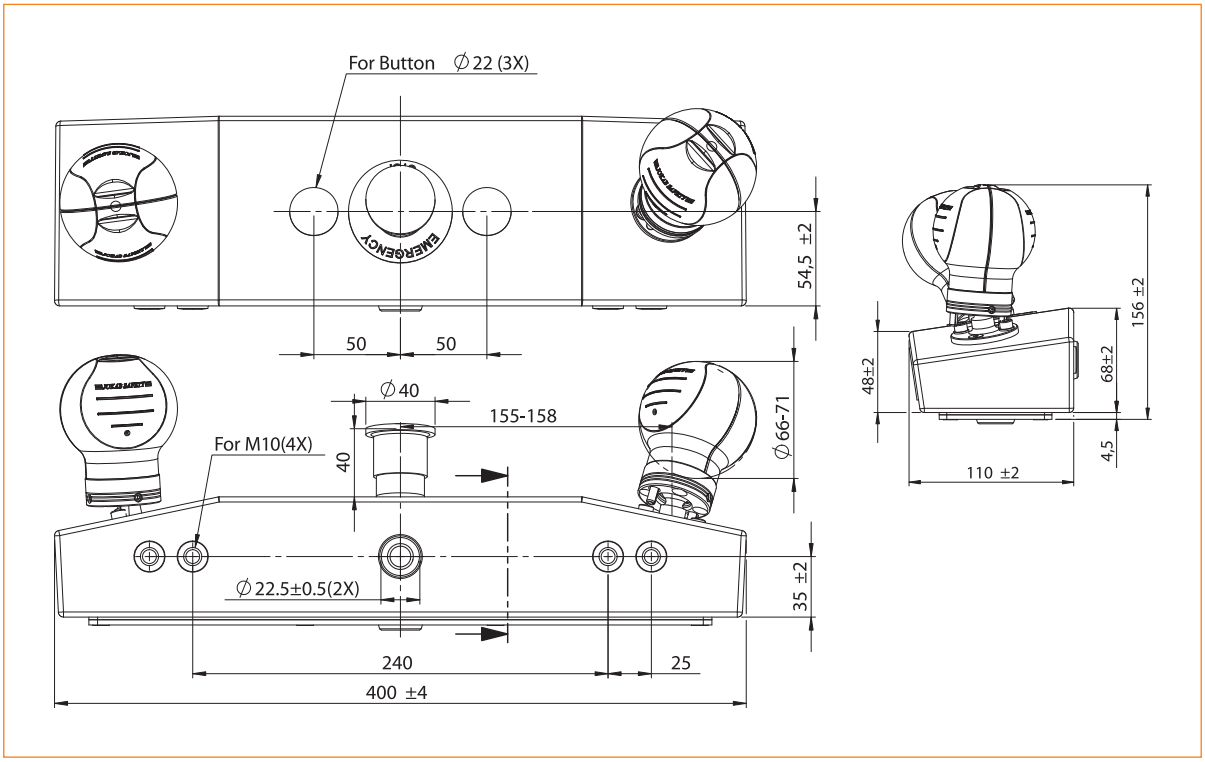
JSNA-SB Adapter for mounting Safeball in any opening designed to hold standard 22 mm or 30 mm devices.

JSTS31
Stand with spacer ring for JSTD25A-E

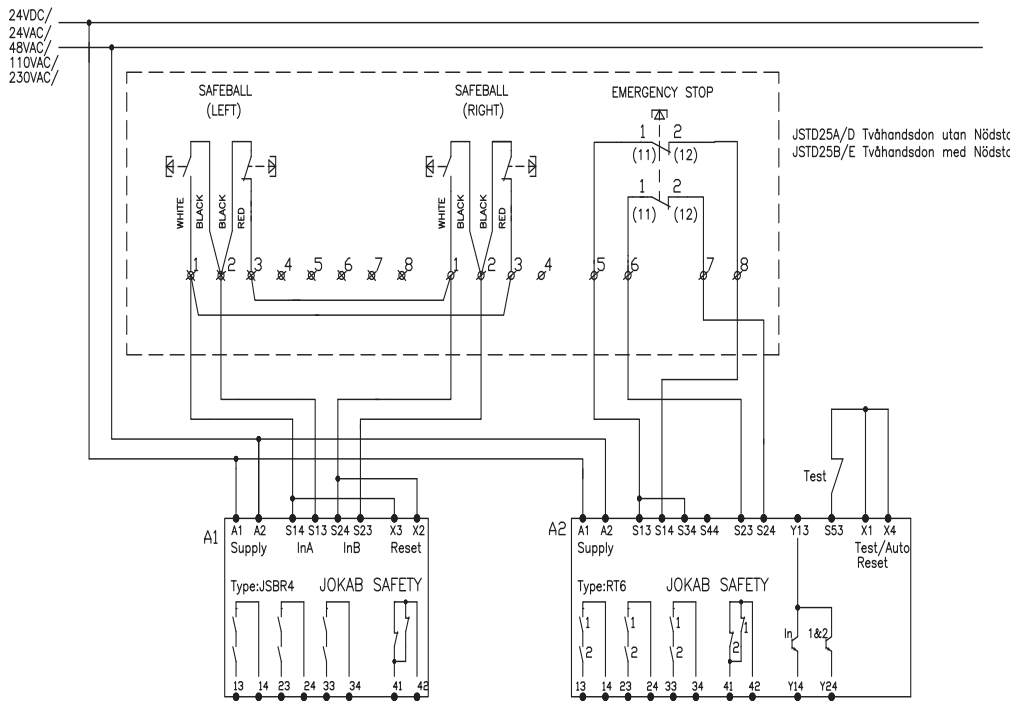
JSTS30
Stand without Spacer Ring for JSTD25A-E

Adjustable Height 850-1100 mm

JSTD25 Dimension Sketch



JSTD25/A/B/D/E Connection Example

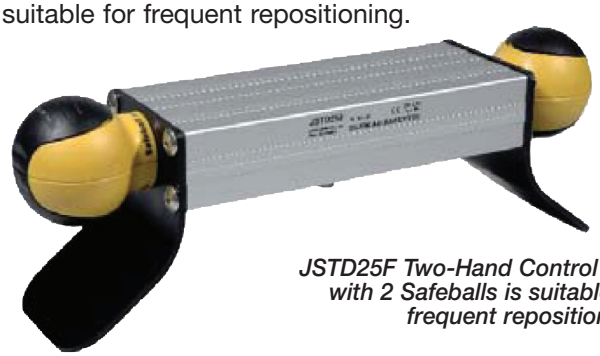


SEE DISCLAIMER ON PAGE 9:35

JSTD25F/G for Mobile Installation

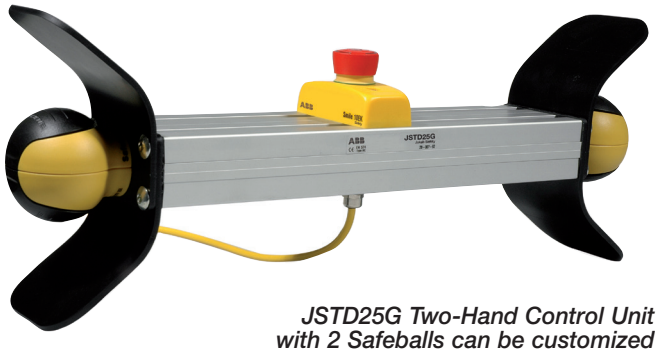
JSTD25F is supplied with two Safeballs mounted on the ends of an aluminum profile, shielded by over hand guards and replaces a traditional two-hand device. It is installed with the aid of grooves in the aluminum profile. It is connected to an M12 connector underneath.

The JSTD25F can be equipped with an external Smile Emergency Stop and an Eden Sensor for position control. Its low weight makes this particularly suitable for frequent repositioning.



JSTD25F Two-Hand Control Unit with 2 Safeballs is suitable for frequent repositioning.

JSTD25G is similar to JSTD25F except the dimensions, additional equipment and type of connection can, to a large extent, be customized before delivery. It can also be equipped with doubled protection plates for use in particularly severe conditions.



JSTD25G Two-Hand Control Unit with 2 Safeballs can be customized for your particular application.

JSTD25P-1 for Mobile Installation with a Built-In Eden Sensor

JSTD25P-1 is supplied with two Safeballs mounted on the ends of an aluminum profile, shielded by over hand guards and is portable. It includes a built-in Eden Sensor for position control.

The JSTD25P-1 was 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 is made via an 8+1 Zylin connector. Accessories include a connector, spiral cable with connector and universal suspension shelf.

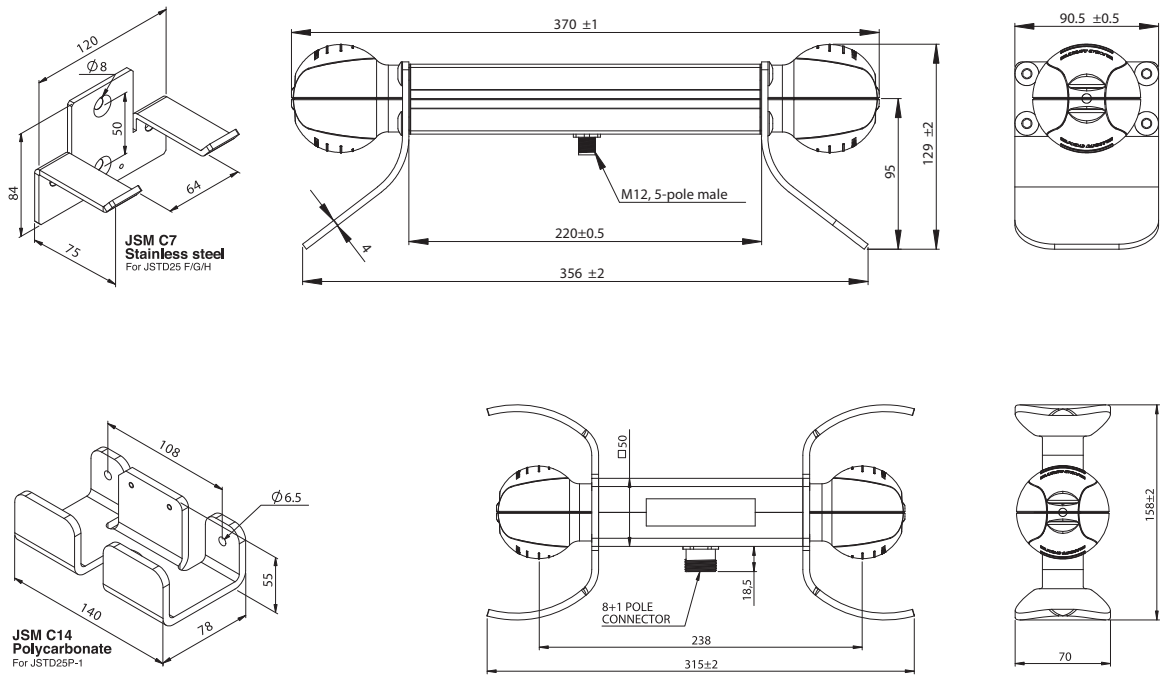
JSTD25P-1 Accessories

JSMC14 Universal Suspension Shelf

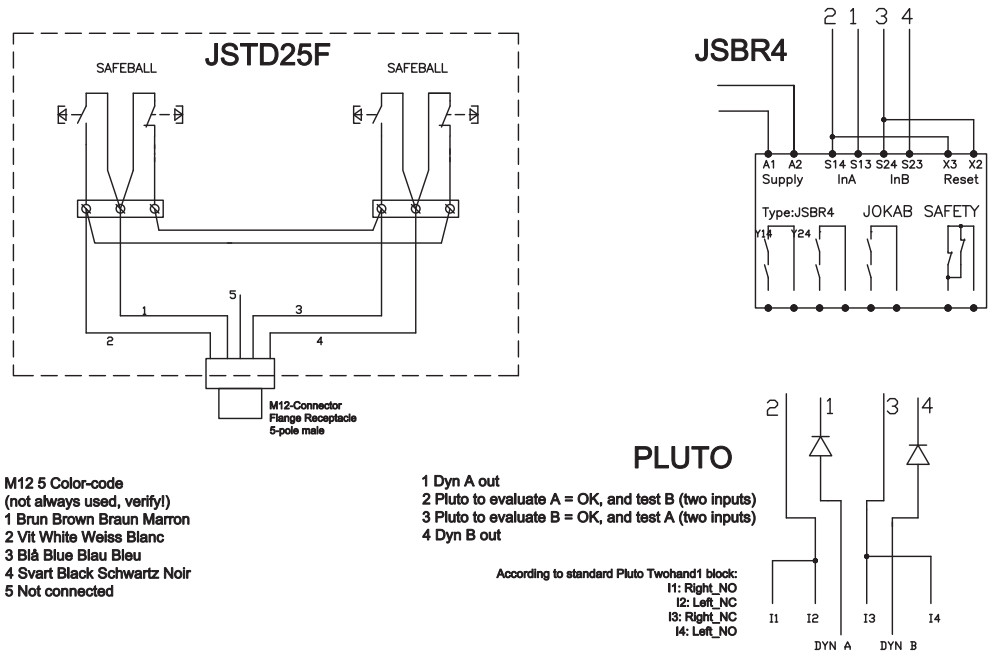
JSTK40S 4 m long Spiral Cable with Connector

JSTK80S 8 m long Spiral Cable with Connector

JSTD25F/P-1 Dimension Sketch



JSTD25F Connection Example



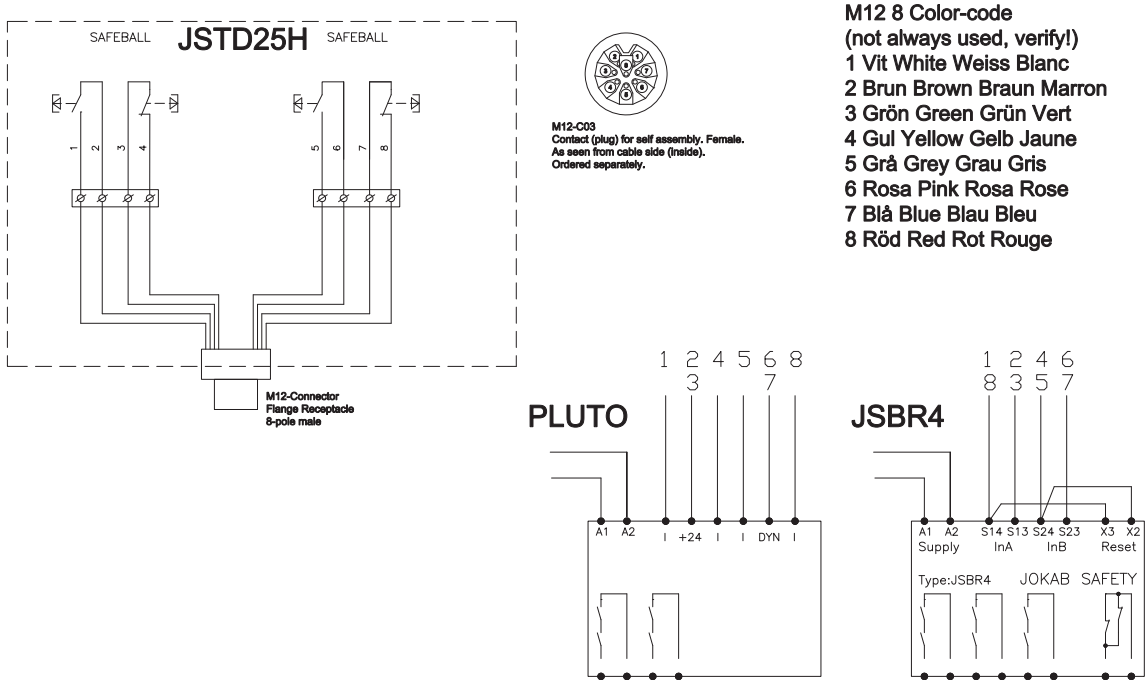
M12 5 Color-code
(not always used, verify!)
1 Brun Brown Braun Marron
2 Vit White Weiss Blanc
3 Blå Blue Blau Bleu
4 Svart Black Schwartz Noir
5 Not connected

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

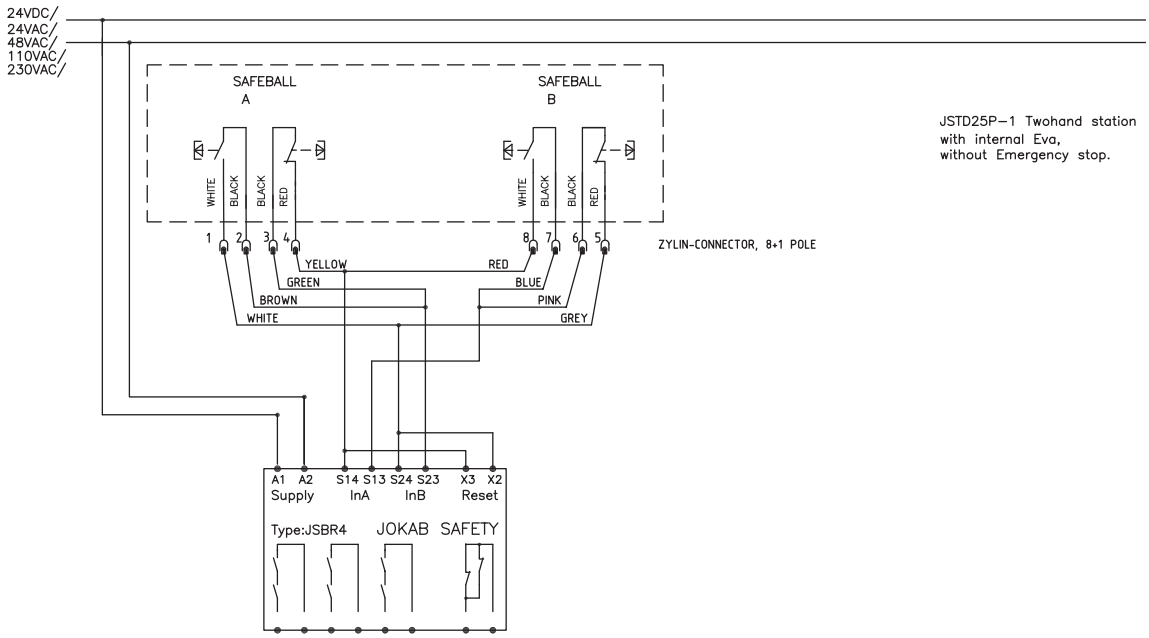
SEE DISCLAIMER ON PAGE 9:35

JSTD25H Connection Example



SEE DISCLAIMER ON PAGE 9:35

JSTD25P-1 Connection Example



SEE DISCLAIMER ON PAGE 9:35

JSTD20 Conventional Two-Hand Control Device

The conventional JSTD20 two-hand device utilizes a welded steel housing. Two operating push buttons are protected by over hand flanges. Between these push buttons there is space for a emergency push button and two extra controls or indication lamps. Below each of the operating push buttons is one normally open and one normally closed contact. To start and run the machine both push buttons must be activated within 0.5 seconds. If one or both push buttons 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 push buttons and contact blocks are easy 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 movable Two hand devices the JSTS31 floor mount, which is provided with a distance ring to fulfill the requirements of EN 574, is recommended. The JSTD20 is available with or without emergency stop push button.

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 large over hand flange according to EN 574. These prevent unintended activation by 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 safety controller's reaction time, the use of the ABB Jokab Safety SMART Stopping Analyzer is recommended.

Highest Safety Level

Correct connection to an 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 push buttons within 0.5 seconds (two hand device type III C according to EN 574. If the emergency push button 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 Safety PLC.

Optional Floor Mount with or without Distance Ring

Applications

- Presses
- Punching Machines
- Cutting Machines
- Fixtures

Features

- Durable material
- With or without emergency stop push button
- Fulfills requirements of EN 574
- Highest safety level (category 4)

Regulations and Standards

The JSTD20 is designed and approved in accordance with appropriate standards. Examples of such are: EN 418, EN 574, EN 954-1/EN ISO 13849-1, EN 999, EN 60947-1 and EN 60947-5-1.

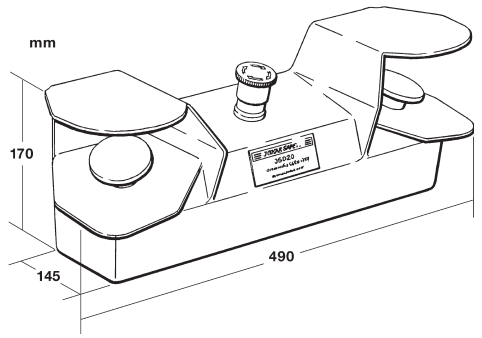
Approvals

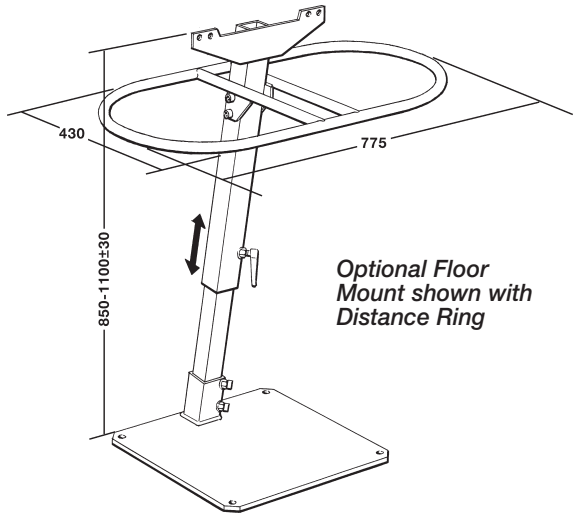
CERTIFIED BY inspecta CE

JSTD20 Technical Data

Manufacturer	ABB AB/Jokab Safety, Sweden
Ordering information	see page 9:35
Weight	JSTD20: 6.4 Kg JSTS30: 20 Kg JSTS31: 23 Kg
Color	Black housing, Black pushbuttons, Black floor stand
Temperature	-10°C…+70°C (Operating) -20°C to +70°C (storage)
Safety level EN ISO 13849-1 EN 954-1	 Upp till kat. 4/PL e Upp till kat. 4
Material	Housing: 3mm Steel Gasket: Rubber Pushbuttons: Plastic
Operating pushbuttons Diameter Operating force Operating distance Mechanical life	 60 mm Approx. 9N 3.5±1mm 10^6 operations
Emergency pushbutton (JSTD20B only) Diameter Operating force Mechanical life Contacts	 40 mm 40N 3 x 10^5 operations Mechanically separated contact blocks
Operating pushbuttons	1 NO + 1 NC
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 mm^2
Contact material	Silver alloy on brass

Protection class	IP 65
Conformity	EN 418, EN 574, EN 954-1, EN ISO 13849, EN 60947-1, EN 60947-5-1, EN 999

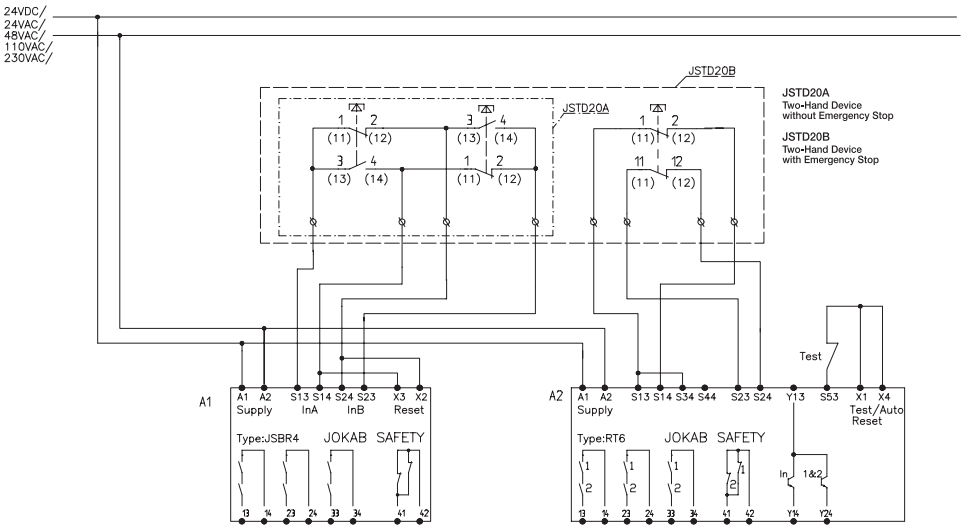




Optional Floor Mount shown with Distance Ring

JSTD20 Electrical Connection

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 safety controller 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 safety controller gives a stop signal if one or both of the push buttons are released.



Component List - Three-Postion Enabling Device

Designation	Ordering Information	Description
JSNAHD4-4MR	2TLA850002R0800	No LEDs or buttons, large plate 5-pole micro receptacle
JSNAHD4S-5MR	2TLA850202R5800	No LEDs or buttons, small Plate 5-pole micro receptacle
JSNAHD4L-4MR	2TLA850002R7200	No buttons, with LEDs, large plate 5-pole micro receptacle
JSNAHD4LS-5MR	2TLA850202R6800	No buttons with LEDs, small plate 5-pole micro receptacle
JSNAHD4-4MP-10M	2TLA850002R0400	No LEDs or buttons, large plate 4-pole micro 10M single ended PVC cable
JSNAHD4-4MP-15M	2TLA850002R0500	No LEDs or buttons, large plate 4-pole micro 15M single ended PVC cable
JSNAHD4-4MP-20M	2TLA850202R6000	No LEDs or buttons, large plate 4-pole micro 20M single ended PVC cable
JSNAHD4S-4MP-10M	2TLA850002R8800	No LEDs or buttons, small plate 4-pole micro 10M single ended PVC cable
JSNAHD4S-4MP-15M	2TLA850202R6100	No LEDs or buttons, small plate 4-pole micro 15M single ended PVC cable
JSNAHD4S-4MP-20M	2TLA850002R8900	No LEDs or buttons, small plate 4-pole micro 20M single ended PVC cable
JSNAHD4L-4MP-10M,	2TLA850002R6900	No buttons with LEDs large plate 4-pole micro 10M single ended PVC cable
JSNAHD4L-4MP-15M	2TLA850002R7000	No buttons with LEDs, large plate 4-pole micro 15M single ended PVC cable
JSNAHD4L-4MP-20M	2TLA850202R2400	No buttons with LEDs, large plate 4-pole micro 20M single ended PVC cable
JSNAHD4LS-4MP-10M	2TLA850202R6900	No buttons with LEDs, small plate 4-pole micro 10M single ended PVC cable
JSNAHD4LS-4MP-15M	2TLA850202R2800	No buttons with LEDs, small plate 4-pole micro 15M single ended PVC cable
JSNAHD4LS-4MP-20M	2TLA850102R9700	No buttons with LEDs, small plate 4-pole micro 20M single ended PVC cable
JSNAHD4BL-8MR	2TLA850002R3400	LEDs with front and top auxiliary buttons, large plate 8-pole mini receptacle
JSNAHD4BLS-8MR	2TLA850002R4200	LEDs with front and top auxiliary buttons, small plate 8-pole mini receptacle
JSNAHD4BL-8MP-20FT	2TLA850202R6200	LEDs with front and top auxiliary buttons, large plate 8-pole mini receptacle, 20 ft PVC cable
JSNAHD4BL-8MP-30FT	2TLA850202R6300	LEDs with front and top auxiliary buttons, large plate 8-pole mini receptacle, 30 ft PVC cable
JSNAHD4BL-8MP-40FT	2TLA850202R6400	LEDs with front and top auxiliary buttons, large plate 8-pole mini receptacle, 40 ft PVC cable

Component List - Three-Postion Enabling Device

Designation	Ordering Information	Description
JSNAHD4BLS-8MP-20FT	2TLA850202R6500	LEDs with front and top auxiliary buttons, small plate 8-pole mini receptacle, 20 ft PVC cable
JSNAHD4BLS-8MP-30FT	2TLA850202R6600	LEDs with front and top auxiliary buttons, small plate 8-pole mini receptacle, 30 ft PVC cable
JSNAHD4BLS-8MP-40FT	2TLA850202R6700	LEDs with front and top auxiliary buttons, small plate 8-pole mini receptacle, 40 ft PVC cable
JSNAHD4BLE-8MR	2TLA850002R3700	LEDs with front and top auxiliary buttons, Eden bracket, 8-pole mini receptacle
JSNAHD4LE-8MR	2TLA850002R8200	No buttons with LEDs, Eden bracket, 8 pole mini receptacle
JSHD4H2A	2TLJ020002R0200	Three-position device for external panel assembly. *(Complete JSHD4 with standard options are available to order separately.)*
JSHD4S2	2TLJ020002R0700	Three-position device, ABB upgrading kit. *(Complete JSHD4 with standard options are available to order separately.)*
JSHD4H2	2TLJ020002R3100	Three-position devices for internal panel assembly. *(Complete JSHD4 with standard options are available to order separately.)*
JSHD2C Type E	2TLJ020001R1000	Three-position button. *(Complete JSHD4 with standard options are available to order separately.)*
JSHD2C Type K	2TLJ020001R1300	Three-position button. *(Complete JSHD4 with standard options are available to order separately.)*

Component List - Pendant Holsters

Designation	Ordering Information	Description
JSNA-JSM-2A	2TLA850102R6300	Standard Pendant Holster with JSNY5As
JSNA-EDENPEN-HOL	2TLA850102R7800	Eden-style Pendant Holster JSHD4-1AA

Component List - Receptacles

Designation	Ordering Information	Description
JSNA-5FR-2-1M	2TLA850102R4000	5-pole micro receptacle with 1M leads
JSNA-8PFR-3	2TLA850102R4500	8-pole mini receptacle with 3 ft leads JSHD4-1AC

Component List - Shorting Plugs

Designation	Ordering Information	Description
JSNA-4PM-SP1	2TLA850102R3800	4-pole micro shorting plug 1-2-3-4
JSNA-8PM-SP1	2TLA850102R6100	8-pole mini shorting plug, pin 1-2-3-4 jumped JSHD4-2AB

Component List - 8-Pole Mini Double Ended Cables

Designation	Ordering Information	Description
JSNA-8PMFEX-20	2TLA850102R5300	8-pole mini, double ended, male/female, 20 ft
JSNA-8PMFEX-30	2TLA850102R5400	8-pole mini, double ended, male/female, 30 ft
JSNA-8PMFEX-40	2TLA850102R5500	8-pole mini, double ended, male/female, 40 ft

Component List - 8-Pole Mini Single Ended Cables

Designation	Ordering Information	Description
JSNA-8PFSE-20	2TLA850102R4800	8-pole mini, single ended, female, 20 ft
JSNA-8PFSE-30	2TLA850102R4900	8-pole mini, single ended, female, 30 ft
JSNA-8PFSE-40	2TLA850102R5000	8-pole mini, single ended, female, 40 ft

Component List - Wall Brackets

Designation	Ordering Information	Description
JSM 54A	2TLJ020205R2800	Eden wall bracket

Component List - Accessories and Spare Parts

Designation	Ordering Information	Description
JSNA-PCG.5B	2TLA850013R5300	Plastic cable gland with 1/2” NPT threads, cable OD range = 0.170” to 0.470”. Locknut not included.
JSNA-1-50S	2TLA850013R2000	Metal locknut for 1/2” NPT threads.

Component List - Pre-Assembled Three-Postion Enabling Devices (European versions only)

Designation	Ordering Information	Description
JSHD4-1AA	2TLA019995R0000	Standard handle, no LEDs, no buttons, no cheat safe, cable gland
JSHD4-1AC	2TLA019995R0100	Standard handle, no LEDs, no buttons, no cheat safe, M12 5 pole male connector
JSHD4-2AB	2TLA019995R0200	Standard handle, LEDs, top and front buttons, no cheat safe, cannon connection
JSHD4-2AB-A	2TLA019995R0300	Standard handle, LEDs, top and front buttons, cheat safe, cannon connection
JSHD4-2AD	2TLA019995R0400	Standard handle, LEDs, top and front buttons, no cheat safe, M12 8 pole male connector
JSHD4-2AD-A	2TLA019995R0500	Standard handle, LEDs, top and front buttons, cheat safe, M12 8 pole male connector

Component List - Pre-Assembled Three-Postion Enabling Devices (European versions only)

Designation	Ordering Information	Description
JSHD4-2AF	2TLA019995R0600	Standard handle, LEDs, top and front buttons, no cheat safe, M12 4 pole male connector and 2 AS-i nodes for top and front buttons
JSHD4-2AF-A	2TLA019995R0700	Standard handle, LEDs, top and front buttons, cheat safe, M12 4 pole male connector and 2 AS-i nodes for top and front buttons
JSHD4-2AH	2TLA019995R0800	Standard handle, LEDs, top and front buttons, no cheat safe, cable gland and pcb with 10 screw connections
JSHD4-2AH-A	2TLA019995R0900	Standard handle, LEDs, top and front buttons, cheat safe, cable gland and pcb with 10 screw connections
JSHD4-3AB	2TLA019995R1200	Standard handle, LEDs, no buttons, no cheat safe, cannon connection
JSHD4-3AB-A	2TLA019995R1300	Standard handle, LEDs, no buttons, cheat safe, cannon connection
JSHD4-3AD	2TLA019995R1400	Standard handle, LEDs, no buttons, no cheat safe, M12 8-pole male connector
JSHD4-3AD-A	2TLA019995R1500	Standard handle, LEDs, no buttons, cheat safe, M12 8-pole male connector
JSHD4-3AE	2TLA019995R1600	Standard handle, LEDs, no buttons, no cheat safe, M12 8-pole male connector and emergency stop
JSHD4-3AF	2TLA019995R1700	Standard handle, LEDs, no buttons, no cheat safe, M12 4-pole male connector and 2 AS-i nodes for top and front buttons
JSHD4-3AF-A	2TLA019995R1800	Standard handle, LEDs, no buttons, cheat safe, M12 4-pole male connector and 2 AS-i nodes for top and front buttons
JSHD4-3AG	2TLA019995R1900	Standard handle, LEDs, no buttons, no cheat safe, M12 4-pole male connector and 2 AS-i nodes for top and front buttons
JSHD4-3AH	2TLA019995R2000	Standard handle, LEDs, no buttons, no cheat safe, cable gland and pcb with 10 screw connections
JSHD4-3AH-A	2TLA019995R2100	Standard handle, LEDs, no buttons, cheat safe, cable gland and pcb with 10 screw connections
JSHD4-4AB	2TLA019995R2400	Standard handle, LEDs, front button, no cheat safe, cannon connection
JSHD4-4AB-A	2TLA019995R2500	Standard handle, LEDs, front button, cheat safe, cannon connection
JSHD4-4AD	2TLA019995R2600	Standard handle, LEDs, front button, no cheat safe, M12 8-pole male connector
JSHD4-4AD-A	2TLA019995R2700	Standard handle, LEDs, front button, cheat safe, M12 8-pole male connector
JSHD4-4AF	2TLA019995R2800	Standard handle, LEDs, front button, no cheat safe, M12 4-pole male connector and 2 AS-i nodes for top and front buttons
JSHD4-4AF-A	2TLA019995R2900	Standard handle, LEDs, front button, cheat safe, M12 4-pole male connector and 2 AS-i nodes for top and front buttons
JSHD4-4AH	2TLA019995R3000	Standard handle, LEDs, front button, no cheat safe, cable gland and pcb with 10 screw connections

Component List - Pre-Assembled Three-Postion Enabling Devices (European versions only)

Designation	Ordering Information	Description
JSHD4-4AH-A	2TLA019995R3100	Standard handle, LEDs, front button, cheat safe, cable gland and pcb with 10 screw connections
JSHD4-5AB	2TLA019995R3400	Standard handle, LEDs, top button, no cheat safe, cannon connection
JSHD4-5AB-A	2TLA019995R3500	Standard handle, LEDs, top button, cheat safe, cannon connection
JSHD4-5AD	2TLA019995R3600	Standard handle, LEDs, top button, no cheat safe, M12 8-pole male connector
JSHD4-5AD-A	2TLA019995R3700	Standard handle, LEDs, top button, cheat safe, M12 8-pole male connector
JSHD4-5AF	2TLA019995R3800	Standard handle, LEDs, top button, no cheat safe, M12 4-pole male connector and 2 AS-i nodes for top and front buttons
JSHD4-5AF-A	2TLA019995R3900	Standard handle, LEDs, top button, cheat safe, M12 4-pole male connector and 2 AS-i nodes for top and front buttons
JSHD4-5AH	2TLA019995R4000	Standard handle, LEDs, top button, no cheat safe, cable gland and pcb with 10 screw connections
JSHD4-5AH-A	2TLA019995R4100	Standard handle, LEDs, top button, cheat safe, cable gland and pcb with 10 screw connections

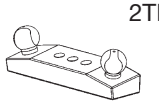
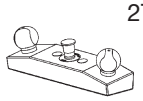
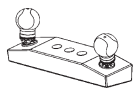
Component List - Accessories for Pre-Assembled Enabling Devices

Designation	Ordering Information	Description
M12-C01	2TLJ020055R1000	M12 5-pole female connector, straight
M12-C03	2TLJ020055R1600	M12 8-pole female conector, straight
JSHK0	2TLJ020003R0300	12-pole connector for JSHD4
C5	2TLJ020057R0000	Cable with 5 conductors; 5x0.34 cut to length
M12-C101	2TLJ020056R1000	Cable with 5 connectors; 10M and connector
M12-C201	2TLJ020056R1400	Cable with 5 connectors; 20M and connector
C8	2TLJ020057R1000	Cable with 8 conductors; 8x0.34 cut to length
M12-C103	2TLJ020056R4000	Cable with 8 connectors; 10M cable and connector
M12-C203	2TLJ020056R4100	Cable with 8 connectors; 20M and connector
HKC12	2TLA020003R5500	Cable with 12 conductors; 12x0.25 cut to length
HK5	2TLA020003R4700	Cable with 12 connectors; 5M and connector
HK10	2TLA020003R4800	Cable with 12 connectors; 10M and connector
HK20	2TLA020003R4900	Cable with 12 connectors; 20M and connector
JSHK16S4	2TLA020003R5000	Spiral cable with 12 connectors; 1.6M and connector
JSHK20S4	2TLA020003R5100	Spiral cable with 12 connectors; 2.0M and connector

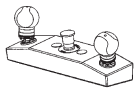
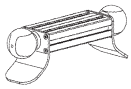
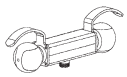
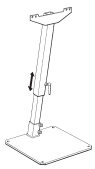
Component List - Accessories for Pre-Assembled Enabling Devices

Designation	Ordering Information	Description
JSHK32S4	2TLA020003R5200	Spiral cable with 12 connectors; 3.2M and connector
JSHK40S4	2TLA020003R3500	Spiral cable with 12 connectors; 4.0M and connector
JSHK3604	2TLA020003R3600	Spiral cable with 12 connectors; 6.0M and connector
JSHK80S4	2TLA020003R5300	Spiral cable with 12 connectors; 8.0M and connector
HK-T2	2TLA020003R5400	Cable drum and connector
JSM55	2TLJ040005R0500	Wall bracket for three-position device
JSM5B	2TLJ040005R0700	Wall bracket for 2 JSNY5 (ordered separately)
JSHD4	2TLA020200R4600	Protection coat

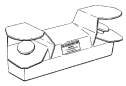
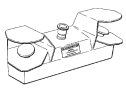
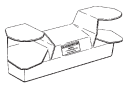
Component List - Safeball

Designation	Ordering Information	Description
JSTD1-A 	2TLJ020007R3000	Safeball device with 1NO & 1NC independent switches for dual channel switching as a one hand device, maximum load of 30VDC - 2A resistive. Ergonomic design with several grip possibilities, low activation force (approx. 2N) and flexible mounting options. Provides highest level of safety for use in two hand control applications when using two Safeballs in conjunction with a JSBR4 safety relay or Pluto Safety PLC. IP67 protection degree, plastic body, 2 meter molded cable.
JSTD1-B 	2TLJ020007R3100	Safeball device with 1NO & 1NC independent switches for dual channel switching as a one hand device, maximum load of 30VDC - 2A resistive. Ergonomic design with several grip possibilities, low activation force (approx. 2N) and flexible mounting options. Provides highest level of safety for use in two hand control applications when using two Safeballs in conjunction with a JSBR4 safety relay or Pluto Safety PLC. IP67 protection degree, plastic body, 0.25m wires x 4 for direct connection into an enclosure.
JSTD1-C 	2TLJ020007R3200	Safeball device with 1NO & 1NC independent switches for dual channel switching as a one hand device, maximum load of 30VDC - 2A resistive. Ergonomic design with several grip possibilities, low activation force (approx. 2N) and flexible mounting options. Provides highest level of safety for use in two hand control applications when using two Safeballs in conjunction with a JSBR4 safety relay or Pluto Safety PLC. IP67 protection degree, plastic body, 10 meter molded cable.
JSTD1-E 	2TLJ020007R3400	Safeball device with 2 NO independent switches for dual channel switching as a one hand device, maximum load of 30VDC - 2A resistive. Ergonimic design with several grip possibilities, low activation force (approx. 2N) and flexible mounting options. Provides highest level of safety for use in two hand control applications when using two Safeballs in conjunction with a JSBR4 safety relay or Pluto Safety PLC. IP67 protection degree, plastic body, 0.25m wires x 4 for direct connection into an enclosure.
JSTD25A 	2TLJ020007R5000	Safeball each with 1NO & 1NC independent switches, maximum load of 30VDC - 2A resistive. Ergonomic design with several grip possibilities and low activation force (approx. 2N). Buttons are mounted in black painted steel housing designed for two-hand applications. Terminal blocks within housing for connection to buttons. Highest level of safety can be achieved when using in conjunction with a JSBR4 safety relay or Pluto Safety PLC.
JSTD25B 	2TLJ020007R5100	2 hand device with JSTD1B Safeballs and e-stop button. Safeball each with 1NO & 1NC independent switches, maximum load of 30VDC - 2A resistive. Ergonomic design with several grip possibilities and low activation force (approx. 2N). E-stop button diameter is 40mm, 40N operating force, 2 NC positive opening contacts, rated current of 10A. Buttons are mounted in black painted steel housing designed for two-hand applications. Terminal blocks within housing for connection to buttons. Highest level of safety can be achieved when using in conjunction with a JSBR4 safety relay for two-hand buttons and RT9/RT6 safety relay for e-stop button or a Pluto Safety PLC.
JSTD25D 	2TLJ020007R5300	2 hand device with JSTD1B Safeballs and JSMC5 ball and socket mounting supports. Safeball each with 1NO & 1NC independent switches, maximum load of 30VDC - 2A resistive. Ergonomic design with several grip possibilities and low activation force (approx. 2N). Buttons are mounted in black painted steel housing designed for two-hand applications. Terminal blocks within housing for connection to buttons. Highest level of safety can be achieved when using in conjunction with a JSBR4 safety relay or Pluto Safety PLC.

Component List - Safeball

Designation	Ordering Information	Description
JSTD25E 	2TLJ020007R5400	2 hand device with JSTD1B safeballs and JSMC5 ball and socket mounting supports and e-stop button. Safeball each with 1NO & 1NC independent switches, maximum load of 30VDC - 2A resistive. Ergonomic design with several grip possibilities and low activation force (approx. 2N). E-stop button diameter is 40mm, 40N operating force, 2 NC positive opening contacts, rated current of 10A. Buttons are mounted in black painted steel housing designed for two-hand applications. Terminal blocks within housing for connection to buttons. Highest level of safety can be achieved when using in conjunction with a JSBR4 safety relay for two-hand buttons and RT9/RT6 safety relay for e-stop button or a Pluto Safety PLC.
JSTD25F 	2TLJ020007R6000	2 hand device with JSTD1B Safeballs. Safeballs each have 1NO & 1NC independent switches, maximum load of 30VDC - 2A resistive. Ergonomic design with several grip possibilities and low activation force (approx. 2N). Buttons are side mounted 44x88 extruded aluminum profile designed for two-hand applications. Pre-wired to a M12 4 pin connector with protective flanges of the safeballs. Highest level of safety can be achieved when used in conjunction with a JSBR4 safetyrelay or Pluto Safety PLC.
	2TLJ020007R6400	Protective plates for Safeball (kit) including fasteners
JSTD25G	2TLJ020007R6200	2 hand device with JSTD1B Safeballs. Safeballs each have 1NO & 1NC independent switches, maximum load of 30VDC - 2A resistive. Ergonomic design with several grip possibilities and low activation force (approx. 2N). Buttons are side mounted 44x88 extruded aluminum profile designed for two-hand applications. Pre-wired to molded yellow cable with protective flanges of the safeballs. Integrated Smile illuminated E-Stop. Highest level of safety can be achieved when used in conjunction with a JSBR4 safety relay for two-hand buttons and RT9/RT6 safety relay for e-stop button or a Pluto Safety PLC.
JSTD25H	2TLJ020007R6300	2 hand device with JSTD1B Safeballs. Safeballs each have 1NO & 1NC independent switches, maximum load of 30VDC - 2A resistive. Ergonomic design with several grip possibilities and low activation force (approx. 2N). Buttons are side mounted 44x88 extruded aluminum profile designed for two-hand applications. Pre-wired to a M12 8 pole connector with protective flanges of the safeballs. Highest level of safety can be achieved when used in conjunction with a JSBR4 safety relay or Pluto Safety PLC.
JSTD25P-1 	2TLJ020007R6500	2 hand device with JSTD1B Safeballs. Safeballs each have 1NO & 1NC independent switches, maximum load of 30VDC - 2A resistive. Ergonomic design with several grip possibilities and low activation force (approx. 2N). Buttons are side mounted on black aluminum profile designed for two-hand applications. Pre-wired to a 9 pin Zylin connector with dual protective flanges of the safeballs. Integrated Eva inside housing for Eden sensor holster JSMC14. Highest level of safety can be achieved when used in conjunction with a JSBR4 safety relay or Pluto Safety PLC.
JSTS30 	2TLJ020007R4000	Floor mount stand for JSTD20/25 two-hand devices. Black painted steel with adjustable height lever.
JSTS31 	2TLJ020007R4100	Floor mount stand for JSTD20/25 two-hand devices. Black painted steel with adjustable height lever and distance ring.

Component List - Safeball

Designation	Ordering Information	Description
JSM C5 	2TLJ020007R0900	Flexible mount for mounting the Safeball to Enclosures. Extrusion or table tops. Includes all hardware.
JSNA-SB Adapter 	2TLA850004R0300	Safeball adapter for integration into 22mm or 30mm punched enclosures. Two are required for a Safeball pair.
JSTS32	2TLJ020007R4200	Distance ring for JSTS30 floor mount stand 2 hand device with JSTD1B Safeballs.
JSTKO-A	2TLJ020007R6600	Connector for JSTD25P-1
JSTK40S	2TLJ020007R6700	4 m long spiral cable for JSTD25P-1
JSTK80S	2TLJ020007R6800	8 m long spiral cable for JSTD25P-1
JSMC14	2TLJ020007R8000	Universal suspension shelf for JSTD25P-1
JSTD20A 	2TLJ020007R2000	2 hand device with conventional operating buttons. Operating push-buttons are 60mm in diameter, black, 9N operating force, 1 NO + 1 NC contacts, rated current of 10A. Buttons are mounted in black painted steel housing designed for two-hand applications. Ingress protection IP65. Terminal blocks within housing for connection to buttons. Highest level of safety can be achieved when using in conjunction with a JSBR4 safety relay for two-hand buttons or a Pluto Safety PLC.
JSTD20B 	2TLJ020007R2100	2 hand device with conventional operating buttons and e-stop button. Operating push buttons are 60mm in diameter, black, 9N operating force, 1 NO + 1 NC contacts, rated current of 10A. E-stop button diameter is 40mm, 40N operating force, 2 NC positive opening contacts, rated current of 10A. Buttons are mounted in black painted steel housing designed for two-hand applications. Ingress protection IP65. Terminal blocks within housing for connection to buttons. Highest level of safety can be achieved when using in conjunction with a JSBR4 safety relay for two-hand buttons and RT9/RT6 safety relay for e-stop button or a Pluto Safety PLC.
JSTD20C 	2TLJ020007R2200	JSTD20 housing only, for two-hand device. Steel and black painted. Accepts up to 60mm operating buttons for two-hand device and 40mm e-stop button.

Notes