

# One and two hand device

# Safeball™

## Approvals



## Safeball for:

Two hand device  
One hand device

## Features:

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



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

## 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 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 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.

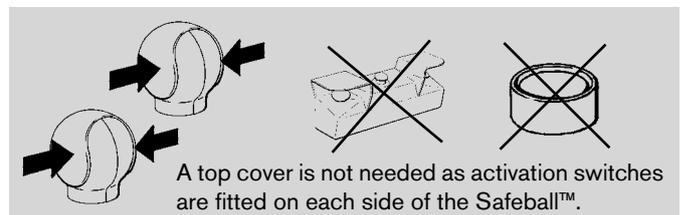
### When can a Two hand or One hand control be used ?

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.

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.

### Highest Safety Level

The Safeball™ is certified by DNV in Sweden for use as a Two hand control device, when used with a JSBR4 JOKAB SAFETY Safety relay or Pluto Safety-PLC, according to the highest safety level in standard EN 574 (type IIIc) and EN 954-1 (safety category 4).



## Function - Safeball

### Two hand control device

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

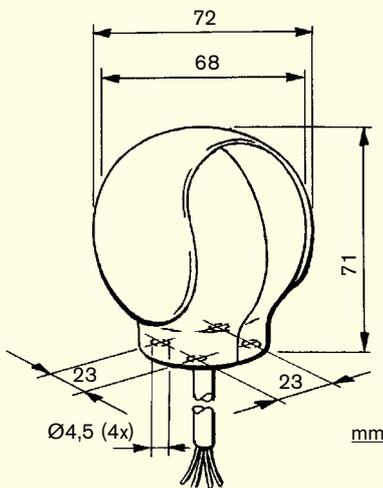
By utilising two pushbuttons in each device a double safety function is provided in each hand.

The highest safety level is achieved by connecting all four pushbuttons to the 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 fitment 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 JOKAB SAFETY safety relay (See Electrical Connection).

## Technical data - Safeball



### Chemical resistance at 20°C.

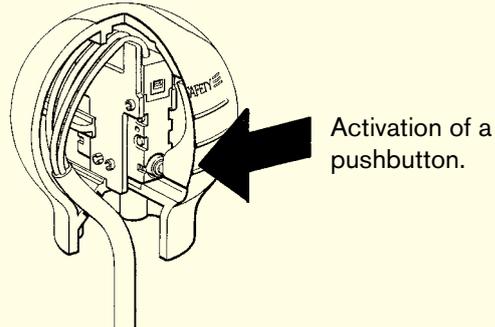
Chemical	Resistance
Alcohols	good
Paraffin oil	good
Milk	good
Silicon oil	good
Acetone	good

Please contact us for more information.

### Versions

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

- **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 0.2 m.
- **JSTD1-C** - Same as JSTD1-A but with 10 m cable.
- **JSTD1-E** - Same as JSTD1-B but with 2 NO contacts.



Safeball™, JSTD1, is certified by DNV.  
Approval number:  
01-MAL-CM-0101 (Two-hand device)  
01-MAL-CM-0100 (One-hand device)

<b>Manufacturer</b>	JOKAB SAFETY AB, Sweden
<b>Ordering data</b>	JSTD1-A, -B, -C, -E
<b>Material</b>	Polypropylene
<b>Colour</b>	Yellow and black
<b>Size</b>	Height: approx. 71 mm, Diameter, min.: 68 mm Diameter, max.: 72 mm Diameter, base: 42 mm
<b>Weight</b>	0.2 kg with 2 m cable 0.7 kg with 10 m cable 0.1 kg with 4x0.2 m wires
<b>Temperature</b>	0°C to +55°C (operating) -20°C to +70°C (storing)
<b>Protection class</b>	IP67. Not intended for use Under water
<b>Operating force</b>	Approx. 2 N
<b>Actuator travel</b>	1.3 +/- 0.6 mm
<b>Max switching load</b>	30 V 2A DC, resistive load
<b>Recommended load</b>	24 V 10mA DC
<b>Min switching load</b>	6V 10mA DC, resistive load
<b>Contact resistance</b>	100 mOhm
<b>Life, mechanical</b>	> 1x10 <sup>6</sup> operations at max 1 Hz
<b>Life, electrical</b>	Dependant upon electrical load characteristics
<b>Connection cable</b>	JSTD1-A: 2m PVC-cable, 4 x 0.75mm <sup>2</sup> JSTD1-B, JSTD1-E: 4 x 0.75mm <sup>2</sup> wires, approx. 0.2 m JSTD1-C: 10 m PVC-cable, 4x0.75 mm <sup>2</sup>

## Mounting - Safeball

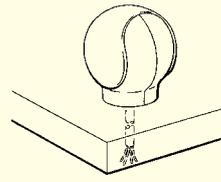
The Safeballs™ can be mounted in many different ways. They can be mounted on a table, a machine, on a support or wherever suitable for ergonomic reasons. The Safeball™ can be mounted in a fixed position or on a tilt and rotational support. This flexibility of mounting permits the Safeball™ to be fitted 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.

**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.

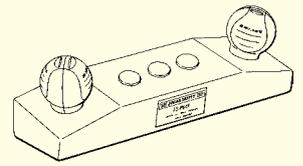
### Approved Two hand device

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 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.

### Alternative mounting methods



Mounting on a table.



Mounting on a two-hand station JSTD25.



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

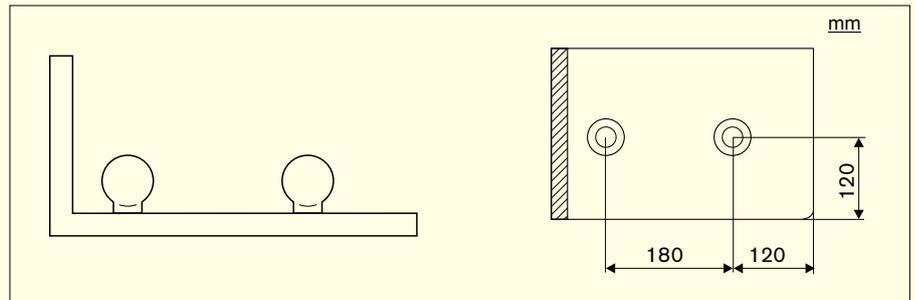


Example of alternative mounting.

## Mounting distance - Safety distance - Safeball

### Mounting distance

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

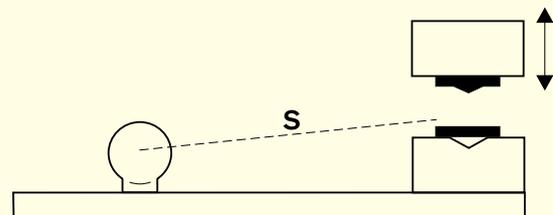


### Safety distance

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 999:  $S = K \times T + C$

### 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.



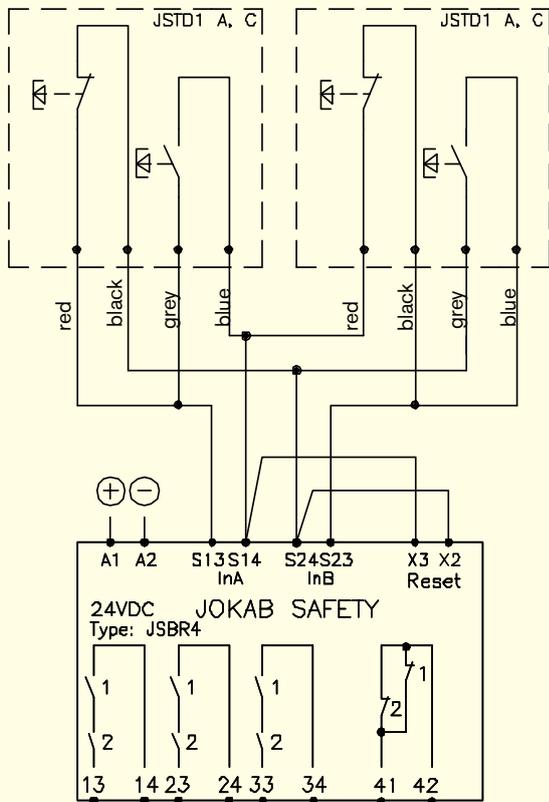
Safety distance is the distance between the Safeballs™ and the dangerous machine movement.

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

## Electrical connection - Safeball

### Two hand device

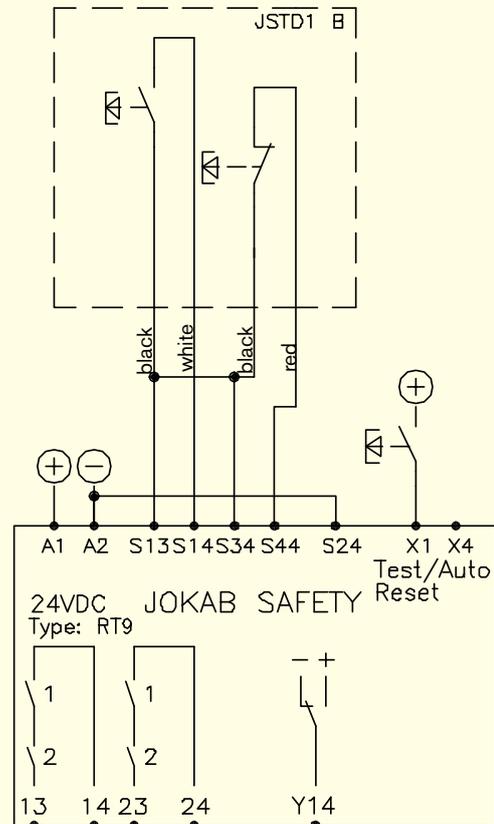
The Safeballs™ are designed to be connected to a Jokab Safety JSBR4 Safety relay or Safety PLC to achieve the requirements for a Two hand device. By connecting the Safeballs™ in this electrical configuration Type IIIc, the highest safety level according to European standard EN 574 is achieved.



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

### One hand device

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

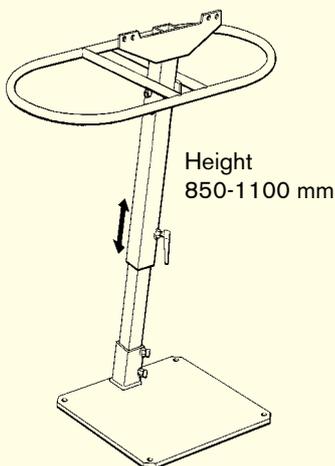


Example of a single Safeball™ connected to Jokab Safety relay RT9. The reaction time at 'stop' is < 20 ms.

## Accessories - Safeball

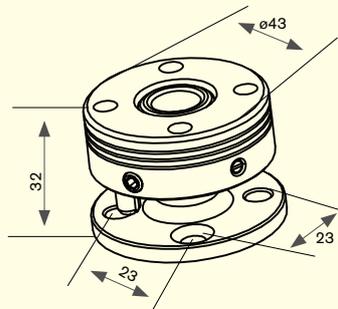
### JSTS31

Floor mount with distance ring (JSTS30 without distance ring).



### JSM C5

Angled ball and socket for mounting on table.



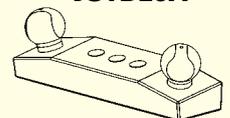
### JSTD25P-1



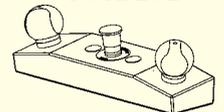
### JSTD25F



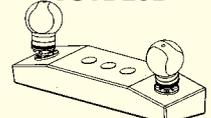
### JSTD25A



### JSTD25B



### JSTD25D



### JSTD25E

