



**EN** Operating instructions. . . . . pages 1 to 10  
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**1. About this document**


**1.1 Function**  
This operating instructions manual provides all the information you need for the mounting, set-up and commissioning to ensure the safe operation and disassembly of the safety switchgear. The operating instructions must be available in a legible condition and a complete version in the vicinity of the device.


**1.2 Target group: authorised qualified personnel**  
All operations described in this operating instructions manual must be carried out by trained specialist personnel, authorised by the plant operator only.

Please make sure that you have read and understood these operating instructions and that you know all applicable legislations regarding occupational safety and accident prevention prior to installation and putting the component into operation.

The machine builder must carefully select the harmonised standards to be complied with as well as other technical specifications for the selection, mounting and integration of the components.

**1.3 Explanation of the symbols used**

 **Information, hint, note:**  
This symbol is used for identifying useful additional information.

 **Caution:** Failure to comply with this warning notice could lead to failures or malfunctions.  
**Warning:** Failure to comply with this warning notice could lead to physical injury and/or damage to the machine.

### 1.4 Appropriate use

The products described in these operating instructions are developed to execute safety-related functions as part of an entire plant or machine. It is the responsibility of the manufacturer of a machine or plant to ensure the correct functionality of the entire machine or plant.

The safety switchgear must be exclusively used in accordance with the versions listed below or for the applications authorised by the manufacturer. Detailed information regarding the range of applications can be found in the chapter "Product description".

### 1.5 General safety instructions

The user must observe the safety instructions in this operating instructions manual, the country specific installation standards as well as all prevailing safety regulations and accident prevention rules.



Further technical information can be found in the Schmersal catalogues or in the online catalogue on the Internet: [products.schmersal.com](http://products.schmersal.com).

The information contained in this operating instructions manual is provided without liability and is subject to technical modifications.

There are no residual risks, provided that the safety instructions as well as the instructions regarding mounting, commissioning, operation and maintenance are observed.

### 1.6 Warning about misuse



In case of inadequate or improper use or manipulations of the safety-monitoring module, personal hazards or damage to machinery or plant components cannot be excluded. The relevant requirements of the standard EN ISO 13850 must be observed.

### 1.7 Exclusion of liability

We shall accept no liability for damages and malfunctions resulting from defective mounting or failure to comply with this operating instructions manual. The manufacturer shall accept no liability for damages resulting from the use of unauthorised spare parts or accessories.

For safety reasons, invasive work on the device as well as arbitrary repairs, conversions and modifications to the device are strictly forbidden; the manufacturer shall accept no liability for damages resulting from such invasive work, arbitrary repairs, conversions and/or modifications to the device.

## 2. Product description

### 2.1 Ordering codes - two-hand control panel

This operating instructions manual applies to the following types:

**SEPK02.0**.①.②.③/④.⑤

**SEPG05.3**.①.②.③/④.⑤

**SEP01.0**.①.②.③/④.⑤

**SEP01.4**.①.②.③/④.⑤

**SEPLC05.2**.①.②.③/④.⑤

**SEP07.0**.①.②.③/④.⑤

**SEP09.0**.①.②.③/④.⑤

No.	Option	Description
①		Command devices make and head diameter (control parts / emergency stop) depending on ② (with SEP09.0... emergency stop not featured)
	1	Schmersal 55 mm / Schmersal 49 mm
	2	Schmersal 42 mm / Schmersal 49 mm or Siemens 40 mm / Schmersal 49 mm
	3	Schmersal 42 mm / Schmersal 38,5 mm or Siemens 40 mm / Siemens 40 mm
	4	Schmersal 55 mm / Schmersal 38,5 mm
	L	Empty enclosure with 22.3 mm holes (no command devices installed)
	S-XXXX	Special version with 4-digit serial number
②	0	Command devices from Schmersal
	1	Command devices from Schmersal or Schmersal / Siemens
③	22	Installation diameter of command devices (22.3 mm)
	30	Installation diameter of command devices (30.5 mm)
④	95	NC contacts and NO contacts of control parts in separated form
⑤	E1	Mushroom button with actuating force 10.5 N
	E2	Mushroom button with actuating force 7.0 N
	Z1	Emergency stop with 2 NC contacts and 2 NO contacts (not with SEPK02.0...)
	Z2	Switch interlock with 1 NC contact and 1 NO contact (yellow palm button with detent instead of emergency stop)
	Z3	Switch interlock with 2 NC contacts and 2 NO contacts (yellow palm button with detent instead of emergency stop)
	Z4	Switch interlock with 1 NC contact and 1 NO contact (yellow palm button with detent in addition to emergency stop)
	Z5	Switch interlock with 2 NC contacts and 2 NO contacts (yellow palm button with detent in addition to emergency stop)
	Z6	Pre-punched Al panel with 11 x Ø 22.3 mm holes (only for SEPLC05.2...)
	Z7	As with Z6 though holes are sealed with dummy plugs (only for SEPLC05.2...)

Not all options and selections described in the ordering code can actually be manufactured and supplied.

### 2.2 Ordering code stands

This operating instructions manual applies to the following types:

STP<sup>①-③</sup>

STP<sup>①-③</sup>

STP<sup>①,②,③</sup>

STP<sup>①,②,③</sup>

No.	Option	Description
①	SK	Moveable stand with height adjustment and suitable for foot switch assembly
	LC	Without height adjustment and spacer ring suitable for foot switch assembly
01	01	Without height adjustment
	02	With height adjustment
	1	Without distance ring 500 mm
②	4	With distance ring 500 mm
	5	With 500 mm spacer ring to be welded in by user (primed only)
	1	With intermediate plate ZPL-1 (L = 360 mm, B = 75 mm)
③	2	With intermediate plate ZPL-2 (L = 410 mm, B = 100 mm) (only for SEPLC05.2...)



Assembly on a stand is not possible for SEP07.0... and SEP09.0. These can only be mounted directly on machine parts and on walls.

Not all options and selections described in the ordering code can actually be manufactured and supplied.

### 2.3 Special versions

For special versions, which are not listed in the order code below 2.1 and 2.2, these specifications apply accordingly, provided that they correspond to the standard version.

### 2.4 Purpose

The two-hand control panels of the SEPK02.0 / SEPG05.3 / SEP01.0 / SEP01.4 / SEPLC05.2 / SEP07.0 / SEP09.0 series are designed for use as a non-isolating guard system. They can be deployed as non-portable or portable two-hand control panels.



The normative requirements must be observed for attachment, safe distances, access periods etc. as well as the C standards applicable for the respective machine type.

The two-hand control panels only represent the enclosure for the command devices. For safe operation, they require a safety monitoring module that meets the normative requirements.

A two-hand control panel requires simultaneous actuation with both hands to start and maintain operation of a machine in the event of risks.



A two-hand control panel must be located outside the hazardous area, to prevent the operator from entering this area before the machine has come to a complete standstill.



The user must evaluate and design the safety chain in accordance with the relevant standards and the required safety level.



The entire concept of the control system, in which the safety component is integrated, must be validated to the relevant standards.

### 3. Technical data

#### 3.1 Technical data Two-hand control panel

Standards: according to EN ISO 13851

Materials:

- SEPK02.0....:	Plastic
- SEPG05.3....:	Al die-cast, powder-coated
- SEP01.0....:	Al sand casting, powder-coated
- SEP01.4....:	Al sand casting, powder-coated
- SEPLC05.2....:	Al sand casting, powder-coated
- SEP07.0....:	Al sand casting, powder-coated
- SEP09.0....:	Al sand casting, powder-coated

Colour: RAL 7035 (depends on model RAL 7004)

Protection class:

- SEPG05.3 and SEPK02.0:	IP65
- SEP0... and SEPLC05.2:	IP54

Notice: The protection class may be reduced by the command devices that are used.

Temperature range:

- SEPG:	-25 °C ... +75 °C
- SEP:	-25 °C ... +75 °C
- SEPK:	-10 °C ... +60 °C

Registrations:

cULus (depending on

the command devices that are installed)



On SEPK-type two hand control panels, a reduction in the specific impact resistance is to be accounted for at temperatures below -5°C and temperatures above +60°C. As a result, it is recommended to use SEP and SEPG-type two-hand control panels for applications of this kind.



The temperature range could be restricted by the command devices that are used. Please observe the operating instructions of the installed command devices in this regard.

#### 3.2 Technical data Command devices

The technical data of the command devices can be obtained from the respective operating instructions. These can be found in our online catalogue at [products.schmersal.com](http://products.schmersal.com) or downloaded from the manufacturer's homepage.



The maximum head diameter must be selected in accordance with EN ISO 13851.

#### 3.3 Safety classification

The technical data of the command devices can be obtained from the respective operating instructions. These can be found in our online catalogue at [products.schmersal.com](http://products.schmersal.com) or downloaded from the manufacturer's homepage.



In connection with a suitable safety monitoring device, max. PL d can be achieved. This depends on the devices, wiring and analysis used.



The normative requirements for use of two-hand control panels as well as the C standards applicable for the respective machine type are to be observed and taken account of in the safety classification.

### 3.4 Safety classification for emergency stop (made by Schmersal)

Standards:	EN ISO 13849-1
B <sub>10D</sub> :	100,000
Mission time:	20 years

$$MTTF_D = \frac{B_{10D}}{0,1 \times n_{op}} \quad n_{op} = \frac{d_{op} \times h_{op} \times 3600 \text{ s/h}}{t_{cycle}}$$

(Determined values can vary depending on the application-specific parameters  $h_{op}$ ,  $d_{op}$  and  $t_{cycle}$  as well as the load.)

If multiple safety components are wired in series, the Performance Level to EN ISO 13849-1 will be reduced due to the restricted error detection under certain circumstances.

## 4. Mounting

### 4.1 General mounting instructions

Depending on the version, the two-hand control panels are equipped with command devices. Electrical connection is to be carried out in accordance with the operating instructions of the command devices. On two-hand control panels without pre-installed command devices, please observe the assembly instructions specified by the manufacturer for the command devices that are used.



When mechanical pushbuttons with a max. diameter of 55 mm are fitted, the two-hand control panels meet the requirements of EN ISO 13851 regarding tampering by hand, elbows and legs.



The corresponding operating instructions can be found in our online catalogue at [products.schmersal.com](http://products.schmersal.com) or downloaded from our manufacturer's homepage.

### 4.2 General installation instructions for non-portable two-hand control panels

- When a rotating mechanism is used, the lower safety distance in no way must be exceeded.
- The panels must be fixed so that they cannot be removed by simple means.

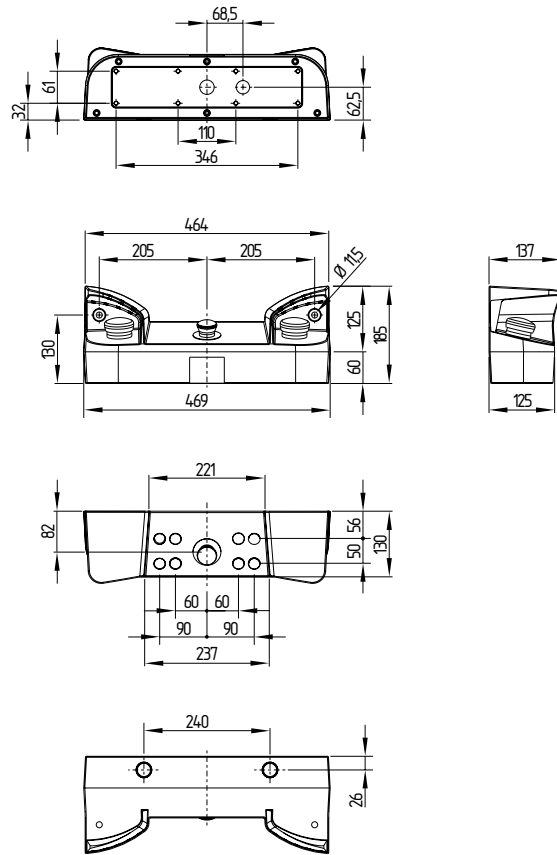
### 4.3 General installation instructions for portable two-hand control panels



With portable two-hand control panels, at least one emergency stop device must always be permanently wired and available at the machine (stationary). Similarly, measures must be taken in accordance with EN ISO 13850 to prevent active and inactive emergency stop devices from being interchanged.

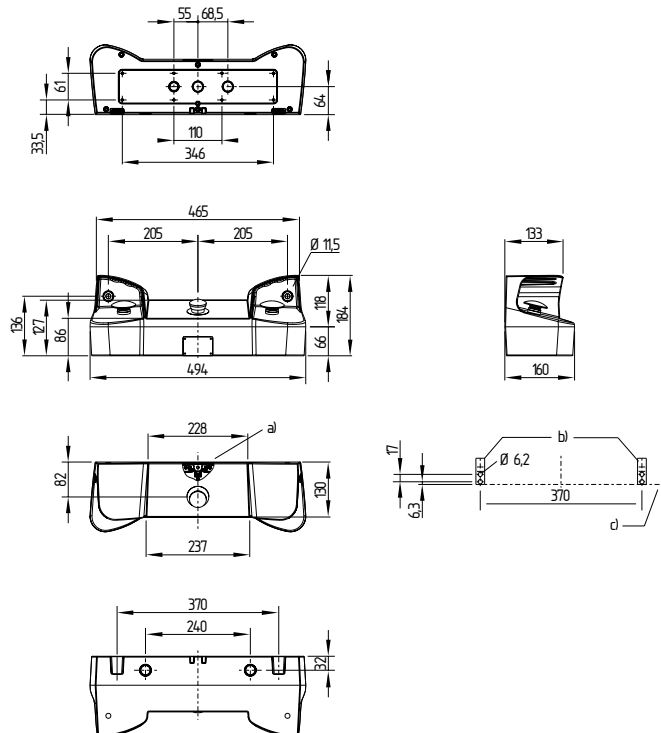
- According to SUVA (CH), a side guard may be included on the outer covers of movable two-hand control panels in addition in cases where the required access speeds cannot be adhered to. If on portable panels there is a chance of the operator gaining access to the danger zone, this must be prevented by an access cable length of an appropriately determined length or by a suitable spacer ring on the stand or by similar preventative measures of a mechanical nature.
- A relocation of the operating unit (two-hand control panel and stand) up to the hazardous point or area must be limited by the user. This can be realised for instance by means of a suitable spacer, which is welded to the stand (refer to EN ISO 13851).

### 4.4 Dimensions of the two-hand control panel SEPK02.0...



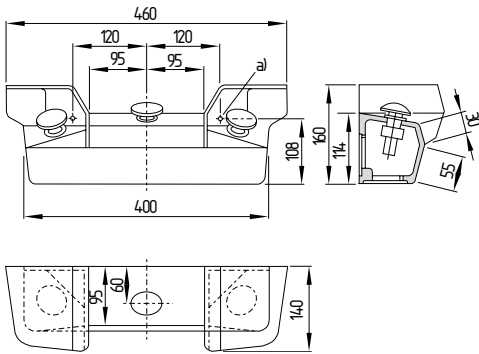
2x M25 "knockout" holes for cable glands on the underside and rear respectively

### 4.5 Dimensions of the two-hand control panel SEPG 05.3...



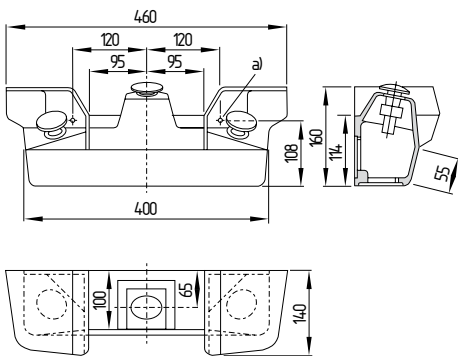
- 3x earth connection
- Assembly of mounting bracket for two-hand control panel on underside (rear)
- Two-hand control panel SEPG05.2... on underside  
2x M25 "knockout" holes for cable glands on underside and rear  
thread length of screw connections at least 10 mm).

**4.6 Dimensions of the two-hand control panel SEP01.0...**



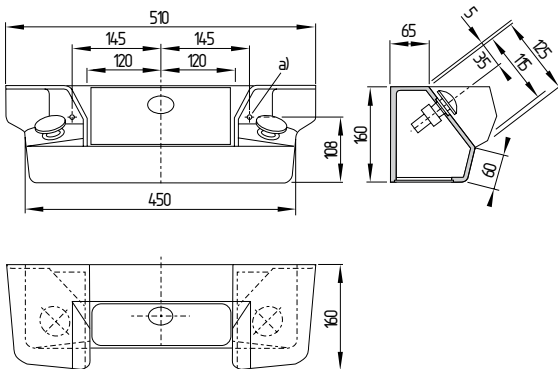
a) Mounting hole  $\varnothing$  11,5 mm

**4.7 Dimensions of the two-hand control panel SEP01.4...**



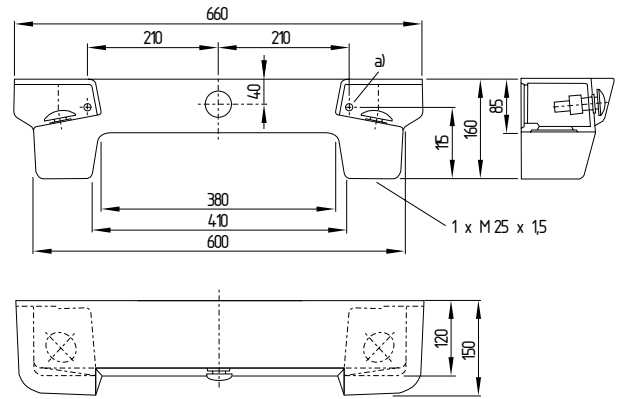
a) Mounting hole  $\varnothing$  11,5 mm

**4.8 Dimensions of the two-hand control panel SEPLC05.2...**



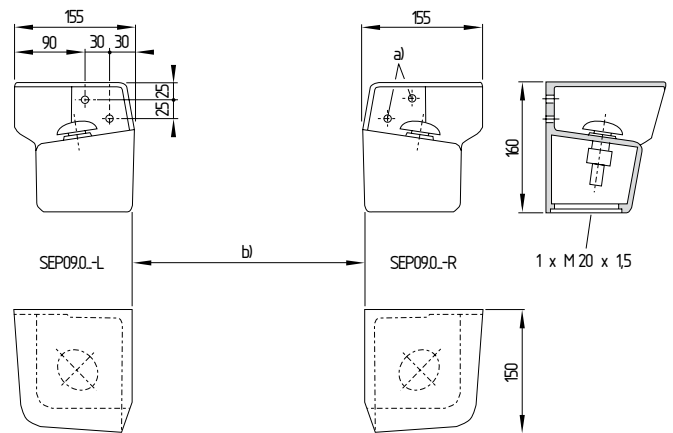
a) Mounting hole  $\varnothing$  11,5 mm  
 Removable front plate, can be fitted with additional command devices.  
 Holes must be made by the user.

**4.9 Dimensions of the two-hand control panel SEP07.0...**



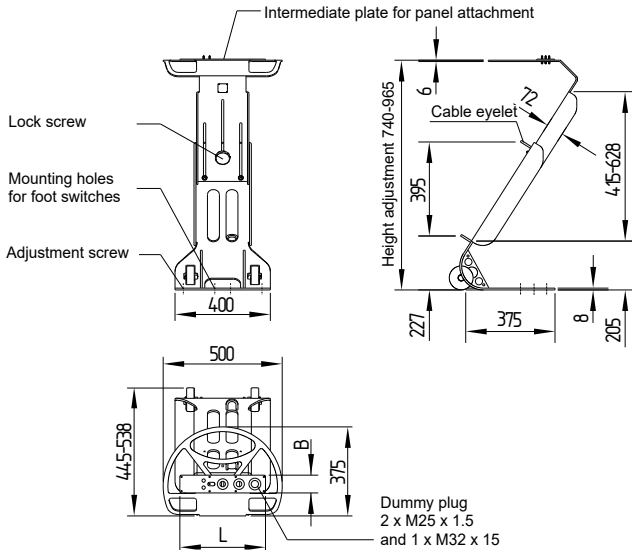
a) Mounting hole  $\varnothing$  13.5 mm  
 Assembly on a stand is not possible.

**4.10 Dimensions of the two-hand control panel SEP09.0...**

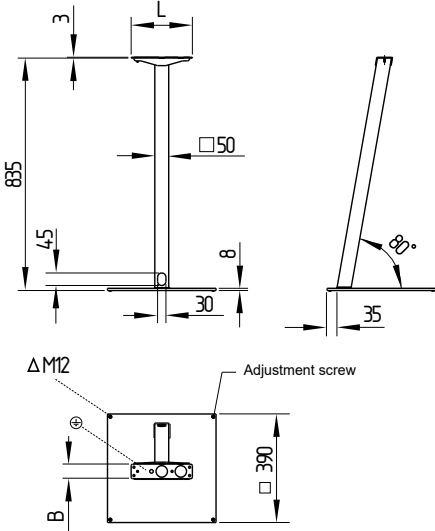


a) Mounting hole  $\varnothing$  11,5 mm  
 b) Determine user-specific spacing in accordance with EN ISO 13851.  
 Assembly on a stand is not possible.

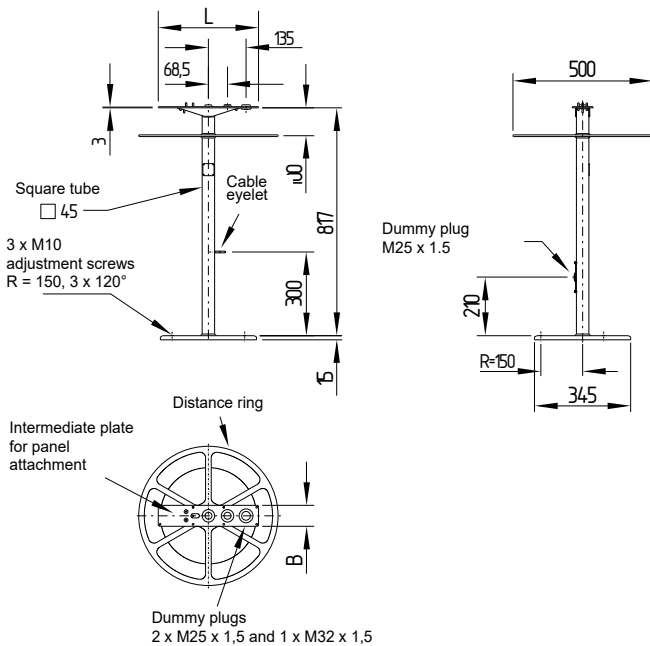
**4.11 Dimensions stand STPSK...**



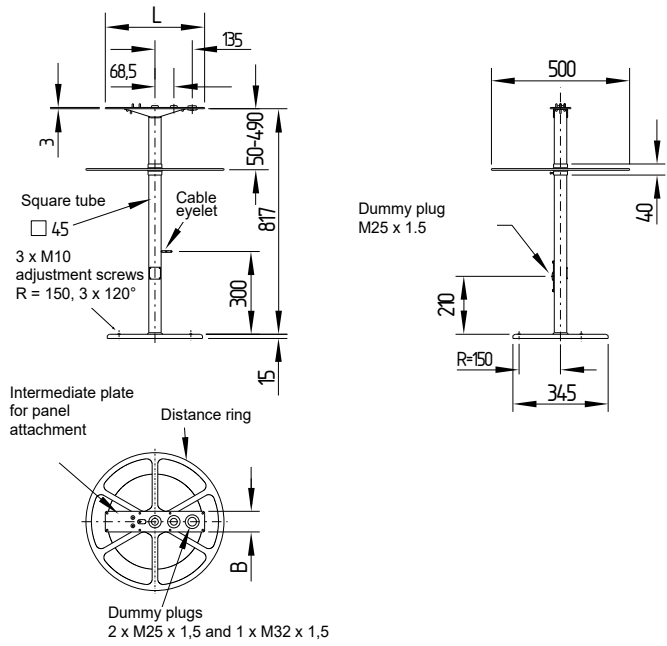
**4.12 Dimensions stand STPLC...**



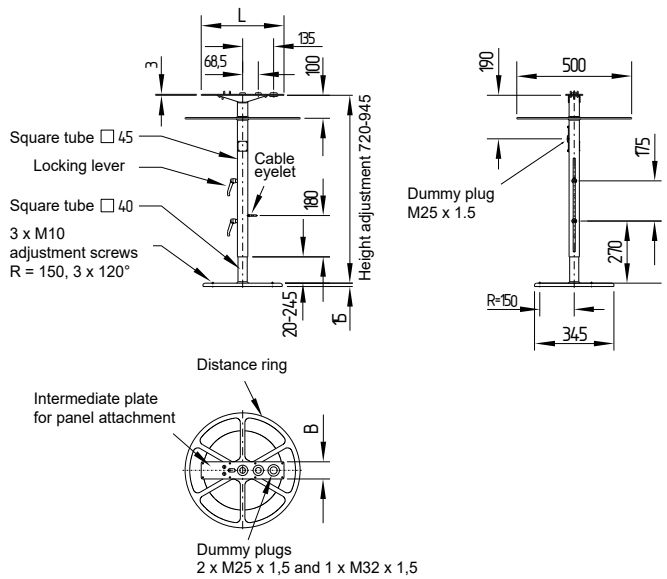
**4.13 Dimensions stand STP01.1.../STP01.4...**



**4.14 Dimensions stand STP01.5...**

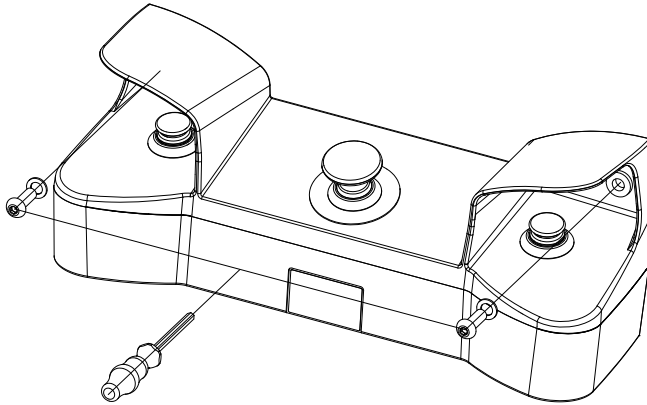


**4.15 Dimensions stand STP02.1.../STP02.4...**



### 4.16 Mounting on walls / machine parts

Mounting on walls / machine parts is carried out with the aid of dedicated assembly holes in the two-hand control panels (marked with a) under Dimensions in the diagrams).

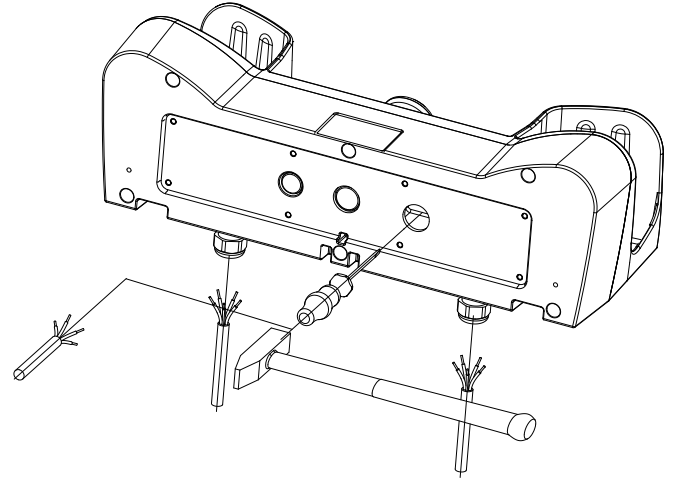


Screws, mounting accessories, walls and machine parts must be mechanically sound to withstand the additional forces (support of operating personnel,...). Take account of the fact that the operator may support himself on the control panel. Further normative requirements for positioning and safety distances are to be observed.

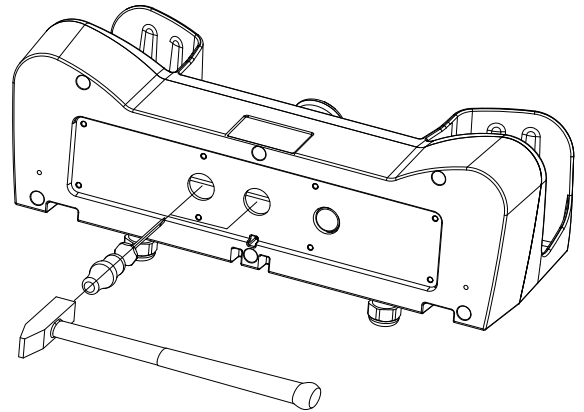
### 4.17 Mounting on stands

Mounting on a stand is carried out with the aid of suitable assembly plates:

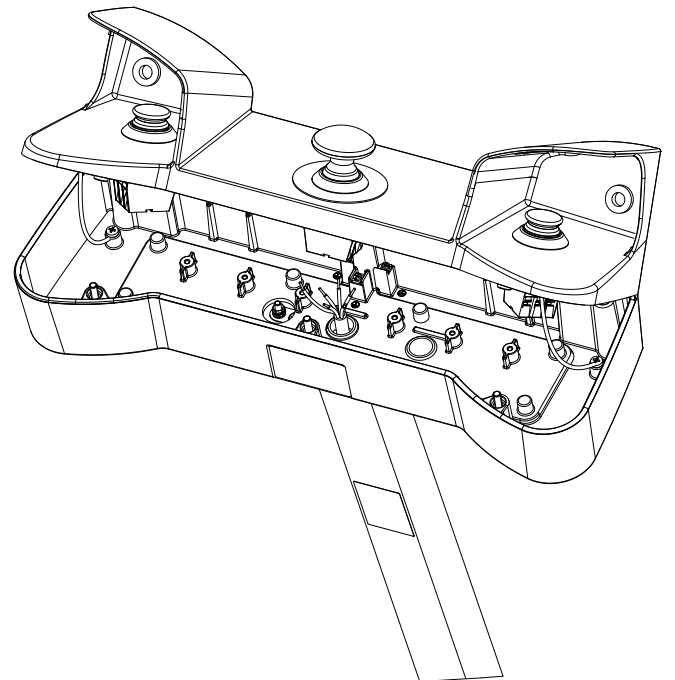
1. Prepare the two-hand control panel by attaching the cable glands or by knocking out the respective holes for the cable and earth connection.



or

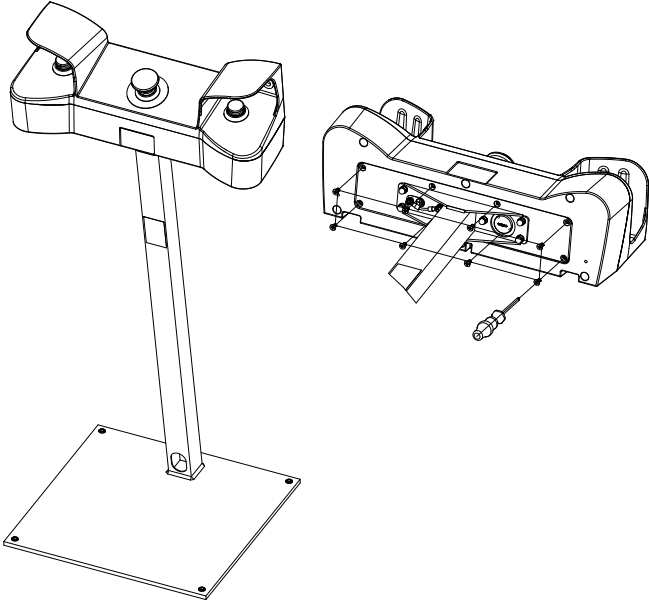


2. Route the cable through the stand and fit the two-hand control panel.





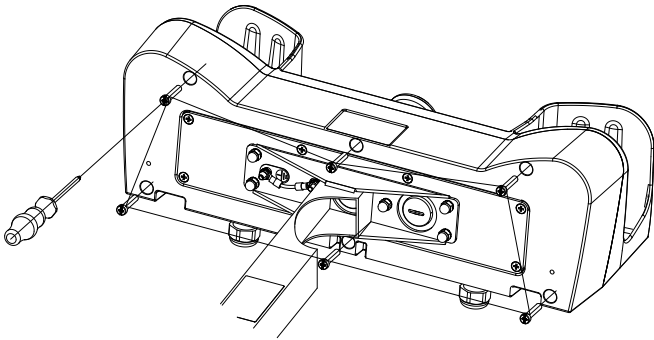
3. Tighten the control panel on the stand using the securing screws.



4. Open the two-hand control panel and wire the buttons.  
Then close the two-hand control panel again.



Observe the chapter "Electrical connection".



Further normative requirements for positioning, stability and safety distances must be adhered to.

## 5. Electrical connection

### 5.1 General information for electrical connection



The electrical connection may only be carried out by authorised personnel in a de-energised condition. At least one contact with positive break must be integrated in the safety circuit.

- Cables only may be fed into the two-hand control panel through the rear or the bottom.
- Cables must be equipped with water-tight cable glands with strain-relief feature and protection against buckling.
- Connection of the protective ground wire in two-hand control panels in accordance with EN 60204-1 must be connected individually during wiring of every protective ground wire.
- According to the harmonised standards, no protective ground wire distribution must be realised through the available ground bolt. For each earth bolt, only one protective ground wire connection is permissible.
- If multiple protective ground wires are connected, e.g. by feeding multiple cables into the enclosure, a commercially available earth terminal with the required number of terminals must be installed in the enclosure and connected to the protective ground wire connection (one PE terminal for each protective ground wire). The cable length for the cable connections must be sufficient, in order to provide for sufficient range during fitting or possible repairs.
- Inside the enclosure, outward insulated terminals must be provided if the protective ground wire is to be "looped through".



If an SEPK02.0... two-hand control panel is mounted on a stand, the earth bolts must be removed on the ZPL intermediate plate.

No conductive parts may protrude into the inside of the plastic two-hand control panel.

If an SEPG05.3... two-hand control panel is mounted on a stand, the outer two earth bolts on the ZPL intermediate plate must be removed by the user.

On Al pressure cast or sand cast two-hand control panels, the user must mount a protective ground wire connection between the upper part and lower part of the enclosure at the dedicated positions.

The electrical connection for the command devices and safety monitoring unit must be carried out in accordance with the operating instructions for these devices.



The corresponding operating instructions can be found in our online catalogue at [products.schmersal.com](http://products.schmersal.com) or downloaded from our manufacturer's homepage.



The safety monitoring module must meet the necessary normative requirements for two-hand control panels (including relevant C standards for the respective machine type).



## 5.2 Recommended safety monitoring modules

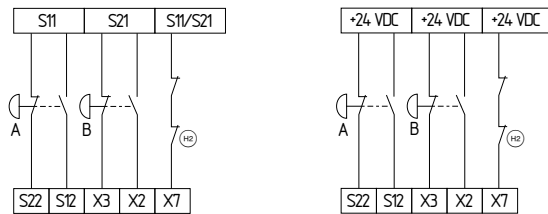
Safety relay module	Material number
SRB-E-201ST	103008067
SRB-E-402ST	103007221
SRB201ZH 24VDC	101163440
SRB201ZH3 24VDC	101182968



Further technical information can be found in the Schmersal catalogues or in the online catalogue on the Internet: [products.schmersal.com](http://products.schmersal.com).

## 5.3 Wiring example with safety relay module SRB-E-201ST

- Malfunctions of every contact as well as earth leakages and cross-wire shorts are detected.
- The feedback circuit (H2) is integrated as shown. The safety-technical function of external positive-guided contactors is monitored by a series-wiring of the NC contacts with the input X7. In idle state, this circuit must be closed.
- If the feedback circuit is not required, establish a bridge.



Rotary knob position	Function
11	Function two-hand control type IIIC



The emergency stop must be evaluated in this wiring example by an additional safety monitoring module. Other safety monitoring modules can also be used in which the emergency stop is evaluated directly with it.

## 6. Set-up and maintenance

### 6.1 Functional testing

The safety function of the safety components must be tested. The following conditions must be checked and met:

- Correct fixing of the fitted component
- Check the integrity of the cable entry and connections
- Check the command devices for damage.

### 6.2 Maintenance

A regular visual inspection and functional test, including the following steps, is recommended:

- Check command devices and contact elements for secure fit
- Remove particles of dust and soiling.
- Check cable entry and connections.

**Damaged or defective components must be replaced.**

## 7. Disassembly and disposal


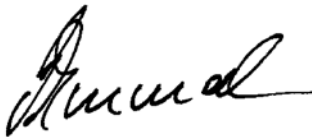
### 7.1 Disassembly

The safety switchgear must be disassembled in a de-energised condition only.

### 7.2 Disposal

The safety switchgear must be disposed of in an appropriate manner in accordance with the national prescriptions and legislations.

8. EU Declaration of conformity

<b>EU Declaration of conformity</b>		
Original	K.A. Schmersal GmbH & Co. KG Möddinghofe 30 42279 Wuppertal Germany Internet: www.schmersal.com	
We hereby certify that the hereafter described components both in their basic design and construction conform to the applicable European Directives.		
<b>Name of the component:</b>	SEPK02.0... / SEPG05.3... / SEP01.0... / SEP01.4... / SEPLC05.2... / SEP07... / SEP09.0...	
<b>Type:</b>	See ordering code	
<b>Description of the component:</b>	Two-hand control panel with <sup>1)</sup> and without emergency-stop (optionally with stand)	
<b>Relevant Directives:</b>	<sup>1)</sup> Machinery Directive Low Voltage Directive RoHS-Directive	2006/42/EC 2014/35/EU 2011/65/EU
<b>Applied standards:</b>	EN ISO 13851:2019 EN 60947-5-1:2017 <sup>1)</sup> EN 60947-5-5:1997 + A1:2005 + A11:2013 + A2:2017	
<b>Person authorised for the compilation of the technical documentation:</b>	Oliver Wacker Möddinghofe 30 42279 Wuppertal	
<b>Place and date of issue:</b>	Wuppertal, December 2, 2020	
		
	Authorised signature <b>Philip Schmersal</b> Managing Director	

SEP-F-EN



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