



**EN** Operating instructions. . . . .pages 1 to 8  
Original

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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 Schmersal range of products is not intended for private consumers.

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](https://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 improper use or manipulation of the safety switchgear, personal hazards or damages to machinery or plant components cannot be excluded.

### 1.7 Exclusion of liability

We shall accept no liability for damages or malfunctions resulting from defective mounting or failure to comply with this operating instructions manual. We shall accept no liability for damages or malfunctions resulting from defective mounting or failure to comply with this operating instructions manual.

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 code

This operating instructions manual applies to the following types:

#### 2.1.1 Emergency stop command device heads

No.	Option	Description
	<b>Basic component</b>	<b>Description</b>
	<b>Emergency stop push button</b> HDRZ②-③-①-GB	With latching, pull to unlock
①	<b>Colour operating surfaces:</b> RT	Red
②	<b>Head diameter emergency stop push button:</b> 40	40 mm
③	<b>Colour of diaphragm:</b> WS SW BL	White (on request) Black (on request) Blue

#### 2.1.2 Contact elements of CLP contact system

Basic component	Description
CLP101	Contact element NC (red)
CLP110	Contact element NO (green)

### 2.2 Special versions

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

### 2.3 Purpose and use

The HDRZ series emergency stop command devices are designed for use in emergency stop circuits to EN ISO 13850. Exposed parts, particularly seals, can be damaged from chemicals, oils, grease and cleaning agents. Defective devices must be renewed without delay. Instructions on how to do this can be found in the removal and disposal sections.



The user must evaluate and design the safety chain in accordance with the relevant standards and the required safety level. If multiple safety switchgears are involved in the same safety function, the PFH values of the individual components must be added.



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



Operation of the devices in areas at risk of explosion is not intended use.

### 2.4 Proper use in hygiene-sensitive areas

The devices are intended for use on food-processing machinery in accordance with DIN EN 1672-2. When designing the machine or system, it must be ensured that the command devices are attached such that lateral actuation via the sealing bellows is rendered impossible, that the devices can be operated at the operating surfaces and that ergonomic operation is possible.

The plant owner must ensure that machines and systems are operated and cleaned only by personnel who have been trained on the machine or system. The machine and system owner and cleaning personnel have been instructed on the specifics of the machine and system.



Operating devices with chain gloves, blades, spatulas or similar objects is impermissible. Doing so can give rise to damage to exposed sealing elements and represents a hygiene risk.



The contact time with foodstuffs should not exceed 8 hours. Exceeding the contact time can pose a hygiene risk.



The devices must be cleaned regularly. Improper or outstanding cleaning represents an elevated hygiene risk. More information can be found in the chapter cleaning and disinfection.


### 2.5 Technical data

#### Emergency stop command device

Standards:	EN ISO 13850, EN 60947-5-1, EN 60947-5-5, EN 60947-1, DIN EN 1672-2
Design:	round
Connection:	central nut
Type of execution:	front plate mounting
Front plate thickness min.:	1.5 mm
Front plate thickness min.:	6 mm
Notice front plate thickness:	incl. identification label
Mounting diameter:	22.3 mm
Anti-twist safeguard, height:	1.8 mm
Anti-twist safeguard, width:	3.2 mm
Installation position:	all surfaces min 3° to the horizontal
Grid dimensions:	65 mm x 65 mm
Switching frequency:	600/h
Actuating stroke NC contact:	3.6 mm
Actuating stroke NO contact:	3.9 mm
Actuating force per device:	50 N
Number of contact elements:	4
Actuating stroke device head:	5.5 mm
Mechanical lifetime:	100,000 operations
Unlocking type:	Draw unlocking
Release force:	50 N
Material operation surface:	PBT-GF30
Material sealing elements:	silicone; HNBR
Material front ring:	PBT-GF30
Typing cULus:	type 4x, 5, 12, 13, Indoor
Degree of protection:	IP67, IP69K
Ambient temperature device heads:	-25 °C ... +80 °C
Storage temperature:	-25 °C ... +80 °C
Tightening torque central nut:	4 Nm
Design contact carrier:	SMF
Design contact elements:	CLP
Resistance to shock according to EN 60068-2-27:	<50 g
Resistance to vibration according to EN 60068-2-6:	5 g
Device labelling:	laser-etched
Cleaning temperature, max.:	+80 °C
Temperature change, max.:	20 °C/min
Authorised cleaning agents:	see table chapter Cleaning
Permissible installation altitude above sea level, max.:	2,000 m
Relative humidity, max.:	93 %
	non condensing, non icing

### Contact elements CLP110 / CLP101

Standards:	EN 60947-5-1, EN 60947-1
Material of the housings:	thermoplastic, self-extinguishing
Material of the contacts:	Carrier made from fine silver, phosphor bronze or brass
Utilisation category AC-15:	250 V / 6 A
Utilisation category DC-13:	24 V / 3 A
Rated insulation voltage $U_i$ :	500 V
Rated impulse withstand voltage $U_{imp}$ :	2.5 kV
Degree of pollution:	3
Overvoltage category:	III
Thermal test current $I_{the}$ :	6 A
Max. fuse rating:	6 A gG
Climatic resistance:	to EN 60068 part 2-30
Ambient temperature:	-25 °C ... +60 °C
Storage temperature:	-25 °C ... +60 °C
Proof of positive opening:	2.5 kV impulse voltage
Positive break travel NC contact:	2 mm
Switch travel NC contact:	1 mm
Switch travel NO contact:	2 mm
Switching system:	Slow action, NC contacts with positive break
Switching elements:	Individual contacts with contact bridge
Actuating force at stroke end:	8 N
Switching frequency:	1,200/h
Mechanical lifetime: :	5,000,000 operations
Resistance to shock:	30 g / 18 ms
Resistance to vibration:	20 g / 10 ... 150 Hz
Wiring configuration:	to EN 60947-1
Connection:	screw terminals
Tightening torque for the connecting screw:	1.0 Nm
Cable section:	
- solid wire:	2x 0.5 ... 1.5 mm <sup>2</sup>
- stranded wire incl. conductor ferrules with protective collar:	2x 0.5 ... 1.5 mm <sup>2</sup>
Degree of protection:	
- Connections:	IP20
- Wiring compartments:	IP40
Permissible installation altitude above sea level, max.:	2,000 m
Relative humidity, max.:	93 %
	non condensing, non icing
Certificates:	cULus

-  - Field wiring terminals: Cu, 75 °C
- Temperature rating of wire insulation: min. 75 °C
- Torque value for terminal block on contact block: 1 Nm

### 2.6 Safety classification

Standards:	EN ISO 13849-1
$B_{10D}$ (NC contact):	100,000
Mission time:	20 years

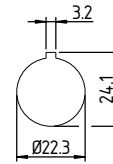
$$MTTF_D = \frac{B_{10D}}{0,1 \times n_{op}} \quad n_{op} = \frac{d_{op} \times h_{op} \times 3600 \text{ s/h}}{t_{cycle}}$$

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

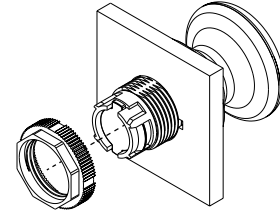
## 3. Mounting

### 3.1 General mounting instructions

1. The installation recess must be designed as follows:



2. Alignment of the command device head in the installation recess and subsequent tightening of the central nut.

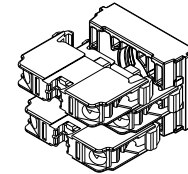


Only fit onto clean and grease-free surface!



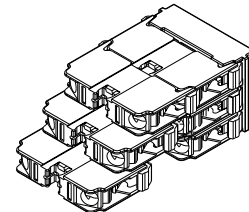
Sealing elements to the control panel must be checked during installation to ensure that they are seated correctly and free of folds.

3. The contact elements are installed by snapping the contact elements onto the contact carrier.



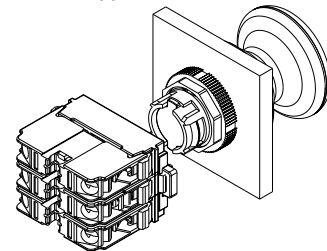
### Double row contact elements

The contact elements in the second row are installed by snapping them onto the contact elements in the first row. No further contact element can be attached to the light element.



A maximum of 4 contact elements may be used on emergency stop command devices with latching. The fourth element must be mounted in the centre.

4. The contact carrier is snapped onto the command device head.



### 3.2 Special mounting instructions for hygienic applications

For hygiene-related devices of the H series, which are mounted and can be used in the food-processing industry, water splash areas or non-food areas, the following additional requirements with regard to the installation are to be observed:

1. The devices must be arranged in such a way that cleaning with a cloth is possible in each position and when the switch is not actuated. It is therefore recommended to maintain a distance of at least 70 mm from mounting hole to mounting hole in order to ensure the normative distance of > 20 mm.
2. If the device is connected from one or more sides to a housing wall, a radius of 100 mm from the centre of the mounting hole must be adhered to so that the device can be cleaned from all sides using a cloth and can be checked from all sides for damage.
3. Devices must be installed in such a way that liquids can drain from all surfaces. An incline of >3° is recommended on all device surfaces. Overhead installation of the devices is not recommended.
4. Contact elements must be installed protected behind the operating surface and are not intended to come into contact with foodstuffs. The devices should be installed in a closed installation space, such as a switch cabinet.



Please note the applicable standards and the design principles that apply to the machine or system in question.

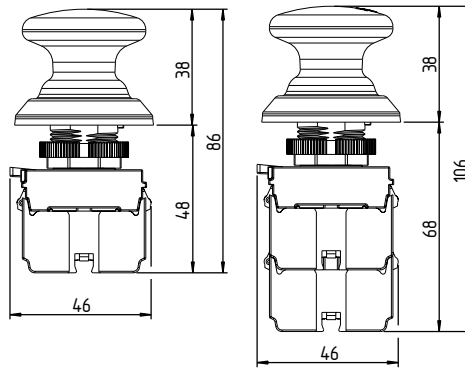
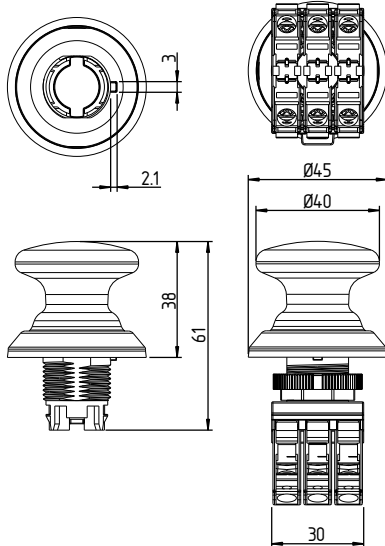


Only fit onto clean, grease-free surface! When installing the device, ensure that the surface is flat and that there are no weld seams or bending radii of 100 mm around the device. Otherwise, the leak-tightness and hygiene properties of the device could be compromised. The surface must have a surface roughness of Ra 0.8 and, in the case of metallic surfaces, a levelness of 0.1.

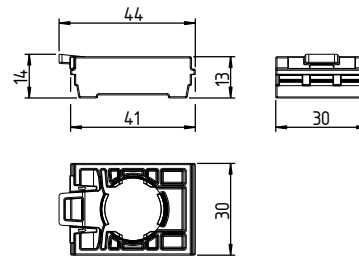
### 3.3 Dimensions

All measurements in mm.

#### Emergency stop pushbutton



#### Contact carrier SMF



## 4. Electrical connection

### 4.1 General information for electrical connection



The electrical connection may only be carried out by authorised personnel in a de-energised condition.



The front panel/operating panel must have an appropriate earth connection.



After wiring, the contact elements must be cleaned (i.e. remove excess cables etc.).

Settle length  $x$  of the conductor CLP contact system: 7 mm



## 5. Set-up and maintenance



The cleaning process and the cleaning/disinfectant agent must be appropriate to the foodstuffs being processed. The cleaning process, such as dry or wet cleaning, and the appropriate disinfection procedure must be designed in accordance with DIN 10516. This may mean that certain actions deviate from the stated recommendations.



All important criteria for the cleaning and disinfection processes must be laid down in a cleaning and disinfection plan that is specific to the company (where, what, when, who, with what, how). A check of the effectiveness of cleaning and disinfection must also be carried out.

### 5.1 Functional testing

The function of the component must be tested.

The following conditions must be checked and met:

1. Correct fixing of the fitted component
2. Check the integrity of the connections
3. Check the command device for damage
4. Check the correct seating of the gaskets
5. Pre-cleaning see chapter 5.3

### 5.2 Maintenance

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

1. Check the correct fixing of the command device and the contact element
2. Remove particles of dust and soiling
3. Check the integrity of the connections
4. Check the correct seating of the gaskets
5. Cleaning see chapter 5.3



The contact carrier must be replaced after disassembly.



Contacts must not be removed from the contact carrier in their installed state.



Damaged or defective components must be replaced immediately. There is an immediate hygiene risk relevant to food safety.



Cleaning must be carried out before commissioning and after maintenance and repair work.



In the event of use with permanent UV influence, weekly checks of the sealing elements must be carried out.

### 5.3 Cleaning and disinfection

#### 5.3.1 General

- The devices must be cleaned thoroughly after installation and before initial commissioning.
- Cleaning and, if applicable, disinfection intervals must be adapted according to the existing cleanliness requirements and the cleaning/disinfection plan. Daily cleaning is recommended. Cleaning must also take place no later than when visible soiling is observed. If disinfection is required, this must always take place after cleaning.
- The selected cleaning and, if applicable, disinfection process and agents must not damage or negatively affect the surfaces and properties of the materials, especially gaskets.
- Use only clean utensils (e.g. soft cloths, soft uncoated sponges, brushes with soft bristles) that cannot damage the surface. Check the cleanliness of the cleaning utensils before use.
- Impermissible and unsuitable cleaning agents and utensils can damage the devices and gaskets and should not be used.
- In the event of wet cleaning and disinfection, the resistance of the cleaning agent, cleaning temperature and selection of the disinfectant in relation to the materials must be clarified with the manufacturer of the disinfectant.
- Cleaning agents must be fully rinsed away afterwards with water of drinking quality without leaving any residue.
- The devices should be checked before and after cleaning for damage. Particular attention must be paid to the sealing elements.
- When cleaning rotating devices, particular care must be exercised to ensure that soiling is removed from grip recesses and lock slots.



If soiling is still visible after cleaning, the cleaning process must be repeated.



Cleaning agents must be fully rinsed away afterwards with water of drinking quality without leaving any residue. A mixture of cleaning agents on the device must be avoided as this can cause damage. The information provided by cleaning agent manufacturers on acting times, mixing ratios, etc. must be observed. Applying cleaning agents overnight or over similarly long periods of time is not permitted.

Not permitted for cleaning:

- Cleaning agents containing abrasive particles.
- Pointed and hard objects, such as brushes with hard bristles, steel brushes, steel wool, steel wool sponges, sponges with an abrasive coating.
- Abrasive methods, such as lasers, ultrasound, dry ice, compressed-air.
- Methods involving vapours, such as nitrogen, steam cleaning.

#### 5.3.2 Dry cleaning

We recommend that dry soiling be removed dry with the cleaning utensils referred to in section 5.3.1 until the desired level of cleanliness is achieved. Hard particles of dirt (e.g. sand) can damage the smooth surfaces of devices when cleaning manually. Work with caution so that surfaces are not damaged and soiling cannot penetrate the area under gaskets.



Dry cleaning can take place before wet cleaning.

#### 5.3.3 Wet cleaning

Procedure:

1. Wash off the devices with water to remove coarse soiling.
2. Lather all surfaces.

We recommend using an alkaline cleaner according to the tested cleaning agents referred to in section 5.3.5. The information provided by cleaning agent manufacturers on acting times, mixing ratios, etc. must be observed.

3. Wash off foam with water. Light water pressure of 3 to 5 bar may be applied. When using a water jet, a distance of >40 cm is recommended. The jet should be angled from above at a maximum angle of 45 to 60°. All surfaces must be reached, Spray shadows must be avoided, as these lead to an inadequate cleaning outcome. If soiling is still visible after cleaning, the cleaning process must be repeated.



It must be ensured that the gaskets are not damaged or destroyed by direct jets at high pressure, and that soiling does not penetrate under the gaskets. In the event that heavy soiling necessitates manual cleaning, also observe the notes in sections 5.3.1 and 5.3.2.



Cleaning with a scouring agent or cleaning agents containing abrasives is not permitted. Removing coarse soiling with steel wool, steel wool sponges or wire brushes is not permitted.



When cleaning at high pressure (80 bar), a distance of >20 cm must be maintained. High-pressure cleaning is not recommended for hygiene reasons. No point must be cleaned for more than 5 seconds at a time.

#### 5.3.4 Disinfection

The notes on use, acting time and other measures stipulated by the disinfectant manufacturer must be observed for disinfection.

### 5.3.5 Recommended cleaning agents

Certified cleaning and care products along with their main ingredients can be gleaned from the list at the end of the chapter. These cleaning agents have been tested in a standardised ECOLAB procedure or in an alternative storage test. A change in colour is no indication of a quality defect on the device.

If other cleaning and care products are used with the same or similar ingredients, no liability will be accepted for damage to the device. Responsibility for this lies solely with the operator of the machine or plant system.

Product	Description	Concentration	PH value (1%)	Main ingredients
Topactive 500	Foam cleaner, acidic	5%	1.7 - 2.1	Phosphoric acid, surfactant
Acipplusfoam VF59	Foam cleaner, acidic	5%	2	Phosphoric acid, surfactant, nitric acid
P3 – Topactive DES	Foam cleaner, acidic	3%	3.2 - 3.6	Hydrogen peroxide, acetic acid, Peracetic acid, surfactants
cd water	Completely desalinated water	100%	5 - 6	Demineralised water
P3 – Alcodes	Acetic acid, alkylamine oxide	100%	6.8 - 7.8	Ethanol
P3 – Topax 990	Disinfectant, neutral	3%	7.4 - 8.4	Acetic acid, alkylamine oxide
Tego 2000 VT25	Disinfectant, neutral	1%	8	Amphotenside
Divodes FG VT29	Disinfectant, neutral	100%	8.8	Alcohol
P3 – Topax 66	Foam cleaner, alkaline	3%	11.6 - 12	Surfactants, phosphonates, sodium hypochlorite
Oxofoam VF5	Foam cleaner, highly alkaline	5%	12.7	Potash, surfactant, sodium hypochlorite
Powerfoam VF4	Foam cleaner, highly alkaline	5%	12.8	Caustic soda, EDTA, surfactant
Topactive 200	Foam cleaner, alkaline	5%	12.8 - 13.2	Ethanol, sodium hydroxide, potassium hydroxide, surfactants

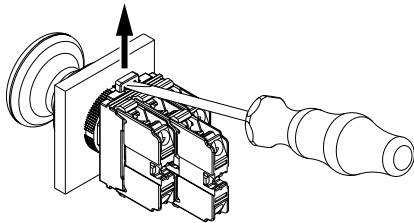
## 6. Disassembly and disposal

### 6.1 Disassembly



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

1. Disassembly of the contact carrier is carried out with the aid of a size 2 slot screwdriver.



2. Disassembly of the CLP contact elements from the contact carrier is carried out with the aid of a slot screwdriver with the recommended width of 5.5 mm.



The contact carrier must be replaced after disassembly.

### 6.2 Disposal

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



7. EU Declaration of conformity

EU Declaration of conformity



Original  
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42279 Wuppertal  
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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.

**Name of the component:** HDRZ

**Type:** see ordering code

**Description of the component:** Emergency stop command device in conjunction with contact element CLP

**Relevant Directives:** Machinery Directive 2006/42/EC  
RoHS-Directive 2011/65/EU

**Applied standards:** EN 60947-5-1:2017 + AC:2020  
EN 60947-5-5:1997 + A1:2005 + A11:2013 + A2:2017  
EN ISO 13850:2015

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**Place and date of issue:** Wuppertal, 18. June 2024

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**Philip Schmersal**  
Managing Director

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The currently valid declaration of conformity can be downloaded from the internet at [products.schmersal.com](http://products.schmersal.com).



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