SCHMERSAL

EN Operating instructions. . . . . .pages 1 to 6
Original

Content

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

Products in Schmersal's range are not intended to be used by private end 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.

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. The relevant requirements of the standard EN ISO 13850 must be observed.

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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 code

This operating instructions manual applies to the following types:

EDR①②③④ Operating element

No.	Option	Description
①	R	Latching (only in combination with EFR); turn and pull to unlock
	RZ	Latching (only in combination with EFR); pull to unlock
	Z	Latching (integrated in device head); pull to unlock
②	40	Head diameter 38.5 mm
	50	Head diameter 49 mm
③		Mounting hole 22,3 mm
	.VH	Mounting hole 30,5 mm
④	RT	red

In conjunction with the following contact elements

EF①… Contact element

No.	Option	Description
①	303	1 NC / 1 NO
	220	2 NC / 0 NO

For more information about contact elements, refer to chapter 4.2.

and the following spring elements:

EFR.① Spring element

No.	Option	Description
①		with securing plate for contact elements
	1	without securing plate for contact elements

By observing the information described in this operating instructions manual, the safety function and therefore the compliance with the Machinery Directive will be maintained.

2.2 Special versions

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

2.3 Purpose

The EDRR…, EDRRZ…, EDRZ… series of emergency stop command devices are designed for use in emergency stop circuits to EN ISO 13850.

2.4 Technical data

Device head:

Standards:	EN ISO 13850, EN 60947-5-1, EN 60947-5-5, EN 60947-1
Design:	Emergency stop pushbutton with latching for front plate mounting
Unlocking type:	turn and pull to unlock or pull to unlock
External snap-action mechanism:	depending on the version
Fully insulated:	Yes
Degree of protection:	IP65
Mechanical life:	100.000 operations
Switching frequency:	600 s/h
Actuating force:	approx. 25 N
Material:	
- Material of the operating unit:	anodised aluminium
- Material of the front ring:	anodised aluminium
Colours	
- Operating unit colour:	red
- Front ring colour:	gold
Dimensions:	
- Height:	29 mm
- Diameter of the operating button:	38,5 mm or 49 mm
- Hole diameter:	22,3 mm + 0,4 mm
- Form:	round
Fixation:	
- EDRR…:	mounting flange ELM
- EDRZ…:	mounting flange EFM
Tightening torque for the fixing screws:	0.6 Nm
Front plate thickness:	
- min. front plate thickness:	1 mm
- max. front plate thickness:	6 mm
Spacing:	
- Head diameter 38,5 mm:	50 mm x 40 mm
- Head diameter 49 mm:	50 mm x 50 mm
Mounting position:	any
Ambient temperature:	−25° C … + 75° C

Contact element EF:

Standards:	EN 60947-1; EN 60947-5-1
Material:	
- Material of the enclosure:	plastic, glass-fibre reinforced thermoplastic, self-extinguishing
- Material of the contacts:	fine silver, spring bronze or brass carrier
Utilisation category:	AC-15: 250 V / 8 A; DC-13: 24 V / 5 A (only in case of fully insulated device head)
Rated insulation voltage U_i:	400 V
Rated impulse withstand voltage U_{imp}:	4 kV
Degree of pollution:	3
Overvoltage category:	III
Suitable low voltage:	≥ 5 VDC / 3.2 mA
Thermal test current I_{the}:	10 A
Max. fuse rating:	gG 10 A
Climatic resistance:	to EN 60068 Part 2-30
Ambient temperature:	−25 °C … +60 °C
Switch travel:	depending on the contact execution
Positive break travel:	2 mm
Test voltage enclosed:	2500 VAC
Actuating force at stroke end:	approx. 8 … 15 N
Switching frequency:	1200 s/h
Mechanical life:	10,000,000 operations
Bounce duration (100 mm/s):	< 5 ms
Resistance to shock:	110 g / 4 ms … 30 g / 18 ms, no bouncing
Shock resistance:	> 20 g / 10 … 200 Hz (for actuating heads with higher mass accordingly lower)
Contact force:	0.5 N each contact point = 2 N each contact bridge

Wiring configuration:	to EN 60947-1
Termination:	screw connection, flat plug-in connector, Cage-Clamp connection (in case of a Cage Clamp connection, the contact elements can not be additionally secured against loosening)
Tightening torque for the connecting screw:	max. 1 Nm
Cable sections:	
- Single-strand:	2 x (0.5 … 2.5 mm²)
- Multi-strand:	2 x (0.5 … 1.5 mm²)
- Flat plug-in connector:	6.3 mm x 0.8 mm / 2 x 2.8mm x 0.8 mm
Degree of protection:	
- Terminals:	IP20 (finger guard)
- Wiring compartments:	IP40 (with plug-in connector depending on the connector plug used)
Approvals:	cULus (save cage clamp connection)

2.5 Safety classification

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

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

(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

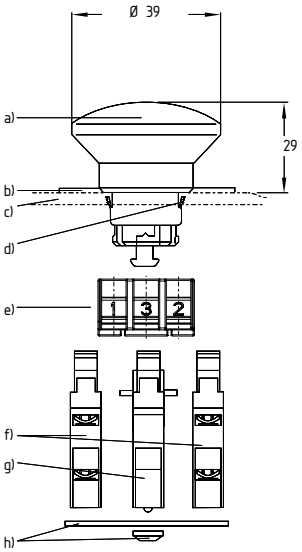
1. Fit the emergency stop actuator in non-actuated condition by means of the ELM mounting flange, align and tighten (max. 0.6 Nm)
2. Snap the EFR.1 or EFR spring elements in the middle position of the ELM mounting flange (position 3).
3. The EMERGENCY STOP actuator is latched, (i.e. mechanically fixed), to the EFR 1 or EFR spring element by actuation. Unlatching by turning and/or pulling on the EMERGENCY STOP actuator retentions the spring element and the EMERGENCY STOP is brought back to the ready position.
4. Snap the desired EF… contact elements onto the free positions to the right and to the left (position 1 and 2) next to the EFR.1 or EFR spring element.
5. Mounting of the securing plate with the EFR (not required with the EFR.1):

Installation of EFR discontinued for EDRZ… emergency stop devices. Instead of the ELM mounting flange, the EFM mounting flange is installed here. The relevant mounting flange is included in the items supplied with the device head.

3.2 Dimensions

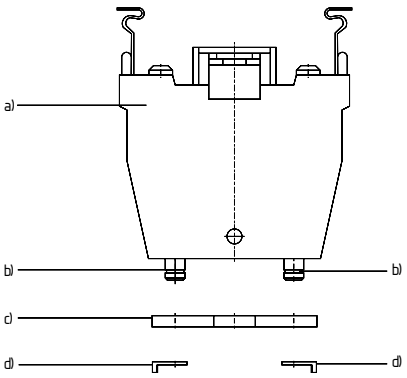
All measurements in mm.

Emergency stop command device EDRR…, EDRRZ…, EDRZ…



a) Emergency stop actuator
b) Emergency stop label
c) Enclosure or mounting panel
d) Clamping element
e) Mounting flange ELM
f) Contact element EF
g) EFR or EFR.1
h) The EFR kit (not required with the EFR.1)

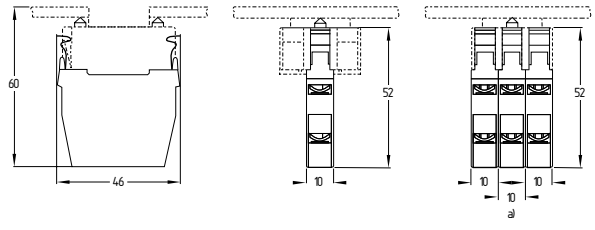
EFR with securing plate



a) EFR (spring element with securing plate)
b) Retaining bolts (not required with the EFR.1)
c) Securing plate
d) 2x Securing ring

Contact elements of the EF contact system must be fitted in the second locking position and must, therefore, lie flush on the mounting flange after fitting.

Contact element EF…
in fitted condition



a) Maximum number of contacts (2 contact elements, max. 4 contacts)

4. Electrical connection

4.1 Important notes

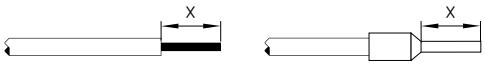
The electrical connection may only be carried out by authorised personnel in a de-energised condition.
At least one contact with positive break must be integrated in the safety circuit.

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

The fixing screws of the contact element must be tightened with 0.8 Nm tightening torque.

Settle length x of the conductor:

- on cage clamp connections of type s or f: 5 … 6 mm
- on screw terminals: 7 mm

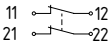


4.2 Contact variants

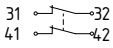
The following contact variants can be combined together:
Screw or plug-in terminals:
- 1 x EF303 (1 NC / 1 NO) + 1x EF220 (2 NC) or
- 2 x EF303 (1 NC / 1 NO each contact element) or
- 2 x EF220 (2 NC each contact element)

EFK cage clamp: contact data upon request

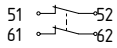
EF 220.1



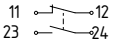
EF 220.2



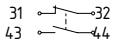
EF 220.3



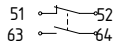
EF 303.1



EF 303.2

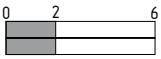


EF 303.3



4.3 Switch travel

EF 220.1
EF 220.2
EF 220.3



EF 303.1
EF 303.2
EF 303.3

5. Set-up and maintenance

5.1 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 emergency stop command device for damage

5.2 Maintenance

A regular visual inspection and functional test, including the following steps, is recommended:
- Check the correct fixing of the emergency stop command device and the contact element
- Remove particles of dust and soiling.
- Check cable entry and connections.

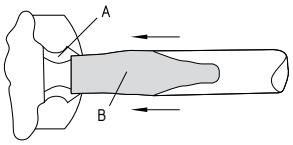
Damaged or defective components must be replaced.

6. Disassembly and disposal

6.1 Disassembly

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

- Disassembly of the EF… contact element(s).
- Actuate/snap in EDRR emergency stop actuator and turn.
- Spread the spring (A) between the EDRR actuator plunger and the EFR spring element by means of a screwdriver (B) or similar (refer to drawing). The actuator jumps back into basic position.
- Snap off the EFR spring element, disassembly the actuating head if necessary.



6.2 Disposal

The safety 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

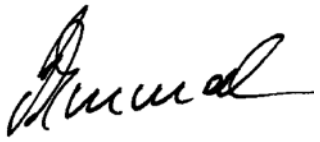
SCHMERSAL

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.

Name of the component:	EDRR…, EDRRZ…, EDRZ…
Type:	See ordering code
Description of the component:	Emergency stop pushbutton
Relevant Directives:	2006/42/EC Machinery Directive 2011/65/EU RoHS-Directive
Applied standards:	EN 60947-5-1:2017 + AC:2020 EN 60947-5-5:1997 + A1:2005 + A11:2013 + A2:2017 EN ISO 13850:2015
Person authorised for the compilation of the technical documentation:	Oliver Wacker Möddinghofe 30 42279 Wuppertal
Place and date of issue:	Wuppertal, February 9, 2023



Authorised signature
Philip Schmersal
Managing Director

EDR-E-EN

The currently valid declaration of conformity can be downloaded from the internet at products.schmersal.com.

K.A. Schmersal GmbH & Co. KG
Möddinghofe 30, 42279 Wuppertal
Germany
Phone: +49 202 6474-0
Telefax: +49 202 6474-100
E-Mail: info@schmersal.com
Internet: www.schmersal.com