



EN Operating instructions.pages 1 to 6
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 indicates 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.

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 against improper use



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.

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:

EX-RD^{①②③④}

| No. | Option | Description |
|-----|--------|-------------------------|
| ① | R | latching |
| ② | Z | Release by pulling only |
| ③ | 45 | Head diameter 45 mm |
| ④ | RT | Red colour |



Only if the information described in this operating instructions manual are realised correctly, the safety function and therefore the compliance with the Machinery Directive and the Explosion Protection Directive is 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 EX-RDRZ45 RT series emergency stop command devices are designed for use in emergency stop circuits to EN 13850.

The EMERGENCY STOP command devices in the EX-RDRZ45RT series are constructed as category 2 equipment designed for use in gas hazardous areas of zone 1 and 2; and dust hazardous areas of Zone 21 and 22.

Mounting box, 1 control unit: EX-EBG 311.O
 Mounting box, 3 control units: EX-EBG 633.O
 Mounting box, 5 control units: EX-EBG 665.O

When installing multiple devices into an assembly housing from another manufacturer, the resulting weakening of the housing structure must be taken into account.

Gas atmospheres

Please use the control devices and indicator lights in conjunction with equipment of the appropriate "intrinsic safe" ignition protection type, which is authorised for the corresponding field of application:

Zone 1: intrinsically safe current circuits of category ia or ib
 (EN 60079-11 / ABNT NBR IEC 60079-11)

Zone 2: intrinsically safe current circuits of category ia, ib or ic
 (EN 60079-11 / ABNT NBR IEC 60079-11)

Dust atmospheres

For Zone 21 and 22, the installation of the cables or wires is realised with the appropriate ignition protection type (e.g. increased safety, EN 60079-7). No intrinsically safe current circuits are required.



The installation and maintenance requirements to the standard series 60079 must be met.

Especially the capacitive and inductive parts of the intrinsically safe current circuit must be observed.

For non-linear current circuits, Appendix A to EN 60079-11 (ABNT NBR IEC 60079-11) (assessment of intrinsically safe current circuits) must be included in the overall assessment.

For intrinsically safe current circuits with protection level ib, a safety coefficient of 1.5 must be included in the calculations, in accordance with EN 60079-11 (ABNT NBR IEC 60079-11) paragraph 5.3.



During installation in intrinsically safe current circuits (Ex i), it must be borne in mind that the device may only be connected to a single, approved electrical apparatus (e.g. SRB 200EXi-..., barrier, isolated switch amplifier). The safety data of both devices must be compared.



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.

Conditions for safe operation

The command devices are suitable for mounting in the installation housings of the type Ex-EBG... (brand: Schmersal) or another enclosure suitable for the zone. Alternatively operating panels (material: stainless steel or metal with painted surface) can be used. These enclosures must meet the requirements of IP65 or higher to EN 60529 as well as the test criterions to EN IEC 60079-0 paragraph 26.4.

The presence of small dust particles inside of the dust-proof IP65 enclosure must be excluded.

The specifications in the operating instructions manual or in the technical data of the EU-type examination certificate regarding the maximum impact energy must be observed. Due to the specific impact energy, the components must be fitted with a protection against mechanical stresses.

2.4 Technical data

EX-R command and signalling devices:

| | |
|--|-------------------------------|
| Designation in accordance with the ATEX Directive: | ⊕ II 2GD |
| Designation in accordance with standards: | Ex ib IIC Gb Ex tb IIIC Db |

| | |
|----------|--------------------|
| ATEX: | TÜV 08 ATEX 7685 U |
| IECEX: | TUR 16.0031 U |
| INMETRO: | TÜV 20.0598 U |

For Ex-R control devices and indicator lights in Ex-EBG enclosure:

| | |
|--|---|
| Designation in accordance with the ATEX Directive: | ⊕ II 2GD |
| Designation in accordance with standards: | Ex ib IIC T4 Gb Ex tb IIIC T110°C Db |

| | |
|----------|--------------------|
| ATEX: | TÜV 08 ATEX 7630 X |
| IECEX: | TUR 16.0030 X |
| INMETRO: | TÜV 20.0599 X |

| | |
|--------------------|--|
| Applied standards: | EN 60947-5-1, EN 60947-5-5, EN 60947-1 |
| - ATEX: | EN IEC 60079-0, EN 60079-11, EN 60079-31 |
| - IECEX: | IEC 60079-0, IEC 60079-11, IEC 60079-31 |
| - INMETRO: | ABNT NBR IEC 60079-0, ABNT NBR IEC 60079-11, ABNT NBR IEC 60079-31 |

Ambient temperature T_{amb} : -20 ... +55°C



Note external heat and/or cold source.

| | |
|---|------|
| Protection class to EN 60529: | IP65 |
| Verified impact energy (according to EN IEC 60079-0 / ABNT NBR IEC 60079-0): | 4 J |

General technical data:

| | |
|------------------------|------------|
| Design: | round |
| Installation diameter: | 22,3 mm |
| Grid dimensions: | 50 × 60 mm |

| | |
|---|---|
| Front plate thickness: | 1 ... 6 mm |
| With identification label: | 1 ... 5 mm |
| Mounting position: | random |
| Switching frequency: | 600 / h |
| Actuating force: | 2 N |
| Mechanical life (operations): | 1 × 10 ⁵ |
| Materials: | Front-ring brass, chromium-plated Emergency stop label (yellow): PVC film Device head: brass coated |
| Fixing: | With mounting flange, Tightening torque: 2 Nm |
| Shock resistance to EN 60068-2-27: | < 50 g |
| Resistance to vibrations to EN 60068-2-6: | 5 g |

Contact elements,

EX-relevant data:

| | |
|--|--------------------|
| Ambient temperature T _{amb} : | -20 ... +55°C |
| Mounting position: | random |
| Number of: | max. 2 (Pos. 2, 3) |

Dust Ex-zones:

| | |
|------------|--------------|
| Voltage U: | 250 V |
| Current I: | 5 A |
| Power P: | max. 1,500 W |

Intrinsically safe to EN 60079-11 (ABNT NBR IEC 60079-11):

| | |
|--------------------------|---|
| Voltage U _i : | 250 V |
| Current I _i : | Ex ib: 3.3 A, Ex ic: 5 A (internal current limitation 30 mA) |

Power P_i: not relevant

Capacity C_i: typ. 0

Inductivity L_i: typ. 0

Overvoltage category: III

Resistance to pressure shocks to EN 60079-11 (ABNT NBR IEC 60079-11) paragraph 10.3: safe separation against earth;

Connection of the cables in case of multiple or different Ex-i current circuits: use conductor ferrules with protective collar.

Bare wires must not protrude beyond the clamping disc.

Contact/light element,

General technical data:

| | |
|--|---|
| Switching points: | NC contact: approx. 1 mm NO contact: approx. 2.5 mm |
| Contact reliability: | 5 VDC / 1 mA |
| Proof of positive opening: | 2,5 kV impulse voltage |
| Positive opening path: | approx. 2 mm after achieving opening point |
| Actuating force at stroke end: | typ. 4.5 N |
| Connection: | screw terminals |
| Cable section: | single-strand wire: 2 × (0.5 ... 2.5 mm ²) multi-strand wire with conductor ferrules with protective collar: 2 × (0.5 ... 1.5 mm ²) |
| Tightening torque for the connecting screws: | max. 1 Nm |

2.5 Safety classification

| | |
|--------------------------------|----------------|
| Standards: | EN ISO 13849-1 |
| B _{10D} (NC contact): | 100.000 |
| Mission time: | 20 years |

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

(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.

Series-wiring for devices in ignition protection type is not permitted.

3. Mounting

3.1 General mounting instructions



The installation may only be carried out with the system de-energised and by authorised personnel.



Before assembly, check the mounting flange to ensure that the four rubber tappets are present (see figure 1).

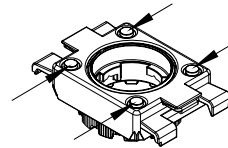


Fig. 1

1. Assembly of the head of the emergency stop device and mounting flange by turning the RMW mounting tool to the right (Fig. 2):

- a) Actuating head
- b) Mounting flange

2. Opening the contact fitting (see Fig. 3)

3. Preliminary fitting of the contact elements onto the contact carrier (see Fig. 4): only the outward positions may be equipped*:

- a) contact carrier

Prior to the assembly of the contact elements onto the contact carrier, the two plunger segments must be fitted onto the central contact element through simple insertion in the trapezoid groovings to the left and the right.



The contact elements must only be fitted in the outmost position of the contact carrier, so that in case of voltages > 150 V the necessary air clearances and creepage distances are ensured.

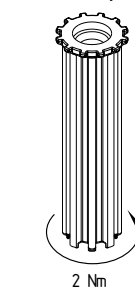
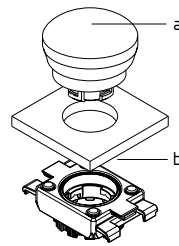


Fig. 2

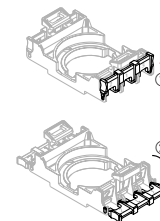


Fig. 3

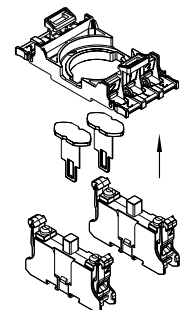


Fig. 4

4. Closing and pressing down the contact fitting (see Fig. 5): the contact fittings to the left and the right are folded up 90° and then pressed down until they engage. In this way, the contact elements are additionally mechanically secured to the contact carrier.

5. Assembly of the pre-assembled contact carrier onto the mounting flange (see Fig. 6): engage the contact carrier on one side of the mounting flange. Then repeat this process on the opposite side.

6. After the contact carrier is snapped onto the mounting flange, the contact lugs are automatically additionally fixed (Fig. 7). This precludes incorrect assembly. The correct assembly should be checked once more.

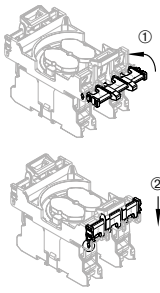


Fig. 5

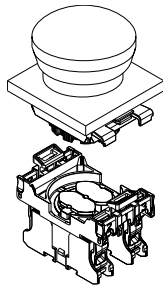


Fig. 6

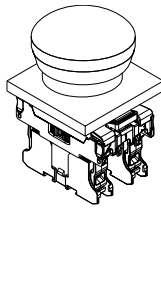


Fig. 7



Only fit onto clean, grease-free surface!
After assembly of the contact elements, both contact lugs (to the left and the right of the contact elements) must be folded up 90° and then pressed down until they engage.
To ensure a smooth disassembly of the contact carrier, we recommend using a slot screwdriver of 5.5 mm wide.

3.2 Dimensions

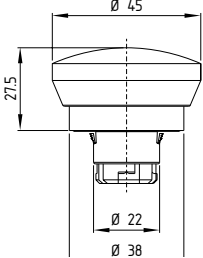


Fig. 8: Emergency stop command device

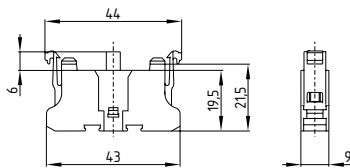


Fig. 9: Contact element EX-RF

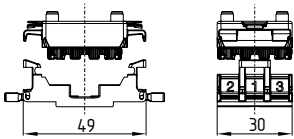


Fig. 10: Dimensions EX-RLM

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.

Settle length x of the conductor: 7 mm



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

The fixing screws of the contact element must be tightened with 1 Nm tightening torque.

Contact variants

EX-RF 03: 1 NO
EX-RF 10: 1 NC



At least one contact with positive break must be integrated in the safety circuit.

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:

1. Correct fixing of the fitted component
2. Check the integrity of the cable entry and connections
3. Check the emergency stop command device for damage.

5.2 Maintenance

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

1. Check the correct fixing of the emergency stop command device and the contact element
2. Remove particles of dust and soiling
3. Check cable entry and connections

Damaged or defective components must be replaced.

6. Disassembly and disposal

6.1 Disassembly

1. Disassembly of the contact carrier from the mounting flange (see Fig. 11):

Insert the screwdriver in the latch of the mounting flange. Slightly move the screwdriver in the direction of the contact element to press the latch outwards. In this way, the contact carrier is released from the mounting flange. Then repeat this process on the opposite side.

2. Contact carrier disassembled and opening the contact lugs (see Fig. 12): lift both contact lugs to release them from the catch mechanism and then fold them 90° up. After that, the contact or light elements can be disassembled.

3. Disassembling the contact elements from the contact carrier (see Fig. 13): insert the screwdriver in the latch of the contact element. Slightly move the screwdriver in the direction of the contact element to press the latch outwards. The contact element is released from the contact carrier.

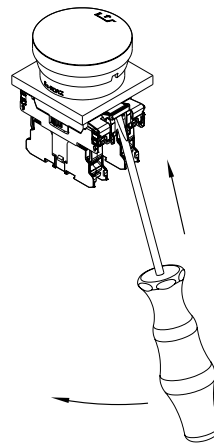


Fig. 11

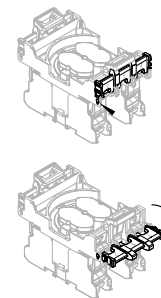


Fig. 12

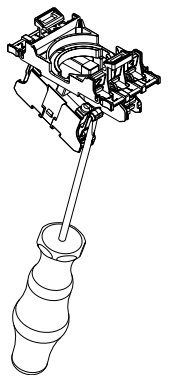


Fig. 13

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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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: EX-RDRZ45RT EX-RDRZ45RT with EX-EBG

Type: see ordering code

Marking II 2G Ex ib IIC Gb II 2G Ex ib IIC T4 Gb
 II 2D Ex tb IIIC Db II 2D Ex tb IIIC T110°C Db

Description of the component: Emergency stop pushbutton with latching without/with assembly housing

Relevant Directives: Machinery Directive 2006/42/EC
Explosion Protection Directive (ATEX) 2014/34/EU
RoHS-Directive 2011/65/EU

Applied standards: EN IEC 60079-0:2018,
EN 60079-11:2012,
EN 60079-31:2014

Notified body, which approved the full quality assurance system, referred to in Appendix IV, 2014/34/EU: TÜV Rheinland Industrie Service GmbH
Am Grauen Stein, 51105 Köln
ID n°: 0035

Notified Body for the certification: TÜV Rheinland Industrie Service GmbH
Am Grauen Stein, 51105 Köln
ID n°: 0035

EU-type examination certificate: TÜV 08 ATEX 7685 U
TÜV 08 ATEX 7630 X

Person authorised for the compilation of the technical documentation: Oliver Wacker
Möddinghofe 30
42279 Wuppertal

Place and date of issue: Wuppertal, July 1, 2021

EX-RDRZ45RT-G-EN

Authorised signature
Philip Schmersal
Managing Director



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



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