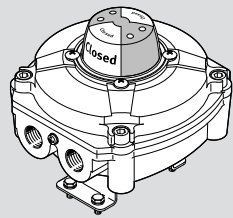


SRBE-...-C1

limit switch box



FESTO

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Operating instructions


8176802
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[8176804]



Translation of the original instructions

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1 Identification EX

Identification	Type
 Class I, Division 1, Groups C, D Class II, Division 1, Groups E, F, G Class III; Temperature Code T4A Ex d IIB T5 Gb; Ex tb IIIC T108°C Db Class I, Zone 1, AEx d IIB T5 Gb Class II, Zone 21, AEx tb IIIC T108°C Db	SRBE-CA3-YR90-MW-22A-1W... – only Div.1 SRBE-CA3-YR90-MW-22A-2W... – only Div.1 SRBE-CA3-YR90-N-20N-ZC-... – Div.1 and 2 SRBE-CA3-YR90-N-1-P-... – Div.1 and 2 SRBE-CA3-YR90-N-1-N-... – Div.1 and 2 SRBE-CA3-YR90-N-1-ZU-... – Div.1 and 2 SRBE-CA3-YR90-R-2A-1W... – Div.1 and 2
Class I, Division 2, Groups A, B, C and D Class II, Division 1, Groups E, F and G Class III; Temperature Code T4A Ex nA IIC T5 Gc; Ex tb IIIC T108°C Db Class I, Zone 2 AEx nA IIC T5 Gc Class II, Zone 21, AEx tb IIIC T108°C Db	
Certificate: CSA-EX-2885024; Ex protection - CSA Canada and USA	

Tab. 1: Identification EX

2 Applicable documents

NOTICE

Technical data for the product can have different values in other documents. For operation in an explosive atmosphere, the technical data in this document always have priority.

All available documents for the product → www.festo.com/sp.

3 Safety

3.1 Safety instructions

The device can be used under the stated operating conditions in potentially explosive gas atmospheres, and in potentially explosive dust atmospheres.

3.2 Intended use

The intended use of the product is to record and display the end positions and intermediate positions of pneumatic drives.

3.3 Training of qualified personnel

Work on the product may only be carried out by qualified personnel who can evaluate the work and detect dangers. The qualified personnel have skills and experience in dealing with electrical (open-loop) control technology.

3.4 CSA certification

Fitting and commissioning is to be carried out by qualified personnel only in accordance with the operating instructions. The personnel must have several years of training and experience in installing and commissioning electrical and pneumatic industrial control systems.

- Please observe the applicable safety requirements and standards.
- Conversion or extension of the product with modules, for which the Recognized Component Mark of CSA does not apply, will lead to loss of the CSA certification.
- Contact Festo if you require information on CSA-certified modules.

Only when connected in potentially explosive areas

Wiring to or from this device, which enters or leaves the system enclosure, must utilize wiring methods suitable for Class I, Division 2 (or Division 1) Hazardous Locations, as appropriate for the installation.

Enclosure Environmental ratings are achieved when conduit entries are torqued to at least 90.4 Nm (800 lbs/inch) and fasteners (Class A2-50) to 40 Nm (354 lbs/inch) not-lubricated conditions.

Use field wiring suitable for 95 °C.

Class I. Division 1. Groups C and D

- Open circuit before removing cover.
- Keep cover tight while circuits are alive.
- Seal required within 18 inches.

Class I. Division 2. Group A. B. C and D

⚠ WARNING

EXPLOSION HAZARD

Substitution of components may impair suitability for Class I, Division 2.

⚠ WARNING

EXPLOSION HAZARD

Do not connect while circuit is alive unless area is known to be nonhazardous.

4 Additional information

- Contact the regional Festo contact if you have technical problems → www.festo.com.
- Accessories and spare parts → www.festo.com/catalogue.

5 Product overview

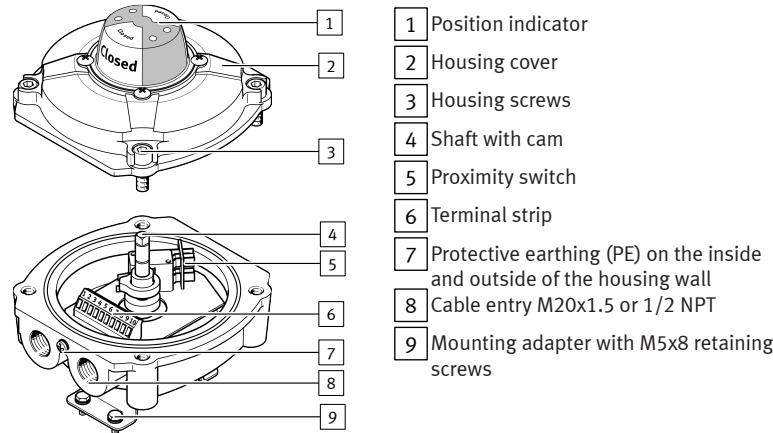


Fig.1

Default settings on delivery:

- Position indicator “closed”
- Switching point for “open” 90° anti-clockwise

6 Function

The limit switch box is used for the detection and electrical and optical feedback of the end positions of a drive. The limit switch box is suitable for operation with semi-rotary drives with a mechanical interface in accordance with VDI/VDE Guideline 3845.

7 Installation

⚠ WARNING

Carry out the commissioning, service and inspection outside of the explosive atmosphere. Disconnect the power supply before this work and secure against reconnection.

1. Close the process valve.
2. Place the limit switch box with the mounting adapter on the drive and align it.
 - Avoid axial load of the drive shaft.
3. Fasten the mounting adapter to the drive.
 - Lock the retaining screws. Tightening torque: 6 Nm ± 10%

Mounting adapter

Observe the tightening torque when replacing the limit switch attachment.

- Tightening torque between mounting adapter and limit switch box: 10 Nm ± 10%

8 Electrical connection

⚠ WARNING

Before switching on the electrical circuit in potentially explosive atmospheres:

- Mount the cover securely on the housing.
- Connect with potential equalisation.

⚠ WARNING

Use cable connectors of type of (ignition) protection Ex-d and a degree of protection of at least IP67. Seal unused cable entries with blanking plugs.

NOTICE

Thread of the cable guide depends on the product variant: M20x1.5 or 1/2 NPT
Cable fittings must be appropriate for the corresponding thread type. Cable connector threads must not protrude into the interior of the housing.

NOTICE

The supplied plastic blanking plugs are intended exclusively for protection against contamination during transport and handling. During operation, these should be replaced by cable connectors and/or blanking plugs approved for use in explosion protection areas.

- Loosen the housing screws [3] on the housing cover [2].
- Screw the cable connector into the cable entry [8]. Insert the electrical connecting cable through the cable connector to the terminal strip [6].
- Wire the connections. Maximum tightening torque of the screws: 0.4 Nm → 9 Terminal plan
- Connect the earth terminal [7] with low impedance (short cable with large cross section) to the earth terminal.
- Place the housing cover in position and tighten the housing screws.
 - Make sure that the seal is positioned correctly.

9 Terminal plan

SRBE-Cxx-YR90-22A-1W-.../SRBE-Cxx-YR90-R-2A-1W-...

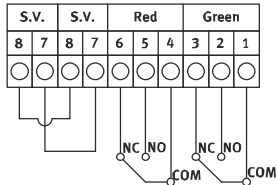


Fig. 2: Two SPDT micro-switches, mechanical or magnetic

SRBE-Cxx-YR90-N-20N-ZC-.../SRBE-Cxx-YR90-N-1-ZU-...

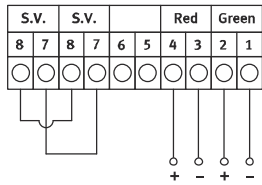


Fig. 3: Two-wire proximity switches, inductive

SRBE-Cxx-YR90-N-1-P-.../SRBE-Cxx-YR90-N-1-N-...

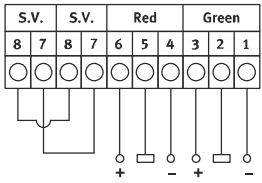


Fig. 4: Three-wire proximity switches, inductive

SRBE-Cxx-YR90-MW-22A-2W-...

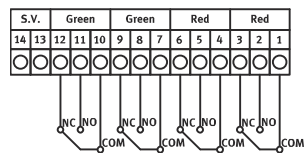


Fig. 5: Four SPDT micro-switches, mechanical

10 Switching point adjustment

The switching points are preset → 5 Product overview

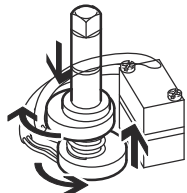


Fig. 6: Switching point adjustment

- Close the process valve.
 - Position indicator: 'closed'.
- Loosen the housing screws on the housing cover and remove the housing cover.
- Lift the red cam against the spring and turn until the lower proximity switch switches.
- Release the red cam.
 - The spring presses the red cam into the ring gear.
 - The switching point for 'closed' is set.
- Open the process valve.
 - Position indicator: 'open'.
- Press down the green cam against the spring and turn until the upper proximity switch switches.

- Release the green cam.
 - The spring presses the green cam into the ring gear.
 - The switching point for 'open' is set.
- Place the housing cover in position and tighten the housing screws.

11 Maintenance and care

- The device is maintenance-free.
- Repairs are not possible.
- Avoid contact with aggressive substances.
- Protect surfaces from excessive heat.

12 Fault clearance

Fault description	Cause	Remedy
Incorrect or unexpected signal	Wire break	Replace cable
	Position of the switching points incorrect	Set switching points
	Proximity switch defective	Replace limit switch box

Tab. 2

13 Technical data

SRBE-...-C1		
Certificates, declaration of conformity	→ www.festo.com/sp	
Technical data, general		
Mounting position	Any	
Degree of protection	IP67, Type 4X	
Cable entry	2 x 1/2 NPT	
Angular detection setting range	[°]	0 ... 90
Nominal cross section of conductor that can be connected	[mm ²]	0.25 ... 2.5
Ambient conditions		
Ex ambient temperature	[°C]	-20 ... +60
Continuous shock resistance in accordance with DIN/IEC 68 Part 2-82	± 15g at 6 ms duration; 1000 shocks per direction	
Vibration resistance in accordance with DIN/IEC 68 Part 2-6	0.35 mm path at 0 ... 60 Hz; 5 g acceleration at 0 ... 150 Hz	
Technical data, electrical		
Operating voltage range AC		
SRBE-CA3-YR90-MW-22A-1W-... SRBE-CA3-YR90-MW-22A-2W-...	[V]	0 ... 250
SRBE-CA3-YR90-R-2A-1W-...	[V]	0 ... 240, taking into account a maximum permissible power P 100 W
Max. output current AC		
SRBE-CA3-YR90-MW-22A-1W-... SRBE-CA3-YR90-MW-22A-2W-...	[A]	3 (250 VAC)
SRBE-CA3-YR90-R-2A-1W-...	[A]	0.416 (240 VAC); 3, taking into account a maximum permissible power P 100 W
Operating voltage range DC		
SRBE-CA3-YR90-MW-22A-1W-... SRBE-CA3-YR90-MW-22A-2W-...	[V]	0 ... 30
SRBE-CA3-YR90-N-20N-ZC-...	[V]	8.2
SRBE-CA3-YR90-N-1-P-... SRBE-CA3-YR90-N-1-N-...	[V]	10 ... 30
SRBE-CA3-YR90-N-1-ZU-...	[V]	5 ... 60
SRBE-CA3-YR90-R-2A-1W-...	[V]	0 ... 30, taking into account a maximum permissible power P 100 W
Max. output current DC		
SRBE-CA3-YR90-MW-22A-1W-... SRBE-CA3-YR90-MW-22A-2W-...	[A]	6
SRBE-CA3-YR90-N-20N-ZC-...	[mA]	3
SRBE-CA3-YR90-N-1-P-... SRBE-CA3-YR90-N-1-N-...	[mA]	100
SRBE-CA3-YR90-N-1-ZU-...	[mA]	4 ... 100
SRBE-CA3-YR90-R-2A-1W-...	[A]	3, taking into account a maximum permissible power P 100 W
Voltage drop		
SRBE-CA3-YR90-N-1-P-... SRBE-CA3-YR90-N-1-N-...	[V]	≤ 3
SRBE-CA3-YR90-N-1-ZU-...	[V]	≤ 5
No-load supply current		
SRBE-CA3-YR90-N-1-P-... SRBE-CA3-YR90-N-1-N-...	[mA]	≤ 15
Residual current		
SRBE-CA3-YR90-N-1-P-... SRBE-CA3-YR90-N-1-N-...	[mA]	0 ... 0.5; typically 0.1 mA at 25°C
SRBE-CA3-YR90-N-1-ZU-...	[mA]	0 ... 1, typical 0.7 mA
Reverse polarity protection		
SRBE-CA3-YR90-N-1-P-... SRBE-CA3-YR90-N-1-N-... SRBE-CA3-YR90-N-1-ZU-...	For all electrical connections	

SRBE-...-C1

Short circuit current rating	
SRBE-CA3-YR90-N-1-P-... SRBE-CA3-YR90-N-1-N-...	Clocked
Materials	
Housing	painted die-cast aluminium
Shaft, screw, mounting adapter	High-alloy stainless steel
Seal	NBR
Optical position indicator	PC

Tab. 3: Technical data