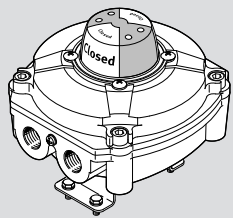


SRBE-...-EX

Limit switch box



FESTO

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Operating instruction

8169567
2022-11d
[8169569]

Translation of the original instructions

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1 Identification EX

Identification		Certificates
	Ex db IIC T6 Gb Ex tb IIIC T(*) Db	IECEx FTZU 15.0014X
	II 2G II 2D Ex db IIC T6 Gb Ex tb IIIC T(*)°C Db	FTZU 15 ATEX 0095X
	Ex db IIC T6 Gb Ex tb IIIC T(*) Db	DNV 16.0067X
	Ex db IIC T6 Gb Ex tb IIIC T(*) Db	GYJ16.1497X

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 zone 1, explosive gas atmospheres, and in zone 21, explosive dust atmospheres.
- Standards applicable to Inmetro: ABNT NBR IEC 60079-0, ABNT NBR IEC 60079-1, ABNT NBR IEC 60079-31.

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.

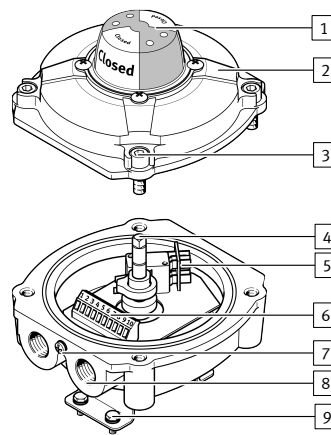
3.4 Identification X: special conditions

- Ambient temperature $-20\text{ °C} \leq T_a \leq +60\text{ °C}$
- Prepare the Ex cable fittings and blanking plugs in the Ex degree of protection according to the identification in this certificate with at least IP66/IP67.
- Contact the manufacturer for information on the dimensions of the pressure-resistant connections.
- Install the product in such a way that there is no danger of spreading brush discharges when used in explosive dust atmospheres.
- The minimum property class of the captive screws used is A2-70 or A4-70.

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



- 1 Position indicator
- 2 Housing cover
- 3 Housing screws
- 4 Shaft with cam
- 5 Proximity switch
- 6 Terminal strip
- 7 Protective earthing (PE) on the inside and outside of the housing wall
- 8 Cable entry M20x1.5 or 1/2 NPT
- 9 Mounting adapter with M5x8 retaining screws

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: $6\text{ Nm} \pm 10\%$

Mounting adapter

- Observe the tightening torque when replacing the limit switch attachment.
- Tightening torque between mounting adapter and limit switch box: $10\text{ Nm} \pm 10\%$

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.

1. Loosen the housing screws [3] on the housing cover [2].
2. Screw the cable fitting into the cable entry [8]. Insert the electrical connecting cable through the cable fitting to the terminal strip [6].
3. Wire the connections. Maximum tightening torque of the screws: $0.4\text{ Nm} \rightarrow 9$ Wiring diagram
4. Connect the earth terminal [7] with low impedance (short cable with large cross section) to the earth terminal.
5. Place the housing cover in position and tighten the housing screws.
 - Make sure that the seal is positioned correctly.

9 Wiring diagram

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

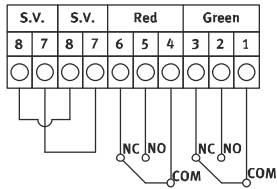


Fig. 2: Two SPDT micro-switches, mechanical or magnetic

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

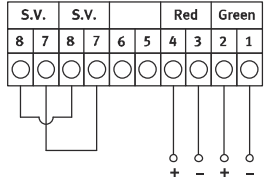


Fig. 3: Two-wire proximity switches, inductive

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

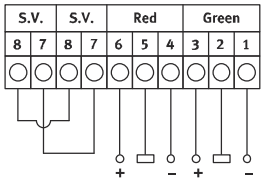


Fig. 4: Three-wire proximity switches, inductive

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

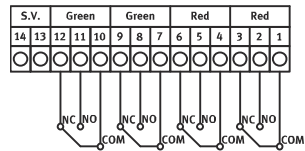


Fig. 5: Four SPDT micro-switches, mechanical

10 Setting the switching point

The switching points are preset → 5 Product overview

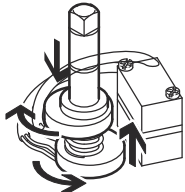


Fig. 6: Setting the switching point

1. Close the process valve.
 - ↙ Position indicator: 'closed'.
2. Loosen the housing screws on the housing cover and remove the housing cover.
3. Lift the red cam against the spring and turn until the lower proximity switch switches.
4. Release the red cam.
 - ↙ The spring presses the red cam into the ring gear.
 - ↙ The switching point for 'closed' is set.
5. Open the process valve.
 - ↙ Position indicator: 'open'.
6. Press down the green cam against the spring and turn until the upper proximity switch switches.
7. Release the green cam.
 - ↙ The spring presses the green cam into the ring gear.
 - ↙ The switching point for 'open' is set.
8. 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-...		
Angular detection setting range	[°]	0 ... 90
Electrical connection		
Nominal cross section of conductor that can be connected	[mm ²]	0.25 ... 2.5
Cable entry SRBE-...-M20		2 x M20x1.5
Cable entry SRBE-...-N12		2 x 1/2 NPT
Mounting position		Any
Operating voltage range AC		
SRBE-Cxx-YR90-R-2A-1W-...	[V]	0 ... 240
SRBE-Cxx-YR90-MW-22A-1W-... SRBE-Cxx-YR90-MW-22A-2W-...	[V]	0 ... 250
Max. output current AC		
SRBE-Cxx-YR90-R-2A-1W-...	[A]	0.416 at 240 V
SRBE-Cxx-YR90-MW-22A-1W-... SRBE-Cxx-YR90-MW-22A-2W-...	[A]	3
Operating voltage range DC		
SRBE-Cxx-YR90-R-2A-1W-...	[V]	0 ... 30
SRBE-Cxx-YR90-MW-22A-1W-... SRBE-Cxx-YR90-MW-22A-2W-...	[V]	0 ... 30
SRBE-Cxx-YR90-N-20N-ZC-...	[V]	8.2
SRBE-Cxx-YR90-N-1-P-... SRBE-Cxx-YR90-N-1-N-...	[V]	10 ... 30
SRBE-Cxx-YR90-N-1-ZU-...	[V]	5 ... 60
Max. output current DC		
SRBE-Cxx-YR90-R-2A-1W-...	[A]	3 at 30 V
SRBE-Cxx-YR90-MW-22A-1W-... SRBE-Cxx-YR90-MW-22A-2W-...	[A]	6
SRBE-Cxx-YR90-N-20N-ZC-...	[mA]	3
SRBE-Cxx-YR90-N-1-P-... SRBE-Cxx-YR90-N-1-N-...	[mA]	100
SRBE-Cxx-YR90-N-1-ZU-...	[mA]	4 ... 100
Voltage drop		
SRBE-Cxx-YR90-N-1-P-... SRBE-Cxx-YR90-N-1-N-...	[V]	≤ 3
SRBE-Cxx-YR90-N-1-ZU-...	[V]	≤ 5
No-load current		
SRBE-Cxx-YR90-N-1-P-... SRBE-Cxx-YR90-N-1-N-...	[mA]	≤ 15
Residual current		
SRBE-Cxx-YR90-N-1-P-... SRBE-Cxx-YR90-N-1-N-...	[mA]	0 ... 0.5; typically 0.1 mA at 25 °C
SRBE-Cxx-YR90-N-1-ZU-...	[mA]	0 ... 1; typically 0.7 mA
Reverse polarity protection		
SRBE-Cxx-YR90-N-1-P-... SRBE-Cxx-YR90-N-1-N-... SRBE-Cxx-YR90-N-1-ZU-...		For all electrical connections
Short circuit current rating		
SRBE-Cxx-YR90-N-1-P-... SRBE-Cxx-YR90-N-1-N-...		Clocked
Ambient temperature EX	[°C]	-20 ... +60
Max. surface temperature T(*) limit switch box		
SRBE-Cxx-YR90-MW-22A-1W-... SRBE-Cxx-YR90-MW-22A-2W-... SRBE-Cxx-YR90-N-1-ZU-...	[°C]	75
SRBE-Cxx-YR90-N-1-P-... SRBE-Cxx-YR90-N-1-N-... SRBE-Cxx-YR90-N-20N-ZC-... SRBE-Cxx-YR90-R-2A-1W-...	[°C]	61
Degree of protection		IP67, NEMA 4/4X
Continuous shock resist. to DIN/IEC 68 Part 2-82		± 15 g at 6 ms duration; 1000 shocks p. direction
Vibration resistance to DIN/IEC 68, Part 2-6		0.35 mm path at 0 ... 60 Hz; 5 g acceleration at 0 ... 150 Hz
Housing material		Painted die-cast metal
Material: shaft, screw, mounting adapter		High-alloy stainless steel
Material: seal		NBR
Material: visual position indicator		PC

Tab. 3: Operating conditions