

SDBT-MSX
Proximity switch

FESTO
Festo SE & Co. KG
Ruiter Straße 82
73734 Esslingen
Germany
+49 711 347-0
www.festo.com
8219235
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[8219237]
CE, UL LISTED
8219235

Operating instruction

Original instructions

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1 Applicable documents

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

2 Safety

2.1 Intended use

This product is intended for sensing the position of magnets (e.g. the piston position) in Festo products. The device is intended for use in an industrial environment.
2.1.1 Area of application and approval
In combination with the UL inspection mark on the product, the information in this section must also be observed in order to comply with the certification conditions of Underwriters Laboratories Inc. (UL) for USA and Canada.

Table with 2 columns: UL approval information, Details. Rows include Product category code (NRKH, NRKH7), File number (E232949), Considered standards (UL 60947-1, UL 60947-5-2, C22.2 No. 60947-1, C22.2 No. 60947-5-2), and UL mark (UL LISTED).

Tab. 1

Only use power sources which guarantee reliable electrical isolation of the operating voltage in accordance with IEC/EN 60204-1. Observe also the general requirements for PELV power circuits in accordance with IEC/EN 60204-1. Only for connection to a NEC/CEC Class 2 supply. The device shall be supplied from an isolating transformer having a secondary listed fuse rated 1 A.

3 Product overview

3.1 Design

Fig.1
1 Connecting cables
2 Open cable end (SDBT-MSX-...-LE)
3 M8 or M12 plug (SDBT-MSX-...-M8/M12)
4 Marking of sensing range
5 Green LED: display of sensing range; only in teach-in mode
6 Yellow LED: switching status display
7 Retaining screw
8 Capacitive operating button

3.2 Function

The proximity switch SDBT-MSX detects the magnetic field of the piston magnet. A switching point can be programmed in the sensing range of the proximity switch. There are two options for setting a switching point in the sensing range of the proximity switch:
- Auto teach-in
- Capacitive operating button

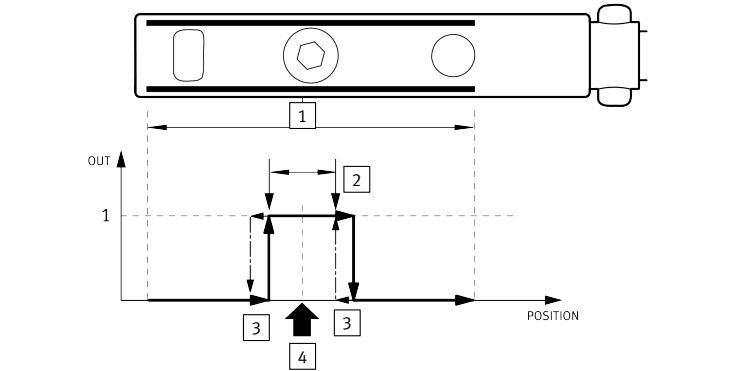


Fig.2

- 1 Sensing range
- 2 Switching window
- 3 Hysteresis
- 4 Teach-in point

4 Mounting

4.1 Mounting

4.1.1 Electrical

WARNING
Risk of injury due to electric shock.
• Use exclusively PELV circuits in accordance with IEC 60204-1/EN 60204-1 for the electrical power supply (Protective Extra-Low Voltage, PELV).
• Observe the general requirements of IEC 60204-1/EN 60204-1 for PELV circuits.
• Use exclusively voltage sources that guarantee reliable electrical isolation from mains power in accordance with IEC 60204-1/EN 60204-1.

Circuit diagrams

Table with 2 columns: SDBT-...-PU-...-LE, SDBT-...-PU-...-M8/M12. Rows show PNP and NPN circuit diagrams for both cable and plug versions.

Tab. 2

4.1.2 Mechanical system

- Mount the proximity switch at the end position of the piston so the end position is within the sensing range of the sensor. If available, the orientation aid shows the marking of the piston end position on the drive.

Fig.3
1 Retaining screw
2 Marking of sensing range
3 T-slot

5 Installation

6 Commissioning

6.1 Automatic switching point setting: auto teach-in

Prerequisite: proximity switch is in the delivery status.

1. Mount the proximity switch roughly in the end position → 4.1.2 Mechanical system.
2. Connect the proximity switch → 4.1.1 Electrical.
 - ✎ Proximity switch is automatically programmed during operation, e.g. on initial commissioning of the complete system.

Application notes on auto teach-in

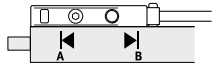
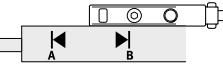
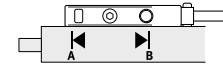
During auto teach-in, each stop > 100 ms of the piston within the sensing range is output as a switching point. If the piston reverses its direction of movement at this position and leaves the sensing range without further stops, this switching point is temporarily saved.

If the piston stops 4x consecutively at the same position, reverses its direction of movement and leaves the sensing range without further stops, this position is saved as a final switching point. Auto teach-in is complete.

The process described corresponds with the classic use case: proximity switch query at the end stop of the piston stroke or at the end stop of the customer application.

If the piston stroke is less than the sensing range of the SDBT-MSX, ensure that the second reversal point of the piston is outside the sensing range during auto teach-in → Tab. 3 .

Application notes on auto teach-in

		
Auto teach-in possible: End position A	Auto teach-in possible: End position B	Auto teach-in not possible. The switching point must be set using the capacitive operating button.

Tab. 3

6.2 Manual operation with capacitive operating button

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The proximity switch is parameterised when it is installed.

- Note the surface temperature of the capacitive operating button and the drive.
- Avoid contamination and moisture on the proximity switch.

6.2.1 Setting switching point with fixed switching window width

The switching point is configured centrally around the current piston position with the standard window width of 2 mm.

1. Move the piston into the sensing range of the proximity switch.
2. Press the capacitive operating button 3 times to activate set-up mode.
3. Press the capacitive operating button once to switch to the "Set switching point" menu item.
4. Press the capacitive operating button once.
 - ✎ The current piston position is configured as a switching point with approx. 2 mm switching window width.

1

If the device is mounted on a different drive or the installation direction is changed, the switching point must be reconfigured.

6.2.2 Setting switching point with variable switching window width

The switching point is configured centrally around the current piston position with a variable switching window width of up to 15 mm.

1. Move the piston into the sensing range of the proximity switch.
2. Press the capacitive operating button 3 times to activate set-up mode.
3. Press the capacitive operating button twice to switch to the "Set switching point with variable switching window width" menu item.
4. Press the capacitive operating button once.
 - ✎ The current piston position is configured as a switching point with approx. 2 mm switching window width. Every additional press of the button increases the switching window width by approx. 1 mm. A maximum switching window width of 15 mm is possible.

1

If the device is mounted on a different drive or the installation direction is changed, the switching point must be reconfigured.

6.2.3 PNP/NPN switch-over

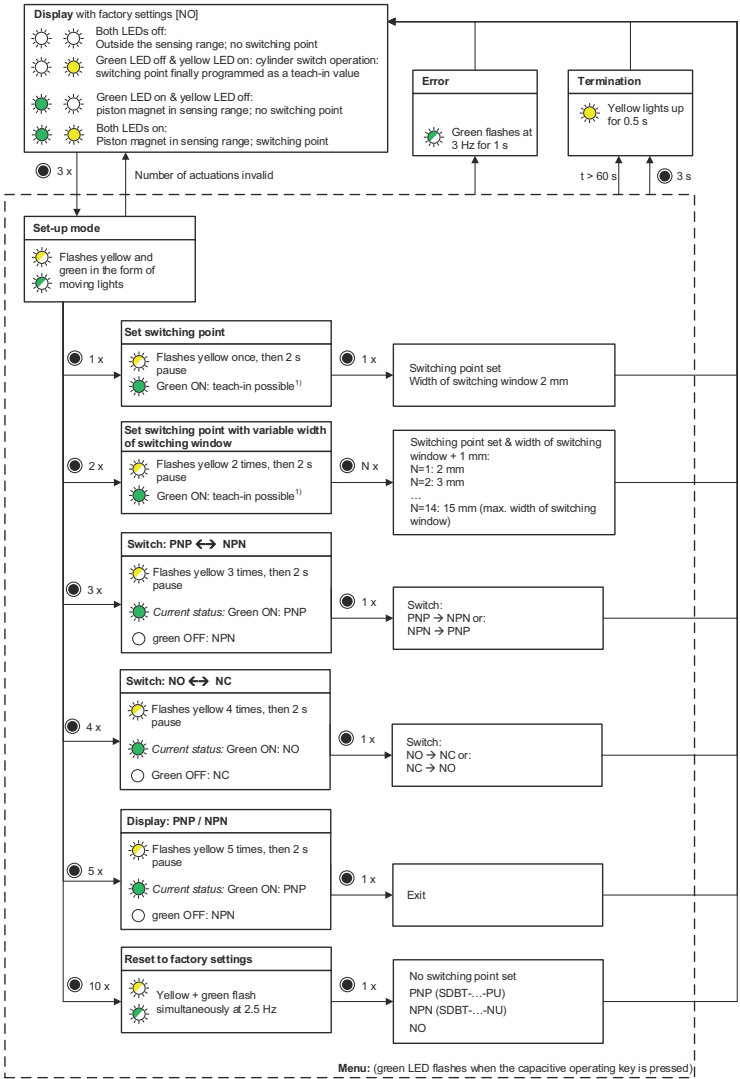
1. Actuate the capacitive operating key 3 times to activate set-up mode.
2. Actuate the capacitive operating key 3 times to switch to the menu item "Switch over between PNP / NPN".
3. Actuate the capacitive operating key once to switch between PNP → NPN or NPN → PNP.

6.2.4 NO/NC switch-over

1. Actuate the capacitive operating key 3 times to activate set-up mode.

2. Actuate the capacitive operating key 4 times to switch to the menu item "Switch over between NO / NC".
3. Actuate the capacitive operating key once to switch between NO → NC or NC → NO.

6.3 Menu structure



- 1) A switching point can only be set when the green LED is ON. When the green LED is flashing at 1.5Hz, the magnet is located in the region of the function reserve. It is not possible to set a switching point. The function reserve is required for the safe setting of switching points in the edge region. When the green LED is OFF, the magnet is outside the sensing range. It is not possible to set a switching point.

Fig.4

7 Operation

8 Reset to factory settings.

Parameter	Factory setting
Operating mode	Auto teach-in
Switching output	No switching point programmed Configuration of the switching output: – SDBT- ... -PU: PNP – SDBT- ... -NU: NPN Switching element function: NO
Variable switching window width	Not programmed

Tab. 4

1. Actuate the capacitive operating key 3 times to activate set-up mode.
2. Actuate the capacitive operating key 10 times to switch to the menu item "Reset to factory settings".
3. Actuate the capacitive operating key once.
 - ✎ Proximity switch is reset to factory settings.

9 Malfunctions

9.1 Diagnostics via LED

Display	Meaning	Action
Both LEDs off	Status indicator: <ul style="list-style-type: none">– Piston outside the sensing range– Piston not at switching point	Normal operating case
	Error: <ul style="list-style-type: none">– Power supply fault– Connecting cable or sensor defective	<ul style="list-style-type: none">– Check power supply– Check connecting cable– Replace device
Green LED flashes at 6 Hz	Hardware error	<ul style="list-style-type: none">– Disconnect and connect proximity switch– Replace device

Tab. 5

9.2 General malfunctions

Fault description	Possible cause	Measures/remedy
Incorrect or unexpected signals at the output	Proximity switch faulty	– Replace proximity switch
	Operating voltage not connected or outside the operating voltage range	– Observe operating voltage range
	Short circuit or overload at output	– Clear short circuit/overload
	Magnetic or ferromagnetic objects close to the proximity switch	<ul style="list-style-type: none">– Keep magnetic or ferromagnetic objects clear of the proximity switch– Conditions when configuring the switching point must correspond to the operating mode (e.g. no screwdriver in the clamping screw)
	Installed orientation of the proximity switch rotated 180° in the slot after adjustment of the switching point	– Reset switching point (with auto teach-in or operating button)
	Proximity switch was mounted on a different drive after setting a switching point	– Reset switching point (with auto teach-in or operating button)
Switching output does not respond in accordance with the settings	Proximity switch faulty	– Replace proximity switch
	Short circuit or overload at output	– Clear short circuit/overload
Capacitive operating button does not respond to input	Dirt or moisture on the proximity switch	– Wipe proximity switch with a dry cloth

Tab. 6

10 Technical data

SDBT-MSX		
Operating voltage range	[V DC]	10 ... 30
Max. output current	[mA]	100
Operating temperature range	[°C]	–40 ... +85 (UL: +80)
Ambient temperature with flexible cable installation	[°C]	–20 ... +85 (UL: +80)
Degree of protection (EN 60529)		IP 65 / IP 68

Tab. 7