

Documentation

about
24 V DC inductive limit switch boxes
with
Pepperl+Fuchs sensors
for
pneumatic rotary actuators



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1. Objectives and practical use

The positions of industrial valves represent an important piece of information for the course of action of a production. These valves are actuated with rotary actuators which the end position of the valve like “open” or “closed” is reported back to a control system. This is done via a mounted a limit switch box which is placed at the actuator, see images 1.



Image 1: Polyamide (Vestamide) limit switch box, 120x80x55mm for actuators acc. to VDI/VDE 3845 with 20mm stem height and hole spacing 80x30mm.

2. Technical specifications

- polyamide (vestamide) housing, 120x80x55mm, F05-slot, closed top or top with transparent window
- 2x inductive 24 V DC Pepperl+Fuchs sensors SB 3,5-E2, SB 3,5-E2-BU, NJ2-12GM40-E2 or NCB2-12GM40-Z0, details see data sheets page 5-8
- 6-pole clamp or 4-pole clamp grey or brown, wiring diagram
- 1x plastic screw M20x1,5mm black, range Ø13-5,5mm
- adjustable aluminium switching cams, 0° - 180° or stainless steel switching cam, 0° - 90°
- stainless steel steam with sealing, stainless steel ground plate
- stainless steel brackets for actuators acc. to VDI/VDE 3845, steam height 20,30 or 50mm, hole spacing 80x30 or 130x30mm
- housing protection class: IP 65
- temperature range limit switch box: $- 20^{\circ}\text{C} < T_a < + 70^{\circ}\text{C}$

3. Mounting at the actuator

Mechanical mounting: The limit switch boxes with the mounted bracket are placed at the actuator and screwed together.

Electrical mounting: The limit switch boxes are electrically mounted to the connection clamp within the housing through the bush and cable gland tightening torque for M20x1,5mm = **5 Nm**. You also have to take the attached wiring diagram, see image 5+6, page 4.

4. Switching cams and wiring diagrams

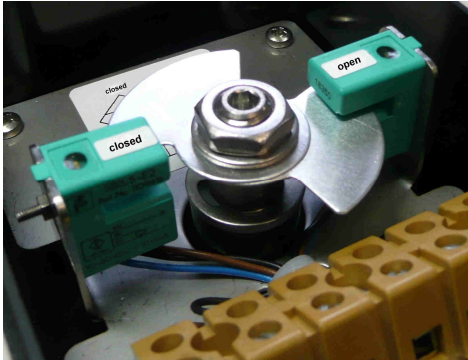


Image 2+3: Inner view 24 V DC Pepperl+Fuchs sensors, left 2x SB 3,5-E2 with 2x aluminium adjustable switching cams for position open/closed (0° - 180°), right 2x NJ2-12GM40-E2 with stainless steel switching cam for position open/closed, 0° and 90°, connecting on 6-pole clamp

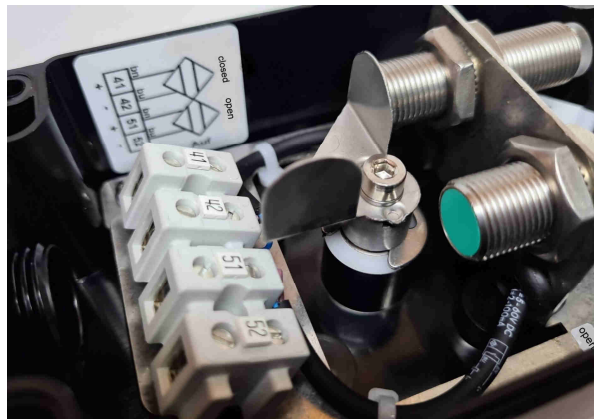


Image 4: Inner view 24 V DC Pepperl+Fuchs sensors 2x NCB2-12GM40-Z0 with stainless steel switching cam for position open/closed, 0° and 90°, connecting on 4-pole clamp

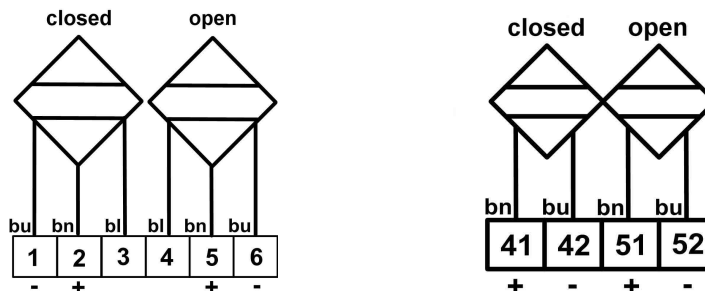
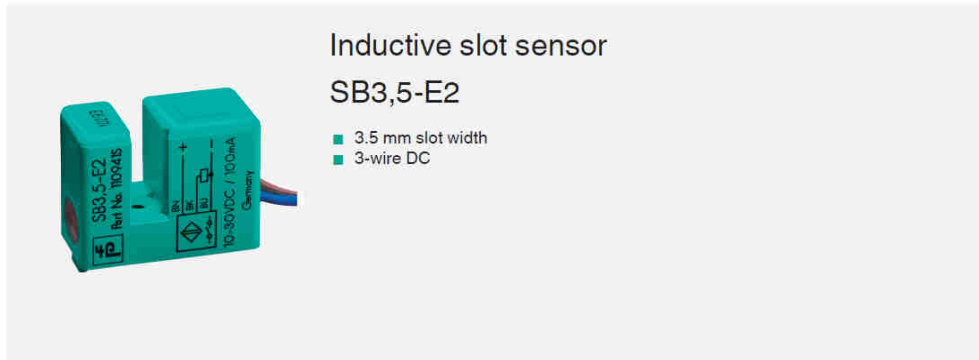


Image 5+6: Wiring diagram Pepperl+Fuchs sensors SB 3,5-E2, NJ2-12GM40-E2 and NCB2-12GM40Z0 connecting on 6-pole/4-pole clamp

5. Data sheets sensors

5.1 Data sheet SB 3,5-E2 (of account only page 1)



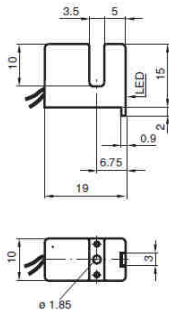
Inductive slot sensor

SB3,5-E2

- 3.5 mm slot width
- 3-wire DC



Dimensions



Technical Data

General specifications

Switching function	Normally open (NO)
Output type	PNP
Slot width	3.5 mm
Depth of immersion (lateral)	5 ... 7 mm
Output polarity	DC
Output type	3-wire

Nominal ratings

Operating voltage	U_B	10 ... 30 V DC
Switching frequency	f	0 ... 3000 Hz
Hysteresis	H	0 ... 0.6 mm
Reverse polarity protection		reverse polarity protected
Short-circuit protection		pulsing

Release date: 2020-03-20 Date of issue: 2020-03-30 Filename: 110041_eng.pdf

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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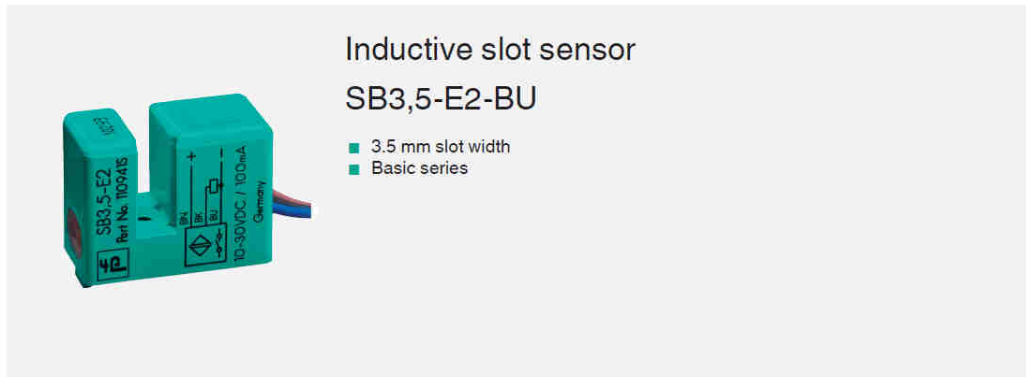
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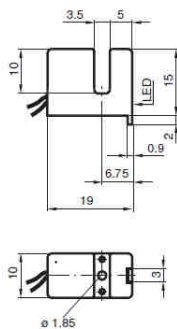
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5.2 Data sheet SB 3,5-E2-BU (of account only page 1)



Dimensions



Technical Data

General specifications

Switching function	Normally open (NO)
Output type	PNP
Slot width	3.5 mm
Depth of immersion (lateral)	5 ... 7 typ. 6 mm
Installation	
Output polarity	DC
Output type	3-wire

Nominal ratings

Operating voltage	U_B	10 ... 30 V
Switching frequency	f	0 ... 3000 Hz
Hysteresis	H	0.1 ... 0.4 mm
Reverse polarity protection		reverse polarity protected

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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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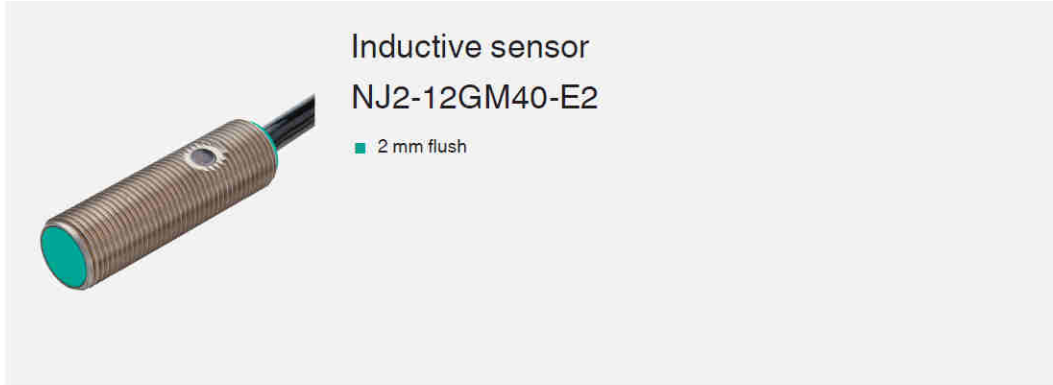
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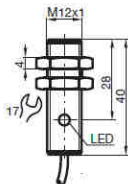
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5.3 Data sheet NJ2-12GM40-E2 (of account only page 1)



Dimensions



Technical Data

General specifications

Switching function		Normally open (NO)
Output type		PNP
Rated operating distance	S_n	2 mm
Installation		flush
Output polarity		DC
Assured operating distance	S_a	0 ... 1.62 mm
Actual operating distance	S_r	1.8 ... 2.2 mm typ.
Reduction factor r_{Al}		0.23
Reduction factor r_{Cu}		0.21
Reduction factor r_{304}		0.7

Nominal ratings

Operating voltage	U_B	10 ... 60 V
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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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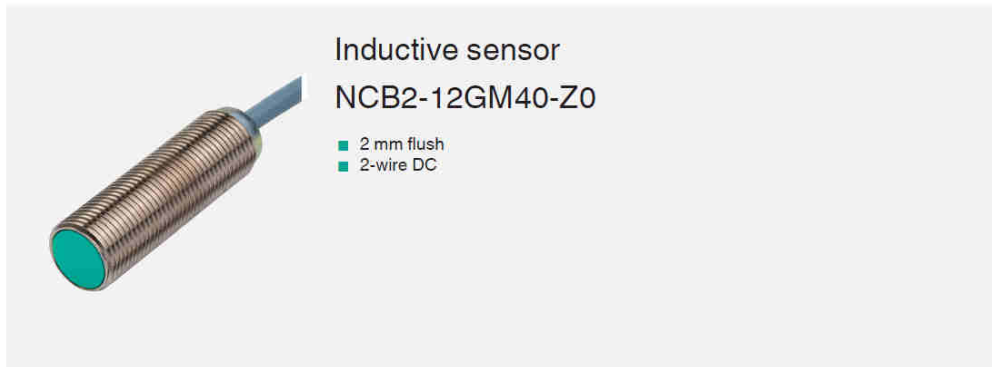
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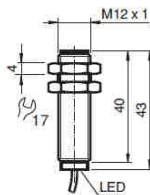
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5.4 Data sheet NCB2-12GM40-Z0 (of account only page 1)



Dimensions



Technical Data

Release date: 2020-03-20 Date of issue: 2020-03-30 Filename: 089250_eng.pdf

General specifications		
Switching function		Normally open (NO)
Output type		Two-wire
Rated operating distance	s_n	2 mm
Installation		flush
Output polarity		DC
Assured operating distance	s_a	0 ... 1.62 mm
Actual operating distance	s_r	1.8 ... 2.2 mm typ.
Reduction factor r_{AI}		0.28
Reduction factor r_{Cu}		0.23
Reduction factor r_{304}		0.7
Nominal ratings		
Operating voltage	U_B	5 ... 60 V
Switching frequency	f	0 ... 800 Hz
Hysteresis	H	1 ... 10 typ. 5 %
Reverse polarity protection		reverse polarity tolerant

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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