ExBin-N Fan belt monitoring via speed control switch up to 10,000 min^{-1}

ExBin - N
ExBin - N - 2

Subject to change!

Electrical, explosion proof transducer for fan belt monitoring
24 VAC/DC supply voltage, potential free switching contact output
EC type-approved in acc. with ATEX directive 94/9/EC for zone 1, 2, 21, 22

Compact. Easy installation. Universal. Cost effective. Safe.

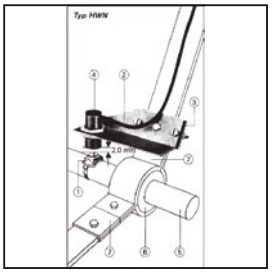
Type	Sensor	Supply	Range	Min. Setting	Output	Max. Ratings	Wiring diagram
ExBin- N	Namur DIN19234	24 VAC/DC	0...10,000 min^{-1}	50 min^{-1}	Switching contact *	250 VAC / 0.1 A – 30 V / 0.5 A	SB 1.0 / 2.0
ExBin- N - 2	as above with additional switching contact output				2 × Switching contact *		SB 1.0 / 2.0
					* potential free		

Product views and applications

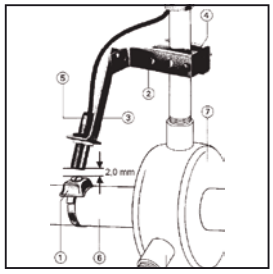
...Bin-N... transducer

...Bin-N with Namur sensor

Installation Kit 3



Installation Kit 4



Description

The ...Bin-N... transducer generation is a revolution for fan belt monitoring in HVAC systems, in chemical, pharmaceutical, industrial and offshore/onshore plants, for use in hazardous areas zone 1, 2 (gas) and zone 21, 22 (dust).
Highest protection class (ATEX) and IP66 protection, small dimensions, universal functions and technical dataguarantee safe operation even under difficult environmental conditions.
All sensors are programmable on site without any additional tools. The switching points are scalable within the maximum ranges. The integrated display (can be switched off as needed) is for parametrisation and an actual value indication at working mode.
...Bin-N-2 transducer are additionally equipped with a second switching output, which can be parameterized independently.

Highlights

- ▶ For all types of gases, mists, vapours and dust for use in zone 1, 2, 21 and 22
- ▶ Power supply 24 VAC/DC
- ▶ Adjustable, potential free switching contact
- ▶ Integrated Ex-e junction box
- ▶ No addional Ex-i module required
- ▶ No intrinsically safe wiring/installation between panel and sensor required
- ▶ No intrinsically safe wiring/installation and no space in the panel required
- ▶ Selectable switching characteristic
- ▶ Adjustable start-up bypass time
- ▶ Optional second switching output
- ▶ Display with backlight, can be switched off
- ▶ Password lock
- ▶ Down to −20 °C ambient temperature applicable
- ▶ Compact design and small dimension
- ▶ Robust aluminium housing with IP66 protection

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Technical data	ExBin- N	ExBin- N- 2
Power supply	24 VAC/DC ± 20 % (19,2...28,8 VAC/DC), 50...60 Hz	
Current, power consumption	150 mA, ~ 4 W, internal fuse 500 mAT, without bracket, not removable	
Galvanic isolation	1,5 kV between supply – contact output	
Electrical connection	Terminals 0,14...2,5 mm² at integrated Ex-e junction box, stripping length 9 mm, torque 0,4...0,5 Nm, equipotential bonding 4 mm²	
Cable glands	2 × M16 × 1,5 mm, Ex-e approved, for cable diameter ~ Ø 5...9 mm	
Protection class	Class I (grounded)	
Display	Matrix LCD, backlit, for configuration, user guidance, parameter and actual value indication	
Control elements	3 buttons for configuration	
Housing material	Aluminium die casting, coated	
Dimensions	L × W × H = 180 × 107 × 66 mm	
Weight	~ 950 g	
Ambient temperature / humidity	−20...+50 °C / 0...95 % rH, non condensing	
Storage temperature	−40...+70 °C	
Sensor	Namur, DIN 19234	
Sensor circuit	internal, intrinsically safe	
Measuring range	0...10.000 min^{-1}, adjustable 50...10.000 min^{-1}	
Response time of sensor	T90 / ~ 16 s	
Accuracy of rotary speed	± 0,5 % of full scale value	
Setting range hysteresis	25...1.000 min^{-1} (default setting 50 min^{-1})	
Start delay	5 s	
Start-up bypass time (AUB)	3...240 s, adjustable per menu (default setting 120 s)	
Output	Potential free switching contact – breaking/making contact adjustable per menu	
max. rating load	0,5 A at 30 VAC/DC – 0,1 A at 250 VAC – 0,1 A at 220 VDC. Power 20 W resp. 10 W per channel	
min. rating load	10 mW / 0,1 V / 1 mA	
Duration of life Mechanical	10×10^6	
Electrical (rated load)	100×10^3	
Wiring diagram	SB 1.0 / 2.0	SB 1.0 / 2.0
Scope of delivery	Transducer, 3 self-tapping screws 4,2 × 13 mm	

Approbations

EC type-approved	EPS 14 ATEX 1 657	
IECEx certified	IECEx EPS 14.0074	
In acc. with ATEX	94/9/EC	
Approval for gas	II 2 (1) G Ex e mb [ia Ga] IIC T6 Gb	zone 1, 2
Approval for dust	II 2 (1) D Ex tb [ia Da] IIIC T80°C Db IP66	zone 21, 22
Identification	CE No. 0158	
EMC	2004/108/EC	
Low voltage	2006/95/EC	
Enclosure protection	IP66 in acc. with EN 60529	

Special solutions and accessories

MKR	Mounting bracket for round ducts up to Ø 600 mm
Installation Kit 3	Mounting kit for Namur sensors on ventilators up to 20.000 m^3/h
Installation Kit 4	Mounting kit for Namur sensors on ventilators over 20.000 m^3/h

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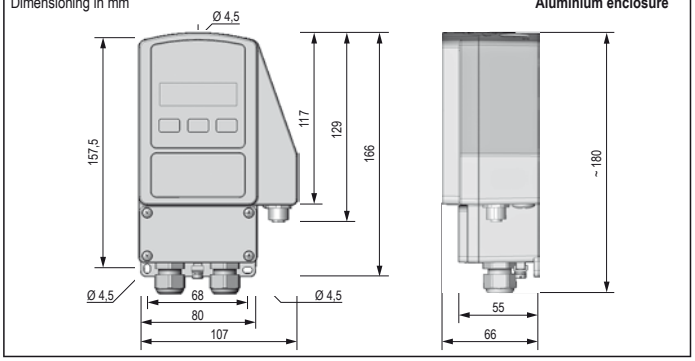
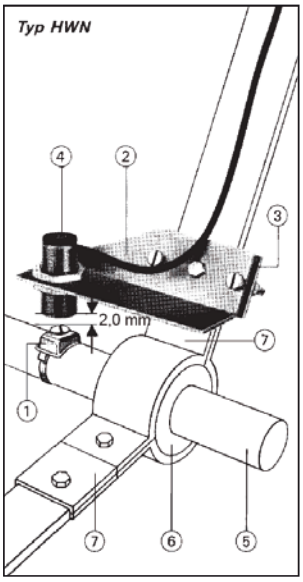
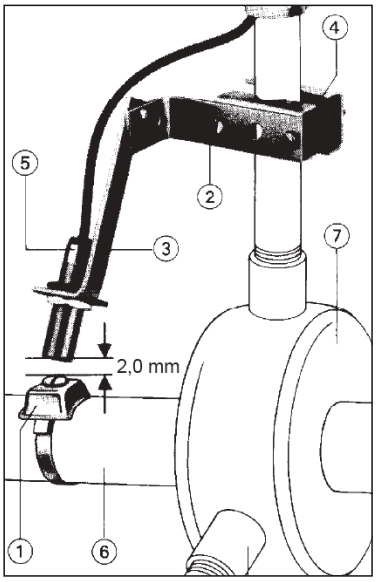
Dimensions

Dimensioning in mm

Aluminium enclosure







Installation

Ex area – zone 1, 2, 21, 22

Safe area

Relais output
250 VAC / 0,1 A
220 VDC / 0,1 A
30 VAC/DC / 0,5 A

Supply *
24 VAC/DC ± 20 %

* electrical wiring see diagrams

- Do not open the cover when circuits are live
- Supply cables must be installed in a fixed position and protected against mechanical damage
- Connect equipotential bonding
- Avoid temperature transfer from sensor to transducer (note max. ambient temperature T_a !)
- Close all openings with min. IP66
- Regard all (inter-)national standards, rules and regulations
- For outdoor installation a hood against rain, snow and sun should be applied
- Use for wiring an explosion proof Ex-e terminal box
- Sensors are maintenance free, an annual function test is recommended
- Clean only with damp cloth, avoid dust accumulation

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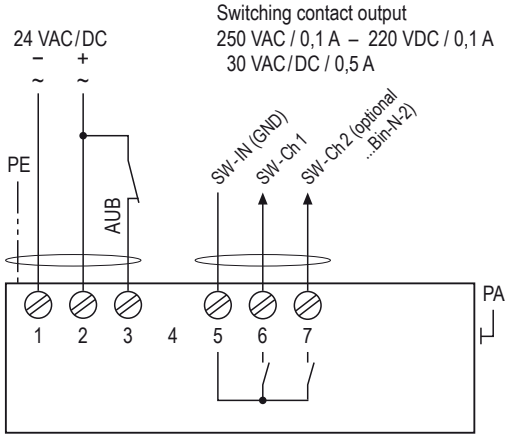
Electrical connection

All transducers require a 24 VAC/DC power supply. The electrical wiring must be realized via the integrated Ex-e junction box acc. to ATEX. The terminals' type of protection is "Increased safety Ex-e".
Attention: Before opening the junction box cover, the supply voltage must be shut off!

The supply has to be connected at terminals 1 (−/~) and 2 (+/~). For start-up bypass time (AUB) a bridge between terminal 2 and 3 has to be connected.

⚠ At different switching contact and supply voltages (24 VAC/DC) the cable installation must be considered! (see „Important information for installation and operation") ⚠

ExBin-N... SB 1.0



Switching function normally closed or open (nc/no) can be selected via menu only.

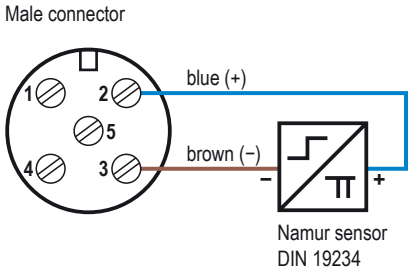
Intrinsically safe parameters (IS) – Internal, for passive sensor

U_o = 9,6 V C_i = 0
I_o = 9,7 mA L_i = 0
P_o = 24 mW

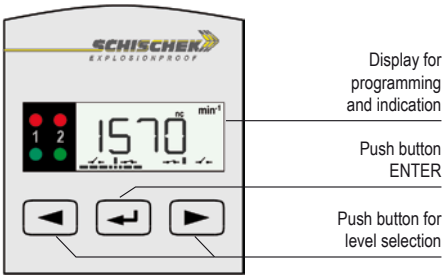
	IIC	IIB	IIA
L_o	5 mH	10 mH	20 mH
C_o	0,84 µF	3,8 µF	4,9 µF

Internal sensor IS values are corresponding to the internal sensor.

Namur sensor connection/terminals SB 2.0



Display, buttons and parameters



Change operation ↔ parametrisation mode
To change from operation to parametrisation mode and vice versa, push ↵ ENTER button for minimum of 3 seconds. Back to operation mode with menu "save".

Indication of data logging
A flashing measuring unit (min^{-1}) shows that data is received and the device is working.

Start-up bypass time (AUB)
Activation is indicated by flashing green LEDs.

Sensor malfunction
A sensor malfunction is indicated by a red flashing LED and the text "SENS" in the display. The switching outputs will be set in the alarm state.

Password input

The default/delivery setup is 0000. In this configuration the password input is not activated. To activate a password, follow menu 15, change the 4 digits into your choosen numbers (e.g. 1234) and press ENTER.
Please keep your password in mind for next parameter change! For a new parameter setup the password is requested.

Important information for installation and operation

A. Installation, commissioning, maintenance
The cable has to be drawn through the cable gland. Only cables with a diameter between 5 mm and 9 mm may be used. After the cable has been connected the cap nut has to be tightened in order to ensure IP Protection (IP66). The cap nut's maximum torque is 1.5 Nm.
The built-in cable glands must not be replaced by other types, otherwise the explosion protection is no longer guaranteed.
In acc. with operation transducers are maintenance free. Nevertheless maintenance must comply with regional standards, rules and regulations. The sensors must not be opened by the customer. For outdoor installation a weather shield against rain, snow and sun should be applied. For electrical connection use the internal approved Ex-e junction box.
Attention: Note the explosion proof rules before opening the internal junction box. Cut off the power supply.

B. Supply and contact
Wires of safety extra-low voltage must be installed separately from other circuits. At 24 VAC/DC only supply and signal wires are permitted in one cable, in all other cases use separate or double isolated cables. An over-current protection fuse < 10 A has to be provided by the installer.

C. Long cabling
For using long signal wires, shielded cables are recommended. The shield must be connected to the ...Bin-... inside the terminal box.

D. Separate ground wires
For supply and signal wires use separate ground.

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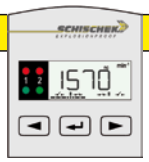
Parametrisation and commissioning



To change from operation to parametrisation mode push the “ENTER” button ↵ for minimum 3 seconds.
If password protected: type password and push ↵.
Skip menu with ►, back to operation mode with menu “save”.

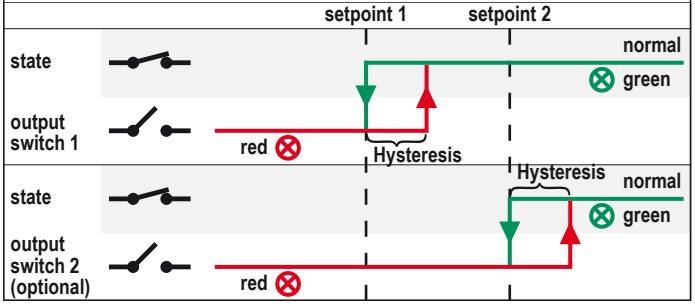
Operation → Parametrisation
push ↵ for min. 3 s

Menu	Function	ENTER	Indication	Select	ENTER	Next indication	Select	ENTER	Next menu
Menu 1	no function – menu skip								
Menu 2	no function – menu skip								
Menu 3	**set 1** Select switching point 1 (rotation speed)	Menu 3 SEt 1 ↵	Menu 3 700 min⁻¹	◄ ►	↵ enter speed				►
Menu 4	**set 2 (optional) *** Select switching point 2 (rotation speed)	Menu 4 SEt2 ↵	Menu 4 1500 min⁻¹	◄ ►	↵ enter speed				►
Menu 5	**hysteresis **** Select hysteresis	Menu 5 HYSt ↵	Menu 5 100 Δmin⁻¹	◄ ►	↵ enter hysteresis				►
Menu 6	**mode **** Select switching properties (break contact, make contact)	Menu 6 ModE ↵	Menu 6 UP nc	◄ ►	↵ Up, Down, Mid *	Menu 6 NC nc	◄ ►	↵ nc, no	►
Menu 7	no function – menu skip								
Menu 8	no function – menu skip								
Menu 9	no function – menu skip								
Menu 10	no function – menu skip								
Menu 11	no function – menu skip								
Menu 12	**time** Select start-up bypass time (AUB)	Menu12 t IME ↵	Menu12 100	◄ ►	↵ enter seconds for AUB				►
Menu 13	**lamp** Select display setting	Menu13 LAMP ↵	Menu13 ON	◄ ►	↵ on, off, backlit				►
Menu 14	no function – menu skip								
Menu 15	**security** Select password protection	Menu15 SECU ↵	Menu15 0000	◄ ►	↵ enter password				►
Menu 16	**save** Select: save data, discard, back to menu, factory setting	Menu16 SAVE ↵	Menu16 YES	◄ ►	↵ Yes, no, menu, dset (default setting)	(operation mode after “save”)			

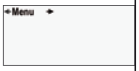
*** for ...Bin-N-2 only (2-stage) ** adjustable in professional mode only**

Default settings ...Bin-N... (for fan belt monitoring)

By default, the …Bin-N… is configured specifically for fan belt monitoring in order to facilitate further parameterization.
Thereby the menu items 5 (”hysterese“) and 6 (”mode“) are hidden. The corresponding values are set automatically.



Professional mode



The default settings can be changed using the professional mode.
Make sure the main menu is selected (the arrows next to “Menu” have to be visible in the display).
Pressing the right button ► for minimum 3 seconds activates the professional mode.
For further parametrisation switching characteristics can be adjusted in menu 5 (”hysteresis”) and 6 (”mode”) acc. to application.

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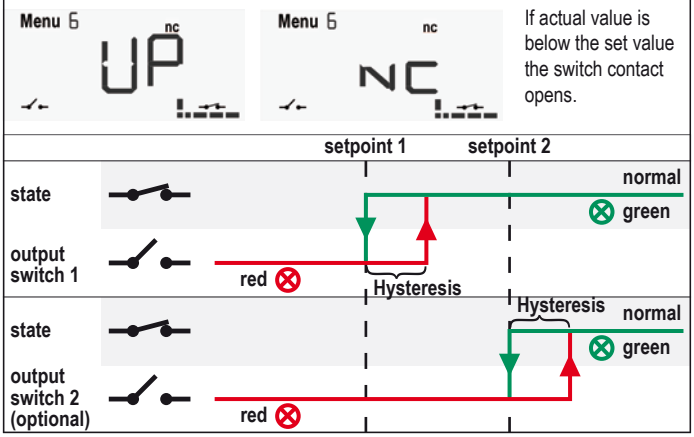
Menu 6 “mode” – Switching properties

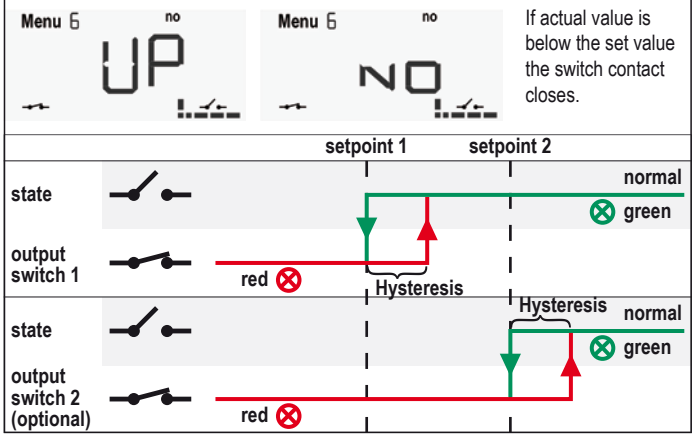
1. Define the device’s normal range first:
   The device should indicate (green LED) when the fan speed is
   - above the setpoints – mode “up-range” has to be selected.
   - below the setpoints – mode “down-range” has to be selected.
   - between the setpoints – mode “mid-range” has to be selected.
     This mode is available for 2-stage devices only (...Bin-N-2).

2. Select the switching charateristic of the output relay:
   When the measured value is in normal range, the corresponding relays shall
   - close – select “normally closed” (nc)
   - open – select “normally open” (no)

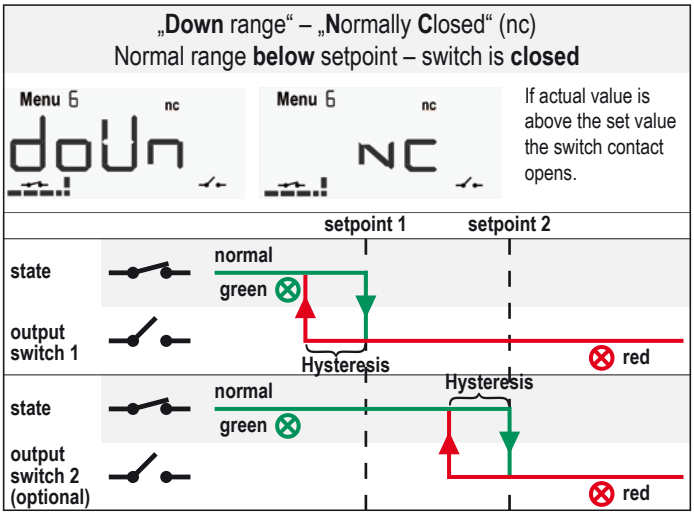
„UP range“ – „Normally Closed“ (nc)
Normal range **above** setpoint – switch is **closed**



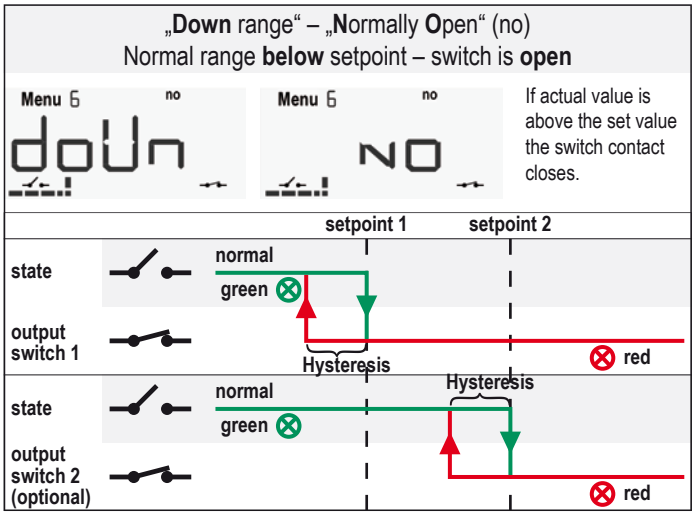
„UP range“ – „Normally Open“ (no)
Normal range **above** setpoint – switch is **open**



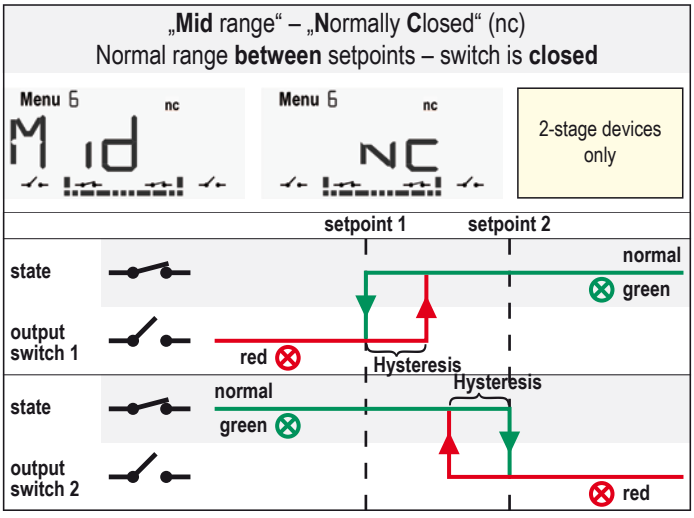
„Down range“ – „Normally Closed“ (nc)
Normal range **below** setpoint – switch is **closed**



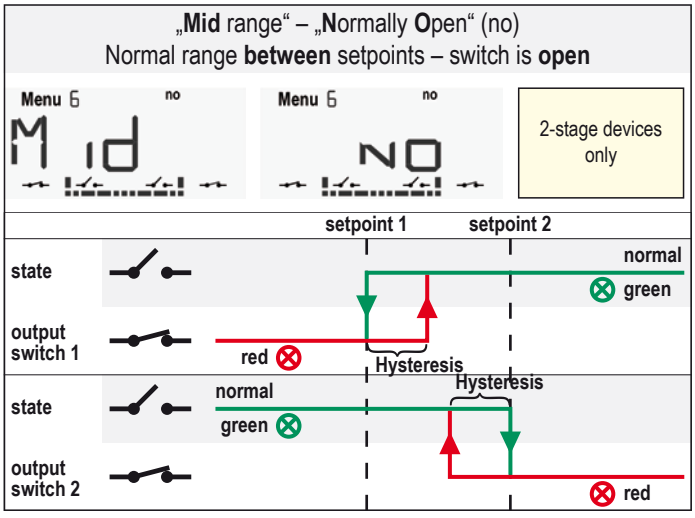
„Down range“ – „Normally Open“ (no)
Normal range **below** setpoint – switch is **open**



„Mid range“ – „Normally Closed“ (nc)
Normal range **between** setpoints – switch is **closed**



„Mid range“ – „Normally Open“ (no)
Normal range **between** setpoints – switch is **open**



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