# InBin-N... Fan belt monitoring via speed control switch up to 10.000 min$^{-1}$

**InBin - N**
**InBin - N - 2**
**Subject to change!**

Electrical fan belt switch for safe area (industrial applications).
24 VAC/DC supply voltage, output potential free switching contact.

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

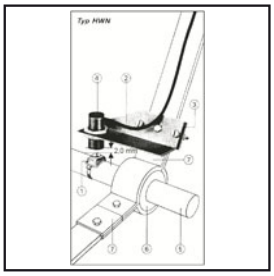
| Type | Sensor | Supply | Range | Min. setting | Output switch | Max. ratings | Wiring |
|---|---|---|---|---|---|---|---|
| **InBin - N** | Namur DIN19234 | 24 VAC/DC | 0..10,000 min$^{-1}$ | 50 min$^{-1}$ | pot. free contact | 250 VAC, 0.1A / 30 V, 0.5 A | SB 1.0 / SB 2.0 |
| **InBin - N - 2** | as above, but with second switching output | | | | 2 pot. free contacts | 250 VAC, 0.1A / 30 V, 0.5 A | SB 1.0 / SB 2.0 |

## Application

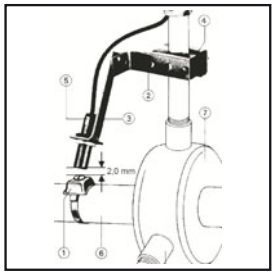
**Fan belt switch**

**Transducer with namur sensor**

**Installation kit 3**



**Installation kit 4**



## Description

The **InBin-N** speed control switch generation up to 10,000 min$^{-1}$ is a revolution for fan belt monitor transducers in HVAC systems, in chemical, pharmaceutical, industrial and Offshore-/Onshore plant). IP 66 protection, small dimension, universal functions and technical data guarantee safe operation even under difficult environmental conditions. The switching points are scalable within the maxium ranges. The integrated display is for actual value indication which can be switched off. All sensors are programmable on site without any additional tools. **InBin-N-2** sensors are additionally equipped with a secondary switching output, which can be parameterized independently.

## Highlights

- Industrial sensor
- Integrated junction box
- Power supply 24 VAC/DC
- Output potential free switching contact
- Display with backlight, can be switched off
- Scalable switching characteristics
- Scalable starting bypass time
- Compact design and small dimension (L × B × H = 180 × 107 × 66 mm)
- Robust aluminium housing in protection class IP 66
- Down to -20°C ambient temperature applicable
- Password locking
- Optional second switching output

| Technical data | InBin - N... |
|---|---|
| **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** | supply – output 1,5 kV |
| **Electrical connection** | terminals 0,14…2,5 mm² at integrated junction box |
| **Cable entry** | 2 × M16 × 1,5 mm, cable diameter ~ Ø 5…10 mm |
| **Display** | LCD with backlight, display for configuration, user guidance, parameter and actual value indication via LEDs |
| **Control elements** | 3 buttons for configuration |
| **Housing protection** | IP66 in acc. to IEC 60529 |
| **Housing material** | aluminium casting, coated |
| **Dimension / weight** | L × W × H = 180 × 107 × 66 mm / ~ 950 g |
| **Amient temperature/-humidity** | - 20…+ 50 °C / 0…95 % rH, non condensed |
| **Storage temperature** | - 20…+ 70°C |
| **Measuring range** | 0…10.000 $min^{-1}$ |
| **Range scalable on site** | 50 $min^{-1}$…10.000 $min^{-1}$ |
| **Maintenance** | maintenance free, nevertheless maintenance must be complied with regional standards, rules and regulations |
| **Sensor circuit** | internal circuit |
| **Sensor** | Namur, DIN 19234 |
| **Response time of sensor** | T90 / 16 Sec. |
| **Accuracy of rotary speed** | ± 0,5 % of end value |
| **Setting range hysteresis** | 25 $min^{-1}$ …1000 $min^{-1}$ (factory setting 50 $min^{-1}$) |
| **Start delay** | 5 sec. |
| **Starting bypass time** | 3…240 sec. (via menu adjustable; preset 120 sec.) |
| **Output switch** | potentail free switching contact |
| | **Ratings load max.** 0,5 A @ 30 VAC/DC / 0,1 A @ 250 VAC / 0,1 A @ 220 VDC |
| | **Ratings load min.** 10 mW / 0,1 V / 1 mA |
| **Mechanical life** | 10 × $10^6$ |
| **Electrical life (rated load)** | 100 × $10^3$ |
| **Wiring diagram (SB)** | SB 1.0 / SB 2.0 |
| **Installation sensor / tubing** | safe area |

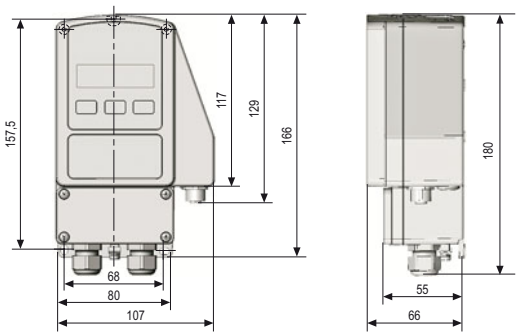
## Approvals

| | |
|---|---|
| **CE-Mark** | CE |
| **EMC directive** | RL 89/336/EC |
| **Low voltage directive** | RL 73/23/EC |
| **Protection type** | IP 66 in acc. to EN 60529 |
| **Elect. safety** | Protection class I (grounded), |
| | Over voltage category II acc. to. EN 61010-1 |

## Accessories

| | |
|---|---|
| **Installation kit 3** | Mounting set for Namur sensor onto ventilators up to 20.000 $m^3/h$ |
| **Installation kit 4** | Mounting set for Namur sensor onto ventilators over 20.000 $m^3/h$ |
| **MKR** | Mounting bracket for round ducts up to Ø 600 mm |

## Dimensions / Drillings

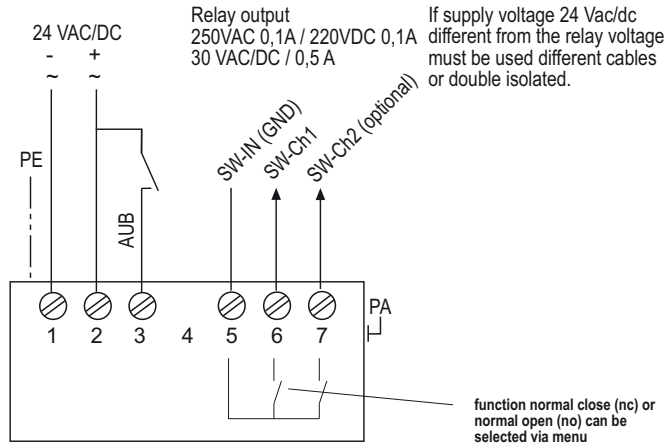


## Electrical connection

**InBin-N...** switches are equipped with a 24 VAC/DC power supply. The supply has to be connected at terminal 1 (-/~) and 2 (+/~). The electrical wiring must be realized via integrated junction box.
If supply voltage 24 VAC/DC different from the relay voltage must be used different or double isolated cables.The starting bypass delay can be activated by a short circuit of terminal 2 and teminal 3 (AUB). An active bypass delay is indicated with green blinking LEDs.
**Attention:** Do not open covers when circuits alive!

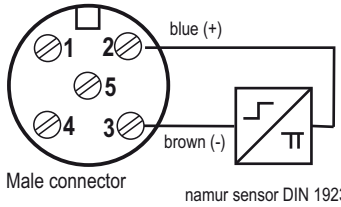
## Wiring Diagram InBin-N / InBin-N-S2

**InBin-N...** **SB 1.0**




## Namur sensor connector

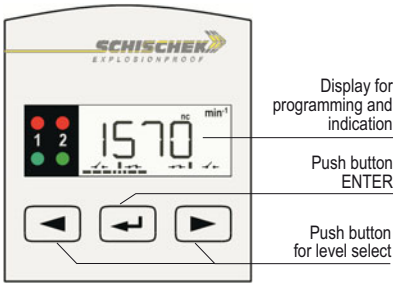
**SB 2.0**




**Values for passive sensors**

U < 10 V
Io < 10 mA
Po < 30 mW

## Display and Buttons




### Change operation-/parametrisation mode

To change from operation to parametrisation mode push the enter button ↵ for minimum 3 seconds. Back over the menu save.

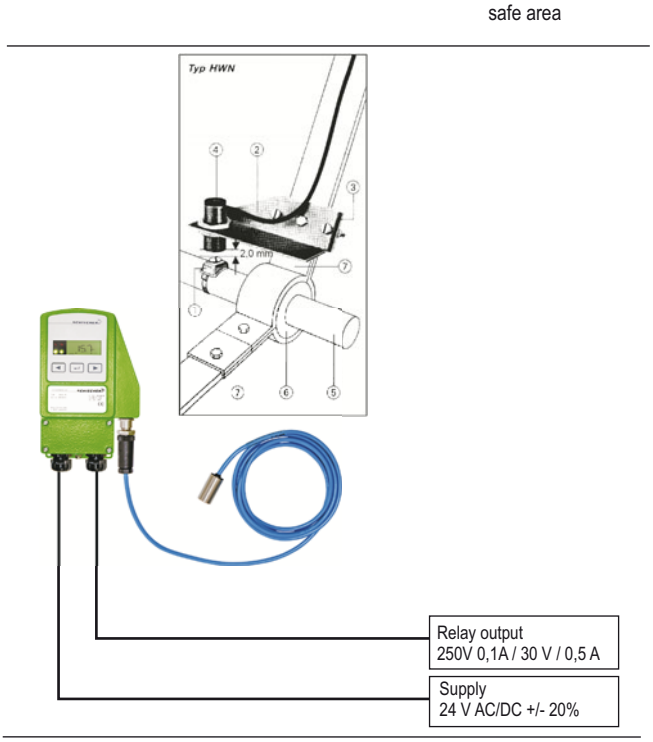
### Indication of data logging

The blinking unit in the display shows that datas received and the device is working.

## Password input

The default / delievery setup is **0000**. In this configuration the password input is not activated. To activate a password change the 4 digits into your choosen numbers (e.g. 1234) and press Enter.
**Please keep your password in mind for next parameter change!**
Due to a new parameter setup the password is requested.

## Installation




- Do not open covers when circuits alive
- The cable must be installed in a fixed position and protected against mechanical and thermical damage.
- Connect protection earth
- Avoid thermal transfer from sensor to transtucer (ensure max ambient temperature !)
- Ambient temperature -20…+50 °C @ T6
- Close all covers, entries with min IP66
- All transducers are maintenance free.
- Nevertheless maintenace must comply with regional standards, rules and regulations.
- Close after settings all covers and cable entries tight min. IP66.
- For outdoor installation a protective housing against rain, snow and sun should be applied
- For electrical connection use the integrated junction box.

## Important information for installation and operation

**Installation, Commisioning, Maintenance**
The cable has to be drawn through the cable gland. After electrical connection the cable gland must be fixed tighten. IP66 must be fulfilled.
In acc. with operation InBin switches are maintenance free. Nevertheless maintenace must comply with regional standards, rules and regulations.
The sensors must not be opened by the customer. For outdoor installation a protective housing against rain, snow and sun should be applied. For electrical connection use the internal junction box.
**Attention:** Note the national rules before opening the internal junction box. Cut off the power supply.
**A. Supply and Contact**
Wires from safety extra low voltage must be separated from others. Only at 24 VAC/DC is supply and signal wires in one cable permitted. All others use separate or double isolated cables. Install overload protection fuse < 10 A.
**B. Long cabeling**
For using long signal wires, shilded cables are recommended. The shield must be connected to the InBin-P switch inside the terminal box.
**C. Separate ground wires**
Use for supply and signal wires a separate ground.

## Parametrisation and commissioning of InBin-N tranducers

### Preparation of parametrisation / operation

| |
|---|
| Operation ⟷ Parametrisation, push ↵ for 3 sec. |
| If password (PW) protection is active: put PW in, push ↵ |


### Change operation- / parametrisation mode

To change from operation to parametrisation mode push „enter button“ ↵ for minimum 3 seconds. Back over the menu save.

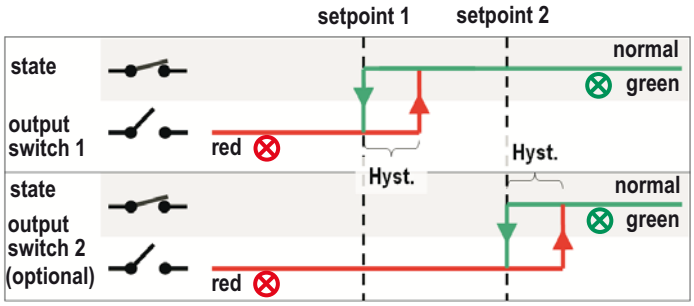
| Menu | Function | Enter | Indication | Select | Enter | Next indication | Next selsction | Enter | Next menu |
|---|---|---|---|---|---|---|---|---|---|
| **Menu 1** | no function - menu skip | | | | | | | | |
| **Menu 2** | no function - menu skip | | | | | | | | |
| **Menu 3** | **set 1** select switching point 1 | ↵ | 700 min⁻¹ | ◄ ► | ↵ adjust set 1 | | | | ► |
| **Menu 4** | **set 2*** select switching point 2 | ↵ | 1500 min⁻¹ | ◄ ► | ↵ adjust set 2 | | | | ► |
| **Menu 5** | **hysteresis**** select hysteresis | ↵ | 100 min⁻¹ | ◄ ► | ↵ adjust hysteresis | | | | ► |
| **Menu 6** | **mode**** select switching charateristic | ↵ | UP | ◄ ► | ↵ norm. open (no), norm. closed (nc) | NC | ◄ ► select normal sensor interval | ↵ | ► |
| **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 time for starting bypass (AUB) | ↵ | 100 | ◄ ► | ↵ adjust bypass time in sec. | | | | ► |
| **Menü 13** | **lamp** select backlight | ↵ | ON | ◄ ► | ↵ on, off | | | | ► |
| **Menu 14** | no function - menu skip | | | | | | | | |
| **Menu 15** | **security** select password | ↵ | 0000 | ◄ ► | ↵ enter password | | | | ► |
| **Menu 16** | **save** select save data | ↵ | YES | ◄ ► | ↵ no, yes, return, default setting | | | | ► |

* avaible for 2-stage version only (InBin-N-2)

** useable in professional mode only (see following section)

## Using the menu

To beware complexity during the parametrisation process, the InBin-N has a predefined setup for the hysteresis (menu 5) and the operation mode (menu 6). This default setting is designed for fan speed monitoring applications. The switching charateristic for that operationmode works as defined in the illustration below:




Menu 5 and Menu 6 will normally skipped during the parametrisation process.

## Professional mode

If the user wants to change the factory setting for hysteresis and the operation mode, press the „right"-button for more than 3 seconds. (Make sure that the main-menu is selected - the arrows next to the „MENU"-icon must be visible) Now „Professional"-mode will be active and two further menus were added:menu 5 „hysteresis" and menu 6 „mode".

## Using the menu 6 „mode"

First of all the user has to define the device normal range. For example:

- The device should indicate (green LED) if the fan speed is under the setpoints, mode „down-range" has to be selected. With other words: the measure value is normally under the setpoints.
- The device should indicate (green LED) if the fan speed is over the setpoints, mode „up-range" has to be selected. (The measure value is normally over the setpoints.)
- The device should indicate (green LED) if the fan speed is between the setpoints, mode „mid-range" has to be selected. (The measure value is normally between the setpoints.) This mode is only for 2-stage devices available (InBin-N-2).

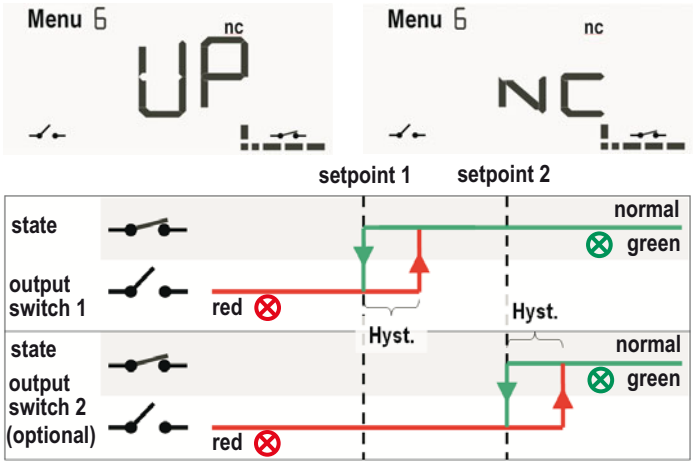
In the second step the switching charateristic of the output relay has to be selected:

- „normally closed" (nc): if the measure value is in the nomal range (see above), the coresponding relays were closed.
- „normally open" (no): if the measure value is in the nomal range (see above), the coresponding relays were open.

You'll find a detailed desciption of all possible settings in the following section.

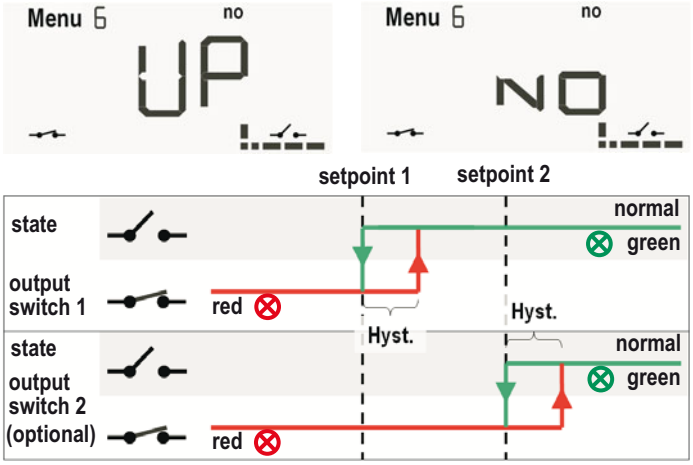
### Switching characteristic „**up**-range" – „**n**ormally **c**losed"

„Up-range": the normal range is above setpoint 1 and setpoint 2



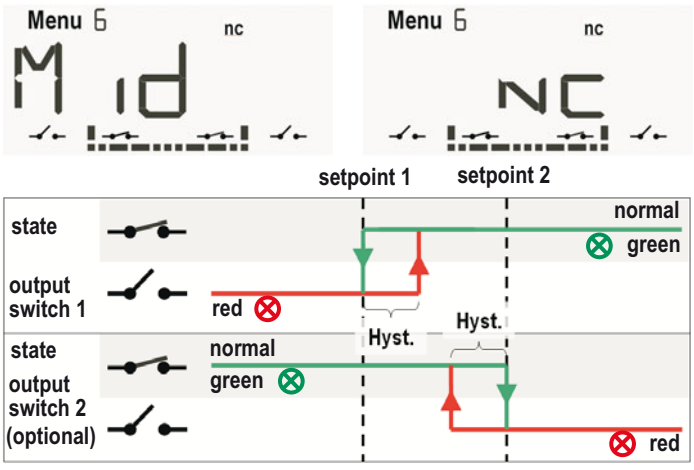

### Switching characteristic „**up**-range" – „**n**ormally **o**pen"

„Up-range": the normal range is above setpoint 1 and setpoint 2



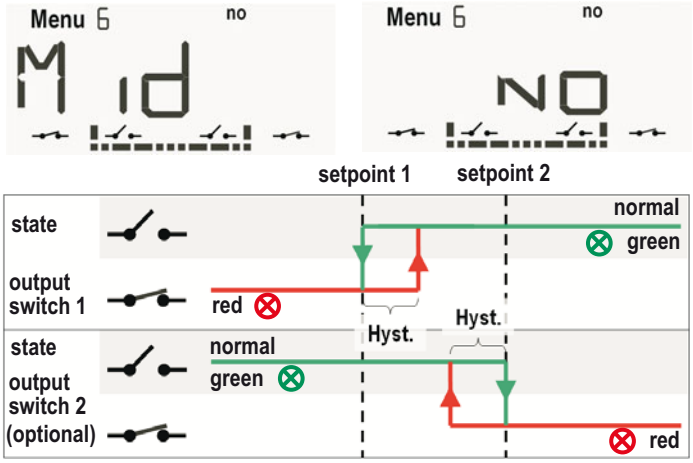

### Switching characteristic „**mid**-range" – „**n**ormally **c**losed"

„Mid-range": the normal range is between setpoint 1 and setpoint 2 (for 2-stage devices only)



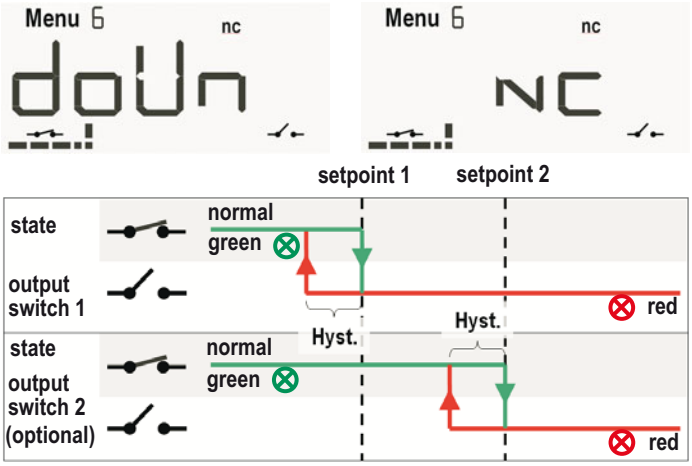
## Switching characteristic „**mid**-range“ – „**n**ormally **o**pen“

„Mid-range“: the normal range is between setpoint 1 and setpoint 2 (for 2-stage devices only)



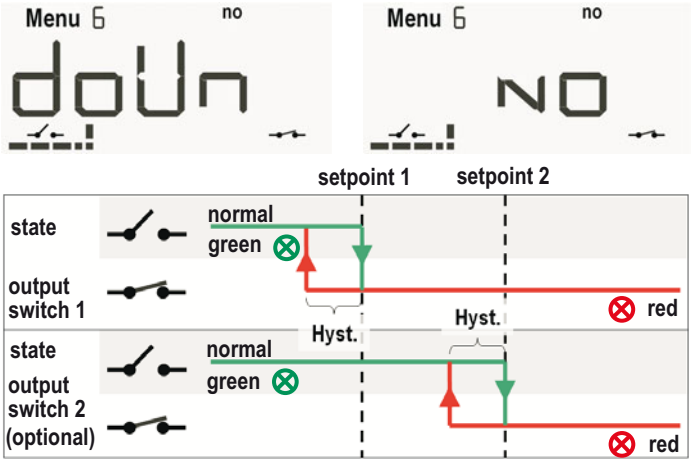

## Switching characteristic „**down**-range“ – „**n**ormally **c**losed“

„Mid-range“: the normal range is under setpoint 1 and setpoint 2




## Switching characteristic „**down**-range“ – „**n**ormally **c**losed“

„Mid-range“: the normal range is under setpoint 1 and setpoint 2



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