



## Model Number

NRB20-U1-E2-IO

## Features

- 20 mm flush
- Reduction factor = 1
- Magnetic field resistant
- IO-link interface for service and process data
- Switch point mode or window mode can be set
- Switching function, stability alarm and pulse extension can be set
- 4-way LED indicator
- Quick mounting bracket

## Description

Reduction factor 1 sensors reliably detect different metals with the same switch state. The integrated IO-Link interface enables clear identification of the sensor and diagnosis of the sensor condition. When using the sensor, parameters and operating modes can be optimally configured specifically for the intended application. In addition to setting the switching function and a pulse extension, the user can select either switch point mode or window mode in combination with a stability alarm. In switch point mode, the stability alarm signals the detection of an object in the area between the assured operating distance and operating distance  $s_n$ . In window mode, it signals the detection of an object below the window between operating distance  $s_n$  and the nearest operating distance. A stability alarm is displayed to the user via a flashing LED and process data.

## Accessories

### IO-Link-Master02-USB

IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

### V1-M20-80

Receptacles, M12/M20; plastic version

### MHW 01

Modular mounting bracket

### MH 04-2681F

Mounting aid for VariKont, +U1+ and +U9\*

## Technical Data

### General specifications

Switching function		Normally open/closed (NO/NC) programmable
Output type		PNP
Rated operating distance	$s_n$	20 mm (factory setting)
Near operating distance		15 mm (can be activated by software)
Installation		flush
Output polarity		DC
Assured operating distance	$s_a$	0 ... 16.2 mm
Reduction factor $r_{Al}$		1
Reduction factor $r_{Cu}$		1
Reduction factor $r_{304}$		1
Reduction factor $r_{St37}$		1
Output type		3-wire

### Nominal ratings

Operating voltage	$U_B$	10 ... 30 V DC
Switching frequency	$f$	0 ... 440 Hz (switch point mode) 0 ... 10 Hz (window mode, switch point mode with stability alarm)
Hysteresis	H	typ. 3 %
Reverse polarity protection		reverse polarity protected
Short-circuit protection		pulsing
Voltage drop	$U_d$	≤ 0.5 V
Operating current	$I_L$	0 ... 200 mA
Off-state current	$I_r$	0 ... 0.5 mA typ. 60 μA at 25 °C
No-load supply current	$I_0$	≤ 20 mA
Time delay before availability	$t_v$	≤ 150 ms
Constant magnetic field	B	200 mT
Alternating magnetic field	B	200 mT
Operating voltage indicator		LED, green
Status indicator		LED, yellow

### Functional safety related parameters

MTTF <sub>d</sub>	701 a
Mission Time (T <sub>M</sub> )	20 a
Diagnostic Coverage (DC)	0 %

### Interface

Interface type	IO-Link ( via C/Q = terminal 4 )
Transfer rate	COM 2 (38.4 kBaud)
IO-Link Revision	1.1
Min. cycle time	2.3 ms
Process data width	Process data input (control system side): 2 Bit Process data output (control system side): none
SIO mode support	yes
Device ID	0x201005 (2101253)
Compatible master port type	A

### Ambient conditions

Ambient temperature	-25 ... 70 °C (-13 ... 158 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)

### Mechanical specifications

Connection type	screw terminals
Information for connection	A maximum of two conductors with the same core cross section may be mounted on one terminal connection! tightening torque 1.2 Nm + 10 %
Core cross-section	up to 2.5 mm <sup>2</sup>
Minimum core cross-section	without wire end ferrule 0.5 mm <sup>2</sup> , with connector sleeves 0.34 mm <sup>2</sup>
Maximum core cross-section	without wire end ferrule 2.5 mm <sup>2</sup> , with connector sleeves 1.5 mm <sup>2</sup>
Housing material	PA/metal with epoxy powder coating
Sensing face	PA
Housing base	plastic
Degree of protection	IP67
Mass	275 g
Note	Tightening torque: 1.8 Nm (housing)

### Factory settings

Default setting	operating mode = switch point mode with stability alarm switching function = Normally open (NO) switching distance = 20 mm
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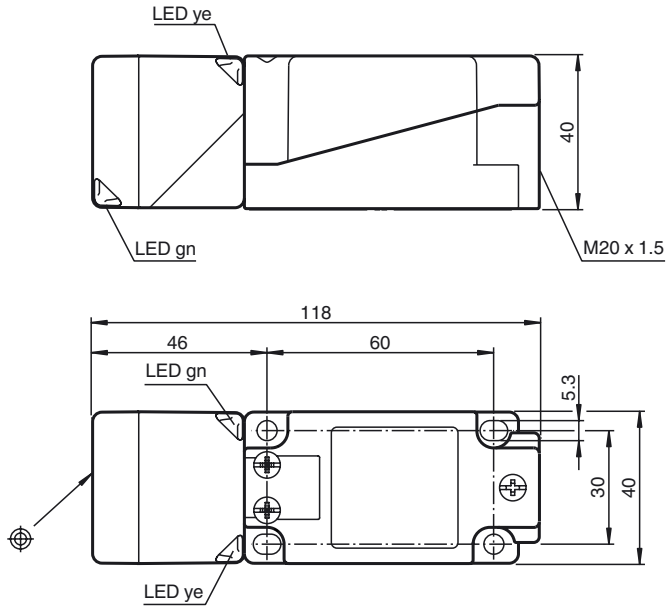
### Compliance with standards and directives

Standard conformity	
Standards	EN 60947-5-2:2007 EN 60947-5-2/A1:2012 IEC 60947-5-2:2007 IEC 60947-5-2 AMD 1:2012

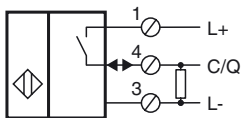
### Approvals and certificates

Protection class	II
Rated insulation voltage	$U_i$ 60 V
Rated impulse withstand voltage	$U_{imp}$ 800 V
UL approval	cULus Listed, General Purpose Class 2 power source
CCC approval	CCC approval / marking not required for products rated ≤36 V

Dimensions



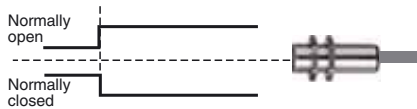
Electrical Connection



Switching output modes

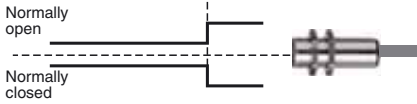
Switch point mode at rated operating distance  $s_n$

Switch point 2 SP 2 (rated operating distance  $s_n$ )



Switch point mode with near operating distance

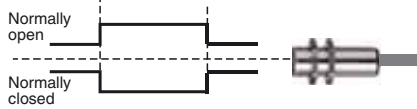
Switch point 1 SP1 (near operating distance)



Window mode

Switch point 2 SP 2 (rated operating distance  $s_n$ )

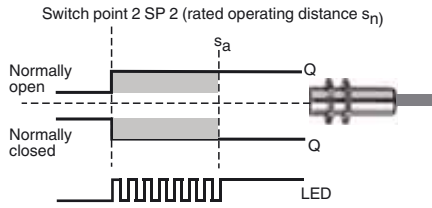
Switch point 1 SP1 (near operating distance)



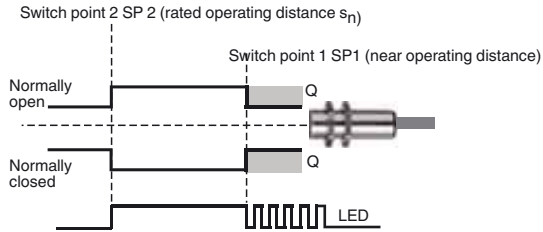
Release date: 2019-06-05 09:47 Date of issue: 2019-06-05 306534-0005\_eng.xml

**Stability alarm**

Switch point mode with stability alarm (factory default)



Window mode with stability alarm



Release date: 2019-06-05 09:47 Date of issue: 2019-06-05 306534-0005\_eng.xml

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

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