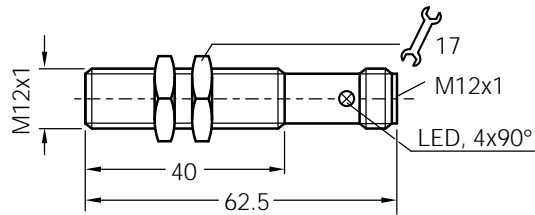
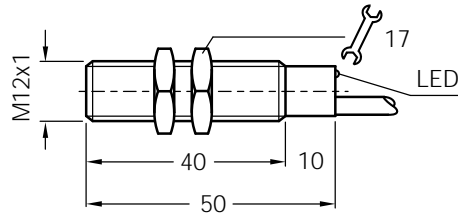


# Magnetic proximity sensors

## MM 12 series, sensing range 60 mm

### DC 3-wire, metal housing

Dimensions in mm



#### Features



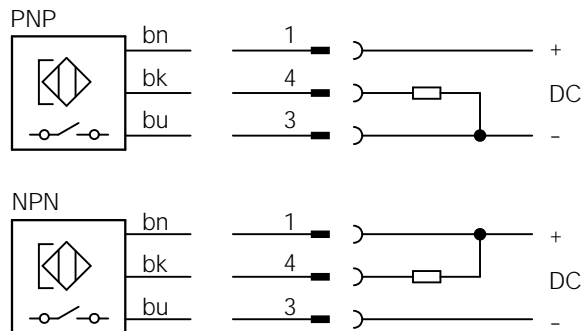
- ▶ Can be installed flush and non-flush in metal
- ▶ Sensing range up to 60 mm
- ▶ PNP or NPN output
- ▶ High switching frequency
- ▶ Short-circuit protection (pulsed)
- ▶ Robust brass housing, nickel-plated with fine thread M12 x 1 mm
- ▶ Cable or connector
- ▶ Enclosure rating IP 67
- ▶ LED status indicator (with 4 x 90° connectors)

#### Accessories

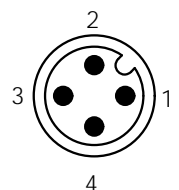
Round connectors

Magnets

#### Connection diagram



Wire colour	Colour	Contact	Assignment
bn	brown	1	+ V DC
bk	black	4	NO
bu	blue	3	- V DC
		2	free



## Electrical and mechanical data

<b>Operating voltage</b> $U_b$	10 ... 30 V DC	<b>Wire-break protection</b>	yes
<b>Ripple</b> $U_{pp}$	$\leq 10\%$ of $U_b$	<b>Short-circuit protection (pulsed)</b>	yes
<b>Voltage drop</b> $U_d$	$\leq 1.5$ V at $I_a$ max.	<b>Reverse polarity protection</b>	yes
<b>Power consumption</b> (without load)	$\leq 10$ mA	<b>Power-up pulse suppression</b>	yes
<b>Continuous current</b> $I_a$	$\leq 300$ mA	<b>Enclosure rating</b> to DIN 40050	IP 67
<b>Time delay before availability</b> $t_v$	$\leq 2$ ms	<b>Shock and vibration stress</b>	30 g, 11 ms 10 to 55 Hz, 1 mm
<b>Hysteresis</b> H	1% - 10% of $s_r$	<b>Ambient temperature</b> $T_a$	- 25 ... + 75 °C
<b>Repeatability</b> R ( $U_b$ and $T_a$ constant)	$\leq 1\%$ of $s_r$	<b>Housing material</b>	Brass, nickel-plated, plastic
<b>Temperature drift</b>	$\pm 10\%$ of $s_r$	<b>Tightening torque</b>	7.0 Nm
<b>EMC</b>	to EN 60 947-5-2	<b>Connection cable</b>	PUR-PVC, 3 x 0.25 mm <sup>2</sup>

## Selection table

Sensing range $s_n^*$ mm	Magnetic alignment	Switching output	Output function	Switching frequency f in Hz	Connection	Type	Order number
60	Axial	PNP		5000	Cable 2 m	MM12-60APS-ZU0	7900268
60	Axial	NPN		5000	Cable 2 m	MM12-60ANS-ZU0	7900269
60	Axial	PNP		5000	Connector M12 x 1 mm	MM12-60APS-ZC0	7900270
60	Axial	NPN		5000	Connector M12 x 1 mm	MM12-60ANS-ZC0	7900271

\* Sensing range  $s_n$  based on installation in non-magnetizable material using magnet M 4.0

## Sensing ranges (Typical values)

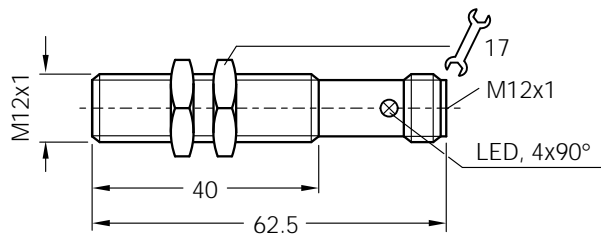
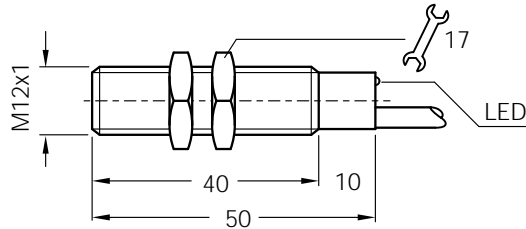
Magnet type	Sensing range $s_n$ Any installation version (flush or non-flush) in non-magnetizable material	Sensing range $s_n$ Flush installation in magnetizable material (e.g. iron)
M 1.0	23 mm	17 mm
M 2.0	24 mm	14 mm
M 3.0	36 mm	23 mm
<b>M 4.0</b>	<b>60 mm</b>	37 mm
M 5.0 / 5.1	68 mm	44 mm

# Magnetic proximity sensors

## MM 12 series, sensing range 60 mm

### NAMUR, metal housing

Dimensions in mm



#### Features



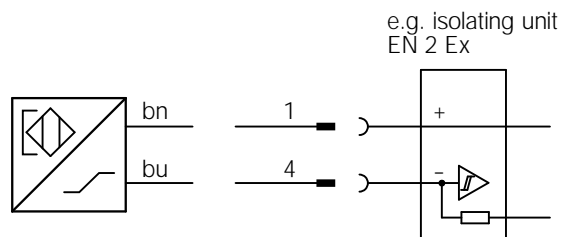
- ▶ Can be installed flush and non-flush in metal
- ▶ Sensing ranges up to 60 mm
- ▶ NAMUR to DIN 19 234
- ▶ High switching frequency
- ▶ Robust brass housing, nickel-plated, with fine thread M12 x 1 mm
- ▶ Cable or connector
- ▶ Enclosure rating IP 67
- ▶ LED status indicator (with 4 x 90° connectors)

#### Accessories

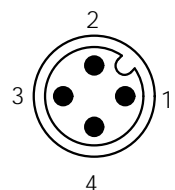
Round connectors

Magnets

#### Connection diagram





Wire colour	Contact	Assignment
bn brown	1	+ V DC
bu blue	4	- V DC
	3	free
	2	free



## Electrical and mechanical data

<b>Operating voltage</b> $U_b$	5 ... 25 V DC	<b>Short-circuit protected</b>	yes
<b>Rated voltage</b> $U_n$	8.2 V DC	<b>Reverse-polarity protected</b>	yes
<b>Ripple</b> $U_{pp}$	$\leq 5\%$ of $U_b$	<b>Enclosure rating</b> to DIN 40050	IP 67
<b>Power consumption, attenuated</b>	$\geq 2.5$ mA	<b>Shock and vibration stress</b>	30 g, 11 ms 10 to 55 Hz, 1 mm
<b>Power consumption, unattenuated</b>	$\leq 1.0$ mA	<b>Ambient temperature</b> $T_a$	- 25 ... + 75 °C
<b>Internal capacitance</b>	$\leq 45$ nF	<b>Housing material</b>	Brass, nickel-plated, plastic
<b>Internal inductance</b>	$\leq 30$ $\mu$ H	<b>Tightening torque</b>	7.0 Nm
<b>Cable resistance</b>	$\leq 50$ $\Omega$	<b>Connection cable</b>	PVC, 2 x 0.34 mm <sup>2</sup> , blue
<b>Time delay before availability</b> $t_v$	$\leq 2$ ms		
<b>Hysteresis</b> H	1% - 10% of $s_r$		
<b>Repeatability</b> R ( $U_b$ and $T_a$ constant)	$\leq 1\%$ of $s_r$		
<b>Temperature drift</b>	$\pm 10\%$ of $s_r$		
<b>EMC</b>	to EN 60 947-5-2		

## Selection table

Sensing range $s_n^*$ mm	Magnetic alignment	Version	Output function	Switching frequency f in Hz	Connection	Type	Order number
60	Axial	NAMUR		5000	Cable 2 m	MM12-60A-N-ZW0	7900286
60	Axial	NAMUR		5000	Connector M12 x 1 mm	MM12-60A-N-ZC0	7900287

\* Sensing range  $s_n$  based on installation in non-magnetizable material using magnet M 4.0

## Sensing ranges (Typical values)

Magnet type	Sensing range $s_n$ Any installation version (flush or non-flush) in non-magnetizable material	Sensing range $s_n$ Flush installation in magnetizable material (e.g. iron)
M 1.0	23 mm	17 mm
M 2.0	24 mm	14 mm
M 3.0	36 mm	23 mm
<b>M 4.0</b>	<b>60 mm</b>	37 mm
M 5.0 / 5.1	68 mm	44 mm