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inductive sensors › › ›

standard design › › ›

short design › › ›

preferred types › › ›

top series › › ›

Ø 3mm
M4x0.5
Ø 4mm
M5x0.5
Ø 6.5mm
M8x1
M12x1
M18x1
M30x1

table of contents

design	sensing range Sn [mm]														flush	non-flush	length [mm]	pnp	npn	2-wire	10-30V DC	up to 250V AC	cable	M8-connector	M12-connector	MC-connector	page
	0.6	0.8	1.5	2	2.5	3	4	5	6	7	8	10	12	15	20												
Ø 3mm	X															X		22	X			X		X	X			6
M4x0.5	X															X		22	X			X		X	X			6
Ø 4mm		X														X		25-38	X			X		X	X			7
M5x0.5		X														X		25-38	X	X		X		X	X			7
Ø 6.5mm			X	X												X		16-60	X	X		X		X	X	X		8-10
Ø 6.5mm				X		X	X										X	40-60	X			X		X	X			10-12
M8x1			X	X												X		16-66	X	X		X		X	X	X		13-15
M8x1				X	X	X	X										X	35-66	X	X		X		X	X	X		16-18
M12x1				X		X	X									X		35-60	X	X		X		X	X	X		19-22
M12x1							X		X		X						X	35-60	X	X		X		X	X	X		22-25
M18x1								X		X						X		40-70	X			X		X		X		26-28
M18x1											X	X	X				X	40-70	X	X		X		X		X		28-30
M30x1.5												X		X		X		60-73.5	X			X				X		31-32
M30x1.5														X	X		X	60-73.5	X			X				X		33-34
M12x1				X												X		60-66.5			X		X	X			X	20
M12x1							X										X	60-66.5			X		X	X			X	23
M18x1								X								X		60-81			X		X	X			X	27
M18x1											X	X					X	60-81			X		X	X			X	29-30
M30x1.5												X				X		60-81			X		X	X			X	32
M30x1.5														X			X	60-81			X		X	X			X	33

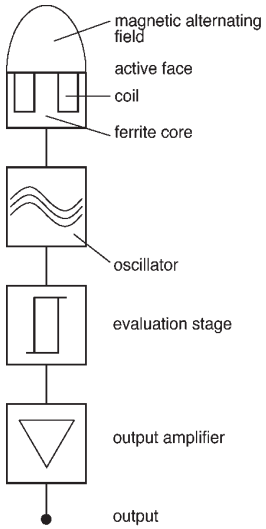
accessories

Information about inductive proximity switches

I	inductive sensor
IA	flush, preferred types
IB	flush, standard and short design, top-series
IM	non-flush, preferred types
IN	non-flush, standard and short design, top-series

Function

The oscillation coil behind the active surface of the proximity switch produces an alternating electromagnetic rotational current field. Any electrically conductive material entering the field will induce rotational currents extracting energy from the oscillating circuit. The damping of the oscillator is then converted into a switch signal in the output amplifier.
It follows from the functional principle that all metals are detected, moving or not.
Important: The high frequency field produces no measurable increase in temperature and no magnetic influence inside the object to be detected. That means the sensors operate without interacting with the system.



Functional principle of an inductive proximity switch

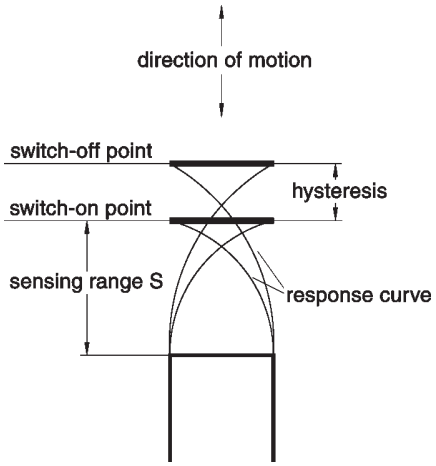
Sensing range

The distance to the sensor surface, where a metal causes a change in the state, is called sensing range. This range is not the same for all metals. That is why a so-called correction factor has been specified for the respective metal, e.g. copper or aluminium. The nominal sensing range is determined by a standard measuring plate. The plate is square, 1mm thick and fabricated out of St37. The length of the edges corresponds to the diameter of the sensor.

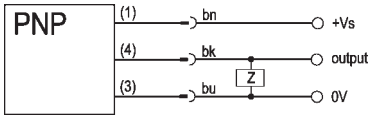
One differentiates between the normal sensing range S_n, which is determined without consideration for manufacturing tolerances or external influences, and the operational sensing range S_o. The safe operational sensing range is between 0 and 90% of S_n ($0 < S_o < 0.9 \times S_n$).

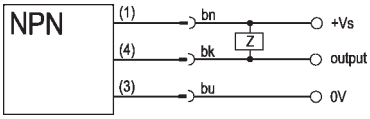
Hysteresis

During the approach and subsequent removal of the measuring plate from the initiator there will be a difference between switch-on point and switch-off point. This integrated hysteresis prevents the switching output from oscillating during mechanical vibrations. Usually the hysteresis is between 5 to 15% of S_n.

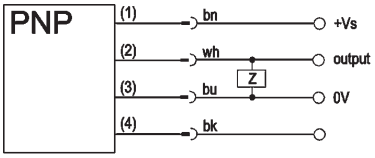


Output circuit
For the switching outputs of direct current devices a differentiation is made between **PNP** and **NPN**. For **PNP** outputs the load is connected in such a way that it is energized (positive switching) when the sensor is driven to full output (damping). **NPN** devices maintain their load permanently energized, switching the earth connection only (negative switching).
A corresponding wiring diagram has been enclosed with every sensor.





For devices with M12-connector and break contact function (NC), the switching output is wired via PIN2. For this reason a 4-pin cable socket should be used and the connection made via the white wire.



The alternating current devices, as a rule, are 2 - wire devices without short-circuit protection. Consequently a load must be connected, which allows for a minimum load current of 2mA, however, not exceeding the maximum load current.

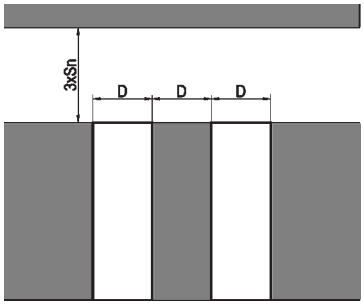
Proximity switches with analogue outputs are used in the control and measurement industry. These devices produce either a linear voltage (0-10V) or a current (4-20mA) instead of a switch signal.

Connection in series
When a number of sensors are connected in series, the voltage drop of each device should be taken into account in order to ensure that the final device also received the required operating voltage. The internal electronics permits a maximum of 3 devices to be connected in series.
To be operationally safe the connection in series of 3 - wire PNP sensors requires a logical AND-gate, e.g. the **VL250100**.

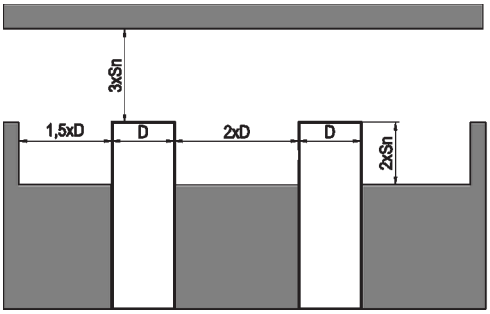
Connection in parallel
When connecting 3 - wire PNP- sensors in parallel, the internal resistance of the sensor that is driven to full output influences the other proximity switches. This requires decoupling diodes to be inserted into the outputs. A logical OR-gate, e.g. the **VL250120**, can be used to facilitate the connection in parallel.

Mounting
Please follow the mounting instructions for flush or non-flush sensors when installing inductive proximity switches into a metal carrier material to avoid undefined switching of the device. For a flush device the active face may be on one level with the carrier material.
Non-flush sensors must protrude. As a rule of thumb use 2x the nominal sensing range of the sensor.

mounting instructions for flush sensors



mounting instructions for non-flush sensors



Switching frequency
The switching frequency states the maximum number of available switching operations per second.
Every switching operation of the inductive proximity switch causes the oscillating circuit to move. The time needed for this puts a limit on the switching frequency.
For half the nominal sensing range the pulse to pause ratio should be at least 1:2, i.e. when choosing the right proximity switch, a compromise needs to be made between the size of the sensor and the switching frequency. General rule: The larger the sensor, the smaller the switching frequency.

Torque range
To avoid damage when mounting proximity switches, never exceed the tightening torque given.

stainless steel thread	*brass thread, nickel-plated*	*plastic thread*
M5 = 2Nm	M8 = 7Nm	M12 = 1.5Nm
M8 = 10Nm	M12 = 15Nm	M18 = 3Nm
M12 = 20Nm	M18 = 40Nm	M30 = 5Nm
M18 = 55Nm	M30 = 200Nm	

Active zone/ Active face
The active zone is the area in front of the active face, within which the proximity switch reacts to the approach of metal parts, i.e. changes the state of the output.

Nominal sensing range (Sn):
The distance, at which a metal part that is approaching the active face of the proximity switch causes a change in the state of the switching output.

Repeatability:
Repeat accuracy of two measurements under standardized conditions. The difference in the measured values should be less than 10%.

Output function:
Make contact (NO): object within the area of the active zone – output switched
Break contact (NC): object within the area of the active zone – output inhibited

Power-on delay time:
The time required by the proximity switch after the supply voltage has been applied before it is ready for operation (lies in the millisecond range).

Correction factors:
Specify the reduction in the sensing range, if materials other than steel St37 are used. The variance in the sensing range depends on the type, composition (internal structure), size and geometry of the material to be detected.

Typical correction factors:
steel: 1 stainless steel V2A: approx. 0.7 brass: approx. 0.4 aluminium: approx. 0.3 copper: approx. 0.2

In order to establish the approximate sensing range of materials that deviate from St37, it is necessary to multiply the sensing range for St37 by the corresponding correction factor.

Reverse polarity protection:
An internal protection prevents the proximity switch being destroyed if the connecting leads are inverted.

Short-circuit protection
An internal protection prevents the proximity switch being destroyed in the event of overcurrent.

Switching point drift:
The switching point shifts due to the change in ambient temperature.

We will be pleased to supply the matching cable socket for your devices with connector, e.g. **VK200071**. Please refer to the list in chapter 14 of our catalogue, data sheet "ipf-*SENSORFLEX*® cable sockets".

Warning: Never use these devices in applications where the safety of a person depends on their functionality!

Technical data and list of articles

design	3mm	3mm	M4x0.5	M4x0.5
sensing range Sn	**0.6mm**	**0.6mm**	**0.6mm**	**0.6mm**
mounting	flush	flush	flush	flush
connection	2m PUR cable	cable/M8-connect. **	2m PUR cable	cable/M8-connect. **
voltage drop	< 1.5V DC	< 1.5V DC	< 1.5V DC	< 1.5V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 5.5mA	≤ 5.5mA	≤ 5.5mA	≤ 5.5mA
current-carrying capacity	≤ 100mA	≤ 100mA	≤ 100mA	≤ 100mA
sampling frequency	5KHz	5KHz	5KHz	5KHz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
housing	stainless steel	stainless steel	brass, nickel-plated	brass, nickel-plated
	short design	**short design**	**short design**	**short design**
switching output pnp, no	**IBR30104**	**IBR30174**	**IB040104**	**IB040174**
switching output pnp, nc	IBR30204	*	IB040204	*
switching output npn, no	*	*	*	*
switching output npn, nc	*	*	*	*
wiring diagram	page 35	page 35	page 35	page 35
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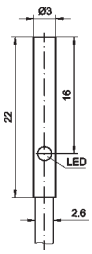
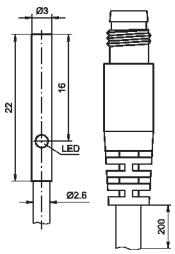
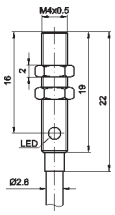
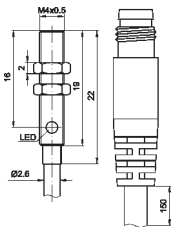
*** on request**
**** cable length 150mm**









Technical data and list of articles

design	4mm	4mm	M5x0.5	M5x0.5
sensing range Sn	**0.8mm**	**0.8mm**	**0.8mm**	**0.8mm**
mounting	flush	flush	flush	flush
connection	2m PUR cable	M8-connector	2m PUR cable	M8-connector
voltage drop	< 1.5V DC	< 1.5V DC	< 1.5V DC	< 1.5V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 5.5mA	≤ 5.5mA	≤ 5.5mA	≤ 5.5mA
current-carrying capacity	≤ 100mA	≤ 100mA	≤ 100mA	≤ 100mA
sampling frequency	5KHz	5KHz	5KHz	5KHz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
housing	stainless steel	stainless steel	brass, nickel-plated	brass, nickel-plated
	short design	**short design**	**short design**	**short design**
switching output pnp, no	**IBR40104**	**IBR40174**	**IB050104**	**IB050174**
switching output pnp, nc	IBR40204	IBR40274	IB050204	IB050274
switching output npn, no	*	*	IB051104	IB051174
switching output npn, nc	*	*	*	*
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
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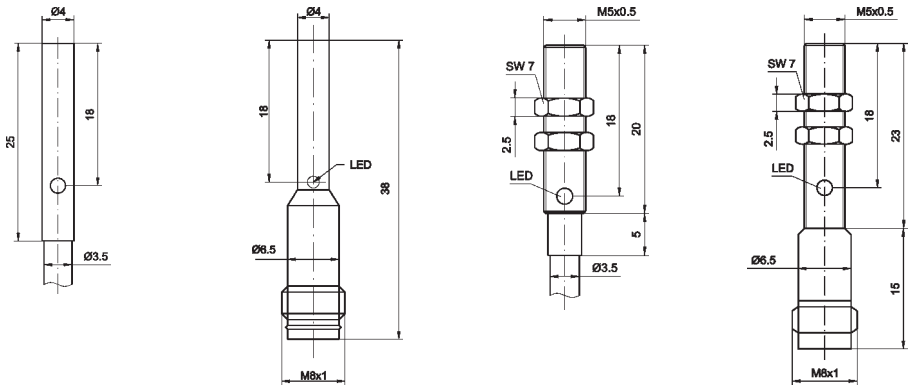

Technical data and list of articles

design	**Ø 6.5**	**Ø 6.5**	**Ø 6.5**	**Ø 6.5**
sensing range Sn	**1.5mm**	**1.5mm**	**1.5mm**	**1.5mm**
mounting	flush	flush	flush	flush
connection	2m cable	M8-connector	2m cable	2m cable
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	1KHz	1KHz	1KHz	1KHz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	stainless steel	stainless steel
	preferred types	**preferred types**	**standard design**	**short design**
switching output pnp, no	**IA060100**	**IA060170**	**IB060100**	**IB060104**
switching output pnp, nc	-	-	IB060200	IB060204
switching output npn, no	-	-	IB061100	IB061104
switching output npn, nc	-	-	*	*
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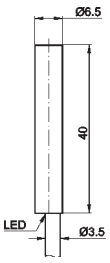

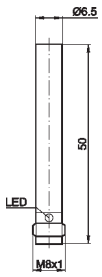

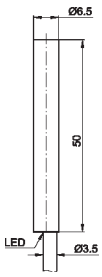

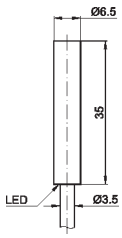

Technical data and list of articles

design	**Ø 6.5**	**Ø 6.5**	**Ø 6.5**	**Ø 6.5**
sensing range Sn	**1.5mm**	**1.5mm**	**1.5mm**	**1.5mm**
mounting	flush	flush	flush	flush
connection	M8-connector	M8-connector	M8-connector	2m PUR cable
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	1KHz	1KHz	1KHz	5KHz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	stainless steel	stainless steel	stainless steel	stainless steel
	standard design	**short design**	**short design**	**short design**
switching output pnp, no	**IB060170**	**IB060174**	**IB060184**	**IB0601A4**
switching output pnp, nc	IB060270	IB060274	IB060284	IB0602A4
switching output npn, no	IB061170	IB061174	*	IB0611A4
switching output npn, nc	*	*	*	*
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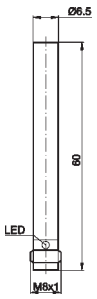

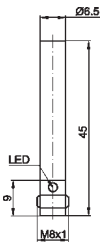

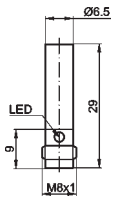

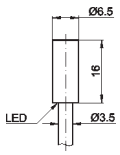

Technical data and list of articles

design	**Ø 6.5**	**Ø 6.5**	**Ø 6.5**	**Ø 6.5**
sensing range Sn	**2mm**	**2mm**	**2mm**	**3mm**
mounting	flush	flush	non-flush	non-flush
connection	M8-connector	2m PUR cable	M8-connector	2m cable
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	1KHz	1KHz	1KHz	1KHz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	stainless steel	stainless steel	brass, nickel-plated	brass, nickel-plated
	top-series	**top-series**	**preferred types**	**preferred types**
switching output pnp, no	**IB060173**	**IB0601A3**	**IM060170**	**IM060100**
switching output pnp, nc	*	*	-	-
switching output npn, no	*	*	-	-
switching output npn, nc	*	*	-	-
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mounting material	page 37	page 37	page 37	page 37

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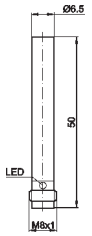

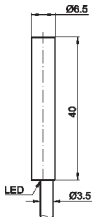

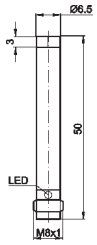

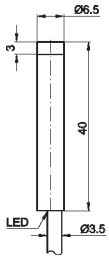

Technical data and list of articles

design	**Ø 6.5**	**Ø 6.5**	**Ø 6.5**	**Ø 6.5**
sensing range Sn	**3mm**	**3mm**	**3mm**	**4mm**
mounting	non-flush	non-flush	non-flush	non-flush
connection	2m cable	M8-connector	M8-connector	2m cable
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	1KHz	1KHz	1KHz	1KHz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	stainless steel	stainless steel	stainless steel	stainless steel
	standard design	**standard design**	**short design**	**short design**
switching output pnp, no	**IN060100**	**IN060170**	**IN060174**	**IN060104**
switching output pnp, nc	*	IN060270	*	*
switching output npn, no	*	IN061170	*	*
switching output npn, nc	*	*	*	*
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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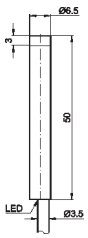

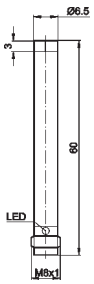

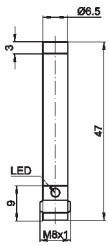

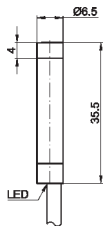

Technical data and list of articles

design	**Ø 6.5**	**Ø 6.5**		
sensing range Sn	**4mm**	**4mm**		
mounting	non-flush	non-flush		
connection	M8-connector	2m PUR cable		
voltage drop	< 2V DC	< 2V DC		
operating voltage	10 to 30V DC	10 to 30V DC		
short-circuit protection	yes	yes		
reverse polarity protection	yes	yes		
current consumption	≤ 15mA	≤ 15mA		
current-carrying capacity	< 200mA	< 200mA		
sampling frequency	1KHz	1KHz		
hysteresis	≤ 15% of Sn	≤ 15% of Sn		
status display	yellow LED	yellow LED		
ambient temperature	- 25 to + 70°C	- 25 to + 70°C		
system of protection	IP67 to EN 60529	IP67 to EN 60529		
housing	stainless steel	stainless steel		
	top-series	**top-series**		
switching output pnp, no	**IN060173**	**IN0601A3**		
switching output pnp, nc	*	*		
switching output npn, no	*	*		
switching output npn, nc	*	*		
wiring diagram	page 35	page 35		
connectors	page 36	page 36		
mounting material	page 37	page 37		

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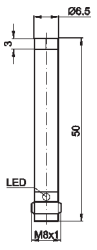

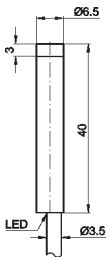

Technical data and list of articles

design	M8x1	M8x1	M8x1	M8x1
sensing range Sn	**1.5mm**	**1.5mm**	**1.5mm**	**1.5mm**
mounting	flush	flush	flush	flush
connection	2m cable	M8-connector	2m cable	2m cable
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	1KHz	1KHz	1KHz	1KHz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	stainless steel	brass, nickel-plated
	preferred types	**preferred types**	**standard design**	**short design**
switching output pnp, no	**IA080100**	**IA080170**	**IB080100**	**IB080104**
switching output pnp, nc	-	-	IB080200	IB080204
switching output npn, no	-	-	IB081100	IB081104
switching output npn, nc	-	-	*	*
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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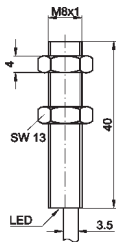

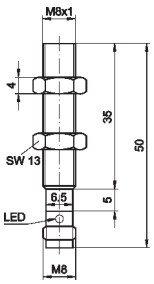

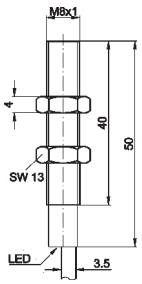

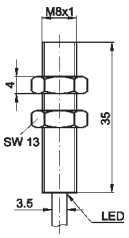

Technical data and list of articles

design	**M8x1**	**M8x1**	**M8x1**	**M8x1**
sensing range Sn	**1.5mm**	**1.5mm**	**1.5mm**	**1.5mm**
mounting	flush	flush	flush	flush
connection	M12-connector	M8-connector	M8-connector	M8-connector
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	1KHz	1KHz	1KHz	1KHz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	stainless steel	stainless steel	brass, nickel-plated	brass, nickel-plated
	standard design	**standard design**	**short design**	**short design**
switching output pnp, no	**IB080121**	**IB080170**	**IB080174**	**IB080184**
switching output pnp, nc	IB080221	IB080270	IB080274	IB080284
switching output npn, no	IB081121	IB081170	IB081174	*
switching output npn, nc	*	*	*	*
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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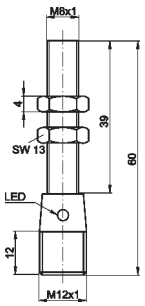

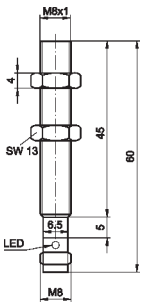

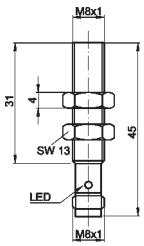

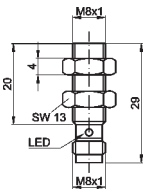

Technical data and list of articles

design	**M8x1**	**M8x1**	**M8x1**	**M8x1**
sensing range Sn	**1.5mm**	**2mm**	**2mm**	**2mm**
mounting	flush	flush	flush	flush
connection	2m PUR cable	M12-connector	M8-connector	2m PUR cable
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	1KHz	1KHz	1KHz	1KHz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	stainless steel	stainless steel	stainless steel	stainless steel
	short design	**top-series**	**top-series**	**top-series**
switching output pnp, no	**IB0801A4**	**IB080123**	**IB080173**	**IB0801A3**
switching output pnp, nc	IB0802A4	*	IB080273	IB0802A3
switching output npn, no	*	IB081123	*	IB0811A3
switching output npn, nc	*	*	*	*
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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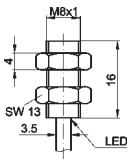

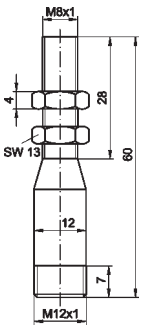

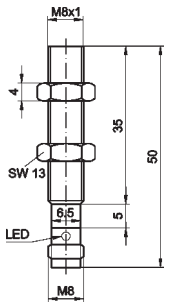

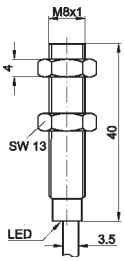

Technical data and list of articles

design	M8x1	M8x1	M8x1	M8x1
sensing range Sn	**2mm**	**2mm**	**2.5mm**	**2.5mm**
mounting	non-flush	non-flush	non-flush	non-flush
connection	2m cable	M8-connector	2m cable	M8-connector
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	1KHz	1KHz	1KHz	1KHz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	stainless steel	brass, nickel-plated
	preferred types	**preferred types**	**short design**	**short design**
switching output pnp, no	**IM080100**	**IM080170**	**IN080104**	**IN080174**
switching output pnp, nc	-	-	*	*
switching output npn, no	-	-	IN081104	IN081174
switching output npn, nc	-	-	*	*
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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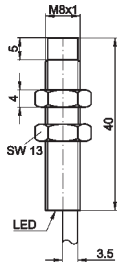

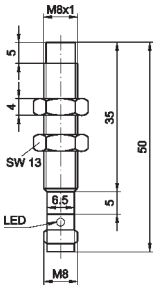

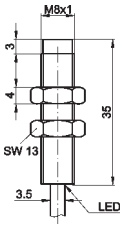

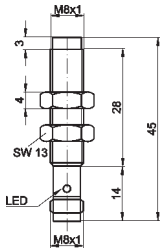

Technical data and list of articles

design	M8x1	M8x1	M8x1	M8x1
sensing range Sn	**3mm**	**3mm**	**3mm**	**4mm**
mounting	non-flush	non-flush	non-flush	non-flush
connection	2m cable	M12-connector	M8-connector	M8-connector
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	1KHz	1KHz	1KHz	1KHz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	stainless steel	brass, nickel-plated	stainless steel	stainless steel
	standard design	**standard design**	**standard design**	**top-series**
switching output pnp, no	**IN080100**	**IN080121**	**IN080170**	**IN080173**
switching output pnp, nc	IN080200	IN080221	IN080270	*
switching output npn, no	*	*	*	IN081173
switching output npn, nc	*	*	IN081270	*
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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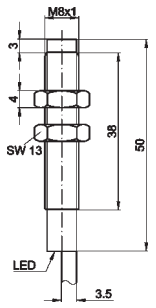

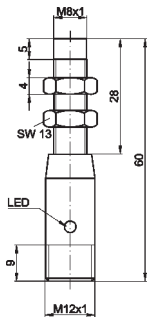

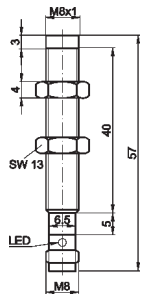

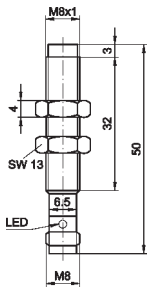

Technical data and list of articles

design	**M8x1**			
sensing range Sn	**4mm**			
mounting	non-flush			
connection	2m PUR cable			
voltage drop	< 2V DC			
operating voltage	10 to 30V DC			
short-circuit protection	yes			
reverse polarity protection	yes			
current consumption	≤ 15mA			
current-carrying capacity	< 200mA			
sampling frequency	1KHz			
hysteresis	≤ 15% of Sn			
status display	yellow LED			
ambient temperature	- 25 to + 70°C			
system of protection	IP67 to EN 60529			
housing	stainless steel			
	top-series			
switching output pnp, no	**IN0801A3**			
switching output pnp, nc	*			
switching output npn, no	IN0811A3			
switching output npn, nc	*			
wiring diagram	page 35			
connectors	page 36			
mounting material	page 37			

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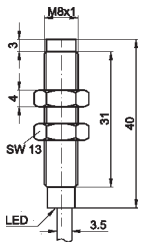

Technical data and list of articles

design	M12x1	M12x1	M12x1	M12x1
sensing range Sn	**2mm**	**2mm**	**2mm**	**2mm**
mounting	flush	flush	flush	flush
connection	2m cable	2m cable	M12-connector	M12-connector
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	800Hz	800Hz	800Hz	800Hz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated
	preferred types	**preferred types**	**preferred types**	**preferred types**
switching output pnp, no	**IA120100**	**IA120104**	**IA120120**	**IA120124**
switching output pnp, nc	-	-	-	-
switching output npn, no	-	-	-	-
switching output npn, nc	-	-	-	-
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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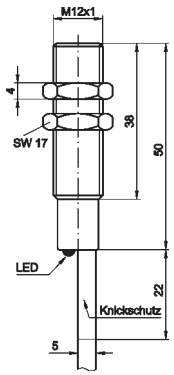

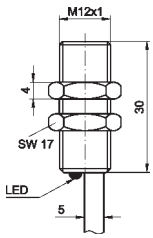

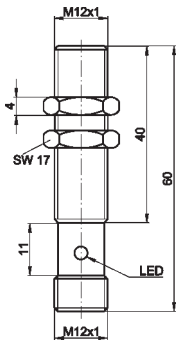

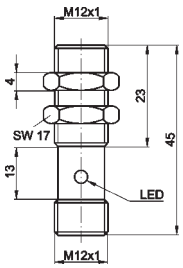

Technical data and list of articles

design	M12x1	M12x1	M12x1	M12x1
sensing range Sn	**2mm**	**2mm**	**3mm**	**3mm**
mounting	flush	flush	flush	flush
connection	2m cable	MC-connector	2m cable	2m cable
voltage drop	< 5V AC	< 5V AC	< 2V DC	< 2V DC
operating voltage	90 - 250V AC	20 - 250V AC	10 to 30V DC	10 to 30V DC
short-circuit protection	-	-	yes	yes
reverse polarity protection	-	-	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 180mA	< 300mA	< 200mA	< 200mA
sampling frequency	10Hz	15Hz	800Hz	800Hz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated
	standard design	**standard design**	**standard design**	**short design**
switching output pnp, no	-	-	**IB120100**	**IB120104**
switching output pnp, nc	-	-	IB120200	IB120204
switching output npn, no	-	-	IB121100	*
switching output npn, nc	-	-	IB121200	*
switching output AC, no	IB124100	IB124131	-	-
switching output AC, nc	IB124200	-	-	-
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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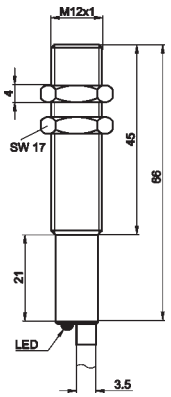

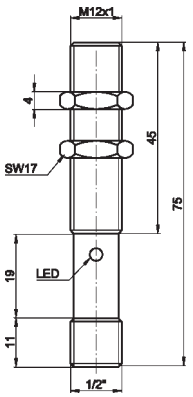

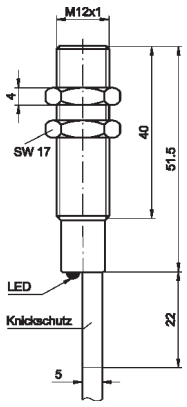

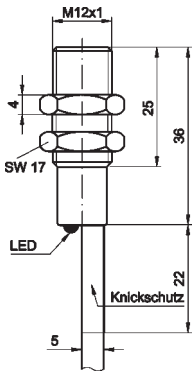

Technical data and list of articles

design	M12x1	M12x1	M12x1	M12x1
sensing range Sn	**3mm**	**3mm**	**3mm**	**3mm**
mounting	flush	flush	flush	flush
connection	M12-connector	M12-connector	M8-connector	M8-connector
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	800Hz	800Hz	800Hz	800Hz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated
	standard design	**short design**	**standard design**	**short design**
switching output pnp, no	**IB120121**	**IB120125**	**IB120170**	**IB120174**
switching output pnp, nc	IB120221	IB120225	*	IB120274
switching output npn, no	IB121121	*	IB121170	*
switching output npn, nc	IB121221	*	*	*
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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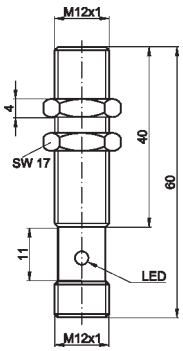

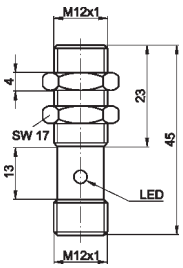

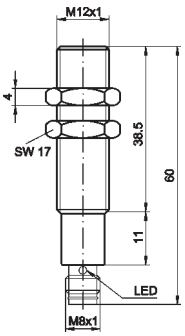

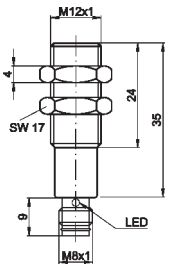

Technical data and list of articles

design	M12x1	M12x1	M12x1	M12x1
sensing range Sn	**4mm**	**4mm**	**4mm**	**4mm**
mounting	flush	flush	non-flush	non-flush
connection	M12-connector	2m cable	2m cable	2m cable
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	800Hz	800Hz	400Hz	400Hz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	stainless steel	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated
	top-series	**top-series**	**preferred types**	**preferred types**
switching output pnp, no	**IB120123**	**IB1201A3**	**IM120100**	**IM120104**
switching output pnp, nc	IB120223	*	-	-
switching output npn, no	*	*	-	-
switching output npn, nc	*	*	-	-
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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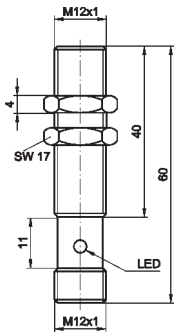

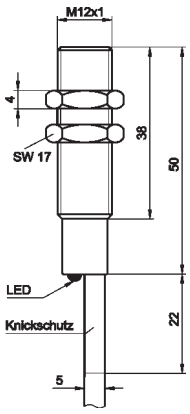

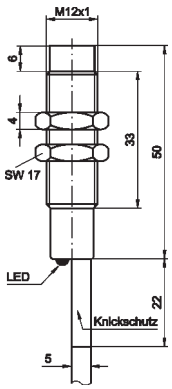

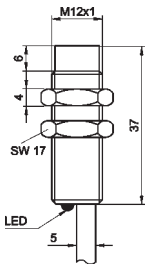

Technical data and list of articles

design	M12x1	M12x1	M12x1	M12x1
sensing range Sn	**4mm**	**4mm**	**4mm**	**4mm**
mounting	non-flush	non-flush	non-flush	non-flush
connection	M12-connector	M12-connector	2m cable	MC-connector
voltage drop	< 2V DC	< 2V DC	< 5V AC	< 5V AC
operating voltage	10 to 30V DC	10 to 30V DC	90 to 250V AC	20 to 250V AC
short-circuit protection	yes	yes	-	-
reverse polarity protection	yes	yes	-	-
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 180mA	< 300mA
sampling frequency	400Hz	400Hz	10Hz	15Hz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated
	preferred types	**preferred types**	**standard design**	**standard design**
switching output pnp, no	**IM120120**	**IM120124**	-	-
switching output pnp, nc	-	-	-	-
switching output npn, no	-	-	-	-
switching output npn, nc	-	-	-	-
switching output AC, no	-	-	IN124100	IN124131
switching output AC, nc	-	-	IN124200	-
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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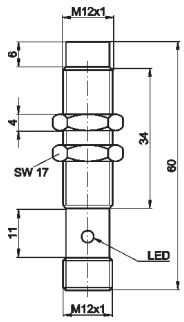

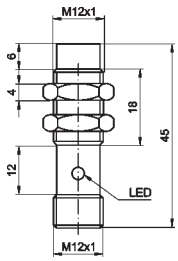

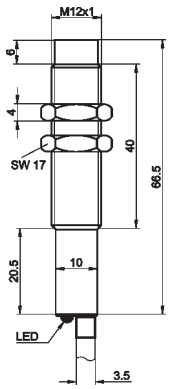

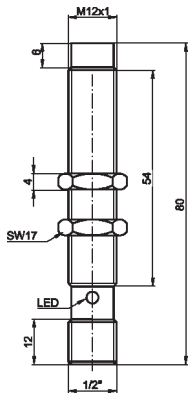

Technical data and list of articles

design	M12x1	M12x1	M12x1	M12x1
sensing range Sn	**6mm**	**6mm**	**6mm**	**6mm**
mounting	non-flush	non-flush	non-flush	non-flush
connection	2m cable	2m cable	M12-connector	M12-connector
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	400Hz	400Hz	400Hz	400Hz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated
	standard design	**short design**	**standard design**	**short design**
switching output pnp, no	**IN120100**	**IN120104**	**IN120121**	**IN120125**
switching output pnp, nc	IN120200	IN120204	IN120221	IN120225
switching output npn, no	IN121100	IN121104	IN121121	*
switching output npn, nc	*	*	IN121221	*
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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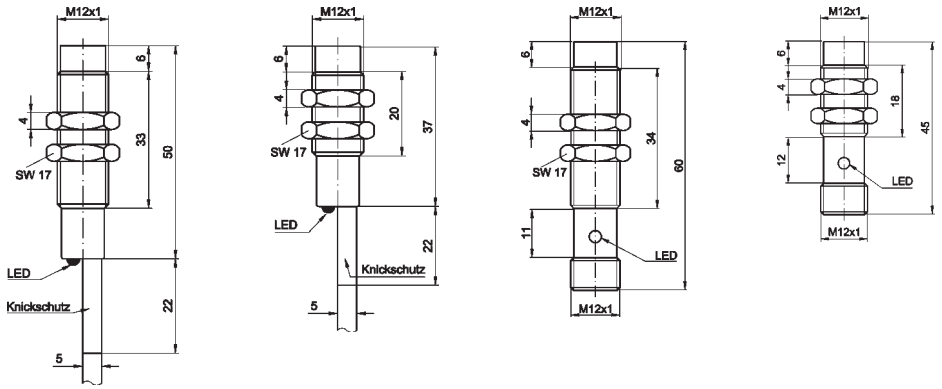

Technical data and list of articles

design	M12x1	M12x1	M12x1	M12x1
sensing range Sn	**6mm**	**6mm**	**8mm**	**8mm**
mounting	non-flush	non-flush	non-flush	non-flush
connection	M8-connector	M8-connector	M12-connector	2m PUR cable
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	400Hz	400Hz	400Hz	400Hz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	stainless steel	stainless steel
	standard design	**short design**	**top-series**	**top-series**
switching output pnp, no	**IN120170**	**IN120174**	**IN120123**	**IN1201A3**
switching output pnp, nc	*	IN120274	*	IN1202A3
switching output npn, no	IN121170	*	*	*
switching output npn, nc	*	*	*	*
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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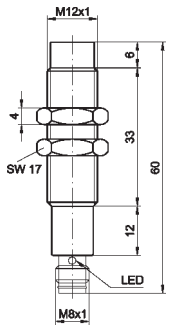

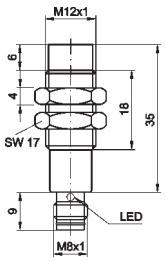

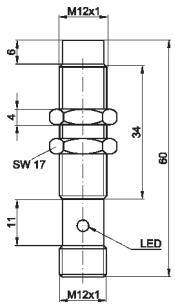

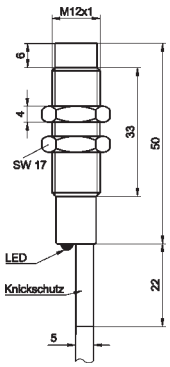

Technical data and list of articles

design	M18x1	M18x1	M18x1	M18x1
sensing range Sn	**5mm**	**5mm**	**5mm**	**5mm**
mounting	flush	flush	flush	flush
connection	2m cable	M12-connector	2m cable	2m cable
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	500Hz	500Hz	500Hz	500Hz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated
	preferred types	**preferred types**	**standard design**	**short design**
switching output pnp, no	**IA180100**	**IA180120**	**IB180100**	**IB180104**
switching output pnp, nc	-	-	IB180200	*
switching output npn, no	-	-	*	*
switching output npn, nc	-	-	*	*
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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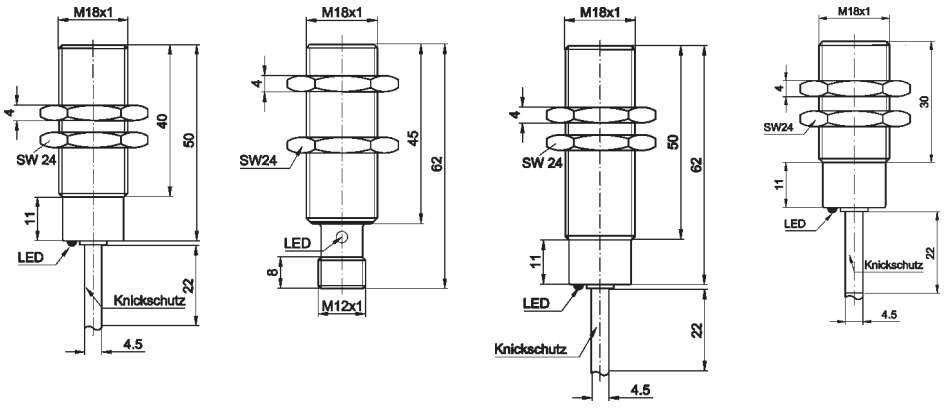

Technical data and list of articles

design	M18x1	M18x1	M18x1	M18x1
sensing range Sn	**5mm**	**5mm**	**5mm**	**5mm**
mounting	flush	flush	flush	flush
connection	M12-connector	M12-connector	2m cable	MC-connector
voltage drop	< 2V DC	< 2V DC	< 5V AC	< 5V AC
operating voltage	10 to 30V DC	10 to 30V DC	20 to 250V AC	20 to 250V AC
short-circuit protection	yes	yes	-	-
reverse polarity protection	yes	yes	-	-
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 400mA	< 500mA
sampling frequency	500Hz	500Hz	10Hz	15Hz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated
	standard design	**short design**	**standard design**	**standard design**
switching output pnp, no	**IB180121**	**IB180125**	-	-
switching output pnp, nc	IB180221	IB180225	-	-
switching output npn, no	*	*	-	-
switching output npn, nc	*	*	-	-
switching output AC, no	-	-	IB184100	IB184131
switching output AC, nc	-	-	IB184200	-
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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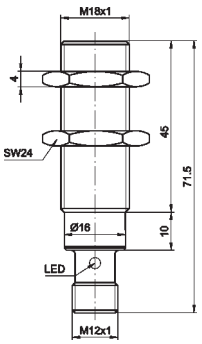

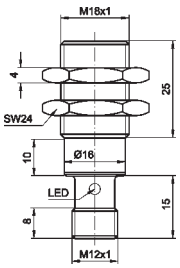

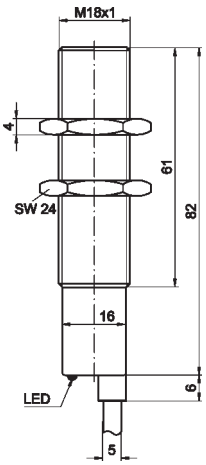

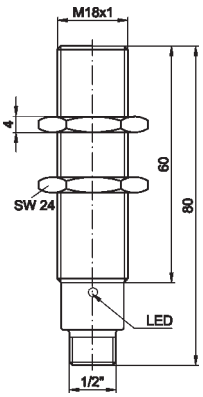

Technical data and list of articles

design	**M18x1**	**M18x1**	**M18x1**	**M18x1**
sensing range Sn	**7mm**	**7mm**	**8mm**	**8mm**
mounting	flush	flush	non-flush	non-flush
connection	M12-connector	2m cable	2m cable	M12-connector
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	500Hz	500Hz	200Hz	200Hz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	stainless steel	stainless steel	brass, nickel-plated	brass, nickel-plated
	top-series	**top-series**	**preferred types**	**preferred types**
switching output pnp, no	**IB180123**	**IB1801A3**	**IM180100**	**IM180120**
switching output pnp, nc	IB180223	*	-	-
switching output npn, no	*	*	-	-
switching output npn, nc	*	*	-	-
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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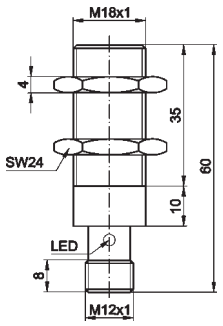

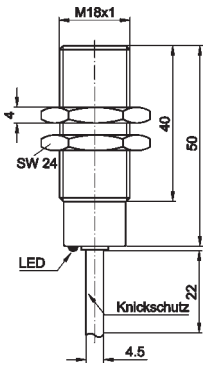

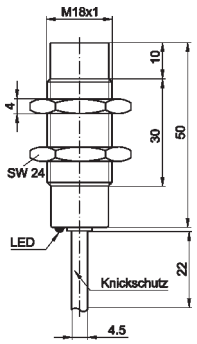

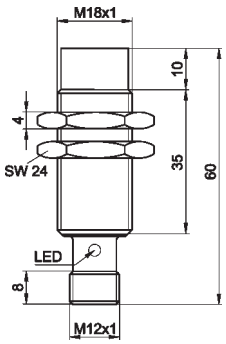

Technical data and list of articles

design	M18x1	M18x1	M18x1	M18x1
sensing range Sn	**8mm**	**10mm**	**10mm**	**10mm**
mounting	non-flush	non-flush	non-flush	non-flush
connection	2m cable	2m cable	2m cable	M12-connector
voltage drop	< 5V AC	< 2V DC	< 2V DC	< 2V DC
operating voltage	20 to 250V AC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	-	yes	yes	yes
reverse polarity protection	-	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 400mA	< 200mA	< 200mA	< 200mA
sampling frequency	10Hz	200Hz	200Hz	200Hz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated
	standard design	**standard design**	**short design**	**standard design**
switching output pnp, no	-	**IN180100**	**IN180104**	**IN180121**
switching output pnp, nc	-	*	IN180204	IN180221
switching output npn, no	-	IN181100	*	IN181121
switching output npn, nc	-	*	*	*
switching output AC, no	IN184100	-	-	-
switching output AC, nc	IN184200	-	-	-
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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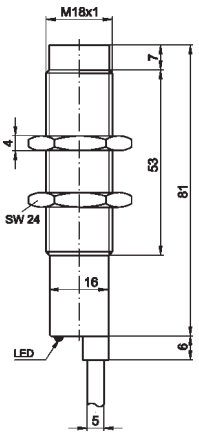

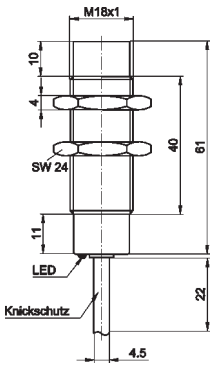

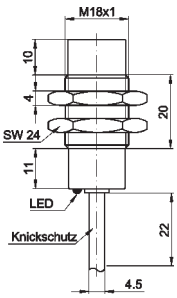

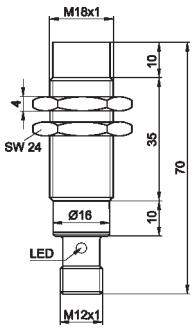

Technical data and list of articles

design	M18x1	M18x1	M18x1	M18x1
sensing range Sn	**10mm**	**10mm**	**12mm**	**12mm**
mounting	non-flush	non-flush	non-flush	non-flush
connection	M12-connector	MC-connector	M12-connector	2m cable
voltage drop	< 2V DC	< 5V AC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	20 to 250V AC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	-	yes	yes
reverse polarity protection	yes	-	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 500mA	< 200mA	< 200mA
sampling frequency	200Hz	15Hz	200Hz	200Hz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	stainless steel	stainless steel
	short design	**standard design**	**top-series**	**top-series**
switching output pnp, no	**IN180125**	**-**	**IN180123**	**IN1801A3**
switching output pnp, nc	IN180225	-	*	*
switching output npn, no	*	-	*	*
switching output npn, nc	*	-	*	*
switching output AC, no	-	IN184131	-	-
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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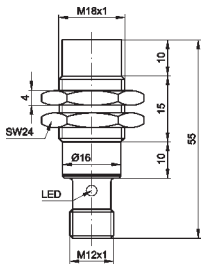

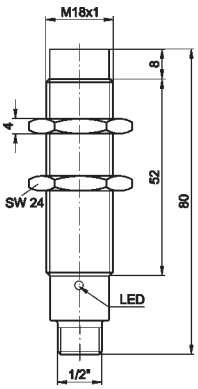

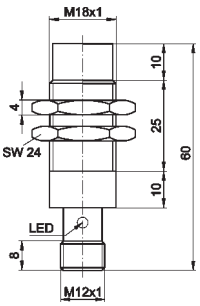

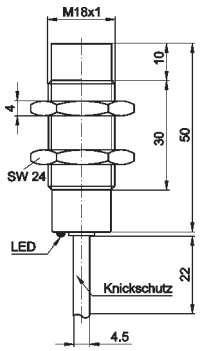

Technical data and list of articles

design	M30x1.5	M30x1.5	M30x1.5	M30x1.5
sensing range Sn	**10mm**	**10mm**	**10mm**	**10mm**
mounting	flush	flush	flush	flush
connection	2m cable	M12-connector	2m cable	M12-connector
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	300Hz	300Hz	300Hz	300Hz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated
	preferred types	**preferred types**	**standard design**	**standard design**
switching output pnp, no	**IA300100**	**IA300120**	**IB300100**	**IB300121**
switching output pnp, nc	-	-	*	*
switching output npn, no	-	-	*	*
switching output npn, nc	-	-	*	*
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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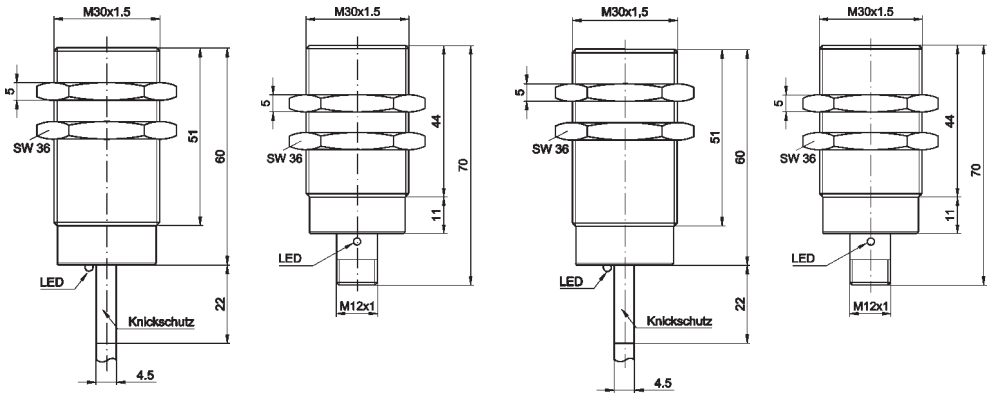

Technical data and list of articles

design	M30x1.5	M30x1.5	M30x1.5	M30x1.5
sensing range Sn	**10mm**	**10mm**	**15mm**	**15mm**
mounting	flush	flush	flush	flush
connection	2m cable	MC-connector	M12-connector	2m cable
voltage drop	< 5V AC	< 5V AC	< 2V DC	< 2V DC
operating voltage	20 to 250V AC	20 to 250V AC	10 to 30V DC	10 to 30V DC
short-circuit protection	-	-	yes	yes
reverse polarity protection	-	-	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 400mA	< 500mA	< 200mA	< 200mA
sampling frequency	10Hz	15Hz	300Hz	300Hz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	stainless steel	stainless steel
	standard design	**standard design**	**top-series**	**top-series**
switching output pnp, no	-	-	**IB300123**	**IB3001A3**
switching output pnp, nc	-	-	*	*
switching output npn, no	-	-	*	*
switching output npn, nc	-	-	*	*
switching output AC, no	IB304100	IB304131	-	-
switching output AC, nc	IB304200	-	-	-
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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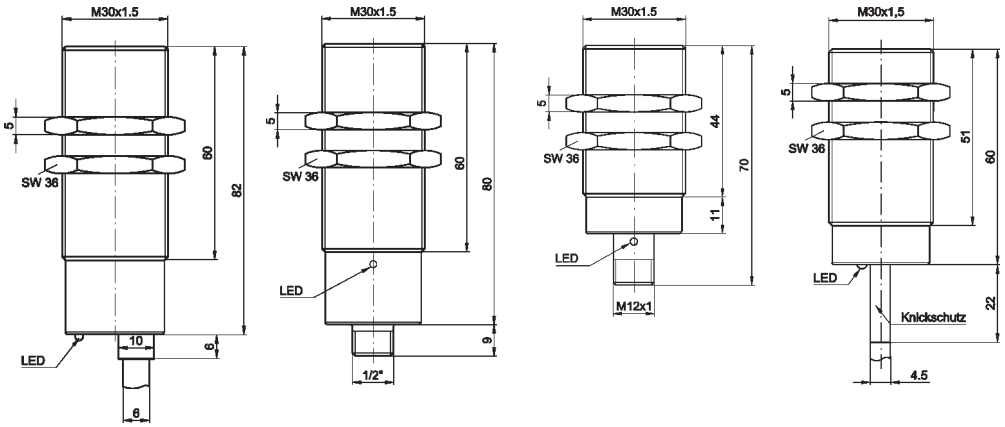

Technical data and list of articles

design	M30x1.5	M30x1.5	M30x1.5	M30x1.5
sensing range Sn	**15mm**	**15mm**	**15mm**	**15mm**
mounting	non-flush	non-flush	non-flush	non-flush
connection	2m cable	M12-connector	2m cable	MC-connector
voltage drop	< 2V DC	< 2V DC	< 5V AC	< 5V AC
operating voltage	10 to 30V DC	10 to 30V DC	20 to 250V AC	20 to 250V AC
short-circuit protection	yes	yes	-	-
reverse polarity protection	yes	yes	-	-
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 400mA	< 500mA
sampling frequency	100Hz	100Hz	10Hz	10Hz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated	brass, nickel-plated
	preferred types	**preferred types**	**standard design**	**standard design**
switching output pnp, no	**IM300100**	**IM300120**	-	-
switching output pnp, nc	-	-	-	-
switching output npn, no	-	-	-	-
switching output npn, nc	-	-	-	-
switching output AC, no	-	-	IN304100	IN304130
switching output AC, nc	-	-	IN304200	-
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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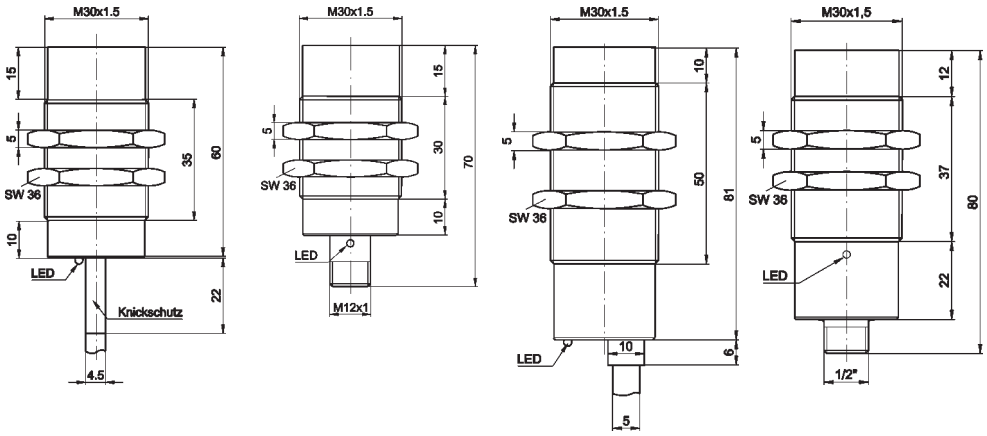

Technical data and list of articles

design	M30x1.5	M30x1.5	M30x1.5	M30x1.5
sensing range Sn	**20mm**	**20mm**	**20mm**	**20mm**
mounting	non-flush	non-flush	non-flush	non-flush
connection	2m cable	M12-connector	M12-connector	2m cable
voltage drop	< 2V DC	< 2V DC	< 2V DC	< 2V DC
operating voltage	10 to 30V DC	10 to 30V DC	10 to 30V DC	10 to 30V DC
short-circuit protection	yes	yes	yes	yes
reverse polarity protection	yes	yes	yes	yes
current consumption	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
current-carrying capacity	< 200mA	< 200mA	< 200mA	< 200mA
sampling frequency	100Hz	100Hz	100Hz	100Hz
hysteresis	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn	≤ 15% of Sn
status display	yellow LED	yellow LED	yellow LED	yellow LED
ambient temperature	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C	- 25 to + 70°C
system of protection	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529	IP67 to EN 60529
housing	brass, nickel-plated	brass, nickel-plated	stainless steel	stainless steel
	standard design	**standard design**	**top-series**	**top-series**
switching output pnp, no	**IN300100**	**IN300121**	**IN300123**	**IN3001A3**
switching output pnp, nc	IN300200	IN300221	*	*
switching output npn, no	*	*	*	*
switching output npn, nc	*	*	*	*
wiring diagram	page 35	page 35	page 35	page 35
connectors	page 36	page 36	page 36	page 36
mounting material	page 37	page 37	page 37	page 37

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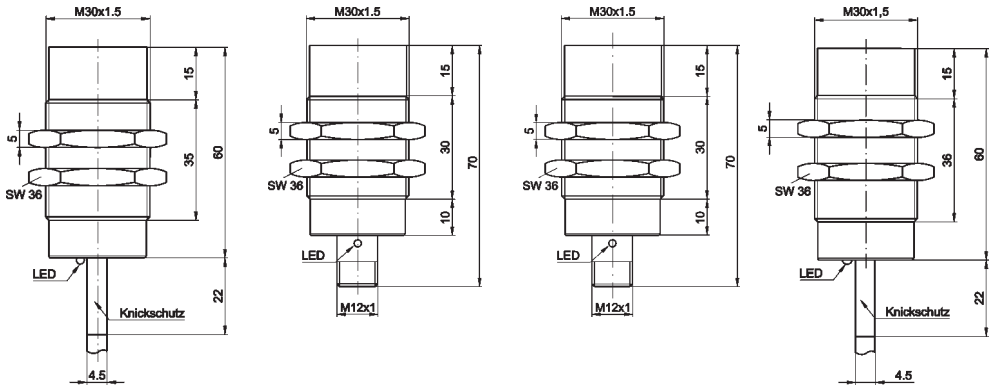
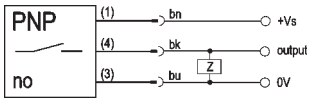
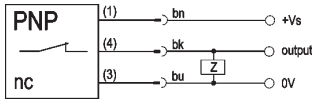


wiring diagram

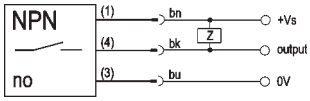
switching output pnp, no



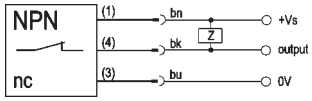
pnp, nc



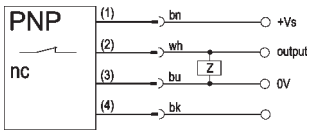
switching output npn, no

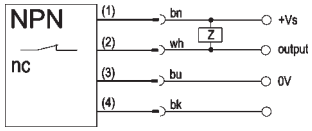


npn, nc

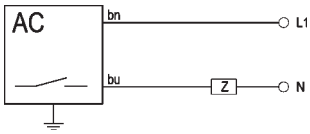


For devices with M12-connector and break contact function (NC), the switching output is wired via PIN2. For this reason a 4-pin cable socket should be used and the connection made via the white wire.

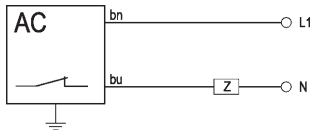




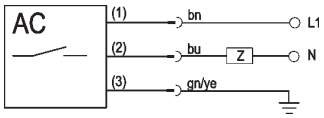
switching output cable AC, no



cable AC, nc



switching output connector AC, no



wire colours: bn = brown (1), bu = blue (2), gn/ye = green/yellow (3)

VK200075	connector	2m, 3x0.34mm², M8	straight, PUR	3 wires
VK500075	connector	5m, 3x0.34mm², M8	straight, PUR	3 wires
VKA00075	connector	10m, 3x0.34mm², M8	straight, PUR	3 wires

VK200071	connector	2m, 3x0.34mm², M8	angular, PUR	3 wires
VK500071	connector	5m, 3x0.34mm², M8	angular, PUR	3 wires
VKA00071	connector	10m, 3x0.34mm², M8	angular, PUR	3 wires

VK200325	connector	2m, 4x0.34mm², M12	straight, PUR	4 wires
VK500325	connector	5m, 4x0.34mm², M12	straight, PUR	4 wires
VKA00325	connector	10m, 4x0.34mm², M12	straight, PUR	4 wires

VK200321	connector	2m, 4x0.34mm², M12	angular, PUR	4 wires
VK500321	connector	5m, 4x0.34mm², M12	angular, PUR	4 wires
VKA00321	connector	10m, 4x0.34mm², M12	angular, PUR	4 wires

Fig. 1

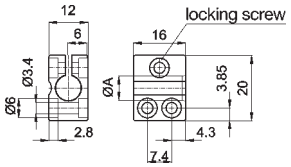


Fig. 2

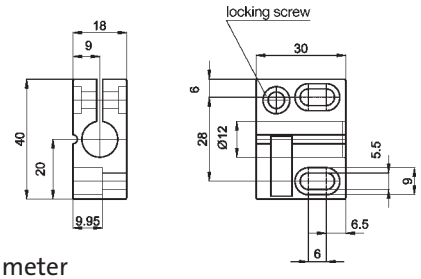
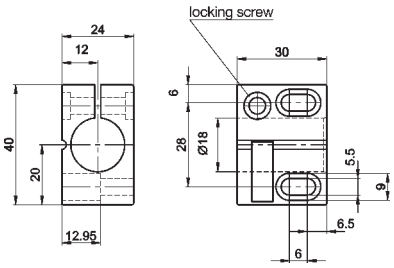


Fig. 3



measure A corresponds to the sensor diameter

Fig. 4

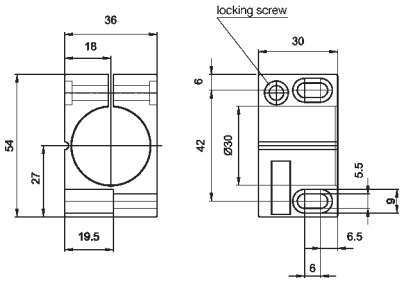


Fig. 5

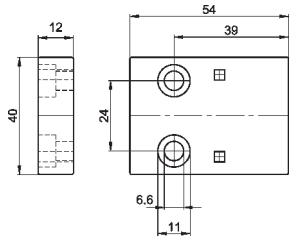
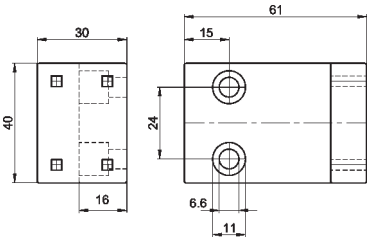


Fig. 6



example

AY000057	quick clip set	**case** with selection quick clips	w/o
AY000044	quick clip 4, plastic	sensor Ø 4mm, clip	1
AY000045	quick clip 5, plastic	sensor Ø 5mm, clip	1
AY000046	quick clip 6.5, plastic	sensor Ø 6.5mm, clip	1
AY000047	quick clip 8, plastic	sensor Ø 8mm, clip	1
AY000048	quick clip 8, plastic	sensor Ø 8mm clip, **permanent stop**	1
AY000049	quick clip 12, plastic	sensor Ø 12mm, clip	2
AY000050	quick clip 12, plastic	sensor Ø 12mm clip, **permanent stop**	2
AY000051	quick clip 18, plastic	sensor Ø 18mm, clip	3
AY000052	quick clip 18, plastic	sensor Ø 18mm clip, **permanent stop**	3
AY000061	quick clip 30, plastic	sensor Ø 30mm, clip	4
AY000062	quick clip 30, plastic	sensor Ø 30mm clip, **permanent stop**	4
AY000053	base straight, plastic	for quick clip Ø 12+18mm	5
AY000054	base, angular, plastic	for quick clip Ø 12+18mm	6
AY000055	identification label, white	for quick clip Ø 12+18+30mm	w/o