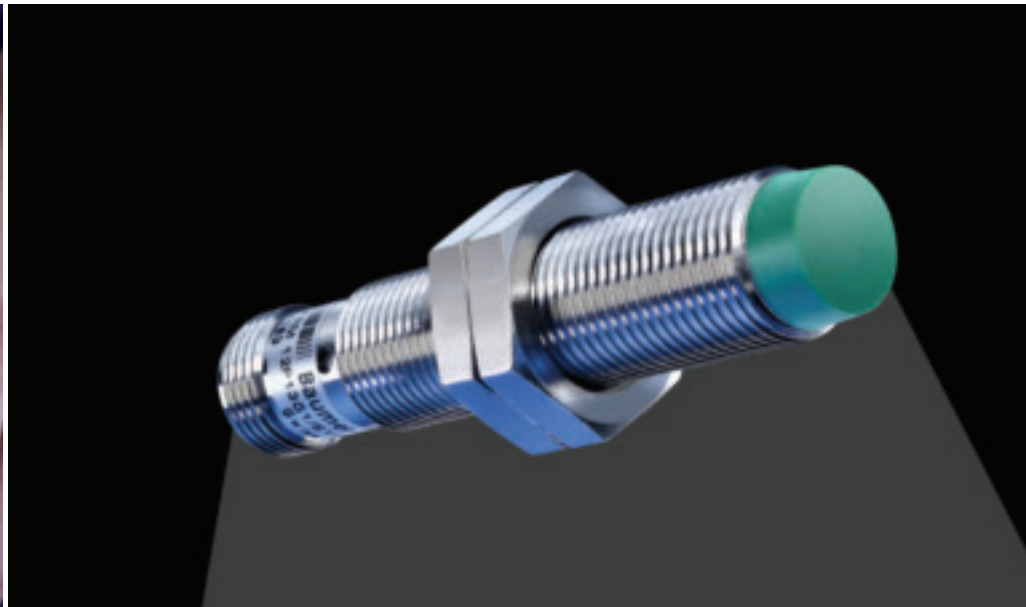
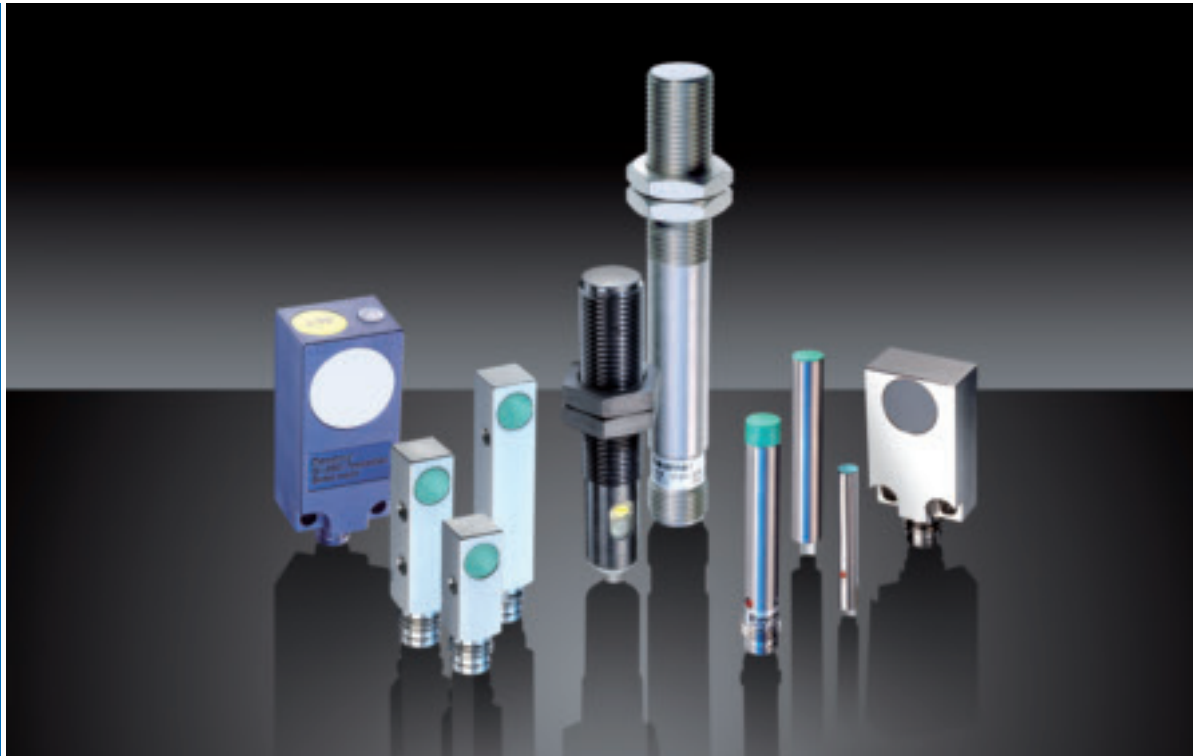


Compact, fast, reliable. Inductive, capacitive and magnetic sensors.





Around the globe, automation would not be the same without non-contact inductive proximity sensors. For decades, millions of such metal-detecting devices have been monitoring presence, measuring movement and position of machine parts, valves and gears. Reliably. Day in and day out. Even in high-speed applications, exposed to the toughest industrial conditions, inductive proximity sensors safely detect steel targets as well as non-ferrous metal targets. The sensors provide feedback with precise switching points and extremely high repeat accuracy.

The range of inductive 3-wire sensors consists of two basic designs:

- Sensors with digital output providing accurate on/off information
- Sensors with analog output signals providing absolute distance information

Both technologies are available in a wide range of housing styles ranging from subminiature to standard size enclosures. Special custom solutions are available for OEM requirements.

Inductive sensors are undoubtedly the best tested and best proven sensor technology on the market. Because of this, they are still going strong and continue to provide good and reliable solutions for many challenging tasks in the world of automation.

Introduction

<i>Powerful and flexible standard sensors</i>	Page 12
<i>Special versions according to customer specifications</i>	Page 13
<i>AlphaProx Inductive distance measuring sensors with high resolution 0,1 μm</i>	Page 14
<i>Miniature versions of inductive sensors</i>	Page 16
<i>GammaProx Sensors with increased sensing distances</i>	Page 18
<i>DuroProx Inductive sensors with rugged full metal housings</i>	Page 20
<i>Applications – digital and analog outputs</i>	Page 22
<i>Technical specifications</i>	Page 23
<i>Sensing characteristics</i>	Page 24
<i>Mounting</i>	Page 25
<i>Electrical and mechanical specifications</i>	Page 26

Inductive distance measuring sensors

<i>Overview</i>	Page 30
<i>Function and applications</i>	Page 32
<i>Dynamic and static resolution</i>	Page 33
<i>Teach-in functions</i>	Page 35
<i>Cylindrical designs</i>	Page 37
<i>Rectangular designs</i>	Page 50

Inductive sensors 3-wire digital output

<i>Overview</i>	Page 58
<i>Cylindrical designs</i>	Page 64
<i>Rectangular designs</i>	Page 108
<i>DuroProx Sensors with full metal housings</i>	Page 120
<i>Sensors immune to welding and magnetic noise up to 90 mT</i>	Page 124
<i>High pressure sensors</i>	Page 125
<i>High temperature sensors</i>	Page 127

Special executions

<i>Overview</i>	Page 130
<i>Sensors with two adjustable switching points</i>	Page 131
<i>Inductive code readers</i>	Page 132
<i>Sensors with banking screw</i>	Page 134
<i>High pressure, high temperature sensor to 2000 bar and +350 °C</i>	Page 135
<i>Inductive area sensor</i>	Page 136

Inductive NAMUR sensors

<i>Overview</i>	Page 138
<i>Cylindrical designs</i>	Page 139
<i>Rectangular designs</i>	Page 145

Capacitive sensors

<i>Overview</i>	Page 148
<i>Design and mode of operation</i>	Page 149
<i>Mounting</i>	Page 150
<i>Cylindrical designs</i>	Page 151
<i>Capacitive fill level sensor</i>	Page 158
<i>Rectangular designs</i>	Page 160
<i>Capacitive high temperature sensor</i>	Page 162
<i>Installation dimensions and accessories</i>	Page 164

Safety sensor system Page 166

Peripheral devices Page 170

Magnetic sensors Page 174

Powerful and flexible standard sensors



You as the client set the standard!

You can choose from Baumer's wide range of inductive and capacitive sensors. Baumer's new miniature range fully meets the current demand for highly compact models with great sensing distances. Sensor sizes with diameters of 6,5 mm and more offer a four times greater sensing distance and models with M12 or larger housings can sense at distances up to five times greater. You can choose from three different housing materials: nickel-plated brass, chrome-nickel steel 1.4305 or plastic to suit your application needs.

Three different housing lengths!

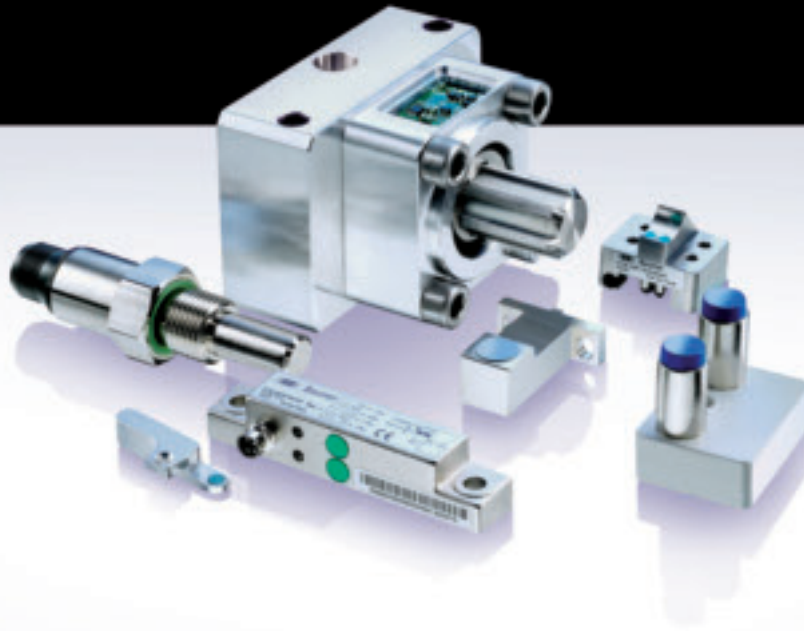
Short and sweet is how we make them, which gives you all the benefits of longer sensors in a much smaller housing. Nothing on earth can beat our star product with the world's shortest installation length of barely 28 mm, naturally equipped with M8 x 1 plug connector.

You want it longer? No problem – simply pick the medium-sized or long version, also available in a cable version!

Plug connector

Compact sensors require space-saving plug connectors too. Our range now includes the new M5 x 0,5 plug connector for our miniature series. We rely on the well-tested M8 x 1 and M12 x 1 connectors for our medium-sized and larger models. They naturally come in both straight and angular configurations.

Special versions according to customer specifications



Special versions according to customer specifications
Baumer's comprehensive range of standard inductive sensors satisfies most engineering and design requirements. Nevertheless, should you encounter an application that cannot be solved with an „off the shelf product“:

Baumer has years of experience in tailor made sensor solutions, a small selection of which is displayed on this page for your reference.

Our R & D team is up to the challenge of tackling your every sensing need with products customized to your application.

Try us. Present your specification sheet today!

AlphaProx Inductive distance measuring sensors with high resolution 0,1 μm



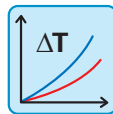
Whether in industry, the construction field or process chemistry, it always requires a team of competent specialists to create strong solutions.

Baumer too puts its faith in a "team" when it comes to finding solutions for industrial applications. This team is known as **AlphaProx** and comprises a family of high-quality, inductive analog sensors. Each sensor displays an individual specification which is ideally matched to its specific application areas.



Miniature housing

The trend towards miniaturization is unstoppable, even when it comes to distance measuring sensors. With a diameter of 4 mm, the IVRM 04 likely holds the title as the smallest inductive distance measuring sensor with an integrated amplifier.



Temperature stability at the greatest measurement distances

High temperature stability at the greatest possible measuring distance represents a further strength. Over 80 % of all distance measuring applications operate at ambient temperatures between +20 ... +50 °C. Our sensors exhibit a negligibly small temperature drift in the range between 0 ... +60 °C.



Flexibility through Teach-In

Sensors with Teach-in inputs can be optimally adapted to their individual applications. The extremely simple Teach-in routine allows not only the analog output to be influenced, but also an additionally integrated switching output.



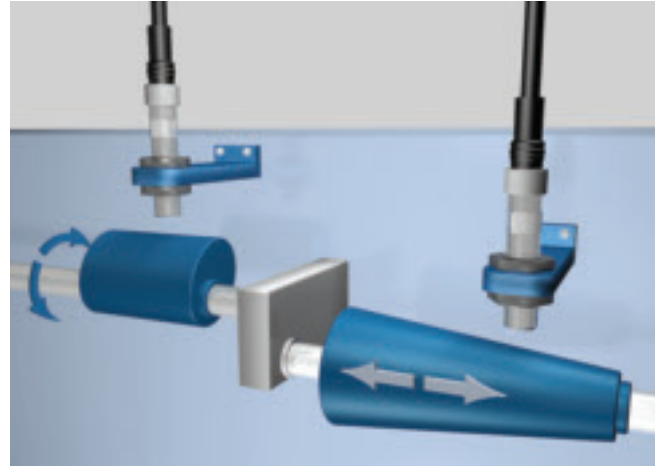
Very high EMI resistance

Resistance to electromagnetic interference is one of the most significant factors for the practical employment of sensors. Our sensor's EMI resistance limit values lie significantly above the specifications defined by the sensor standard, thus ensuring extremely high operational security.



Absolute linear and angular measurement

- Absolute linear measurement
- High reliability through contactless measurement
- Dirt-resistant measuring system
- Linear ways greater than the sensor measuring range can be measured
- Linear and rotary movements can be measured
- Compact sensor designs permit installation in even the most limited spaces



Belt tension regulation and monitoring

- High regulation quality at large frequencies is possible
- The sensor performs two functions: linear measurement (analog) and end position shutoff (digital)
- Using Teach-in, the sensor's measuring range can be optimally adjusted to the roll diameter



Vibration measurements on shafts and bearings

- Bearing play or true running measurements
- Measurements of distances down 1 μm
- Installation in even the most limited spaces (the amplifier is integrated in the sensor)
- Very rapid movements can be measured
- Miniature sensors also available in connector versions

Miniature versions of inductive sensors



The trend towards ultra compact machines and devices is here to stay. Baumer recognized this trend early on, resulting in the development of the world's smallest inductive sensors. A complete range of different sizes and enclosure shapes is perfectly matched to applications where space is scarce.



Miniature versions

- Smallest \varnothing 3 mm sensor
- Unthreaded housing designs for \varnothing 3 mm, \varnothing 4 mm, \varnothing 6,5 mm
- Steel housings with threads for M4, M5 and M8 dimensions
- Rectangular sensors for 4 mm, 6 mm, 8 mm dimensions



Special versions in miniaturized design

- 2-wire NAMUR versions in dimensions from 4 to 8 mm
- 2-wire NAMUR button sensors for mounting directly on PCBs in 10 mm dimension
- Measuring sensors with analog output (current/voltage) in dimensions from 4 to 8 mm



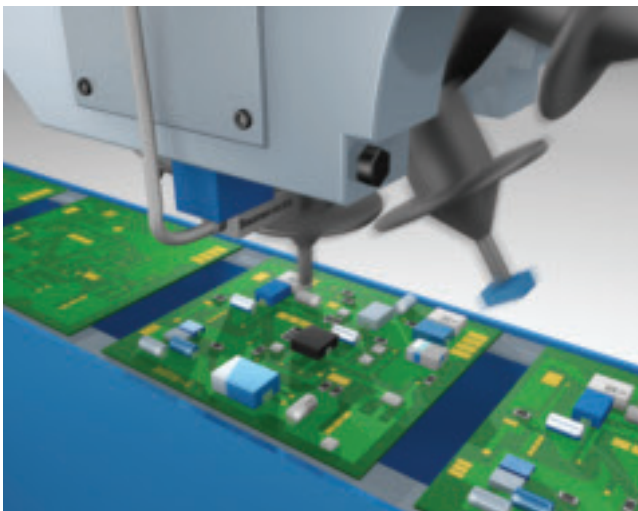
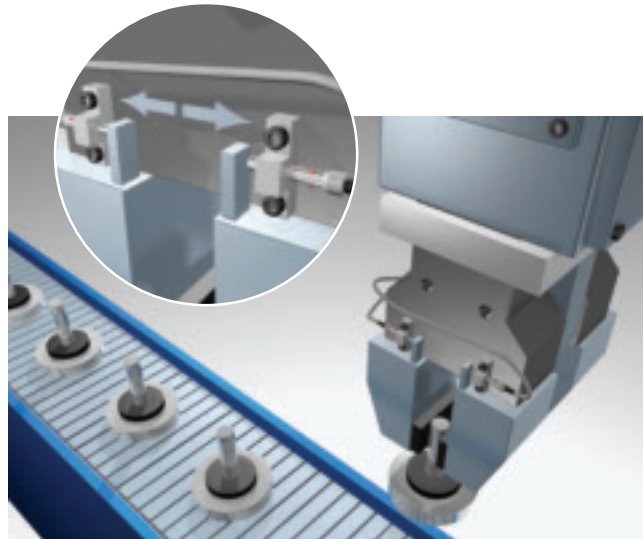
Electrical connection

- PUR and PVC leads
- M5 x 0,5 miniature connectors
- M8 x 1 connectors



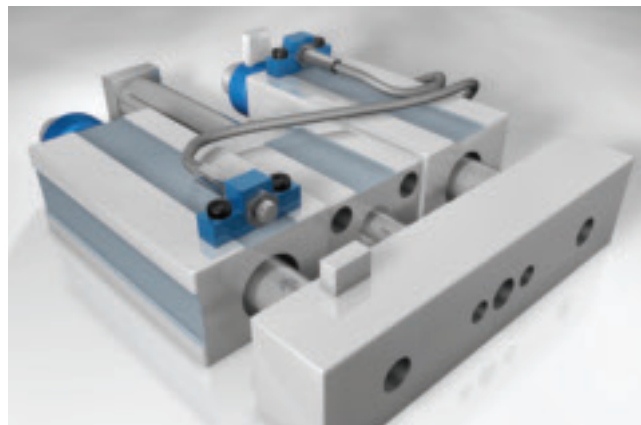
Robot grippers

- Gripper jaw end position detection
- Workpiece presence/absence check
- Miniature sensors designed for limited space conditions



Automatic SMD population equipment

- Synchronization of processes
- Precise position determination
- Absolute spacing measurement at high resolution



Linear unit

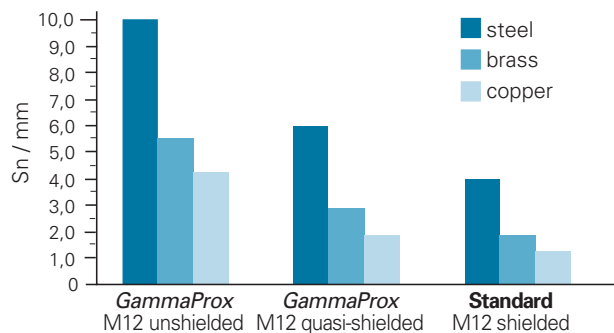
- Return report of the end positions
- Referencing / initialization

GammaProx Sensors with increased sensing distances



Five times greater sensing distance than the CENELEC standard

The sensing distances of the *GammaProx* line of sensors is up to five times that required by the CENELEC standard. This allows both steel and nonferrous metals to be effectively and reliably detected. The increased sensing distance generally permits greater distances to the moving objects to be selected which, in turn, allows greater mounting tolerances and helps to prevent mechanical damage and increase the overall reliability of the equipment.



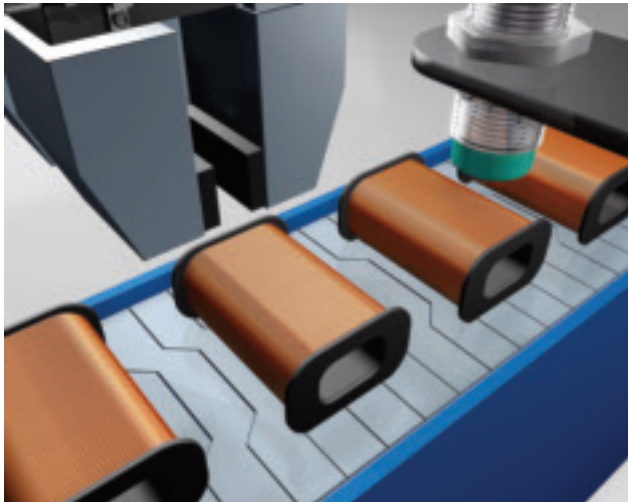
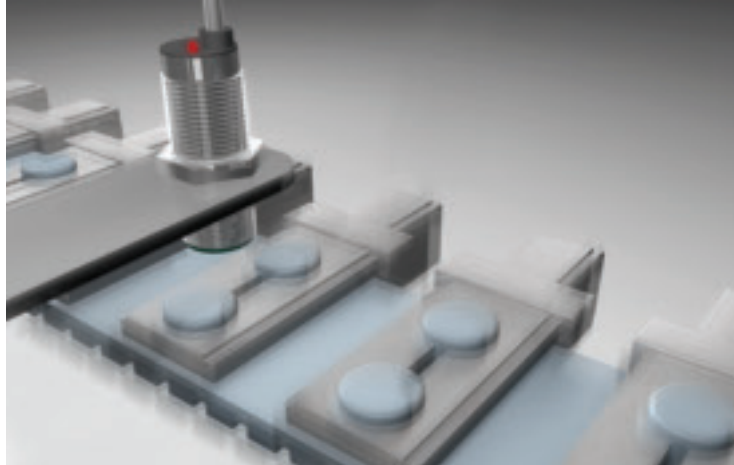
Quasi-shielded installation method

When installing quasi-shielded sensors in ferromagnetic metals, special installation instructions must be observed. In non-ferromagnetic materials such as copper, brass and aluminum, the sensors can be installed shielded.



Detection and counting of metal objects

- Where object distances vary greatly (mechanical tolerance compensation)
- Reliable detection of varying object sizes
- Detects a variety of metals (lowering the influence of the reduction factor)
- Also detects plastic-coated metals reliably

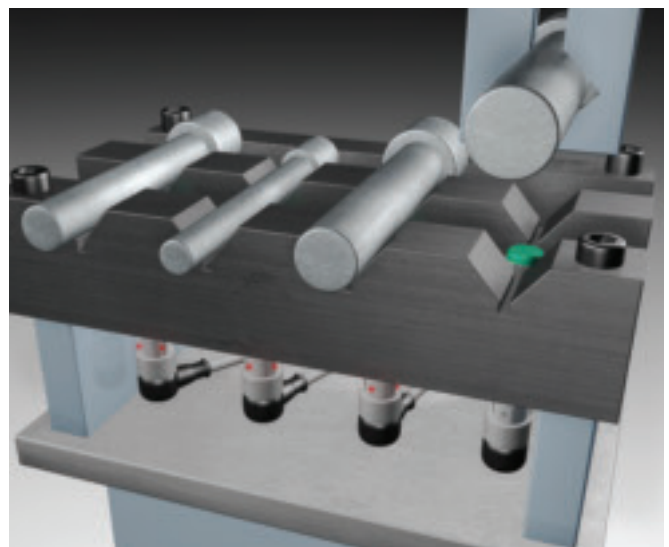


Coil and transformer production

- Detection of copper windings
- Quality control during spool manufacturing
- Can be employed on automatic winders

Handling and robotics

- Presence detection for tool pickups
- Permits greater mounting tolerances
- Reliable detection even where object distances vary greatly



DuroProx Inductive sensors with rugged full metal housings



DuroProx Designed for daily use under harsh industrial conditions

DuroProx sensors are built to take it in every sense. The inductive sensors with their full metal housing (Ø 6,5 to M18) providing IP 69K class protection were designed from the outset for harsh and demanding industrial applications. Thanks to an operating temperature range from -25 ... +100 °C and a housing made of V4A stainless steel, these sensors are equally at home in food handling applications, cutting oil environments and any other applications where heavy contamination is a factor. They also function flawlessly under conditions of severe EMI pollution thanks to both their full metal housing with an active surface made of stainless steel and increased noise immunity in accordance with EN 61000-6-2.



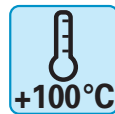
Quasi-shielded installation method

When installing quasi-shielded sensors in ferromagnetic metals, special installation instructions must be observed. In non-ferromagnetic materials such as copper, brass and aluminum, the sensors can be installed shielded.



Highest protection class

The family of *DuroProx* sensors meets the requirements of protection class IP 69K and is practically predestined for use in the food handling industry.



Large operating temperature range

The temperature span across which *DuroProx* sensors can be reliably employed ranges from -25 ... +100 °C.



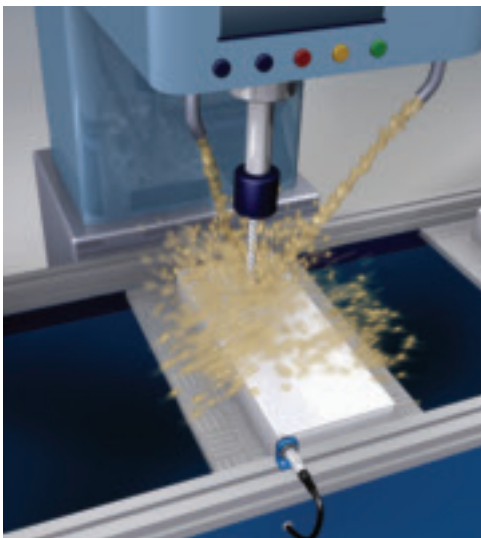
Full metal housing

The entire housing, including the active surface is made of V4A (1.4404) stainless steel. This makes *DuroProx* highly resistant to abrasive and chemically aggressive media such as acids, bases and salt water and is according the food and beverage standards.



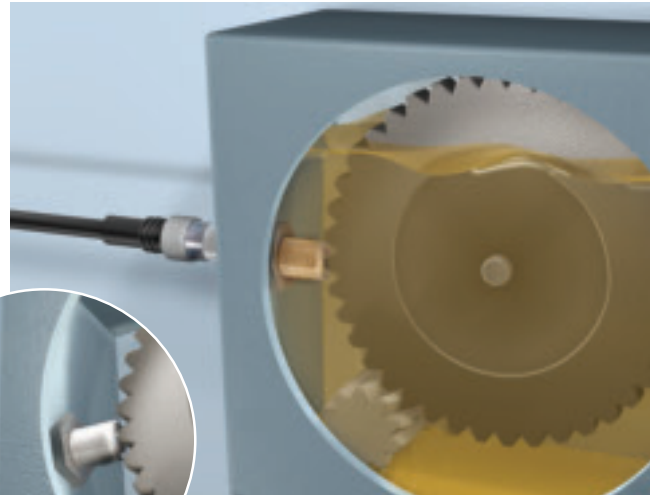
Long-term employment – Directly exposed to transmission fluid or motor oil

- Motor rpm counters
- Position reporting in transmissions
- Resistant to aggressive media such as oil additives



Continuous employment in wet cells

- During production processes involving cutting (CNC)
- Subjected to the influence of cutting, grinding and cooling/lubricating agents



Food processing industry

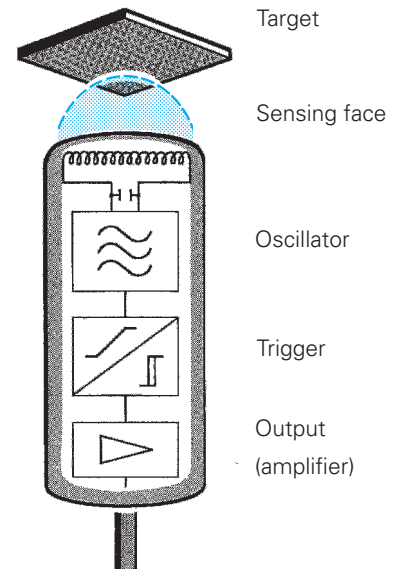
- Direct contact with foods (V4A steel)
- Cleaning using high-pressure water and steam
- Resistant to industrial detergents



The sensor

Baumer inductive proximity switches are non-contact electronic sensors. They consist of three components: Oscillator, Schmitt Trigger and Output.

Inductive sensors will recognize any conducting metal target. Care must be taken when specifying a sensor to take into account correction factors due to target material. It is also important to ensure that target size guidelines are met.



Operation

The oscillator creates a high frequency electromagnetic field, which radiates from the sensing face of the switch. When a conductive metal object enters this electromagnetic field, eddy currents are induced within the metal, causing a change in the amplitude of the oscillations. The result is a voltage change at the output of the oscillator, which causes the trigger to change state and alter the output state.

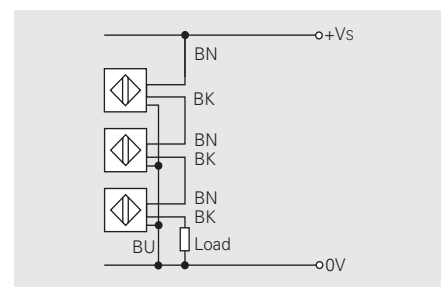
Output

Standard DC proximity sensors use digital on/off NPN or PNP transistor outputs. Analog DC outputs are available on the NAMUR range (current) as well as on the inductive linear sensor range (voltage and current).

Series switching

3-wire DC (PNP circuit shown)

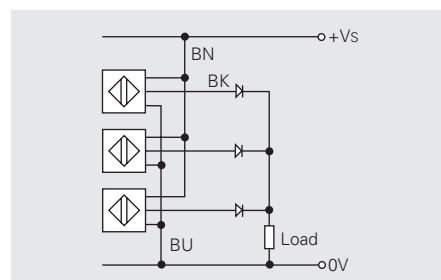
The voltage drop across each conducting sensor reduces the voltage available to drive the load. The number of proximity switches which can be connected in series is therefore limited and may be worked out by summing the individual voltage drops plus the load requirement.



Parallel switching

3-wire DC

3-wire DC sensors may be connected in parallel as shown. A parallel connection, however, must incorporate a decoupling diode.





Sensing distance

The IEC defines the sensing distance (s) in the international Standards IEC 60947-5-2 as follows:

Sensing distance

Sensing distance is defined as the distance at which the output signal is triggered when a standard target is moving towards the active sensor face.

Nominal sensing distance s_n

Nominal sensing distance is defined as a classification, that does not take into account either manufacturing tolerances or variations due to external conditions.

Real sensing distance s_r

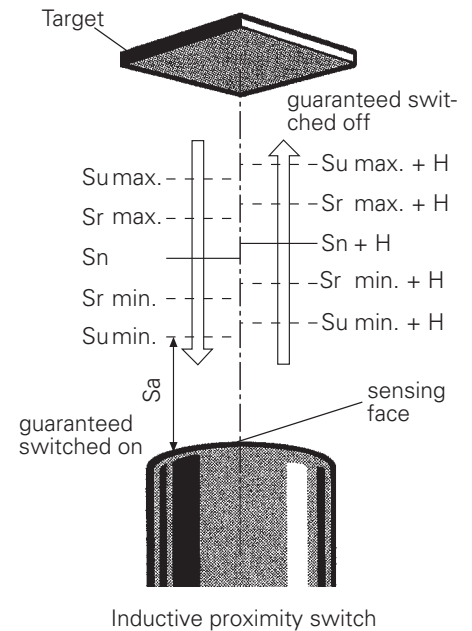
At nominal voltage (V_n) and nominal ambient temperature of 20 °C (68 °F) the real sensing distance has to be in the range of 90% to 110% of the s_n . ($0,9 \times s_n \leq s_r \leq 1,1 \times s_n$)

Usable sensing distance s_u

Usable sensing distance is defined to be within the allowable range for the operating voltage and ambient temperature in the range of 90% to 110% of the s_r . ($0,9 \times s_r \leq s_u \leq 1,1 \times s_r$)

Operational sensing distance s_a

The safe operational sensing distance lies between 0% and 81% of the s_n ($0 \leq s_a \leq 0,9 \times 0,9 \times s_n$)



Standard target

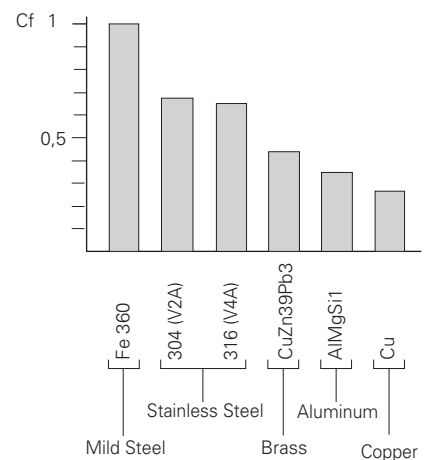
The standard target is defined as a square plate, 1 mm thick, made of Fe 360 (mild steel). The length of its side is defined as the larger of either the sensing face diameter or three times s_n (nominal sensing distance).

Correction factor

If the target material differs from the standard target (as defined above), then the applicable published sensing distance must be multiplied by the appropriate correction factor (Cf).

Note: The published figures should be taken as a guideline only. Targets which differ in size and shape from the standard geometry may also give a different sensing distance when compared to the figures stated in the data sheets.

When sensing aluminum foil or non-metallic materials coated with a thin layer of aluminum or copper, the sensing distance achieved may be close to the value of mild steel. Actual S_n depends on the thickness of the layer as well as the alloy composition.

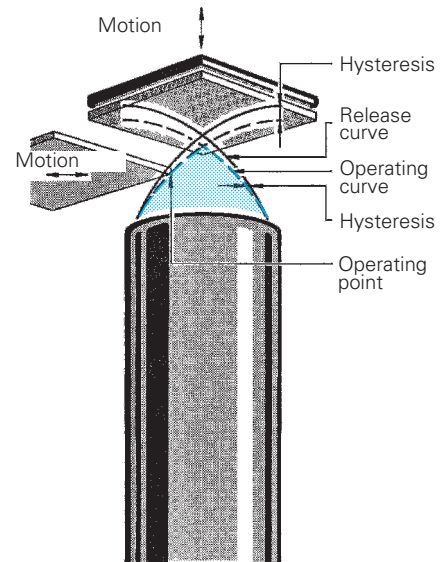




Hysteresis

At approach and removal of the target, there is a difference between operating and release point which is defined as Hysteresis.

Hysteresis is designed into a sensor's characteristics to guard against possible incorrect pick-up due to vibration.



Repeatability

The repeatability of the actual switching point of two successive switchings within 8 hours, at an ambient temperature between +15 °C and +30 °C, and a voltage of ±5% deviation from nominal, is ±5%.

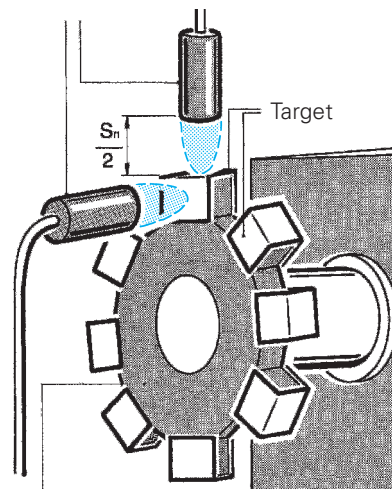
Temperature range

The normal temperature range is between -25 °C and +75 °C. Please call should your application require installations in areas where this range may be exceeded.

Switching frequency

Inductive proximity switches

Meeting EN50010 standards, the switching frequency is the highest possible number of switchings per second.



Disk
Non-magnetic and
non-conducting material



Mounting instructions for cylindrical forms

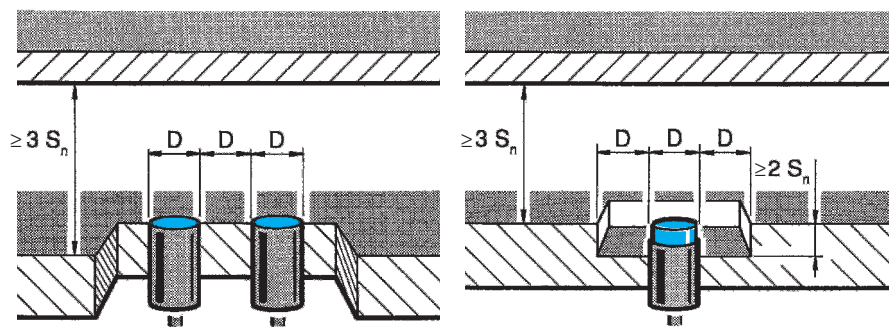
● shielded (flush) mounting

Sensor may be mounted flush in a metal plate.

Choice of carrier material can have an influence on sensing distance.

○ unshielded (non-flush) mounting

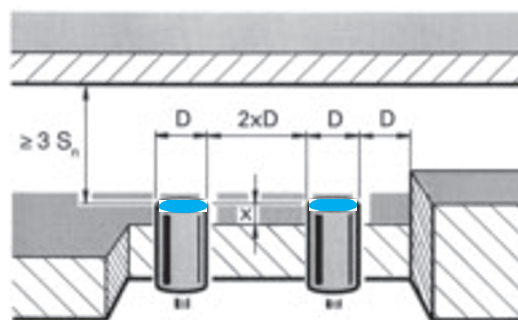
There must be a space equal to the diameter of the sensing head, with no metal interference. Following this rule the electrical field strength is less attenuated, which enables a larger sensing distance.



● quasi shielded mounting

When mounted in ferromagnetic material these sensors require a space (x) behind the active area that is free of metal.

Sensors can be installed shielded (flush) when mounted in non ferrous materials (colored metals etc.).



$x \geq 1/3 S_n$ for ferromagnetic material
 $x = 0$ for all other materials

Electrical and mechanical specifications



Voltage supply range +Vs	Maximum ripple 10 % of Vs. The supply voltage should not be higher or lower than the indicated maximum or minimum values.
Voltage drop Vd	This value indicates the maximum voltage drop measured across the conducting output.
Supply current	This is the maximum current consumed by the sensor, at nominal voltage, exclusive of output.
Oil resistant	The standard PVC cables as well as the PBT sensing faces are not made to operate continuously within an oily environment. PUR (polyurethane) cable options are available on both sensors and connectors.
Output resistance	3-wire proximity switches have a built- in load resistance. In case of high frequency switching an external load resistance can be connected in parallel in order to reduce the time constant.
Maximum cable length	A large cable length means a capacitive load for the output circuit and increases the influence of interference. Length should therefore be kept as short as possible.
Dimension	Normally the dimension refers to the width of the sensor, which for cylindrical body styles equals the diameter. Normally, the larger the body, the larger the coil and therefore the larger the sensing distance.
Reverse polarity protection	These sensors are protected against temporary reversed polarity voltage connection.
Max. Switching current	The maximum permissible load current passed through the sensor.
Output protection	All Baumer sensors are protected against back EMF.
Short circuit protection	Depending on the application, any sensor in our product range may be available with protection against short circuiting.
Magnetic fields	Strong magnetic fields might push the ferrite cores of the proximity switch into saturation. A proper switching is no longer guaranteed. Protective shielding is recommended.
NAMUR	NAMUR proximity switches change their current consumption as a metallic object approaches. The changed current consumption or the change in the internal resistance serves as the output signal. Together with suitable tested switching amplifiers, they can be used in an explosive environment.
Status display	Most of our proximity switches have an LED-display. It indicates the output switching status.
Connection cable	The voltage supplied to the sensor should always be within the specified range for proper operation. Within this range a 10% ripple (V_r) is allowed. Most of our proximity switches are equipped with highly flexible PVC cable. If a high resistance against oil and grease is required, the cable material can be changed to PUR. For high temperature resistance a teflon cable is used. The standard cable length is 2 meters.

Electrical and mechanical specifications



Maximum installation torque

To avoid damage to the proximity switches during mounting, the default torque value should not be exceeded.

Stainless steel thread:

M4 = 1,8 Nm / M5 = 2 Nm / M8 = 10 Nm M12 = 20 Nm / M18 = 55 Nm

Brass nickel plated thread:

M8 = 7 Nm / M12 = 15 Nm

M18 = 40 Nm / M30 = 200 Nm

Polybutylenterephthalate thread:

M12 = 1,5 Nm / M18 = 3 Nm

M30 = 15 Nm

(reduce torque values by 30% at the sensor's face)

The above data is valid for installations using the mounting nuts supplied with the sensor.

Protection class

IP 65 1) Protection against penetration of dust and complete protection against contact with electrical components.

2) Protection against a water jet from any direction.

IP 67 The stipulations in 1) also apply here. In addition, this class provides protection against water when the housing is immersed in water under specified conditions of time and pressure (30 minutes at 1 m water depth).

IP 69 The stipulations in 1) also apply here. In addition, water directed from any direction under strong pressure against the housing must have no detrimental effects.

IP 69K Protection class IP 69K is an important standard for devices used in the food and automotive industries. It describes high-pressure cleaning with pure water at a pressure of 8,000 to 10,000 kPa and a temperature of +80 °C. The duration of exposure is 30 seconds in each position. As this test method differs significantly from the other IP tests, devices with the test label IP 69K do not automatically have protection class IP 67 or IP 68. Only devices in protection class IP 67 also have the lower protection classes.

Mounting instructions for housings without threads

Heavy point loads on the housing, as can occur during fastening with grub screws, must be avoided (IFRM 03, 04, 06). Incorrect installation can cause irreversible damage to the proximity switch.

Various mounting aids are available for sensors without threads (ø 3, ø 4, ø 6,5).

Cable dimensions

Housing diam. Wire diam.

ø 3 3 x 0,05 mm² PVC

M5 / ø 4 3 x 0,08 mm² PUR

M8 / ø 6,5 3 x 0,14 mm² PVC

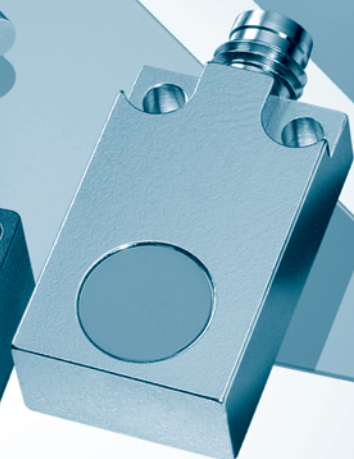
M12 3 x 0,25 mm² PVC

M18 3 x 0,25 / 3 x 0,50 mm² PVC








M30 3 x 0,50 mm² PVC









*Inductive distance
measuring sensors
AlphaProx*









cylindrical designs

product family	IWRM 04	IWRM 06	IWRM 08	IPRM 12	IWRM 12	IWRM 12	IWRM 12Z
							
	<i>AlphaProx</i>	<i>AlphaProx</i>	<i>AlphaProx</i>	<i>AlphaProx</i>	<i>AlphaProx</i>	<i>AlphaProx</i>	<i>AlphaProx</i>
shielded					■		
quasi shielded	■	■	■	■		■	■
measuring distance Sd	0 ... 1 mm	0 ... 2 mm	0 ... 2 mm	0 ... 2 mm	1 ... 1,5 mm 1 ... 2 mm	0 ... 4 mm	0 ... 4 mm
housing length	30 mm	40 mm 46 mm	40 mm 46 mm	90 mm	50 mm	50 mm	60 mm
voltage output	■	■	■		■	■	
voltage output / PNP							■
current output		■	■	■		■	
cable		■	■		■		
connector M5	■						
connector M8		■	■				
connector M12				■		■	■
stainless steel	■	■	■				
brass nickel plated					■	■	■
steel (9 SMn (Pb) 28/36)				■			
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
Page	37	38	39	40	41	42	43

rectangular designs

product family	IWFM 12	IWFM 12	IWFM 18	IWFM 20	IWFK 20	IWFM 20
						
	<i>AlphaProx</i>	<i>AlphaProx</i>	<i>AlphaProx</i>	<i>AlphaProx</i>	<i>AlphaProx</i>	<i>AlphaProx</i>
shielded	■	■	■	■		■
quasi shielded					■	
measuring distance Sd	0 ... 4 mm	1 ... 2 mm	0 ... 4 mm	2 ... 3 mm 2 ... 5 mm	0 ... 10 mm	0 ... 2 mm
housing length	60 mm	55 mm	30 mm	35 mm	42 mm	30 mm
voltage - / current output	■		■			
voltage output		■	■	■		■
voltage output / PNP					■	
current output				■		
cable		■				
flylead connector M8						■
connector M8	■		■	■	■	
brass nickel plated	■	■	■	■		■
polyester					■	
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
Page	50	51	52	53	54	55

IWRM 18	IWRM 18	IWRM 18Z	IWRM 30	IWRM 30	IWRM 30Z
					
<i>AlphaProx</i>	<i>AlphaProx</i>	<i>AlphaProx</i>	<i>AlphaProx</i>	<i>AlphaProx</i>	<i>AlphaProx</i>
■			■		
2 ... 4 mm 2 ... 5 mm	0 ... 8 mm	0 ... 8 mm	5 ... 9 mm 5 ... 10 mm	0 ... 16 mm	0 ... 16 mm
31,5 mm 65 mm	60 mm	60 mm	60 mm	63 mm	62 mm
■	■		■	■	
		■			■
■	■		■	■	
■			■		
	■	■		■	■
■	■	■	■	■	■
IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
44	45	46	47	48	49

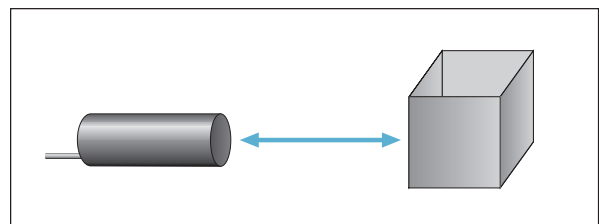


Function

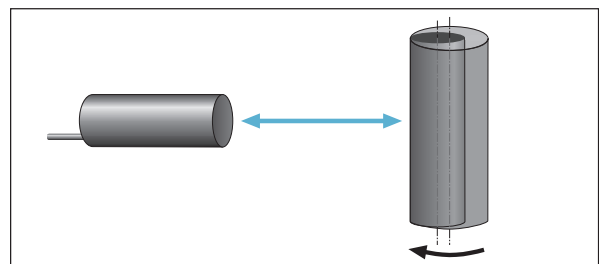
Inductive sensors with analog output signals are characterized by their short response times, high resolution and linearity as well as their outstanding repeat accuracy. The output current and voltage values are proportional to the distance between the sensor and the object being detected. In other words, they represent absolute measured values corresponding to the distance between the active surface and the object. These properties make inductively measuring linear sensors extremely interesting for numerous applications in the area of measurement and control engineering.

Typical applications

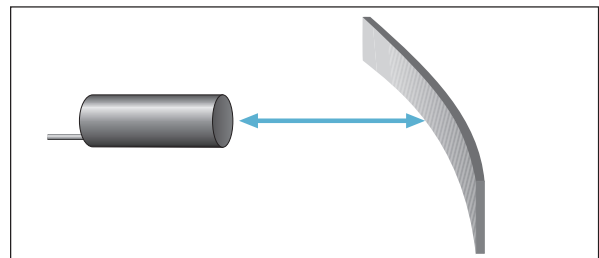
Travel / position / displacement



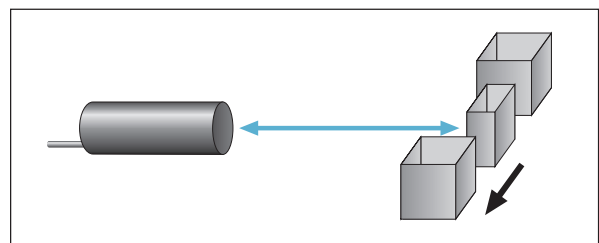
Diameter / eccentricity



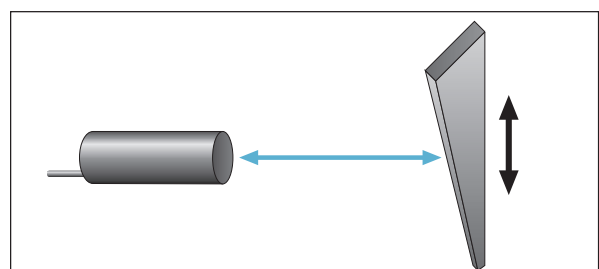
Deflection / deformation



Size comparison / measurement tolerance

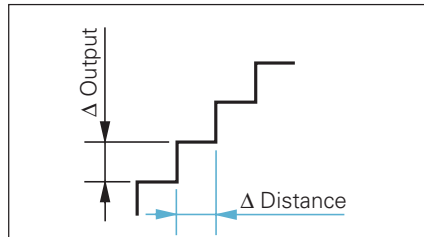


Taper / ramp



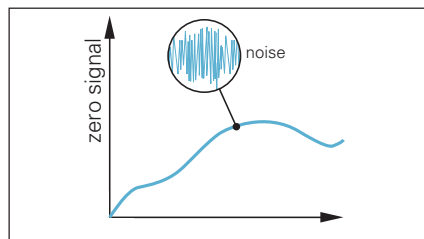


Resolution in general



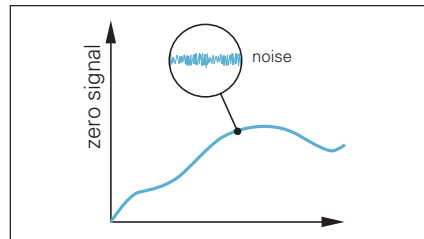
Resolution represents the smallest possible change in distance which will produce a measurable signal change at the sensor's output. Resolution can be impaired by high-frequency electrical interference (noise) or by the resolution of digital/analog converters.

Dynamic resolution



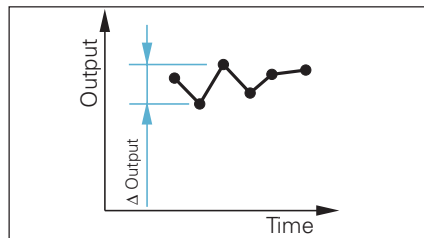
Signal noise exerts full effect on signal processing during very rapid measurements (high scan rates). Filtration without influencing the useful signal is only possible to a limited extent, if at all.

Static resolution



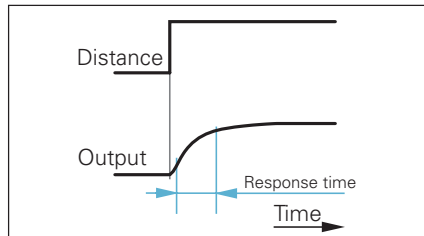
Very slow object movements (low scan rates) such as the temperature expansion of shafts allow the high-frequency interference to be filtered. The carrier signal is not influenced by this filtration. Using this technique significantly increases the resolution when compared to dynamic measurements.

Repeat accuracy



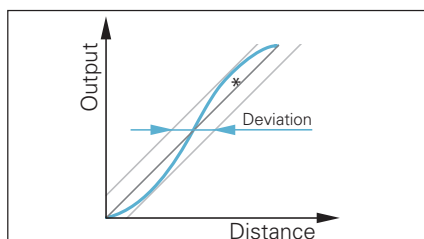
Repeat accuracy means the difference between the measured values of successive measurements within a period of 8 hours at an ambient temperature of 23 °C ± 5 °C.

Response time



The time which the signal output of a sensor requires to rise from 10% to 90% of the maximum signal level is called the response time.

FS Linearity



Linearity defines the deviation between the output signal and a straight line. It is given as a percentage of the measuring range end value (FS or Full Scale). The following alternatives are available for applications where the indicated linearity is insufficient:

- Sensors with linearized output curves
- Polynomials for the mathematical linearization of the sensor curve's in the controller

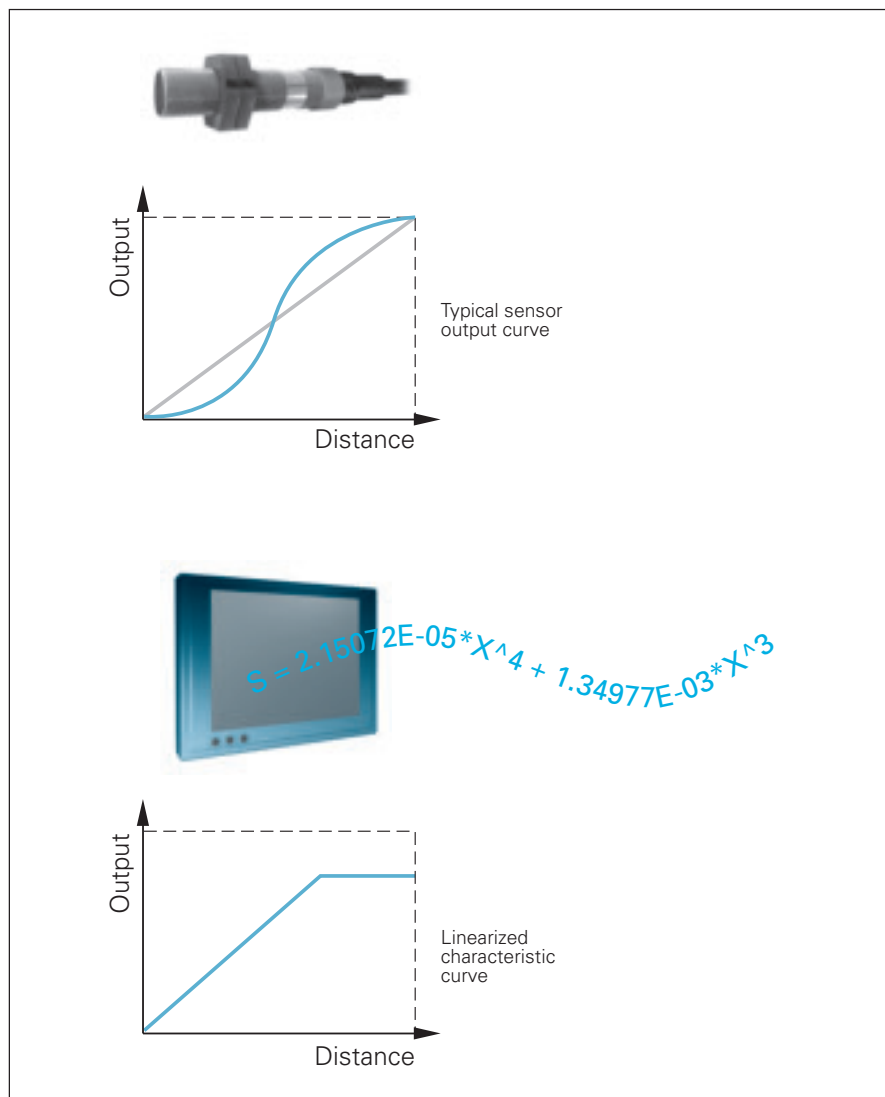


Signal linearization with polynomials

Polynomials represent a mathematical function which converts a typical inductive analog sensor output curve into a linear signal. For example, it is integrated in the software of a programmable logic control to change the s-shaped sensor signal into a straight line.

Polynomials are used when ...

- a linear signal progression is required across the entire signal range
- rapid measurements are to be performed
- no sensors with linear output curves are available for the intended measuring range
- an economical solution is desired



A variety of sensors with linear output curves are also available as alternatives.



Functions

The following parameters can be altered using the Teach-in function:

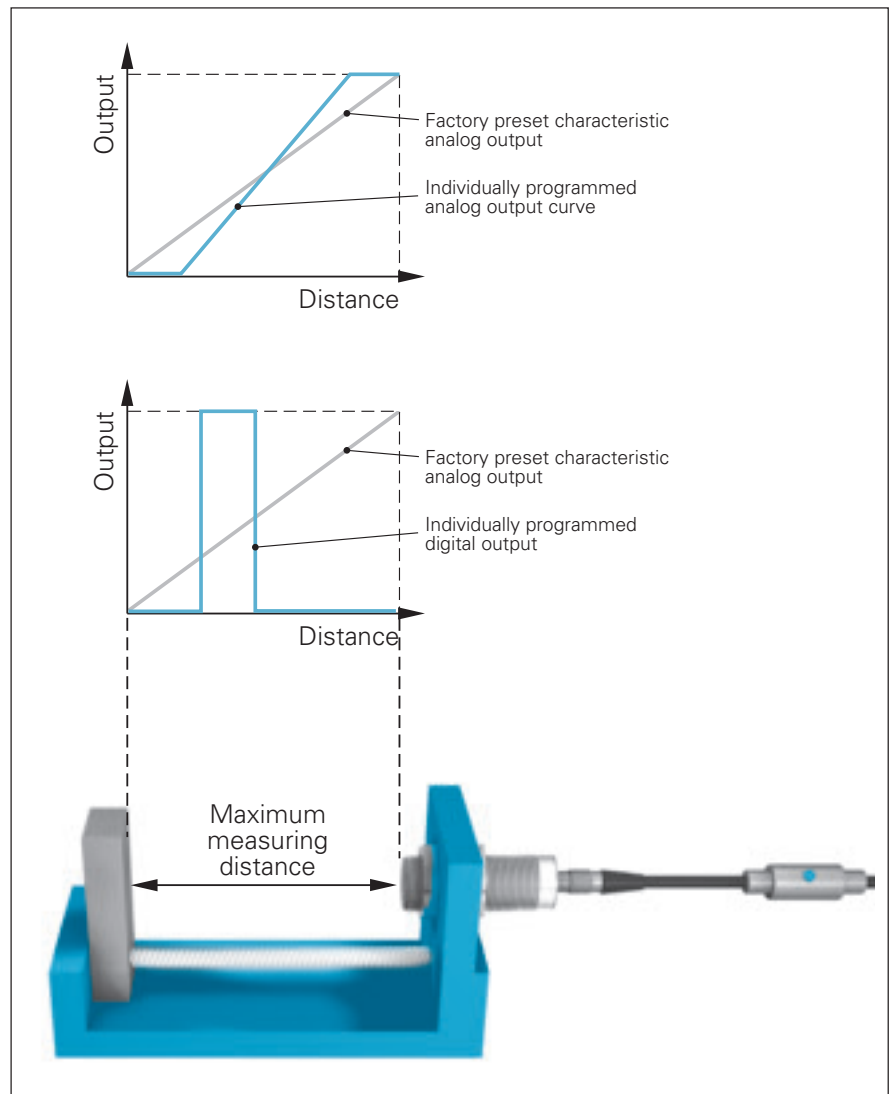
- Analog output (measuring range)
- Digital output (switching window)

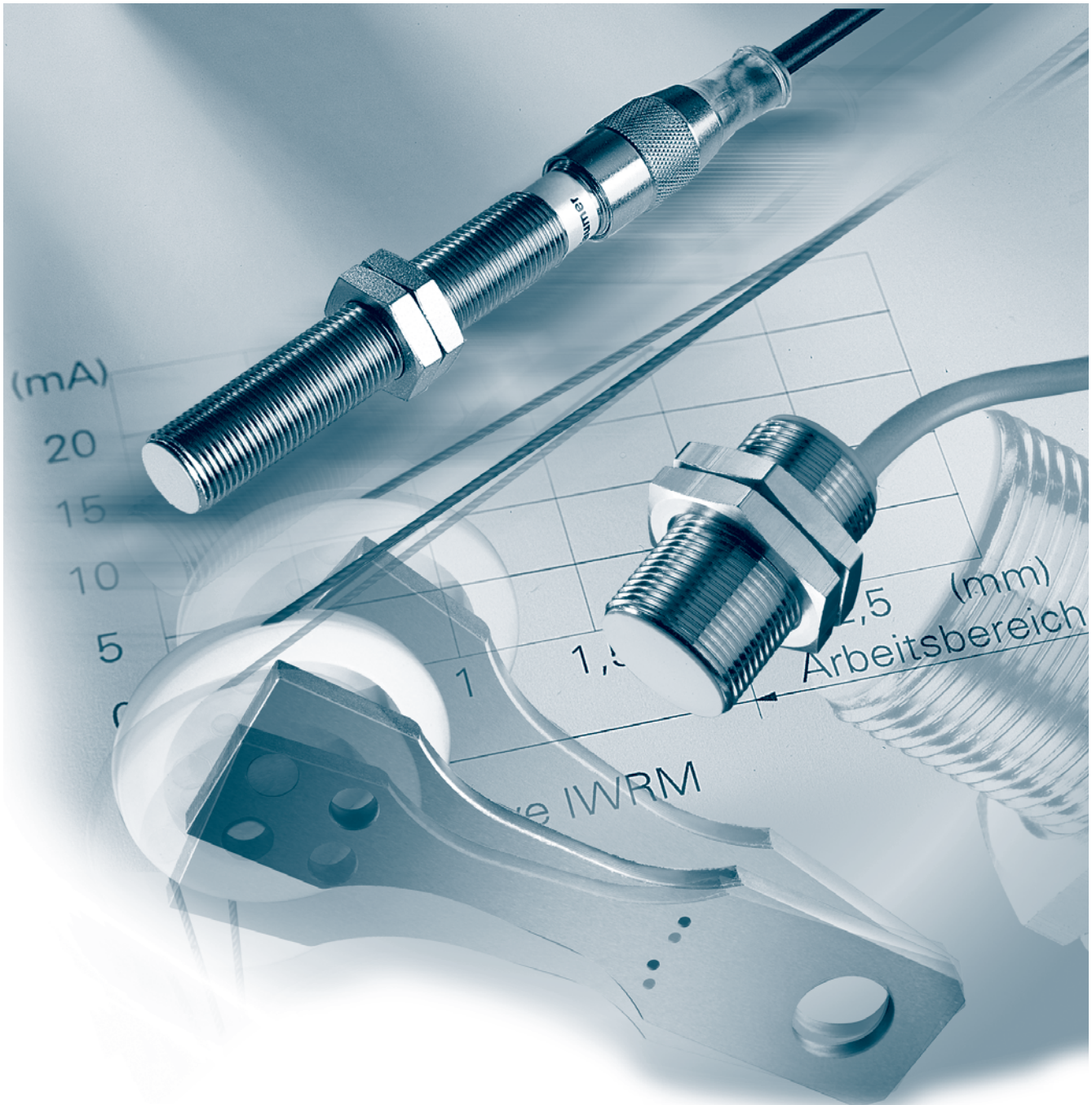
Procedure

The same Teach-in function menu structure is used for all sensors from Baumer, with the primary emphasis being on the simplest operation possible. This function allows the measuring range to be freely programmed within predefined limits. If, for example, a small measuring range with a large signal amplitude is desired, the range can be limited to merely a few millimeters. If necessary, the direction of the analog output's flow can be inverted, too.

In addition, the points at which one of the digital outputs switches on and off can be specified. These can lie either within or outside the individually programmed measuring range.

Programmable output curve







Sd = 0 ... 1 mm

- Compact housing design
- Very high resolution
- Short response time



general data

mounting type	quasi shielded
measuring distance Sd	0 ... 1 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeatability	< 0,005 mm
linearity error	± 100 µm
temperature drift	± 5% (Full Scale)

electrical data

response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	15 ... 30 VDC
current consumption max.	25 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
housing material	stainless steel
dimension	4 mm
housing length	30 mm
connection types	connector M5

ambient conditions

operating temperature	10 ... +60 °C
protection class	IP 67

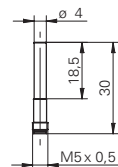
accessories

connectors	ESW 05, ESG 05
------------	----------------

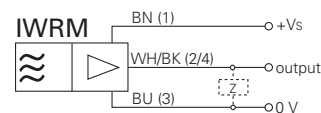
order reference

IWRM 04U9701/S05

dimension drawing



connection diagram





Sd = 0 ... 2 mm

ANALOG

- Very high resolution
- Short response time



general data

mounting type	quasi shielded
measuring distance Sd	0 ... 2 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeatability	< 0,02 mm
linearity error	± 100 µm
temperature drift	± 5% (Full Scale)

electrical data

response time (factory characteristic)	< 0,7 ms
voltage supply range +Vs	15 ... 30 VDC
short circuit protection	yes
reverse polarity protection	yes

voltage output

current consumption max.	25 mA
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm

current output

current consumption max.	35 mA
output signal	0 ... 10 mA
load resistance +Vs min.	< 910 Ohm
load resistance +Vs max.	< 2400 Ohm

mechanical data

type	cylindrical smooth
housing material	stainless steel
dimension	6,5 mm

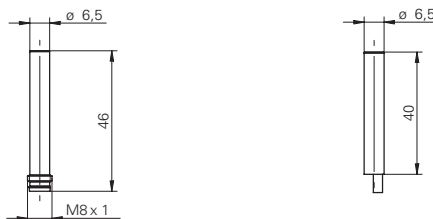
ambient conditions

operating temperature	10 ... +60 °C
protection class	IP 67

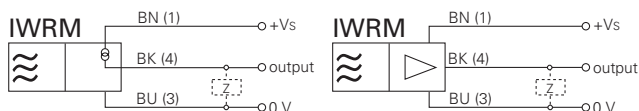
accessories

connectors	ESW 31S, ESG 32S
------------	------------------

dimension drawings



connection diagrams



IWRM 06 Sd = 0 ... 2 mm

Inductive distance measuring sensors *AlphaProx*

order reference	output circuit	housing length	connection types
IWRM 06I9501	current output	40 mm	cable
IWRM 06I9501/S35	current output	46 mm	connector M8
IWRM 06U9501	voltage output	40 mm	cable
IWRM 06U9501/S35	voltage output	46 mm	connector M8



Sd = 0 ... 2 mm

- Very high resolution
- Short response time



general data

mounting type	quasi shielded
measuring distance Sd	0 ... 2 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeatability	< 0,02 mm
linearity error	± 100 µm
temperature drift	± 5% (Full Scale)

electrical data

response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	15 ... 30 VDC
short circuit protection	yes
reverse polarity protection	yes

voltage output

current consumption max.	25 mA
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm

current output

current consumption max.	35 mA
output signal	0 ... 10 mA
load resistance +Vs min.	< 910 Ohm
load resistance +Vs max.	< 2400 Ohm

mechanical data

type	cylindrical threaded
housing material	stainless steel
dimension	8 mm

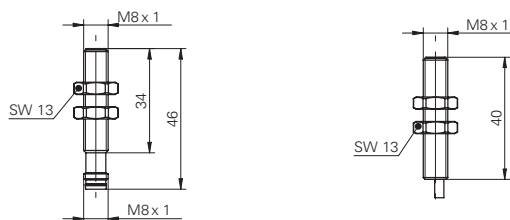
ambient conditions

operating temperature	10 ... +60 °C
protection class	IP 67

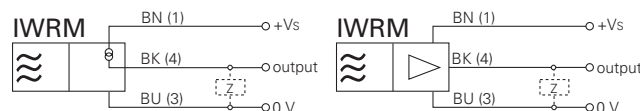
accessories

connectors	ESW 31S, ESG 32S
------------	------------------

dimension drawings



connection diagrams



order reference	output circuit	housing length	connection types
IWRM 08I9501	current output	40 mm	cable
IWRM 08I9501/S35	current output	46 mm	connector M8
IWRM 08U9501	voltage output	40 mm	cable
IWRM 08U9501/S35	voltage output	46 mm	connector M8

IWRM 08 Sd = 0 ... 2 mm Inductive distance measuring sensors AlphaProx



Sd = 0 ... 2 mm

ANALOG

- Very high resolution
- High repeat accuracy
- Minimized temperature drift



general data

mounting type	quasi shielded
measuring speed	< 1 mm / ms
measuring distance Sd	0 ... 2 mm
resolution	< 0,0001 mm
linearity error	± 60 µm
repeat accuracy S = 0 ... 1 mm	< 1 µm
repeat accuracy S = 0 ... 2 mm	< 5 µm
temperature drift S = 0 ... 1 mm	± 10 µm
temperature drift S = 1 ... 2 mm	± 40 µm

electrical data

voltage supply range +Vs	12 ... 30 VDC
current consumption max.	20 mA
output circuit	current output
output signal	0 ... 20 mA
load resistance +Vs min.	< 100 Ohm
load resistance +Vs max.	< 330 Ohm
zero point offset	< 0,3 mA
voltage drop Vd	< 7 VDC
short circuit protection	yes
reverse polarity protection	yes

mechanical data

connection types	connector M12
type	cylindrical threaded
dimension	12 mm
housing length	90 mm
housing material	steel (9 SMn (Pb) 28/36)

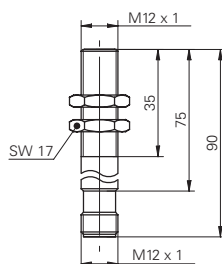
ambient conditions

operating temperature	0 ... +60 °C
protection class	IP 67

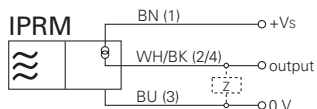
accessories

connectors	ES 14, ES 18, ESW 33S, ESG 34S
------------	--------------------------------

dimension drawing



connection diagram



order reference

IPRM 12I9505/S14

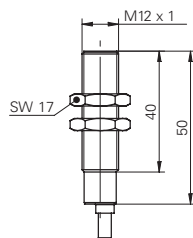


Sd = 1 ... 2 mm

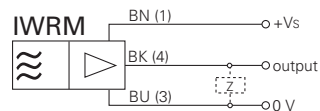


general data	
mounting type	shielded
measuring speed	< 0,5 mm / ms
repeatability	< 0,02 mm
temperature coefficient	1 µm / (K mm)
electrical data	
voltage supply range +Vs	14 ... 30 VDC
current consumption max.	20 mA
output circuit	voltage output
output signal	1 ... 9 VDC
load resistance	> 1000 Ohm
residual output ripple	< 0,5 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	12 mm
housing length	50 mm
connection types	cable
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

dimension drawing



connection diagram



order reference	measuring distance Sd	reference distance	linearity error
IWRM 12U9501	1 ... 2 mm	1,35 ... 1,65 mm	± 80 µm
IWRM 12U9502	1 ... 1,5 mm	1,15 ... 1,35 mm	± 60 µm



Sd = 0 ... 4 mm

ANALOG

- Large measuring distance
- Very high resolution
- Short response time



general data

mounting type	quasi shielded
measuring distance Sd	0 ... 4 mm
linearity error	± 160 µm
temperature drift	± 4% (Full Scale)

electrical data

voltage supply range +Vs	15 ... 30 VDC
short circuit protection	yes
reverse polarity protection	yes

voltage output

current consumption max.	20 mA
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm

current output

output signal	4 ... 20 mA
load resistance +Vs min.	< 330 Ohm
load resistance +Vs max.	< 1000 Ohm

mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	12 mm
housing length	50 mm
connection types	connector M12

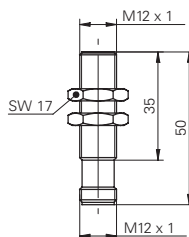
ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

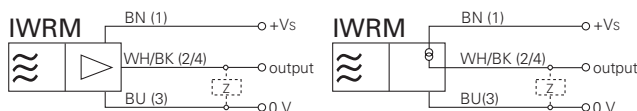
accessories

connectors	ES 14, ES 18, ESW 33S, ESG 34S
------------	--------------------------------

dimension drawing



connection diagrams



IWRM 12 Sd = 0 ... 4 mm

Inductive distance measuring sensors *AlphaProx*

order reference	resolution	repeatability	output circuit	response time (factory characteristic)
IWRM 12I9704/S14	< 0,001 mm (stat.) < 0,005 mm (dynam.)	< 0,01 mm	current output	< 2 ms
IWRM 12I9705/S14	< 0,001 mm (dynam.) < 0,0005 mm (stat.)	< 0,005 mm	current output	< 30 ms
IWRM 12U9704/S14	< 0,001 mm (stat.) < 0,005 mm (dynam.)	< 0,01 mm	voltage output	< 2 ms
IWRM 12U9705/S14	< 0,0005 mm (stat.) < 0,001 mm (dynam.)	< 0,005 mm	voltage output	< 30 ms



Sd = 0 ... 4 mm



- External Teach-in
- Integrated Analog- and switching output
- Linear analog output

general data

mounting type	quasi shielded
measuring distance Sd	0 ... 4 mm
resolution	< 0,005 mm (stat.), < 0,005 mm (dynam.)
repeatability	< 0,01 mm
adjustment means	external Teach-in
linearity error	± 16 µm
temperature drift	± 5% (Full Scale)

electrical data

response time (factory characteristic)	< 2,5 ms
response time (teach in characteristic)	< 3,1 ms
voltage supply range +Vs	15 ... 30 VDC
short circuit protection	yes
reverse polarity protection	yes
current consumption max.	20 mA

analog output

output circuit	voltage output / PNP
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm

digital output

output circuit	PNP normally closed (NO)
output current	< 10 mA
voltage drop Vd	< 5 VDC

mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	12 mm
housing length	60 mm
connection types	connector M12

ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

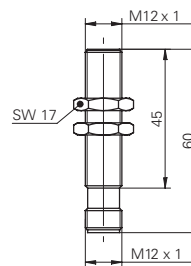
accessories

teach-in-adapter	Nr. 141584
connectors	ES 33C, ES 34C

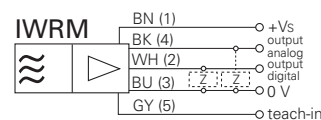
order reference

IWRM 12Z8704/S14C

dimension drawing



connection diagram



Sd = 0 ... 4 mm

IWRM 12Z

Inductive distance measuring sensors *AlphaProx*



Sd = 2 ... 5 mm



IWRM 18 Sd = 2 ... 5 mm

general data

mounting type	shielded
measuring speed	< 1 mm / ms
repeatability	< 0,02 mm
temperature coefficient	1 µm / (K mm)

electrical data

voltage supply range +Vs	15 ... 30 VDC
residual output ripple	< 0,5 % Vs
short circuit protection	yes
reverse polarity protection	yes

voltage output

current consumption max.	20 mA
output signal	1 ... 9 VDC

current output

current consumption max.	35 mA
output signal	4 ... 20 mA
load resistance +Vs min.	< 500 Ohm
load resistance +Vs max.	< 1000 Ohm

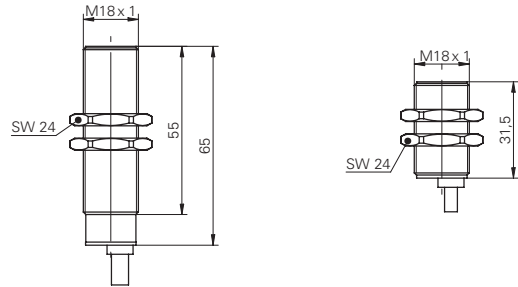
mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	18 mm
connection types	cable

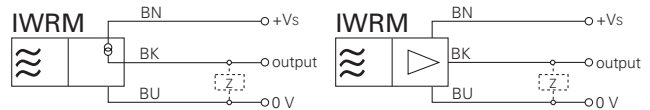
ambient conditions

operating temperature	0 ... +60 °C
protection class	IP 67

dimension drawings



connection diagrams



Inductive distance measuring sensors *AlphaProx*

order reference	measuring distance Sd	reference distance	output circuit	housing length	linearity error	load resistance
IWRM 18I9501	2 ... 5 mm	3,25 ... 3,75 mm	current output	65 mm	± 100 µm	-
IWRM 18I9502	2 ... 4 mm	2,8 ... 3,2 mm	current output	65 mm	± 80 µm	-
IWRM 18I9511	2 ... 5 mm	3,25 ... 3,75 mm	current output	31,5 mm	± 100 µm	500...1000 Ohm
IWRM 18U9501	2 ... 5 mm	3,25 ... 3,75 mm	voltage output	65 mm	± 100 µm	> 1000 Ohm
IWRM 18U9502	2 ... 4 mm	2,8 ... 3,2 mm	voltage output	65 mm	± 80 µm	> 1000 Ohm
IWRM 18U9511	2 ... 5 mm	3,25 ... 3,75 mm	voltage output	31,5 mm	± 100 µm	> 1000 Ohm
IWRM 18U9512	2 ... 4 mm	2,8 ... 3,2 mm	voltage output	31,5 mm	± 80 µm	> 1000 Ohm



Sd = 0 ... 8 mm



- Large measuring distance
- Short response time
- Extended immunity against electrical interference

general data

mounting type	quasi shielded
measuring distance Sd	0 ... 8 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeatability	< 0,015 mm
linearity error	± 400 µm
temperature drift	± 5% (Full Scale)

electrical data

response time (factory characteristic)	< 2 ms
voltage supply range +Vs	15 ... 30 VDC
short circuit protection	yes
reverse polarity protection	yes

voltage output

current consumption max.	20 mA
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm

current output

current consumption max.	40 mA
output signal	4 ... 20 mA
load resistance +Vs min.	< 330 Ohm
load resistance +Vs max.	< 1000 Ohm

mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	18 mm
housing length	60 mm
connection types	connector M12

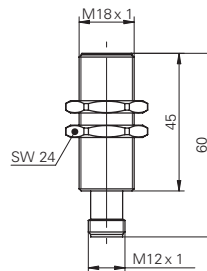
ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

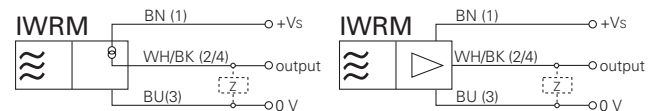
accessories

connectors	ES 14, ES 18, ESW 33S, ESG 34S
------------	--------------------------------

dimension drawing



connection diagrams



order reference **output circuit**

IWRM 18I9704/S14	current output
IWRM 18U9704/S14	voltage output



Sd = 0 ... 8 mm



- External Teach-in
- Integrated Analog- and switching output
- Linear analog output

general data

mounting type	quasi shielded
measuring distance Sd	0 ... 8 mm
resolution	< 0,010 mm (stat.), < 0,010 mm (dynam.)
repeatability	< 0,015 mm
adjustment means	external Teach-in
linearity error	< 32 µm
temperature drift	± 5% (Full Scale)

electrical data

response time (factory characteristic)	< 2 ms
response time (teach in characteristic)	< 3,1 ms
voltage supply range +Vs	15 ... 30 VDC
short circuit protection	yes
reverse polarity protection	yes
current consumption max.	20 mA

analog output

output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm

digital output

output circuit	PNP normally closed (NO)
output current	< 10 mA
voltage drop Vd	< 5 VDC

mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	18 mm
housing length	60 mm
connection types	connector M12

ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

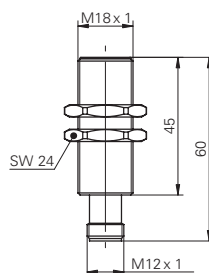
accessories

teach-in-adapter	Nr. 141584
connectors	ESW 33, ESG 34

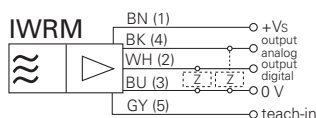
order reference

IWRM 18Z8704/S14C

dimension drawing



connection diagram



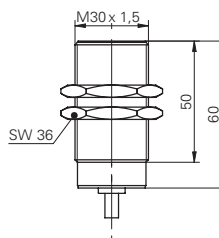


Sd = 5 ... 10 mm

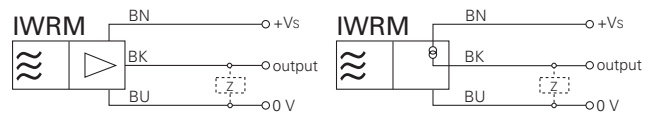


general data	
mounting type	shielded
measuring speed	< 1,5 mm / ms
repeatability	< 0,02 mm
temperature coefficient	1 µm / (K mm)
electrical data	
voltage supply range +Vs	15 ... 30 VDC
residual output ripple	< 0,5 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max.	20 mA
output signal	1 ... 9 VDC
load resistance	> 1000 Ohm
current output	
current consumption max.	35 mA
output signal	4 ... 20 mA
load resistance +Vs min.	< 500 Ohm
load resistance +Vs max.	< 1000 Ohm
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	30 mm
housing length	60 mm
connection types	cable
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

dimension drawing



connection diagrams



order reference	measuring distance Sd	reference distance	output circuit	linearity error
IWRM 30I9501	5 ... 10 mm	7,1 ... 7,9 mm	current output	± 200 µm
IWRM 30U9501	5 ... 10 mm	7,1 ... 7,9 mm	voltage output	± 200 µm
IWRM 30U9502	5 ... 9 mm	6,7 ... 7,3 mm	voltage output	± 150 µm

IWRM 30 Sd = 5 ... 10 mm Inductive distance measuring sensors AlphaProx



Sd = 0 ... 16 mm

ANALOG

- Large measuring distance
- Short response time
- Extended immunity against electrical interference



general data

mounting type	quasi shielded
measuring distance Sd	0 ... 16 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeatability	< 0,015 mm
linearity error	± 1600 µm
temperature drift	± 5% (Full Scale)

electrical data

response time (factory characteristic)	< 2 ms
voltage supply range +Vs	15 ... 30 VDC
short circuit protection	yes
reverse polarity protection	yes

voltage output

current consumption max.	20 mA
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm

current output

current consumption max.	40 mA
output signal	4 ... 20 mA
load resistance +Vs min.	< 330 Ohm
load resistance +Vs max.	< 1000 Ohm

mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	30 mm
housing length	63 mm
connection types	connector M12

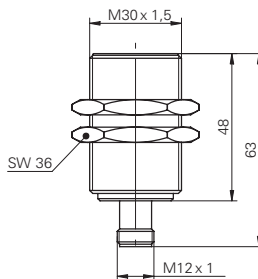
ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

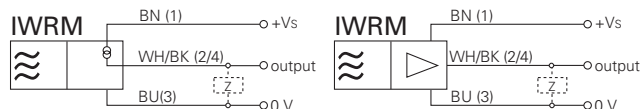
accessories

connectors	ES 14, ES 18, ESW 33S, ESG 34S
------------	--------------------------------

dimension drawing



connection diagrams



order reference **output circuit**

IWRM 30I9704/S14	current output
IWRM 30U9704/S14	voltage output



Sd = 0 ... 16 mm

ANALOG

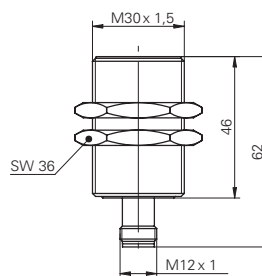
- External Teach-in
- Integrated Analog- and switching output
- Linear analog output



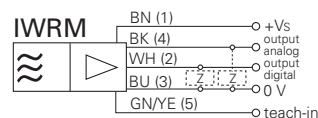
general data	
mounting type	quasi shielded
measuring distance Sd	0 ... 16 mm
resolution	< 0,01 mm (stat.) < 0,01 mm (dynam.)
repeatability	< 0,015 mm
adjustment	external Teach-in
linearity error	± 160 µm
temperature drift	± 5% (Full Scale)
electrical data	
response time (factory characteristic)	< 2,5 ms
response time (teach in characteristic)	< 3,1 ms
voltage supply range +Vs	15 ... 30 VDC
short circuit protection	yes
reverse polarity protection	yes
current consumption max.	20 mA
analog output	
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm
digital output	
output circuit	PNP normally closed (NO)
output current	< 10 mA
voltage drop Vd	< 5 VDC
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	30 mm
housing length	62 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 ... +70 °C
protection class	IP 67
accessories	
connectors	ES 33C, ES 34C
teach-in-adapter	Nr. 141584

order reference
IWRM 30Z8704/S14C

dimension drawing



connection diagram



IWRM 30Z Sd = 0 ... 16 mm

Inductive distance measuring sensors *AlphaProx*



Sd = 0 ... 4 mm

- Very high resolution
- Short response time
- Integrated current- and voltage output



general data

mounting type	shielded
measuring distance Sd	0 ... 4 mm
linearity error	± 160 µm
temperature drift	± 4% (Full Scale)

electrical data

voltage supply range +Vs	15 ... 30 VDC
current consumption max.	40 mA
short circuit protection	yes
reverse polarity protection	yes

analog output 1

output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm

analog output 2

output circuit	current output
output signal	4 ... 20 mA
load resistance at +Vs min.	< 300 Ohm
load resistance at +Vs max.	< 1000 Ohm

mechanical data

type	rectangular
housing material	brass nickel plated
dimension	12 mm
housing length	60 mm
connection types	connector M8

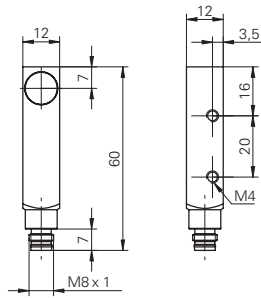
ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

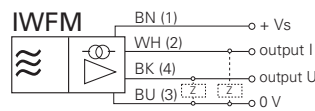
accessories

connectors	ESW 31A, ESG 32A
------------	------------------

dimension drawing



connection diagram



order reference	resolution	repeatability	response time (factory characteristic)
IWFM 12L9504/S35A	< 0,001 mm (stat.) < 0,005 mm (dynam.)	< 0,01 mm	< 2 ms
IWFM 12L9505/S35A	< 0,0005 mm (stat.) < 0,001 mm (dynam.)	< 0,005 mm	< 30 ms

Sd = 0 ... 4 mm

IWFM 12

Inductive distance measuring sensors *AlphaProx*



Sd = 1 ... 2 mm



general data

mounting type	shielded
measuring distance Sd	1 ... 2 mm
reference distance	1,35 ... 1,65 mm
measuring speed	< 0,5 mm / ms
repeatability	< 0,02 mm
linearity error	± 80 µm
temperature coefficient	1 µm / (K mm)

electrical data

voltage supply range +Vs	15 ... 30 VDC
current consumption max.	20 mA
output circuit	voltage output
output signal	1 ... 9 VDC
load resistance	> 1000 Ohm
residual output ripple	< 0,5 % Vs
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
housing material	brass nickel plated
dimension	12 mm
housing length	55 mm
connection types	cable

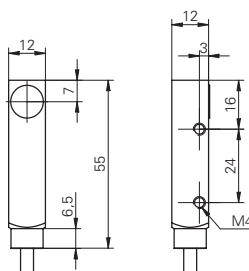
ambient conditions

operating temperature	0 ... +60 °C
protection class	IP 67

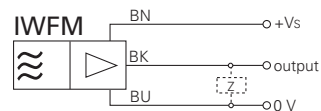
order reference

IWFM 12U9501/O1

dimension drawing



connection diagram





Sd = 0 ... 4 mm

ANALOG

- Very high resolution
- Short response time



general data

mounting type	shielded
measuring distance Sd	0 ... 4 mm
temperature drift	± 5 % (Full Scale)

electrical data

voltage supply range +Vs	15 ... 30 VDC
short circuit protection	yes
reverse polarity protection	yes

analog output 1

output circuit	voltage output
output signal	4 ... 20 mA
load resistance at +Vs min.	< 330 Ohm
load resistance at +Vs max.	< 1000 Ohm

analog output 2

output circuit	current output
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm

mechanical data

type	rectangular
housing material	brass nickel plated
dimension	18 mm
housing length	30 mm
connection types	connector M8

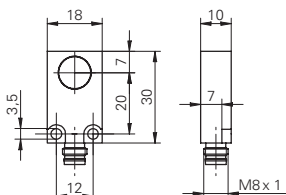
ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

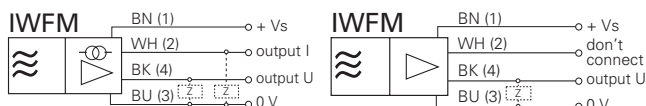
accessories

connectors	ESW 31A, ESG 32A
------------	------------------

dimension drawing



connection diagrams



Sd = 0 ... 4 mm

IWFM 18

Inductive distance measuring sensors *AlphaProx*

order reference	resolution	repeatability	output circuit	response time (factory characteristic)	linearity error	current consumption max.
IWFM 18L9504/S35A	0,001 mm (stat.) 0,005 mm (dynam.)	< 0,01 mm	voltage - / current output	< 2 ms	± 160 µm	40 mA
IWFM 18L9505/S35A	0,0005 mm (stat.) 0,001 mm (dynam.)	< 0,05 mm	voltage - / current output	< 30 ms	± 160 µm	40 mA
IWFM 18U7504/S35A	0,005 mm (stat.) 0,005 mm (dynam.)	< 0,01 mm	voltage output	< 2,5 ms	± 16 µm (linear)	20 mA



Sd = 2 ... 5 mm



general data

mounting type	shielded
measuring speed	< 1 mm / ms
repeatability	< 0,01 mm
temperature coefficient	1 µm / (K mm)

electrical data

voltage supply range +Vs	15 ... 30 VDC
residual output ripple	< 0,5 % Vs
short circuit protection	yes
reverse polarity protection	yes

voltage output

current consumption max.	20 mA
output signal	1 ... 9 VDC
load resistance	> 1000 Ohm

current output

current consumption max.	35 mA
output signal	4 ... 20 mA
load resistance +Vs min.	< 500 Ohm
load resistance +Vs max.	< 1000 Ohm

mechanical data

type	rectangular
housing material	brass nickel plated
dimension	20 mm
housing length	35 mm
connection types	connector M8

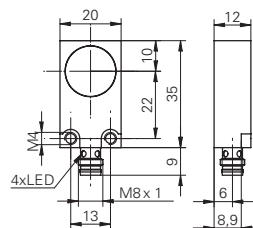
ambient conditions

operating temperature	0 ... +60 °C
protection class	IP 67

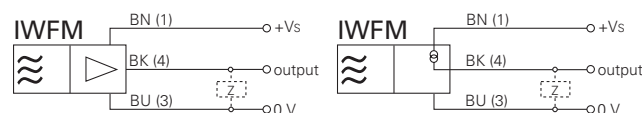
accessories

connectors	ESW 31S, ESG 32S
------------	------------------

dimension drawing



connection diagrams



order reference	measuring distance Sd	reference distance	output circuit	linearity error
IWFM 20I9501/S35	2 ... 5 mm	3,25 ... 3,75 mm	current output	± 100 µm
IWFM 20I9503/S35	2 ... 3 mm	2,35 ... 2,65 mm	current output	± 60 µm
IWFM 20U9501/S35	2 ... 5 mm	3,25 ... 3,75 mm	voltage output	± 100 µm
IWFM 20U9503/S35	2 ... 3 mm	2,35 ... 2,65 mm	voltage output	± 60 µm

Inductive distance measuring sensors *AlphaProx* IWFM 20 Sd = 2 ... 5 mm



Sd = 0 ... 10 mm

ANALOG

- Internal Teach-In
- Integrated Analog- and switching output
- Linear analog output



general data

mounting type	quasi shielded
measuring distance Sd	0 ... 10 mm
resolution	< 0,01 mm (stat.) < 0,01 mm (dynam.)
repeatability	< 0,015 mm
adjustment means	Teach-in
linearity error	± 50 µm
temperature drift	± 5% (Full Scale)

electrical data

response time (factory characteristic)	< 2,5 ms
response time (teach in characteristic)	< 3,1 ms
voltage supply range +Vs	15 ... 30 VDC
current consumption max.	20 mA
short circuit protection	yes
reverse polarity protection	yes

analog output

output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm

digital output

output circuit	PNP normally closed (NO)
output current	< 10 mA
voltage drop Vd	< 5 VDC

mechanical data

type	rectangular
housing material	polyester
dimension	20 mm
housing length	42 mm
connection types	connector M8

ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

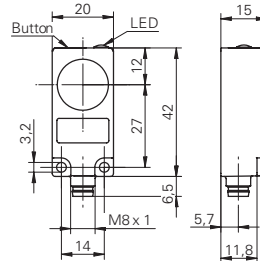
accessories

connectors	ESW 31A, ESG 32A
------------	------------------

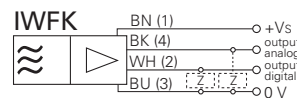
order reference

IWFK 20Z8704/S35A

dimension drawing



connection diagram





Sd = 0 ... 2 mm

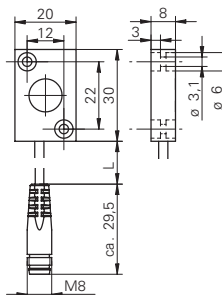
- Small linearity error
- Very short response time
- Thin housing



general data	
mounting type	shielded
measuring distance Sd	0 ... 2 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeatability	< 0,01 mm
linearity error	± 40 µm
temperature drift	± 2% (Full Scale)
electrical data	
response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	15 ... 30 VDC
current consumption max.	20 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	brass nickel plated
dimension	20 mm
housing length	30 mm
connection types	flylead connector M8
ambient conditions	
operating temperature	-10 ... +70 °C
protection class	IP 67
accessories	
connectors	ESW 31A, ESG 32A

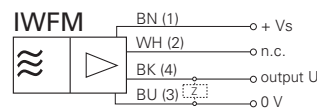
order reference	
IWFM 20U9509/KS35AP	

dimension drawing



standard cable length 200 mm

connection diagram










Inductive distance measuring sensors *AlphaProx* IWFM 20 Sd = 0 ... 2 mm
















***Inductive sensors
3-wire digital output***










cylindrical designs

product family	IFRM 03	IFRM 03	IFRM 04	IFRM 04	IFRM 04	IFRM 04	IFRM 04
							
shielded	■	■	■	■	■	■	■
quasi shielded							
nominal sensing distance Sn	0,8 mm	0,8 mm	0,8 mm	1 mm	1 mm	1 mm	1 mm
housing length	12 mm	16 mm 22 mm	22 mm	15 mm	20 mm 24 mm	25 mm	36 mm 45 mm
NPN	■	■	■	■	■	■	■
PNP	■	■	■	■	■	■	■
cable		■	■		■	■	
flylead connector M8		■	■		■	■	
wires		■		■			
connector M5					■		
connector M8	■						■
stainless steel	■	■	■	■	■	■	■
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
Page	64	65	66	67	68	69	70








cylindrical designs

product family	IFRM 06	IFRM 08	IFRM 08	IFRM 08	IFRM 08	IFRM 08	IFRM 08
							
	<i>GammaProx</i>					<i>GammaProx</i>	<i>GammaProx</i>
shielded		■	■	■	■		
unshielded	■						■
quasi shielded						■	
nominal sensing distance Sn	6 mm	2 mm	2 mm	2 mm	2 mm	3 mm	6 mm
housing length	40 mm 46 mm	22 mm 28 mm	30 mm 36 mm	40 mm 46 mm	50 mm 56 mm	40 mm 46 mm	40 mm 46 mm
NPN	■	■	■	■	■	■	■
PNP	■	■	■	■	■	■	■
cable	■	■	■	■	■	■	■
flylead connector M8		■	■	■	■		
connector M8	■	■	■	■	■	■	■
connector M12							
stainless steel	■	■	■	■	■	■	■
brass nickel plated							
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
Page	80	81	82	83	84	85	86

IFRM 05	IFRM 05	IFRM 05	IFRM 05	IFRM 06	IFRM 06	IFRM 06	IFRM 06	IFRM 06
								
								GammaProx
■	■	■	■	■	■	■	■	■
1 mm	1 mm	1 mm	1 mm	2 mm	2 mm	2 mm	2 mm	3 mm
15 mm	20 mm 24 mm	25 mm	36 mm 45 mm	22 mm 28 mm	30 mm 36 mm	40 mm 46 mm	50 mm 56 mm	40 mm 46 mm
■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■
	■	■		■	■	■	■	
■								
	■							
■	■	■	■	■	■	■	■	■
IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
71	72	73	74	75	76	77	78	79






IFRM 08	IFRM 12	IFRM 12	IFRM 12	IFRM 12	IFRM 12	IFRM 12	IFRM 12	IFRM 12
								
				GammaProx	GammaProx	GammaProx	GammaProx	
■	■	■	■			■	■	■
				■	■			
2 mm	4 mm	4 mm	4 mm	6 mm	6 mm	10 mm	10 mm	4 mm
50 mm	30,4 mm 40,4 mm	40 mm 50 mm	50 mm 60 mm	40 mm 50 mm	50 mm 60 mm	40 mm 50 mm	50 mm 60 mm	50 mm
■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■
	■	■	■	■	■	■	■	
								■
■	■	■	■	■	■	■	■	
■								
	■	■	■	■	■	■	■	■
IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
87	88	89	90	91	92	93	94	95






cylindrical designs

product family	IFRK 12	IFRM 18	IFRM 18	IFRM 18	IFRM 18	IFRM 18	IFRM 18
							
shielded							
unshielded	■						■
quasi shielded		■	■	■	■	■	
nominal sensing distance Sn	4 mm	8 mm	8 mm	8 mm	8 mm	8 mm	12 mm
housing length	40 mm	34,5 mm 45 mm	49,5 mm 60 mm	32 mm 45 mm	50 mm 60 mm	65 mm 78 mm	39 mm 52,5 mm
NPN	■	■	■	■	■		
PNP	■	■	■	■	■	■	■
cable	■	■	■	■	■	■	■
connector M8							
connector M12		■	■	■	■	■	■
brass nickel plated				■	■	■	■
brass nickel plated / PC		■	■				
PBT	■						
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
Page	96	97	98	99	100	101	102







rectangular designs



product family	IFFM 04	IFFM 06	IFFM 06	IFFM 08	IFFM 08	IFFM 08	IFFM 08
							
shielded	■	■	■	■	■	■	■
nominal sensing distance Sn	0,8 mm	1 mm	1 mm	2 mm	2 mm	2 mm	2 mm
housing length	22 mm	20 mm 24 mm	30 mm	20 mm 27 mm	28,5 mm 35,5 mm	38,5 mm 45,5 mm	16 mm
NPN	■	■	■	■	■	■	■
PNP	■	■	■	■	■	■	■
cable	■	■	■	■	■	■	■
flylead connector M8							■
connector M5		■					
connector M8				■	■	■	
stainless steel	■						
brass nickel plated		■	■	■	■	■	
PBT							
die-cast zinc nickel plated							■
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
Page	108	109	110	111	112	113	114

IFRM 18	IFRK 18	IFRK 30	IFRM 30	IFRM 30
				
■	■	■	■	■
8 mm	8 mm	15 mm	10 mm	15 mm
50 mm	80 mm	80 mm	60 mm 65 mm	69,5 mm 74,4 mm
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
IP 67	IP 67	IP 67	IP 67	IP 67
103	104	105	106	107

IFFK 08	IFFM 08	IFFM 12	IFFM 20	IFFM 20
				
■	■	■	■	■
2 mm	2 mm	4 mm	5 mm	8 mm
34 mm 42 mm	24 mm 34 mm	23,5 mm	32 mm	32 mm
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
IP 67	IP 67	IP 67	IP 67	IP 67
115	116	117	118	119

Overview
Inductive sensors 3-wire digital output

product family	IFRD 06	IFRD 08	IFRD 12	IFRD 18	IFRW 12 / IFRW 18	IFRP 12	IFRP 16 / IFRP 18
							
	<i>DuroProx</i>	<i>DuroProx</i>	<i>DuroProx</i>	<i>DuroProx</i>			
full metal housing (<i>DuroProx</i>)	■	■	■	■			
high pressure						■	■
welding and magnetic noise					■		
shielded					■	■	■
quasi shielded	■	■	■	■			
nominal sensing distance Sn	2 mm	2 mm	4 mm	6 mm	2 mm 5 mm	2 mm	2 mm
housing length	46 mm	46 mm	50 mm	60 mm	50 mm 60 mm	50 mm 70 mm	60 mm
NPN	■	■	■	■			
PNP	■	■	■	■	■	■	■
connector M8	■	■					
connector M12			■	■	■	■	■
brass chromium plated					■		
stainless steel						■	■
stainless steel 1.4404 (A4)	■	■	■	■			
IP 67					■		
IP 68/67 (sensing face/sensor)	■	■	■	■		■	■
IP 69 K (sensing face/sensor)	■	■	■	■			
Page	120	121	122	123	124	125	126

product family	IFRM 08 / IFRM 12	IFRH 12 / IFRH 18
		
high temperature	■	■
shielded	■	■
nominal sensing distance Sn	2 mm 4 mm	2 mm 5 mm
housing length	30 mm 40 mm	30 mm 71 mm
NPN	■	
PNP	■	■
cable	■	■
stainless steel	■	■
brass nickel plated	■	■
IP 67	■	■
Page	127	128

Inductive 3-wire sensors in harsh industrial applications



Inductive 3-wire sensors in harsh industrial applications



Sn = 0,8 mm

W I R E

- Sensing probe 12 mm long
- Remote cable amplifier
- M8 x 1 quick disconnect



general data

mounting type	shielded
nominal sensing distance Sn	0,8 mm
hysteresis	2 ... 20 % of Sr
output indicator	3 port LED red

electrical data

switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	Acrylate mod. PUR
housing material	stainless steel
dimension	3 mm
housing length	12 mm
connection types	connector M8

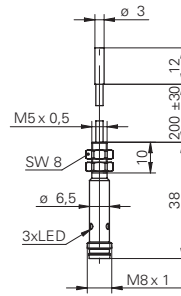
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

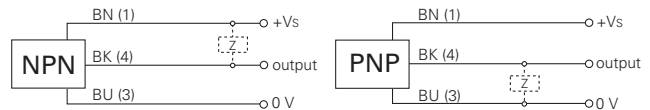
accessories

clamping nut	Nr. 137021
connectors	ESG 32S, ESW 31S

dimension drawing



connection diagrams



order reference

order reference	output circuit
IFRM 03N1505/CS35L	NPN make function (NO)
IFRM 03N3505/CS35L	NPN break function (NC)
IFRM 03P1505/CS35L	PNP make function (NO)
IFRM 03P3505/CS35L	PNP break function (NC)



Sn = 0,8 mm

WIRE

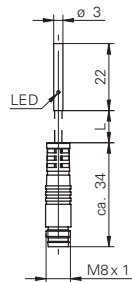
- Smallest sensor housing size
- Fully contained electronics
- 16 mm long version with individual strands

general data	
mounting type	shielded
nominal sensing distance Sn	0,8 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	Acrylate mod. PUR
housing material	stainless steel
dimension	3 mm
cable	
housing length	22 mm
flylead connector M8	
housing length	22 mm
wires	
housing length	16 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
clamping nut	Nr. 137021
connectors	ESG 32S, ESW 31S
remarks	
PUR cable	

dimension drawings

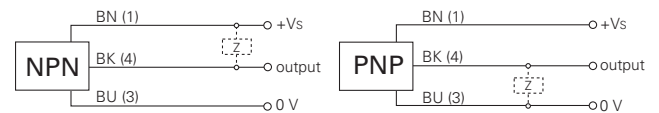


flylead connector version



standard cable length 200 mm

connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 03N1501/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 03N1501/L	cable	NPN make function (NO)	LED red
IFRM 03N1503/Q	wires	NPN make function (NO)	-
IFRM 03N3501/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 03N3501/L	cable	NPN break function (NC)	LED red
IFRM 03N3503/Q	wires	NPN break function (NC)	-
IFRM 03P1501/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 03P1501/L	cable	PNP make function (NO)	LED red
IFRM 03P1503/Q	wires	PNP make function (NO)	-
IFRM 03P3501/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 03P3501/L	cable	PNP break function (NC)	LED red
IFRM 03P3503/Q	wires	PNP break function (NC)	-



Sn = 0,8 mm

W I R E

- Smallest diameter threaded housing sensor M4 x 0,5



general data

mounting type	shielded
nominal sensing distance Sn	0,8 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	Acrylate mod. PUR
housing material	stainless steel
dimension	4 mm
housing length	22 mm

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

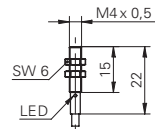
accessories

connectors	ESG 32S, ESW 31S
------------	------------------

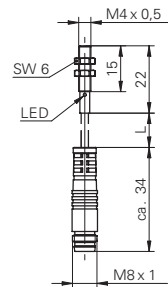
remarks

PUR cable	
-----------	--

dimension drawing

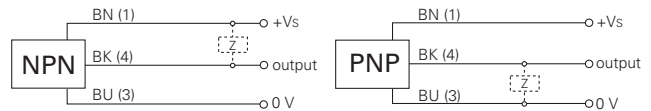


flylead connector version



standard cable length 200 mm

connection diagrams



order reference	connection types	output circuit
IFRM 04N15B1/KS35PL	flylead connector M8	NPN make function (NO)
IFRM 04N15B1/L	cable	NPN make function (NO)
IFRM 04N35B1/KS35PL	flylead connector M8	NPN break function (NC)
IFRM 04N35B1/L	cable	NPN break function (NC)
IFRM 04P15B1/KS35PL	flylead connector M8	PNP make function (NO)
IFRM 04P15B1/L	cable	PNP make function (NO)
IFRM 04P35B1/KS35PL	flylead connector M8	PNP break function (NC)
IFRM 04P35B1/L	cable	PNP break function (NC)

IFRM 04 Sn = 0,8 mm

Inductive sensors 3-wire digital output



Sn = 1 mm

W I R E

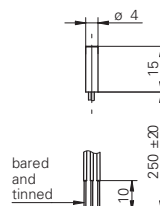
- Fully contained electronics
- 3 individual strands
- 15 mm housing length



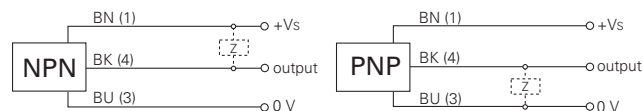
general data	
mounting type	shielded
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel
dimension	4 mm
housing length	15 mm
connection types	wires
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
clamping nut	Nr. 119345

order reference	output circuit
IFRM 04N15A5/Q	NPN make function (NO)
IFRM 04N35A5/Q	NPN break function (NC)
IFRM 04P15A5/Q	PNP make function (NO)
IFRM 04P35A5/Q	PNP break function (NC)

dimension drawing



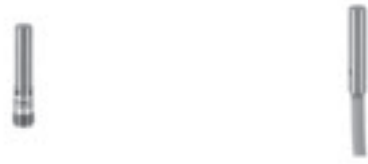
connection diagrams





Sn = 1 mm

- Fully contained electronics
- Miniature connector M5 x 0,5
- Integrated LED-status display



general data

mounting type	shielded
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel
dimension	4 mm

cable

housing length	20 mm
----------------	-------

flylead connector M8

housing length	20 mm
----------------	-------

connector M5

housing length	24 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

accessories

clamping nut	Nr. 119345
--------------	------------

connector M5

connectors	ESG 05, ESW 05
------------	----------------

flylead connector M8

connectors	ESG 32S, ESW 31S
------------	------------------

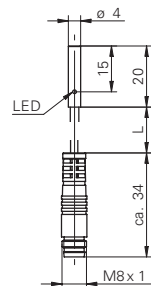
remarks

PUR cable	
-----------	--

dimension drawings

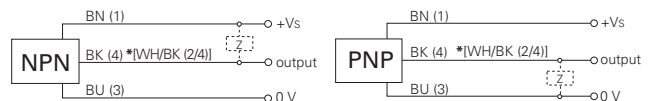


flylead connector version



standard cable length 200 mm

connection diagrams



* .../S05L pin 2 & 4 electrically connected

order reference	connection types	output circuit	output indicator
IFRM 04N15A3/KS35PL	flylead connector M8	NPN make function (NO)	LED red
IFRM 04N15A3/L	cable	NPN make function (NO)	LED red
IFRM 04N15A3/S05L	connector M5	NPN make function (NO)	2 port LED red
IFRM 04N35A3/KS35PL	flylead connector M8	NPN break function (NC)	LED red
IFRM 04N35A3/L	cable	NPN break function (NC)	LED red
IFRM 04N35A3/S05L	connector M5	NPN break function (NC)	2 port LED red
IFRM 04P15A3/KS35PL	flylead connector M8	PNP make function (NO)	LED red
IFRM 04P15A3/L	cable	PNP make function (NO)	LED red
IFRM 04P15A3/S05L	connector M5	PNP make function (NO)	2 port LED red
IFRM 04P35A3/KS35PL	flylead connector M8	PNP break function (NC)	LED red
IFRM 04P35A3/L	cable	PNP break function (NC)	LED red
IFRM 04P35A3/S05L	connector M5	PNP break function (NC)	2 port LED red



Sn = 1 mm

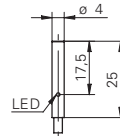
W I R E

- Fully contained electronics
- Standard cable version
- Integrated LED-status display

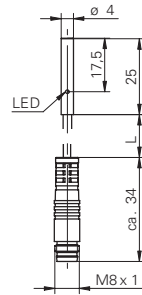


general data	
mounting type	shielded
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel
dimension	4 mm
housing length	25 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
clamping nut	Nr. 119345
connectors	ESG 32S, ESW 31S
remarks	
PUR cable	

dimension drawing

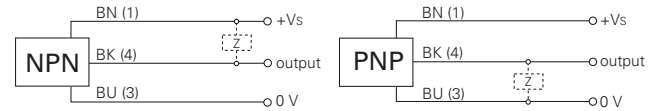


flylead connector version



standard cable length 200 mm

connection diagrams



order reference	connection types	output circuit
IFRM 04N15A1/KS35PL	flylead connector M8	NPN make function (NO)
IFRM 04N15A1/L	cable	NPN make function (NO)
IFRM 04N35A1/KS35PL	flylead connector M8	NPN break function (NC)
IFRM 04N35A1/L	cable	NPN break function (NC)
IFRM 04P15A1/KS35PL	flylead connector M8	PNP make function (NO)
IFRM 04P15A1/L	cable	PNP make function (NO)
IFRM 04P35A1/KS35PL	flylead connector M8	PNP break function (NC)
IFRM 04P35A1/L	cable	PNP break function (NC)



Sn = 1 mm

W I R E

- Robust metal housing
- M8 x 1 quick disconnect
- 3 port LED



general data

mounting type	shielded
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
output indicator	3 port LED red

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel
dimension	4 mm
connection types	connector M8

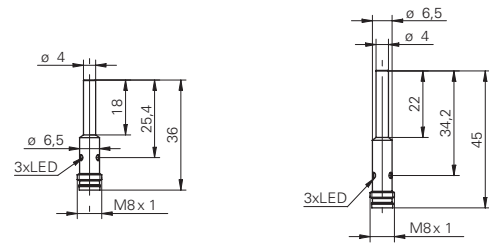
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

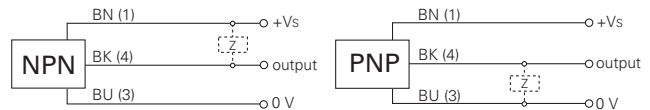
accessories

clamping nut	Nr. 119345
connectors	ESG 32S, ESW 31S

dimension drawings



connection diagrams



order reference	output circuit	housing length
IFRM 04N15A3/S35L	NPN make function (NO)	36 mm
IFRM 04N35A3/S35L	NPN break function (NC)	36 mm
IFRM 04P15A1/S35L	PNP make function (NO)	45 mm
IFRM 04P15A3/S35L	PNP make function (NO)	36 mm
IFRM 04P35A1/S35L	PNP break function (NC)	45 mm
IFRM 04P35A3/S35L	PNP break function (NC)	36 mm



Sn = 1 mm

W I R E

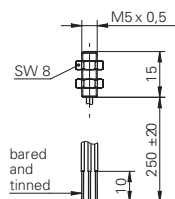
- Fully contained electronics
- 3 individual strands
- 15 mm housing length



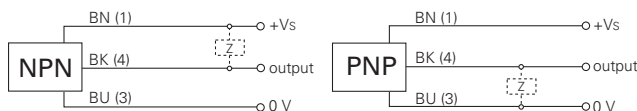
general data	
mounting type	shielded
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel
dimension	5 mm
housing length	15 mm
connection types	wires
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

order reference	output circuit
IFRM 05N15A5/Q	NPN make function (NO)
IFRM 05N35A5/Q	NPN break function (NC)
IFRM 05P15A5/Q	PNP make function (NO)
IFRM 05P35A5/Q	PNP break function (NC)

dimension drawing



connection diagrams



IFRM 05 Sn = 1 mm

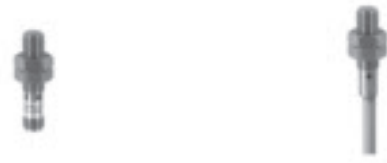
Inductive sensors 3-wire digital output



Sn = 1 mm

W I R E

- Fully contained electronics
- Miniature connector M5 x 0,5
- Integrated LED-status display



general data

mounting type	shielded
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel
dimension	5 mm

cable

housing length	20 mm
----------------	-------

flylead connector M8

housing length	20 mm
----------------	-------

connector M5

housing length	24 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

accessories

connector M5

connectors	ESG 05, ESW 05
------------	----------------

flylead connector M8

connectors	ESG 32S, ESW 31S
------------	------------------

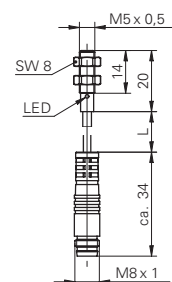
remarks

PUR cable	
-----------	--

dimension drawings

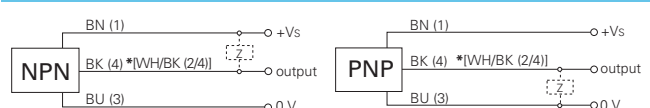


flylead connector version



standard cable length 200 mm

connection diagrams



* .../S05L pin 2 & 4 electrically connected

order reference	connection types	output circuit	output indicator
IFRM 05N15A3/KS35PL	flylead connector M8	NPN make function (NO)	LED red
IFRM 05N15A3/L	cable	NPN make function (NO)	LED red
IFRM 05N15A3/S05L	connector M5	NPN make function (NO)	2 port LED red
IFRM 05N35A3/KS35PL	flylead connector M8	NPN break function (NC)	LED red
IFRM 05N35A3/L	cable	NPN break function (NC)	LED red
IFRM 05N35A3/S05L	connector M5	NPN break function (NC)	2 port LED red
IFRM 05P15A3/KS35PL	flylead connector M8	PNP make function (NO)	LED red
IFRM 05P15A3/L	cable	PNP make function (NO)	LED red
IFRM 05P15A3/S05L	connector M5	PNP make function (NO)	2 port LED red
IFRM 05P35A3/KS35PL	flylead connector M8	PNP break function (NC)	LED red
IFRM 05P35A3/L	cable	PNP break function (NC)	LED red
IFRM 05P35A3/S05L	connector M5	PNP break function (NC)	2 port LED red

IFRM 05 Sn = 1 mm Inductive sensors 3-wire digital output



Sn = 1 mm

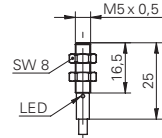
WIRE

- Fully contained electronics
- Standard cable version
- Integrated LED-status display

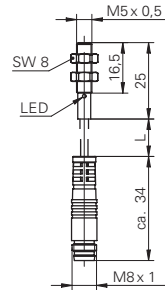


general data	
mounting type	shielded
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel
dimension	5 mm
housing length	25 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
connectors	ESG 32S, ESW 31S
remarks	
PUR cable	

dimension drawing

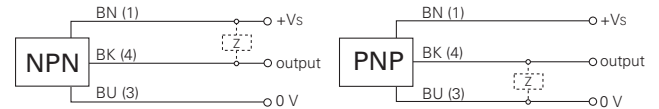


flylead connector version



standard cable length 200 mm

connection diagrams



order reference	connection types	output circuit
IFRM 05N15A1/KS35PL	flylead connector M8	NPN make function (NO)
IFRM 05N15A1/L	cable	NPN make function (NO)
IFRM 05N35A1/KS35PL	flylead connector M8	NPN break function (NC)
IFRM 05N35A1/L	cable	NPN break function (NC)
IFRM 05P15A1/KS35PL	flylead connector M8	PNP make function (NO)
IFRM 05P15A1/L	cable	PNP make function (NO)
IFRM 05P35A1/KS35PL	flylead connector M8	PNP break function (NC)
IFRM 05P35A1/L	cable	PNP break function (NC)



Sn = 1 mm

W I R E

- Robust metal housing
- M8 x 1 quick disconnect
- 3 port LED



general data

mounting type	shielded
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
output indicator	3 port LED red

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel
dimension	5 mm
connection types	connector M8

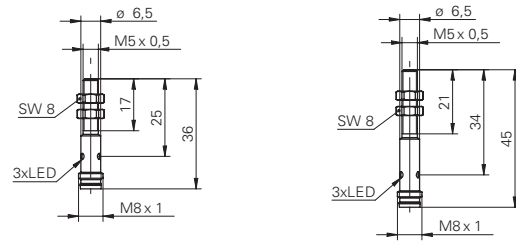
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

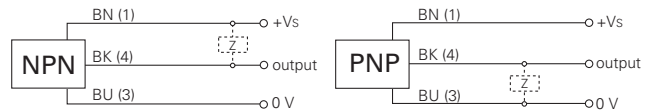
accessories

connectors	ESG 32S, ESW 31S
------------	------------------

dimension drawings



connection diagrams



order reference	output circuit	housing length
IFRM 05N15A3/S35L	NPN make function (NO)	36 mm
IFRM 05N35A3/S35L	NPN break function (NC)	36 mm
IFRM 05P15A1/S35L	PNP make function (NO)	45 mm
IFRM 05P15A3/S35L	PNP make function (NO)	36 mm
IFRM 05P35A1/S35L	PNP break function (NC)	45 mm
IFRM 05P35A3/S35L	PNP break function (NC)	36 mm

IFRM 05 Sn = 1 mm

Inductive sensors 3-wire digital output



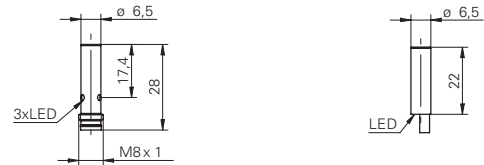
Sn = 2 mm

W I R E

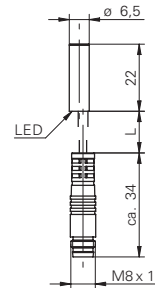
- Robust metal housing
- Shortest version with M8 x 1 connector
- High switching frequency

general data	
mounting type	shielded
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm
cable	
housing length	22 mm
flylead connector M8	
housing length	22 mm
connector M8	
housing length	28 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
support	Nr. 109474
clamping nut	Nr. 117742
connectors	ESG 32S, ESW 31S

dimension drawings

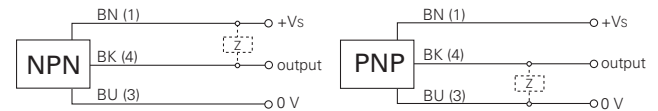


flylead connector version



standard cable length 200 mm

connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 06N1713/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 06N1713/L	cable	NPN make function (NO)	LED red
IFRM 06N17A5/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 06N3713/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 06N3713/L	cable	NPN break function (NC)	LED red
IFRM 06N37A5/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 06P1713/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 06P1713/L	cable	PNP make function (NO)	LED red
IFRM 06P17A5/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 06P3713/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 06P3713/L	cable	PNP break function (NC)	LED red
IFRM 06P37A5/S35L	connector M8	PNP break function (NC)	3 port LED red



Sn = 2 mm

W I R E

- Robust metal housing
- High switching frequency
- Mounting with special support



general data

mounting type	shielded
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm

cable

housing length	30 mm
----------------	-------

flylead connector M8

housing length	30 mm
----------------	-------

connector M8

housing length	36 mm
----------------	-------

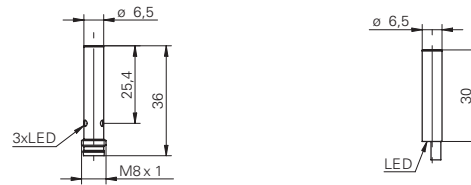
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

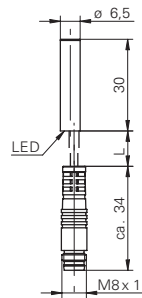
accessories

support	Nr. 109474
clamping nut	Nr. 117742
connectors	ESG 32S, ESW 31S

dimension drawings

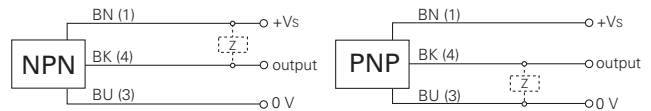


flylead connector version



standard cable length 200 mm

connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 06N1701/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 06N1701/L	cable	NPN make function (NO)	LED red
IFRM 06N17A3/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 06N3701/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 06N3701/L	cable	NPN break function (NC)	LED red
IFRM 06N37A3/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 06P1701/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 06P1701/L	cable	PNP make function (NO)	LED red
IFRM 06P17A3/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 06P3701/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 06P3701/L	cable	PNP break function (NC)	LED red
IFRM 06P37A3/S35L	connector M8	PNP break function (NC)	3 port LED red



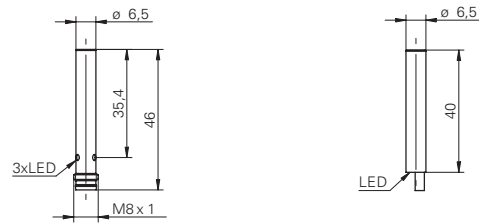
Sn = 2 mm

WIRE

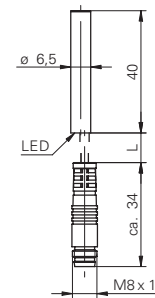
- Robust metal housing
- High switching frequency
- Mounting with special support

general data	
mounting type	shielded
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm
cable	
housing length	40 mm
flylead connector M8	
housing length	40 mm
connector M8	
housing length	46 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
support	Nr. 109474
clamping nut	Nr. 117742
connectors	ESG 32S, ESW 31S

dimension drawings

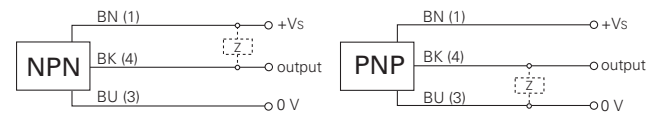


flylead connector version



standard cable length 200 mm

connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 06N17A1/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 06N17A1/L	cable	NPN make function (NO)	LED red
IFRM 06N17A1/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 06N37A1/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 06N37A1/L	cable	NPN break function (NC)	LED red
IFRM 06N37A1/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 06P17A1/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 06P17A1/L	cable	PNP make function (NO)	LED red
IFRM 06P17A1/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 06P37A1/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 06P37A1/L	cable	PNP break function (NC)	LED red
IFRM 06P37A1/S35L	connector M8	PNP break function (NC)	3 port LED red



Sn = 2 mm

W I R E

- Long, robust steel housings
- Cable and connector versions
- Mounting with special support



general data

mounting type	shielded
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm

cable

housing length	50 mm
----------------	-------

flylead connector M8

housing length	50 mm
----------------	-------

connector M8

housing length	56 mm
----------------	-------

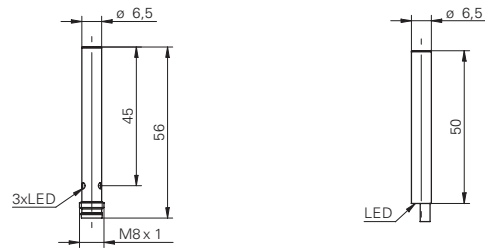
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

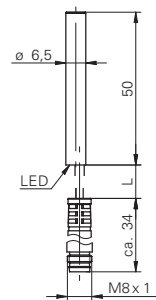
accessories

support	Nr. 109474
clamping nut	Nr. 117742
connectors	ESG 32S, ESW 31S

dimension drawings

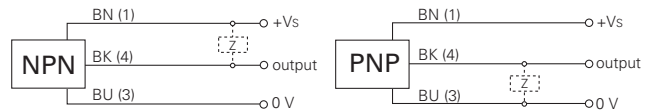


flylead connector version



standard cable length 200 mm

connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 06N17A4/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 06N17A4/L	cable	NPN make function (NO)	LED red
IFRM 06N17A4/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 06N37A4/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 06N37A4/L	cable	NPN break function (NC)	LED red
IFRM 06N37A4/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 06P17A4/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 06P17A4/L	cable	PNP make function (NO)	LED red
IFRM 06P17A4/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 06P37A4/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 06P37A4/L	cable	PNP break function (NC)	LED red
IFRM 06P37A4/S35L	connector M8	PNP break function (NC)	3 port LED red



Sn = 3 mm

W I R E

- Version with extended Sn *GammaProx*
- Quasi shielded mounting
- Robust metal housing



general data

mounting type	quasi shielded
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	3 mm

electrical data

switching frequency	< 1 kHz
voltage supply range +Vs	12 ... 30 VDC
current consumption max.	18 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm

cable

housing length	40 mm
----------------	-------

connector M8

housing length	46 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

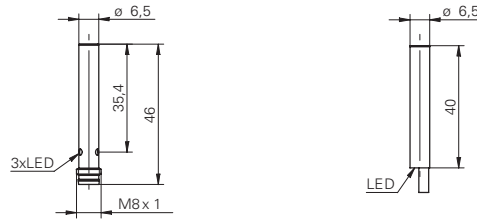
accessories

support	Nr. 109474
clamping nut	Nr. 117742
connectors	ESG 32S, ESW 31S

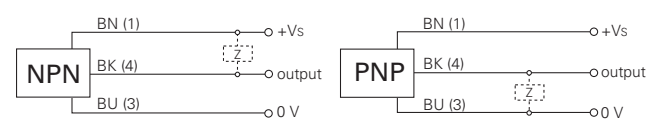
remarks

For correct installation refer to chapter 1 "mounting instructions"

dimension drawings



connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 06N17G1/L	cable	NPN make function (NO)	LED red
IFRM 06N17G1/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 06N37G1/L	cable	NPN break function (NC)	LED red
IFRM 06N37G1/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 06P17G1/L	cable	PNP make function (NO)	LED red
IFRM 06P17G1/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 06P37G1/L	cable	PNP break function (NC)	LED red
IFRM 06P37G1/S35L	connector M8	PNP break function (NC)	3 port LED red



Sn = 6 mm

W I R E

- Version with extended Sn *GammaProx*
- Non shielded mounting
- Robust metal housing



general data

mounting type	unshielded
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	6 mm
hysteresis	2 ... 25 % of Sr

electrical data

switching frequency	< 400 Hz
voltage supply range +Vs	12 ... 30 VDC
current consumption max.	18 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm

cable

housing length	40 mm
----------------	-------

connector M8

housing length	46 mm
----------------	-------

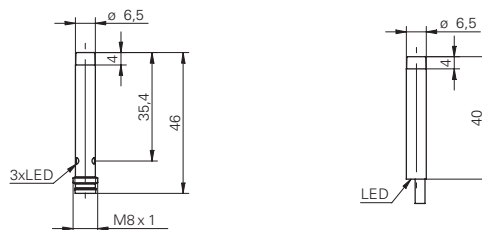
ambient conditions

operating temperature	0 ... +60 °C
protection class	IP 67

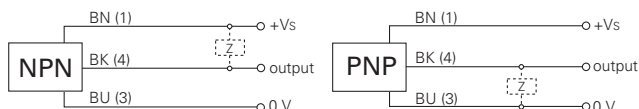
accessories

support	Nr. 109474
clamping nut	Nr. 117742
connectors	ESG 32S, ESW 31S

dimension drawings



connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 06N13G1/L	cable	NPN make function (NO)	LED red
IFRM 06N13G1/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 06N33G1/L	cable	NPN break function (NC)	LED red
IFRM 06N33G1/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 06P13G1/L	cable	PNP make function (NO)	LED red
IFRM 06P13G1/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 06P33G1/L	cable	PNP break function (NC)	LED red
IFRM 06P33G1/S35L	connector M8	PNP break function (NC)	3 port LED red



Sn = 2 mm

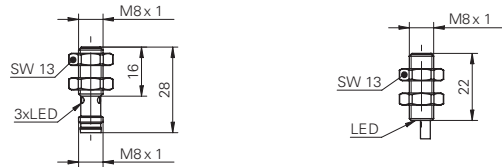
W I R E

- Shortest version with M8 x 1 connector
- High switching frequency
- Robust metal housing

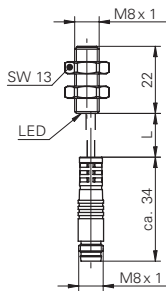


general data	
mounting type	shielded
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm
cable	
housing length	22 mm
flylead connector M8	
housing length	22 mm
connector M8	
housing length	28 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
connectors	ESG 32S, ESW 31S

dimension drawings

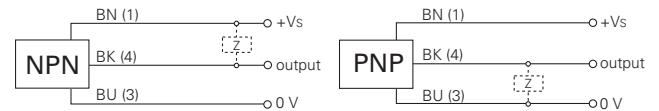


flylead connector version



standard cable length 200 mm

connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 08N1713/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 08N1713/L	cable	NPN make function (NO)	LED red
IFRM 08N17A5/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 08N3713/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 08N3713/L	cable	NPN break function (NC)	LED red
IFRM 08N37A5/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 08P1713/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 08P1713/L	cable	PNP make function (NO)	LED red
IFRM 08P17A5/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 08P3713/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 08P3713/L	cable	PNP break function (NC)	LED red
IFRM 08P37A5/S35L	connector M8	PNP break function (NC)	3 port LED red



Sn = 2 mm

W I R E

- Robust metal housing
- High switching frequency



general data

mounting type	shielded
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm

cable

housing length	30 mm
----------------	-------

flylead connector M8

housing length	30 mm
----------------	-------

connector M8

housing length	36 mm
----------------	-------

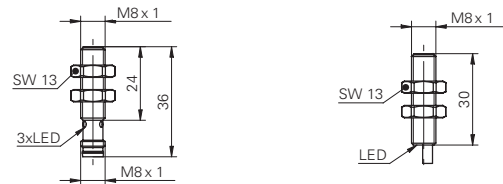
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

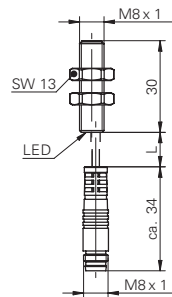
accessories

connectors	ESG 32S, ESW 31S
------------	------------------

dimension drawings

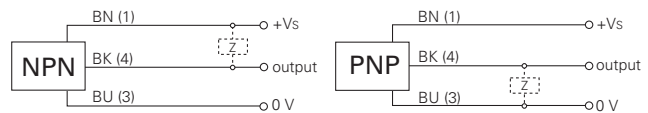


flylead connector version



standard cable length 200 mm

connection diagrams



IFRM 08 Sn = 2 mm

Inductive sensors 3-wire digital output

order reference	connection types	output circuit	output indicator
IFRM 08N1701/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 08N1701/L	cable	NPN make function (NO)	LED red
IFRM 08N17A3/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 08N3701/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 08N3701/L	cable	NPN break function (NC)	LED red
IFRM 08N37A3/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 08P1701/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 08P1701/L	cable	PNP make function (NO)	LED red
IFRM 08P17A3/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 08P3701/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 08P3701/L	cable	PNP break function (NC)	LED red
IFRM 08P37A3/S35L	connector M8	PNP break function (NC)	3 port LED red



Sn = 2 mm

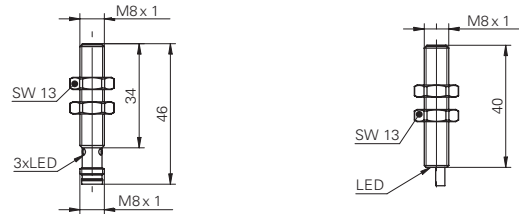
WIRE

- Robust metal housing
- High switching frequency

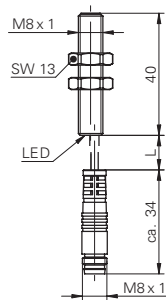


general data	
mounting type	shielded
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm
cable	
housing length	40 mm
flylead connector M8	
housing length	40 mm
connector M8	
housing length	46 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
connectors	ESG 32S, ESW 31S

dimension drawings

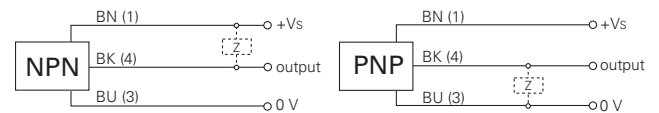


flylead connector version



standard cable length 200 mm

connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 08N17A1/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 08N17A1/L	cable	NPN make function (NO)	LED red
IFRM 08N17A1/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 08N37A1/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 08N37A1/L	cable	NPN break function (NC)	LED red
IFRM 08N37A1/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 08P17A1/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 08P17A1/L	cable	PNP make function (NO)	LED red
IFRM 08P17A1/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 08P37A1/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 08P37A1/L	cable	PNP break function (NC)	LED red
IFRM 08P37A1/S35L	connector M8	PNP break function (NC)	3 port LED red



Sn = 2 mm

W I R E

- Robust metal housing
- High switching frequency



general data

mounting type	shielded
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm

cable

housing length	50 mm
----------------	-------

flylead connector M8

housing length	50 mm
----------------	-------

connector M8

housing length	56 mm
----------------	-------

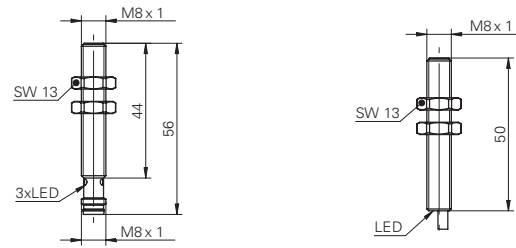
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

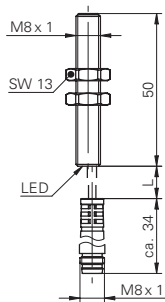
accessories

connectors	ESG 32S, ESW 31S
------------	------------------

dimension drawings

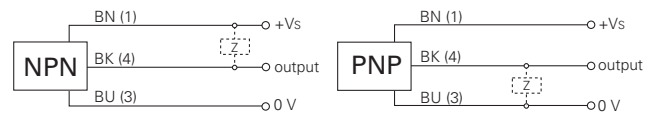


flylead connector version



standard cable length 200 mm

connection diagrams



IFRM 08 Sn = 2 mm

Inductive sensors 3-wire digital output

order reference	connection types	output circuit	output indicator
IFRM 08N17A4/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 08N17A4/L	cable	NPN make function (NO)	LED red
IFRM 08N17A4/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 08N37A4/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 08N37A4/L	cable	NPN break function (NC)	LED red
IFRM 08N37A4/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 08P17A4/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 08P17A4/L	cable	PNP make function (NO)	LED red
IFRM 08P17A4/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 08P37A4/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 08P37A4/L	cable	PNP break function (NC)	LED red
IFRM 08P37A4/S35L	connector M8	PNP break function (NC)	3 port LED red



Sn = 3 mm

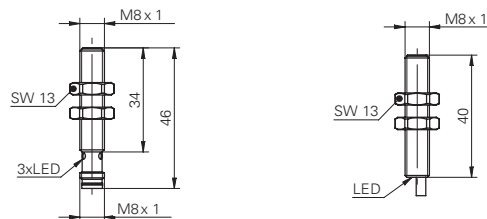
W I R E

- Version with extended Sn *GammaProx*
- Quasi shielded mounting
- Robust metal housing

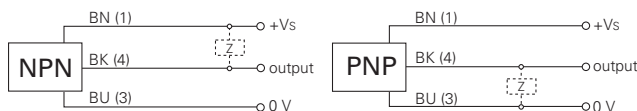


general data	
mounting type	quasi shielded
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	3 mm
hysteresis	2 ... 25 % of Sr
electrical data	
switching frequency	< 1 kHz
voltage supply range +Vs	12 ... 30 VDC
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm
cable	
housing length	40 mm
connector M8	
housing length	46 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
connectors	ESG 32S, ESW 31S
remarks	
For correct installation refer to chapter 1 "mounting instructions"	

dimension drawings



connection diagrams



order reference	connection types	output circuit	output indicator	current consumption max.
IFRM 08N17G1/L	cable	NPN make function (NO)	LED red	12 mA
IFRM 08N17G1/S35L	connector M8	NPN make function (NO)	3 port LED red	18 mA
IFRM 08N37G1/L	cable	NPN break function (NC)	LED red	12 mA
IFRM 08N37G1/S35L	connector M8	NPN break function (NC)	3 port LED red	18 mA
IFRM 08P17G1/L	cable	PNP make function (NO)	LED red	12 mA
IFRM 08P17G1/S35L	connector M8	PNP make function (NO)	3 port LED red	18 mA
IFRM 08P37G1/L	cable	PNP break function (NC)	LED red	12 mA
IFRM 08P37G1/S35L	connector M8	PNP break function (NC)	3 port LED red	18 mA

IFRM 08 Sn = 3 mm *GammaProx* Inductive sensors 3-wire digital output



Sn = 6 mm

W I R E

- Version with extended Sn *GammaProx*
- Non shielded mounting
- Robust metal housing



general data

mounting type	unshielded
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	6 mm
hysteresis	2 ... 25 % of Sr

electrical data

switching frequency	< 400 Hz
voltage supply range +Vs	12 ... 30 VDC
current consumption max.	18 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm

cable

housing length	40 mm
----------------	-------

connector M8

housing length	46 mm
----------------	-------

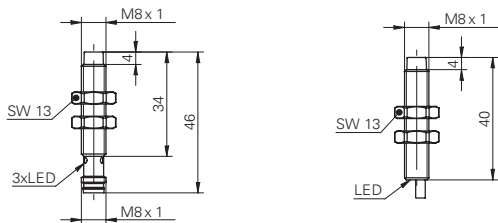
ambient conditions

operating temperature	0 ... +60 °C
protection class	IP 67

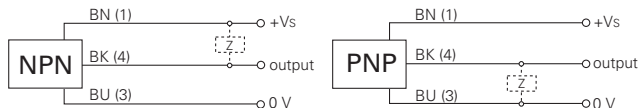
accessories

connectors	ESG 32S, ESW 31S
------------	------------------

dimension drawings



connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 08N13G1/L	cable	NPN make function (NO)	LED red
IFRM 08N13G1/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 08N33G1/L	cable	NPN break function (NC)	LED red
IFRM 08N33G1/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 08P13G1/L	cable	PNP make function (NO)	LED red
IFRM 08P13G1/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 08P33G1/L	cable	PNP break function (NC)	LED red
IFRM 08P33G1/S35L	connector M8	PNP break function (NC)	3 port LED red



Sn = 2 mm

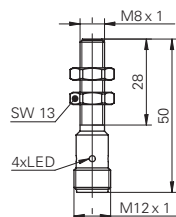
WIRE

- Robust metal housing
- High switching frequency
- M12 x 1 quick disconnect

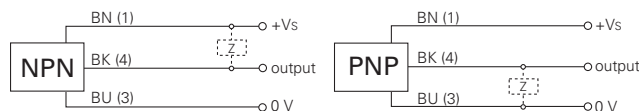


general data	
mounting type	shielded
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
output indicator	4 port LED red
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm
housing length	50 mm
connection types	connector M12
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
connectors	ESG 34S, ESW 33S

dimension drawing



connection diagrams



order reference	output circuit
IFRM 08N1703/S14L	NPN make function (NO)
IFRM 08N3703/S14L	NPN break function (NC)
IFRM 08P1703/S14L	PNP make function (NO)
IFRM 08P3703/S14L	PNP break function (NC)



Sn = 4 mm

W I R E

- Shortest version with M12 x 1 connector
- High stability across entire temperature range



general data

mounting type	shielded
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm

cable

housing length	30,4 mm
----------------	---------

connector M12

housing length	40,4 mm
----------------	---------

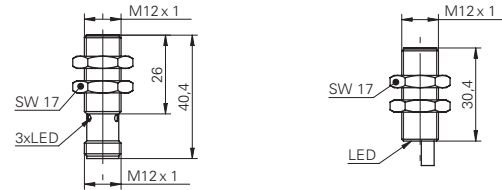
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

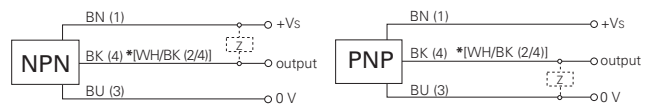
accessories

connectors	ESG 34S, ESW 33S
------------	------------------

dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

order reference	connection types	output circuit	output indicator
IFRM 12N1701/L	cable	NPN make function (NO)	LED red
IFRM 12N1703/S14L	connector M12	NPN make function (NO)	3 port LED red
IFRM 12N3701/L	cable	NPN break function (NC)	LED red
IFRM 12N3703/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 12P1701/L	cable	PNP make function (NO)	LED red
IFRM 12P1703/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 12P3701/L	cable	PNP break function (NC)	LED red
IFRM 12P3703/S14L	connector M12	PNP break function (NC)	3 port LED red

IFRM 12 Sn = 4 mm

Inductive sensors 3-wire digital output



Sn = 4 mm

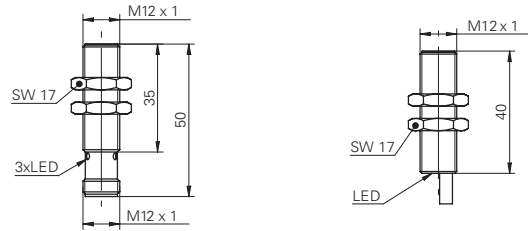
WIRE

- High stability across entire temperature range

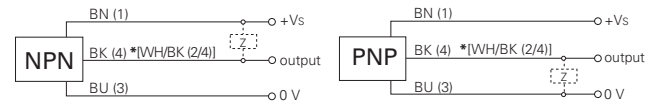


general data	
mounting type	shielded
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
cable	
housing length	40 mm
connector M12	
housing length	50 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
connectors	ESG 34S, ESW 33S

dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

order reference	connection types	output circuit	output indicator
IFRM 12N1701/S14L	connector M12	NPN make function (NO)	3 port LED red
IFRM 12N1702/L	cable	NPN make function (NO)	LED red
IFRM 12N3701/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 12N3702/L	cable	NPN break function (NC)	LED red
IFRM 12P1701/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 12P1702/L	cable	PNP make function (NO)	LED red
IFRM 12P3701/S14L	connector M12	PNP break function (NC)	3 port LED red
IFRM 12P3702/L	cable	PNP break function (NC)	LED red

IFRM 12 Sn = 4 mm

Inductive sensors 3-wire digital output



Sn = 4 mm

W I R E

- Extra long housings
- High stability across entire temperature range



general data

mounting type	shielded
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm

cable

housing length	50 mm
----------------	-------

connector M12

housing length	60 mm
----------------	-------

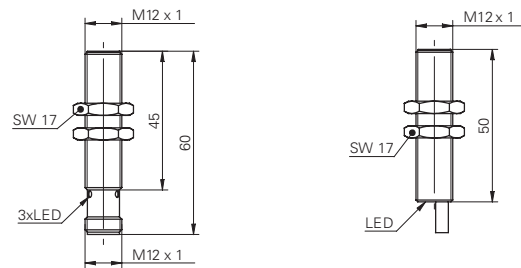
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

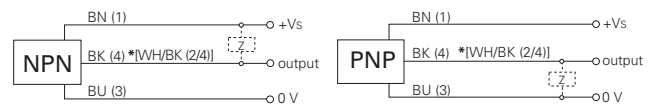
accessories

connectors	ESG 34S, ESW 33S
------------	------------------

dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

order reference	connection types	output circuit	output indicator
IFRM 12N1704/L	cable	NPN make function (NO)	LED red
IFRM 12N1704/S14L	connector M12	NPN make function (NO)	3 port LED red
IFRM 12N3704/L	cable	NPN break function (NC)	LED red
IFRM 12N3704/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 12P1704/L	cable	PNP make function (NO)	LED red
IFRM 12P1704/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 12P3704/L	cable	PNP break function (NC)	LED red
IFRM 12P3704/S14L	connector M12	PNP break function (NC)	3 port LED red



Sn = 6 mm

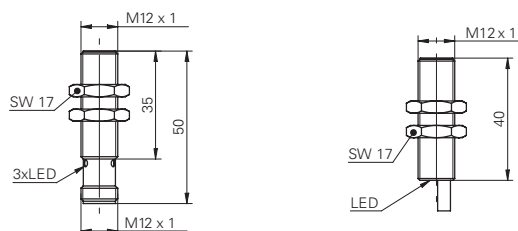
W I R E

- Version with extended Sn *GammaProx*
- Quasi shielded mounting

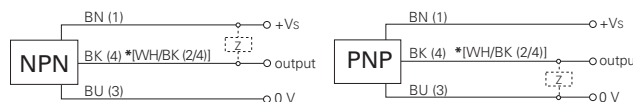


general data	
mounting type	quasi shielded
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	6 mm
hysteresis	2 ... 25 % of Sr
electrical data	
switching frequency	< 400 Hz
voltage supply range +Vs	12 ... 30 VDC
current consumption max.	18 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
cable	
housing length	40 mm
connector M12	
housing length	50 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
connectors	ESG 34S, ESW 33S
remarks	
For correct installation refer to chapter 1 "mounting instructions"	

dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

order reference	connection types	output circuit	output indicator
IFRM 12N17G3/L	cable	NPN make function (NO)	LED red
IFRM 12N17G3/S14L	connector M12	NPN make function (NO)	3 port LED red
IFRM 12N37G3/L	cable	NPN break function (NC)	LED red
IFRM 12N37G3/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 12P17G3/L	cable	PNP make function (NO)	LED red
IFRM 12P17G3/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 12P37G3/L	cable	PNP break function (NC)	LED red
IFRM 12P37G3/S14L	connector M12	PNP break function (NC)	3 port LED red



Sn = 6 mm

W I R E

- Version with extended Sn *GammaProx*
- Quasi shielded mounting



general data

mounting type	quasi shielded
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	6 mm
hysteresis	2 ... 25 % of Sr

electrical data

switching frequency	< 400 Hz
voltage supply range +Vs	12 ... 30 VDC
current consumption max.	18 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm

cable

housing length	50 mm
----------------	-------

connector M12

housing length	60 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

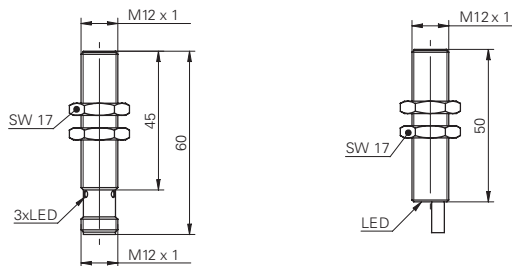
accessories

connectors	ESG 34S, ESW 33S
------------	------------------

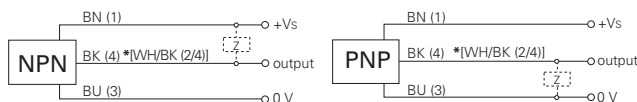
remarks

For correct installation refer to chapter 1 "mounting instructions"

dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

order reference	connection types	output circuit	output indicator
IFRM 12N17G1/L	cable	NPN make function (NO)	LED red
IFRM 12N17G1/S14L	connector M12	NPN make function (NO)	3 port LED red
IFRM 12N37G1/L	cable	NPN break function (NC)	LED red
IFRM 12N37G1/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 12P17G1/L	cable	PNP make function (NO)	LED red
IFRM 12P17G1/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 12P37G1/L	cable	PNP break function (NC)	LED red
IFRM 12P37G1/S14L	connector M12	PNP break function (NC)	3 port LED red



Sn = 10 mm

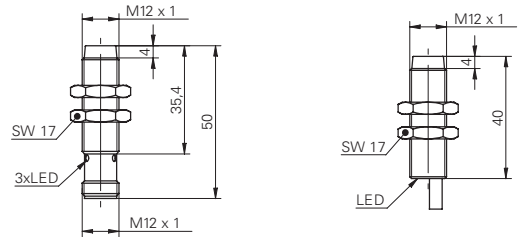
WIRE

- Version with extended Sn *GammaProx*
- Non shielded mounting

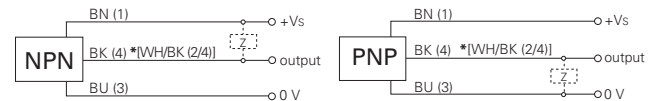


general data	
mounting type	unshielded
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	10 mm
hysteresis	2 ... 25 % of Sr
electrical data	
switching frequency	< 400 Hz
voltage supply range +Vs	12 ... 30 VDC
current consumption max.	18 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
cable	
housing length	40 mm
connector M12	
housing length	50 mm
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67
accessories	
connectors	ESG 34S, ESW 33S

dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

order reference	connection types	output circuit	output indicator
IFRM 12N13G3/L	cable	NPN make function (NO)	LED red
IFRM 12N13G3/S14L	connector M12	NPN make function (NO)	3 port LED red
IFRM 12N33G3/L	cable	NPN break function (NC)	LED red
IFRM 12N33G3/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 12P13G3/L	cable	PNP make function (NO)	LED red
IFRM 12P13G3/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 12P33G3/L	cable	PNP break function (NC)	LED red
IFRM 12P33G3/S14L	connector M12	PNP break function (NC)	3 port LED red

IFRM 12 Sn = 10 mm

GammaProx

Inductive sensors 3-wire digital output



Sn = 10 mm

- Version with extended Sn *GammaProx*
- Non shielded mounting



general data

mounting type	unshielded
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	10 mm
hysteresis	2 ... 25 % of Sr

electrical data

switching frequency	< 400 Hz
voltage supply range +Vs	12 ... 30 VDC
current consumption max.	18 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm

cable

housing length	50 mm
----------------	-------

connector M12

housing length	60 mm
----------------	-------

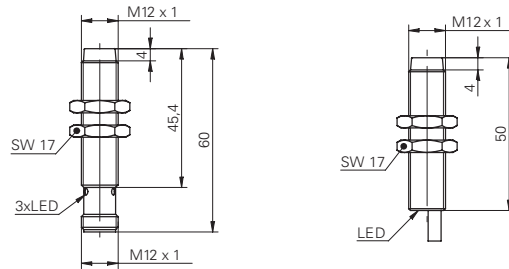
ambient conditions

operating temperature	0 ... +60 °C
protection class	IP 67

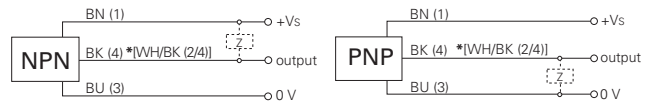
accessories

connectors	ESG 34S, ESW 33S
------------	------------------

dimension drawings



connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 12N13G1/L	cable	NPN make function (NO)	LED red
IFRM 12N13G1/S14L	connector M12	NPN make function (NO)	3 port LED red
IFRM 12N33G1/L	cable	NPN break function (NC)	LED red
IFRM 12N33G1/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 12P13G1/L	cable	PNP make function (NO)	LED red
IFRM 12P13G1/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 12P33G1/L	cable	PNP break function (NC)	LED red
IFRM 12P33G1/S14L	connector M12	PNP break function (NC)	3 port LED red



Sn = 4 mm

W I R E

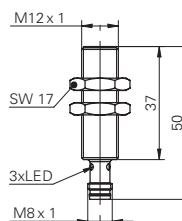
- M8 x 1 quick disconnect
- High stability across entire temperature range



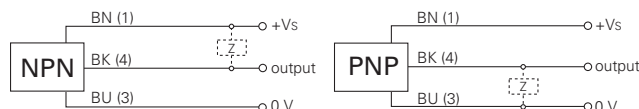
general data	
mounting type	shielded
nominal sensing distance Sn	4 mm
hysteresis	3 ... 25 % of Sr
output indicator	4 port LED red
electrical data	
switching frequency	< 2 kHz
voltage supply range +Vs	12 ... 30 VDC
current consumption max.	18 mA
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
housing length	50 mm
connection types	connector M8
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
connectors	ESG 32S, ESW 31S

order reference	output circuit
IFRM 12N1701/S35L	NPN make function (NO)
IFRM 12N3701/S35L	NPN break function (NC)
IFRM 12P1701/S35L	PNP make function (NO)
IFRM 12P3701/S35L	PNP break function (NC)

dimension drawing



connection diagrams





Sn = 4 mm

W I R E

- PBT plastic housing
- Non shielded mounting



general data

mounting type	unshielded
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

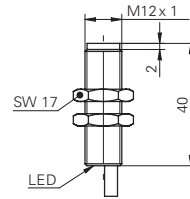
mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	PBT
dimension	12 mm
housing length	40 mm
connection types	cable

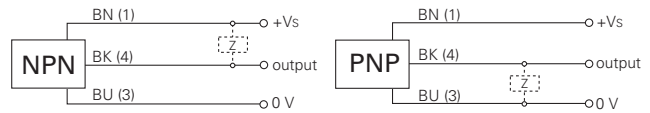
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawing



connection diagrams



order reference output circuit

IFRK 12N1102/L	NPN make function (NO)
IFRK 12P1102/L	PNP make function (NO)

IFRK 12 Sn = 4 mm

Inductive sensors 3-wire digital output



Sn = 8 mm

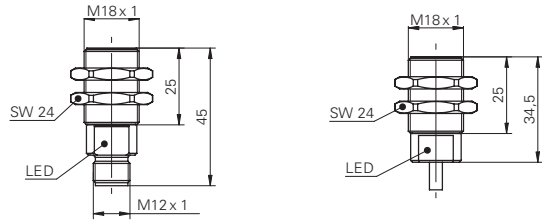
W I R E

- Quasi shielded mounting
- Improved EMC compatibility

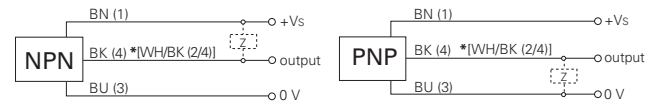


general data	
mounting type	quasi shielded
nominal sensing distance Sn	8 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated / PC
dimension	18 mm
cable	
housing length	34,5 mm
connector M12	
housing length	45 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
connectors	ESG 34S, ESW 33S
remarks	
For correct installation refer to chapter 1 "mounting instructions"	

dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

order reference	connection types	output circuit
IFRM 18N17A5/L	cable	NPN make function (NO)
IFRM 18N17A5/S14L	connector M12	NPN make function (NO)
IFRM 18N37A5/L	cable	NPN break function (NC)
IFRM 18N37A5/S14L	connector M12	NPN break function (NC)
IFRM 18P17A5/L	cable	PNP make function (NO)
IFRM 18P17A5/S14L	connector M12	PNP make function (NO)
IFRM 18P37A5/L	cable	PNP break function (NC)
IFRM 18P37A5/S14L	connector M12	PNP break function (NC)



Sn = 8 mm

W I R E

- Quasi shielded mounting
- Improved EMC compatibility



general data

mounting type	quasi shielded
nominal sensing distance Sn	8 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated / PC
dimension	18 mm

cable

housing length	49,5 mm
----------------	---------

connector M12

housing length	60 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

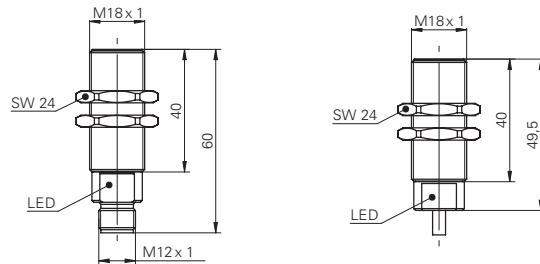
accessories

connectors	ESG 34S, ESW 33S
------------	------------------

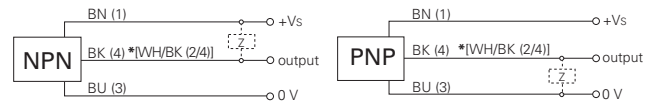
remarks

For correct installation refer to chapter 1 "mounting instructions"

dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

order reference	connection types	output circuit
IFRM 18N17A3/L	cable	NPN make function (NO)
IFRM 18N17A3/S14L	connector M12	NPN make function (NO)
IFRM 18N37A3/L	cable	NPN break function (NC)
IFRM 18N37A3/S14L	connector M12	NPN break function (NC)
IFRM 18P17A3/L	cable	PNP make function (NO)
IFRM 18P17A3/S14L	connector M12	PNP make function (NO)
IFRM 18P37A3/L	cable	PNP break function (NC)
IFRM 18P37A3/S14L	connector M12	PNP break function (NC)



Sn = 8 mm

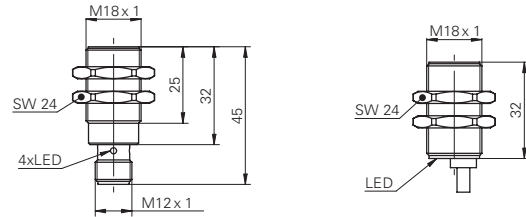
WIRE

- Quasi shielded mounting
- Voltage supply range +Vs 10 ... 50 VDC

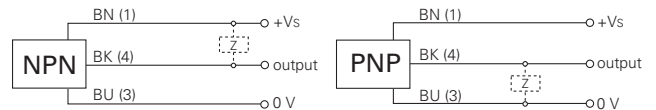


general data	
mounting type	quasi shielded
nominal sensing distance Sn	8 mm
hysteresis	3 ... 25 % of Sr
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 50 VDC
current consumption max.	10 mA
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
cable	
housing length	32 mm
connector M12	
housing length	45 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
connectors	ESG 34S, ESW 33S
remarks	
For correct installation refer to chapter 1 "mounting instructions"	

dimension drawings



connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 18N1701/L	cable	NPN make function (NO)	LED red
IFRM 18N1703/S14L	connector M12	NPN make function (NO)	4 port LED red
IFRM 18N3701/L	cable	NPN break function (NC)	LED red
IFRM 18N3703/S14L	connector M12	NPN break function (NC)	4 port LED red
IFRM 18P1701/L	cable	PNP make function (NO)	LED red
IFRM 18P1703/S14L	connector M12	PNP make function (NO)	4 port LED red
IFRM 18P3701/L	cable	PNP break function (NC)	LED red
IFRM 18P3703/S14L	connector M12	PNP break function (NC)	4 port LED red



Sn = 8 mm

W I R E

- Voltage supply range +Vs 10 ... 50 VDC
- Quasi shielded mounting



general data

mounting type	quasi shielded
nominal sensing distance Sn	8 mm
hysteresis	3 ... 25 % of Sr

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 50 VDC
current consumption max.	10 mA
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm

cable

housing length	50 mm
----------------	-------

connector M12

housing length	60 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

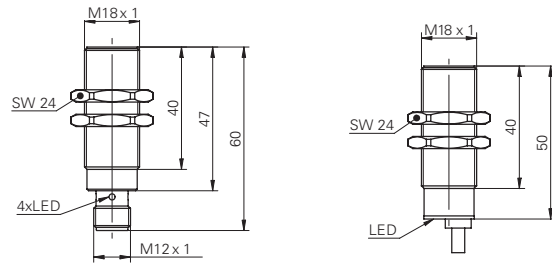
accessories

connectors	ESG 34S, ESW 33S
------------	------------------

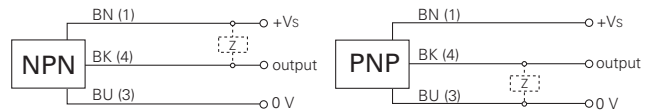
remarks

For correct installation refer to chapter 1 "mounting instructions"

dimension drawings



connection diagrams



IFRM 18 Sn = 8 mm

Inductive sensors 3-wire digital output

order reference	connection types	output circuit	output indicator
IFRM 18N1701/S14L	connector M12	NPN make function (NO)	4 port LED red
IFRM 18N1702/L	cable	NPN make function (NO)	LED red
IFRM 18N3701/S14L	connector M12	NPN break function (NC)	4 port LED red
IFRM 18N3702/L	cable	NPN break function (NC)	LED red
IFRM 18P1701/S14L	connector M12	PNP make function (NO)	4 port LED red
IFRM 18P1702/L	cable	PNP make function (NO)	LED red
IFRM 18P3701/S14L	connector M12	PNP break function (NC)	4 port LED red
IFRM 18P3702/L	cable	PNP break function (NC)	LED red



Sn = 8 mm

W I R E

- Voltage supply range +Vs 10 ... 50 VDC
- Quasi shielded mounting
- Very long housing



general data

mounting type	quasi shielded
nominal sensing distance Sn	8 mm
hysteresis	3 ... 25 % of Sr

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 50 VDC
current consumption max.	10 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm

cable

housing length	65 mm
----------------	-------

connector M12

housing length	78 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

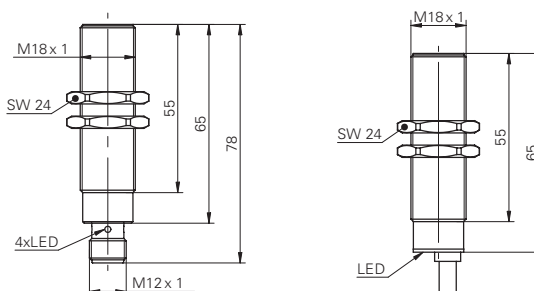
accessories

connectors	ESG 34S, ESW 33S
------------	------------------

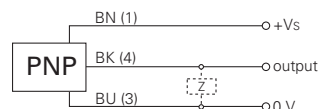
remarks

For correct installation refer to chapter 1 "mounting instructions"

dimension drawings



connection diagram



order reference	connection types	output indicator
IFRM 18P1704/L	cable	LED red
IFRM 18P1704/S14L	connector M12	4 port LED red



Sn = 12 mm

WIRE

- Increased sensing distance
- Non shielded mounting



general data

mounting type	unshielded
nominal sensing distance Sn	12 mm
hysteresis	3 ... 25 % of Sr

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	15 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm

cable

housing length	39 mm
----------------	-------

connector M12

housing length	52,5 mm
----------------	---------

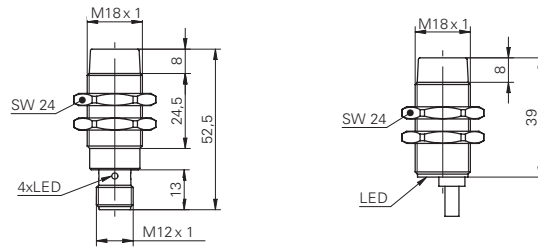
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

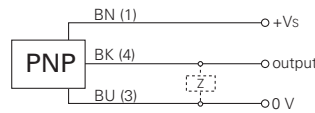
accessories

connectors	ESG 34S, ESW 33S
------------	------------------

dimension drawings



connection diagram



order reference	connection types	output indicator
IFRM 18P1301/L	cable	LED red
IFRM 18P1301/S14L	connector M12	4 port LED red

IFRM 18 Sn = 12 mm

Inductive sensors 3-wire digital output



Sn = 8 mm

W I R E

- Voltage supply range +Vs 10 ... 50 VDC
- Quasi shielded mounting
- M8 x 1 quick disconnect



general data

mounting type	quasi shielded
nominal sensing distance Sn	8 mm
hysteresis	3 ... 25 % of Sr
output indicator	4 port LED red

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 50 VDC
current consumption max.	10 mA
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
housing length	50 mm
connection types	connector M8

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

accessories

connectors	ESG 32S, ESW 31S
------------	------------------

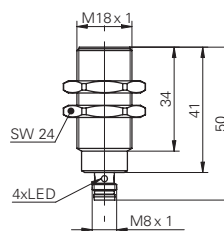
remarks

For correct installation refer to chapter 1 "mounting instructions"

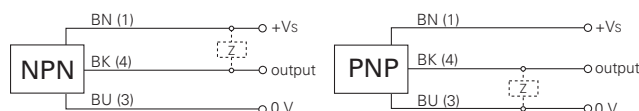
order reference

order reference	output circuit
IFRM 18N1701/S35L	NPN make function (NO)
IFRM 18N3701/S35L	NPN break function (NC)
IFRM 18P1701/S35L	PNP make function (NO)
IFRM 18P3701/S35L	PNP break function (NC)

dimension drawing



connection diagrams





Sn = 8 mm

W I R E

- Voltage supply range +Vs 10 ... 50 VDC
- PBT plastic housing
- Non shielded mounting



general data

mounting type	unshielded
nominal sensing distance Sn	8 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 1 kHz
voltage supply range +Vs	10 ... 50 VDC
current consumption max.	10 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	PBT
dimension	18 mm
housing length	80 mm
connection types	cable

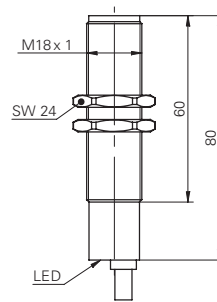
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

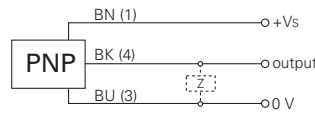
order reference

IFRK 18P1104/L

dimension drawing



connection diagram





Sn = 15 mm

W I R E

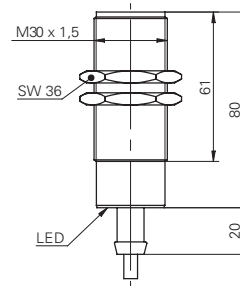
- Voltage supply range +Vs 10 ... 50 VDC
- PBT plastic housing
- Non shielded mounting



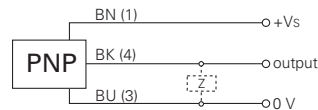
general data	
mounting type	unshielded
nominal sensing distance Sn	15 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 50 VDC
current consumption max.	10 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	PBT
dimension	30 mm
housing length	80 mm
connection types	cable
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

order reference
IFRK 30P1201/L

dimension drawing



connection diagram



IFRK 30 Sn = 15 mm

Inductive sensors 3-wire digital output



Sn = 10 mm

W I R E

- Voltage supply range +Vs 10 ... 50 VDC
- Shielded mounting
- M12 x 1 quick disconnect



general data

mounting type	shielded
nominal sensing distance Sn	10 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 50 VDC
current consumption max.	10 mA
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	30 mm

cable

housing length	60 mm
----------------	-------

connector M12

housing length	65 mm
----------------	-------

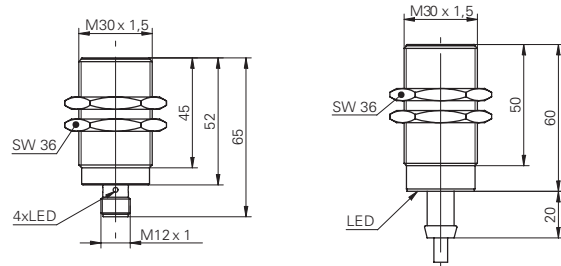
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

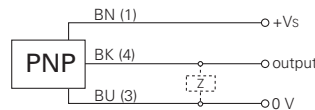
accessories

connectors	ESG 34S, ESW 33S
------------	------------------

dimension drawings



connection diagram



order reference	connection types	output circuit	output indicator
IFRM 30P1501/S14L	connector M12	PNP make function (NO)	4 port LED red
IFRM 30P1601/L	cable	PNP make function (NO)	LED red
IFRM 30P3501/S14L	connector M12	PNP break function (NC)	4 port LED red
IFRM 30P3601/L	cable	PNP break function (NC)	LED red

IFRM 30 Sn = 10 mm

Inductive sensors 3-wire digital output



Sn = 15 mm

W I R E

- Voltage supply range +Vs 10 ... 50 VDC
- Non shielded mounting
- M12 x 1 quick disconnect



general data

mounting type	unshielded
nominal sensing distance Sn	15 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 50 VDC
current consumption max.	10 mA
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	30 mm

cable

housing length	69,5 mm
----------------	---------

connector M12

housing length	74,4 mm
----------------	---------

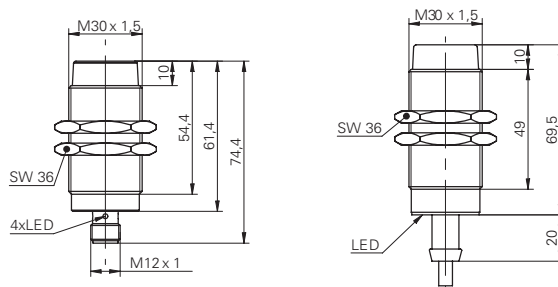
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

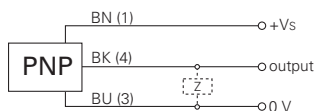
accessories

connectors	ESG 34S, ESW 33S
------------	------------------

dimension drawings



connection diagram



order reference	connection types	output circuit	output indicator
IFRM 30P1101/S14L	connector M12	PNP make function (NO)	4 port LED red
IFRM 30P1201/L	cable	PNP make function (NO)	LED red
IFRM 30P3101/S14L	connector M12	PNP break function (NC)	4 port LED red
IFRM 30P3201/L	cable	PNP break function (NC)	LED red

IFRM 30 Sn = 15 mm

Inductive sensors 3-wire digital output



Sn = 0,8 mm

W I R E

- Smallest rectangular housing
- Stainless steel housing



general data

mounting type	shielded
nominal sensing distance Sn	0,8 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red (backside)

electrical data

switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

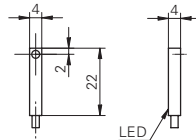
mechanical data

type	rectangular
material (sensing face)	EP
housing material	stainless steel
dimension	4 mm
housing length	22 mm
connection types	cable

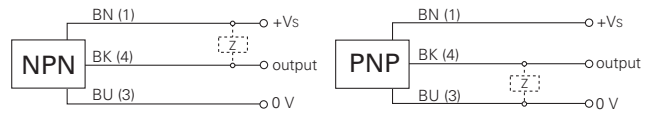
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawing



connection diagrams



order reference output circuit

IFFM 04N1501/O1L	NPN make function (NO)
IFFM 04N3501/O1L	NPN break function (NC)
IFFM 04P1501/O1L	PNP make function (NO)
IFFM 04P3501/O1L	PNP break function (NC)

IFFM 04 Sn = 0,8 mm

Inductive sensors 3-wire digital output



Sn = 1 mm

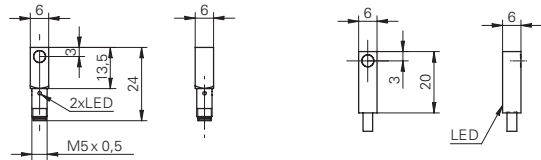
W I R E

- Miniature connector M5 x 0,5
- Smallest rectangular housing with connector

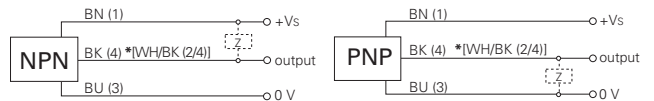


general data	
mounting type	shielded
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
material (sensing face)	LCP
housing material	brass nickel plated
dimension	6 mm
cable	
housing length	20 mm
connector M5	
housing length	24 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
connectors	ESG 05, ESW 05

dimension drawings



connection diagrams



* .../S05L pin 2 & 4 electrically connected

order reference	connection types	output circuit	output indicator
IFFM 06N15A3/O1L	cable	NPN make function (NO)	LED red (backside)
IFFM 06N15A3/O1S05L	connector M5	NPN make function (NO)	2 port LED red
IFFM 06N35A3/O1L	cable	NPN break function (NC)	LED red (backside)
IFFM 06N35A3/O1S05L	connector M5	NPN break function (NC)	2 port LED red
IFFM 06P15A3/O1L	cable	PNP make function (NO)	LED red (backside)
IFFM 06P15A3/O1S05L	connector M5	PNP make function (NO)	2 port LED red
IFFM 06P35A3/O1L	cable	PNP break function (NC)	LED red (backside)
IFFM 06P35A3/O1S05L	connector M5	PNP break function (NC)	2 port LED red



Sn = 1 mm

W I R E

- Standard cable version
- High switching frequency



general data

mounting type	shielded
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red (backside)

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

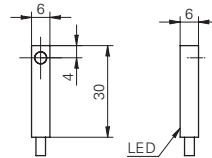
mechanical data

type	rectangular
material (sensing face)	LCP
housing material	brass nickel plated
dimension	6 mm
housing length	30 mm
connection types	cable

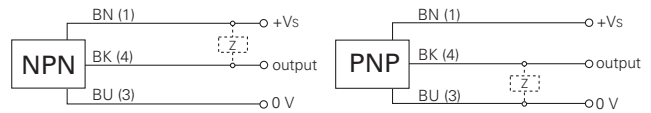
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawing



connection diagrams



order reference output circuit

IFFM 06N15A1/O1L	NPN make function (NO)
IFFM 06N35A1/O1L	NPN break function (NC)
IFFM 06P15A1/O1L	PNP make function (NO)
IFFM 06P35A1/O1L	PNP break function (NC)

IFFM 06 Sn = 1 mm

Inductive sensors 3-wire digital output



Sn = 2 mm

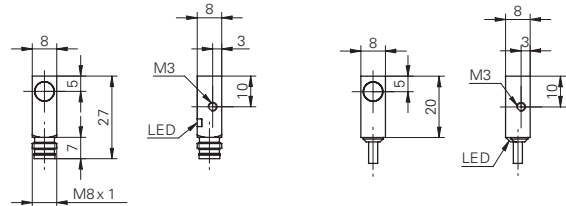
W I R E

- Shortest rectangular design
- Cable and connector versions
- High switching frequency

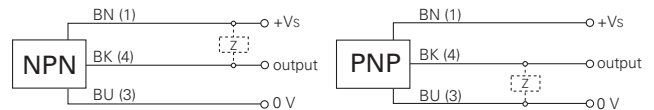


general data	
mounting type	shielded
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
material (sensing face)	PBT
housing material	brass nickel plated
dimension	8 mm
cable	
housing length	20 mm
connector M8	
housing length	27 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
connectors	ESG 32S, ESW 31S

dimension drawings



connection diagrams



order reference	connection types	output circuit
IFFM 08N1703/O1L	cable	NPN make function (NO)
IFFM 08N17A5/O1S35L	connector M8	NPN make function (NO)
IFFM 08N3703/O1L	cable	NPN break function (NC)
IFFM 08N37A5/O1S35L	connector M8	NPN break function (NC)
IFFM 08P1703/O1L	cable	PNP make function (NO)
IFFM 08P17A5/O1S35L	connector M8	PNP make function (NO)
IFFM 08P3703/O1L	cable	PNP break function (NC)
IFFM 08P37A5/O1S35L	connector M8	PNP break function (NC)

IFFM 08 Sn = 2 mm

Inductive sensors 3-wire digital output



Sn = 2 mm

W I R E

- High switching frequency
- Cable and connector versions



general data

mounting type	shielded
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
material (sensing face)	PBT
housing material	brass nickel plated
dimension	8 mm

cable

housing length	28,5 mm
----------------	---------

connector M8

housing length	35,5 mm
----------------	---------

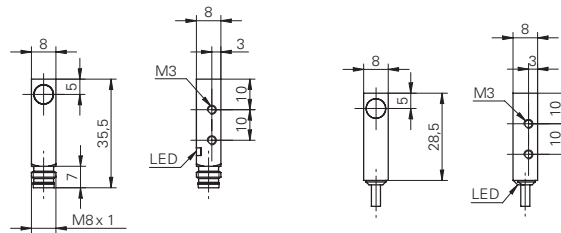
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

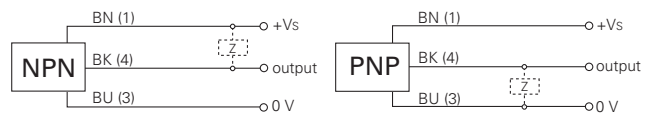
accessories

connectors	ESG 32S, ESW 31S
------------	------------------

dimension drawings



connection diagrams



order reference	connection types	output circuit
IFFM 08N1702/O1L	cable	NPN make function (NO)
IFFM 08N17A3/O1S35L	connector M8	NPN make function (NO)
IFFM 08N3702/O1L	cable	NPN break function (NC)
IFFM 08N37A3/O1S35L	connector M8	NPN break function (NC)
IFFM 08P1702/O1L	cable	PNP make function (NO)
IFFM 08P17A3/O1S35L	connector M8	PNP make function (NO)
IFFM 08P3702/O1L	cable	PNP break function (NC)
IFFM 08P37A3/O1S35L	connector M8	PNP break function (NC)

IFFM 08 Sn = 2 mm

Inductive sensors 3-wire digital output



Sn = 2 mm

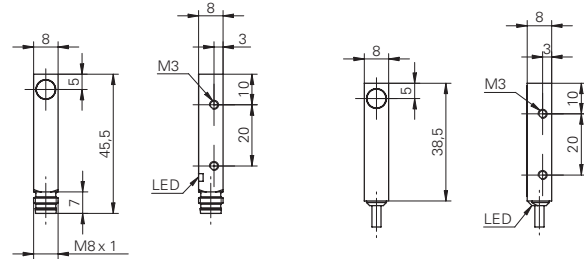
WIRE

- High switching frequency
- Cable and connector versions

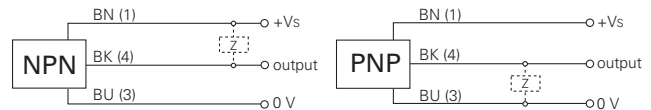


general data	
mounting type	shielded
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
material (sensing face)	PBT
housing material	brass nickel plated
dimension	8 mm
cable	
housing length	38,5 mm
connector M8	
housing length	45,5 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
connectors	ESG 32S, ESW 31S

dimension drawings



connection diagrams



order reference	connection types	output circuit
IFFM 08N1701/O1L	cable	NPN make function (NO)
IFFM 08N17A1/O1S35L	connector M8	NPN make function (NO)
IFFM 08N3701/O1L	cable	NPN break function (NC)
IFFM 08N37A1/O1S35L	connector M8	NPN break function (NC)
IFFM 08P1701/O1L	cable	PNP make function (NO)
IFFM 08P17A1/O1S35L	connector M8	PNP make function (NO)
IFFM 08P3701/O1L	cable	PNP break function (NC)
IFFM 08P37A1/O1S35L	connector M8	PNP break function (NC)



Sn = 2 mm

W I R E

- Extra flat version
- Through bore for M3 screw
- Robust metal housing



general data

mounting type	shielded
nominal sensing distance Sn	2 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
material (sensing face)	PBT
housing material	die-cast zinc nickel plated
dimension	8 mm
housing length	16 mm

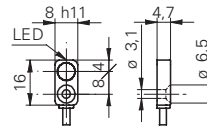
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

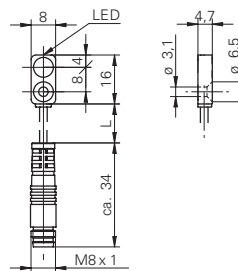
accessories

connectors	ESG 32S, ESW 31S
------------	------------------

dimension drawing

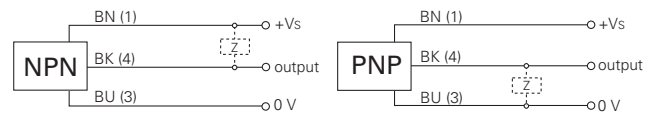


flylead connector version



standard cable length 200 mm

connection diagrams



order reference	connection types	output circuit
IFFM 08N17A6/KS35L	flylead connector M8	NPN make function (NO)
IFFM 08N17A6/L	cable	NPN make function (NO)
IFFM 08N37A6/KS35L	flylead connector M8	NPN break function (NC)
IFFM 08N37A6/L	cable	NPN break function (NC)
IFFM 08P17A6/KS35L	flylead connector M8	PNP make function (NO)
IFFM 08P17A6/L	cable	PNP make function (NO)
IFFM 08P37A6/KS35L	flylead connector M8	PNP break function (NC)
IFFM 08P37A6/L	cable	PNP break function (NC)



Sn = 2 mm

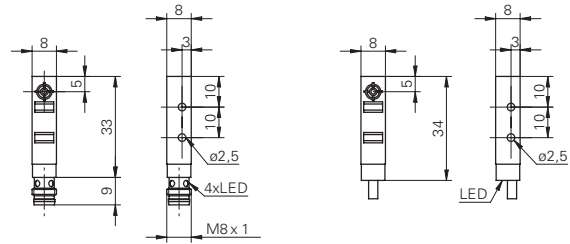
WIRE

- PBT plastic housing
- Installation with self tapping screws M3
- Shielded mounting

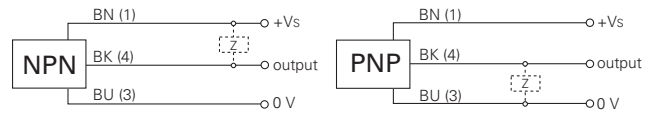


general data	
mounting type	shielded
nominal sensing distance Sn	2 mm
hysteresis	3 ... 25 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	18 mA
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
material (sensing face)	PBT
housing material	PBT
dimension	8 mm
cable	
housing length	34 mm
connector M8	
housing length	42 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
connectors	ESG 32S, ESW 31S

dimension drawings



connection diagrams



order reference	connection types	output circuit	output indicator
IFFK 08N1703/O1L	cable	NPN make function (NO)	LED red
IFFK 08N1703/O1S35L	connector M8	NPN make function (NO)	4 port LED red
IFFK 08N3703/O1S35L	connector M8	NPN break function (NC)	4 port LED red
IFFK 08P1703/O1L	cable	PNP make function (NO)	LED red
IFFK 08P1703/O1S35L	connector M8	PNP make function (NO)	4 port LED red
IFFK 08P3703/O1S35L	connector M8	PNP break function (NC)	4 port LED red

IFFK 08 Sn = 2 mm

Inductive sensors 3-wire digital output



Sn = 2 mm

W I R E

- High switching frequency
- Miniature connector M5 x 0,5



general data

mounting type	shielded
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
material (sensing face)	PBT
housing material	brass nickel plated
dimension	8 mm
connection types	connector M5

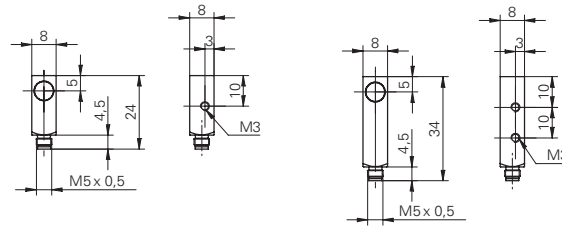
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

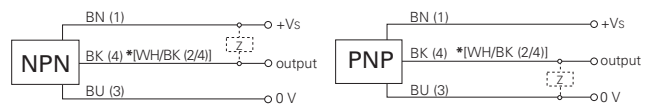
accessories

connectors	ESG 05, ESW 05
------------	----------------

dimension drawings



connection diagrams



* .../S05L pin 2 & 4 electrically connected

order reference	output circuit	housing length
IFFM 08N17A3/O1S05	NPN make function (NO)	34 mm
IFFM 08N17A5/O1S05	NPN make function (NO)	24 mm
IFFM 08N37A3/O1S05	NPN break function (NC)	34 mm
IFFM 08N37A5/O1S05	NPN break function (NC)	24 mm
IFFM 08P17A3/O1S05	PNP make function (NO)	34 mm
IFFM 08P17A5/O1S05	PNP make function (NO)	24 mm
IFFM 08P37A3/O1S05	PNP break function (NC)	34 mm
IFFM 08P37A5/O1S05	PNP break function (NC)	24 mm

IFFM 08 Sn = 2 mm

Inductive sensors 3-wire digital output



Sn = 4 mm

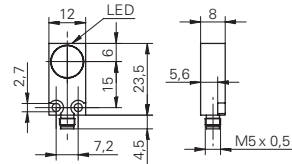
W I R E

- Extra flat version
- Miniature connector M5 x 0,5

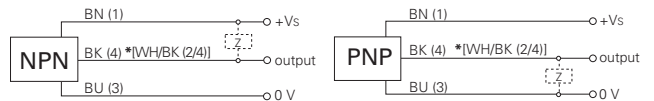


general data	
mounting type	shielded
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
housing length	23,5 mm
connection types	connector M5
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
connectors	ESG 05, ESW 05

dimension drawing



connection diagrams



* .../S05L pin 2 & 4 electrically connected

order reference	output circuit
IFFM 12N17A3/S05L	NPN make function (NO)
IFFM 12N37A3/S05L	NPN break function (NC)
IFFM 12P17A3/S05L	PNP make function (NO)
IFFM 12P37A3/S05L	PNP break function (NC)



Sn = 5 mm

W I R E

- Voltage supply range +Vs 10 ... 50 VDC
- Extra flat version
- 4 port LED



general data

mounting type	shielded
nominal sensing distance Sn	5 mm
hysteresis	3 ... 20 % of Sr
output indicator	4 port LED red

electrical data

switching frequency	< 1 kHz
voltage supply range +Vs	10 ... 50 VDC
current consumption max.	10 mA
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
material (sensing face)	PBT
housing material	brass nickel plated
dimension	20 mm
housing length	32 mm
connection types	connector M8

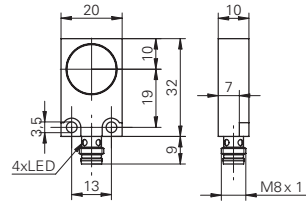
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

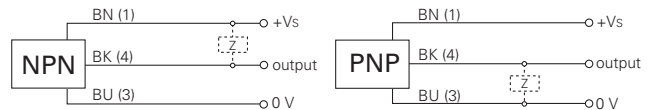
accessories

connectors	ESG 32S, ESW 31S
------------	------------------

dimension drawing



connection diagrams



order reference output circuit

IFFM 20N1501/S35L	NPN make function (NO)
IFFM 20N3501/S35L	NPN break function (NC)
IFFM 20P1501/S35L	PNP make function (NO)
IFFM 20P3501/S35L	PNP break function (NC)

IFFM 20 Sn = 5 mm

Inductive sensors 3-wire digital output



Sn = 8 mm

W I R E

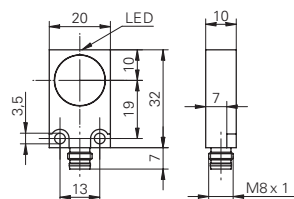
- Increased sensing distance
- Extra flat version



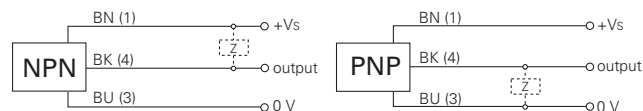
general data	
mounting type	shielded
nominal sensing distance Sn	8 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
material (sensing face)	PBT
housing material	brass nickel plated
dimension	20 mm
housing length	32 mm
connection types	connector M8
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
connectors	ESG 32S, ESW 31S

order reference	output circuit
IFFM 20N17A3/S35L	NPN make function (NO)
IFFM 20N37A3/S35L	NPN break function (NC)
IFFM 20P17A3/S35L	PNP make function (NO)
IFFM 20P37A3/S35L	PNP break function (NC)

dimension drawing



connection diagrams





Sn = 2 mm

W I R E

- Full stainless steel housing 1.4404 (A4)
- Active face with 20 bar pressure rating
- Protection class IP 69K



general data

mounting type	quasi shielded
special type	full metal housing (<i>DuroProx</i>)
nominal sensing distance Sn	2 mm
hysteresis	2 ... 20 % of Sr

electrical data

switching frequency	< 150 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	20 mA
voltage drop Vd	< 2 VDC
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	stainless steel 1.4404 (A4)
housing material	stainless steel 1.4404 (A4)
pressure static	< 20 bar
dimension	6 mm
housing length	46 mm
connection types	connector M8

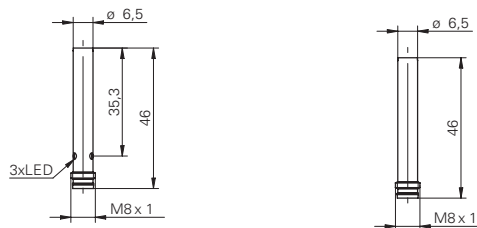
accessories

connectors	ESW 31S, ESG 32S
------------	------------------

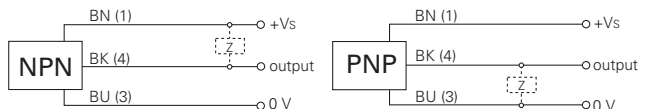
remarks

For correct installation refer to chapter 1 "mounting instructions"

dimension drawings



connection diagrams



IFRD 06 Sn = 2 mm

Inductive sensors with full metal housing *DuroProx*

order reference	output circuit	operating temperature	protection class	output indicator	output current
IFRD 06N17A1/S35L	NPN make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	3 port LED red	< 200 mA
IFRD 06N17T1/S35	NPN make function (NO)	-25 ... +100 °C	IP 69 K (sensing face/sensor)	-	< 100 mA
IFRD 06N37A1/S35L	NPN break function (NC)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	3 port LED red	< 200 mA
IFRD 06N37T1/S35	NPN break function (NC)	-25 ... +100 °C	IP 69 K (sensing face/sensor)	-	< 100 mA
IFRD 06P17A1/S35L	PNP make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	3 port LED red	< 200 mA
IFRD 06P17T1/S35	PNP make function (NO)	-25 ... +100 °C	IP 69 K (sensing face/sensor)	-	< 100 mA
IFRD 06P37A1/S35L	PNP break function (NC)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	3 port LED red	< 200 mA
IFRD 06P37T1/S35	PNP break function (NC)	-25 ... +100 °C	IP 69 K (sensing face/sensor)	-	< 100 mA



Sn = 2 mm

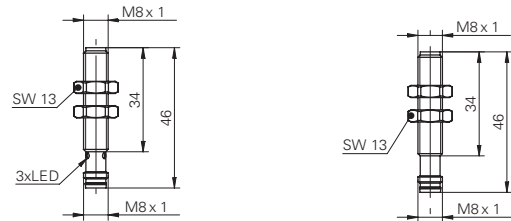
WIRE

- Full stainless steel housing 1.4404 (A4)
- Active face with 20 bar pressure rating
- Protection class IP 69K

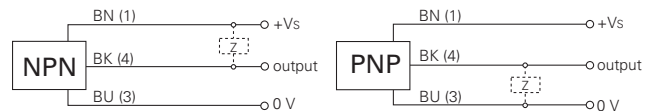


general data	
mounting type	quasi shielded
special type	full metal housing (<i>DuroProx</i>)
nominal sensing distance Sn	2 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 150 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	20 mA
voltage drop Vd	< 2 VDC
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	stainless steel 1.4404 (A4)
housing material	stainless steel 1.4404 (A4)
pressure static	< 20 bar
dimension	8 mm
housing length	46 mm
connection types	connector M8
accessories	
connectors	ESW 31S, ESG 32S
remarks	
For correct installation refer to chapter 1 "mounting instructions"	

dimension drawings



connection diagrams



order reference	output circuit	operating temperature	protection class	output indicator	output current
IFRD 08N17A1/S35L	NPN make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	3 port LED red	< 200 mA
IFRD 08N17T1/S35	NPN make function (NO)	-25 ... +100 °C	IP 69 K (sensing face/sensor)	-	< 100 mA
IFRD 08N37A1/S35L	NPN break function (NC)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	3 port LED red	< 200 mA
IFRD 08N37T1/S35	NPN break function (NC)	-25 ... +100 °C	IP 69 K (sensing face/sensor)	-	< 100 mA
IFRD 08P17A1/S35L	PNP make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	3 port LED red	< 200 mA
IFRD 08P17T1/S35	PNP make function (NO)	-25 ... +100 °C	IP 69 K (sensing face/sensor)	-	< 100 mA
IFRD 08P37A1/S35L	PNP break function (NC)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	3 port LED red	< 200 mA
IFRD 08P37T1/S35	PNP break function (NC)	-25 ... +100 °C	IP 69 K (sensing face/sensor)	-	< 100 mA



Sn = 4 mm

W I R E

- Full stainless steel housing 1.4404 (A4)
- Active face with 20 bar pressure rating
- Protection class IP 69K



general data

mounting type	quasi shielded
special type	full metal housing (<i>DuroProx</i>)
nominal sensing distance Sn	4 mm
hysteresis	2 ... 20 % of Sr

electrical data

switching frequency	< 100 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	14 mA
voltage drop Vd	< 2 VDC
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	stainless steel 1.4404 (A4)
housing material	stainless steel 1.4404 (A4)
pressure static	< 20 bar
dimension	12 mm
housing length	50 mm
connection types	connector M12

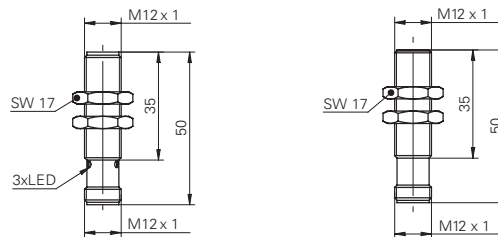
accessories

connectors	ES 14, ES 18, ESW 33S, ESG 34S
------------	--------------------------------

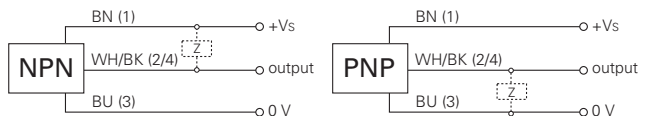
remarks

For correct installation refer to chapter 1 "mounting instructions"

dimension drawings



connection diagrams



order reference	output circuit	operating temperature	protection class	output indicator	output current
IFRD 12N17A3/S14L	NPN make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	3 port LED red	< 200 mA
IFRD 12N17T3/S14	NPN make function (NO)	-25 ... +100 °C	IP 69 K (sensing face/sensor)	-	< 100 mA
IFRD 12N37A3/S14L	NPN break function (NC)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	3 port LED red	< 200 mA
IFRD 12N37T3/S14	NPN break function (NC)	-25 ... +100 °C	IP 69 K (sensing face/sensor)	-	< 100 mA
IFRD 12P17A3/S14L	PNP make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	3 port LED red	< 200 mA
IFRD 12P17T3/S14	PNP make function (NO)	-25 ... +100 °C	IP 69 K (sensing face/sensor)	-	< 100 mA
IFRD 12P37A3/S14L	PNP break function (NC)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	3 port LED red	< 200 mA
IFRD 12P37T3/S14	PNP break function (NC)	-25 ... +100 °C	IP 69 K (sensing face/sensor)	-	< 100 mA



Sn = 6 mm

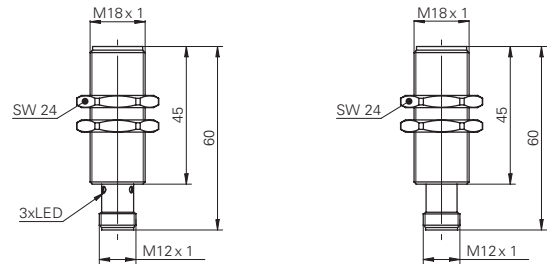
WIRE

- Full stainless steel housing 1.4404 (A4)
- Active face with 20 bar pressure rating
- Protection class IP 69K

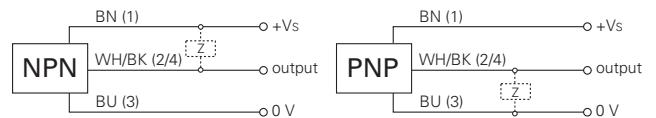


general data	
mounting type	quasi shielded
special type	full metal housing (<i>DuroProx</i>)
nominal sensing distance Sn	6 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 100 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	14 mA
voltage drop Vd	< 2 VDC
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	stainless steel 1.4404 (A4)
housing material	stainless steel 1.4404 (A4)
pressure static	< 20 bar
dimension	18 mm
housing length	60 mm
connection types	connector M12
accessories	
connectors	ES 14, ES 18, ESW 33S, ESG 34S
remarks	
For correct installation refer to chapter 1 "mounting instructions"	

dimension drawings



connection diagrams



order reference	output circuit	operating temperature	protection class	output indicator	output current
IFRD 18N17A3/S14L	NPN make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	3 port LED red	< 200 mA
IFRD 18N17T3/S14	NPN make function (NO)	-25 ... +100 °C	IP 69 K (sensing face/sensor)	-	< 100 mA
IFRD 18N37A3/S14L	NPN break function (NC)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	3 port LED red	< 200 mA
IFRD 18N37T3/S14	NPN break function (NC)	-25 ... +100 °C	IP 69 K (sensing face/sensor)	-	< 100 mA
IFRD 18P17A3/S14L	PNP make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	3 port LED red	< 200 mA
IFRD 18P17T3/S14	PNP make function (NO)	-25 ... +100 °C	IP 69 K (sensing face/sensor)	-	< 100 mA
IFRD 18P37A3/S14L	PNP break function (NC)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	3 port LED red	< 200 mA
IFRD 18P37T3/S14	PNP break function (NC)	-25 ... +100 °C	IP 69 K (sensing face/sensor)	-	< 100 mA



Sn = 2 mm / 5 mm

- Teflon coated sensing face
- Housing made of chromium plated brass
- Resist welding spark induced damage



general data

mounting type	shielded
special type	welding and magnetic noise
hysteresis	3 ... 20 % of Sr

electrical data

voltage supply range +Vs	10 ... 30 VDC
current consumption max.	10 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 1 VDC
output current	< 250 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	teflon coated
housing material	brass chromium plated
connection types	connector M12

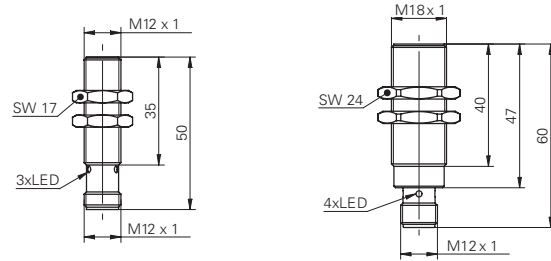
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

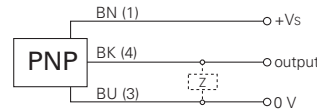
accessories

connectors	ES 14, ES 18, ESW 33S, ESG 34S
------------	--------------------------------

dimension drawings



connection diagram



order reference	nominal sensing distance Sn	switching frequency	dimension	housing length	output indicator
IFRW 12P1501/S14L	2 mm	< 1 kHz	12 mm	50 mm	3 port LED red
IFRW 18P1501/S14L	5 mm	< 500 Hz	18 mm	60 mm	4 port LED red



Sn = 2 mm

W I R E

- Zirconium oxide ZrO_2 sensing face
- 500 bar/7000 psi pressure rating
- Sensing face sealed to IP 68



general data

mounting type	shielded
special type	high pressure
nominal sensing distance Sn	2 mm
hysteresis	2 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	ceramic
housing material	stainless steel
pressure static	< 500 bar
pressure dynamic	< 350 bar
dimension	12 mm
connection types	connector M12

ambient conditions

operating temperature	-25 ... +80 °C
protection class	IP 68/67 (sensing face/sensor)

accessories

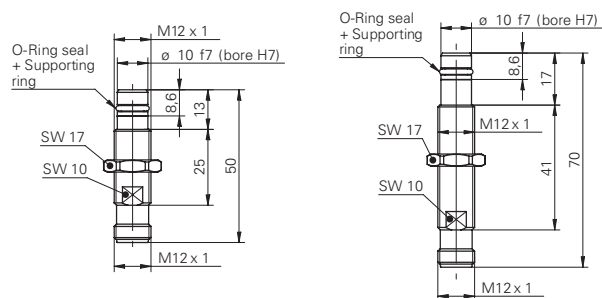
connectors	ES 14, ES 18, ESW 33S, ESG 34S
------------	--------------------------------

order reference

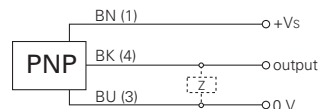
housing length

IFRP 12P1501/S14	50 mm
IFRP 12P1504/S14	70 mm

dimension drawings



connection diagram





Sn = 2 mm

WIRE

- Zirconium oxide ZrO₂ sensing face
- 500 bar/7000 psi pressure rating
- Sensing face sealed to IP 68



general data

mounting type	shielded
special type	high pressure
nominal sensing distance Sn	2 mm
hysteresis	2 ... 20 % of Sr

electrical data

switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	ceramic
housing material	stainless steel
pressure static	< 500 bar
pressure dynamic	< 350 bar
housing length	60 mm
connection types	connector M12

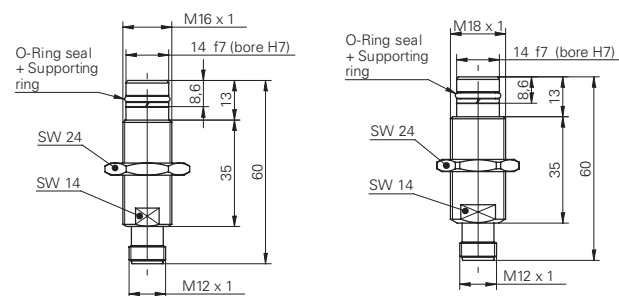
ambient conditions

operating temperature	-25 ... +80 °C
protection class	IP 68/67 (sensing face/sensor)

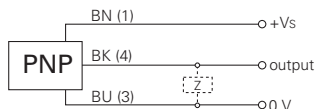
accessories

connectors	ES 14, ES 18, ESW 33S, ESG 34S
------------	--------------------------------

dimension drawings



connection diagram



order reference dimension

IFRP 16P1501/S14	16 mm
IFRP 18P1501/S14	18 mm

IFRP 16 / IFRP 18 Sn = 2 mm

High pressure sensors up to 500 bar



Sn = 2 mm / 4 mm

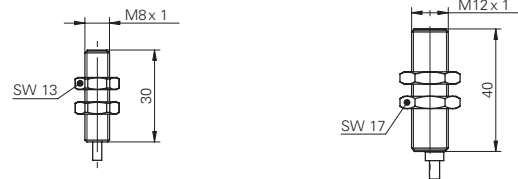
W I R E

- With integral electronics up to 100°C
- Teflon cable

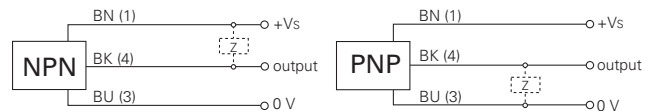


general data	
mounting type	shielded
special type	high temperature
hysteresis	3 ... 20 % of Sr
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 3 VDC
output current	< 50 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
connection types	cable
ambient conditions	
operating temperature	-25 ... +100 °C
protection class	IP 67

dimension drawings



connection diagrams



order reference	nominal sensing distance Sn	switching frequency	output circuit	dimension	housing material	housing length
IFRM 08N1707	2 mm	< 5 kHz	NPN make function (NO)	8 mm	stainless steel	30 mm
IFRM 08P1707	2 mm	< 5 kHz	PNP make function (NO)	8 mm	stainless steel	30 mm
IFRM 12N1707	4 mm	< 2 kHz	NPN make function (NO)	12 mm	brass nickel plated	40 mm
IFRM 12P1707	4 mm	< 2 kHz	PNP make function (NO)	12 mm	brass nickel plated	40 mm

IFRM 08 / IFRM 12 Sn = 2 mm / 4 mm

High temperature sensors up to +100 °C



Sn = 2 mm / 5 mm

WIRE

- Probe designed for use up to 180°C
- Active face made of LCP
- Detached cable amplifier



general data

mounting type	shielded
special type	high temperature
hysteresis	2 ... 20 % of Sr

electrical data

voltage supply range +Vs	10 ... 30 VDC
current consumption max.	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

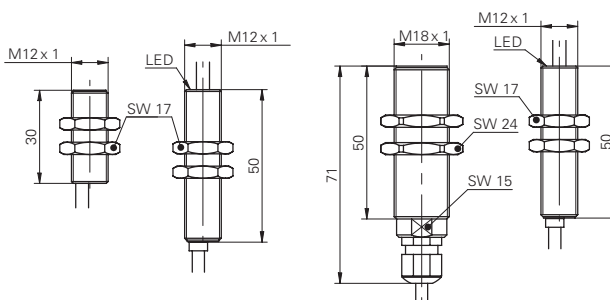
mechanical data

type	cylindrical threaded
connection types	cable

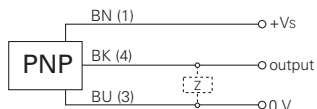
ambient conditions

operating temperature	-25 ... +180 °C
protection class	IP 67

dimension drawings



connection diagram








order reference	nominal sensing distance Sn	switching frequency	output circuit	dimension	housing material	housing length
IFRH 12P1501/L	2 mm	< 2 kHz	PNP make function (NO)	12 mm	brass nickel plated	30 mm
IFRH 12P3501/L	2 mm	< 2 kHz	PNP break function (NC)	12 mm	brass nickel plated	30 mm
IFRH 18P1501/L	5 mm	< 1 kHz	PNP make function (NO)	18 mm	stainless steel	71 mm
IFRH 18P3501/L	5 mm	< 1 kHz	PNP break function (NC)	18 mm	stainless steel	71 mm

IFRH 12 / IFRH 18 Sn = 2 mm / 5 mm

High temperature sensors up to +180 °C



Special executions

product family	IZRM 18 / IZRM 30	ILFK 12	IARM 08 / IARM 12	IHTP 2000	IFFM360
					
2 adjustable switching points	■				
dynamical operation				■	■
high temperature proof				■	
inductive code reader		■			
with banking screw			■		
shielded	■	■	■	■	
unshielded		■			
nominal sensing distance Sn		2 mm 4 mm	0,4 mm 1,2 mm		70 mm
operating range	2 ... 5 mm 5 ... 10 mm			0 ... 1 mm (Measuring distance)	
housing length	111 mm 114 mm	38 mm 79 mm	50,5 mm 56 mm	63 mm	360 mm 205 mm
NPN	■		■		
PNP	■	■	■		■
cable		■		■	
screw connections	■				
connector M8			■		
connector M12					
brass nickel plated / PBT / PC	■				■
PA 6		■			
Titan TiAl6V4					
steel / hardened steel			■		
IP 64					■
IP 65	■				
IP 67		■	■		
IP 68				■	
Page	131	133	134	135	136



Sr = 2 ... 5 mm / 5 ... 10 mm

SPECIAL

- Two adjustable switching points
- Thresholds set by means of potentiometer



general data

mounting type	shielded
special type	2 adjust. switching points
hysteresis	1 ... 15 % of Sr
output indicator	LED red

electrical data

voltage supply range +Vs	14 ... 30 VDC
current consumption max.	20 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

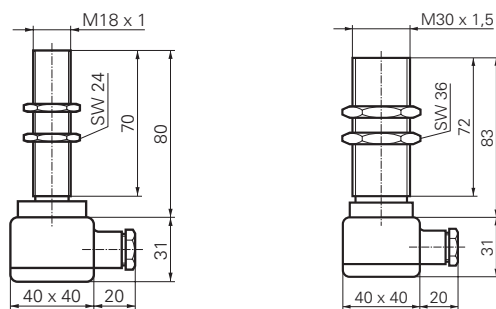
mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated / PBT / PC
connection types	screw connections

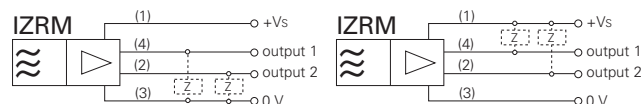
ambient conditions

operating temperature	0 ... +60 °C
protection class	IP 65

dimension drawings



connection diagrams



order reference	operating range	switching frequency	output circuit	dimension	housing length
IZRM 18N1501	2 ... 5 mm	< 1 kHz	NPN make function (NO)	18 mm	111 mm
IZRM 18P1501	2 ... 5 mm	< 1 kHz	PNP make function (NO)	18 mm	111 mm
IZRM 30N1501	5 ... 10 mm	< 500 Hz	NPN make function (NO)	30 mm	114 mm
IZRM 30P1501	5 ... 10 mm	< 500 Hz	PNP make function (NO)	30 mm	114 mm

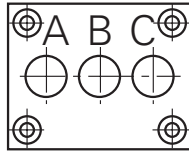
Sensors with two adjustable switching points IZRM 18 / IZRM 30 Sr = 2 ... 5 mm / 5 ... 10 mm



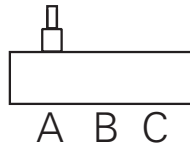
Inductive code readers are compact detection units available with 3-wire inductive proximity switches. The sensors have a common voltage supply but provide individual outputs.

A typical application for the code reader would be for identifying changeable tool heads on complex handling or machining units. Prior to the code reader, several individual sensors were needed, which required individual mounting and set up. Now the inductive code reader can be installed, bringing considerable cost savings in both installation and service.

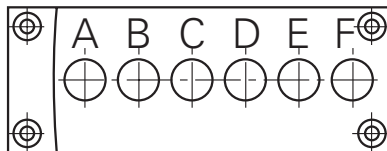
Sensor outputs 3 heads



A	green
B	yellow
C	grey
+Vs	brown
0 V	white



Sensor outputs 6 heads



A	white
B	pink
C	red
D	yellow
E	grey
F	green
+Vs	brown
0 V	blue



Sn = 2 mm / 4 mm

SPECIAL

- 3 head and 6 head versions
- Common voltage supply
- Individual outputs



general data

special type	inductive code reader
hysteresis	1 ... 20 % of Sr

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
output circuit	PNP make function (NO)
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

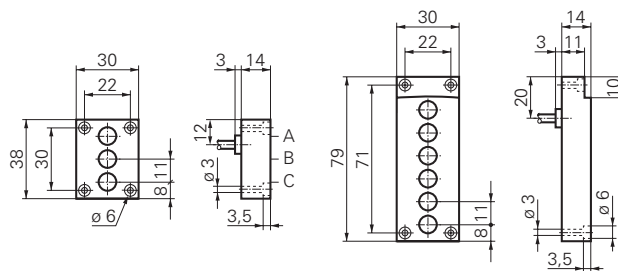
mechanical data

type	rectangular
material (sensing face)	PA 6
housing material	PA 6
dimension	30 mm
connection types	cable

ambient conditions

operating temperature	0 ... +60 °C
protection class	IP 67

dimension drawings



connection diagram



order reference	nominal sensing distance Sn	mounting type	housing length	current consumption max.
ILFK 12P1101/I03	4 mm	unshielded	38 mm	10 mA
ILFK 12P1101/I06	4 mm	unshielded	79 mm	20 mA
ILFK 12P1501/I03	2 mm	shielded	38 mm	10 mA
ILFK 12P1501/I06	2 mm	shielded	79 mm	20 mA

ILFK 12 Sn = 2 mm / 4 mm

Inductive code readers



Sn = 0,4 mm / 1,2 mm

SPECIAL

- Face hardened steel 1.0737
- Output triggered on impact
- Quick and easy sensor replacement



general data

mounting type	shielded
special type	with banking screw
hysteresis	3 ... 20 % of Sr
output indicator	4 port LED red

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max.	18 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	steel / hardened steel
connection types	connector M8

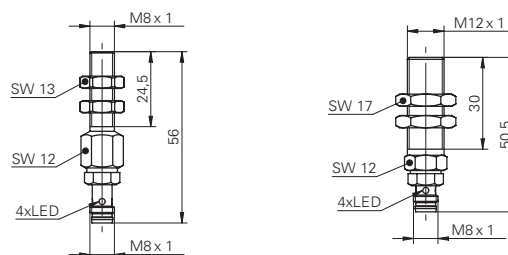
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

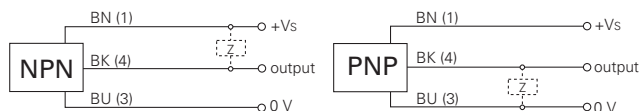
accessories

connectors	ESW 31S, ESG 32S
------------	------------------

dimension drawings



connection diagrams



order reference	nominal sensing distance Sn	output circuit	dimension	housing length	voltage drop Vd	output current
IARM 08N1503/S35L	0,4 mm	NPN make function (NO)	8 mm	56 mm	< 2,5 VDC	< 100 mA
IARM 08P1503/S35L	0,4 mm	PNP make function (NO)	8 mm	56 mm	< 2,5 VDC	< 100 mA
IARM 12N1503/S35L	1,2 mm	NPN make function (NO)	12 mm	50,5 mm	< 3 VDC	< 200 mA
IARM 12P1503/S35L	1,2 mm	PNP make function (NO)	12 mm	50,5 mm	< 3 VDC	< 200 mA



Measuring distance = 0 ... 1 mm

- Wide temperature range
- High pressure probe
- For the detection of dynamic targets



technical data

sensing distance	0 ... 1 mm
sensing face material	Titan TiAl6V4
collar material	stainless steel (1.4305)
cable material	chromium nickel steel (V2A)/ glass fabric
max. sensing face temperature (continuous)	-20 ... +350 °C
max. sensing face temperature (short term)	-20 ... +700 °C
max. sensor cable temperature	-20 ... +300 °C
max. pressure static / dynamic	-1 ... +2000 bar
protection class	IP 68

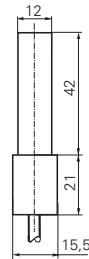
remarks

Sensor probe material: titanium TiAl6V4
Signal amplifier customer specific

order reference

IHTP 2000

dimension drawing



amplifier





Sn = 70 mm

- Large sensing distance and detection area
- Sensing distance set by Teach-in
- For the detection of dynamic targets



technical data

nominal sensing distance Sn	70 mm
real sensing distance Sr	set by Teach-in
voltage supply range +Vs	12 ... 30 VDC
output current	< 200 mA
output circuit	PNP normally open (NO)
current consumption max.	200 mA
voltage drop Vd	< 3 VDC

ambient available

operating temperature	+5 ... +50 °C
protection class	IP 64

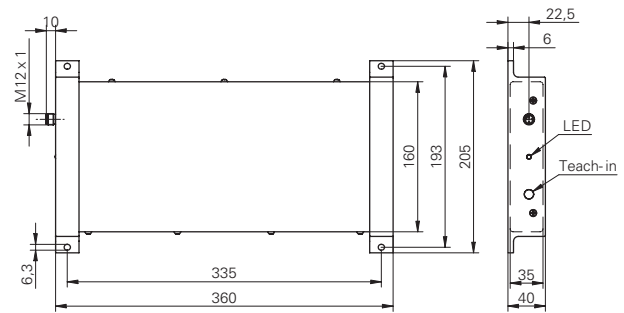
remarks

material of sensor housing: aluminum and black PET

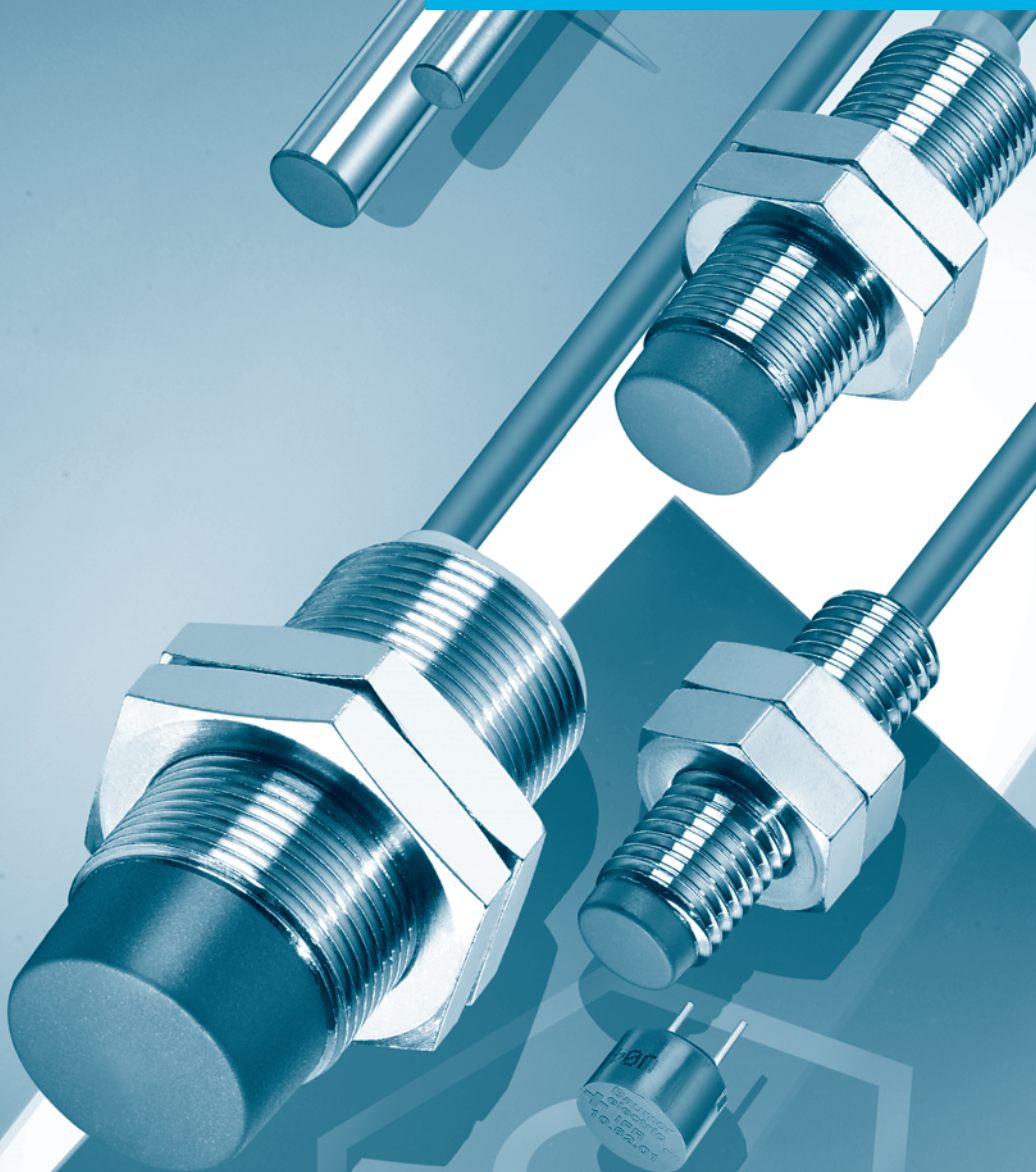
order reference

IFFM360P13G1/S14L







dimension drawing





Inductive NAMUR sensors



cylindrical designs

product family	IFR 04 / IFR 05	IFRM 06X	IFRM 08X	IFR 10	IFRM 12X	IFRM 18X
						
shielded	■	■	■	■	■	■
unshielded			■	■	■	■
nominal sensing distance Sn	0,8 mm	1,5 mm	1,5 mm 2 mm	2 mm 4 mm	2 mm 4 mm	5 mm 8 mm
housing length	25 mm	25 mm	25 mm 27 mm	6,5 mm	30 mm 34 mm	30 mm 38 mm
cable	■	■	■		■	■
print				■		
stainless steel	■					
brass nickel plated		■	■		■	■
PBT				■		
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
Page	139	140	141	142	143	144

rectangular designs

product family	IFF 08	IFFK 10E
		
shielded	■	
unshielded		■
nominal sensing distance Sn	1,5 mm	2 mm
housing length	25 mm	27,8 mm
cable	■	
spade lug		■
brass nickel plated	■	
PBT		■
protection class	IP 67	IP 67
Page	145	146



Sn = 0,8 mm

- Smallest NAMUR type sensors
- High switching frequency
- Robust metal housing

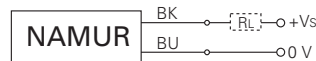


general data	
mounting type	shielded
nominal sensing distance Sn	0,8 mm
electrical data	
switching frequency	< 5 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	5 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max.	10 mA
residual ripple	< 10% Vs
mechanical data	
housing material	stainless steel
housing length	25 mm
connection types	cable
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
accessories	
clamping nut	Nr. 119345

dimension drawings



connection diagram



order reference	type	dimension
IFR 04.82.05	cylindrical smooth	4 mm
IFR 05.82.05	cylindrical threaded	5 mm



Sn = 1,5 mm

- High switching frequency



general data

mounting type	shielded
nominal sensing distance Sn	1,5 mm

electrical data

switching frequency	< 5 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	5 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max.	10 mA
residual ripple	< 10% Vs

mechanical data

type	cylindrical smooth
housing material	brass nickel plated
dimension	6,5 mm
housing length	25 mm
connection types	cable

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

safe maximum values

EC-type-examination Certificate	PTB 03 ATEX 2146
marking	II 1G EEx ia IIC T5/6
current Ii	< 37 mA
voltage Ui	< 13,5 VDC
power Pi	< 0,125 W
internal capacitance Ci	< 50 nF
internal inductance Li	< 0,2 mH
operating temperature Ta (temp. class T5)	-20 ... +60 °C
operating temperature Ta (temp. class T6)	-20 ... +40 °C

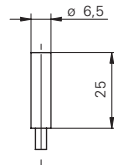
accessories

support	Nr. 109474
---------	------------

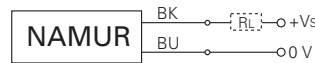
order reference

IFRM 06X9503

dimension drawing



connection diagram



operating data according to EN 50227

+Vs = 8,2 V
 RL = 1 kΩ
 T = 20 °C
 Sn at 1,8 mA

for applications in hazardous areas



Sn = 1,5 mm / 2 mm

- Shielded and unshielded versions
- High switching frequency



electrical data

switching frequency	< 5 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	5 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max.	10 mA
residual ripple	< 10% Vs

mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	8 mm
connection types	cable

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

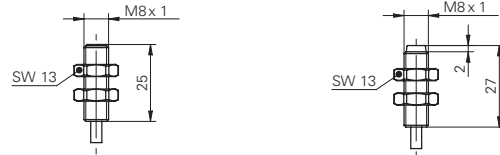
safe maximum values

EC-type-examination Certificate	PTB 03 ATEX 2146
marking	II 1G EEx ia IIC T5/6
current Ii	< 37 mA
voltage Ui	< 13,5 VDC
power Pi	< 0,125 W
internal capacitance Ci	< 50 nF
internal inductance Li	< 0,2 mH
operating temperature Ta (temp. class T5)	-20 ... +60 °C
operating temperature Ta (temp. class T6)	-20 ... +40 °C

remarks

available with connector S35

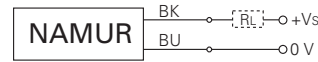
dimension drawings



shielded

unshielded

connection diagram



operating data according to EN 50227

+Vs = 8,2 V
 RL = 1 kΩ
 T = 20 °C
 Sn at 1,8 mA

for applications in hazardous areas

order reference	nominal sensing distance Sn	mounting type	housing length
IFRM 08X9103	2 mm	unshielded	27 mm
IFRM 08X9503	1,5 mm	shielded	25 mm

IFRM 08X Sn = 1,5 mm / 2 mm

Inductive NAMUR sensors



Sn = 2 mm / 4 mm



- Circuit board mountable
- Pin-spacing 5 mm
- Shielded and unshielded versions

electrical data

switching frequency	< 2 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	5 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max.	10 mA
residual ripple	< 10% Vs

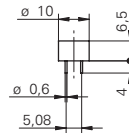
mechanical data

type	cylindrical smooth
housing material	PBT
dimension	10 mm
housing length	6,5 mm
connection types	print

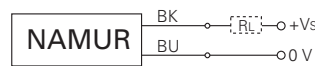
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawing



connection diagram



order reference	nominal sensing distance Sn	mounting type
IFR 10.82.01	4 mm	unshielded
IFR 10.82.05	2 mm	shielded



Sn = 2 mm / 4 mm

- Shielded and unshielded versions



electrical data

switching frequency	< 2 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	5 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max.	10 mA
residual ripple	< 10% Vs

mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	12 mm
connection types	cable

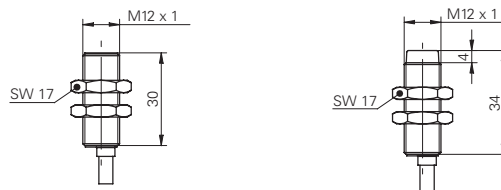
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

safe maximum values

EC-type-examination Certificate	PTB 03 ATEX 2146
marking	II 1G EEx ia IIC T5/6
current Ii	< 37 mA
voltage Ui	< 13,5 VDC
power Pi	< 0,125 W
internal capacitance Ci	< 50 nF
internal inductance Li	< 0,2 mH
operating temperature Ta (temp. class T5)	-20 ... +60 °C
operating temperature Ta (temp. class T6)	-20 ... +40 °C

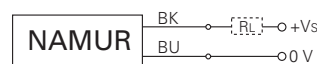
dimension drawings



shielded

unshielded

connection diagram



operating data according to EN 50227

+Vs = 8,2 V
 RL = 1 kΩ
 T = 20 °C
 Sn at 1,8 mA

for applications in hazardous areas

order reference	nominal sensing distance Sn	mounting type	housing length
IFRM 12X9103	4 mm	unshielded	34 mm
IFRM 12X9503	2 mm	shielded	30 mm

Inductive NAMUR sensors IFRM 12X Sn = 2 mm / 4 mm



Sn = 5 mm / 8 mm

- Shielded and unshielded versions



electrical data

switching frequency	< 1 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	5 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max.	10 mA
residual ripple	< 10% Vs

mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	18 mm
connection types	cable

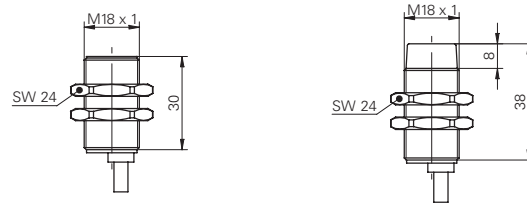
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

safe maximum values

EC-type-examination Certificate	PTB 03 ATEX 2146
marking	II 1G EEx ia IIC T5/6
current Ii	< 37 mA
voltage Ui	< 13,5 VDC
power Pi	< 0,125 W
internal capacitance Ci	< 50 nF
internal inductance Li	< 0,2 mH
operating temperature Ta (temp. class T5)	-20 ... +60 °C
operating temperature Ta (temp. class T6)	-20 ... +40 °C

dimension drawings



shielded

unshielded

connection diagram



operating data according to EN 5027

- +Vs = 8,2 V
- RL = 1 kΩ
- T = 20 °C
- Sn at 1,8 mA

for applications in hazardous areas

order reference	nominal sensing distance Sn	mounting type	housing length
IFRM 18X9103	8 mm	unshielded	38 mm
IFRM 18X9503	5 mm	shielded	30 mm



Sn = 1,5 mm



general data

mounting type	shielded
nominal sensing distance Sn	1,5 mm

electrical data

switching frequency	< 5 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	5 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max.	10 mA
residual ripple	< 10% Vs

mechanical data

type	rectangular
housing material	brass nickel plated
dimension	8 mm
housing length	25 mm
connection types	cable

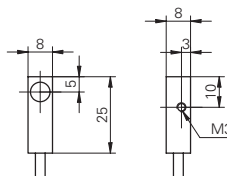
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

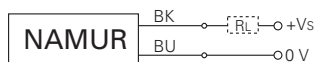
order reference

IFF 08.82.05

dimension drawing



connection diagram





Sn = 2 mm



general data

mounting type	unshielded
nominal sensing distance Sn	2 mm

electrical data

switching frequency	< 5 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	5 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max.	10 mA
residual ripple	< 10% Vs

mechanical data

type	rectangular
housing material	PBT
dimension	16 mm
housing length	27,8 mm
connection types	spade lug

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

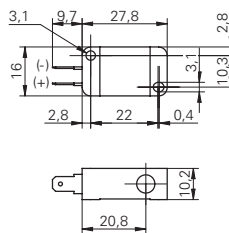
remarks

spade plug 4,8 x 0,5 mm

order reference

IFFK 10E9101

dimension drawing



connection diagram

