Baumer
Passion for Sensors

Inductive Sensors.

Compact, reliable and highly precise –
Indispensable in all machines.

ELTRA trade

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Baumer inductive sensors are special units that track inductance changes to determine the position of metal objects.

The German company produces several types of equipment that works with an inductive principle of action:

- Proximity switchers
- Distance sensors AlphaProx
- Hard-wearing and heat-resistant
- With reduction factor 1
- Miniature

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Table of contents.

Introduction

Miniature sensors for confined installation spaces 4
Sturdy sensors for demanding environments 5
Factor 1 sensors – treat all metals equally 6
AlphaProx® – Measure distances accurate to a micrometer 7
Sensing characteristics 8
Protection classes 11
Mounting and mounting procedure 12
General definitions 16

Inductive proximity switches for factory automation

Overview 20
Proximity switches for factory automation 30
Factor 1 100
Hygienic design 105
Washdown design 110
Outdoor design 115
Full metal housings *DuroProx* 127
High temperature sensors up to +100 °C 132
Sensors immune to welding and magnetic fields 137
High pressure sensors up to 500 bar 138
ATEX/NAMUR sensors 140

Inductive distance sensors *AlphaProx*®

Overview 154
Function and applications 160
Dynamic and static resolution 161
Teach-in functions 162
Distance sensors for factory automation 164
Distance sensors with linearized characteristic curve 185
Application specific distance sensors 197

Accessories

Connectors and mating connectors 204
Connectors/Pin assignment 212
Installation dimensions 213
Mounting accessories 214
Mounting kits *SENSOFIX* 217

Quick reference list 220

Smart & Small – top performance in smallest designs

Inductive miniature sensors

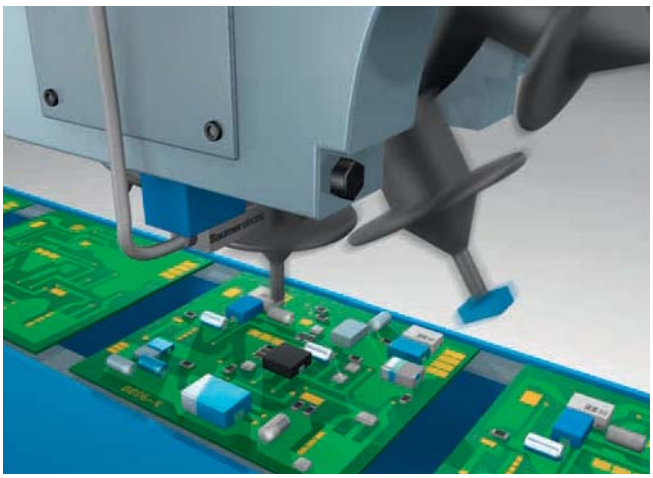
«Top performances in smallest designs» is the maxim of Baumer which leads to very small sensors with all integrated evaluation electronics and large sensing distance.

Highlights proximity switches:

- Cylindrical sensors from Ø 3 mm
- Flat sensors with an installation depth of merely 4 mm onward
- Large sensing distances up to 2 mm

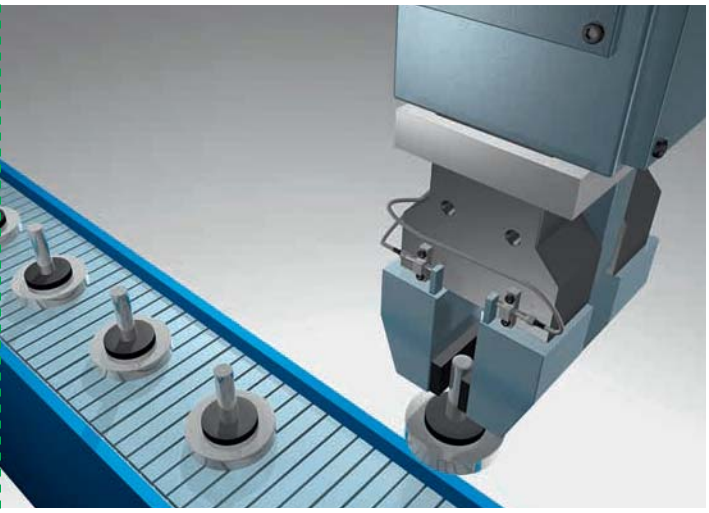
Highlights distance sensors:

- World›s smallest inductive distance sensor
- Ø 4 mm to M8 in short designs
- Flat sensor designs starting with 4.7 mm in height
- Measuring ranges up to 3 mm



SMD placement machine

- Ideal for fast processes thanks to a high switching frequency up to 5 kHz and their light weight
- Position detection of gripper jaws
- Work piece presence/absence check



Pick & Place / Robotic

- Precise position detection
- Absolute distance measurement with high resolution

Machine tools

- Reliable condition detection during automatic tool change prevents machine downtime
- Minimum space requirement enables more compact motor spindles
- Detection of misalignment and incorrect tools with measuring sensors.

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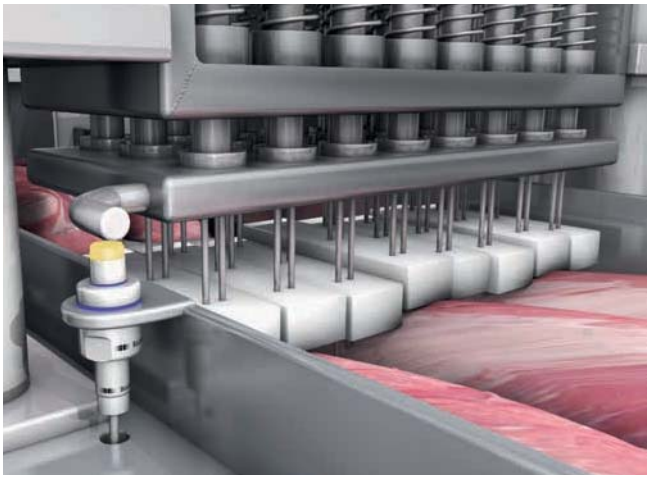
Hard-wearing and heat-resistant with long-term seal - Reliable in any environments

Sturdy inductive proximity switches and distance sensors

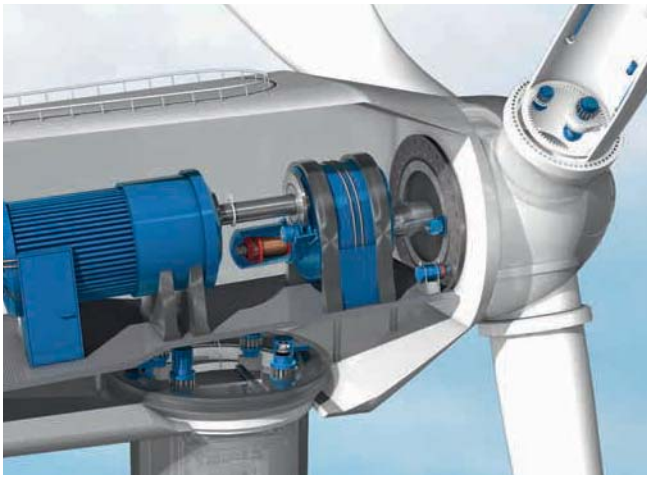


Hygienic sensors

- Highest chemical-resistant to cleaning agents and high-pressure cleaning
- Rugged, FDA compliant materials
- EHEDG certified design, 100% gap-free to prevent formation of bacterial residue
- Stainless steel housings V4h with protection class IP 69K and *proTect+*

Continuous operation in the metal cutting industry

- Closed housing made of stainless V4A steel (*DuroProx*)
- Resistant to mechanical loads, shocks and abrasive media
- Reliable use even under the influence of cutting, grinding and cooling lubricants



Outdoor and Washdown

- Wide temperature range from –40 … +80 °C
- Developed for onshore and offshore use
- Meets impermeability requirements up to protection class IP69K as well as the Baumer impermeability concept *proTect+*

The extremely sturdy Baumer inductive proximity switches and distance sensors offer reliable object detection and measurement results even in the most demanding environments. Thanks to front surfaces made of stainless steel or carbon fiber reinforced polymers (LCP), the sensors are optimally protected against mechanical damage.

Other Highlights:

- *DuroProx* full metal sensors are resistant to abrasive and chemically aggressive media like acid, lye or salt water
- High pressure resistant sensors resistant up to 500 bar with IP 68
- High temperature sensors up to 180 °C
- Sensors immune to welding and magnetic fields up to 90 mT
- ATEX certified sensors

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Same sensing distance on any metal

Inductive sensors with reduction factor 1

Inductive Factor 1 sensors offer the great benefit of maintaining the same sensing distance towards all metals. This uniform distance offers outstanding flexibility in system conception and sensor installation. However, the benefits of Baumer sensors go even further: They are the fastest in their class in relation to sensing distance and have exceptional sensing latitude.

Highlights proximity sensors:

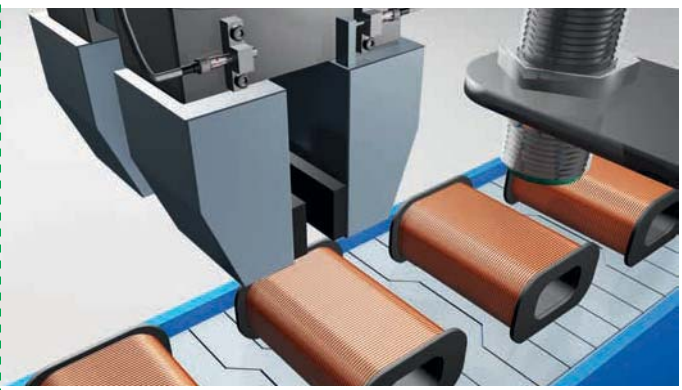
- Comprehensive portfolio from Ø 6.5 to M18
- Large sensing distances on all metals
- High switching frequency up to 3 kHz
- Excellent EMC properties

Highlights distance sensors:

- M18 with 8 mm measuring range for all metals
- Simple adjustment and installation thanks to teach method
- Linear characteristic curve for simple signal evaluation

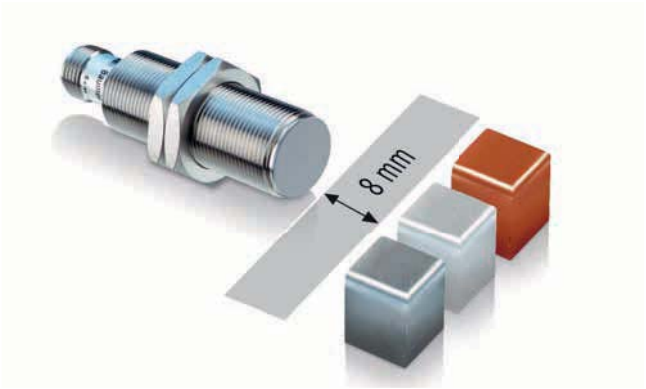
The fastest in their class

- Factor 1 sensors from Baumer have a very high switching frequency (up to 3 kHz). Baumer Factor 1 sensors are therefore the first choice for feeding different small parts such as nuts or rivets.



Coil and transformer production

- Use in winding machines
- Copper wire coil detection
- Quality control during coil production



Distance measurement with factor 1

- Standard sensors face up to 70% reduction of the sensing distance towards aluminum or copper. Distance sensors with factor 1 offer a 2-3 times larger effective measuring range.

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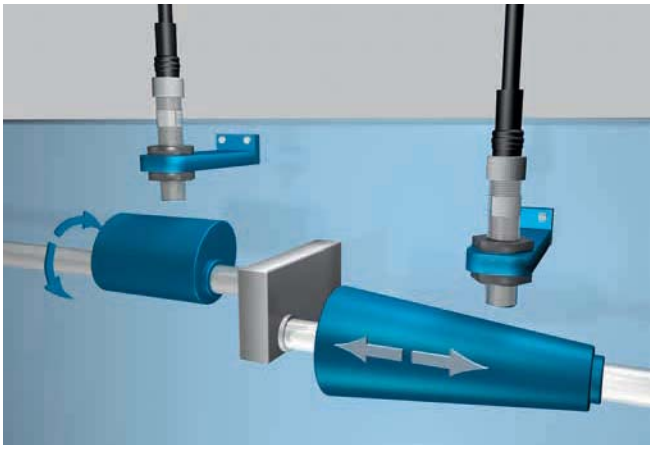
Measure distances accurate to a micrometer

Inductive distance sensors – *AlphaProx*®



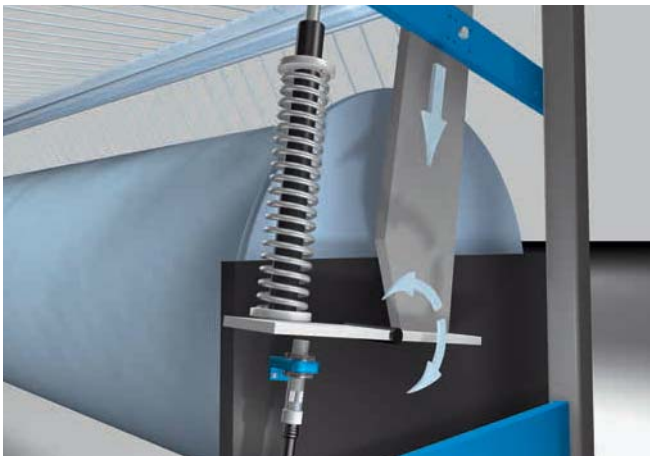
Absolute distance and angular measurement

- High reliability thanks to contact less measuring
- Dirt-resistant measuring system
- Measurement of linear and rotary movements possible
- Compact sensor sizes allow mounting even in limited spaces

With *AlphaProx*® Baumer offers the most comprehensive portfolio of standard and application-specific sensors with fully integrated signal processing and a very good price-performance ratio.

Highlights:

- Excellent measuring accuracy down to the nanometer range
- End-of-line calibration for minimized production lot variation
- Minimum deviation from sensor to sensor thanks to factory calibration
- Simple adjustment to the application thanks to its integrated powerful microcontroller



Tape tension control and monitoring

- *AlphaProx*® sensors enable high control quality when monitoring tape tensions. The sensor has two functions: displacement measurement (analog) and end position switch-off (digital). The measuring range of the sensor can be optimally adapted to different roll diameters by means of teach-in.

Vibration measurements on shafts and bearings

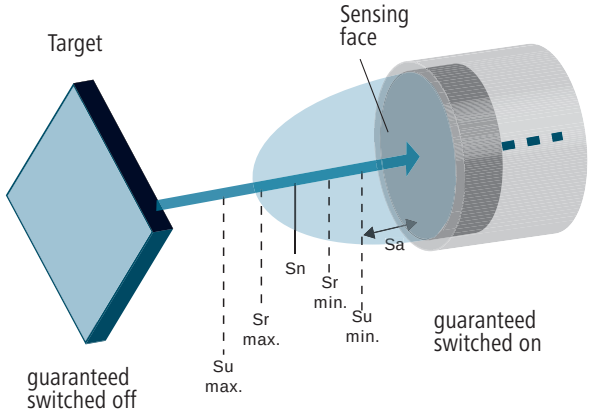
- Bearing play or true running measurements
- Detection of bearing damages
- *AlphaProx*® High Sensitivity for measurements in the micrometer range

Sensing distance

The international standard EN 60947-5-2 defines the sensing distance as follows: the sensing distance is the distance at which a standard target moving toward the sensing face of a proximity switch causes a signal change.

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).



Nominal sensing distance S_n

Nominal sensing distance S_n is a type classification parameter and does not take into account tolerances during machining or changes due to external conditions such as voltage or temperature.

Assured sensing distance S_a

Distance from the sensing face at which the operation of the proximity switch is ensured under defined conditions. For inductive proximity switches the assured sensing distance is between 0% and 81% of the nominal switching distance.

Effective sensing distance S_r

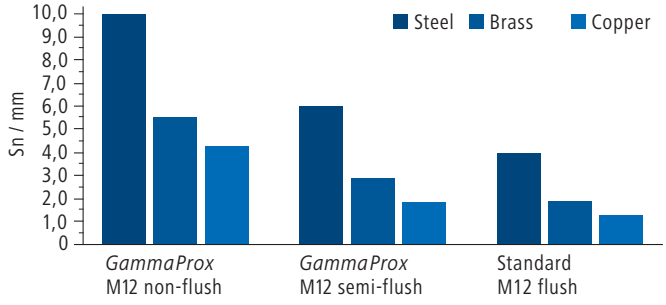
Effective sensing distance of an individual proximity switch which is measured at a defined temperature, voltage and installation conditions. For inductive proximity switches it must be between 90% and 110% of the nominal sensing distance at 23 ±5 °C.

Usable sensing distance S_u

Sensing distance of an individual proximity switch measured over the temperature range and at a supply voltage of 90% and 110% of the rated value. For inductive proximity switches it must be between 90% and 110% of the effective sensing distance.

Especially large sensing distances
GammaProx

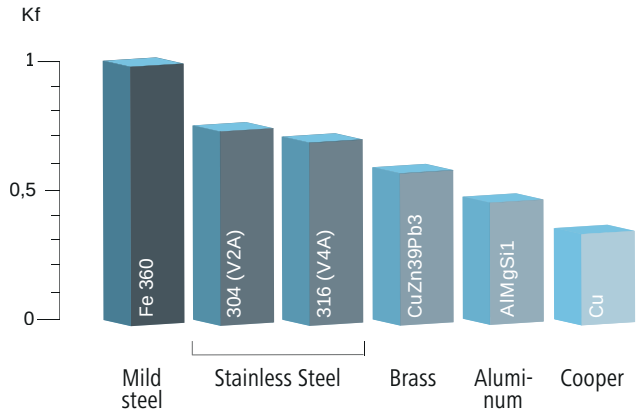
The sensing distances of the inductive *GammaProx* family are up to five times greater than the CENELEC standard value. This enables equally safe and reliable detection of steel and non-ferrous metals. Thanks to the increased sensing distance, it is possible to select generally greater distances to the moved objects, which permits greater installation tolerances, prevents damage, and increases plant reliability.



Due to the increased switching distance, *GammaProx* sensors react more sensitively to the surrounding material.For this reason, front-flush installation is not possible in all materials. The exact installation conditions and correction factors are specified in the data sheets.

Correction factor Cf

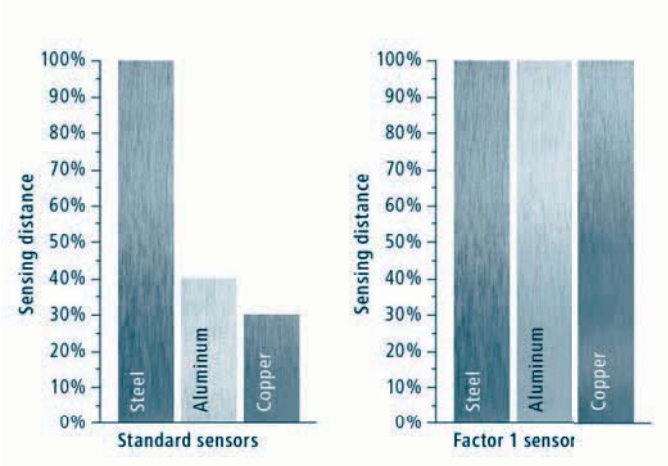
If metallic materials other than those of the standard measuring plate (Fe 360) are used for damping, the specified switching distances must be multiplied by the material correction factor specified in the data sheet. These results should be considered as guidelines. If no correction factors are specified in the data sheet, the standard values specified in this table can be used. Geometries deviating from the standard measuring plate also have an influence on the switching distance.



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.

Factor 1

Standard sensors face up to 70% reduction of the sensing distance towards non-ferromagnetic metals. Factor 1 sensors integrate a micro-controller for compensation. As a result, factor 1 sensors do not have the drawback of material-dependent reduction of the sensing distance. They feature negligible temperature drift and also stand out by high switching speed which makes them ideal for measurements on aluminum, non-ferrous metals and for rotation speed acquired towards gear wheels or perforated discs.



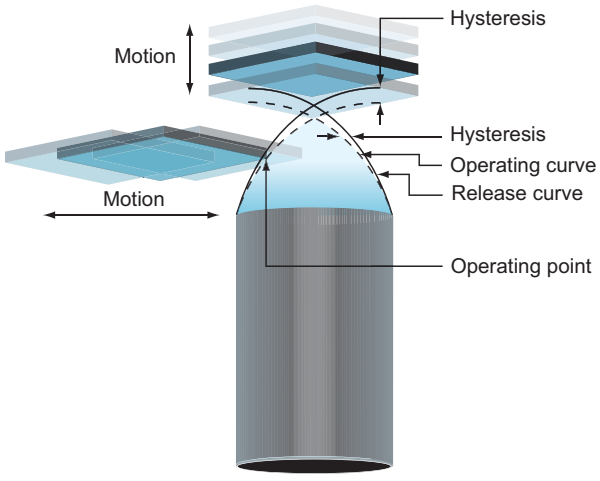
The uniform distance offers outstanding flexibility in system conception and sensor installation. However, the benefits of Baumer sensors go even further: They are the fastest in their class in relation to sensing distance and have exceptional sensing latitude.

Sensing characteristics

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.



Repeat accuracy (digital sensors)

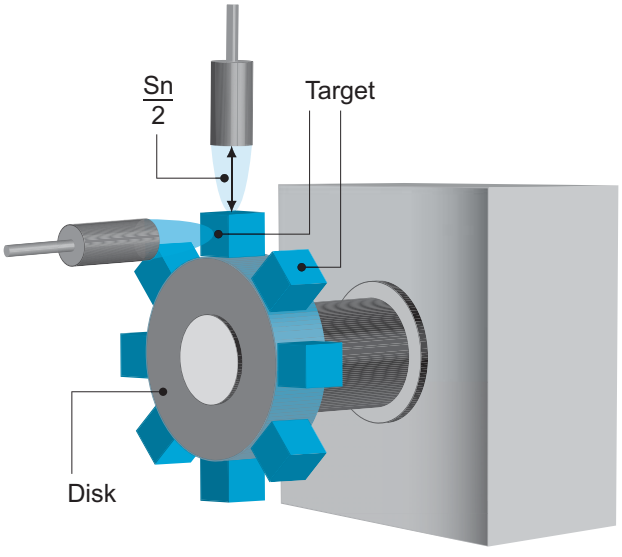
Repeat accuracy is described in the sensor standard EN 60947-5-2, which specifies that reproducibility amounts to 5% when two arbitrary measurements are taken within 8 hours, at a temperature of +23°C ±5 °C, and with a voltage supply that varies less than ±5 %.

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

Meeting EN 60947-5-2 standards, the switching frequency is the highest possible number of switchings per second.



Protection classes

Protection class

1) Protection from ingress of dust and complete protection against electric shock.

2) Protection from water jets from any direction.

IP 67 includes the IP 65 specification. In addition this class offers protection against water when the housing is immersed in water under defined pressure and time conditions (30 minutes in 1 meter deep water).

Water must not enter in a quantity that will produce harmful effects if the housing is continuously immersed in water and if conditions which are specified between the manufacturer and user are fulfilled. The conditions must however be more difficult than in IP 67.

Protection from ingress of water during high-pressure cleaning with pure water at a water pressure of 8,000 to 10,000 kPa and a water temperature of +80 °C. The pressurization period is 30 seconds per position. Because this test procedure distinctly differs from the other IP tests, devices with the test seal IP 69K do not automatically have protection class IP 67 or IP 68. Solely devices with protection class IP 67 also have the underlying protection classes as well.

DuroProx all-metal sensors

Baumer *DuroProx* (IFRD) sensors are tough in the truest sense of the word. The entire housing, including the sensing face, is made of stainless steel V4A (1.4404). As a result, *DuroProx* sensors are resistant to abrasive and chemically aggressive media like acid, lye or salt water. This is ensured not only by the all-metal housing with a sensing face made of stainless steel but also by increased noise immunity in accordance with EN 61000-6-2.

Durability at high temperatures

The operating temperature range of *DuroProx* sensors runs from –25 … +100° C. As a result, they can also be operated continuously in the surroundings of generators, combustion engines or in cleaning processes.

The *proTect+* impermeability concept by Baumer ensures absolute dependability even under most adverse conditions. Thanks to the specifically conceived construction and the use of high-quality materials, sensors with *proTect+* provide IP 69K protection and ensure absolute stability even after countless temperature cycles. In order to achieve this, the sensors have been shock-tested over the entire temperature range. The *proTect+* concept ensures enhanced reliability and extended sensor service life.

What constitutes *proTect+*?

- Long-term seal: Temperature shock test in water and air over the entire temperature range
- Hose-proof and withstands high-pressure cleaning: Meets the highest IP requirements for the areas of application
- Excellent resistance: Selected materials with high resistance to materials such as cleaning agents and oils
- Impermeability properties by design: Optimized mechanical interfaces and manufacturing processes

Mounting and mounting procedure

To rule out unintentional interference of the measuring field and to achieve maximum sensing distances, it is required to follow the mounting instructions and to maintain the specified minimum distances. If the minimum distances are undercut, a reduction of the sensing distances is expectable. A sensor test directly at the application is recommended.

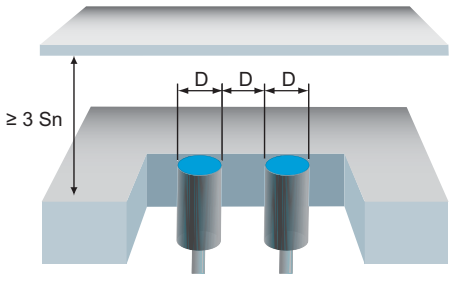
Correction factors for different installation situations specified in the sensor data sheet have priority over the general guidelines below.

Mounting instructions for cylindrical forms

shielded (flush) mounting

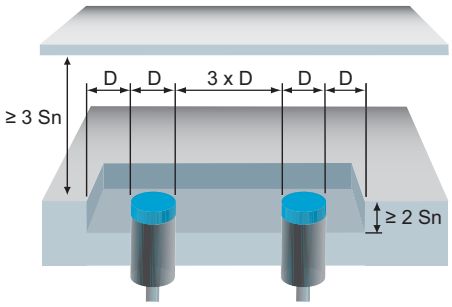
Sensor may be mounted flush in a metal plate.

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.

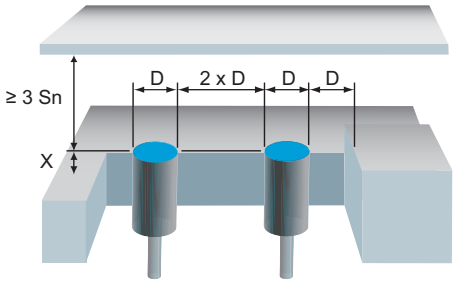


quasi shielded mounting

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.).

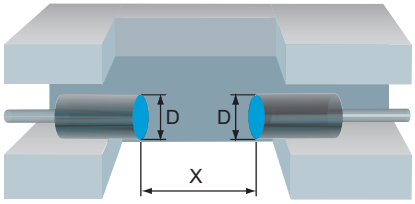
Always read and follow the installation instructions for distance measuring sensors.



x ≥ 1/3 Sn	for ferromagnetic material
x = 0	for all other materials

opposite mounting

Minimum distances must be observed to prevent oppositely positioned sensors from affecting each other.



Sensor types	Minimum distance X
Standard sensors	2 x D
DuroProx sensors	3 x D
GammaProx sensors	5 x D

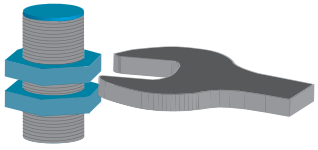
Installation

Maximum installation torque

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

Detailed information on the maximum tightening torque in the sensor data sheet has priority over the general guidelines below.

Reduce torque values by 30 % at the sensor's face.



Stainless steel thread:	Brass nickel plated thread: Die-cast zinc thread:	Polybutylenterephthalate thread:
M4 = 1,8 Nm	M3 = 0,9 Nm	M12 = 1,5 Nm
M5 = 2 Nm	M8 = 7 Nm	M18 = 3 Nm
M8 = 10 Nm	M12 = 15 Nm	M30 = 15 Nm
M12 = 20 Nm	M18 = 40 Nm	
M18 = 55 Nm	M30 = 200 Nm	

Mounting instructions for housings without threads

Strong, occasional housing loads, like those which occur e.g. during fixing with headless screws, must be avoided (IFRM 03, 04, 06). Incorrect installation can lead to irreversible damage to the proximity switch.

Sensors with a housing diameter of 6.5 mm can be installed optimally with the plastic support bracket 10109474.

Cable dimensions

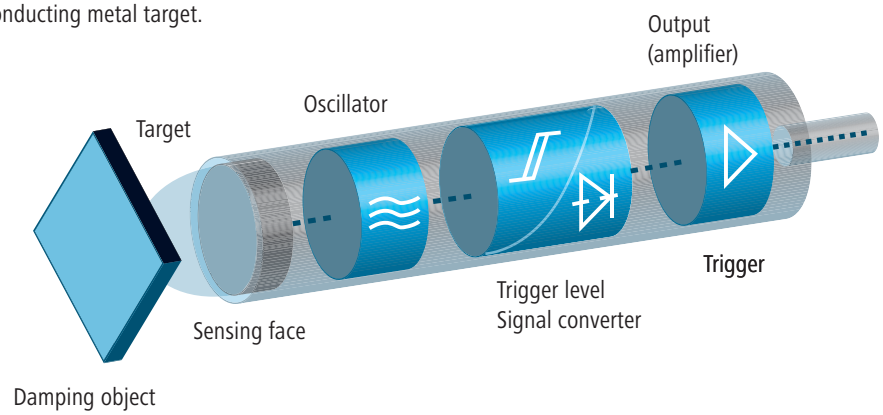
Housing ø	Wire diameter	Cable material*
ø3	3 x 0,05 mm^2	PVC
ø 4 /M5	3 x 0,08 mm^2	PUR
ø 6,5 / M8	3 x 0,14 mm^2	PVC
M12	3 x 0,25 mm^2	PVC
M18	3 x 0,25 / 3 x 0,50 mm^2	PVC
M30	3 x 0,50 mm^2	PVC

* where not otherwise stated

Design, function and electrical connection

The sensor

Baumer inductive proximity switches are non-contact electronic sensors. Inductive sensors will recognize any conducting metal target.



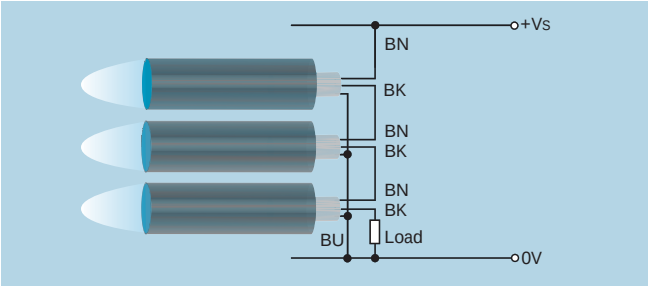
Operation

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

Digitally switching sensors are available with a PNP, NPN or Namur output; measuring sensors come with voltage output (0 … 10 V) or current output (e.g. 4 ... 20 mA or 0...10 mA).

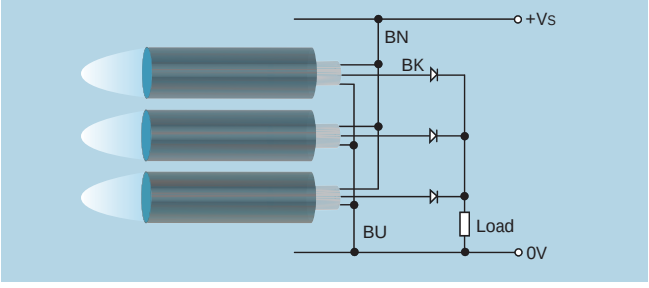
Series switching



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.

Connection diagrams

Explanatory notes on the connection diagrams

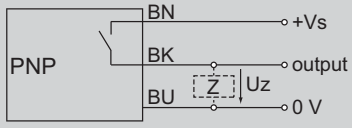
The specified diagrams indicate the undamped output. A sensor is in a damped state when an object is located in within its scanning range. In the diagrams Z denotes the typical load resistance position; Uz denotes the voltage applied to this load resistance. If Uz = high (≈ +Vs), then current flows; if Uz = low (≈ 0 V), then no current flows via the load resistance. Load resistance between output and +Vs is referred to as pull-up resistance, load resistance between output and 0 V as pull-down resistance.

PNP or NPN output

Sensors with a PNP or NPN output have a 3-wire design (+Vs, output and 0 V) and operate with direct current (DC). The load resistance of PNP sensors is between output and 0 V (pull-down resistance), while load resistance of NPN sensors is between +Vs and output (pull-up resistance). As a result, the PNP output is connected to the positive voltage supply during switching (positive switching output), whereas the NPN output is connected to the negative voltage supply during switching (negative switching output).

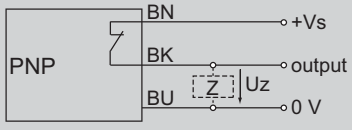
Normally open contacts and/or normally closed contacts define the switching function. Normally open contacts are referred to as normally open (NO), normally closed contacts as normally closed (NC). During damping with an object, sensors with normally open function establish contact connections (Uz = high), while sensors with normally closed function disconnect connections (Uz = low).

PNP normally open (NO)



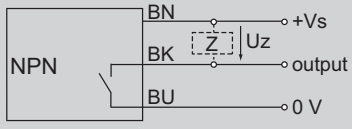
State	Uz	LED
undamped	low	off
damped	high	on

PNP normally closed (NC)



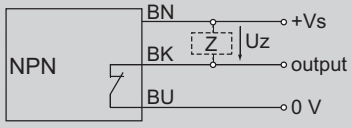
State	Uz	LED
undamped	high	on
damped	low	off

NPN normally open (NO)



State	Uz	LED
undamped	low	off
damped	high	on

NPN normally closed (NC)



State	Uz	LED
undamped	high	on
damped	low	off

■ C

Connection cable

Most of our proximity switches are equipped with highly flexible PVC cable. If high resistance against oil and grease is required, the cable material can be changed to PUR. A FEP cable is used for high temperature resistance. The standard cable length is 2 meters.

■ D

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.

DNV-GL Guidelines and certifications

Amalgamation of the classification companies "Det Norske Veritas" (Norway) and "Germanischer Lloyd" (Germany). DNV-GL certifies equipment for the maritime sector, mainly for use on ships. Before a certificate can be issued, increased vibration resistance in particular must be demonstrated in laboratory tests.

■ H

Hysteresis

Hysteresis is the difference between the operating and switching-off point as an object approaches and moves away from the sensor.

■ M

Magnetic fields

Strong magnetic fields might push the ferrite cores of the proximity switch into saturation. Proper switching is no longer guaranteed. Protective shielding is recommended.

Maximum cable length

A large cable length is a capacitive load for the output circuit and increases the influence of interference. Length should therefore be kept as short as possible.

Max. switching current

The maximum permissible load current passed through the sensor.

■ N

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.

■ O

Oil resistant

The standard PVC cables as well as the PBT sensing faces are not made to operate continuously in oily environments. PUR (polyurethane) cable options are available for both sensors and connectors.

Operating temperature range

The sensors are designed and tested for function in the specified temperature range.

Output protection

The sensors are protected against voltage peaks, short circuits and reverse polarity.

Output indicator

The LED indicates the current output.

■ R

Reverse polarity protection

These sensors are protected against temporary reversed polarity voltage connection.

Ripple

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.

■ S

Sensor standard

The sensor standard is described in EN 60947-5-2.

Status display

Most of our proximity switches have an LED display. Most of our proximity switches have an LED display which indicates the output switching status.

Short circuit protection

The sensors are protected against voltage peaks, short circuits and reverse polarity.

Supply current

This is the maximum current consumed by the sensor, at nominal voltage, exclusive of output.

■ V

Voltage drop Vd

This value indicates the maximum voltage drop measured across the conducting output.

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.

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Inductive proximity switches

Overview	Page 20
Proximity switches for factory automation	Page 30
Factor 1	Page 100
Hygienic design	Page 105
Washdown design	Page 110
Outdoor design	Page 115
Full metal housings *DuroProx*	Page 127
High temperature sensors	Page 132
Sensors immune to welding and magnetic fields	Page 137
High pressure sensors	Page 138
ATEX/NAMUR sensors	Page 140

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Standard solutions for factory automation – cylindrical designs

product family	IFRM 03	IFRM 03	IFRM 04	IFRM 04	IFRM 04	IFRM 05	IFRM 05
feature							
dimension	ø 3 mm	ø 3 mm	M4	ø 4 mm	ø 4 mm	M5	M5
nominal sensing distance Sn	0,8 mm	1 mm	0,8 mm	1 mm	1,6 mm	1 mm	1,6 mm
mounting type	flush	flush	flush	flush	flush	flush	flush
switching frequency max.	3 kHz	4 kHz	3 kHz	5 kHz	3 kHz	5 kHz	3 kHz
output current max.	100 mA	100 mA	100 mA	100 mA	100 mA	100 mA	100 mA
operating temperature	–25 ... +75 °C	–10 ... +70 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
housing length	12 ... 22 mm	12 ... 16 mm	22 mm	15 ... 45 mm	20 ... 45 mm	15 ... 45 mm	20 ... 45 mm
output circuit	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN
output function	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	cable flylead connector wires ext. electronic	cable wires	flylead connector wires	connector M5 connector M8 cable flylead connector wires	connector M5 connector M8 cable flylead connector	connector M5 connector M8 cable flylead connector wires	connector M5 connector M8 cable
page	**30 ... 31**	**32**	**33**	**34 ... 37**	**38 ... 40**	**41 ... 44**	**45 ... 47**

product family	IR12.P10S	IFRM 18	IFRM 18	IR18.P08S	IR18.P12S	IR18.P15S	IFRM 30
feature	*GammaProx*				*GammaProx*		
dimension	M12	M18	M18	M18	M18	M18	M30
nominal sensing distance Sn	10 mm	8 mm	12 mm	8 mm	12 mm	15 mm	10 mm
mounting type	non flush	quasi-flush	non flush	flush	flush	non flush	flush
switching frequency max.	1,5 kHz	500 Hz	500 Hz	500 Hz	400 Hz	400 Hz	500 Hz
output current max.	100 mA	200 mA	200 mA	200 mA	100 mA	100 mA	200 mA
operating temperature	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	0 ... +65 °C	–25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	brass-nickel	brass-nickel	brass-nickel	brass-nickel	brass-nickel	brass-nickel	brass-nickel
housing length	40 ... 60 mm	35 ... 75 mm	39 ... 53 mm	50 ... 60 mm	35 ... 60 mm	35 ... 60 mm	60 ... 65 mm
output circuit	PNP NPN	PNP NPN	PNP	PNP	PNP NPN	PNP NPN	PNP
output function	break (NC) make (NO)	break (NC) make (NO)	make (NO)	complemen-tary	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	connector M12 cable	connector M8 connector M12 cable	connector M12 cable	connector M12 cable	connector M12 cable	connector M12 cable	connector M12 cable
page	**69 ... 70**	**71 ... 74**	**75**	**76**	**77 ... 78**	**79 ... 80**	**81**

IFRM 06	IR06.P03S	IR06.P06S	IFRM 08	IR08.P03S	IR08.P06S	IFRM 12	IR12.P04S	IR12.P06S
	GammaProx	*GammaProx*		*GammaProx*	*GammaProx*			*GammaProx*
ø 6,5 mm	ø 6,5 mm	ø 6,5 mm	M8	M8	M8	M12	M12	M12
2 mm	3 mm	6 mm	2 mm	3 mm	6 mm	4 mm	4 mm	6 mm
flush	flush	non flush	flush	flush	non flush	flush	flush	flush
5 kHz	2 kHz	400 Hz	5 kHz	2 kHz	400 Hz	2 kHz	2 kHz	1 kHz
200 mA	100 mA	100 mA	200 mA	100 mA	100 mA	200 mA	200 mA	100 mA
–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C
IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
stainless steel	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel	brass-nickel	brass-nickel	brass-nickel
22 ... 56 mm	40 ... 46 mm	40 ... 46 mm	22 ... 56 mm	40 ... 46 mm	40 ... 46 mm	30 ... 60 mm	50 ... 85 mm	40 ... 60 mm
PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP	PNP NPN
break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	complemen-tary	break (NC) make (NO)
connector M8 cable flylead connector	connector M8 cable	connector M8 cable	connector M8 connector M12 cable flylead connector	connector M8 cable	connector M8 cable	connector M8 connector M12 cable	connector M12	connector M12 cable
48 ... 51	**52**	**53**	**54 ... 58**	**59**	**60**	**61 ... 64**	**65 ... 66**	**67 ... 68**

IFRM 30	IR30.P18S	IR30.P24S
	GammaProx	*GammaProx*
M30	M30	M30
15 mm	18 mm	24 mm
non flush	flush	non flush
500 Hz	500 Hz	500 Hz
200 mA	200 mA	200 mA
–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C
IP 67	IP 67	IP 67
brass-nickel	brass-nickel	brass-nickel
70 ... 75 mm	35 ... 60 mm	35 ... 60 mm
PNP	PNP NPN	PNP NPN
break (NC) make (NO)	complemen-tary	complemen-tary
connector M12 cable	connector M12 cable	connector M12 cable
82	**83 ... 84**	**85 ... 86**

Standard solutions for factory automation – cylindrical designs

product family	IFFM 04	IFFM 06	IFFM 08	IFFM 08	IFFM 08	IFFM 12	IFFM 20
dimension	4 x 4 mm	6 x 6 mm	8 x 4,7 mm	8 x 8 mm	8 x 8 mm	12 x 8 mm	20 x 10 mm
nominal sensing distance Sn	0,8 mm	1 mm	2 mm	2 mm	2 mm	4 mm	5 mm
switching frequency max.	3 kHz	5 kHz	5 kHz	5 kHz	5 kHz	2 kHz	1 kHz
output current max.	100 mA	100 mA	100 mA	200 mA	200 mA	200 mA	200 mA
operating temperature	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	stainless steel	brass-nickel	die-cast zinc	brass-nickel die-cast zinc	brass-nickel	brass-nickel	brass-nickel
housing length	22 mm	20 ... 30 mm	16 mm	20 ... 60 mm	49 mm	24 mm	32 mm
output circuit	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN
output function	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	cable	connector M5 cable	cable flylead connector	connector M8 cable	connector M8	connector M5	connector M8
page	**87**	**88 ... 89**	**90**	**91 ... 93**	**94 ... 95**	**96**	**97**

Factor 1 sensors

product family	IR06.P02F	IR08.P02F	IR12.P04F	IR18.P06F	IR18.P08F
dimension	ø 6,5 mm	M8	M12	M18	M18
nominal sensing distance Sn	2 mm	2 mm	4 mm	6 mm	8 mm
mounting type	flush	flush	flush	flush	qausi-flush
switching frequency max.	3 kHz	3 kHz	2 kHz	500 Hz	500 Hz
output current max.	200 mA	200 mA	200 mA	200 mA	200 mA
operating temperature	–25 ... +75 °C	–25 ... +75 °C	–10 ... +70 °C	–25 ... +75 °C	–25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	stainless steel	stainless steel	brass-nickel	brass-nickel	brass-nickel
housing length	40 ... 46 mm	40 ... 46 mm	40 ... 50 mm	50 ... 60 mm	50 ... 60 mm
output circuit	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN
output function	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	connector M8 cable	connector M8 cable	connector M12 cable	connector M12 cable	connector M12 cable
page	**100**	**101**	**102**	**103**	**104**

IFFM 20
20 x 10 mm
8 mm
500 Hz
200 mA
–25 ... +75 °C
IP 67
brass-nickel
32 mm
PNP NPN
break (NC) make (NO)
connector M8
98

Hygienic design

product family	IFBR 06	IFBR 11	IFBR 11	IFBR 17	IFBR 17
dimension	ø 6,5 mm	ø 11 mm	ø 11 mm	ø 17 mm	ø 17 mm
nominal sensing distance Sn	3 mm	4 mm	6 mm	8 mm	12 mm
mounting type	non flush	flush	non flush	quasi-flush	non flush
switching frequency max.	3 kHz	1 kHz	1 kHz	500 Hz	500 Hz
output current max.	200 mA	200 mA	200 mA	200 mA	200 mA
operating temperature	–40 ... +80 °C	–40 ... +80 °C	–40 ... +80 °C	–40 ... +80 °C	–40 ... +80 °C
protection class	IP 68/69K & proTect+	IP 68/69K & proTect+	IP 68/69K & proTect+	IP 68/69K & proTect+	IP 68/69K & proTect+
housing material	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
housing length	55 mm	54 ... 60 mm	54 ... 60 mm	55 ... 60 mm	55 ... 60 mm
output circuit	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN
output function	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	connector M12	connector M12 cable	connector M12 cable	connector M12 cable	connector M12 cable
approvals / certificates	FDA conform EHEDG Ecolab	FDA conform EHEDG Ecolab	FDA conform EHEDG Ecolab	FDA conform EHEDG Ecolab	FDA conform EHEDG Ecolab
page	**105**	**106**	**107**	**108**	**109**

Outdoor design

product family	IFRR 08	IR12.P04S	IFRR 12	IFRR 12	IFRM 12	IFRR 18	IFRM 18
dimension	M8	M12	M12	M12	M12	M18	M18
nominal sensing distance Sn	3 mm	4 mm	4 mm	6 mm	6 mm	8 mm	10 mm
mounting type	non flush	flush	flush	non flush	non flush	quasi-flush	flush
switching frequency max.	3 kHz	1 kHz	1 kHz	1 kHz	2 kHz	500 Hz	400 Hz
output current max.	200 mA	100 mA	200 mA	200 mA	200 mA	200 mA	200 mA
operating temperature	–40 ... +80 °C	–40 ... +75 °C	–40 ... +80 °C	–40 ... +80 °C	–40 ... +80 °C	–40 ... +80 °C	–40 ... +80 °C
protection class	IP 68/69K & proTect+	IP 67	IP 68/69K & proTect+	IP 68/69K & proTect+	IP 67	IP 68/69K & proTect+	IP 67
housing material	stainless steel	stainless steel	stainless steel	stainless steel	brass-nickel	stainless steel	brass-nickel
housing length	55 mm	50 mm	54 ... 60 mm	54 ... 60 mm	50 ... 60 mm	55 ... 60 mm	50 ... 60 mm
output circuit	PNP NPN	PNP	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN
output function	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	connector M12	connector M12	connector M12 cable	connector M12 cable	connector M12	connector M12 cable	connector M12 cable
approvals / certificates		DNVGL					
page	**115**	**116**	**117**	**118 ... 119**	**120**	**121**	**122**

Washdown design

product family	IFRR 08	IFRR 12	IFRR 12	IFRR 18	IFRR 18
dimension	M8	M12	M12	M18	M18
nominal sensing distance Sn	3 mm	4 mm	6 mm	8 mm	12 mm
mounting type	non flush	flush	non flush	quasi-flush	non flush
switching frequency max.	3 kHz	1 kHz	1 kHz	500 Hz	500 Hz
output current max.	200 mA	200 mA	200 mA	200 mA	200 mA
operating temperature	–40 ... +80 °C	–40 ... +80 °C	–40 ... +80 °C	–40 ... +80 °C	–40 ... +80 °C
protection class	IP 68/69K & proTect+	IP 68/69K & proTect+	IP 68/69K & proTect+	IP 68/69K & proTect+	IP 68/69K & proTect+
housing material	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
housing length	55 mm	54 ... 60 mm	54 ... 60 mm	55 ... 60 mm	55 ... 60 mm
output circuit	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN
output function	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	connector M12	connector M12 cable	connector M12 cable	connector M12 cable	connector M12 cable
approvals / certificates	Ecolab	Ecolab	Ecolab	Ecolab	Ecolab
page	**110**	**111**	**112**	**113**	**114**

IR18.P10S	IFRR 18	IFRM 18
M18	M18	M18
10 mm	12 mm	12 mm
flush	non flush	non flush
800 Hz	500 Hz	500 Hz
200 mA	200 mA	200 mA
–40 ... +75 °C	–40 ... +80 °C	–40 ... +80 °C
IP 67	IP 68/69K & proTect+	IP 67
brass-nickel	stainless steel	brass-nickel
60 mm	55 ... 60 mm	50 ... 60 mm
PNP	PNP NPN	PNP NPN
make (NO)	break (NC) make (NO)	break (NC) make (NO)
connector M12	connector M12 cable	connector M12 cable
DNVGL		
123	**124 ... 125**	**126**

Full metal housings *DuroProx*

product family	IFRD 06	IFRD 08	IFRD 12	IFRD 18
dimension	ø 6,5 mm	M8	M12	M18
nominal sensing distance Sn	2 mm	2 mm	4 mm	6 mm
mounting type	qausi-flush	qausi-flush	qausi-flush	qausi-flush
switching frequency max.	150 Hz	150 Hz	100 Hz	100 Hz
operating temperature	–25 ... +100 °C	–25 ... +100 °C	–25 ... +100 °C	–25 ... +100 °C
protection class	IP 67/68 IP 69K	IP 67/68 IP 69K	IP 67/68 IP 69K	IP 67/68 IP 69K
housing material	stainless steel	stainless steel	stainless steel	stainless steel
housing length	46 mm	46 mm	50 mm	60 mm
output circuit	PNP NPN	PNP NPN	PNP NPN	PNP NPN
output function	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	connector M8	connector M8	connector M12	connector M12
page	**127**	**128**	**129**	**130**

Immunity to welding and magnetic fields

product family	IFRW 12	IFRW 18
features	welding noise	welding noise
dimension	M12	M18
nominal sensing distance Sn	2 mm	5 mm
mounting type	flush	flush
switching frequency max.	1 kHz	500 Hz
Ausgangsstrom max.	250 mA	250 mA
operating temperature	–25 ... +75 °C	–25 ... +75 °C
protection class	IP 67	IP 67
housing material	brass	brass
housing length	50 mm	60 mm
output circuit	PNP	PNP
output function	break (NC)	break (NC)
connection types	connector M12	connector M12
page	**137**	**137**

High temperature

product family	IFRM 06	IFRM 08	IFRM 12	IFRH 08	IFRH 12	IFRH 18
dimension	ø 6,5 mm	M8	M12	M8	M12	M18
nominal sensing distance Sn	2 mm	2 mm	4 mm	1,5 mm	2 mm	5 mm
mounting type	flush	flush	flush	flush	flush	flush
switching frequency max.	5 kHz	5 kHz	2 kHz	2 kHz	2 kHz	1 kHz
output current max.	100 mA	100 mA	100 mA	200 mA	200 mA	200 mA
operating temperature	–25 ... +100 °C	–25 ... +100 °C	–25 ... +100 °C	–25 ... +180 °C	–25 ... +180 °C	–25 ... +180 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
housing length	30 mm	30 mm	40 mm	30 mm	30 mm	71 mm
output circuit	PNP NPN	PNP NPN	PNP NPN	PNP	PNP	PNP
output function	break (NC)	break (NC) make (NO)	break (NC)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	cable	cable	cable	cable	cable	cable
features				inline amplifier	inline amplifier	inline amplifier
page	**132**	**133 ... 134**	**134**	**135**	**136**	**136**

High pressure

product family	IFRP 12	IFRP 16	IFRP 18
features	high pressure	high pressure	high pressure
dimension	M12	M16	M18
nominal sensing distance Sn	2 mm	2 mm	2 mm
mounting type	flush	flush	flush
switching frequency max.	5 kHz	3 kHz	3 kHz
Ausgangsstrom max.	200 mA	200 mA	200 mA
operating temperature	–25 ... +80 °C	–25 ... +80 °C	–25 ... +80 °C
protection class	IP 68	IP 68	IP 68
housing material	stainless steel	stainless steel	stainless steel
housing length	50 ... 70 mm	60 mm	60 mm
output circuit	PNP	PNP	PNP
output function	break (NC)	break (NC)	break (NC)
connection types	connector M12	connector M12	connector M12
page	**138**	**139**	**139**

ATEX / NAMUR

product family	IFR 04	IFR 05	IFRM 06X	IFRM 08X	IFRM 08X	IFRM 12X	IFRM 12X
dimension	ø 4 mm	M5	ø 6,5 mm	M8	M8	M12	M12
nominal sensing distance Sn	0,8 mm	0,8 mm	1,5 mm	1,5 mm	2 mm	2 mm	4 mm
mounting type	flush	flush	flush	flush	non flush	flush	non flush
switching frequency max.	5 kHz	5 kHz	5 kHz	5 kHz	5 kHz	2 kHz	2 kHz
operating temperature	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	stainless steel	stainless steel	brass	stainless steel	brass	brass	brass
housing length	25 mm	25 mm	25 mm	27 mm	27 mm	30 mm	40 mm
output circuit	NAMUR	NAMUR	NAMUR	NAMUR	NAMUR	NAMUR	NAMUR PNP NPN
connection types	cable	cable	cable	connector M8 cable	cable	cable	cable
features			ATEX 1G	ATEX 1G	ATEX 1G	ATEX 1G	ATEX 1G ATEX 3D
page	**140**	**140**	**141**	**142**	**142**	**143**	**143 ... 145**

IFRM 18X	IFRM 18X	IFF 08	IFFK 10E	IFR 10	IFR 10
M18	M18	8 x 8 mm	10 x 16 mm	Ø 10 mm	Ø 10 mm
5 mm	8 mm	1,5 mm	2 mm	2 mm	4 mm
flush	non flush	flush	non flush	flush	non flush
1 kHz	1 kHz	5 kHz	5 kHz	2 kHz	2 kHz
–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C
IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
brass	brass	brass	PBT	PBT	PBT
30 mm	38 mm	25 mm	27,8 mm	6,6 mm	6,6 mm
NAMUR	NAMUR	NAMUR	NAMUR	NAMUR	NAMUR
cable	cable	cable	cable	pins	pins
ATEX 1G	ATEX 1G			ATEX 3G	
146	**146**	**147**	**148**	**149**	**150**

Sn = 0,8 mm

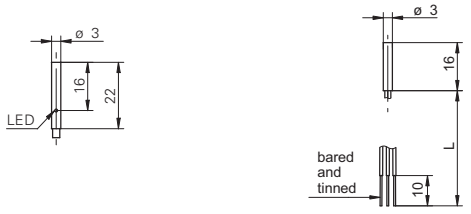
- smallest sensor housing size
- fully contained electronics
- 16 mm long version with individual strands

general data	
mounting type	flush
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. (no load)	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)	POM
housing material	stainless steel
dimension	3 mm
cable, 2 m	
housing length	22 mm
flylead connector M8	
housing length	22 mm
wires, 0,5 m	
housing length	16 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

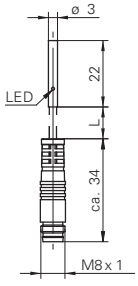
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10137021	Clamping nut for sensors Ø 3 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawings

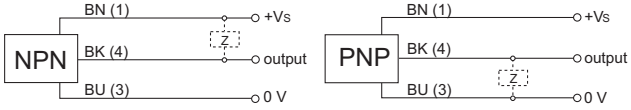


flylead connector version



standard cable length 200 mm (L)

connection diagrams



remarks

PUR cable

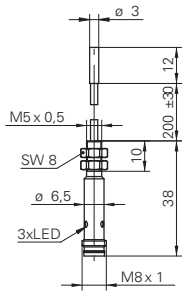
order reference	connection types	output circuit	output indicator
IFRM 03N1501/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 03N1501/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 03N1503/Q	wires, 0,5 m	NPN make function (NO)	-
IFRM 03N3501/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 03N3501/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 03N3503/Q	wires, 0,5 m	NPN break function (NC)	-
IFRM 03P1501/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 03P1501/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 03P1503/Q	wires, 0,5 m	PNP make function (NO)	-
IFRM 03P3501/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 03P3501/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 03P3503/Q	wires, 0,5 m	PNP break function (NC)	-

Sn = 0,8 mm

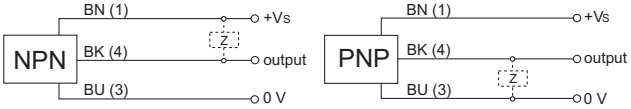
- sensing probe 12 mm long
- remote cable amplifier
- M8 x 1 quick disconnect

general data	
mounting type	flush
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. (no load)	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)	POM
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

dimension drawing



connection diagrams



connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10137021	Clamping nut for sensors Ø 3 mm
for details: see accessories section	

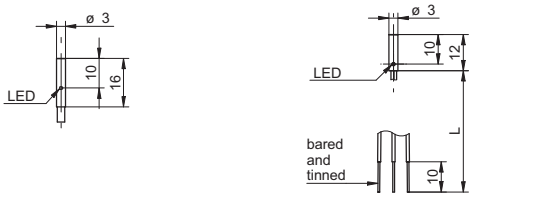
order reference	output circuit
IFRM 03N1505/CS35L	NPN make function (NO)
IFRM 03N3505/CS35L	NPN break function (NC)
IFRM 03P1505/CS35L	PNP make function (NO)
IFRM 03P3505/CS35L	PNP break function (NC)

Sn = 1 mm

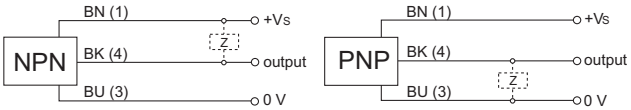
- smallest sensor housing size
- fully contained electronics
- 12 mm long version with individual strands

general data	
mounting type	flush
nominal sensing distance Sn	1 mm
temperature drift	- 5 % / + 10 % (+10 ... +60 °C) - 5 % / + 15 % (-10 ... +70 °C)
hysteresis	2 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 4 kHz
voltage supply range +Vs	6 ... 30 VDC
current consumption max. (no load)	10 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)	POM
housing material	stainless steel
dimension	3 mm
cable, 2 m	
housing length	16 mm
wires, 0,5 m	
housing length	12 mm
ambient conditions	
operating temperature	-10 ... +70 °C
protection class	IP 67

dimension drawings



connection diagrams



remarks

PUR cable

Accessories

10137021	Clamping nut for sensors Ø 3 mm

for details: see accessories section

order reference	connection types	output circuit
IFRM 03N1713/L	cable, 2 m	NPN make function (NO)
IFRM 03N1713/QL	wires, 0,5 m	NPN make function (NO)
IFRM 03N3713/L	cable, 2 m	NPN break function (NC)
IFRM 03N3713/QL	wires, 0,5 m	NPN break function (NC)
IFRM 03P1713/L	cable, 2 m	PNP make function (NO)
IFRM 03P1713/QL	wires, 0,5 m	PNP make function (NO)
IFRM 03P3713/L	cable, 2 m	PNP break function (NC)
IFRM 03P3713/QL	wires, 0,5 m	PNP break function (NC)

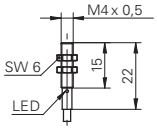
Sn = 0,8 mm

- smallest diameter threaded housing sensor M4 x 0,5

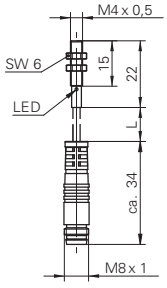
general data	
mounting type	flush
nominal sensing distance Sn	0,8 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	POM
housing material	stainless steel
dimension	4 mm
housing length	22 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawing

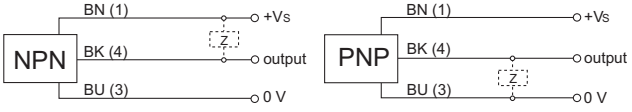


flylead connector version



standard cable length 200 mm (L)

connection diagrams



remarks

PUR cable

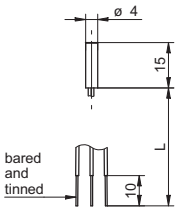
order reference	connection types	output circuit
IFRM 04N15B1/KS35PL	flylead connector M8	NPN make function (NO)
IFRM 04N15B1/L	cable, 2 m	NPN make function (NO)
IFRM 04N35B1/KS35PL	flylead connector M8	NPN break function (NC)
IFRM 04N35B1/L	cable, 2 m	NPN break function (NC)
IFRM 04P15B1/KS35PL	flylead connector M8	PNP make function (NO)
IFRM 04P15B1/L	cable, 2 m	PNP make function (NO)
IFRM 04P35B1/KS35PL	flylead connector M8	PNP break function (NC)
IFRM 04P35B1/L	cable, 2 m	PNP break function (NC)

Sn = 1 mm

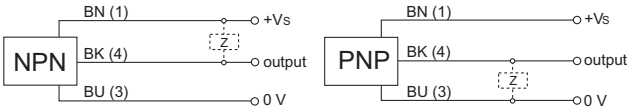
- fully contained electronics
- 3 individual strands
- 15 mm housing length

general data	
mounting type	flush
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. (no load)	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, 0,5 m
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawing



connection diagrams



Accessories	
10119345	Clamping nut for sensors Ø 4 mm
for details: see accessories section	

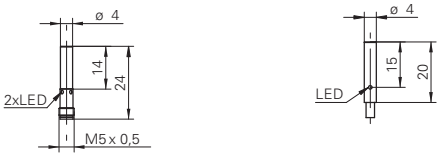
order reference	output circuit
IFRM 04N15A5/Q	NPN make function (NO)
IFRM 04N35A5/Q	NPN break function (NC)
IFRM 04P15A5/Q	PNP make function (NO)
IFRM 04P35A5/Q	PNP break function (NC)

Sn = 1 mm

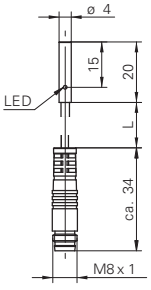
- fully contained electronics
- miniature connector M5 x 0,5
- high switching frequency

general data	
mounting type	flush
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. (no load)	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, 2 m	
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
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10119345	Clamping nut for sensors Ø 4 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawings

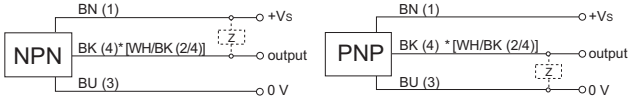


flylead connector version



standard cable length 200 mm (L)

connection diagrams



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

remarks

PUR cable

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

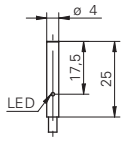
Sn = 1 mm

- fully contained electronics
- standard cable version
- high switching frequency

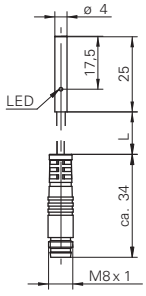
general data	
mounting type	flush
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit 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

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10119345	Clamping nut for sensors Ø 4 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawing

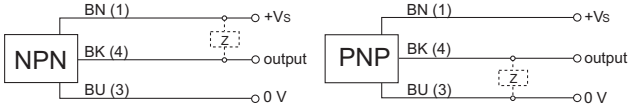


flylead connector version



standard cable length 200 mm (L)

connection diagrams



remarks

PUR cable

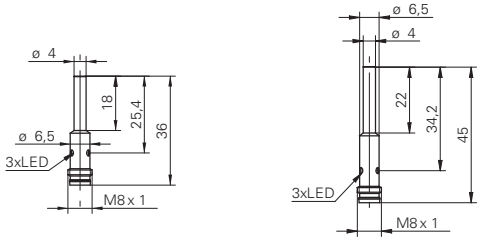
order reference	connection types	output circuit
IFRM 04N15A1/KS35PL	flylead connector M8	NPN make function (NO)
IFRM 04N15A1/L	cable, 2 m	NPN make function (NO)
IFRM 04N35A1/KS35PL	flylead connector M8	NPN break function (NC)
IFRM 04N35A1/L	cable, 2 m	NPN break function (NC)
IFRM 04P15A1/KS35PL	flylead connector M8	PNP make function (NO)
IFRM 04P15A1/L	cable, 2 m	PNP make function (NO)
IFRM 04P35A1/KS35PL	flylead connector M8	PNP break function (NC)
IFRM 04P35A1/L	cable, 2 m	PNP break function (NC)

Sn = 1 mm

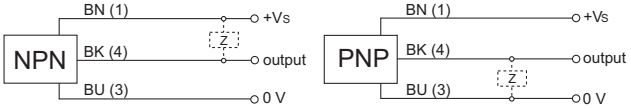
- robust steel housing
- M8 x 1 quick disconnect
- high switching frequency

general data	
mounting type	flush
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. (no load)	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

dimension drawings



connection diagrams



connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10119345	Clamping nut for sensors Ø 4 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

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 = 1,6 mm

- fully contained electronics
- miniature connector M5 x 0,5
- increased sensing distance

general data	
mounting type	flush
nominal sensing distance Sn	1,6 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	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, 2 m	
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

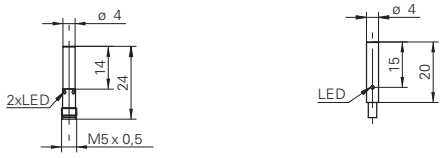
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

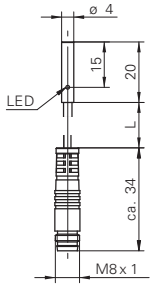
Accessories	
10119345	Clamping nut for sensors Ø 4 mm
11163236	Adapter for pulse stretching M8

for details: see accessories section

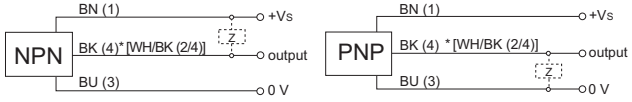
dimension drawings



flylead connector version



connection diagrams



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

remarks

PUR cable

order reference	connection types	output circuit	output indicator
IFRM 04N17A3/KS35PL	flylead connector M8	NPN make function (NO)	LED red
IFRM 04N17A3/PL	cable, 2 m	NPN make function (NO)	LED red
IFRM 04N17A3/S05L	connector M5	NPN make function (NO)	2 port LED red
IFRM 04N37A3/KS35PL	flylead connector M8	NPN break function (NC)	LED red
IFRM 04N37A3/PL	cable, 2 m	NPN break function (NC)	LED red
IFRM 04N37A3/S05L	connector M5	NPN break function (NC)	2 port LED red
IFRM 04P17A3/KS35PL	flylead connector M8	PNP make function (NO)	LED red
IFRM 04P17A3/PL	cable, 2 m	PNP make function (NO)	LED red
IFRM 04P17A3/S05L	connector M5	PNP make function (NO)	2 port LED red
IFRM 04P37A3/KS35PL	flylead connector M8	PNP break function (NC)	LED red
IFRM 04P37A3/PL	cable, 2 m	PNP break function (NC)	LED red
IFRM 04P37A3/S05L	connector M5	PNP break function (NC)	2 port LED red

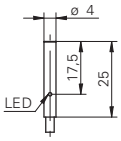
Sn = 1,6 mm

- fully contained electronics
- standard cable version
- increased sensing distance

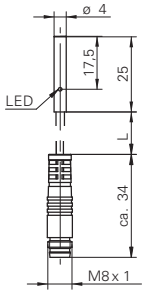
general data	
mounting type	flush
nominal sensing distance Sn	1,6 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short 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

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10119345	Clamping nut for sensors Ø 4 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawing

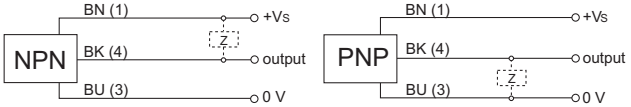


flylead connector version



standard cable length 200 mm (L)

connection diagrams



remarks

PUR cable

order reference	connection types	output circuit
IFRM 04N17A1/KS35PL	flylead connector M8	NPN make function (NO)
IFRM 04N17A1/PL	cable, 2 m	NPN make function (NO)
IFRM 04N37A1/KS35PL	flylead connector M8	NPN break function (NC)
IFRM 04N37A1/PL	cable, 2 m	NPN break function (NC)
IFRM 04P17A1/KS35PL	flylead connector M8	PNP make function (NO)
IFRM 04P17A1/PL	cable, 2 m	PNP make function (NO)
IFRM 04P37A1/KS35PL	flylead connector M8	PNP break function (NC)
IFRM 04P37A1/PL	cable, 2 m	PNP break function (NC)

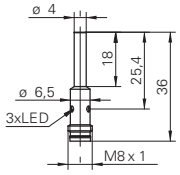
Sn = 1,6 mm

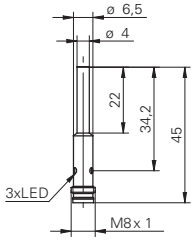
- robust steel housing
- M8 x 1 quick disconnect
- increased sensing distance

general data	
mounting type	flush
nominal sensing distance Sn	1,6 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. (no load)	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

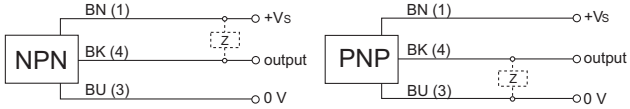
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10119345	Clamping nut for sensors Ø 4 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawings





connection diagrams



order reference	output circuit	housing length
IFRM 04N17A1/S35L	NPN make function (NO)	45 mm
IFRM 04N17A3/S35L	NPN make function (NO)	36 mm
IFRM 04N37A1/S35L	NPN break function (NC)	45 mm
IFRM 04N37A3/S35L	NPN break function (NC)	36 mm
IFRM 04P17A1/S35L	PNP make function (NO)	45 mm
IFRM 04P17A3/S35L	PNP make function (NO)	36 mm
IFRM 04P37A1/S35L	PNP break function (NC)	45 mm
IFRM 04P37A3/S35L	PNP break function (NC)	36 mm

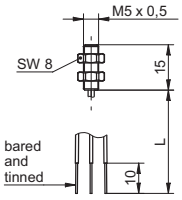
Sn = 1 mm

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

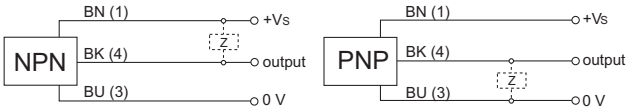
general data	
mounting type	flush
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse 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, 0,5 m
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

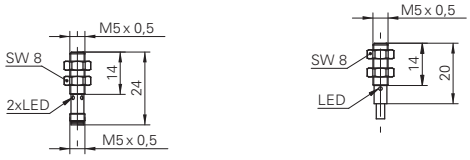


Sn = 1 mm

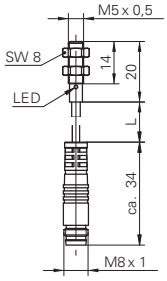
- fully contained electronics
- miniature connector M5 x 0,5
- integrated LED-status display

general data	
mounting type	flush
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. (no load)	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, 2 m	
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
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawings

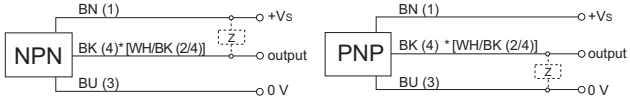


flylead connector version



standard cable length 200 mm (L)

connection diagrams



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

remarks

PUR cable

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

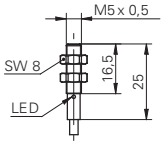
Sn = 1 mm

- fully contained electronics
- standard cable version
- integrated LED-status display

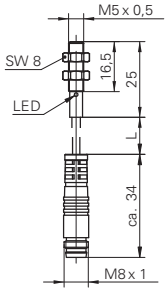
general data	
mounting type	flush
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit 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

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawing

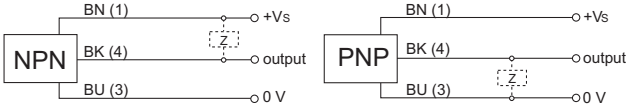


flylead connector version



standard cable length 200 mm (L)

connection diagrams



remarks

PUR cable

order reference	connection types	output circuit
IFRM 05N15A1/KS35PL	flylead connector M8	NPN make function (NO)
IFRM 05N15A1/L	cable, 2 m	NPN make function (NO)
IFRM 05N35A1/KS35PL	flylead connector M8	NPN break function (NC)
IFRM 05N35A1/L	cable, 2 m	NPN break function (NC)
IFRM 05P15A1/KS35PL	flylead connector M8	PNP make function (NO)
IFRM 05P15A1/L	cable, 2 m	PNP make function (NO)
IFRM 05P35A1/KS35PL	flylead connector M8	PNP break function (NC)
IFRM 05P35A1/L	cable, 2 m	PNP break function (NC)

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Sn = 1 mm

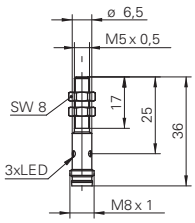
- robust steel housing
- M8 x 1 quick disconnect
- 3 port LED

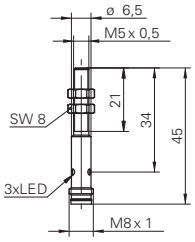
general data	
mounting type	flush
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
output indicator	3 port LED red
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short 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

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11163236	Adapter for pulse stretching M8
for details: see accessories section	

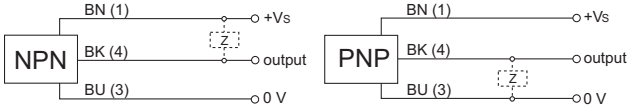
order reference	output circuit	housing length
IFRM 05N15A3/S35L	NPN make function (NO)	36 mm
IFRM 05N35A3/S35L	NPN break function (NC)	36 mm
IFRM 05P15A1/S35L	PNP make function (NO)	45 mm
IFRM 05P15A3/S35L	PNP make function (NO)	36 mm
IFRM 05P35A1/S35L	PNP break function (NC)	45 mm
IFRM 05P35A3/S35L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

dimension drawings





connection diagrams



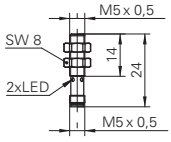
Sn = 1,6 mm

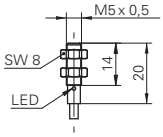
- fully contained electronics
- miniature connector M5 x 0,5
- increased sensing distance

general data	
mounting type	flush
nominal sensing distance Sn	1,6 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	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, 2 m	
housing length	20 mm
connector M5	
housing length	24 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

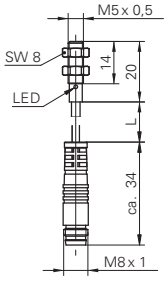
connectors and mating connectors	
ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

dimension drawings

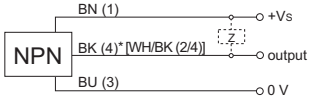




flylead connector version



connection diagrams



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

remarks

PUR cable

order reference	connection types	output circuit	output indicator
IFRM 05N17A3/PL	cable, 2 m	NPN make function (NO)	LED red
IFRM 05N17A3/S05L	connector M5	NPN make function (NO)	2 port LED red
IFRM 05N37A3/PL	cable, 2 m	NPN break function (NC)	LED red
IFRM 05N37A3/S05L	connector M5	NPN break function (NC)	2 port LED red
IFRM 05P17A3/PL	cable, 2 m	PNP make function (NO)	LED red
IFRM 05P17A3/S05L	connector M5	PNP make function (NO)	2 port LED red
IFRM 05P37A3/PL	cable, 2 m	PNP break function (NC)	LED red
IFRM 05P37A3/S05L	connector M5	PNP break function (NC)	2 port LED red

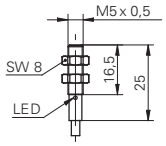
Sn = 1,6 mm

- fully contained electronics
- standard cable version
- increased sensing distance

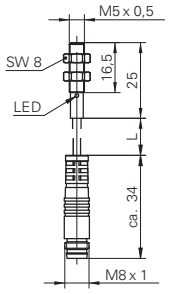
general data	
mounting type	flush
nominal sensing distance Sn	1,6 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short 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
connection types	cable, 2 m
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

order reference	output circuit
IFRM 05N17A1/PL	NPN make function (NO)
IFRM 05N37A1/PL	NPN break function (NC)
IFRM 05P17A1/PL	PNP make function (NO)
IFRM 05P37A1/PL	PNP break function (NC)

dimension drawing

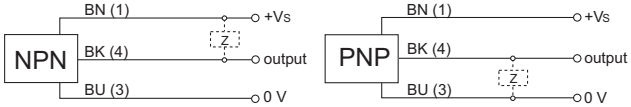


flylead connector version



standard cable length 200 mm (L)

connection diagrams



remarks

PUR cable

Sn = 1,6 mm

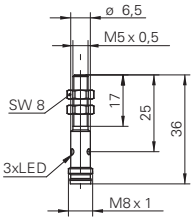
- robust steel housing
- M8 x 1 quick disconnect
- increased sensing distance

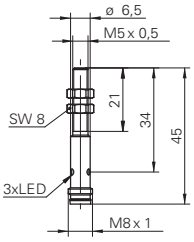
general data	
mounting type	flush
nominal sensing distance Sn	1,6 mm
hysteresis	2 ... 20 % of Sr
output indicator	3 port LED red
electrical data	
switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
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

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11163236	Adapter for pulse stretching M8
for details: see accessories section	

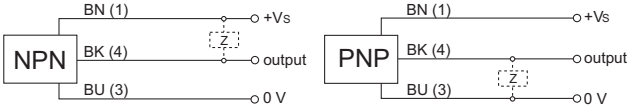
order reference	output circuit	housing length
IFRM 05N17A1/S35L	NPN make function (NO)	45 mm
IFRM 05N17A3/S35L	NPN make function (NO)	36 mm
IFRM 05N37A1/S35L	NPN break function (NC)	45 mm
IFRM 05N37A3/S35L	NPN break function (NC)	36 mm
IFRM 05P17A1/S35L	PNP make function (NO)	45 mm
IFRM 05P17A3/S35L	PNP make function (NO)	36 mm
IFRM 05P37A1/S35L	PNP break function (NC)	45 mm
IFRM 05P37A3/S35L	PNP break function (NC)	36 mm

dimension drawings





connection diagrams



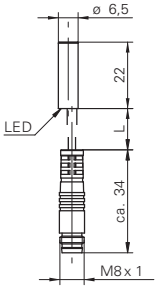
Sn = 2 mm

- robust steel housing
- shortest version with M8 x 1 connector
- high switching frequency

general data	
mounting type	flush
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. (no load)	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, 2 m	
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
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

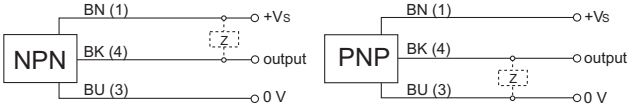
dimension drawings

flylead connector version



standard cable length 200 mm (L)

connection diagrams



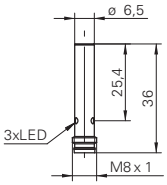
order reference	connection types	output circuit	output indicator
IFRM 06N1713/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 06N1713/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 06N17A5/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 06N3713/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 06N3713/L	cable, 2 m	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, 2 m	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, 2 m	PNP break function (NC)	LED red
IFRM 06P37A5/S35L	connector M8	PNP break function (NC)	3 port LED red

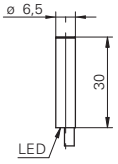
Sn = 2 mm

- robust steel housing
- high switching frequency
- mounting with special support

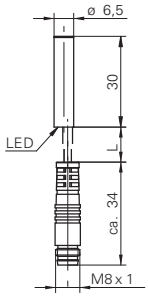
general data	
mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm
cable, 2 m	
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
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawings



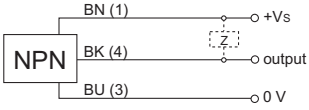


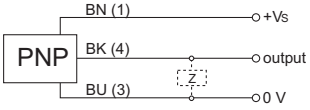
flylead connector version



standard cable length 200 mm (L)

connection diagrams





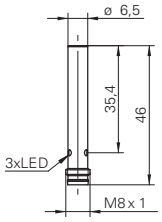
order reference	connection types	output circuit	output indicator
IFRM 06N1701/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 06N1701/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 06N17A3/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 06N3701/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 06N3701/L	cable, 2 m	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, 2 m	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, 2 m	PNP break function (NC)	LED red
IFRM 06P37A3/S35L	connector M8	PNP break function (NC)	3 port LED red

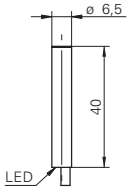
Sn = 2 mm

- robust steel housing
- high switching frequency
- mounting with special support

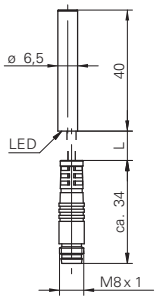
general data	
mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm
cable, 2 m	
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
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawings



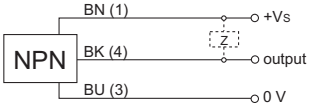


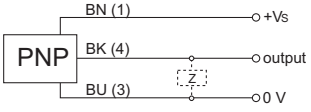
flylead connector version



standard cable length 200 mm (L)

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, 2 m	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, 2 m	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, 2 m	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, 2 m	PNP break function (NC)	LED red
IFRM 06P37A1/S35L	connector M8	PNP break function (NC)	3 port LED red

Sn = 2 mm

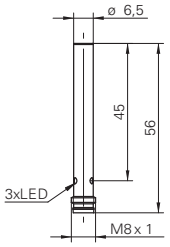
- long, robust steel housings
- cable and connector versions
- mounting with special support

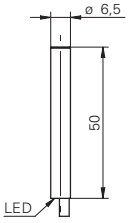
general data	
mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm
cable, 2 m	
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

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

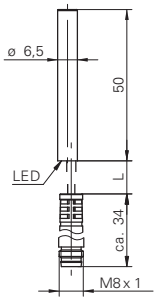
Accessories	
10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawings



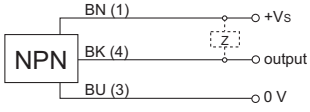


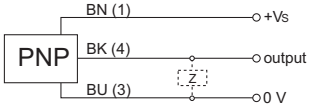
flylead connector version



standard cable length 200 mm (L)

connection diagrams





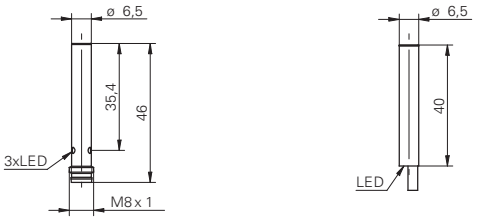
order reference	connection types	output circuit	output indicator
IFRM 06N17A4/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 06N17A4/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 06N37A4/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 06N37A4/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 06P17A4/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 06P17A4/L	cable, 2 m	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, 2 m	PNP break function (NC)	LED red
IFRM 06P37A4/S35L	connector M8	PNP break function (NC)	3 port LED red

Sn = 3 mm

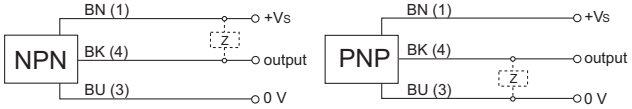
- version with extended Sn *GammaProx*
- shielded mounting
- robust steel housing

general data	
mounting type	flush
special type	enhanced distance (*GammaProx*)
nominal sensing distance Sn	3 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 65 %, aluminum 30 %
electrical data	
switching frequency	< 2 kHz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 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)	PBT
housing material	stainless steel
dimension	6,5 mm
cable, 2 m	
housing length	40 mm
connector M8	
housing length	46 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

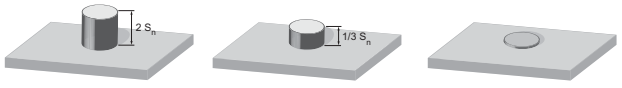
dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	85 %
Stainless steel	65 %
Aluminum	55 %

Mounting material	Correction factor
Mild steel	90 %
Stainless steel	60 %
Aluminum	45 %

remarks

for correct installation refer to “mounting instructions”

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

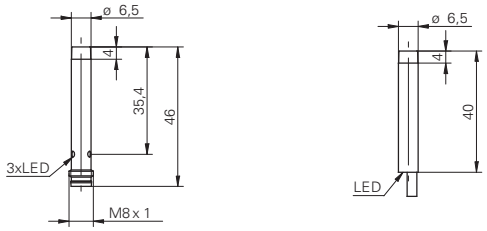
order reference	connection types	output circuit	output indicator
IR06.P03S-11148708	cable, 2 m	NPN break function (NC)	LED red
IR06.P03S-11148685	cable, 2 m	NPN make function (NO)	LED red
IR06.P03S-11148739	cable, 2 m	PNP break function (NC)	LED red
IR06.P03S-11148719	cable, 2 m	PNP make function (NO)	LED red
IR06.P03S-11148711	connector M8	NPN break function (NC)	3 port LED red
IR06.P03S-11148689	connector M8	NPN make function (NO)	3 port LED red
IR06.P03S-11148740	connector M8	PNP break function (NC)	3 port LED red
IR06.P03S-11148736	connector M8	PNP make function (NO)	3 port LED red

Sn = 6 mm

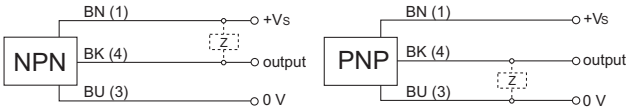
- version with extended Sn *GammaProx*
- non shielded mounting
- robust steel housing

general data	
mounting type	non-flush
special type	enhanced distance (*GammaProx*)
nominal sensing distance Sn	6 mm
temperature drift	± 10 % (0 ... +60 °C) ± 15 % (-25 ... +75 °C)
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 80 %, aluminum 50 %
electrical data	
switching frequency	< 400 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	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)	PBT
housing material	stainless steel
dimension	6,5 mm
cable, 2 m	
housing length	40 mm
connector M8	
housing length	46 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

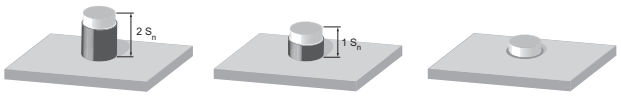
dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	110 %
Stainless steel	95 %
Aluminum	90 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	95 %
Aluminum	80 %

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

order reference	connection types	output circuit	output indicator
IR06.P06S-11148702	cable, 2 m	NPN break function (NC)	LED red
IR06.P06S-11148683	cable, 2 m	NPN make function (NO)	LED red
IR06.P06S-11148737	cable, 2 m	PNP break function (NC)	LED red
IR06.P06S-11148714	cable, 2 m	PNP make function (NO)	LED red
IR06.P06S-11148705	connector M8	NPN break function (NC)	3 port LED red
IR06.P06S-11148684	connector M8	NPN make function (NO)	3 port LED red
IR06.P06S-11148738	connector M8	PNP break function (NC)	3 port LED red
IR06.P06S-11148717	connector M8	PNP make function (NO)	3 port LED red

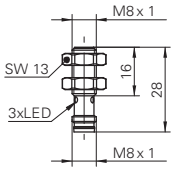
Sn = 2 mm

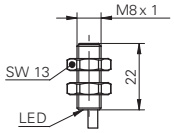
- shortest version with M8 x 1 connector
- high switching frequency
- robust steel housing

general data	
mounting type	flush
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. (no load)	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, 2 m	
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

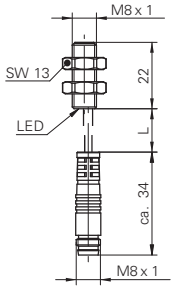
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151719	Sensofix series 08 round
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawings



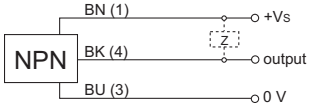


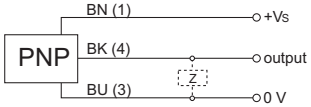
flylead connector version



standard cable length 200 mm (L)

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, 2 m	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, 2 m	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, 2 m	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, 2 m	PNP break function (NC)	LED red
IFRM 08P37A5/S35L	connector M8	PNP break function (NC)	3 port LED red

Sn = 2 mm

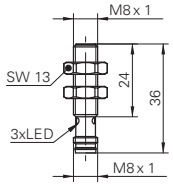
- robust steel housing
- high switching frequency

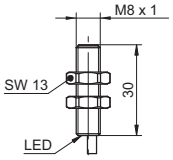
general data	
mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm
cable, 2 m	
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

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

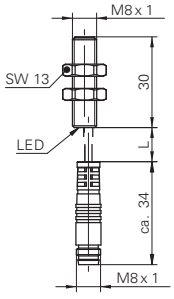
Accessories	
10151719	Sensofix series 08 round
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawings



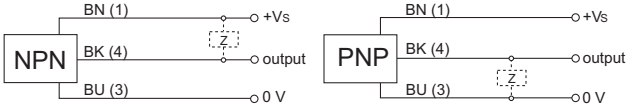


flylead connector version



standard cable length 200 mm (L)

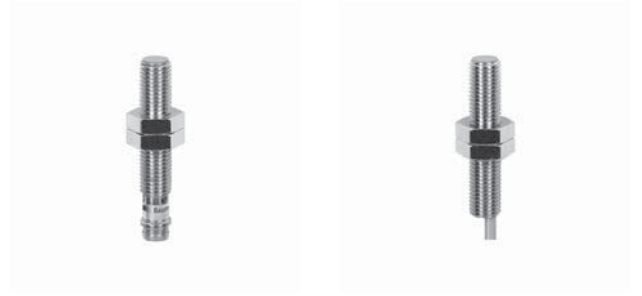
connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 08N1701/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 08N1701/L	cable, 2 m	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, 2 m	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, 2 m	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, 2 m	PNP break function (NC)	LED red
IFRM 08P37A3/S35L	connector M8	PNP break function (NC)	3 port LED red

Sn = 2 mm

- robust steel housing
- high switching frequency

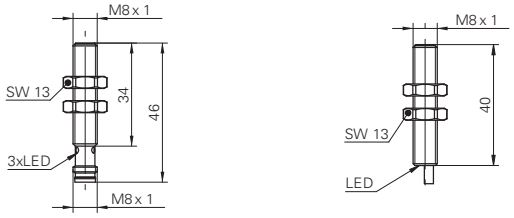


general data	
mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm
cable, 2 m	
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

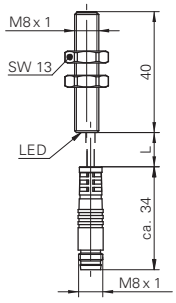
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151719	Sensofix series 08 round
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawings

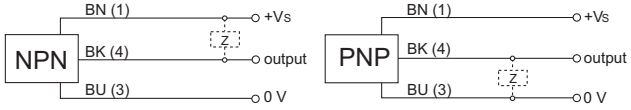


flylead connector version



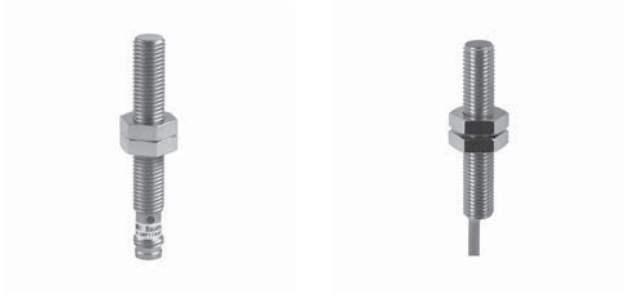
standard cable length 200 mm (L)

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, 2 m	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, 2 m	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, 2 m	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, 2 m	PNP break function (NC)	LED red
IFRM 08P37A1/S35L	connector M8	PNP break function (NC)	3 port LED red

Sn = 2 mm



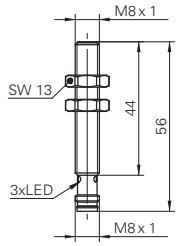
- robust steel housing
- high switching frequency

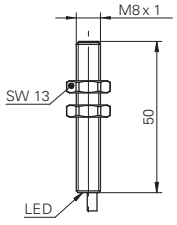
general data	
mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm
cable, 2 m	
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

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

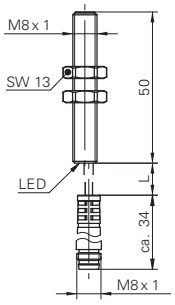
Accessories	
10151719	Sensofix series 08 round
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawings



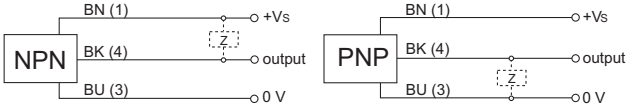


flylead connector version



standard cable length 200 mm (L)

connection diagrams



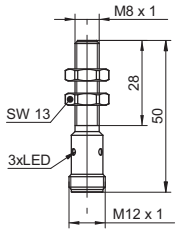
order reference	connection types	output circuit	output indicator
IFRM 08N17A4/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 08N17A4/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 08N17A4/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 08N37A4/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 08N37A4/L	cable, 2 m	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, 2 m	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, 2 m	PNP break function (NC)	LED red
IFRM 08P37A4/S35L	connector M8	PNP break function (NC)	3 port LED red

Sn = 2 mm

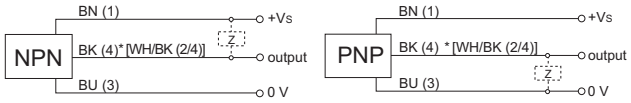
- robust steel housing
- high switching frequency
- M12 x 1 quick disconnect

general data	
mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 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. (no load)	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

dimension drawing



connection diagrams



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

connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151719	Sensofix series 08 round
11163237	Adapter for pulse stretching M12
for details: see accessories section	

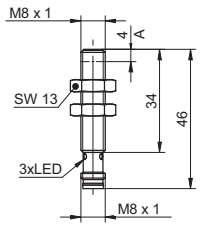
order reference	output circuit
IFRM 08N1703/S14L	NPN make function (NO)
IFRM 08N3703/S14L	NPN break function (NC)
IFRM 08P1703/S14L	PNP make function (NO)
IFRM 08P3703/S14L	PNP break function (NC)

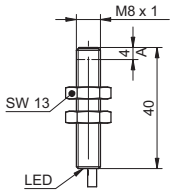
Sn = 3 mm

- version with extended Sn *GammaProx*
- shielded mounting
- robust steel housing

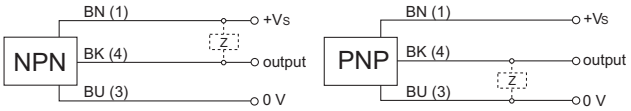
general data	
mounting type	flush
special type	enhanced distance (*GammaProx*)
nominal sensing distance Sn	3 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 65 %, aluminum 30 %
electrical data	
switching frequency	< 2 kHz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 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)	PBT
housing material	stainless steel
dimension	8 mm
tightening torque max.	10 Nm (A: 7 Nm)
cable, 2 m	
housing length	40 mm
connector M8	
housing length	46 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings

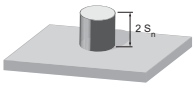




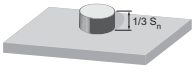
connection diagrams



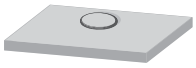
correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	90 %
Aluminum	85 %



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	80 %
Aluminum	70 %

remarks

for correct installation refer to “mounting instructions”

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151719	Sensofix series 08 round
11163236	Adapter for pulse stretching M8
for details: see accessories section	

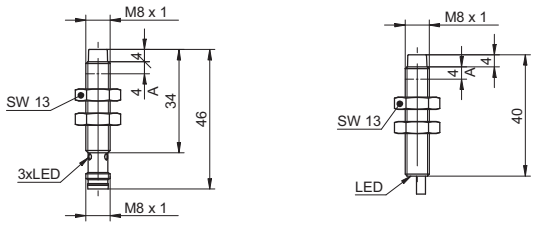
order reference	connection types	output circuit	output indicator
IR08.P03S-11148764	cable, 2 m	NPN break function (NC)	LED red
IR08.P03S-11148749	cable, 2 m	NPN make function (NO)	LED red
IR08.P03S-11148790	cable, 2 m	PNP break function (NC)	LED red
IR08.P03S-11148775	cable, 2 m	PNP make function (NO)	LED red
IR08.P03S-11148766	connector M8	NPN break function (NC)	3 port LED red
IR08.P03S-11148760	connector M8	NPN make function (NO)	3 port LED red
IR08.P03S-11148791	connector M8	PNP break function (NC)	3 port LED red
IR08.P03S-11148757	connector M8	PNP make function (NO)	3 port LED red

Sn = 6 mm

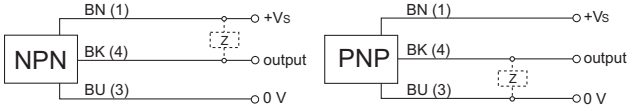
- version with extended Sn *GammaProx*
- shielded mounting
- robust steel housing

general data	
mounting type	non-flush
special type	enhanced distance (*GammaProx*)
nominal sensing distance Sn	6 mm
temperature drift	± 10 % (0 ... +60 °C) ± 15 % (-25 ... +75 °C)
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 80 %, aluminum 50 %
electrical data	
switching frequency	< 400 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	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)	PBT
housing material	stainless steel
dimension	8 mm
tightening torque max.	10 Nm (A: 7 Nm)
cable, 2 m	
housing length	40 mm
connector M8	
housing length	46 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

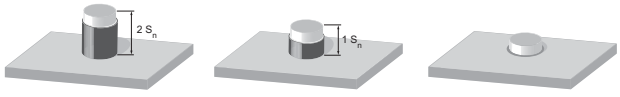
dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	110 %
Stainless steel	95 %
Aluminum	90 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	95 %
Aluminum	80 %

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151719	Sensofix series 08 round
11163236	Adapter for pulse stretching M8
for details: see accessories section	

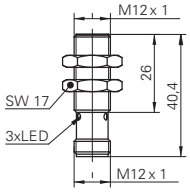
order reference	connection types	output circuit	output indicator
IR08.P06S-11148761	cable, 2 m	NPN break function (NC)	LED red
IR08.P06S-11148741	cable, 2 m	NPN make function (NO)	LED red
IR08.P06S-11148758	cable, 2 m	PNP break function (NC)	LED red
IR08.P06S-11148768	cable, 2 m	PNP make function (NO)	LED red
IR08.P06S-11148763	connector M8	NPN break function (NC)	3 port LED red
IR08.P06S-11148744	connector M8	NPN make function (NO)	3 port LED red
IR08.P06S-11148759	connector M8	PNP break function (NC)	3 port LED red
IR08.P06S-11148770	connector M8	PNP make function (NO)	3 port LED red

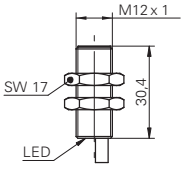
Sn = 4 mm

- shortest version with M12 x 1 connector
- high stability across entire temperature range

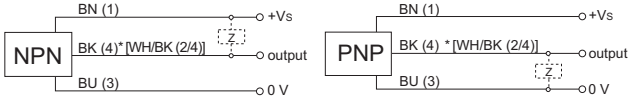
general data	
mounting type	flush
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
cable, 2 m	
housing length	30,4 mm
connector M12	
housing length	40,4 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings





connection diagrams



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

connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12
for details: see accessories section	

order reference	connection types	output circuit	output indicator
IFRM 12N1701/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 12N1703/S14L	connector M12	NPN make function (NO)	3 port LED red
IFRM 12N3701/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 12N3703/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 12P1701/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 12P1703/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 12P3701/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 12P3703/S14L	connector M12	PNP break function (NC)	3 port LED red

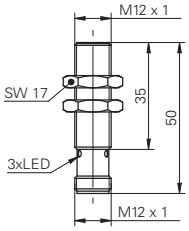
Sn = 4 mm

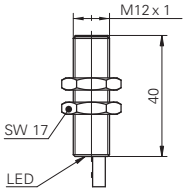
- high stability across entire temperature range

general data	
mounting type	flush
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. (no load)	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, 2 m	
housing length	40 mm
connector M12	
housing length	50 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

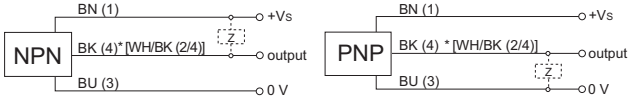
connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12
for details: see accessories section	

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, 2 m	NPN make function (NO)	LED red
IFRM 12N3701/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 12N3702/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 12P1701/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 12P1702/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 12P3701/S14L	connector M12	PNP break function (NC)	3 port LED red
IFRM 12P3702/L	cable, 2 m	PNP break function (NC)	LED red

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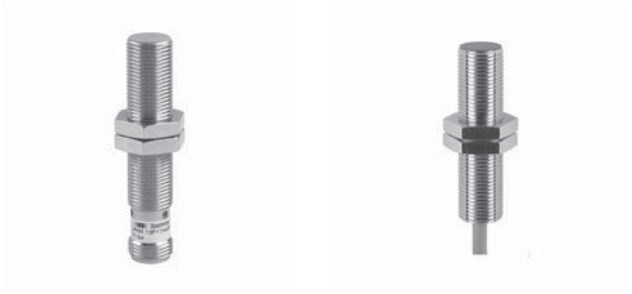
Sn = 4 mm

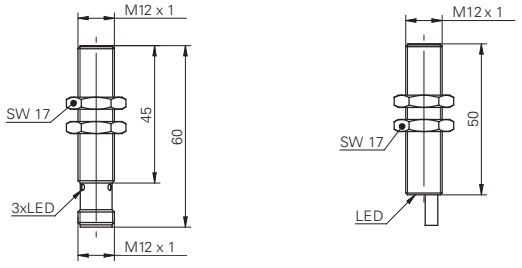
- extra long housings
- high stability across entire temperature range



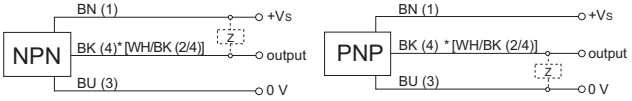
general data	
mounting type	flush
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
cable, 2 m	
housing length	50 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12
for details: see accessories section	

dimension drawings



connection diagrams



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

order reference	connection types	output circuit	output indicator
IFRM 12N1704/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 12N1704/S14L	connector M12	NPN make function (NO)	3 port LED red
IFRM 12N3704/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 12N3704/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 12P1704/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 12P1704/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 12P3704/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 12P3704/S14L	connector M12	PNP break function (NC)	3 port LED red

Sn = 4 mm

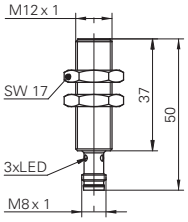
- M8 x 1 quick disconnect
- high stability across entire temperature range

general data	
mounting type	flush
nominal sensing distance Sn	4 mm
hysteresis	3 ... 25 % of Sr
output indicator	3 port LED red
electrical data	
switching frequency	< 2 kHz
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	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

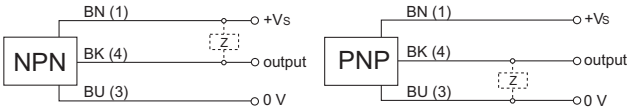
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
11163236	Adapter for pulse stretching M8
for details: see accessories section	

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

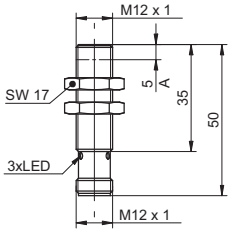
- antivalent output
- short housing (50 mm length)

general data	
mounting type	flush
nominal sensing distance Sn	4 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
output indicator	3 port LED red
correction factor typ.	mild steel 100 %, stainless steel 80 %, aluminum 50 %
electrical data	
switching frequency	< 2 kHz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	PNP complementary (NO / NC)
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
housing length	50 mm
connection types	connector M12
tightening torque max.	15 Nm (A: 10 Nm)
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

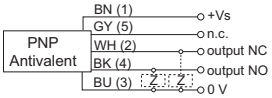
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
for details: see accessories section	

order reference
IR12.P04S-11159797

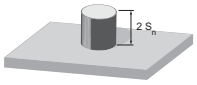
dimension drawing



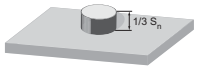
connection diagram



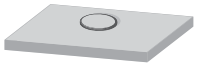
correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %



Mounting material	Correction factor
Mild steel	115 %
Stainless steel	110 %
Aluminum	105 %

remarks

for correct installation refer to “mounting instructions”

Sn = 4 mm

- antivalent output
- long housing (85 mm length)

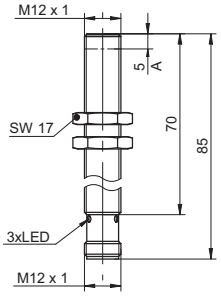
general data	
mounting type	flush
nominal sensing distance Sn	4 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
output indicator	3 port LED red
correction factor typ.	mild steel 100 %, stainless steel 80 %, aluminum 50 %
electrical data	
switching frequency	< 2 kHz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	PNP complementary (NO / NC)
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
housing length	85 mm
connection types	connector M12
tightening torque max.	15 Nm (A: 10 Nm)
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

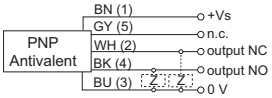
Accessories	
10151720	Sensofix series 12 round
for details: see accessories section	

order reference
IR12.P04S-11159790

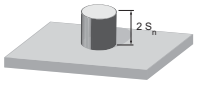
dimension drawing



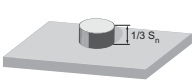
connection diagram



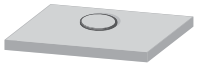
correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %



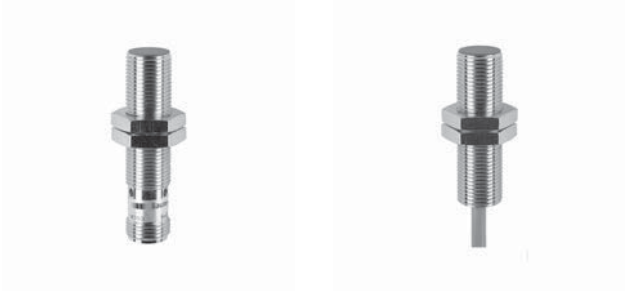
Mounting material	Correction factor
Mild steel	115 %
Stainless steel	110 %
Aluminum	105 %

remarks

for correct installation refer to “mounting instructions”

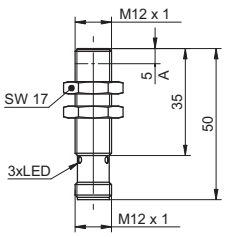
Sn = 6 mm

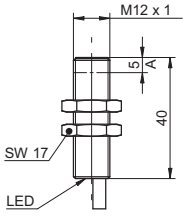
- version with extended Sn *GammaProx*
- quasi shielded mounting



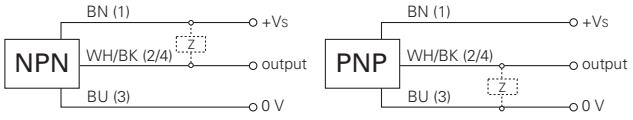
general data	
mounting type	flush
special type	enhanced distance (*GammaProx*)
nominal sensing distance Sn	6 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 75 %, aluminum 45 %
electrical data	
switching frequency	< 1 kHz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 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)	PBT
housing material	brass nickel plated
dimension	12 mm
tightening torque max.	15 Nm (A: 10 Nm)
cable, 2 m	
housing length	40 mm
connector M12	
housing length	50 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings

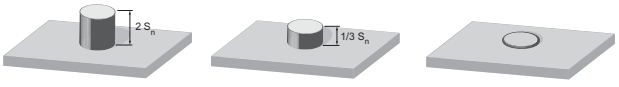




connection diagrams



correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	95 %
Aluminum	95 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	95 %
Aluminum	80 %

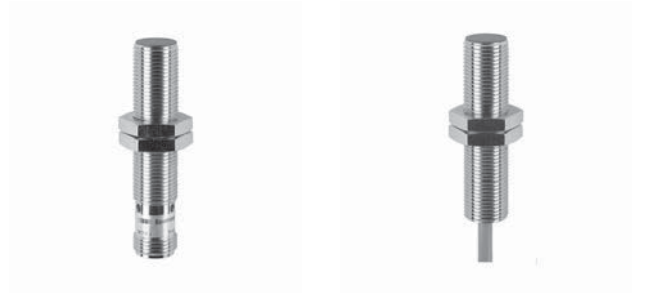
remarks

for correct installation refer to “mounting instructions”

connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12
for details: see accessories section	

order reference	connection types	output circuit	output indicator
IR12.P06S-11148447	cable, 2 m	NPN break function (NC)	LED red
IR12.P06S-11148363	cable, 2 m	NPN make function (NO)	LED red
IR12.P06S-11148657	cable, 2 m	PNP break function (NC)	LED red
IR12.P06S-11148580	cable, 2 m	PNP make function (NO)	LED red
IR12.P06S-11148466	connector M12	NPN break function (NC)	3 port LED red
IR12.P06S-11148364	connector M12	NPN make function (NO)	3 port LED red
IR12.P06S-11148659	connector M12	PNP break function (NC)	3 port LED red
IR12.P06S-11148587	connector M12	PNP make function (NO)	3 port LED red

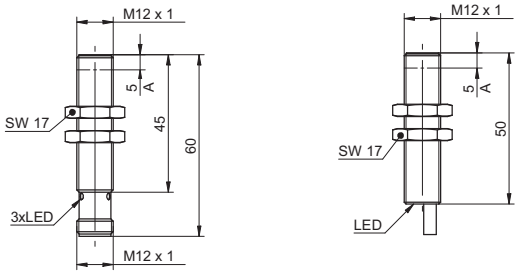
Sn = 6 mm



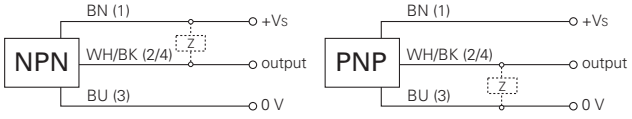
- version with extended Sn *GammaProx*
- shielded mounting

general data	
mounting type	flush
special type	enhanced distance (*GammaProx*)
nominal sensing distance Sn	6 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 75 %, aluminum 45 %
electrical data	
switching frequency	< 1 kHz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 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)	PBT
housing material	brass nickel plated
dimension	12 mm
tightening torque max.	15 Nm (A: 10 Nm)
cable, 2 m	
housing length	50 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

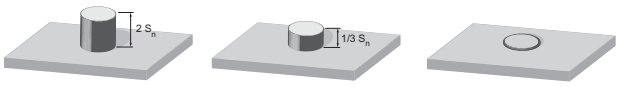
dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	95 %
Aluminum	95 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	95 %
Aluminum	80 %

remarks

for correct installation refer to "mounting instructions"

connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12
for details: see accessories section	

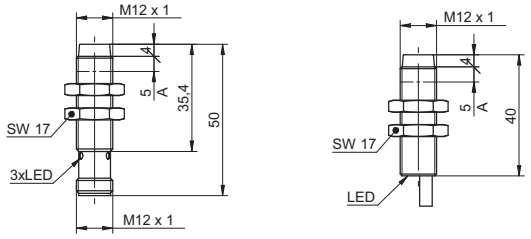
order reference	connection types	output circuit	output indicator
IR12.P06S-11148441	cable, 2 m	NPN break function (NC)	LED red
IR12.P06S-11148360	cable, 2 m	NPN make function (NO)	LED red
IR12.P06S-11148655	cable, 2 m	PNP break function (NC)	LED red
IR12.P06S-11148575	cable, 2 m	PNP make function (NO)	LED red
IR12.P06S-11148446	connector M12	NPN break function (NC)	3 port LED red
IR12.P06S-11148362	connector M12	NPN make function (NO)	3 port LED red
IR12.P06S-11148656	connector M12	PNP break function (NC)	3 port LED red
IR12.P06S-11148578	connector M12	PNP make function (NO)	3 port LED red

Sn = 10 mm

- version with extended Sn *GammaProx*
- non shielded mounting

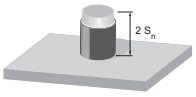
general data	
mounting type	non-flush
special type	enhanced distance (*GammaProx*)
nominal sensing distance Sn	10 mm
temperature drift	± 10 % (0 ... +60 °C) ± 15 % (-25 ... +75 °C)
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 75 %, aluminum 50 %
electrical data	
switching frequency	< 1,5 kHz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 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)	PBT
housing material	brass nickel plated
dimension	12 mm
tightening torque max.	15 Nm (A: 10 Nm)
cable, 2 m	
housing length	40 mm
connector M12	
housing length	50 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings

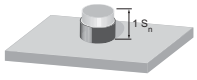


connection diagrams

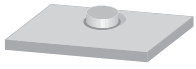
correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %



Mounting material	Correction factor
Mild steel	105 %
Stainless steel	100 %
Aluminum	100 %

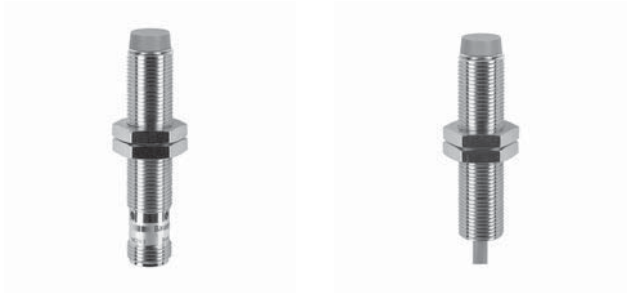


Mounting material	Correction factor
Mild steel	not possible
Stainless steel	not possible
Aluminum	90 %

connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12
for details: see accessories section	

order reference	connection types	output circuit	output indicator
IR12.P10S-11148436	cable, 2 m	NPN break function (NC)	LED red
IR12.P10S-11148327	cable, 2 m	NPN make function (NO)	LED red
IR12.P10S-11148590	cable, 2 m	PNP break function (NC)	LED red
IR12.P10S-11148573	cable, 2 m	PNP make function (NO)	LED red
IR12.P10S-11148439	connector M12	NPN break function (NC)	3 port LED red
IR12.P10S-11148328	connector M12	NPN make function (NO)	3 port LED red
IR12.P10S-11148654	connector M12	PNP break function (NC)	3 port LED red
IR12.P10S-11148574	connector M12	PNP make function (NO)	3 port LED red

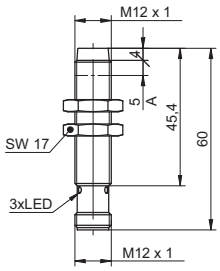
Sn = 10 mm

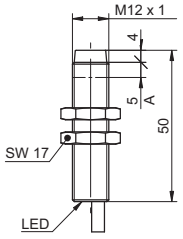


- version with extended Sn *GammaProx*
- non shielded mounting

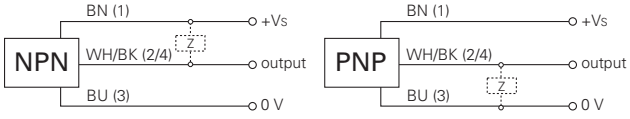
general data	
mounting type	non-flush
special type	enhanced distance (*GammaProx*)
nominal sensing distance Sn	10 mm
temperature drift	± 10 % (0 ... +60 °C) ± 15 % (-25 ... +75 °C)
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 75 %, aluminum 50 %
electrical data	
switching frequency	< 1,5 kHz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 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)	PBT
housing material	brass nickel plated
dimension	12 mm
tightening torque max.	15 Nm (A: 10 Nm)
cable, 2 m	
housing length	50 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings

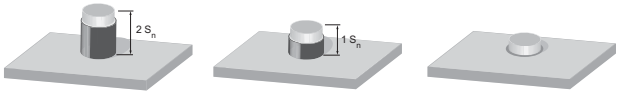




connection diagrams



correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	105 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	not possible
Aluminum	90 %

connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12
for details: see accessories section	

order reference	connection types	output circuit	output indicator
IR12.P10S-11148366	cable, 2 m	NPN break function (NC)	LED red
IR12.P10S-11148324	cable, 2 m	NPN make function (NO)	LED red
IR12.P10S-11148588	cable, 2 m	PNP break function (NC)	LED red
IR12.P10S-11148566	cable, 2 m	PNP make function (NO)	LED red
IR12.P10S-11148367	connector M12	NPN break function (NC)	3 port LED red
IR12.P10S-11148325	connector M12	NPN make function (NO)	3 port LED red
IR12.P10S-11148589	connector M12	PNP break function (NC)	3 port LED red
IR12.P10S-11148572	connector M12	PNP make function (NO)	3 port LED red

Sn = 8 mm

- quasi shielded mounting
- improved EMC compatibility

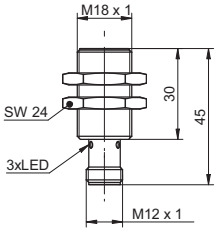
general data	
mounting type	quasi-flush
nominal sensing distance Sn	8 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm
cable, 2 m	
housing length	35 mm
connector M12	
housing length	45 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

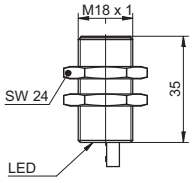
connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12
for details: see accessories section	

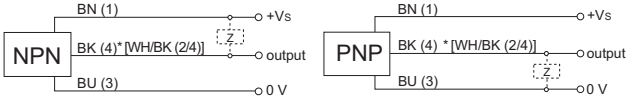
order reference	connection types	output circuit
IFRM 18N17A5/L	cable, 2 m	NPN make function (NO)
IFRM 18N17A5/S14L	connector M12	NPN make function (NO)
IFRM 18N37A5/L	cable, 2 m	NPN break function (NC)
IFRM 18N37A5/S14L	connector M12	NPN break function (NC)
IFRM 18P17A5/L	cable, 2 m	PNP make function (NO)
IFRM 18P17A5/S14L	connector M12	PNP make function (NO)
IFRM 18P37A5/L	cable, 2 m	PNP break function (NC)
IFRM 18P37A5/S14L	connector M12	PNP break function (NC)

dimension drawings





connection diagrams

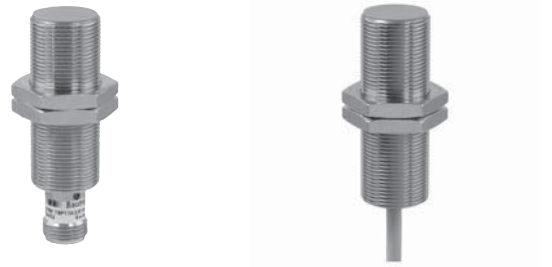


* .../S14L pin 2 & 4 electrically connected

remarks

for correct installation refer to "mounting instructions"

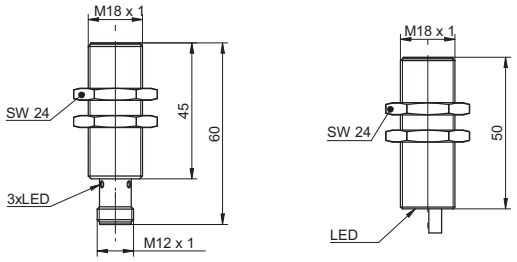
Sn = 8 mm



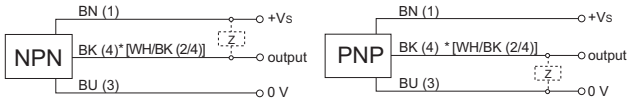
- quasi shielded mounting
- improved EMC compatibility

general data	
mounting type	quasi-flush
nominal sensing distance Sn	8 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	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	18 mm
tightening torque max.	40 Nm
cable, 2 m	
housing length	50 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings



connection diagrams



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

remarks

for correct installation refer to "mounting instructions"

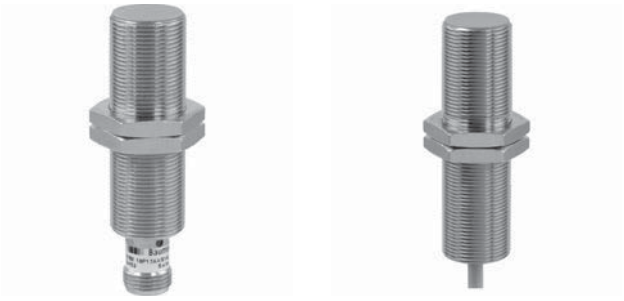
connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12
for details: see accessories section	

order reference	connection types	output circuit	output indicator
IFRM 18N17A3/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 18N17A3/S14L	connector M12	NPN make function (NO)	3 port LED red
IFRM 18N37A3/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 18N37A3/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 18P17A3/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 18P17A3/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 18P37A3/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 18P37A3/S14L	connector M12	PNP break function (NC)	3 port LED red

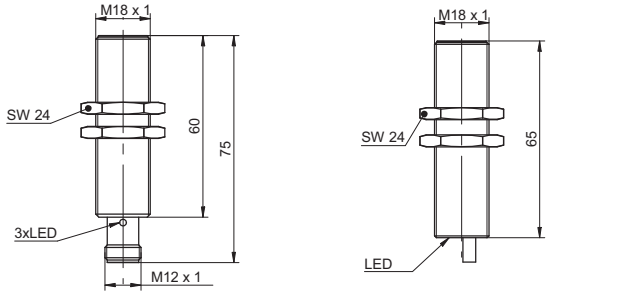
Sn = 8 mm

- quasi shielded mounting
- improved EMC compatibility

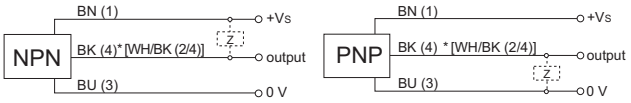


general data	
mounting type	quasi-flush
nominal sensing distance Sn	8 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm
cable, 2 m	
housing length	65 mm
connector M12	
housing length	75 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings



connection diagrams



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

remarks

for correct installation refer to "mounting instructions"

connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12
for details: see accessories section	

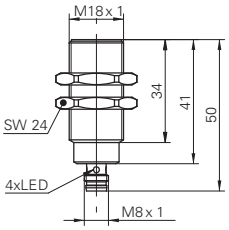
order reference	connection types	output circuit	output indicator
IFRM 18N17A4/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 18N17A4/S14L	connector M12	NPN make function (NO)	3 port LED red
IFRM 18N37A4/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 18N37A4/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 18P17A4/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 18P17A4/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 18P37A4/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 18P37A4/S14L	connector M12	PNP break function (NC)	3 port LED red

Sn = 8 mm

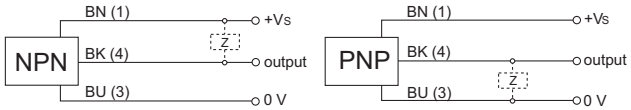
- voltage supply range +Vs 10 ... 50 VDC
- quasi shielded mounting
- M8 x 1 quick disconnect

general data	
mounting type	quasi-flush
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. (no load)	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

dimension drawing



connection diagrams



remarks

for correct installation refer to "mounting instructions"

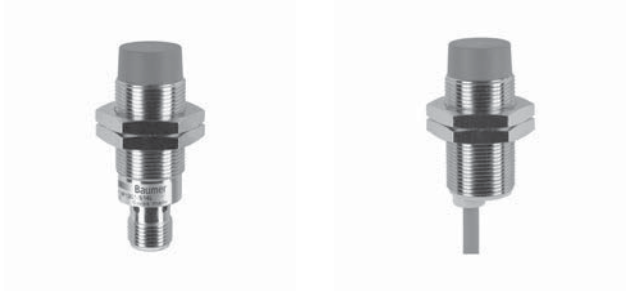
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163236	Adapter for pulse stretching M8
for details: see accessories section	

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)

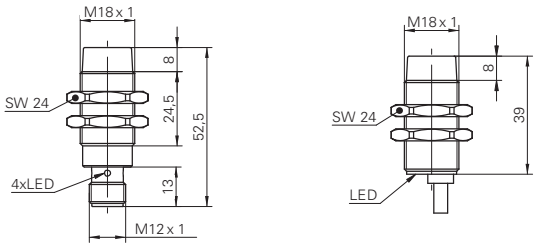
Sn = 12 mm

- non shielded mounting

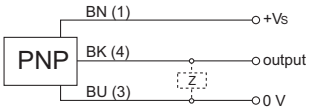


general data	
mounting type	non-flush
nominal sensing distance Sn	12 mm
hysteresis	3 ... 25 % of Sr
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	15 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 3 VDC
output current	< 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, 2 m	
housing length	39 mm
connector M12	
housing length	52,5 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings



connection diagram



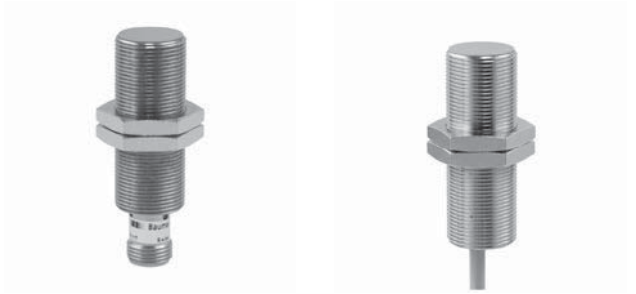
connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12
for details: see accessories section	

order reference	connection types	output indicator
IFRM 18P1301/L	cable, 2 m	LED red
IFRM 18P1301/S14L	connector M12	4 port LED red

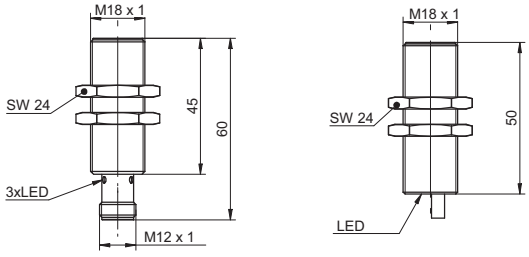
Sn = 8 mm

- shielded mounting
- antivalent output

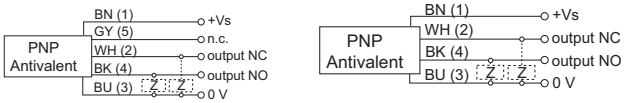


general data	
mounting type	flush
nominal sensing distance Sn	8 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 70 %, aluminum 40 %
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	PNP complementary (NO / NC)
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	18 mm
tightening torque max.	40 Nm
cable, 2 m	
housing length	50 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

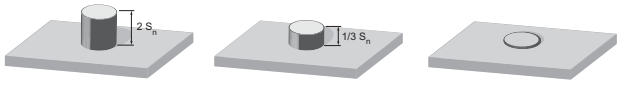
dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	105 %
Stainless steel	100 %
Aluminum	95 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	100 %
Aluminum	80 %

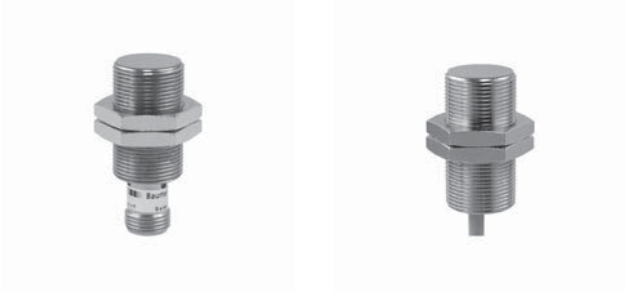
connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
for details: see accessories section	

order reference	connection types	output indicator
IR18.P08S-11184279	cable, 2 m	LED red
IR18.P08S-11184278	connector M12	3 port LED red

Sn = 12 mm

- version with extended Sn *GammaProx*
- quasi shielded mounting



general data	
mounting type	flush
special type	enhanced distance (*GammaProx*)
nominal sensing distance Sn	12 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 70 %, aluminum 40 %
electrical data	
switching frequency	< 400 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 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)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm
cable, 2 m	
housing length	35 mm
connector M12	
housing length	45 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m

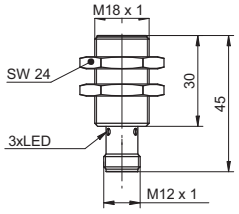
additional cable connectors and field wireable connectors: see accessories

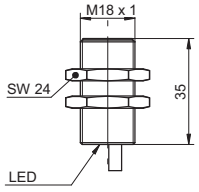
Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12

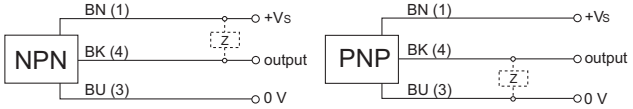
for details: see accessories section

dimension drawings

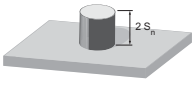




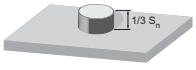
connection diagrams



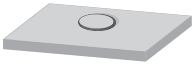
correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %



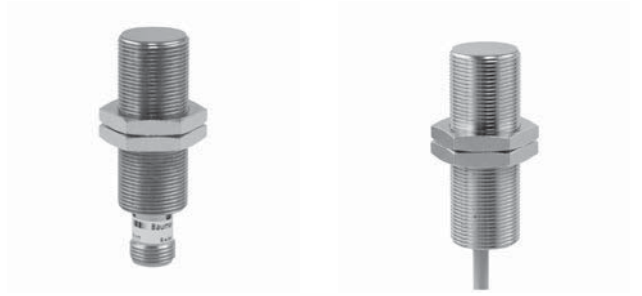
Mounting material	Correction factor
Mild steel	105 %
Stainless steel	95 %
Aluminum	95 %



Mounting material	Correction factor
Mild steel	not possible
Stainless steel	110 %
Aluminum	65 %

order reference	connection types	output circuit	output indicator
IR18.P12S-11149099	cable, 2 m	NPN break function (NC)	LED red
IR18.P12S-11148846	cable, 2 m	NPN make function (NO)	LED red
IR18.P12S-11149168	cable, 2 m	PNP break function (NC)	LED red
IR18.P12S-11149146	cable, 2 m	PNP make function (NO)	LED red
IR18.P12S-11149112	connector M12	NPN break function (NC)	3 port LED red
IR18.P12S-11148847	connector M12	NPN make function (NO)	3 port LED red
IR18.P12S-11149169	connector M12	PNP break function (NC)	3 port LED red
IR18.P12S-11149149	connector M12	PNP make function (NO)	3 port LED red

Sn = 12 mm



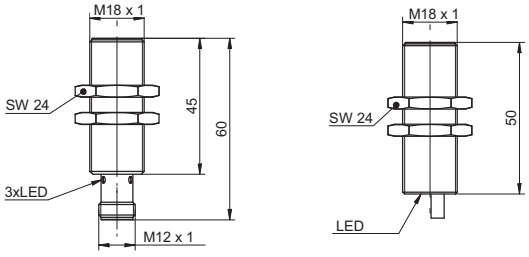
- version with extended Sn *GammaProx*
- shielded mounting

general data	
mounting type	flush
special type	enhanced distance (*GammaProx*)
nominal sensing distance Sn	12 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 70 %, aluminum 40 %
electrical data	
switching frequency	< 400 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 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)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm
cable, 2 m	
housing length	50 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

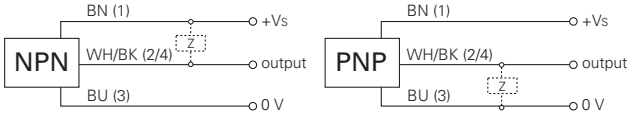
connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12
for details: see accessories section	

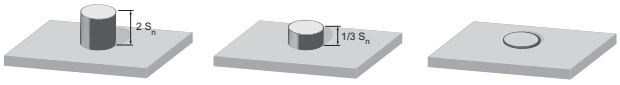
dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	105 %
Stainless steel	95 %
Aluminum	95 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	110 %
Aluminum	65 %

order reference	connection types	output circuit	output indicator
IR18.P12S-11148902	cable, 2 m	NPN break function (NC)	LED red
IR18.P12S-11148844	cable, 2 m	NPN make function (NO)	LED red
IR18.P12S-11149166	cable, 2 m	PNP break function (NC)	LED red
IR18.P12S-11149142	cable, 2 m	PNP make function (NO)	LED red
IR18.P12S-11149098	connector M12	NPN break function (NC)	3 port LED red
IR18.P12S-11148845	connector M12	NPN make function (NO)	3 port LED red
IR18.P12S-11149167	connector M12	PNP break function (NC)	3 port LED red
IR18.P12S-11148329	connector M12	PNP make function (NO)	3 port LED red

Sn = 15 mm

- version with extended Sn *GammaProx*
- non shielded mounting

general data	
mounting type	non-flush
special type	enhanced distance (*GammaProx*)
nominal sensing distance Sn	15 mm
temperature drift	- 5 % / + 10 % (+10 ... +60 °C) - 5 % / + 15 % (0 ... +65 °C)
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 85 %, aluminum 55 %
electrical data	
switching frequency	< 400 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 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)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm
cable, 2 m	
housing length	35 mm
connector M12	
housing length	45 mm
ambient conditions	
operating temperature	0 ... +65 °C
protection class	IP 67

connectors and mating connectors

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m

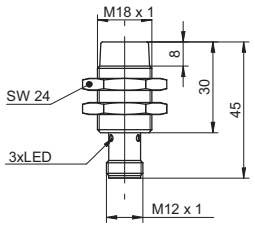
additional cable connectors and field wireable connectors: see accessories

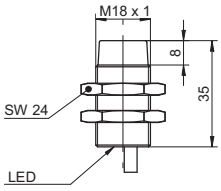
Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12

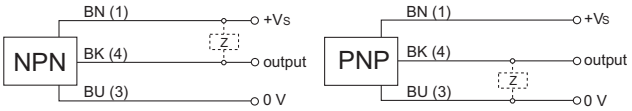
for details: see accessories section

dimension drawings

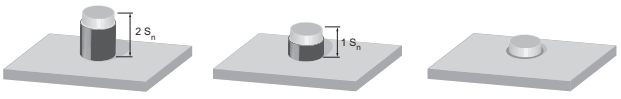




connection diagrams



correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	105 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	115%
Aluminum	95 %

order reference	connection types	output circuit	output indicator
IR18.P15S-11148900	cable, 2 m	NPN break function (NC)	LED red
IR18.P15S-11148809	cable, 2 m	NPN make function (NO)	LED red
IR18.P15S-11149164	cable, 2 m	PNP break function (NC)	LED red
IR18.P15S-11149138	cable, 2 m	PNP make function (NO)	LED red
IR18.P15S-11148901	connector M12	NPN break function (NC)	3 port LED red
IR18.P15S-11148820	connector M12	NPN make function (NO)	3 port LED red
IR18.P15S-11149165	connector M12	PNP break function (NC)	3 port LED red
IR18.P15S-11149140	connector M12	PNP make function (NO)	3 port LED red

Sn = 15 mm

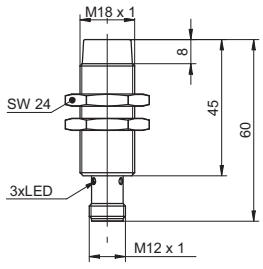
- version with extended Sn *GammaProx*
- non shielded mounting

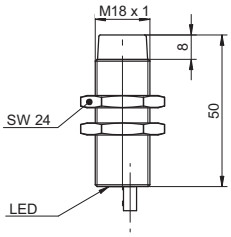
general data	
mounting type	non-flush
special type	enhanced distance (*GammaProx*)
nominal sensing distance Sn	15 mm
temperature drift	- 5 % / + 10 % (+10 ... +60 °C) - 5 % / + 15 % (0 ... +65 °C)
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 85 %, aluminum 55 %
electrical data	
switching frequency	< 400 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 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)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm
cable, 2 m	
housing length	50 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	0 ... +65 °C
protection class	IP 67

connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

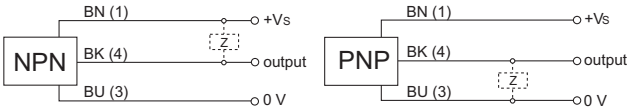
Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12
for details: see accessories section	

dimension drawings

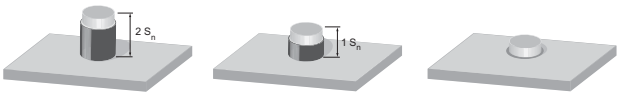




connection diagrams



correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	105 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	115%
Aluminum	95 %

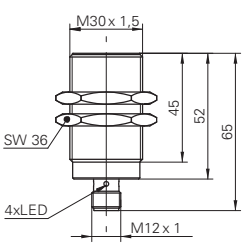
order reference	connection types	output circuit	output indicator
IR18.P15S-11148848	cable, 2 m	NPN break function (NC)	LED red
IR18.P15S-11148796	cable, 2 m	NPN make function (NO)	LED red
IR18.P15S-11149161	cable, 2 m	PNP break function (NC)	LED red
IR18.P15S-11149115	cable, 2 m	PNP make function (NO)	LED red
IR18.P15S-11148849	connector M12	NPN break function (NC)	3 port LED red
IR18.P15S-11148813	connector M12	NPN make function (NO)	3 port LED red
IR18.P15S-11149163	connector M12	PNP break function (NC)	3 port LED red
IR18.P15S-11149133	connector M12	PNP make function (NO)	3 port LED red

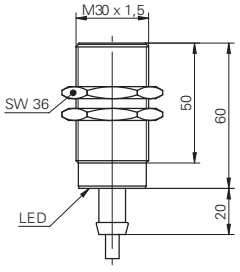
Sn = 10 mm

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

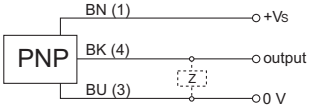
general data	
mounting type	flush
nominal sensing distance Sn	10 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 50 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	30 mm
cable, 2 m	
housing length	60 mm
connector M12	
housing length	65 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings





connection diagram



connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11163237	Adapter for pulse stretching M12
for details: see accessories section	

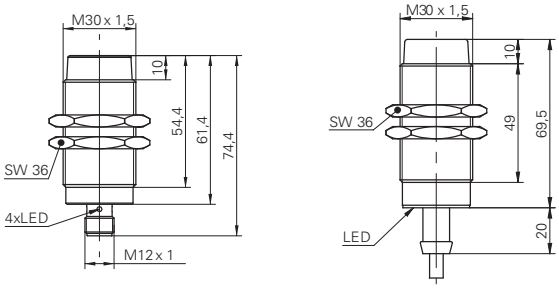
order reference	connection types	output circuit	output indicator
IFRM 30P1501/S14L	connector M12	PNP make function (NO)	4 port LED red
IFRM 30P1601/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 30P3501/S14L	connector M12	PNP break function (NC)	4 port LED red
IFRM 30P3601/L	cable, 2 m	PNP break function (NC)	LED red

Sn = 15 mm

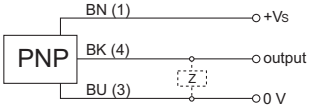
- voltage supply range +Vs 10 ... 50 VDC
- non shielded mounting
- M12 x 1 quick disconnect

general data	
mounting type	non-flush
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. (no load)	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, 2 m	
housing length	69,5 mm
connector M12	
housing length	74,4 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings



connection diagram



connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11163237	Adapter for pulse stretching M12
for details: see accessories section	

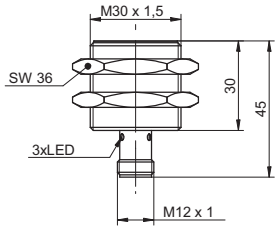
order reference	connection types	output circuit	output indicator
IFRM 30P1101/S14L	connector M12	PNP make function (NO)	4 port LED red
IFRM 30P1201/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 30P3101/S14L	connector M12	PNP break function (NC)	4 port LED red
IFRM 30P3201/L	cable, 2 m	PNP break function (NC)	LED red

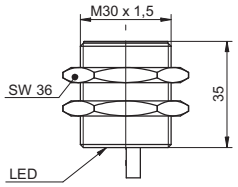
Sn = 18 mm

- version with extended Sn *GammaProx*
- shielded mounting

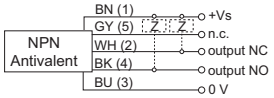
general data	
mounting type	flush
special type	enhanced distance (*GammaProx*)
nominal sensing distance Sn	18 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 70 %, aluminum 40 %
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	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	30 mm
tightening torque max.	140 Nm
cable, 2 m	
housing length	35 mm
connector M12	
housing length	45 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

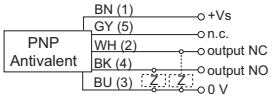
dimension drawings



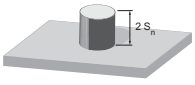


connection diagrams

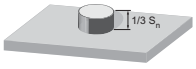




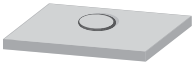
correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %



Mounting material	Correction factor
Mild steel	105 %
Stainless steel	105 %
Aluminum	100 %

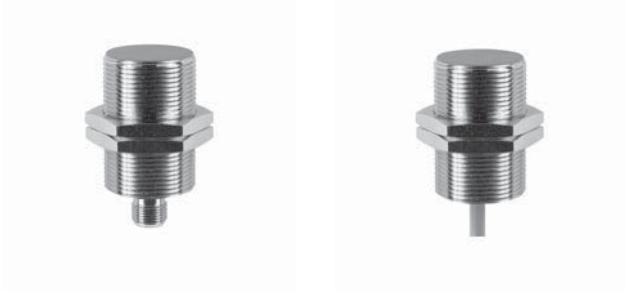


Mounting material	Correction factor
Mild steel	not possible
Stainless steel	not possible
Aluminum	75 %

connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11163237	Adapter for pulse stretching M12
for details: see accessories section	

order reference	connection types	output circuit	output indicator
IR30.P18S-11174004	cable, 2 m	NPN complementary (NO / NC)	LED red
IR30.P18S-11174005	cable, 2 m	PNP complementary (NO / NC)	LED red
IR30.P18S-11174008	connector M12	NPN complementary (NO / NC)	3 port LED red
IR30.P18S-11174009	connector M12	PNP complementary (NO / NC)	3 port LED red

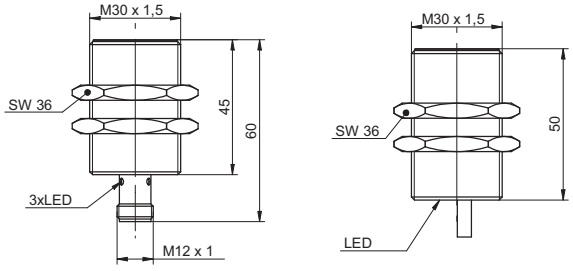
Sn = 18 mm



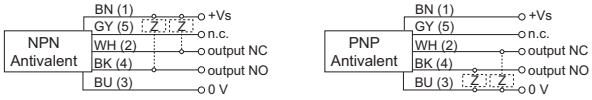
- version with extended Sn *GammaProx*
- shielded mounting

general data	
mounting type	flush
special type	enhanced distance (*GammaProx*)
nominal sensing distance Sn	18 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 70 %, aluminum 40 %
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	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	30 mm
tightening torque max.	140 Nm
cable, 2 m	
housing length	50 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

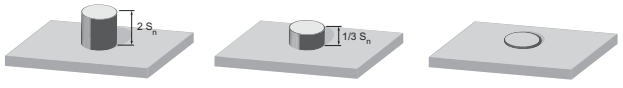
dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	105 %
Stainless steel	105 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	not possible
Aluminum	75 %

connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
11163237	Adapter for pulse stretching M12
for details: see accessories section	

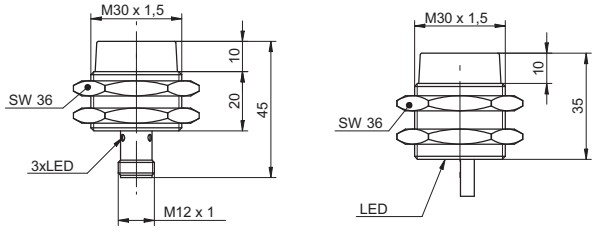
order reference	connection types	output circuit	output indicator
IR30.P18S-11174003	cable, 2 m	NPN complementary (NO / NC)	LED red
IR30.P18S-11171575	cable, 2 m	PNP complementary (NO / NC)	LED red
IR30.P18S-11174006	connector M12	NPN complementary (NO / NC)	3 port LED red
IR30.P18S-11174007	connector M12	PNP complementary (NO / NC)	3 port LED red

Sn = 24 mm

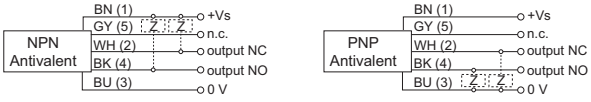
- version with extended Sn *GammaProx*
- non shielded mounting

general data	
mounting type	non-flush
special type	enhanced distance (*GammaProx*)
nominal sensing distance Sn	24 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 70 %, aluminum 50 %
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	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	30 mm
tightening torque max.	140 Nm
cable, 2 m	
housing length	35 mm
connector M12	
housing length	45 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

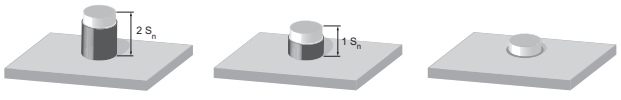
dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	95 %
Aluminum	95 %

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	95 %
Aluminum	95 %

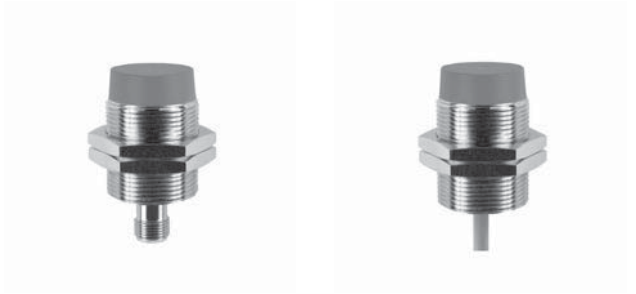
Mounting material	Correction factor
Mild steel	not possible
Stainless steel	115 %
Aluminum	90 %

connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11163237	Adapter for pulse stretching M12
for details: see accessories section	

order reference	connection types	output circuit	output indicator
IR30.P24S-11174032	cable, 2 m	NPN complementary (NO / NC)	LED red
IR30.P24S-11174033	cable, 2 m	PNP complementary (NO / NC)	LED red
IR30.P24S-11174036	connector M12	NPN complementary (NO / NC)	3 port LED red
IR30.P24S-11174037	connector M12	PNP complementary (NO / NC)	3 port LED red

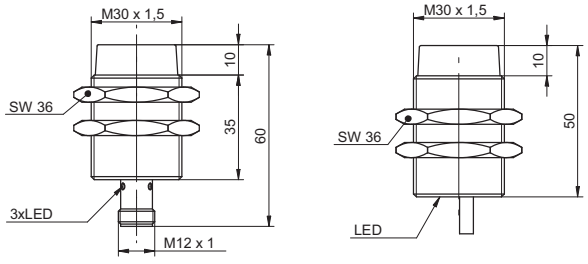
Sn = 24 mm

- version with extended Sn *GammaProx*
- non shielded mounting

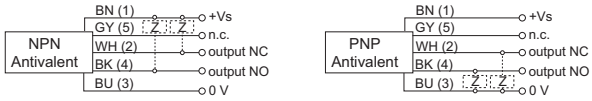


general data	
mounting type	non-flush
special type	enhanced distance (*GammaProx*)
nominal sensing distance Sn	24 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 70 %, aluminum 50 %
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	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	30 mm
tightening torque max.	140 Nm
cable, 2 m	
housing length	50 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

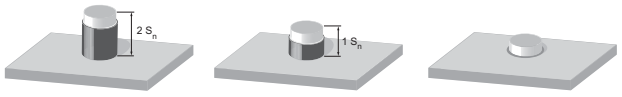
dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)



Mounting material	Correction factor
Mild steel	100 %
Stainless steel	95 %
Aluminum	95 %

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	95 %
Aluminum	95 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	115 %
Aluminum	90 %

connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

11163237	Adapter for pulse stretching M12

for details: see accessories section

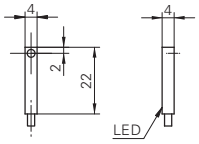
order reference	connection types	output circuit	output indicator
IR30.P24S-11174030	cable, 2 m	NPN complementary (NO / NC)	LED red
IR30.P24S-11174031	cable, 2 m	PNP complementary (NO / NC)	LED red
IR30.P24S-11174034	connector M12	NPN complementary (NO / NC)	3 port LED red
IR30.P24S-11174035	connector M12	PNP complementary (NO / NC)	3 port LED red

Sn = 0,8 mm

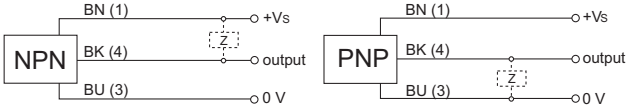
- smallest rectangular housing
- stainless steel housing

general data	
mounting type	flush
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. (no load)	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, 2 m
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawing



connection diagrams



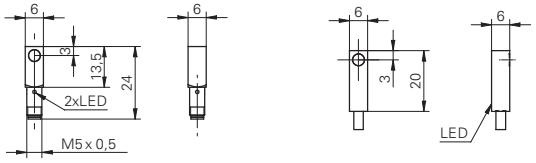
order reference	output circuit
IFFM 04N1501/O1L	NPN make function (NO)
IFFM 04N3501/O1L	NPN break function (NC)
IFFM 04P1501/O1L	PNP make function (NO)
IFFM 04P3501/O1L	PNP break function (NC)

Sn = 1 mm

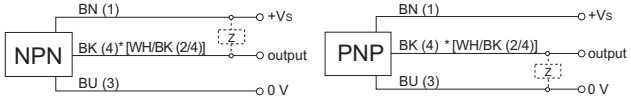
- miniature connector M5 x 0,5
- smallest rectangular housing with connector

general data	
mounting type	flush
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. (no load)	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, 2 m	
housing length	20 mm
connector M5	
housing length	24 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings



connection diagrams



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

connectors and mating connectors	
ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

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

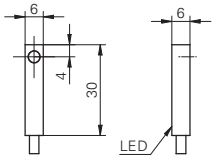
Sn = 1 mm

- standard cable version
- high switching frequency

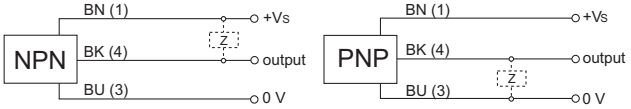
general data	
mounting type	flush
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red (backside)
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 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, 2 m
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

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)

dimension drawing



connection diagrams



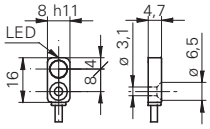
Sn = 2 mm

- extra flat version
- through bore for M3 screw
- robust metal housing

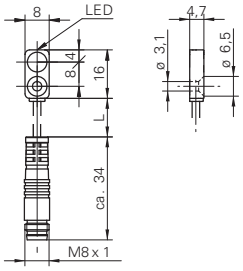
general data	
mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit 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

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawing

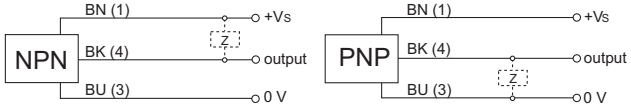


flylead connector version



standard cable length 200 mm (L)

connection diagrams



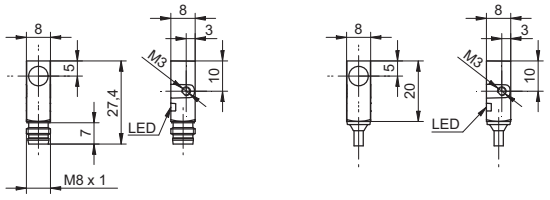
order reference	connection types	output circuit
IFFM 08N17A6/KS35L	flylead connector M8	NPN make function (NO)
IFFM 08N17A6/L	cable, 2 m	NPN make function (NO)
IFFM 08N37A6/KS35L	flylead connector M8	NPN break function (NC)
IFFM 08N37A6/L	cable, 2 m	NPN break function (NC)
IFFM 08P17A6/KS35L	flylead connector M8	PNP make function (NO)
IFFM 08P17A6/L	cable, 2 m	PNP make function (NO)
IFFM 08P37A6/KS35L	flylead connector M8	PNP break function (NC)
IFFM 08P37A6/L	cable, 2 m	PNP break function (NC)

Sn = 2 mm

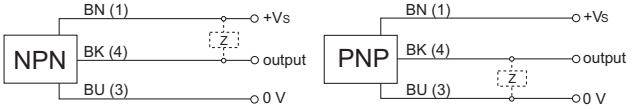
- shortest rectangular design with M8 x 1 connector
- cable and connector versions
- high switching frequency

general data	
mounting type	flush
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. (no load)	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	die-cast zinc nickel plated
dimension	8 mm
cable, 2 m	
housing length	20 mm
connector M8	
housing length	27,4 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings



connection diagrams



connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
11163236	Adapter for pulse stretching M8
for details: see accessories section	

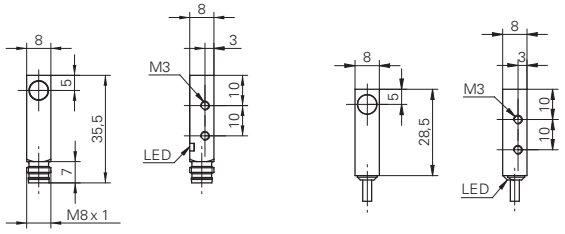
order reference	connection types	output circuit
IFFM 08N1703/O1L	cable, 2 m	NPN make function (NO)
IFFM 08N17A5/O1S35L	connector M8	NPN make function (NO)
IFFM 08N3703/O1L	cable, 2 m	NPN break function (NC)
IFFM 08N37A5/O1S35L	connector M8	NPN break function (NC)
IFFM 08P1703/O1L	cable, 2 m	PNP make function (NO)
IFFM 08P17A5/O1S35L	connector M8	PNP make function (NO)
IFFM 08P3703/O1L	cable, 2 m	PNP break function (NC)
IFFM 08P37A5/O1S35L	connector M8	PNP break function (NC)

Sn = 2 mm

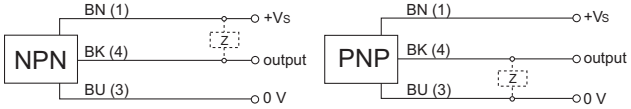
- high switching frequency
- cable and connector versions

general data	
mounting type	flush
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. (no load)	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, 2 m	
housing length	28,5 mm
connector M8	
housing length	35,5 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings



connection diagrams



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

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11163236	Adapter for pulse stretching M8
for details: see accessories section	

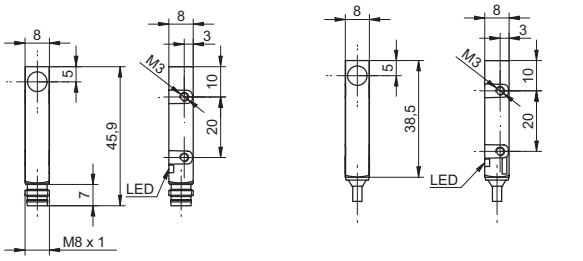
order reference	connection types	output circuit
IFFM 08N1702/O1L	cable, 2 m	NPN make function (NO)
IFFM 08N17A3/O1S35L	connector M8	NPN make function (NO)
IFFM 08N3702/O1L	cable, 2 m	NPN break function (NC)
IFFM 08N37A3/O1S35L	connector M8	NPN break function (NC)
IFFM 08P1702/O1L	cable, 2 m	PNP make function (NO)
IFFM 08P17A3/O1S35L	connector M8	PNP make function (NO)
IFFM 08P3702/O1L	cable, 2 m	PNP break function (NC)
IFFM 08P37A3/O1S35L	connector M8	PNP break function (NC)

Sn = 2 mm

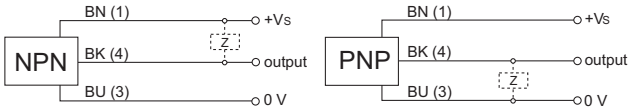
- high switching frequency
- cable and connector versions

general data	
mounting type	flush
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. (no load)	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	die-cast zinc nickel plated
dimension	8 mm
cable, 2 m	
housing length	38,5 mm
connector M8	
housing length	45,9 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings



connection diagrams



connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11163236	Adapter for pulse stretching M8
for details: see accessories section	

order reference	connection types	output circuit
IFFM 08N1701/O1L	cable, 2 m	NPN make function (NO)
IFFM 08N17A1/O1S35L	connector M8	NPN make function (NO)
IFFM 08N3701/O1L	cable, 2 m	NPN break function (NC)
IFFM 08N37A1/O1S35L	connector M8	NPN break function (NC)
IFFM 08P1701/O1L	cable, 2 m	PNP make function (NO)
IFFM 08P17A1/O1S35L	connector M8	PNP make function (NO)
IFFM 08P3701/O1L	cable, 2 m	PNP break function (NC)
IFFM 08P37A1/O1S35L	connector M8	PNP break function (NC)

Sn = 2 mm

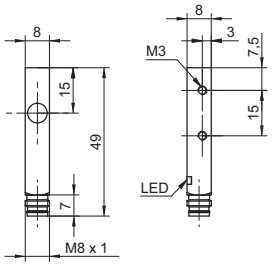
- active area at mid position
- high switching frequency
- cable and connector versions

general data	
mounting type	flush
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. (no load)	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
housing length	49 mm
connection types	connector M8
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

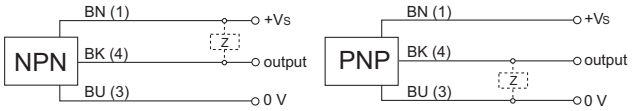
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11163236	Adapter for pulse stretching M8
for details: see accessories section	

order reference	output circuit
IFFM 08N1703/O2S35L	NPN make function (NO)
IFFM 08N3703/O2S35L	NPN break function (NC)
IFFM 08P1703/O2S35L	PNP make function (NO)
IFFM 08P3703/O2S35L	PNP break function (NC)

dimension drawing



connection diagrams

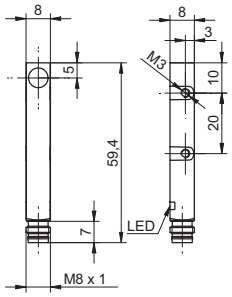


Sn = 2 mm

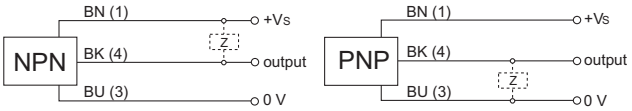
- high switching frequency
- cable and connector versions
- very long housing

general data	
mounting type	flush
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. (no load)	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	die-cast zinc nickel plated
dimension	8 mm
housing length	59,4 mm
connection types	connector M8
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawing



connection diagrams



connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11163236	Adapter for pulse stretching M8
for details: see accessories section	

order reference	output circuit
IFFM 08N1701/O1S35L	NPN make function (NO)
IFFM 08N3701/O1S35L	NPN break function (NC)
IFFM 08P1701/O1S35L	PNP make function (NO)
IFFM 08P3701/O1S35L	PNP break function (NC)

Sn = 4 mm

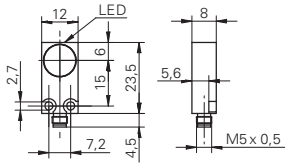
- extra flat version
- miniature connector M5 x 0,5

general data	
mounting type	flush
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. (no load)	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

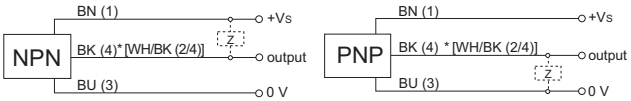
connectors and mating connectors	
ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

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)

dimension drawing



connection diagrams



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

Sn = 5 mm

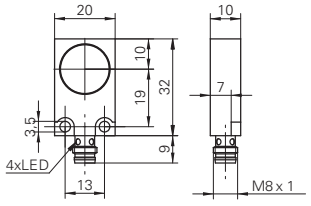
- voltage supply range +Vs 10 ... 50 VDC
- extra flat version
- 4 port LED

general data	
mounting type	flush
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. (no load)	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

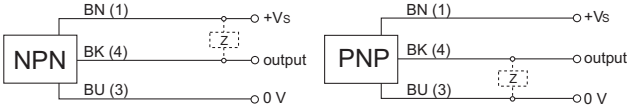
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10152385	Sensofix series 18/20 inductive rectangular
11163236	Adapter for pulse stretching M8
for details: see accessories section	

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)

dimension drawing



connection diagrams



Sn = 8 mm

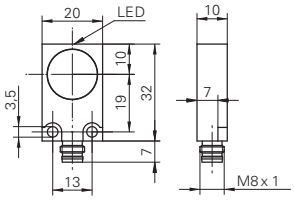
- increased sensing distance
- extra flat version

general data	
mounting type	flush
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. (no load)	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

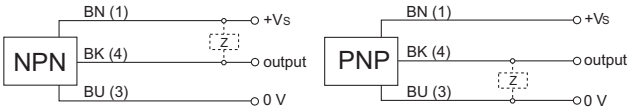
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10152385	Sensofix series 18/20 inductive rectangular
11163236	Adapter for pulse stretching M8
for details: see accessories section	

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

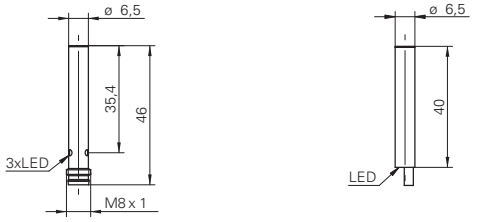


Sn = 2 mm

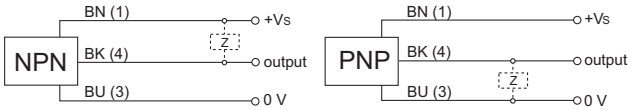
- robust steel housing
- high switching frequency
- mounting with special support

general data	
mounting type	flush
special type	factor 1
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 3 kHz
voltage supply range +Vs	5 ... 36 VDC
current consumption max. (no load)	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, 2 m	
housing length	40 mm
connector M8	
housing length	46 mm
ambient conditions	
operating temperature	-25 ... +75 °C
storage temperature	-40 ... +85 °C
protection class	IP 67

dimension drawings



connection diagrams



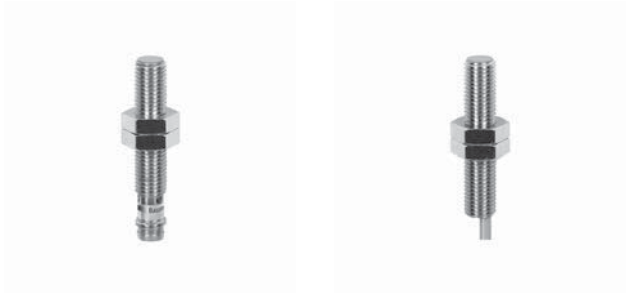
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

order reference	connection types	output circuit	voltage supply range +Vs	output indicator
IR06.P02F-11119425	cable, 2 m	NPN break function (NC)	5 ... 36 VDC	LED red
IR06.P02F-11119423	cable, 2 m	NPN make function (NO)	5 ... 36 V AC/DC	LED red
IR06.P02F-11119424	cable, 2 m	PNP break function (NC)	5 ... 36 V AC/DC	LED red
IR06.P02F-11119422	cable, 2 m	PNP make function (NO)	5 ... 36 V AC/DC	LED red
IR06.P02F-11119421	connector M8	NPN break function (NC)	5 ... 36 V AC/DC	3 port LED red
IR06.P02F-11117732	connector M8	NPN make function (NO)	5 ... 36 V AC/DC	3 port LED red
IR06.P02F-11119408	connector M8	PNP break function (NC)	5 ... 36 V AC/DC	3 port LED red
IR06.P02F-11117730	connector M8	PNP make function (NO)	5 ... 36 V AC/DC	3 port LED red

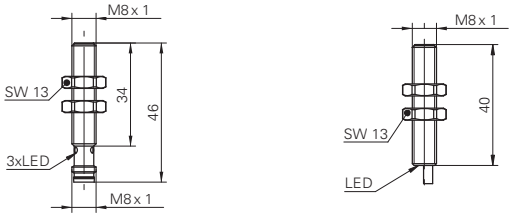
Sn = 2 mm

- robust steel housing
- high switching frequency

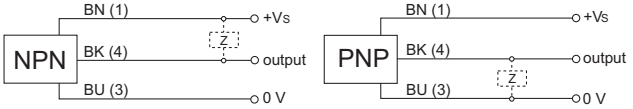


general data	
mounting type	flush
special type	factor 1
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 3 kHz
voltage supply range +Vs	5 ... 36 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm
tightening torque max.	10 Nm
cable, 2 m	
housing length	40 mm
connector M8	
housing length	46 mm
ambient conditions	
operating temperature	-25 ... +75 °C
storage temperature	-40 ... +85 °C
protection class	IP 67

dimension drawings



connection diagrams



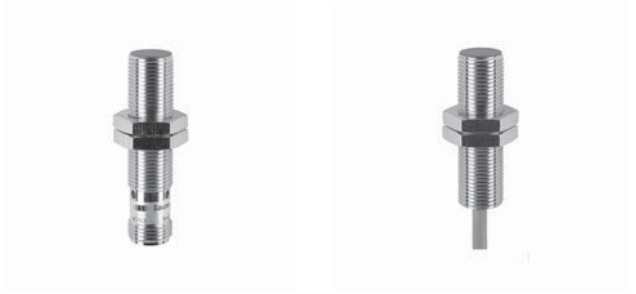
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151719	Sensofix series 08 round
11163236	Adapter for pulse stretching M8
for details: see accessories section	

order reference	connection types	output circuit	output indicator
IR08.P02F-11119431	cable, 2 m	NPN break function (NC)	LED red
IR08.P02F-11119429	cable, 2 m	NPN make function (NO)	LED red
IR08.P02F-11119430	cable, 2 m	PNP break function (NC)	LED red
IR08.P02F-11119428	cable, 2 m	PNP make function (NO)	LED red
IR08.P02F-11119427	connector M8	NPN break function (NC)	3 port LED red
IR08.P02F-11116607	connector M8	NPN make function (NO)	3 port LED red
IR08.P02F-11119426	connector M8	PNP break function (NC)	3 port LED red
IR08.P02F-11111235	connector M8	PNP make function (NO)	3 port LED red

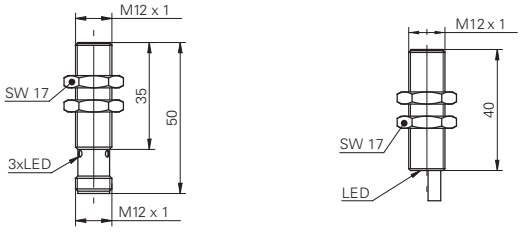
Sn = 4 mm

- high stability across entire temperature range

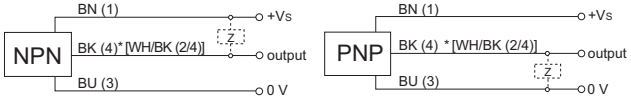


general data	
mounting type	flush
special type	factor 1
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 2 kHz
voltage supply range +Vs	5 ... 36 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
tightening torque max.	15 Nm
cable, 2 m	
housing length	40 mm
connector M12	
housing length	50 mm
ambient conditions	
operating temperature	-25 ... +75 °C
storage temperature	-40 ... +85 °C
protection class	IP 67

dimension drawings



connection diagrams



* pin 2 & 4 electrically connected

connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12
for details: see accessories section	

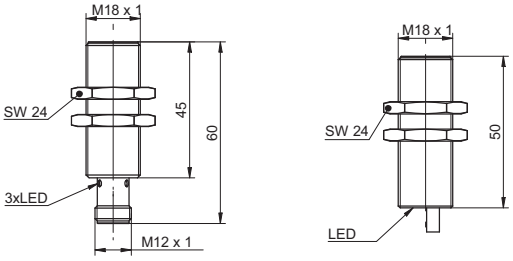
order reference	connection types	output circuit	output indicator
IR12.P04F-11119439	cable, 2 m	NPN break function (NC)	LED red
IR12.P04F-11119438	cable, 2 m	NPN make function (NO)	LED red
IR12.P04F-11119496	cable, 2 m	PNP break function (NC)	LED red
IR12.P04F-11119436	cable, 2 m	PNP make function (NO)	LED red
IR12.P04F-11119435	connector M12	NPN break function (NC)	3 port LED red
IR12.P04F-11116610	connector M12	NPN make function (NO)	3 port LED red
IR12.P04F-11119433	connector M12	PNP break function (NC)	3 port LED red
IR12.P04F-11111236	connector M12	PNP make function (NO)	3 port LED red

Sn = 6 mm

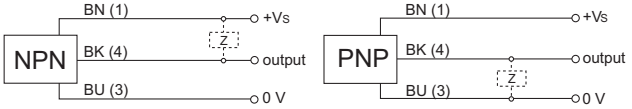
- robust steel housing
- high switching frequency

general data	
mounting type	flush
special type	factor 1
nominal sensing distance Sn	6 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	5 ... 36 VDC
current consumption max. (no load)	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	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm
cable, 2 m	
housing length	50 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-25 ... +75 °C
storage temperature	-40 ... +85 °C
protection class	IP 67

dimension drawings



connection diagrams



connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12
for details: see accessories section	

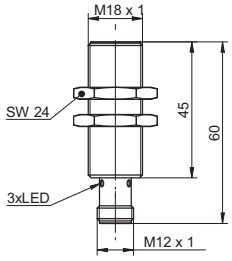
order reference	connection types	output circuit	output indicator
IR18.P06F-11119473	cable, 2 m	NPN break function (NC)	LED red
IR18.P06F-11119459	cable, 2 m	NPN make function (NO)	LED red
IR18.P06F-11119472	cable, 2 m	PNP break function (NC)	LED red
IR18.P06F-11119458	cable, 2 m	PNP make function (NO)	LED red
IR18.P06F-11119457	connector M12	NPN break function (NC)	3 port LED red
IR18.P06F-11117735	connector M12	NPN make function (NO)	3 port LED red
IR18.P06F-11119456	connector M12	PNP break function (NC)	3 port LED red
IR18.P06F-11117733	connector M12	PNP make function (NO)	3 port LED red

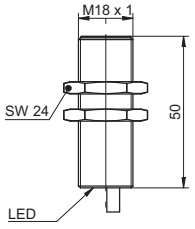
Sn = 8 mm

- robust steel housing
- high switching frequency

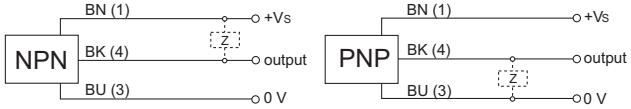
general data	
mounting type	quasi-flush
special type	factor 1
nominal sensing distance Sn	8 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	5 ... 36 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm
cable, 2 m	
housing length	50 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-25 ... +75 °C
storage temperature	-40 ... +85 °C
protection class	IP 67

dimension drawings





connection diagrams



connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12
for details: see accessories section	

order reference	connection types	output circuit	output indicator
IR18.P08F-11119479	cable, 2 m	NPN break function (NC)	LED red
IR18.P08F-11119477	cable, 2 m	NPN make function (NO)	LED red
IR18.P08F-11119478	cable, 2 m	PNP break function (NC)	LED red
IR18.P08F-11119476	cable, 2 m	PNP make function (NO)	LED red
IR18.P08F-11119475	connector M12	NPN break function (NC)	3 port LED red
IR18.P08F-11116612	connector M12	NPN make function (NO)	3 port LED red
IR18.P08F-11119474	connector M12	PNP break function (NC)	3 port LED red
IR18.P08F-11111237	connector M12	PNP make function (NO)	3 port LED red

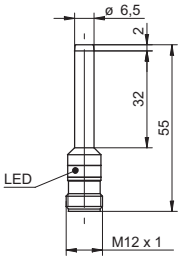
Sn = 3 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 … +80°C

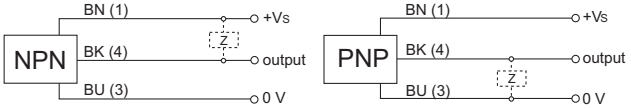
general data	
mounting type	non-flush
special type	hygienic design
nominal sensing distance Sn	3 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab EHEDG REGULATION (EC) 1935/2004 REGULATION (EC) 2023/2006 REGULATION (EU) 1282/2011 FDA 21 CFR § 175.300 FDA 21 CFR § 177.2600 FCN 742
electrical data	
switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	6,5 mm
housing length	55 mm
connection types	connector M12
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+

order reference	output circuit
IFBR 06N13T1/S14L-9	NPN make function (NO)
IFBR 06N33T1/S14L-9	NPN break function (NC)
IFBR 06P13T1/S14L-9	PNP make function (NO)
IFBR 06P33T1/S14L-9	PNP break function (NC)

dimension drawing



connection diagrams



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

connectors and mating connectors	
ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
additional cable connectors and field wireable connectors: see accessories	

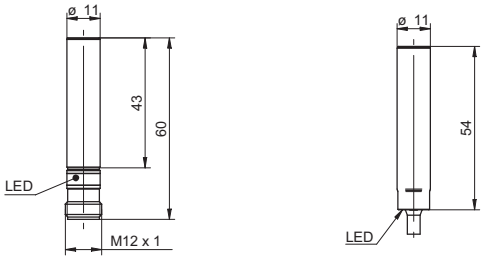
Accessories	
HI06-1H	Mounting for sensors in hygienic design Ø 6,5 mm
for details: see accessories section	

Sn = 4 mm

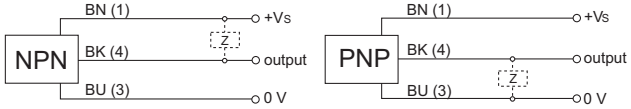
- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 … +80°C

general data	
mounting type	flush
special type	hygienic design
nominal sensing distance Sn	4 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab EHEDG REGULATION (EC) 1935/2004 REGULATION (EC) 2023/2006 REGULATION (EU) 1282/2011 FDA 21 CFR § 175.300 FDA 21 CFR § 177.2600 FCN 742
electrical data	
switching frequency	< 1 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	11 mm
cable PVC, 2 m	
housing length	54 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+

dimension drawings



connection diagrams



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

connectors and mating connectors	
ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
additional cable connectors and field wireable connectors: see accessories	

Accessories	
HI11-1H	Mounting for sensors in hygienic design Ø 11 mm
for details: see accessories section	

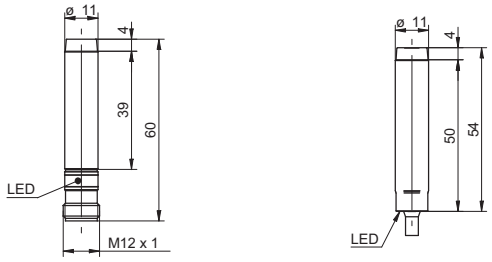
order reference	connection types	output circuit
IFBR 11N17T1/L-9	cable PVC, 2 m	NPN make function (NO)
IFBR 11N17T1/S14L-9	connector M12	NPN make function (NO)
IFBR 11N37T1/L-9	cable PVC, 2 m	NPN break function (NC)
IFBR 11N37T1/S14L-9	connector M12	NPN break function (NC)
IFBR 11P17T1/L-9	cable PVC, 2 m	PNP make function (NO)
IFBR 11P17T1/S14L-9	connector M12	PNP make function (NO)
IFBR 11P37T1/L-9	cable PVC, 2 m	PNP break function (NC)
IFBR 11P37T1/S14L-9	connector M12	PNP break function (NC)

Sn = 6 mm

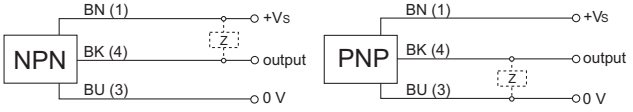
- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 … +80°C

general data	
mounting type	non-flush
special type	hygienic design
nominal sensing distance Sn	6 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab EHEDG REGULATION (EC) 1935/2004 REGULATION (EC) 2023/2006 REGULATION (EU) 1282/2011 FDA 21 CFR § 175.300 FDA 21 CFR § 177.2600 FCN 742
electrical data	
switching frequency	< 1 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	11 mm
cable PVC, 2 m	
housing length	54 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+

dimension drawings



connection diagrams



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

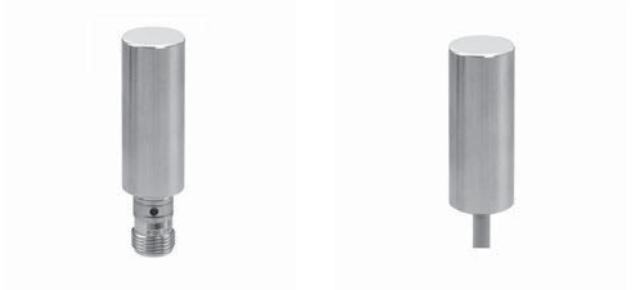
connectors and mating connectors	
ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
additional cable connectors and field wireable connectors: see accessories	

Accessories	
HI11-1H	Mounting for sensors in hygienic design Ø 11 mm
for details: see accessories section	

order reference	connection types	output circuit
IFBR 11N13T1/L-9	cable PVC, 2 m	NPN make function (NO)
IFBR 11N13T1/S14L-9	connector M12	NPN make function (NO)
IFBR 11N33T1/L-9	cable PVC, 2 m	NPN break function (NC)
IFBR 11N33T1/S14L-9	connector M12	NPN break function (NC)
IFBR 11P13T1/L-9	cable PVC, 2 m	PNP make function (NO)
IFBR 11P13T1/S14L-9	connector M12	PNP make function (NO)
IFBR 11P33T1/L-9	cable PVC, 2 m	PNP break function (NC)
IFBR 11P33T1/S14L-9	connector M12	PNP break function (NC)

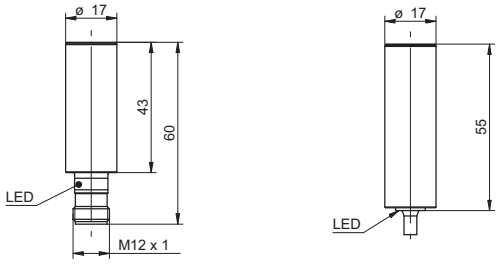
Sn = 8 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 … +80°C

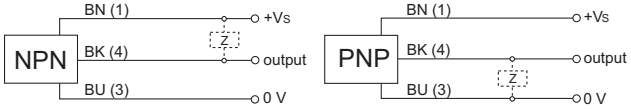


general data	
mounting type	quasi-flush
special type	hygienic design
nominal sensing distance Sn	8 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab EHEDG REGULATION (EC) 1935/2004 REGULATION (EC) 2023/2006 REGULATION (EU) 1282/2011 FDA 21 CFR § 175.300 FDA 21 CFR § 177.2600 FCN 742
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	17 mm
cable PVC, 2 m	
housing length	55 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+

dimension drawings



connection diagrams



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

connectors and mating connectors	
ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
additional cable connectors and field wireable connectors: see accessories	

Accessories	
HI17-1H	Mounting for sensors in hygienic design Ø 17 mm
for details: see accessories section	

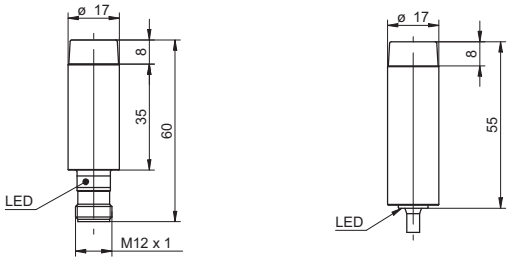
order reference	connection types	output circuit
IFBR 17N17T1/L-9	cable PVC, 2 m	NPN make function (NO)
IFBR 17N17T1/S14L-9	connector M12	NPN make function (NO)
IFBR 17N37T1/L-9	cable PVC, 2 m	NPN break function (NC)
IFBR 17N37T1/S14L-9	connector M12	NPN break function (NC)
IFBR 17P17T1/L-9	cable PVC, 2 m	PNP make function (NO)
IFBR 17P17T1/S14L-9	connector M12	PNP make function (NO)
IFBR 17P37T1/L-9	cable PVC, 2 m	PNP break function (NC)
IFBR 17P37T1/S14L-9	connector M12	PNP break function (NC)

Sn = 12 mm

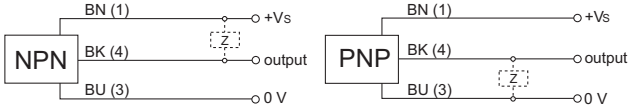
- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 … +80°C

general data	
mounting type	non-flush
special type	hygienic design
nominal sensing distance Sn	12 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab EHEDG REGULATION (EC) 1935/2004 REGULATION (EC) 2023/2006 REGULATION (EU) 1282/2011 FDA 21 CFR § 175.300 FDA 21 CFR § 177.2600 FCN 742
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	17 mm
cable PVC, 2 m	
housing length	55 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+

dimension drawings



connection diagrams



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

connectors and mating connectors	
ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
additional cable connectors and field wireable connectors: see accessories	

Accessories	
HI17-1H	Mounting for sensors in hygienic design Ø 17 mm
for details: see accessories section	

order reference	connection types	output circuit
IFBR 17N13T1/L-9	cable PVC, 2 m	NPN make function (NO)
IFBR 17N13T1/S14L-9	connector M12	NPN make function (NO)
IFBR 17N33T1/L-9	cable PVC, 2 m	NPN break function (NC)
IFBR 17N33T1/S14L-9	connector M12	NPN break function (NC)
IFBR 17P13T1/L-9	cable PVC, 2 m	PNP make function (NO)
IFBR 17P13T1/S14L-9	connector M12	PNP make function (NO)
IFBR 17P33T1/L-9	cable PVC, 2 m	PNP break function (NC)
IFBR 17P33T1/S14L-9	connector M12	PNP break function (NC)

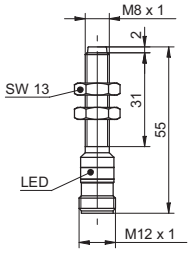
Sn = 3 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 … +80°C

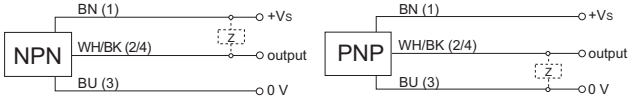
general data	
mounting type	non-flush
special type	Outdoor design Washdown design
nominal sensing distance Sn	3 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab
electrical data	
switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	8 mm
housing length	55 mm
connection types	connector M12
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

order reference	output circuit
IFRR 08N13T1/S14L-9	NPN make function (NO)
IFRR 08N33T1/S14L-9	NPN break function (NC)
IFRR 08P13T1/S14L-9	PNP make function (NO)
IFRR 08P33T1/S14L-9	PNP break function (NC)

dimension drawing



connection diagrams

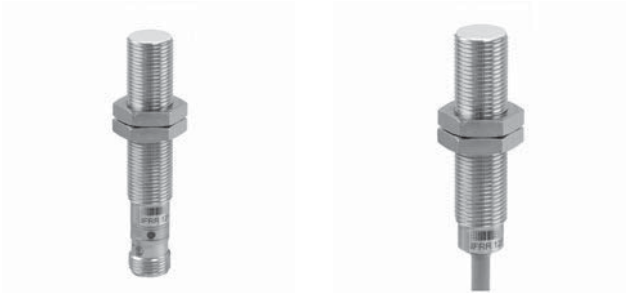


* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors	
ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

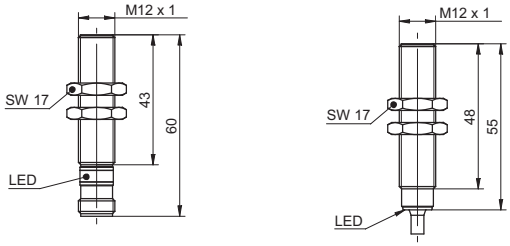
Sn = 4 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 … +80°C

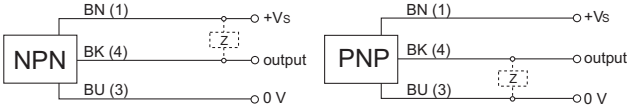


general data	
mounting type	flush
nominal sensing distance Sn	4 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab
electrical data	
switching frequency	< 1 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	12 mm
cable PVC, 2 m	
housing length	55 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

dimension drawings



connection diagrams



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

connectors and mating connectors	
ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

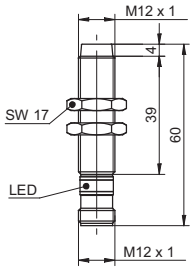
order reference	special type	connection types	output circuit
IFRR 12N17T1/L-9	Washdown design	cable PVC, 2 m	NPN make function (NO)
IFRR 12N17T1/S14L-9	Outdoor design Washdown design	connector M12	NPN make function (NO)
IFRR 12N37T1/L-9	Washdown design	cable PVC, 2 m	NPN break function (NC)
IFRR 12N37T1/S14L-9	Outdoor design Washdown design	connector M12	NPN break function (NC)
IFRR 12P17T1/L-9	Washdown design	cable PVC, 2 m	PNP make function (NO)
IFRR 12P17T1/S14L-9	Outdoor design Washdown design	connector M12	PNP make function (NO)
IFRR 12P37T1/L-9	Washdown design	cable PVC, 2 m	PNP break function (NC)
IFRR 12P37T1/S14L-9	Outdoor design Washdown design	connector M12	PNP break function (NC)

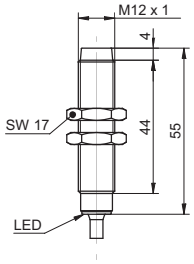
Sn = 6 mm

- robust steel housing
- high switching frequency
- M12 x 1 quick disconnect

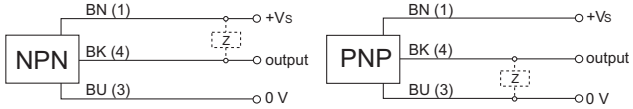
general data	
mounting type	non-flush
nominal sensing distance Sn	6 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab
electrical data	
switching frequency	< 1 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	12 mm
cable PVC, 2 m	
housing length	55 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

dimension drawings





connection diagrams



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

connectors and mating connectors	
ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

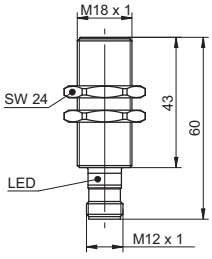
order reference	special type	connection types	output circuit
IFRR 12N13T1/L-9	Washdown design	cable PVC, 2 m	NPN make function (NO)
IFRR 12N13T1/S14L-9	Outdoor design Washdown design	connector M12	NPN make function (NO)
IFRR 12N33T1/L-9	Washdown design	cable PVC, 2 m	NPN break function (NC)
IFRR 12N33T1/S14L-9	Outdoor design Washdown design	connector M12	NPN break function (NC)
IFRR 12P13T1/L-9	Washdown design	cable PVC, 2 m	PNP make function (NO)
IFRR 12P13T1/S14L-9	Outdoor design Washdown design	connector M12	PNP make function (NO)
IFRR 12P33T1/L-9	Washdown design	cable PVC, 2 m	PNP break function (NC)
IFRR 12P33T1/S14L-9	Outdoor design Washdown design	connector M12	PNP break function (NC)

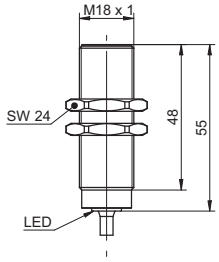
Sn = 8 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 … +80°C

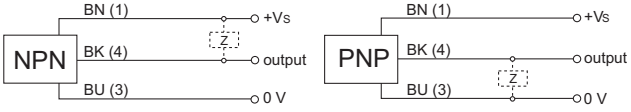
general data	
mounting type	quasi-flush
nominal sensing distance Sn	8 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	18 mm
cable PVC, 2 m	
housing length	55 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

dimension drawings





connection diagrams



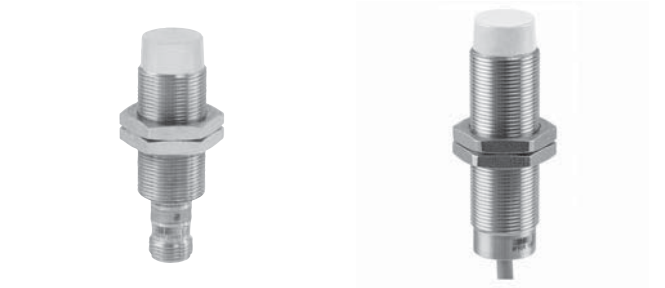
* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors	
ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
for details: see accessories section	

order reference	special type	connection types	output circuit
IFRR 18N17T1/L-9	Washdown design	cable PVC, 2 m	NPN make function (NO)
IFRR 18N17T1/S14L-9	Outdoor design Washdown design	connector M12	NPN make function (NO)
IFRR 18N37T1/L-9	Washdown design	cable PVC, 2 m	NPN break function (NC)
IFRR 18N37T1/S14L-9	Outdoor design Washdown design	connector M12	NPN break function (NC)
IFRR 18P17T1/L-9	Washdown design	cable PVC, 2 m	PNP make function (NO)
IFRR 18P17T1/S14L-9	Outdoor design Washdown design	connector M12	PNP make function (NO)
IFRR 18P37T1/L-9	Washdown design	cable PVC, 2 m	PNP break function (NC)
IFRR 18P37T1/S14L-9	Outdoor design Washdown design	connector M12	PNP break function (NC)

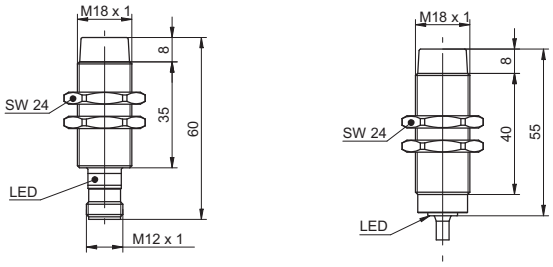
Sn = 12 mm



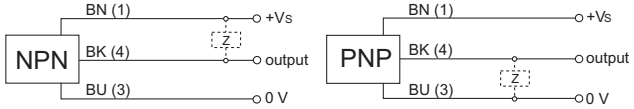
- robust steel housing
- high switching frequency
- M12 x 1 quick disconnect

general data	
mounting type	non-flush
nominal sensing distance Sn	12 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	18 mm
cable PVC, 2 m	
housing length	55 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

dimension drawings



connection diagrams



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

connectors and mating connectors	
ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
for details: see accessories section	

order reference	special type	connection types	output circuit
IFRR 18N13T1/L-9	Washdown design	cable PVC, 2 m	NPN make function (NO)
IFRR 18N13T1/S14L-9	Outdoor design Washdown design	connector M12	NPN make function (NO)
IFRR 18N33T1/L-9	Washdown design	cable PVC, 2 m	NPN break function (NC)
IFRR 18N33T1/S14L-9	Outdoor design Washdown design	connector M12	NPN break function (NC)
IFRR 18P13T1/L-9	Washdown design	cable PVC, 2 m	PNP make function (NO)
IFRR 18P13T1/S14L-9	Outdoor design Washdown design	connector M12	PNP make function (NO)
IFRR 18P33T1/L-9	Washdown design	cable PVC, 2 m	PNP break function (NC)
IFRR 18P33T1/S14L-9	Outdoor design Washdown design	connector M12	PNP break function (NC)

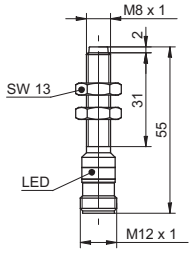
Sn = 3 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 … +80°C

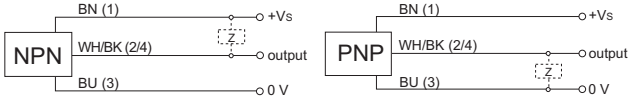
general data	
mounting type	non-flush
special type	Outdoor design Washdown design
nominal sensing distance Sn	3 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab
electrical data	
switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	8 mm
housing length	55 mm
connection types	connector M12
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

order reference	output circuit
IFRR 08N13T1/S14L-9	NPN make function (NO)
IFRR 08N33T1/S14L-9	NPN break function (NC)
IFRR 08P13T1/S14L-9	PNP make function (NO)
IFRR 08P33T1/S14L-9	PNP break function (NC)

dimension drawing



connection diagrams



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

connectors and mating connectors	
ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

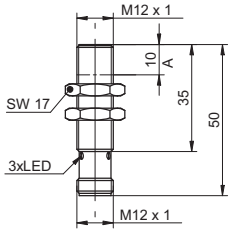
Sn = 4 mm

- DNV-GL certification
- robust steel housing

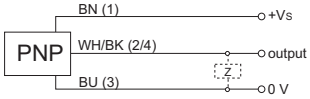
general data	
mounting type	flush
special type	Marine
nominal sensing distance Sn	4 mm
temperature drift	± 20 %
hysteresis	2 ... 18 % of Sr
output indicator	3 port LED red
correction factor typ.	mild steel 100 %, stainless steel 70 %, aluminum 35 %
approvals/certificates	DNV GL
electrical data	
switching frequency	< 1 kHz
voltage supply range +Vs	6 ... 36 VDC
normal operating voltage	24 VDC
current consumption max. (no load)	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)	PBT
housing material	stainless steel 1.4404 (V4A)
dimension	12 mm
housing length	50 mm
connection types	connector M12
tightening torque max.	20 Nm (A: 12 Nm)
ambient conditions	
operating temperature	-40 ... +75 °C
protection class	IP 67

order reference	output circuit
IR12.P04S-11158411	PNP break function (NC)
IR12.P04S-11158406	PNP make function (NO)

dimension drawing



connection diagram



remarks

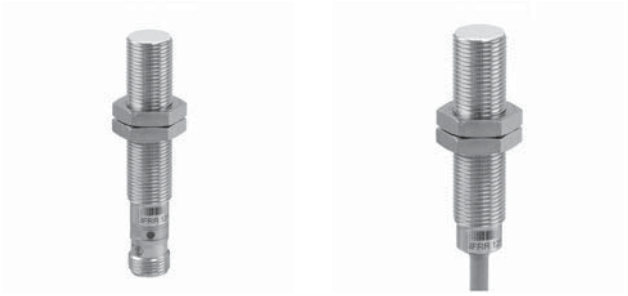
for correct installation refer to “mounting instructions”

connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12
for details: see accessories section	

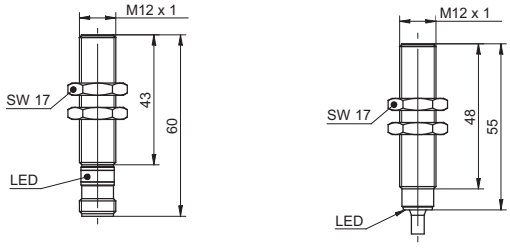
Sn = 4 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 … +80°C

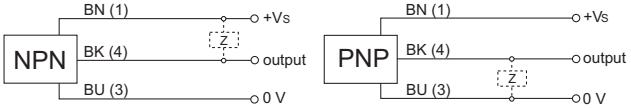


general data	
mounting type	flush
nominal sensing distance Sn	4 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab
electrical data	
switching frequency	< 1 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	12 mm
cable PVC, 2 m	
housing length	55 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

dimension drawings



connection diagrams



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

connectors and mating connectors	
ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

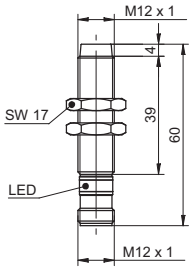
order reference	special type	connection types	output circuit
IFRR 12N17T1/L-9	Washdown design	cable PVC, 2 m	NPN make function (NO)
IFRR 12N17T1/S14L-9	Outdoor design Washdown design	connector M12	NPN make function (NO)
IFRR 12N37T1/L-9	Washdown design	cable PVC, 2 m	NPN break function (NC)
IFRR 12N37T1/S14L-9	Outdoor design Washdown design	connector M12	NPN break function (NC)
IFRR 12P17T1/L-9	Washdown design	cable PVC, 2 m	PNP make function (NO)
IFRR 12P17T1/S14L-9	Outdoor design Washdown design	connector M12	PNP make function (NO)
IFRR 12P37T1/L-9	Washdown design	cable PVC, 2 m	PNP break function (NC)
IFRR 12P37T1/S14L-9	Outdoor design Washdown design	connector M12	PNP break function (NC)

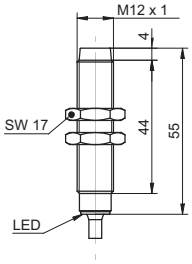
Sn = 6 mm

- robust steel housing
- high switching frequency
- M12 x 1 quick disconnect

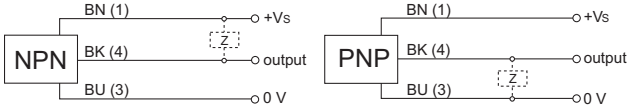
general data	
mounting type	non-flush
nominal sensing distance Sn	6 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 1 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	12 mm
cable PUR 3 x 0,25, 2 m	
housing length	55 mm
cable PVC, 2 m	
housing length	55 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

dimension drawings





connection diagrams



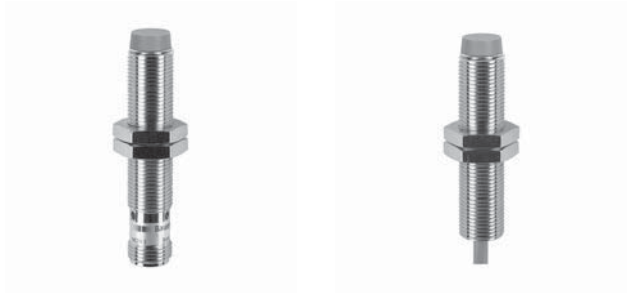
* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors	
ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

order reference	special type	connection types	output circuit	approvals/certificates
IFRR 12N13T1/L-9	Washdown design	cable PVC, 2 m	NPN make function (NO)	Ecolab
IFRR 12N13T1/PL-9	Outdoor design	cable PUR 3 x 0,25, 2 m	NPN make function (NO)	-
IFRR 12N13T1/S14L-9	Outdoor design Washdown design	connector M12	NPN make function (NO)	Ecolab
IFRR 12N33T1/L-9	Washdown design	cable PVC, 2 m	NPN break function (NC)	Ecolab
IFRR 12N33T1/PL-9	Outdoor design	cable PUR 3 x 0,25, 2 m	NPN break function (NC)	-
IFRR 12N33T1/S14L-9	Outdoor design Washdown design	connector M12	NPN break function (NC)	Ecolab
IFRR 12P13T1/L-9	Washdown design	cable PVC, 2 m	PNP make function (NO)	Ecolab
IFRR 12P13T1/PL-9	Outdoor design	cable PUR 3 x 0,25, 2 m	PNP make function (NO)	-
IFRR 12P13T1/S14L-9	Outdoor design Washdown design	connector M12	PNP make function (NO)	Ecolab
IFRR 12P33T1/L-9	Washdown design	cable PVC, 2 m	PNP break function (NC)	Ecolab
IFRR 12P33T1/PL-9	Outdoor design	cable PUR 3 x 0,25, 2 m	PNP break function (NC)	-
IFRR 12P33T1/S14L-9	Outdoor design Washdown design	connector M12	PNP break function (NC)	Ecolab

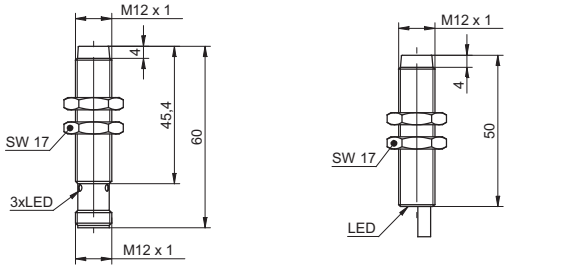
Sn = 6 mm

- operating temperature -40 … +80 °C

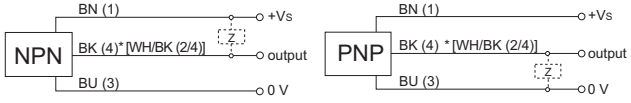


general data	
mounting type	non-flush
special type	Outdoor design
nominal sensing distance Sn	6 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
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 PUR 3 x 0,25, 2 m	
housing length	50 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
protection class	IP 67

dimension drawings



connection diagrams



connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12
for details: see accessories section	

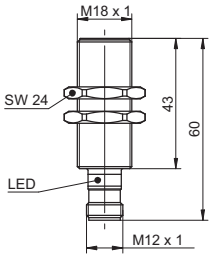
order reference	connection types	output circuit
IFRM 12N13T1/PL	cable PUR 3 x 0,25, 2 m	NPN make function (NO)
IFRM 12N13T1/S14L	connector M12	NPN make function (NO)
IFRM 12N33T1/PL	cable PUR 3 x 0,25, 2 m	NPN break function (NC)
IFRM 12N33T1/S14L	connector M12	NPN break function (NC)
IFRM 12P13T1/PL	cable PUR 3 x 0,25, 2 m	PNP make function (NO)
IFRM 12P13T1/S14L	connector M12	PNP make function (NO)
IFRM 12P33T1/PL	cable PUR 3 x 0,25, 2 m	PNP break function (NC)
IFRM 12P33T1/S14L	connector M12	PNP break function (NC)

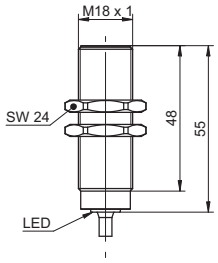
Sn = 8 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 … +80°C

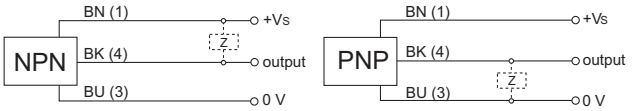
general data	
mounting type	quasi-flush
nominal sensing distance Sn	8 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	18 mm
cable PVC, 2 m	
housing length	55 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

dimension drawings





connection diagrams



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

connectors and mating connectors	
ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
for details: see accessories section	

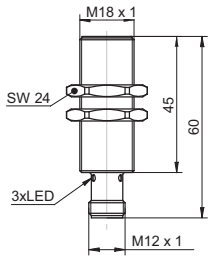
order reference	special type	connection types	output circuit
IFRR 18N17T1/L-9	Washdown design	cable PVC, 2 m	NPN make function (NO)
IFRR 18N17T1/S14L-9	Outdoor design Washdown design	connector M12	NPN make function (NO)
IFRR 18N37T1/L-9	Washdown design	cable PVC, 2 m	NPN break function (NC)
IFRR 18N37T1/S14L-9	Outdoor design Washdown design	connector M12	NPN break function (NC)
IFRR 18P17T1/L-9	Washdown design	cable PVC, 2 m	PNP make function (NO)
IFRR 18P17T1/S14L-9	Outdoor design Washdown design	connector M12	PNP make function (NO)
IFRR 18P37T1/L-9	Washdown design	cable PVC, 2 m	PNP break function (NC)
IFRR 18P37T1/S14L-9	Outdoor design Washdown design	connector M12	PNP break function (NC)

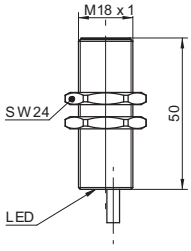
Sn = 10 mm

- increased sensing distance
- operating temperature -40 … +80 °C

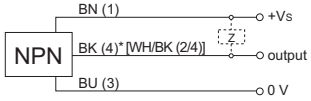
general data	
mounting type	flush
special type	Outdoor design
nominal sensing distance Sn	10 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 400 Hz
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	24 mA
voltage drop Vd	< 2 VDC
output 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	18 mm
cable PUR 3 x 0,25, 2 m	
housing length	50 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
protection class	IP 67

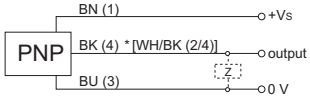
dimension drawings





connection diagrams





connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12
for details: see accessories section	

order reference	connection types	output circuit
IFRM 18N17M1/PL	cable PUR 3 x 0,25, 2 m	NPN make function (NO)
IFRM 18N17M1/S14L	connector M12	NPN make function (NO)
IFRM 18N37M1/PL	cable PUR 3 x 0,25, 2 m	NPN break function (NC)
IFRM 18N37M1/S14L	connector M12	NPN break function (NC)
IFRM 18P17M1/PL	cable PUR 3 x 0,25, 2 m	PNP make function (NO)
IFRM 18P17M1/S14L	connector M12	PNP make function (NO)
IFRM 18P37M1/PL	cable PUR 3 x 0,25, 2 m	PNP break function (NC)
IFRM 18P37M1/S14L	connector M12	PNP break function (NC)

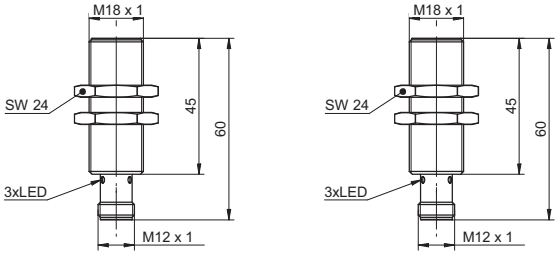
Sn = 10 mm

- DNV-GL certification
- robust steel housing

general data	
mounting type	flush
special type	Marine
nominal sensing distance Sn	10 mm
temperature drift	± 20 %
hysteresis	2 ... 18 % of Sr
output indicator	3 port LED red
correction factor typ.	mild steel 100 %, stainless steel 95 %, aluminum 50 %
approvals/certificates	DNV GL
electrical data	
switching frequency	< 800 Hz
voltage supply range +Vs	6 ... 36 VDC
normal operating voltage	24 VDC
current consumption max. (no load)	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)	PBT
housing material	brass nickel plated, chromium plated
dimension	18 mm
housing length	60 mm
tightening torque max.	40 Nm
ambient conditions	
operating temperature	-40 ... +75 °C
protection class	IP 67

order reference	connection types
IR18.P10S-11174188	connector M12 5 pin
IR18.P10S-11158437	connector M12 4 pin

dimension drawings



connection diagrams

connectors and mating connectors

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12

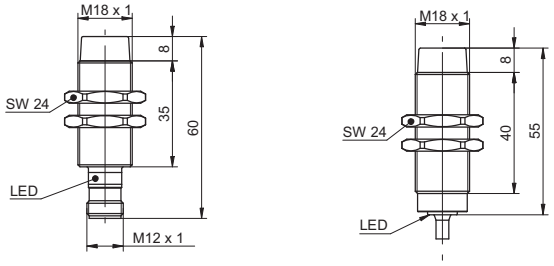
for details: see accessories section

Sn = 12 mm

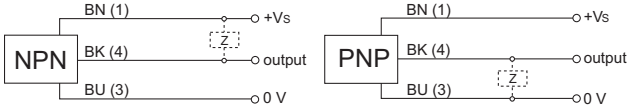
- robust steel housing
- high switching frequency
- M12 x 1 quick disconnect

general data	
mounting type	non-flush
nominal sensing distance Sn	12 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	18 mm
cable PUR 3 x 0,25, 2 m	
housing length	55 mm
cable PVC, 2 m	
housing length	55 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

dimension drawings



connection diagrams



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

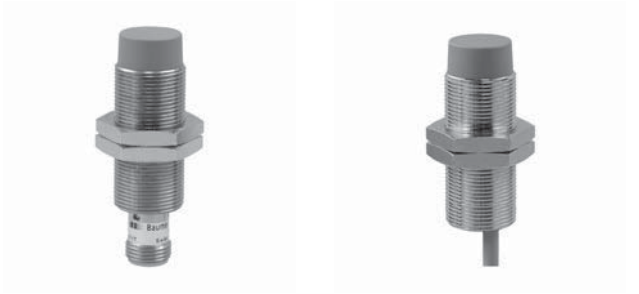
connectors and mating connectors	
ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
for details: see accessories section	

order reference	special type	connection types	output circuit	approvals/certificates
IFRR 18N13T1/L-9	Washdown design	cable PVC, 2 m	NPN make function (NO)	Ecolab
IFRR 18N13T1/PL-9	Outdoor design	cable PUR 3 x 0,25, 2 m	NPN make function (NO)	-
IFRR 18N13T1/S14L-9	Outdoor design Washdown design	connector M12	NPN make function (NO)	Ecolab
IFRR 18N33T1/L-9	Washdown design	cable PVC, 2 m	NPN break function (NC)	Ecolab
IFRR 18N33T1/PL-9	Outdoor design	cable PUR 3 x 0,25, 2 m	NPN break function (NC)	-
IFRR 18N33T1/S14L-9	Outdoor design Washdown design	connector M12	NPN break function (NC)	Ecolab
IFRR 18P13T1/L-9	Washdown design	cable PVC, 2 m	PNP make function (NO)	Ecolab
IFRR 18P13T1/PL-9	Outdoor design	cable PUR 3 x 0,25, 2 m	PNP make function (NO)	-
IFRR 18P13T1/S14L-9	Outdoor design Washdown design	connector M12	PNP make function (NO)	Ecolab
IFRR 18P33T1/L-9	Washdown design	cable PVC, 2 m	PNP break function (NC)	Ecolab
IFRR 18P33T1/PL-9	Outdoor design	cable PUR 3 x 0,25, 2 m	PNP break function (NC)	-
IFRR 18P33T1/S14L-9	Outdoor design Washdown design	connector M12	PNP break function (NC)	Ecolab

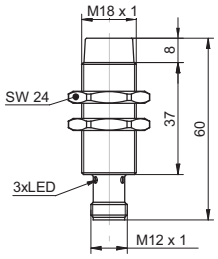
Sn = 12 mm

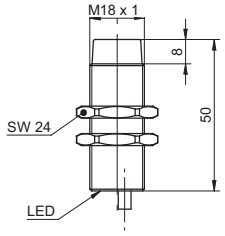
- operating temperature -40 … +80 °C



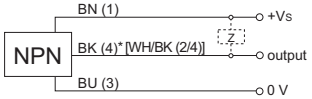
general data	
mounting type	non-flush
special type	Outdoor design
nominal sensing distance Sn	12 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
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	18 mm
cable PUR 3 x 0,25, 2 m	
housing length	50 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
protection class	IP 67

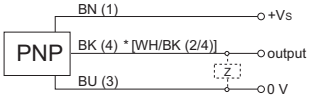
dimension drawings





connection diagrams





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

connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12
for details: see accessories section	

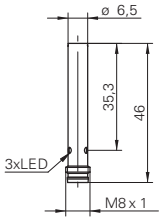
order reference	connection types	output circuit
IFRM 18N13T1/PL	cable PUR 3 x 0,25, 2 m	NPN make function (NO)
IFRM 18N13T1/S14L	connector M12	NPN make function (NO)
IFRM 18N33T1/PL	cable PUR 3 x 0,25, 2 m	NPN break function (NC)
IFRM 18N33T1/S14L	connector M12	NPN break function (NC)
IFRM 18P13T1/PL	cable PUR 3 x 0,25, 2 m	PNP make function (NO)
IFRM 18P13T1/S14L	connector M12	PNP make function (NO)
IFRM 18P33T1/PL	cable PUR 3 x 0,25, 2 m	PNP break function (NC)
IFRM 18P33T1/S14L	connector M12	PNP break function (NC)

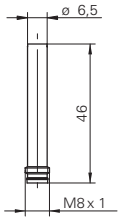
Sn = 2 mm

- full stainless steel housing 1.4404 (V4A)
- protection class IP 69K

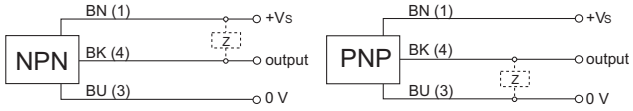
general data	
mounting type	quasi-flush
nominal sensing distance Sn	2 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 150 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	20 mA
voltage drop Vd	< 2 VDC
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	stainless steel 1.4404 (V4A)
housing material	stainless steel 1.4404 (V4A)
pressure static	< 20 bar
dimension	6,5 mm
housing length	46 mm
connection types	connector M8

dimension drawings





connection diagrams



remarks

for correct installation refer to "mounting instructions"

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
ESG 32SF0500	Connector M8, 3 pin, straight, 5 m, V4A-PVC
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

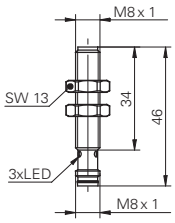
order reference	special type	output circuit	operating temperature	protection class	output current	output indicator
IFRD 06N17A1/S35L	full metal housing (*DuroProx*)	NPN make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 06N17T1/S35	full metal housing (*DuroProx*)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

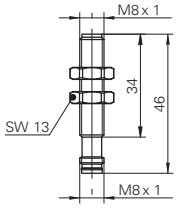
Sn = 2 mm

- full stainless steel housing 1.4404 (V4A)
- protection class IP 69K

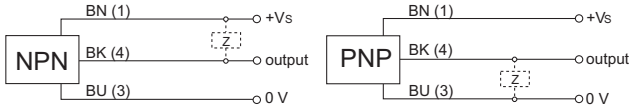
general data	
mounting type	quasi-flush
nominal sensing distance Sn	2 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 150 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	20 mA
voltage drop Vd	< 2 VDC
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	stainless steel 1.4404 (V4A)
housing material	stainless steel 1.4404 (V4A)
pressure static	< 20 bar
dimension	8 mm
housing length	46 mm
connection types	connector M8

dimension drawings





connection diagrams



remarks

for correct installation refer to “mounting instructions”

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
ESG 32SF0500	Connector M8, 3 pin, straight, 5 m, V4A-PVC
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151719	Sensofix series 08 round
11163236	Adapter for pulse stretching M8
for details: see accessories section	

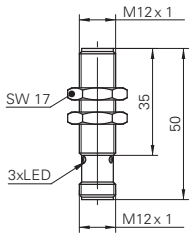
order reference	special type	output circuit	operating temperature	protection class	output current	output indicator
IFRD 08N17A1/S35L	full metal housing (*DuroProx*)	NPN make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 08N17T1/S35	full metal housing (*DuroProx*)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

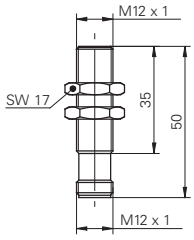
Sn = 4 mm

- full stainless steel housing 1.4404 (V4A)
- protection class IP 69K

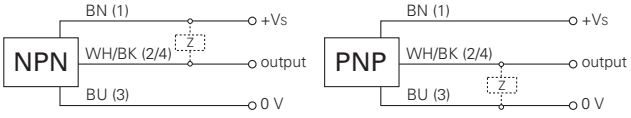
general data	
mounting type	quasi-flush
nominal sensing distance Sn	4 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 100 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	14 mA
voltage drop Vd	< 2 VDC
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	stainless steel 1.4404 (V4A)
housing material	stainless steel 1.4404 (V4A)
pressure static	< 20 bar
dimension	12 mm
housing length	50 mm
connection types	connector M12

dimension drawings





connection diagrams



remarks

for correct installation refer to "mounting instructions"

connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12
for details: see accessories section	

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

Sn = 6 mm

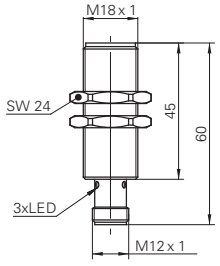
- full stainless steel housing 1.4404 (V4A)
- protection class IP 69K

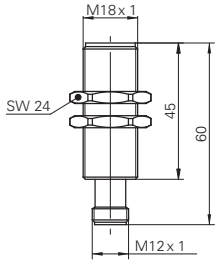
general data	
mounting type	quasi-flush
nominal sensing distance Sn	6 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 100 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	14 mA
voltage drop Vd	< 2 VDC
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	stainless steel 1.4404 (V4A)
housing material	stainless steel 1.4404 (V4A)
pressure static	< 20 bar
dimension	18 mm
housing length	60 mm
connection types	connector M12

connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

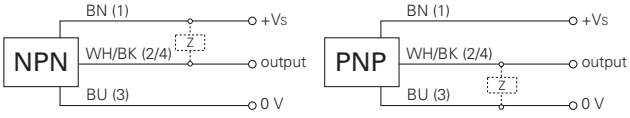
Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12
for details: see accessories section	

dimension drawings





connection diagrams



remarks

for correct installation refer to “mounting instructions”

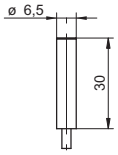
order reference	special type	output circuit	operating temperature	protection class	output current	output indicator
IFRD 18N17A3/S14L	full metal housing (*DuroProx*)	NPN make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 18N17T3/S14	full metal housing (*DuroProx*)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

Sn = 2 mm

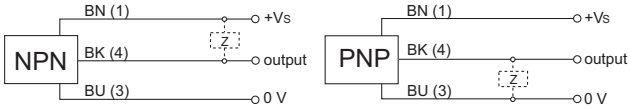
- with integral electronics up to +100 °C
- FEP cable

general data	
mounting type	flush
special type	high temperature
nominal sensing distance Sn	2 mm
temperature drift	± 10 % (-25 ... +75 °C) - 10 % / + 15 % (-25 ... +100 °C)
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	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)	PBT
housing material	stainless steel
dimension	6,5 mm
housing length	30 mm
connection types	cable FEP, 1 m
ambient conditions	
operating temperature	-25 ... +100 °C
protection class	IP 67

dimension drawing



connection diagrams



Accessories	
10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
for details: see accessories section	

order reference	output circuit
IFRM 06N1707	NPN make function (NO)
IFRM 06P1707	PNP make function (NO)

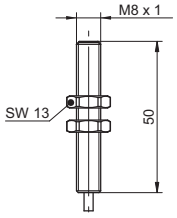
Sn = 2 mm

- with integral electronics up to +100 °C
- very long housing

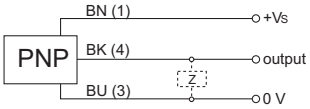
general data	
mounting type	flush
special type	high temperature
nominal sensing distance Sn	2 mm
temperature drift	± 10 % (-25 ... +75 °C) - 10 % / + 15 % (-25 ... +100 °C)
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	12 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 3 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	stainless steel
dimension	8 mm
housing length	50 mm
connection types	cable FEP, 1 m
ambient conditions	
operating temperature	-25 ... +100 °C
protection class	IP 67

order reference
IFRM 08P17T4

dimension drawing



connection diagram



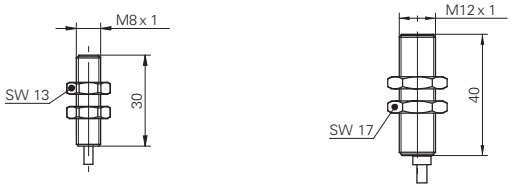
Sn = 2 mm / 4 mm

- with integral electronics up to +100°C
- FEP cable

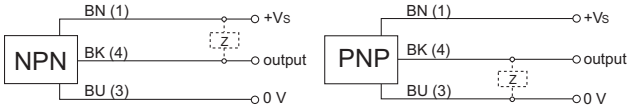
general data	
mounting type	flush
special type	high temperature
hysteresis	3 ... 20 % of Sr
electrical data	
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 3 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
connection types	cable FEP, 1 m
ambient conditions	
operating temperature	-25 ... +100 °C
protection class	IP 67

Accessories	
10151720	Sensofix series 12 round
for details: see accessories section	

dimension drawings



connection diagrams



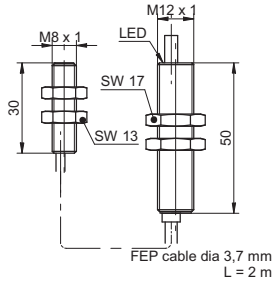
order reference	nominal sensing distance Sn	switching frequency	output circuit	dimension	housing material	housing length	temperature drift
IFRM 08N1707	2 mm	< 5 kHz	NPN make function (NO)	8 mm	stainless steel	30 mm	± 10 % (-25 ... +75 °C) - 10 % / + 15 % (-25 ... +100 °C)
IFRM 08P1707	2 mm	< 5 kHz	PNP make function (NO)	8 mm	stainless steel	30 mm	± 10 % (-25 ... +75 °C) - 10 % / + 15 % (-25 ... +100 °C)
IFRM 08P3707	2 mm	< 5 kHz	PNP break function (NC)	8 mm	stainless steel	30 mm	± 10 % (-25 ... +75 °C) - 10 % / + 15 % (-25 ... +100 °C)
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	-

Sn = 1,5 mm

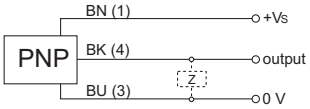
- probe designed for use up to +180°C
- active face made of LCP
- detached cable amplifier

general data	
mounting type	flush
special type	high temperature
nominal sensing distance Sn	1,5 mm
hysteresis	2 ... 25 % of Sr
electrical data	
switching frequency	< 4 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	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)	LCP
housing material	stainless steel
dimension	8 mm
housing length	30 mm
connection types	cable, 2 m
ambient conditions	
operating temperature	-25 ... +180 °C
protection class	IP 67
inline amplifier	
operating temperature	-25 ... +75 °C

dimension drawing



connection diagram



Accessories	
10151719	Sensofix series 08 round
for details: see accessories section	

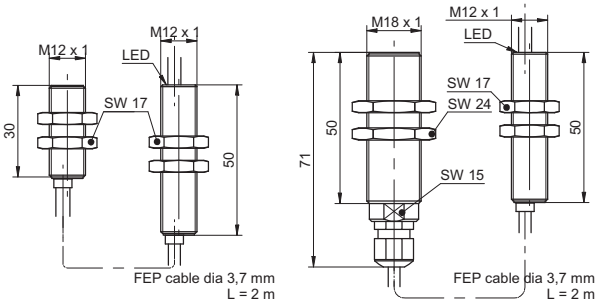
order reference	output circuit
IFRH 08P1501/L	PNP make function (NO)
IFRH 08P3501/L	PNP break function (NC)

Sn = 2 mm / 5 mm

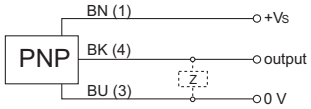
- probe designed for use up to +180°C
- active face made of LCP
- detached cable amplifier

general data	
mounting type	flush
special type	high temperature
hysteresis	2 ... 20 % of Sr
electrical data	
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	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, 2 m
ambient conditions	
operating temperature	-25 ... +180 °C
protection class	IP 67
inline amplifier	
operating temperature	-25 ... +75 °C

dimension drawings



connection diagram



Accessories	
10151720	Sensofix series 12 round
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
for details: see accessories section	

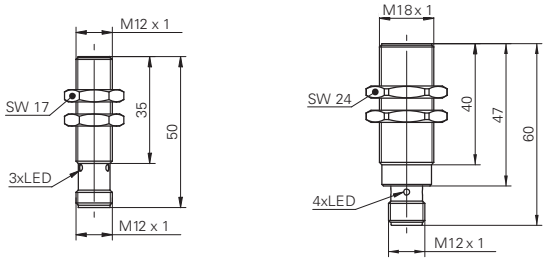
order reference	nominal sensing distance Sn	switching frequency	output circuit	dimension	housing material	housing length
IFRH 12P1501/L	2 mm	< 2 kHz	PNP make function (NO)	12 mm	brass nickel plated	30 mm
IFRH 12P3501/L	2 mm	< 2 kHz	PNP break function (NC)	12 mm	brass nickel plated	30 mm
IFRH 18P1501/L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

Sn = 2 mm / 5 mm

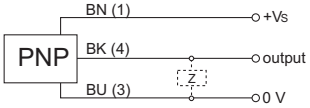
- PTFE coated sensing face
- housing made of chromium plated brass
- resist welding spark induced damage

general data	
mounting type	flush
special type	welding and magnetic noise
hysteresis	3 ... 20 % of Sr
electrical data	
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	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)	PTFE coated
housing material	brass chromium plated
connection types	connector M12
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings



connection diagram

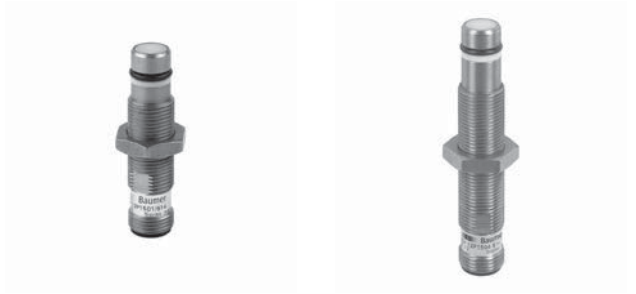


connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
10151658	Sensofix series 18
11163237	Adapter for pulse stretching M12
for details: see accessories section	

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

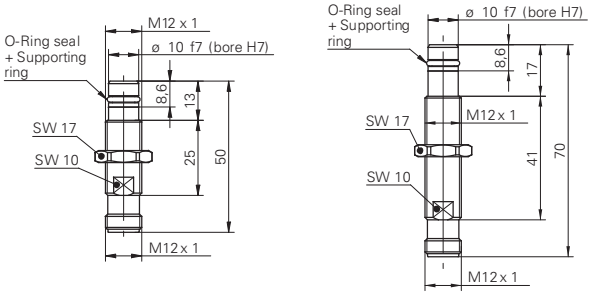
Sn = 2 mm

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

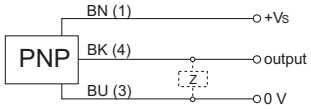


general data	
mounting type	flush
special type	high pressure
nominal sensing distance Sn	2 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 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
peak pressure	1000 bar
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)

dimension drawings



connection diagram

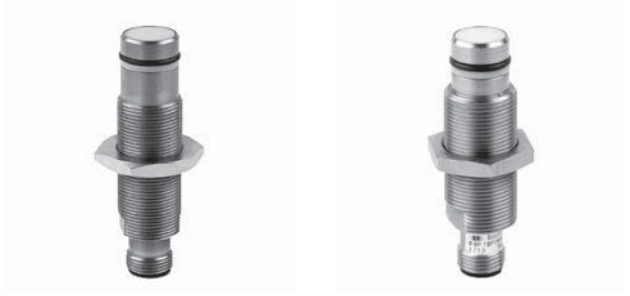


connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
11163237	Adapter for pulse stretching M12
for details: see accessories section	

order reference	housing length
IFRP 12P1501/S14	50 mm
IFRP 12P1504/S14	70 mm

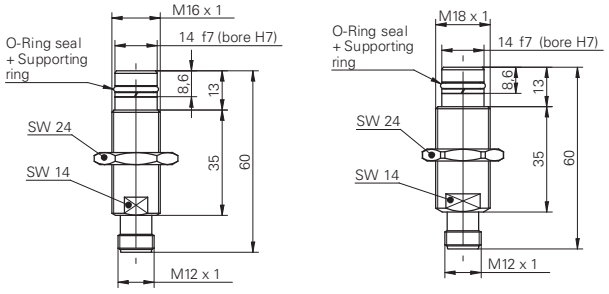
Sn = 2 mm

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

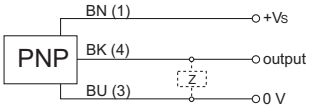


general data	
mounting type	flush
special type	high pressure
nominal sensing distance Sn	2 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 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
peak pressure	1000 bar
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)

dimension drawings



connection diagram



connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12
for details: see accessories section	

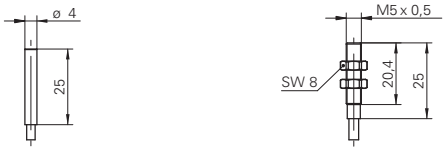
order reference	dimension
IFRP 16P1501/S14	16 mm
IFRP 18P1501/S14	18 mm

Sn = 0,8 mm

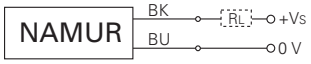
- smallest NAMUR type sensors
- high switching frequency
- robust steel housing

general data	
mounting type	flush
nominal sensing distance Sn	0,8 mm
electrical data	
switching frequency	< 5 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	6 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max. (no load)	10 mA
output circuit	NAMUR
residual ripple	< 10 % Vs
mechanical data	
housing material	stainless steel
housing length	25 mm
connection types	cable, 2 m
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings



connection diagram



Accessories	
10119345	Clamping nut for sensors Ø 4 mm
for details: see accessories section	

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

Sn = 1,5 mm

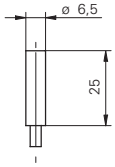
- high switching frequency
- ATEX certification

general data	
mounting type	flush
nominal sensing distance Sn	1,5 mm
approvals/certificates	ATEX 1G
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. (no load)	10 mA
output circuit	NAMUR
residual ripple	< 10 % Vs
mechanical data	
type	cylindrical smooth
housing material	brass nickel plated
dimension	6,5 mm
housing length	25 mm
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 Ex ia IIC T6 Ga
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

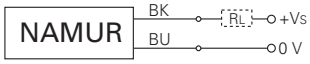
Accessories	
10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
for details: see accessories section	

order reference	connection types
IFRM 06X9503	cable, 2 m
IFRM 06X9503/P	cable PUR 5 x 0,14, 2 m

dimension drawing



connection diagram



operating data according to EN 60947-5-6

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

for applications in hazardous areas

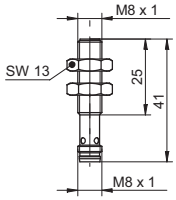
Sn = 1,5 mm / 2 mm

- shielded and unshielded versions
- high switching frequency
- ATEX certification

general data	
approvals/certificates	ATEX 1G
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. (no load)	10 mA
output circuit	NAMUR
residual ripple	< 10 % Vs
mechanical data	
type	cylindrical threaded
dimension	8 mm
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 Ex ia IIC T6 Ga
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

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151719	Sensofix series 08 round
for details: see accessories section	

dimension drawings



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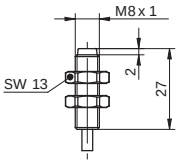
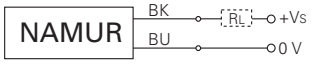
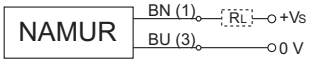


non-flush

connection diagrams





operating data according to EN 60947-5-6

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

for applications in hazardous areas

remarks

available with connector S35

order reference	nominal sensing distance Sn	mounting type	housing material	housing length	connection types
IFRM 08X9103	2 mm	non-flush	brass nickel plated	27 mm	cable, 2 m
IFRM 08X9501/S35	1,5 mm	flush	stainless steel	50 mm	connector M8
IFRM 08X9503	1,5 mm	flush	brass nickel plated	25 mm	cable, 2 m
IFRM 08X9503/S35	1,5 mm	flush	stainless steel	41 mm	connector M8

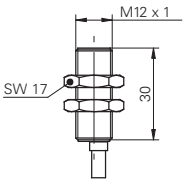
Sn = 2 mm / 4 mm

- shielded and unshielded versions
- ATEX certification

general data	
approvals/certificates	ATEX 1G
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. (no load)	10 mA
output circuit	NAMUR
residual ripple	< 10 % Vs
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	12 mm
connection types	cable, 2 m
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 Ex ia IIC T6 Ga
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	
10151720	Sensofix series 12 round
for details: see accessories section	

dimension drawings



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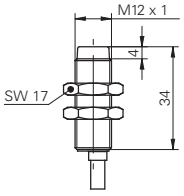
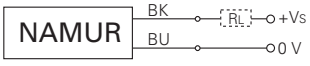


non-flush

connection diagram



operating data according to EN 60947-5-6

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

for applications in hazardous areas

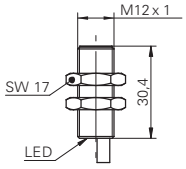
order reference	nominal sensing distance Sn	mounting type	housing length
IFRM 12X9103	4 mm	non-flush	34 mm
IFRM 12X9503	2 mm	flush	30 mm

Sn = 4 mm

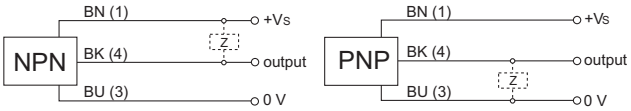
- high stability across entire temperature range
- ATEX Zulassung

general data	
mounting type	flush
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red
approvals/certificates	ATEX 3D
electrical data	
switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	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
housing length	30,4 mm
connection types	cable, 2 m
ambient conditions	
protection class	IP 67
safe maximum values	
marking	II 3D Ex tc IIIC T100°C Dc X
operating temperature Ta	-25 ... +65 °C

dimension drawing



connection diagrams



Accessories		
10151720	Sensofix series 12 round	
for details: see accessories section		

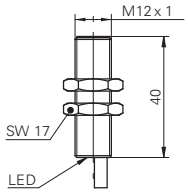
order reference	output circuit
IFRM 12N17X1/L	NPN make function (NO)
IFRM 12N37X1/L	NPN break function (NC)
IFRM 12P17X1/L	PNP make function (NO)
IFRM 12P37X1/L	PNP break function (NC)

Sn = 4 mm

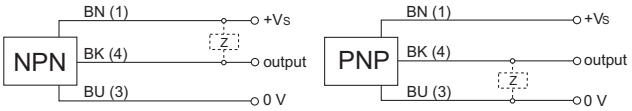
- high stability across entire temperature range
- ATEX Zulassung

general data	
mounting type	flush
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red
approvals/certificates	ATEX 3D
electrical data	
switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	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
housing length	40 mm
connection types	cable, 2 m
ambient conditions	
protection class	IP 67
safe maximum values	
marking	II 3D Ex tc IIIC T100°C Dc X
operating temperature Ta	-25 ... +65 °C

dimension drawing



connection diagrams



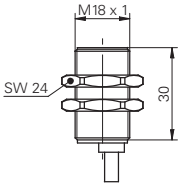
Accessories		
10151720	Sensofix series 12 round	
for details: see accessories section		

order reference	output circuit
IFRM 12N17X2/L	NPN make function (NO)
IFRM 12N37X2/L	NPN break function (NC)
IFRM 12P17X2/L	PNP make function (NO)
IFRM 12P37X2/L	PNP break function (NC)

- shielded and unshielded versions
- ATEX certification

general data	
approvals/certificates	ATEX 1G
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. (no load)	10 mA
output circuit	NAMUR
residual ripple	< 10 % Vs
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	18 mm
connection types	cable, 2 m
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 Ex ia IIC T6 Ga
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



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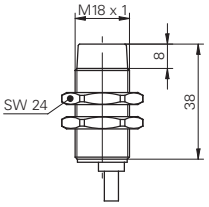
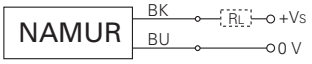


non-flush

connection diagram



operating data according to EN 60947-5-6

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

for applications in hazardous areas

Accessories	
10151658	Sensofix series 18
for details: see accessories section	

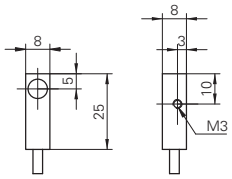
order reference	nominal sensing distance Sn	mounting type	housing length
IFRM 18X9103	8 mm	non-flush	38 mm
IFRM 18X9503	5 mm	flush	30 mm

- shielded mounting
- ATEX certification
- NAMUR sensor

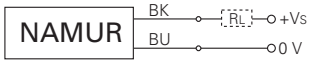
general data	
mounting type	flush
nominal sensing distance Sn	1,5 mm
electrical data	
switching frequency	< 5 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	5 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max. (no load)	10 mA
output circuit	NAMUR
residual ripple	< 10 % Vs
mechanical data	
type	rectangular
housing material	brass nickel plated
dimension	8 mm
housing length	25 mm
connection types	cable, 2 m
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

order reference
IFF 08.82.05

dimension drawing



connection diagram



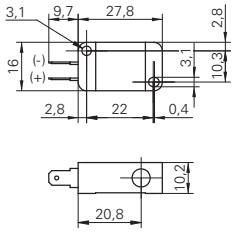
Sn = 2 mm

- non shielded mounting
- ATEX certification
- NAMUR sensor

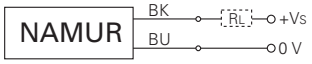
general data	
mounting type	non-flush
nominal sensing distance Sn	2 mm
electrical data	
switching frequency	< 5 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	5 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max. (no load)	10 mA
output circuit	NAMUR
residual ripple	< 10 % Vs
mechanical data	
type	rectangular
housing material	PBT
dimension	10 mm
housing length	27,8 mm
connection types	spade lug
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

order reference
IFFK 10E9101

dimension drawing



connection diagram



remarks

spade plug 4,8 x 0,5 mm

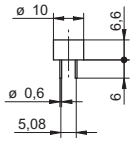
Sn = 2 mm / 4 mm

- circuit board mountable
- pin-spacing 5 mm
- ATEX certification

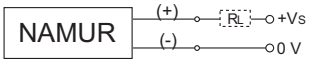
general data	
mounting type	flush
nominal sensing distance Sn	2 mm
approvals/certificates	ATEX 3G
electrical data	
switching frequency	< 2 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	5 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max. (no load)	10 mA
output circuit	NAMUR
residual ripple	< 10 % Vs
mechanical data	
type	cylindrical smooth
housing material	PBT
dimension	10 mm
housing length	6,6 mm
connection types	pins
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
safe maximum values	
marking	II 3G Ex ic IIC T5 Gc X
current Ii	< 20 mA
voltage Ui	< 13 VDC
power Pi	< 0,065 W
internal capacitance Ci	< 100 nF
internal inductance Li	< 0,1 mH
operating temperature Ta (temp. class T5)	-20 ... +60 °C

order reference
IFR 10.82E05

dimension drawing



connection diagram

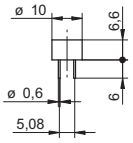


Sn = 2 mm / 4 mm

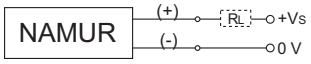
- circuit board mountable
- pin-spacing 5 mm
- shielded and unshielded versions

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. (no load)	10 mA
output circuit	NAMUR
residual ripple	< 10 % Vs
mechanical data	
type	cylindrical smooth
housing material	PBT
dimension	10 mm
housing length	6,6 mm
connection types	pins
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

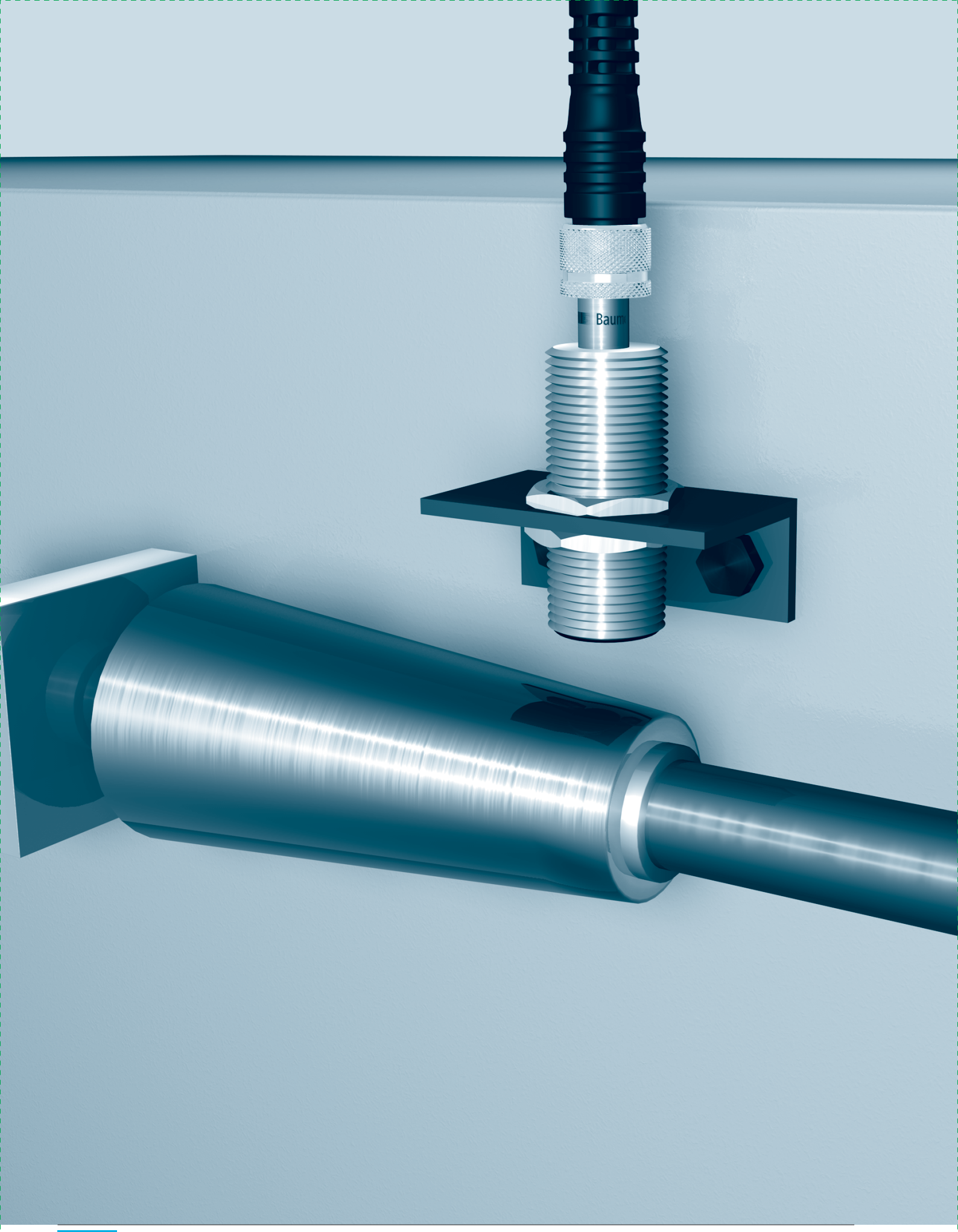
dimension drawing

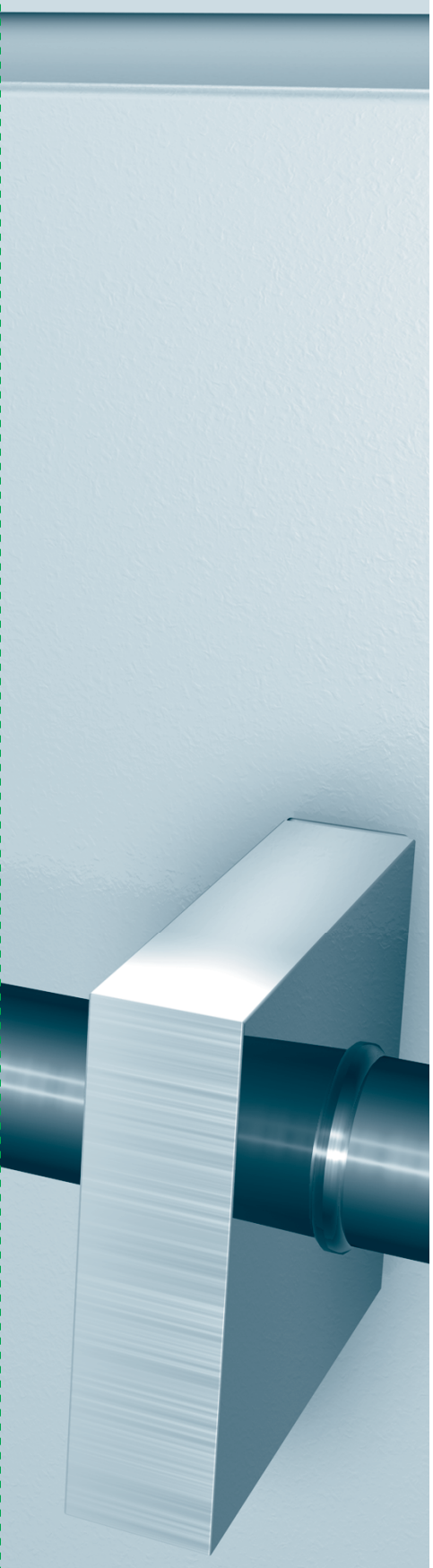


connection diagram



order reference	nominal sensing distance Sn	mounting type
IFR 10.82.01	4 mm	non-flush
IFR 10.82.05	2 mm	flush


Baum



Inductive distance sensors AlphaProx®

Overview	Page 154
Function and applications	Page 160
Dynamic and static resolution	Page 161
Teach-in functions	Page 162
For factory automation	Page 164
With linearized characteristic curve	Page 185
Application specific distance sensors	Page 197

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Distance sensors for factory automation – cylindrical designs

product family	IWRM 04	IR06.D03S	IR08.D02S	IR08.D03S	IR12.D04S	IR12.D06S	IR18.D05S
dimension	ø 4 mm	ø 6,5 mm	M8	M8	M12	M12	M18
measuring distance Sd	0 ... 1 mm	0 ... 3 mm	0 ... 2 mm	0 ... 3 mm	0 ... 4 mm	0 ... 6 mm	2 ... 5 mm
mounting type	quasi-flush	quasi-flush	flush	quasi-flush	flush	quasi-flush	flush
resolution min.	1 µm	1 µm	1 µm	1 µm	1 µm	5 µm	5 µm
repeat accuracy	5 µm	20 µm	20 µm	10 µm	10 µm	10 µm	15 µm
response time	0,5 ms	0,5 ms	0,5 ms	0,5 ms	1 ms	1 ms	2 ms
operating temperature	–10 ... +60 °C	–10 ... +70 °C	–10 ... +70 °C	–10 ... +70 °C	–25 ... +75 °C	–25 ... +75 °C	–10 ... +70 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	stainless steel	stainless steel	stainless steel	stainless steel	brass	brass	brass
housing length	30 mm	22 ... 46 mm	40 ... 46 mm	22 ... 46 mm	40 ... 50 mm	40 ... 50 mm	60 mm
connection types	connector M5	connector M8 cable	connector M8 cable	connector M8 cable	connector M12 cable	connector M12 cable	connector M12
output circuit	0 ... 10 V	0 ... 10 V 0 ... 10 mA	0 ... 10 V 0 ... 10 mA	0 ... 10 V 0 ... 10 mA	0 ... 10 V	0 ... 10 V 0 ... 10 mA	1 ... 9 V
page	**164**	**165 ... 167**	**168**	**169 ... 171**	**172**	**173**	**174**

Distance sensors for factory automation – rectangular designs

product family	IWFM 05	IF08.D02S	IWFM 12	IWFM 12	IWFM 18	IWFM 20	IWFM 20
dimension	5 × 5 mm	8 × 4,7 mm	12 × 12 mm	12 × 12 mm	18 × 10 mm	20 × 12 mm	20 × 12 mm
measuring distance Sd	0 ... 1 mm	0 ... 2 mm	0 ... 4 mm	1 ... 2 mm	0 ... 4 mm	0 ... 2 mm	2 ... 5 mm
mounting type	flush	flush	flush	flush	flush	flush	flush
resolution min.	1 µm	1 µm	1 µm	1 µm	1 µm	1 µm	1 µm
repeat accuracy	10 µm	20 µm	5 µm	20 µm	5 µm	10 µm	10 µm
response time	0,5 ms	1 ms	2 ms	2 ms	2 ms	0,5 ms	1 ms
operating temperature	+10 ... +60 °C	+10 ... +60 °C	–10 ... +70 °C	0 ... +60 °C	–10 ... +70 °C	–10 ... +70 °C	0 ... +60 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	brass	zinc die-cast	brass	brass	brass	brass	brass
housing length	32 mm	16 mm	60 mm	60 mm	30 mm	30 mm	35 mm
connection types	connector M5	cable flylead connector M5/M8	connector M8 cable	cable	connector M8	flylead connector M8	connector M8
output circuit	0 ... 10 V	0 ... 10 V	0 ... 10 V 4 ... 20 mA		0 ... 10 V 4 ... 20 mA	0 ... 10 V	1 ... 9 V 4 ... 20 mA
page	**178**	**179**	**180**	**181**	**182**	**183**	**184**

IR18.D08S	IR30.D18S	IR30.D24S
M18	M30	M30
0 ... 8 mm	0 ... 18 mm	0 ... 24 mm
quasi-flush	flush	non flush
2 µm	5 µm	5 µm
15 µm	20 µm	20 µm
2 ms	2 ms	2 ms
–10 ... +70 °C	–25 ... +75 °C	–25 ... +75 °C
IP 67	IP 67	IP 67
brass	brass	brass
50 ... 60 mm	50 ... 60 mm	50 ... 60 mm
connector M12 cable	connector M12 cable	connector M12 cable
0 ... 10 V	0 ... 10 V 0 ... 10 mA	0 ... 10 V 0 ... 10 mA
175	**176**	**177**

With linearized characteristic curve

product family	IR06.D03L	IR08.D03L	IR12.D04L	IR12.D06L	IR18.D08L	IR30.D18L	IR30.D24L
dimension	ø 6,5 mm	M8	M12	M12	M18	M30	M30
measuring distance Sd	0 ... 3 mm	0 ... 3 mm	0 ... 4 mm	0 ... 6 mm	0 ... 8 mm	0 ... 24 mm	0 ... 24 mm
mounting type	quasi-flush	quasi-flush	flush	quasi-flush	quasi-flush	flush	non flush
resolution min.	3 µm	3 µm	3 µm	3 µm	8 µm	5 µm	5 µm
repeat accuracy	10 µm	10 µm	10 µm	10 µm	15 µm	20 µm	20 µm
response time	2 ms	2 ms	1 ms	1 ms	1 ms	5 ms	5 ms
operating temperature	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	stainless steel	stainless steel	brass	brass	brass	brass	brass
housing length	40 ... 46 mm	46 mm	60 mm	60 mm	60 mm	60 mm	60 mm
connection types	connector M8	connector M8	connector M12	connector M12	connector M12	connector M12	connector M12
output circuit	0 ... 10 V	0 ... 10 V	0 ... 10 V	0 ... 10 V 4 ... 20 mA	0 ... 10 V	0 ... 10 V 4 ... 20 mA	0 ... 10 V 4 ... 20 mA
page	**185**	**186**	**187**	**188 ... 190**	**191 ... 192**	**193**	**194**

IWFM 18	IWFK 20
18 x 10 mm	20 x 15 mm
0 ... 4 mm	0 ... 10 mm
flush	flush
5 µm	10 µm
10 µm	15 µm
2,5 ms	3 ms
–10 ... +70 °C	–10 ... +70 °C
IP 67	IP 67
brass	polyester
30 mm	42 mm
connector M8	connector M8
0 ... 10 V	0 ... 10 V
195	**196**

Application specific distance sensors

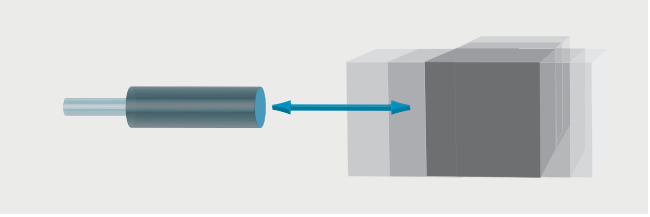
product family	IR12.D03K	IR18.D03K	IR18.D08F	IWRR 18	IWRM 18	IWRM 12
features	High Sensitivity	High Sensitivity	Faktor 1	Outdoor Washdown	Outdoor	ATEX 2D
dimension	M12	M18	M18	M18	M18	M12
measuring distance Sd	2,75 ... 3 mm	2,75 ... 3 mm	0 ... 8 mm	0 ... 7 mm	0 ... 8 mm	0 ... 4 mm
mounting type	flush	flush	flush	quasi-flush	quasi-flush	quasi-flush
resolution min.	0,25 µm	0,25 µm	20 µm	5 µm	5 µm	1 µm
sensitivity	40 V/mm 64 mA/mm	40 V/mm 64 mA/mm	1,25 V/mm	2,3 mA/mm	2 mA/mm	4 mA/mm
repeat accuracy	1 µm	1 µm	30 µm	15 µm	15 µm	10 µm
response time	3 ms	3 ms	15 ms	2 ms	2 ms	2 ms
operating temperature	–10 ... +60 °C	–10 ... +60 °C	–25 ... +75 °C	–40 ... +70 °C	–40 ... +70 °C	–40 ... +70 °C
protection class	IP 67	IP 67	IP 67	IP 68/69K & proTect+	IP 67	IP 67
housing material	steel-nickel plated	steel-nickel plated	brass	stainless steel	brass	brass
housing length	60 mm	60 mm	60 mm	60 mm	60 mm	50 mm
connection types	connector M12 cable	connector M12 cable	connector M12	connector M12	connector M12	connector M12
output circuit	0 ... 10 V 4 ... 20 mA	0 ... 10 V 4 ... 20 mA	0 ... 10 V	4 ... 20 mA	4 ... 20 mA	4 ... 20 mA
page	**197**	**198**	**199**	**200**	**201**	**202**

Function

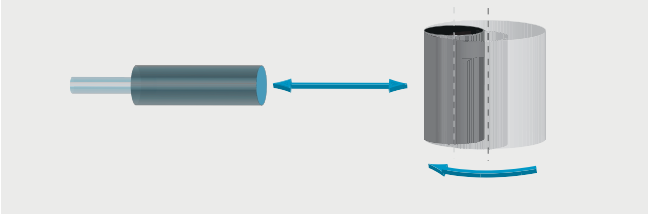
Inductive sensors with analog output signals are characterized by their short response times, high resolution and linearity as well as their outstanding repeat accuracy. The output current and voltage values are proportional to the distance between the sensor and the object being detected. In other words, 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

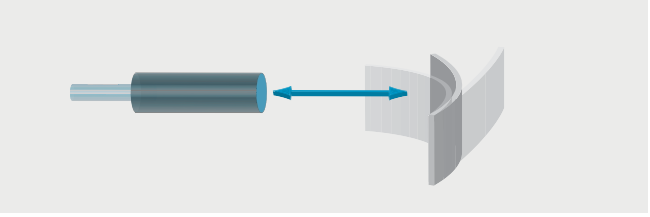
Travel / position / displacement



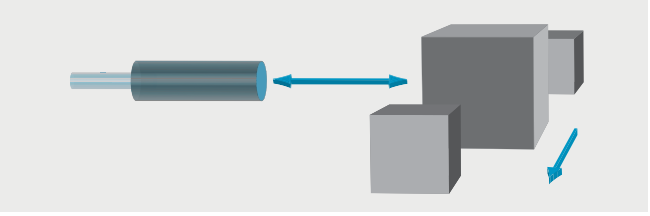
Diameter / eccentricity



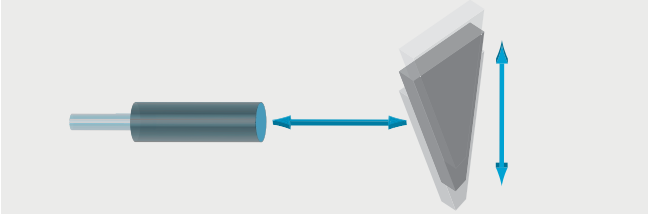
Deflection / deformation



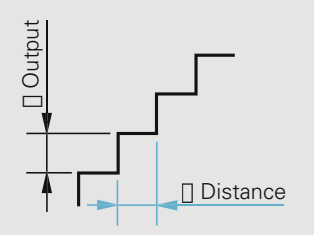
Size comparison / measurement tolerance



Taper / ramp

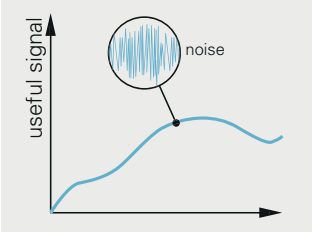


Resolution in general



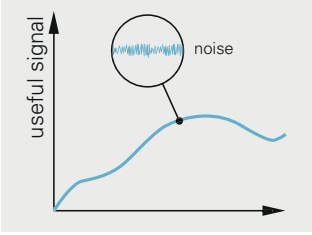
Resolution represents the smallest possible change in distance which will produce a measurable signal change at the sensor's output. Resolution can be impaired by high-frequency electrical interference (noise) or by the resolution of digital/analog converters.

Dynamic resolution



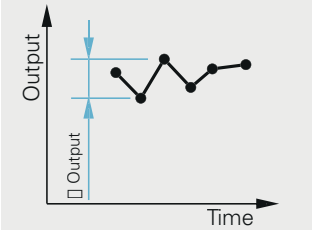
Signal noise exerts full effect on signal processing during very rapid measurements (high scan rates). Filtration without influencing the useful signal is only possible to a limited extent, if at all.

Static resolution



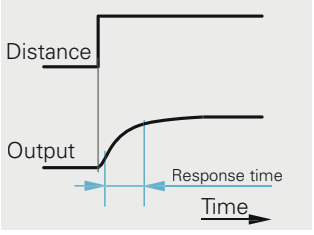
Very slow object movements (low scan rates) such as the temperature expansion of shafts allow the high-frequency interference to be filtered. The carrier signal is not influenced by this filtration. Using this technique significantly increases the resolution when compared to dynamic measurements.

Repeat accuracy



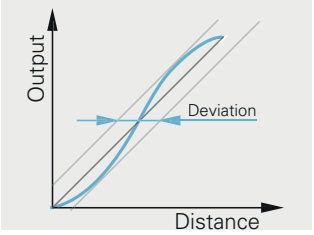
Repeat accuracy means the difference between the measured values of suc-cessive measurements within a period of 8 hours at an ambient temperature of 23 °C ± 5 °C.

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

Functions

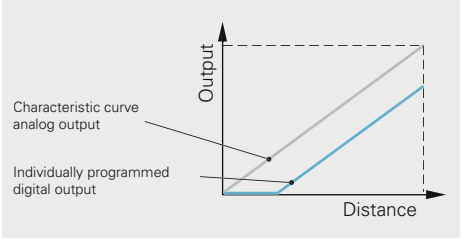
The following parameters can be altered using the Teach-in function:

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

Procedure

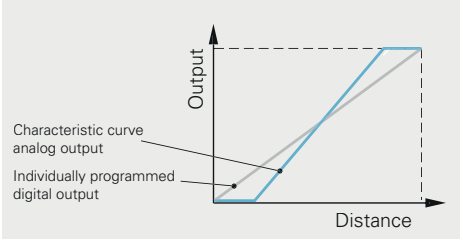
Baumer AlphaProx sensors with linearized characteristic curve, factor 1 sensors and high sensitivity sensors have a teach function with several teach modes. This allows the measuring range to be freely configured within specified limits. If, for example, a small measuring range with a large signal amplitude is required, it is possible to limit this to a few millimeters. The operating direction of the analog output can also be inverted if required.

In addition, the switch-on and switch-off points of a digital output can be defined. These may lie both within and outside the individually programmed measuring range.



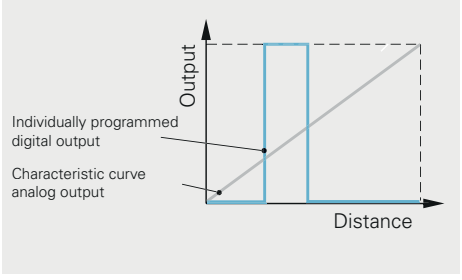
1-Point Teach Analog

Teaching-in of the start position (e.g. 0 V), center position (e.g. 5 V) or end position (e.g. 10 V) of the measuring range. In this teach mode, the output characteristic curve can be shifted without changing the sensitivity or slope of the characteristic curve. It is used for electronic compensation of installation tolerances and thus enables quick and easy adjustment in series production.



2-Point Teach Analog

The 2-point teach is used in applications in which two reference points (start and end position) can be approached. By adjusting the measuring range, the sensitivity or slope of the output characteristic curve can be perfectly adapted to the application and installation and mechanical manufacturing tolerances can be compensated. The first taught-in position always corresponds to the start value (e.g. 0 V) and the second to the end value (e.g. 10 V) Depending on the teach sequence, the output characteristic curve increases or decreases as the target object approaches.



Window Teach Digital

Analog distance sensors with an additional digital output offer a window teach digital instead of a 2-point Teach analog. This allows defining a valid or invalid distance range between the target and sensor for the digital output - independent of the analog output signal. Depending on the teach sequence, the digital output is HIGH or LOW if the measured object is within the taught-in distance range. This teach function is used to define a separate switching signal, e.g. for an end position circuit, independently of the analog signal.

Procedure	Factory Reset All sensors with teach functions have a factory reset to reset the sensor to the factory settings.
Accessories	Various accessories are available for analog sensors, such as an external teach-in adapter or an analog sensor tester.

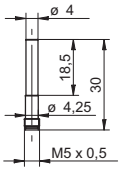
Sd = 0 ... 1 mm

- compact housing design
- very high resolution
- short response time

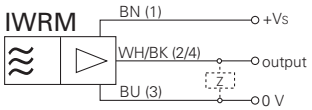
general data	
mounting type	quasi-flush
measuring distance Sd	0 ... 1 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeat accuracy	< 0,005 mm
linearity error	± 100 µm
temperature drift	± 5 % (Full Scale)
electrical data	
response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	15 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

order reference
IWRM 04U9701/S05

dimension drawing



connection diagram



connectors and mating connectors	
ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m
ESG 05AP0200G	Connector M5, 4 pin, straight, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

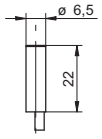
Sd = 0 ... 3 mm

- large measuring distance
- very short type
- very high resolution

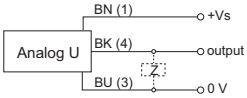
general data	
mounting type	quasi-flush
measuring distance Sd	0 ... 3 mm
resolution	< 0,001 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	- 0 µm / + 270 µm (S = 0,2 ... 1,7 mm) - 150 µm / + 900 µm (S = 0 ... 3 mm)
temperature drift	± 4 % (Full Scale; 0 ... +60 °C) ± 6 % (Full Scale; -25 ... +75 °C)
electrical data	
response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
housing material	stainless steel
dimension	6,5 mm
housing length	22 mm
connection types	cable, 2 m
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

order reference
IR06.D03S-11144078

dimension drawing



connection diagram



Accessories	
10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm

for details: see accessories section

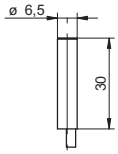
Sd = 0 ... 3 mm

- large measuring distance
- short type
- very high resolution

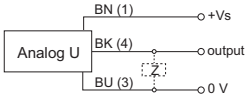
general data	
mounting type	quasi-flush
measuring distance Sd	0 ... 3 mm
resolution	< 0,001 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	± 120 µm (S = 0,75 ... 2,25 mm) ± 360 µm (S = 0 ... 3 mm)
temperature drift	± 4 % (Full Scale; 0 ... +60 °C) ± 6 % (Full Scale; -10 ... +70 °C)
electrical data	
response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
housing material	stainless steel
dimension	6,5 mm
housing length	30 mm
connection types	cable, 2 m
ambient conditions	
operating temperature	-10 ... +70 °C
protection class	IP 67

order reference
IR06.D03S-11144090

dimension drawing



connection diagram



Accessories	
10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
for details: see accessories section	

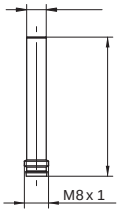
Sd = 0 ... 3 mm

- large measuring distance
- very high resolution

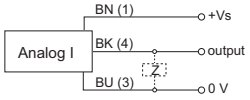
general data	
mounting type	quasi-flush
measuring distance Sd	0 ... 3 mm
resolution	< 0,001 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	± 120 µm (S = 0,75 ... 2,25 mm) ± 360 µm (S = 0 ... 3 mm)
temperature drift	± 4 % (Full Scale; 0 ... +60 °C) ± 6 % (Full Scale; -10 ... +70 °C)
electrical data	
response time (factory characteristic)	< 0,5 ms
short circuit protection	yes
reverse polarity protection	yes
voltage output	
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
current output	
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	12 mA
output signal	0 ... 10 mA
load resistance	< 100 Ohm/V * Vs - 400 Ohm > 500 Ohm (Vs = 30 ... 36 VDC)
mechanical data	
type	cylindrical smooth
housing material	stainless steel
dimension	6,5 mm
housing length	46 mm
connection types	connector M8
ambient conditions	
operating temperature	-10 ... +70 °C
protection class	IP 67

order reference	output circuit
IR06.D03S-11141032	current output
IR06.D03S-11137807	voltage output

dimension drawing



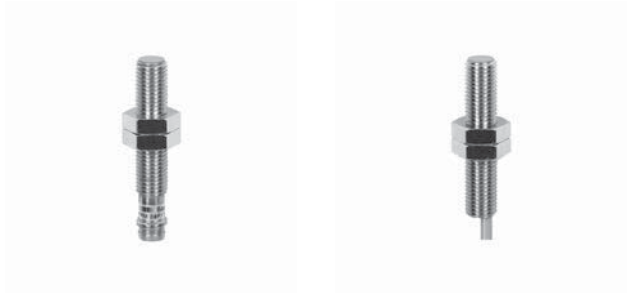
connection diagrams



connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
for details: see accessories section	

Sd = 0 ... 2 mm

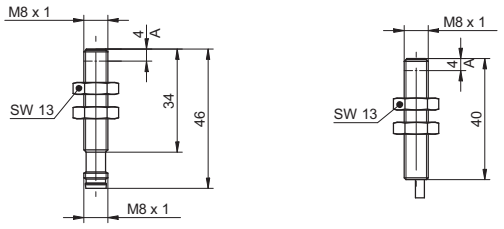
- large measuring distance
- very high resolution



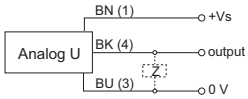
general data	
mounting type	flush
measuring distance Sd	0 ... 2 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	± 60 µm (S = 0,5 ... 1,5 mm) ± 140 µm (S = 0 ... 2 mm)
temperature drift	± 3 % (Full Scale; 0 ... +60 °C) ± 5 % (Full Scale; -10 ... +70 °C)
electrical data	
response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	stainless steel
dimension	8 mm
tightening torque max.	10 Nm (A: 7 Nm)
ambient conditions	
operating temperature	-10 ... +70 °C
protection class	IP 67

order reference	housing length	connection types
IR08.D02S-11130472	40 mm	cable, 2 m
IR08.D02S-11123872	46 mm	connector M8

dimension drawings



connection diagram



connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151719	Sensofix series 08 round
for details: see accessories section	

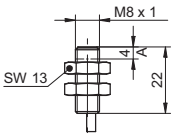
Sd = 0 ... 3 mm

- large measuring distance
- very high resolution

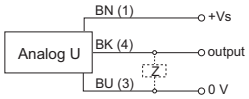
general data	
mounting type	quasi-flush
measuring distance Sd	0 ... 3 mm
resolution	< 0,001 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	- 0 µm / + 270 µm (S = 0,2 ... 1,7 mm) - 150 µm / + 900 µm (S = 0 ... 3 mm)
temperature drift	± 4 % (Full Scale; 0 ... +60 °C) ± 6 % (Full Scale; -25 ... +75 °C)
electrical data	
response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	stainless steel
dimension	8 mm
housing length	22 mm
connection types	cable, 2 m
tightening torque max.	10 Nm (A: 7 Nm)
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

order reference
IR08.D03S-11141036

dimension drawing



connection diagram



Accessories

10151719	Sensofix series 08 round

for details: see accessories section

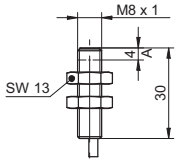
Sd = 0 ... 3 mm

- large measuring distance
- very high resolution

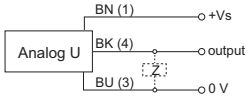
general data	
mounting type	quasi-flush
measuring distance Sd	0 ... 3 mm
resolution	< 0,001 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	± 120 µm (S = 0,75 ... 2,25 mm) ± 360 µm (S = 0 ... 3 mm)
temperature drift	± 4 % (Full Scale; 0 ... +60 °C) ± 6 % (Full Scale; -10 ... +70 °C)
electrical data	
response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	stainless steel
dimension	8 mm
housing length	30 mm
connection types	cable, 2 m
tightening torque max.	10 Nm (A: 7 Nm)
ambient conditions	
operating temperature	-10 ... +70 °C
protection class	IP 67

order reference
IR08.D03S-11141037

dimension drawing



connection diagram



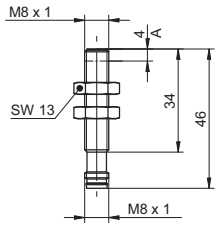
Accessories	
10151719	Sensofix series 08 round
for details: see accessories section	

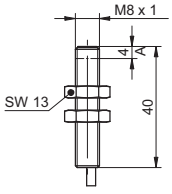
Sd = 0 ... 3 mm

- large measuring distance
- very high resolution

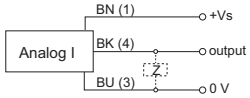
general data	
mounting type	quasi-flush
measuring distance Sd	0 ... 3 mm
resolution	< 0,001 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	± 120 µm (S = 0,75 ... 2,25 mm) ± 360 µm (S = 0 ... 3 mm)
temperature drift	± 4 % (Full Scale; 0 ... +60 °C) ± 6 % (Full Scale; -10 ... +70 °C)
electrical data	
response time (factory characteristic)	< 0,5 ms
short circuit protection	yes
reverse polarity protection	yes
voltage output	
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
current output	
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	12 mA
output signal	0 ... 10 mA
load resistance	< 100 Ohm/V * Vs - 400 Ohm > 500 Ohm (Vs = 30 … 36 VDC)
mechanical data	
type	cylindrical threaded
housing material	stainless steel
dimension	8 mm
tightening torque max.	10 Nm (A: 7 Nm)
ambient conditions	
operating temperature	-10 ... +70 °C
protection class	IP 67

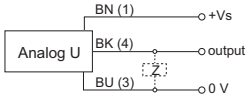
dimension drawings





connection diagrams





connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151719	Sensofix series 08 round
for details: see accessories section	

order reference	output circuit	housing length	connection types
IR08.D03S-11130473	voltage output	40 mm	cable, 2 m
IR08.D03S-11141034	current output	46 mm	connector M8
IR08.D03S-11123873	voltage output	46 mm	connector M8

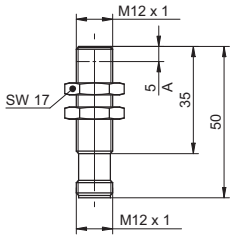
Sd = 0 ... 4 mm

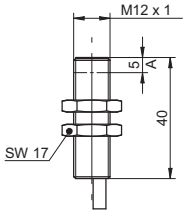
- large measuring distance
- very high resolution

general data	
mounting type	flush
measuring distance Sd	0 ... 4 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeat accuracy	< 0,01 mm
linearity error	± 80 µm (S = 1 ... 3 mm) ± 280 µm (S = 0 ... 4 mm)
temperature drift	± 2 % (Full Scale; 0 ... +60 °C) ± 3 % (Full Scale; -25 ... +75 °C)
electrical data	
response time (factory characteristic)	< 1 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	12 mm
tightening torque max.	15 Nm (A: 10 Nm)
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

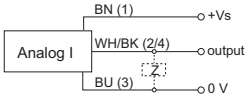
order reference	housing length	connection types
IR12.D04S-11130475	40 mm	cable, 2 m
IR12.D04S-11123876	50 mm	connector M12

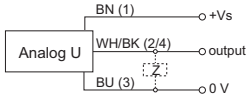
dimension drawings





connection diagrams





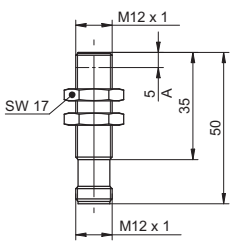
connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10151720	Sensofix series 12 round
for details: see accessories section	

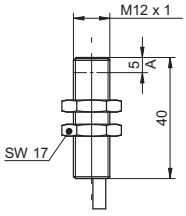
Sd = 0 ... 6 mm

- large measuring distance
- very high resolution

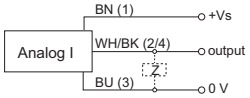
general data	
mounting type	quasi-flush
measuring distance Sd	0 ... 6 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,01 mm
linearity error	± 300 µm (S = 1,5 ... 4,5 mm) ± 720 µm (S = 0 ... 6 mm)
temperature drift	± 4 % (Full Scale; 0 ... +60 °C) ± 6 % (Full Scale; -25 ... +75 °C)
electrical data	
response time (factory characteristic)	< 1 ms
current consumption max. (no load)	10 mA
short circuit protection	yes
reverse polarity protection	yes
voltage output	
voltage supply range +Vs	12 ... 36 VDC
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
current output	
voltage supply range +Vs	8 ... 36 VDC
output signal	4 ... 20 mA
load resistance	< 50 Ohm/V * Vs - 150 Ohm > 500 Ohm (Vs = 30 ... 36 VDC)
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	12 mm
tightening torque max.	15 Nm (A: 10 Nm)
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

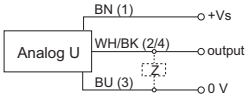
dimension drawings





connection diagrams





connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151720	Sensofix series 12 round
for details: see accessories section	

order reference	output circuit	housing length	connection types
IR12.D06S-11130476	voltage output	40 mm	cable, 2 m
IR12.D06S-11141039	current output	50 mm	connector M12
IR12.D06S-11123877	voltage output	50 mm	connector M12

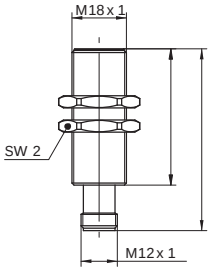
Sd = 2 ... 5 mm

- large measuring distance
- very high resolution

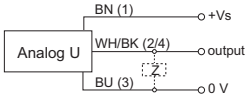
general data	
mounting type	flush
measuring distance Sd	2 ... 5 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,015 mm
linearity error	± 350 µm
temperature drift	± 2 % (Full Scale; 0 ... +60 °C) ± 4 % (Full Scale; -10 ... +70 °C)
electrical data	
response time (factory characteristic)	< 2 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	voltage output
output signal	1 ... 9 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	18 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	40 Nm
ambient conditions	
operating temperature	-10 ... +70 °C
protection class	IP 67

order reference
IR18.D05S-11140166

dimension drawing



connection diagram

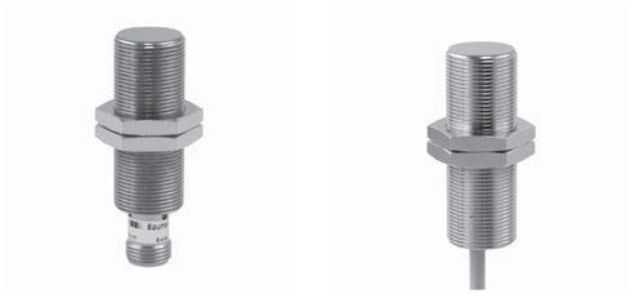


connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
for details: see accessories section	

Sd = 0 ... 8 mm

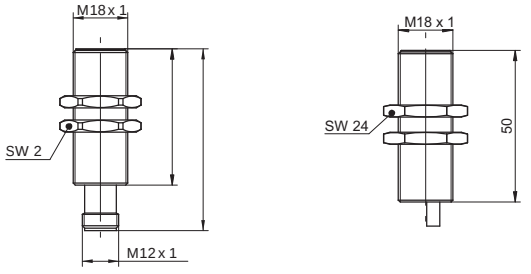
- large measuring distance
- very high resolution



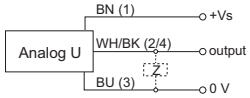
general data	
mounting type	quasi-flush
measuring distance Sd	0 ... 8 mm
resolution	< 0,002 mm (stat.) < 0,006 mm (dynam.)
repeat accuracy	< 0,015 mm
linearity error	± 240 µm (S = 2 ... 6 mm) ± 640 µm (S = 0 ... 8 mm)
temperature drift	± 2 % (Full Scale; 0 ... +60 °C) ± 4 % (Full Scale; -10 ... +70 °C)
electrical data	
response time (factory characteristic)	< 2 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm
ambient conditions	
operating temperature	-10 ... +70 °C
protection class	IP 67

order reference	housing length	connection types
IR18.D08S-11130479	50 mm	cable, 2 m
IR18.D08S-11123879	60 mm	connector M12

dimension drawings



connection diagram



connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
for details: see accessories section	

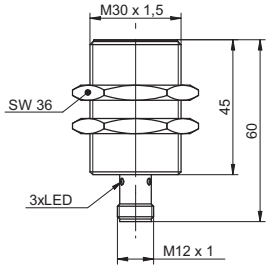
Sd = 0 ... 18 mm

- linear analog output
- large measuring distance

general data	
mounting type	flush
measuring distance Sd	0 ... 18 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	± 800 µm (S = 4,5 ... 13,5 mm) ± 2400 µm (S = 0 ... 18 mm)
temperature drift	± 6 % (Full Scale)
electrical data	
response time (factory characteristic)	< 2 ms
short circuit protection	yes
reverse polarity protection	yes
voltage output	
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
current output	
voltage supply range +Vs	8 ... 36 VDC
current consumption max. (no load)	20 mA
output signal	4 ... 20 mA
load resistance	< 50 Ohm/V * Vs - 250 Ohm > 500 Ohm (Vs = 30 ... 36 VDC)
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	30 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	100 Nm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

order reference	output circuit
IR30.D18S-11179024	current output
IR30.D18S-11179023	voltage output

dimension drawing



connection diagrams

connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

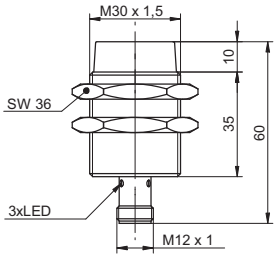
Sd = 0 ... 24 mm

- linear analog output
- large measuring distance

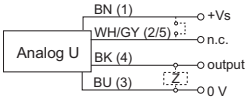
general data	
mounting type	non-flush
measuring distance Sd	0 ... 24 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	± 800 µm (S = 6 ... 18 mm) ± 3000 µm (S = 0 ... 24 mm)
temperature drift	± 8 % (Full Scale)
electrical data	
response time (factory characteristic)	< 2 ms
short circuit protection	yes
reverse polarity protection	yes
voltage output	
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
current output	
voltage supply range +Vs	8 ... 36 VDC
current consumption max. (no load)	20 mA
output signal	4 ... 20 mA
load resistance	< 50 Ohm/V * Vs - 250 Ohm > 500 Ohm (Vs = 30 ... 36 VDC)
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	30 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	100 Nm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

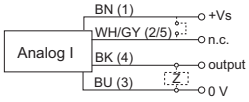
order reference	output circuit
IR30.D24S-11179026	current output
IR30.D24S-11179025	voltage output

dimension drawing



connection diagrams





connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

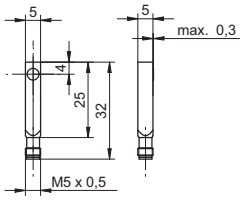
Sd = 0 ... 1 mm

- very high resolution
- short response time

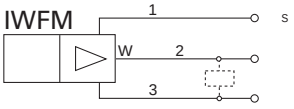
general data	
mounting type	quasi-flush
measuring distance Sd	0 ... 1 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeat accuracy	< 0,01 mm
linearity error	± 70 µm
temperature drift	± 5 % (Full Scale)
electrical data	
response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	15 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	5 mm
housing length	32 mm
connection types	connector M5
ambient conditions	
operating temperature	10 ... +60 °C
protection class	IP 67

order reference
IWFM 05U9701/S05

dimension drawing



connection diagram



connectors and mating connectors	
ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m
ESG 05AP0200G	Connector M5, 4 pin, straight, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

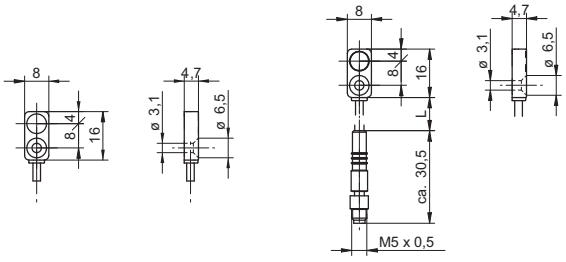
Sd = 0 ... 2 mm

- very high resolution
- short response time

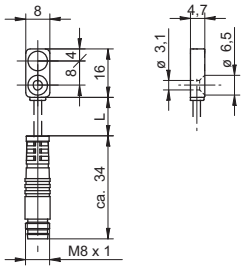
general data	
mounting type	flush
measuring distance Sd	0 ... 2 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	± 120 µm
temperature drift	± 5 % (Full Scale)
electrical data	
response time (factory characteristic)	< 1 ms
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	8 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	die-cast zinc nickel plated
dimension	8 mm
housing length	16 mm
ambient conditions	
operating temperature	10 ... +60 °C
protection class	IP 67

order reference	connection types
IF08.D02S-F16.UA1Z.7WCU	cable PUR, 2 m
IF08.D02S-F16.UA1Z.7WCV	cable PVC, 2 m
IF08.D02S-F16.UA1Z.7WLV	flylead connector M8
IF08.D02S-F16.UA1Z.7WMV	flylead connector M5

dimension drawings

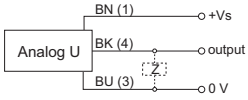


flylead connector version



standard cable length 200 mm (L)

connection diagram



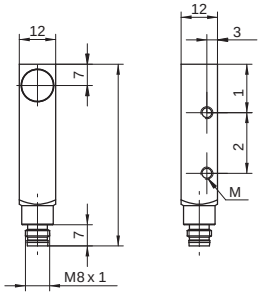
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
ESG 05AP0200G	Connector M5, 4 pin, straight, 2 m, shielded
ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Sd = 0 ... 4 mm

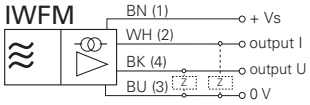
- very high resolution
- short response time
- current- and voltage output

general data	
mounting type	flush
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. (no load)	40 mA
output circuit	voltage - / current output
output signal	0 ... 10 V / 4 ... 20 mA
load resistance	> 1000 Ohm (Uout) / 330 ... 1000 Ohm (Iout)
voltage drop Vd	< 7,2 VDC (Iout)
short circuit protection	yes
reverse polarity protection	yes
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

dimension drawing



connection diagram



connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

order reference	resolution	repeat accuracy	response time (factory characteristic)
IWFM 12L9504/S35A	< 0,005 mm	< 0,01 mm	< 2 ms
IWFM 12L9505/S35A	< 0,001 mm	< 0,005 mm	< 30 ms

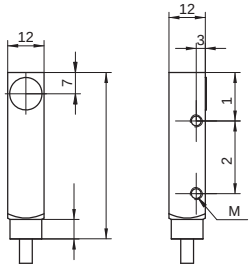
Sd = 1 ... 2 mm

- shielded mounting
- short design

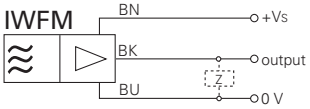
general data	
mounting type	flush
measuring distance Sd	1 ... 2 mm
reference distance	1,35 ... 1,65 mm
measuring speed	< 0,5 mm / ms
repeat accuracy	< 0,02 mm
linearity error	± 80 µm
temperature coefficient	1 µm / (K mm)
electrical data	
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	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, 2 m
ambient conditions	
operating temperature	0 ... +60 °C
protection class	IP 67

order reference
IWFM 12U9501/O1

dimension drawing



connection diagram

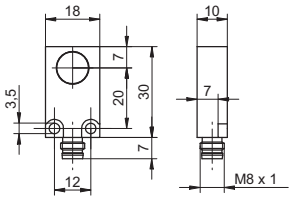


Sd = 0 ... 4 mm

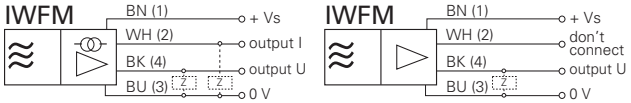
- very high resolution
- short response time
- linear analog output

general data	
mounting type	flush
measuring distance Sd	0 ... 4 mm
voltage - / current output	
linearity error	± 160 µm
temperature drift	± 4 % (Full Scale)
voltage output	
special type	linearized
linearity error	± 16 µm
temperature drift	± 5 % (Full Scale)
electrical data	
voltage supply range +Vs	15 ... 30 VDC
short circuit protection	yes
reverse polarity protection	yes
voltage - / current output	
current consumption max. (no load)	40 mA
output signal	0 ... 10 V / 4 ... 20 mA
load resistance	> 1000 Ohm (Uout) / 330 ... 1000 Ohm (Iout)
voltage drop Vd	< 7,2 VDC (Iout)
voltage output	
current consumption max. (no load)	20 mA
output signal	0 ... 10 VDC
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

dimension drawing



connection diagrams



connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10152385	Sensofix series 18/20 inductive rectangular
for details: see accessories section	

order reference	resolution	repeat accuracy	output circuit	response time (factory characteristic)	linearity error	temperature drift	special type
IWFM 18L9504/S35A	< 0,005 mm	< 0,01 mm	voltage - / current output	< 2 ms	± 160 µm	± 4 % (Full Scale)	-
IWFM 18L9505/S35A	< 0,001 mm	< 0,005 mm	voltage - / current output	< 30 ms	± 160 µm	± 4 % (Full Scale)	-
IWFM 18U7504/S35A	< 0,005 mm	< 0,01 mm	voltage output	< 2,5 ms	± 16 µm	± 5 % (Full Scale)	linearized

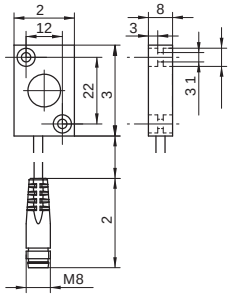
Sd = 0 ... 2 mm

- small linearity error
- very short response time

general data	
mounting type	flush
measuring distance Sd	0 ... 2 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeat accuracy	< 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. (no load)	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

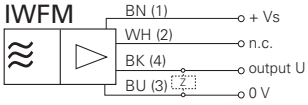
order reference
IWFM 20U9509/KS35AP

dimension drawing



standard cable length 200 mm (L)

connection diagram



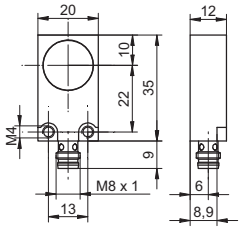
connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Sd = 2 ... 5 mm

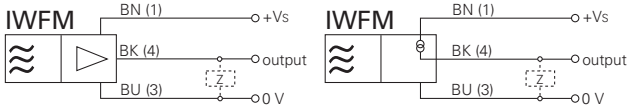
- Integrated current and voltage output
- Fully integrated electronics

general data	
mounting type	flush
measuring speed	< 1 mm / ms
repeat accuracy	< 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. (no load)	20 mA
output signal	1 ... 9 VDC
load resistance	> 1000 Ohm
current output	
current consumption max. (no load)	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

dimension drawing



connection diagrams



connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10152385	Sensofix series 18/20 inductive rectangular
for details: see accessories section	

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

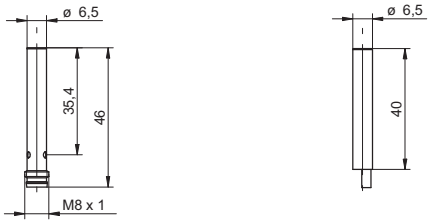
Inductive distance sensors linearized characteristic curve *AlphaProx*® IR06.D03L

Sd = 0 ... 3 mm

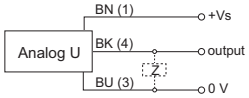
- linear analog output
- large measuring distance
- magnetic teach

general data	
mounting type	quasi-flush
special type	linearized
measuring distance Sd	0 ... 3 mm
sensitivity	3,33 V/mm
resolution	< 0,003 mm (stat.) < 0,009 mm (dynam.,S = 0 ... 2 mm) < 0,018 mm (dynam.,S = 0 ... 3 mm)
repeat accuracy	< 0,01 mm
temperature drift	± 2 % (Full Scale; S = 0 ... 2 mm) ± 6 % (Full Scale; S = 0 ... 3 mm)
electrical data	
response time (factory characteristic)	< 2 ms
voltage supply range +Vs	12 ... 30 VDC
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
housing material	stainless steel
dimension	6,5 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings



connection diagram



connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11137318	Teach Pen for sensors in metal housing
11141124	Teach Pen for sensors in metal housing (USA, CAN, JP)
for details: see accessories section	

order reference	adjustment	housing length	linearity error	connection types	current consumption max. (no load)
IR06.D03L-11174154	-	40 mm	± 15 µm (S = 0 ... 2 mm) ± 90 µm (S = 0 ... 3 mm)	cable, 2 m	10 mA
IR06.D03L-11176070	Teach-in	46 mm	± 10 µm (S = 0 ... 2 mm) ± 90 µm (S = 0 ... 3 mm)	connector M8	12 mA
IR06.D03L-11174153	-	46 mm	± 15 µm (S = 0 ... 2 mm) ± 90 µm (S = 0 ... 3 mm)	connector M8	10 mA

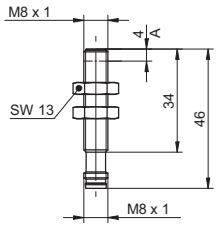
Inductive distance sensors linearized characteristic curve *AlphaProx*® IR08.D03L

Sd = 0 ... 3 mm

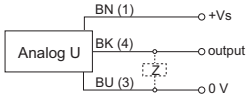
- linear analog output
- large measuring distance
- magnetic teach

general data	
mounting type	quasi-flush
special type	linearized
measuring distance Sd	0 ... 3 mm
sensitivity	3,33 V/mm
resolution	< 0,003 mm (stat.) < 0,009 mm (dynam.,S = 0 ... 2 mm) < 0,018 mm (dynam.,S = 0 ... 3 mm)
repeat accuracy	< 0,01 mm
linearity error	± 10 µm (S = 0 ... 2 mm) ± 90 µm (S = 0 ... 3 mm)
temperature drift	± 2 % (Full Scale; S = 0 ... 2 mm) ± 6 % (Full Scale; S = 0 ... 3 mm)
electrical data	
response time (factory characteristic)	< 2 ms
voltage supply range +Vs	12 ... 30 VDC
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	stainless steel
dimension	8 mm
housing length	46 mm
connection types	connector M8
tightening torque max.	10 Nm (A: 7 Nm)
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawing



connection diagram



connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151719	Sensofix series 08 round
11137318	Teach Pen for sensors in metal housing
11141124	Teach Pen for sensors in metal housing (USA, CAN, JP)
for details: see accessories section	

order reference	adjustment	current consumption max. (no load)
IR08.D03L-11175999	Teach-in	12 mA
IR08.D03L-11141038	-	10 mA

Inductive distance sensors linearized characteristic curve *AlphaProx*® IR12.D04L

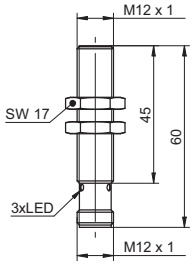
Sd = 0 ... 4 mm

- linear analog output
- external Teach-in
- 2 adjustable switching points

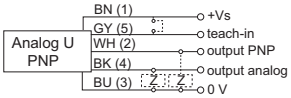
general data	
mounting type	flush
special type	2 adjust. switching points linearized
measuring distance Sd	0 ... 4 mm
sensitivity	2,5 V/mm
resolution	< 0,003 mm (stat.) < 0,005 mm (dynam.)
repeat accuracy	< 0,01 mm
adjustment	external Teach-in
teach	1-point analog, window digital, factory reset
linearity error	± 16 µm
temperature drift	± 4 % (Full Scale)
electrical data	
response time (factory characteristic)	< 1 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	15 mA
output circuit	voltage output / PNP
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
output current	< 100 mA (PNP)
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	12 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	15 Nm (A: 10 Nm)
ambient conditions	
operating temperature	-25 ... +75 °C (Vs = 12 ... 30 VDC) -25 ... +60 °C (Vs = 12 ... 36 VDC)
protection class	IP 67

order reference
IR12.D04L-11130474

dimension drawing



connection diagram



connectors and mating connectors	
ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12
for details: see accessories section	

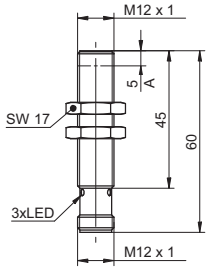
Inductive distance sensors linearized characteristic curve *AlphaProx*® IR12.D06L

Sd = 0 ... 6 mm

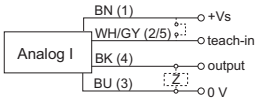
- linear analog output
- external Teach-in
- large measuring distance

general data	
mounting type	quasi-flush
special type	linearized
measuring distance Sd	0 ... 6 mm
resolution	< 0,003 mm (stat.) < 0,005 mm (dynam.,S = 0 ... 4 mm) < 0,022 mm (dynam.,S = 0 ... 6 mm)
repeat accuracy	< 0,01 mm
adjustment	external Teach-in
teach	1-point analog, 2-point analog, factory reset
temperature drift	± 2 % (Full Scale; S = 0 ... 4 mm) ± 5 % (Full Scale; S = 0 ... 6 mm)
voltage output	
sensitivity	1,67 V/mm
linearity error	± 25 µm (S = 0 ... 4 mm) ± 60 µm (S = 0 ... 6 mm)
current output	
sensitivity	2,67 mA/mm
linearity error	± 25 µm (S = 0 ... 4 mm) ± 120 µm (S = 0 ... 6 mm)
electrical data	
response time (factory characteristic)	< 1 ms
short circuit protection	yes
reverse polarity protection	yes
voltage output	
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	15 mA
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
current output	
voltage supply range +Vs	8 ... 36 VDC
current consumption max. (no load)	25 mA
output signal	4 ... 20 mA
load resistance	< 50 Ohm/V * Vs - 250 Ohm > 500 Ohm (Vs = 30 ... 36 VDC)
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	12 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	15 Nm (A: 10 Nm)
ambient conditions	
operating temperature	-25 ... +75 °C (Vs = 8 ... 30 VDC) -25 ... +60 °C (Vs = 8 ... 36 VDC)
protection class	IP 67

dimension drawing



connection diagrams



connectors and mating connectors	
ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12
for details: see accessories section	

order reference	output circuit	linearity error	operating temperature	sensitivity
IR12.D06L-11157693	current output	± 25 µm (S = 0 ... 4 mm) ± 120 µm (S = 0 ... 6 mm)	-25 ... +75 °C (Vs = 8 ... 30 VDC) -25 ... +60 °C (Vs = 8 ... 36 VDC)	2,67 mA/mm
IR12.D06L-11141090	voltage output	± 25 µm (S = 0 ... 4 mm) ± 60 µm (S = 0 ... 6 mm)	-25 ... +75 °C (Vs = 12 ... 30 VDC) -25 ... +60 °C (Vs = 12 ... 36 VDC)	1,67 V/mm

Inductive distance sensors linearized characteristic curve *AlphaProx*® IR12.D06L

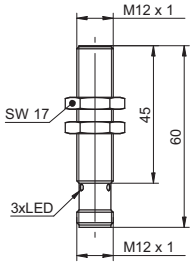
Sd = 0 ... 6 mm

- linear analog output
- external Teach-in
- 2 adjustable switching points

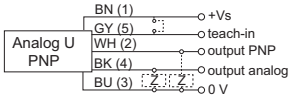
general data	
mounting type	quasi-flush
special type	2 adjust. switching points linearized
measuring distance Sd	0 ... 6 mm
sensitivity	1,67 V/mm
resolution	< 0,003 mm (stat.) < 0,005 mm (dynam.,S = 0 ... 4 mm) < 0,022 mm (dynam.,S = 0 ... 6 mm)
repeat accuracy	< 0,01 mm
adjustment	external Teach-in
teach	1-point analog, window digital, factory reset
linearity error	± 25 µm (S = 0 ... 4 mm) ± 60 µm (S = 0 ... 6 mm)
temperature drift	± 2 % (Full Scale; S = 0 ... 4 mm) ± 5 % (Full Scale; S = 0 ... 6 mm)
electrical data	
response time (factory characteristic)	< 1 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	15 mA
output circuit	voltage output / PNP
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
output current	< 100 mA (PNP)
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	12 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	15 Nm (A: 10 Nm)
ambient conditions	
operating temperature	-25 ... +75 °C (Vs = 12 ... 30 VDC) -25 ... +60 °C (Vs = 12 ... 36 VDC)
protection class	IP 67

order reference
IR12.D06L-11135332

dimension drawing



connection diagram



connectors and mating connectors	
ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12
for details: see accessories section	

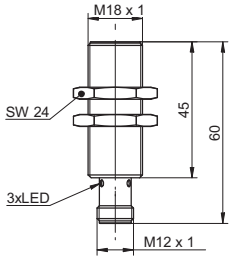
Inductive distance sensors linearized characteristic curve *AlphaProx*® IR18.D08L

Sd = 0 ... 8 mm

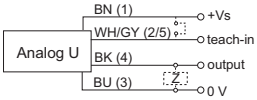
- linear analog output
- external Teach-in
- large measuring distance

general data	
mounting type	quasi-flush
special type	linearized
measuring distance Sd	0 ... 8 mm
resolution	< 0,002 mm (stat.) < 0,006 mm (dynam.)
repeat accuracy	< 0,015 mm
adjustment	external Teach-in
teach	1-point analog, 2-point analog, factory reset
linearity error	± 32 µm
voltage output	
sensitivity	1,25 V/mm
temperature drift	± 3 % (Full Scale)
current output	
sensitivity	2,0 mA/mm
temperature drift	± 4 % (Full Scale)
electrical data	
response time (factory characteristic)	< 1 ms
voltage supply range +Vs	12 ... 36 VDC
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	15 mA
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
current output	
current consumption max. (no load)	20 mA
output signal	4 ... 20 mA
load resistance	< 50 Ohm/V * Vs - 250 Ohm > 500 Ohm (Vs = 30 … 36 VDC)
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	18 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	40 Nm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawing



connection diagram



connectors and mating connectors	
ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
10141584	Teach-in Adapter M12
for details: see accessories section	

order reference	output circuit	temperature drift	sensitivity
IR18.D08L-11164789	current output	± 4 % (Full Scale)	2,0 mA/mm
IR18.D08L-11141092	voltage output	± 3 % (Full Scale)	1,25 V/mm

Inductive distance sensors linearized characteristic curve *AlphaProx*® IR18.D08L

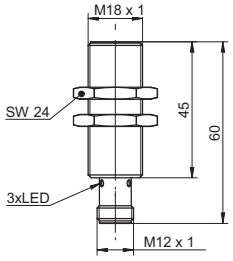
Sd = 0 ... 8 mm

- linear analog output
- external Teach-in
- 2 adjustable switching points

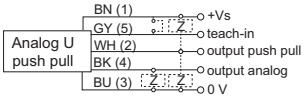
general data	
mounting type	quasi-flush
special type	2 adjust. switching points linearized
measuring distance Sd	0 ... 8 mm
sensitivity	1,25 V/mm
resolution	< 0,002 mm (stat.) < 0,006 mm (dynam.)
repeat accuracy	< 0,015 mm
adjustment	external Teach-in
teach	1-point analog, window digital, factory reset
linearity error	± 32 µm
temperature drift	± 3 % (Full Scale)
electrical data	
response time (factory characteristic)	< 1 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	15 mA
output circuit	voltage output / push-pull
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
output current	< 100 mA (push-pull)
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	18 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	40 Nm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

order reference
IR18.D08L-11130478

dimension drawing



connection diagram



connectors and mating connectors	
ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
10141584	Teach-in Adapter M12
for details: see accessories section	

Inductive distance sensors linearized characteristic curve *AlphaProx*® IR30.D18L

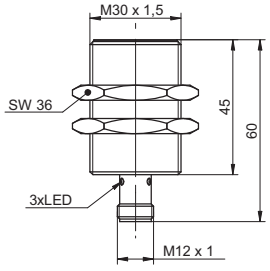
Sd = 0 ... 18 mm

- linear analog output
- external Teach-in
- large measuring distance

general data	
mounting type	flush
special type	linearized
measuring distance Sd	0 ... 18 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
adjustment	external Teach-in
teach	1-point analog, 2-point analog, factory reset
linearity error	± 360 µm
temperature drift	± 6 % (Full Scale)
voltage output	
sensitivity	0,56 V/mm
current output	
sensitivity	0,89 mA/mm
electrical data	
response time (factory characteristic)	< 5 ms
current consumption max. (no load)	20 mA
short circuit protection	yes
reverse polarity protection	yes
voltage output	
voltage supply range +Vs	12 ... 36 VDC
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
current output	
voltage supply range +Vs	8 ... 36 VDC
output signal	4 ... 20 mA
load resistance	< 50 Ohm/V * Vs - 250 Ohm > 500 Ohm (Vs = 30 ... 36 VDC)
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	30 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	100 Nm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

order reference	output circuit	sensitivity
IR30.D18L-11179029	current output	0,89 mA/mm
IR30.D18L-11179028	voltage output	0,56 V/mm

dimension drawing



connection diagrams

connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10141584	Teach-in Adapter M12
for details: see accessories section	

Inductive distance sensors linearized characteristic curve *AlphaProx*® IR30.D24L

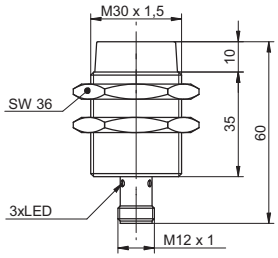
Sd = 0 ... 24 mm

- linear analog output
- external Teach-in
- large measuring distance

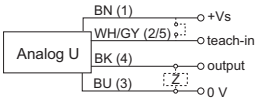
general data	
mounting type	non-flush
special type	linearized
measuring distance Sd	0 ... 24 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
adjustment	external Teach-in
teach	1-point analog, 2-point analog, factory reset
linearity error	± 480 µm
temperature drift	± 6 % (Full Scale)
voltage output	
sensitivity	0,42 V/mm
current output	
sensitivity	0,67 mA/mm
electrical data	
response time (factory characteristic)	< 5 ms
current consumption max. (no load)	20 mA
short circuit protection	yes
reverse polarity protection	yes
voltage output	
voltage supply range +Vs	12 ... 36 VDC
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
current output	
voltage supply range +Vs	8 ... 36 VDC
output signal	4 ... 20 mA
load resistance	< 50 Ohm/V * Vs - 250 Ohm > 500 Ohm (Vs = 30 ... 36 VDC)
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	30 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	100 Nm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

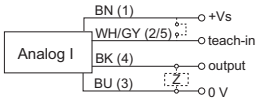
order reference	output circuit	sensitivity
IR30.D24L-11179051	current output	0,67 mA/mm
IR30.D24L-11179050	voltage output	0,42 V/mm

dimension drawing



connection diagrams





connectors and mating connectors	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

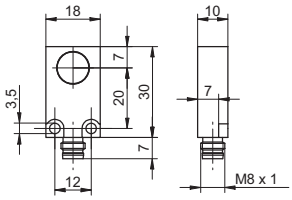
Accessories	
10141584	Teach-in Adapter M12
for details: see accessories section	

Sd = 0 ... 4 mm

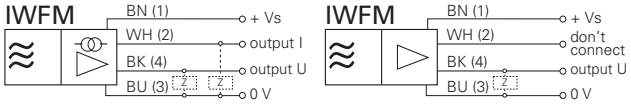
- very high resolution
- short response time
- linear analog output

general data	
mounting type	flush
measuring distance Sd	0 ... 4 mm
voltage - / current output	
linearity error	± 160 µm
temperature drift	± 4 % (Full Scale)
voltage output	
special type	linearized
linearity error	± 16 µm
temperature drift	± 5 % (Full Scale)
electrical data	
voltage supply range +Vs	15 ... 30 VDC
short circuit protection	yes
reverse polarity protection	yes
voltage - / current output	
current consumption max. (no load)	40 mA
output signal	0 ... 10 V / 4 ... 20 mA
load resistance	> 1000 Ohm (Uout) / 330 ... 1000 Ohm (Iout)
voltage drop Vd	< 7,2 VDC (Iout)
voltage output	
current consumption max. (no load)	20 mA
output signal	0 ... 10 VDC
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

dimension drawing



connection diagrams



connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10152385	Sensofix series 18/20 inductive rectangular
for details: see accessories section	

order reference	resolution	repeat accuracy	output circuit	response time (factory characteristic)	linearity error	temperature drift	special type
IWFM 18L9504/S35A	< 0,005 mm	< 0,01 mm	voltage - / current output	< 2 ms	± 160 µm	± 4 % (Full Scale)	-
IWFM 18L9505/S35A	< 0,001 mm	< 0,005 mm	voltage - / current output	< 30 ms	± 160 µm	± 4 % (Full Scale)	-
IWFM 18U7504/S35A	< 0,005 mm	< 0,01 mm	voltage output	< 2,5 ms	± 16 µm	± 5 % (Full Scale)	linearized

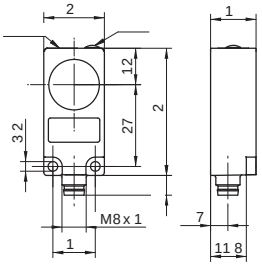
Sd = 0 ... 10 mm

- internal Teach-in
- analog- and switching output
- linear analog output

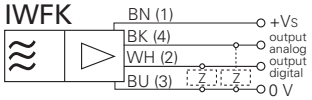
general data	
mounting type	quasi-flush
special type	linearized
measuring distance Sd	0 ... 10 mm
resolution	< 0,01 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,015 mm
adjustment	Teach-in
linearity error	± 50 µm
temperature drift	± 5 % (Full Scale)
electrical data	
response time (factory characteristic)	< 2,5 ms
response time (teach in characteristic)	< 3,1 ms
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	30 mA
output circuit	voltage output / PNP
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm
output current	< 10 mA (PNP)
voltage drop Vd	< 5 VDC (PNP)
short circuit protection	yes
reverse polarity protection	yes
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

order reference
IWFK 20Z8704/S35A

dimension drawing



connection diagram



connectors and mating connectors	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10152385	Sensofix series 18/20 inductive rectangular
for details: see accessories section	

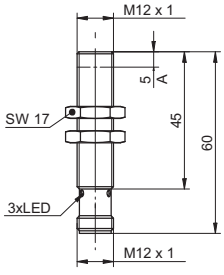
Sd = 2,75 ... 3 mm

- linear analog output
- external Teach-in
- large measuring distance

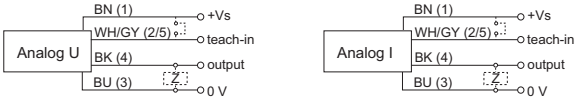
general data	
mounting type	flush
special type	linearized high sensitivity
measuring distance Sd	2,75 ... 3 mm
resolution	< 0,00025 mm (stat.) < 0,0005 mm (dynam.)
repeat accuracy	< 0,001 mm
adjustment	external Teach-in
teach	1-point analog, factory reset
linearity error	± 5 µm
temperature drift	± 4 % (Full Scale; +10 ... +30 °C) ± 12 % (Full Scale; -10 ... +60 °C)
voltage output	
sensitivity	40 V/mm (Range: 0,25 mm)
current output	
sensitivity	64 mA/mm (Range: 0,25 mm)
electrical data	
response time (factory characteristic)	< 3 ms
current consumption max. (no load)	15 mA
short circuit protection	yes
reverse polarity protection	yes
voltage output	
voltage supply range +Vs	12 ... 30 VDC
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
current output	
voltage supply range +Vs	8 ... 30 VDC
output signal	4 ... 20 mA
load resistance	< 25 Ohm/V * Vs
mechanical data	
type	cylindrical threaded
material (sensing face)	ceramic
housing material	steel nickel plated
dimension	12 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	15 Nm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

order reference	output circuit	sensitivity
IR12.D03K-11158152	current output	64 mA/mm (Range: 0,25 mm)
IR12.D03K-11158153	voltage output	40 V/mm (Range: 0,25 mm)

dimension drawing



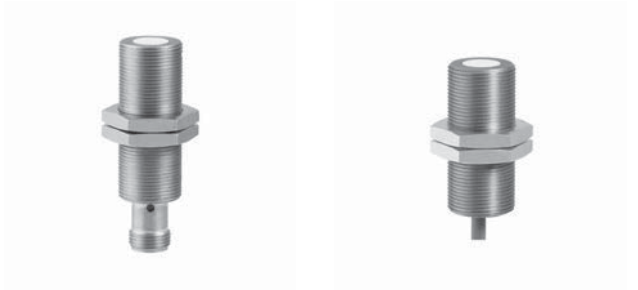
connection diagrams



connectors and mating connectors	
ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12
for details: see accessories section	

Sd = 2,75 ... 3 mm

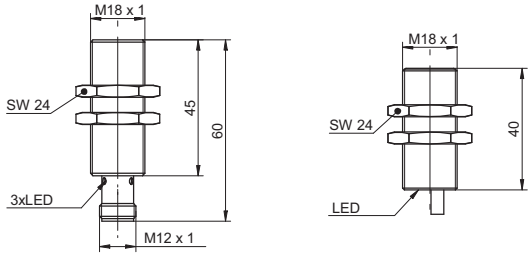


- linear analog output
- High Sensitivity
- large measuring distance

general data	
mounting type	flush
special type	linearized high sensitivity
measuring distance Sd	2,75 ... 3 mm
resolution	< 0,00025 mm (stat.) < 0,0005 mm (dynam.)
repeat accuracy	< 0,001 mm
adjustment	external Teach-in
teach	1-point analog, factory reset
linearity error	± 5 µm
temperature drift	± 4 % (Full Scale; +10 ... +30 °C) ± 12 % (Full Scale; -10 ... +60 °C)
voltage output	
sensitivity	40 V/mm (Range: 0,25 mm)
current output	
sensitivity	64 mA/mm (Range: 0,25 mm)
electrical data	
response time (factory characteristic)	< 3 ms
current consumption max. (no load)	15 mA
short circuit protection	yes
reverse polarity protection	yes
voltage output	
voltage supply range +Vs	12 ... 30 VDC
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
current output	
voltage supply range +Vs	8 ... 30 VDC
output signal	4 ... 20 mA
load resistance	< 25 Ohm/V * Vs
mechanical data	
type	cylindrical threaded
material (sensing face)	ceramic
housing material	steel nickel plated
dimension	18 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	40 Nm
ambient conditions	
operating temperature	-10 ... +60 °C
protection class	IP 67

order reference	output circuit	sensitivity
IR18.D03K-11158154	current output	64 mA/mm (Range: 0,25 mm)
IR18.D03K-11158155	voltage output	40 V/mm (Range: 0,25 mm)

dimension drawings



connection diagrams

connectors and mating connectors	
ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
10141584	Teach-in Adapter M12
for details: see accessories section	

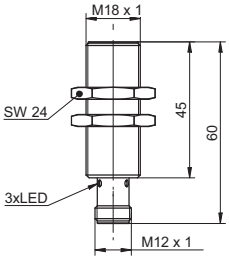
Sd = 0 ... 8 mm

- factor 1
- linear analog output
- external Teach-in

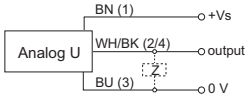
general data	
mounting type	flush
special type	linearized factor 1
measuring distance Sd	0 ... 8 mm
sensitivity	1,25 V/mm
resolution	< 0,02 mm (stat.) < 0,03 mm (dynam.)
repeat accuracy	< 0,03 mm
adjustment	external Teach-in
teach	1-point analog, 2-point analog, factory reset
linearity error	± 70 µm
temperature drift	± 3 % (Full Scale; S = 0 ... 6 mm) ± 5 % (Full Scale; S = 0 ... 8 mm)
electrical data	
response time (factory characteristic)	< 15 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	15 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	18 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	40 Nm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

order reference
IR18.D08F-11170540

dimension drawing



connection diagram



connectors and mating connectors	
ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
10141584	Teach-in Adapter M12
for details: see accessories section	

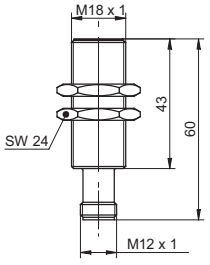
Sd = 0 ... 7 mm

- outdoor design, robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 … +70°C

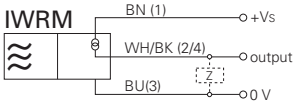
general data	
mounting type	quasi-flush
special type	Outdoor design Washdown design
measuring distance Sd	0 ... 7 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,015 mm
linearity error	± 350 µm
temperature drift	± 10 % (Full Scale)
approvals/certificates	Ecolab
electrical data	
response time (factory characteristic)	< 2 ms
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	40 mA
output circuit	current output
output signal	4 ... 20 mA
load resistance +Vs min.	< 330 Ohm
load resistance +Vs max.	< 1000 Ohm
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A)
dimension	18 mm
housing length	60 mm
connection types	connector M12
ambient conditions	
operating temperature	-40 ... +70 °C
cleaning temperature	70 ... +85 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

order reference
IWRR 18I97T4/S14

dimension drawing



connection diagram



connectors and mating connectors	
ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
for details: see accessories section	

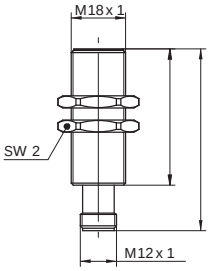
Sd = 0 ... 8 mm

- large measuring distance
- operating temperature -40 … +70°C

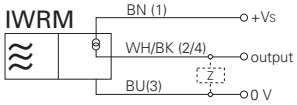
general data	
mounting type	quasi-flush
special type	Outdoor design
measuring distance Sd	0 ... 8 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,015 mm
linearity error	± 400 µm
temperature drift	± 10 % (Full Scale)
electrical data	
response time (factory characteristic)	< 2 ms
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	40 mA
output circuit	current output
output signal	4 ... 20 mA
load resistance +Vs min.	< 330 Ohm
load resistance +Vs max.	< 1000 Ohm
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	60 mm
connection types	connector M12
ambient conditions	
operating temperature	-40 ... +70 °C
protection class	IP 67

order reference
IWRM 18I97T4/S14

dimension drawing



connection diagram



connectors and mating connectors	
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
additional cable connectors and field wireable connectors: see accessories	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
for details: see accessories section	

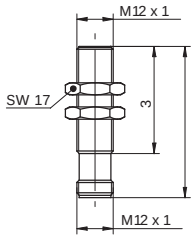
Sd = 0 ... 4 mm

- ATEX certification
- very high resolution

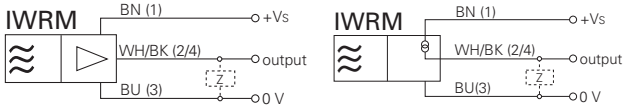
general data	
mounting type	quasi-flush
measuring distance Sd	0 ... 4 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeat accuracy	< 0,01 mm
linearity error	± 160 µm
temperature drift	± 4 % (Full Scale)
approvals/certificates	ATEX 2D
electrical data	
response time (factory characteristic)	< 2 ms
voltage supply range +Vs	15 ... 27 VDC
current consumption max. (no load)	20 mA
output circuit	current output
output signal	4 ... 20 mA
load resistance +Vs min.	< 330 Ohm
load resistance +Vs max.	< 1000 Ohm
Maximal zulässige Verlustleistung	< 1,35 W
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	connector M12
tightening torque max.	15 Nm
ambient conditions	
protection class	IP 67
safe maximum values	
marking	II 2D Ex tb IIIC T100°C Db IP6X
operating temperature Ta	-10 ... +50 °C

order reference
IWRM 12I9704/S14X

dimension drawing

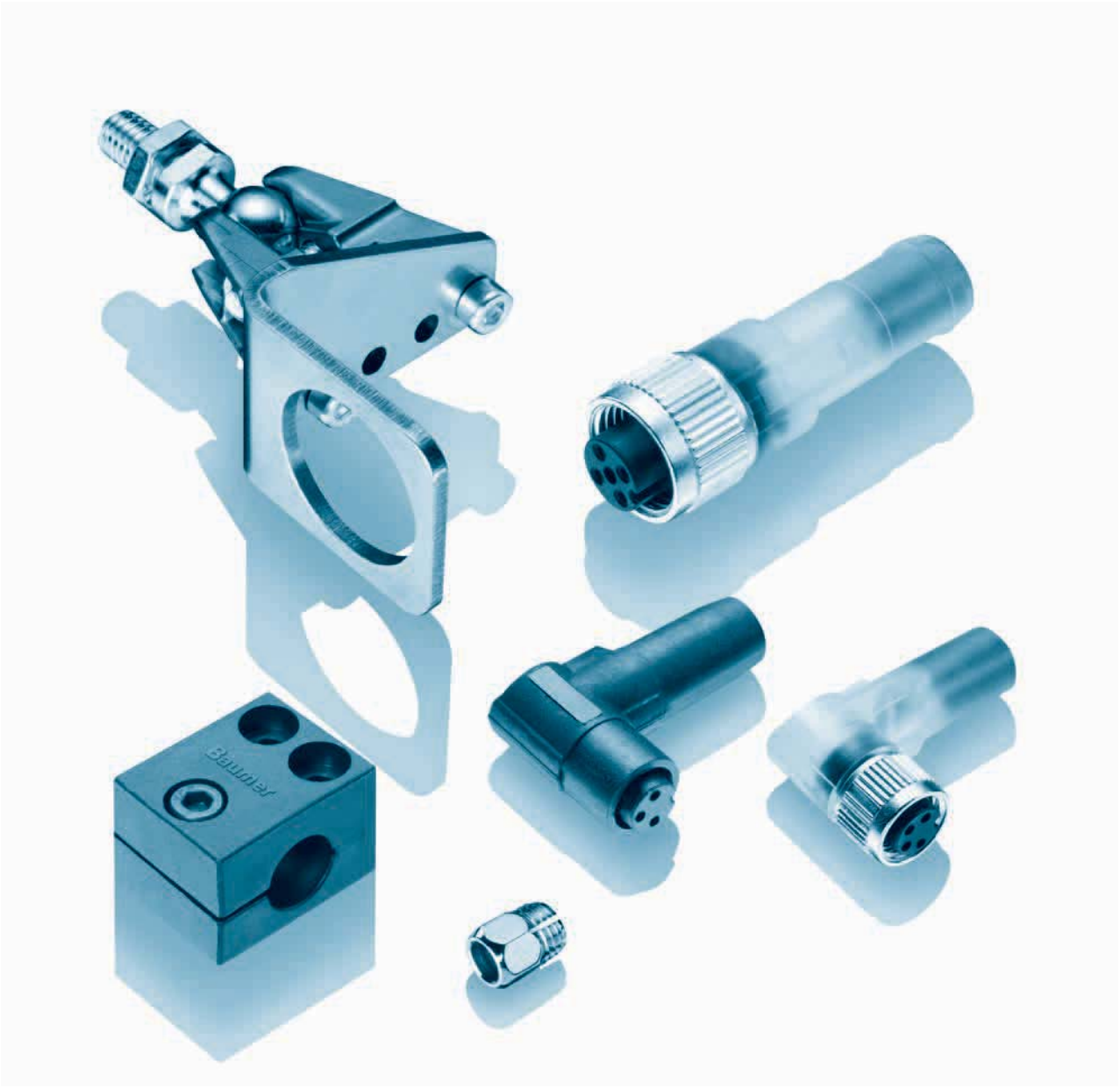


connection diagrams



connectors and mating connectors	
ESG 34SH0200X	Connector M12, 3 pin, straight, 2 m, only for ATEX applications with sensor IWRM 12I9704/S14X
ESW 33SH0200X	Connector M12, 3 pin, angular, 2 m, only for ATEX applications with sensor IWRM 12I9704/S14X
additional cable connectors and field wireable connectors: see accessories	

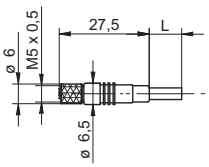
Accessories	
10151720	Sensofix series 12 round
for details: see accessories section	



Accessories

Connectors and mating connectors	Page 204
Connectors/Pin assignment	Page 212
Installation dimensions	Page 213
Mounting accessories	Page 214
Mounting kits *SENSOFIX*	Page 217

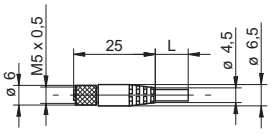
ESG 05 - Connector M5 straight



order reference	
ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESG 05SP0500	Connector M5, 3 pin, straight, 5 m
ESG 05SP1000	Connector M5, 3 pin, straight, 10 m

- Connector unshielded
- Miniature version
- Cable coating PUR

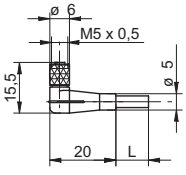
ESG 05G - Connector M5 straight, shielded



order reference	
ESG 05AP0200G	Connector M5, 4 pin, straight, 2 m, shielded

- Connector shielded
- Miniature version
- Cable coating PUR

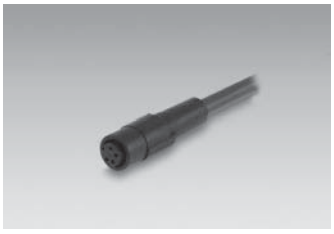
ESW 05 - Connector M5 angular

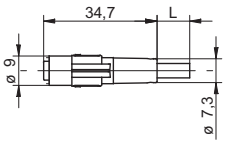


order reference	
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m
ESW 05SP0500	Connector M5, 3 pin, angular, 5 m

- Connector unshielded
- Miniature version
- Cable coating PUR

ESG 09 - Connector Ø 8 mm straight, snap-in

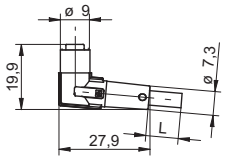




order reference	
ESG 09SH0200	Connector clip fastener, 3 pin, straight, 2 m
ESG 09SH0500	Connector clip fastener, 3 pin, straight, 5 m
ESG 09SH1000	Connector clip fastener, 3 pin, straight, 10 m

- Connector unshielded "snap-in"
- 3 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

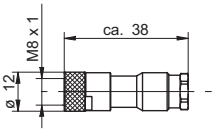
ESW 08 - Connector Ø 8 mm angular, snap-in



order reference	
ESW 08AH0200	Connector clip fastener, 4 pin, straight, 2 m
ESW 08AH0500	Connector clip fastener, 4 pin, straight, 5 m
ESW 08SH0200	Connector clip fastener, 3 pin, straight, 2 m
ESW 08SH0500	Connector clip fastener, 3 pin, straight, 5 m

- Connector unshielded "snap-in"
- 3 and 4 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

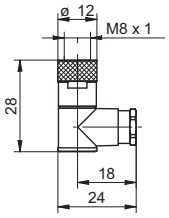
ES 21 - Cable socket M8 straight, not pre-assembled



order reference	
ES 21	Connector M8, 3 pin, straight
ES 21A	Connector M8, 4 pin, straight

- Connector female unshielded
- Connector only, no cable supplied
- 3 and 4 pin version

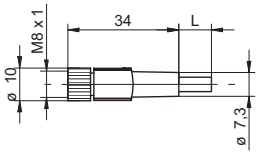
ES 22 - Cable socket M8 angular, not pre-assembled



order reference	
ES 22	Connector M8, 3 pin, angular
ES 22A	Connector M8, 4 pin, angular

- Connector female unshielded
- Connector only, no cable supplied
- 3 and 4 pin versions

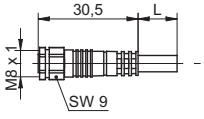
ESG 32 - Connector M8 straight



order reference	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESG 32AH0500	Connector M8, 4 pin, straight, 5 m
ESG 32AH1000	Connector M8, 4 pin, straight, 10 m
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESG 32SH0500	Connector M8, 3 pin, straight, 5 m
ESG 32SH1000	Connector M8, 3 pin, straight, 10 m

- Connector unshielded
- 3 and 4 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836
- Meet EN 60079-25 requirements for intrinsically safe ATEX applications

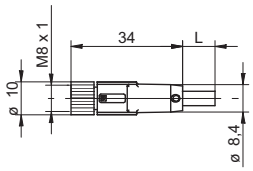
ESG 32F - Connector M8 straight, PVC/V4A



order reference	
ESG 32SF0500	Connector M8, 3 pin, straight, 5 m, V4A-PVC
ESG 32SF1000	Connector M8, 3 pin, straight, 10 m, V4A-PVC

- Connector unshielded
- 3 pin version
- Cable coating PVC
- Cap nut material in stainless steel V4A
- Suitable for flexible cable carriers

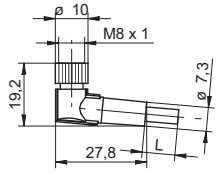
ESG 32G - Connector M8 straight, shielded



order reference	
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESG 32AH0500G	Connector M8, 4 pin, straight, 5 m, shielded
ESG 32AH1000G	Connector M8, 4 pin, straight, 10 m, shielded
ESG 32SH0500G	Connector M8, 3 pin, straight, 5 m, shielded
ESG 32SH1000G/T	Connector M8, 3 pin, straight, 10 m, shielded

- Connector shielded, screen connected with cap nut
- 3 and 4 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

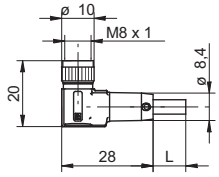
ESW 31 - Connector M8 angular



order reference	
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
ESW 31AH0500	Connector M8, 4 pin, angular, 5 m
ESW 31AH1000	Connector M8, 4 pin, angular, 10 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
ESW 31SH0500	Connector M8, 3 pin, angular, 5 m
ESW 31SH1000	Connector M8, 3 pin, angular, 10 m

- Connector unshielded
- 3 and 4 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836
- Meet EN 60079-25 requirements for intrinsically safe ATEX applications

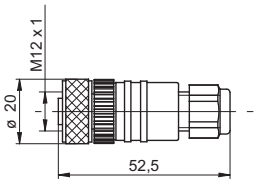
ESW 31G - Connector M8 angular, shielded



order reference	
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded
ESW 31AH0500G	Connector M8, 4 pin, angular, 5 m, shielded
ESW 31AH1000G	Connector M8, 4 pin, angular, 10 m, shielded
ESW 31SH0200G	Connector M8, 3 pin, angular, 2 m, shielded
ESW 31SH0500G	Connector M8, 3 pin, angular, 5 m, shielded

- Connector shielded, screen connected with cap nut
- 3 and 4 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

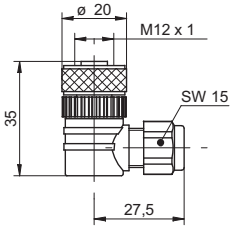
ES 18 - Cable socket M12 straight, not pre-assembled



order reference	
ES 18A PG7	Connector M12, 4 pin, straight
ES 18C PG7	Connector M12, 5 pin, straight

- Connector female unshielded
- Connector only, no cable supplied
- 4 and 5 pin versions

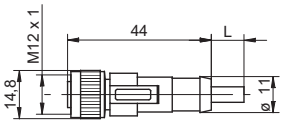
ES 14 - Cable socket M12 angular, not pre-assembled



order reference	
ES 14A PG7	Connector M12, 4 pin, angular
ES 14C PG7	Connector M12, 5 pin, angular

- Connector female unshielded
- Connector only, no cable supplied
- 4 and 5 pin versions

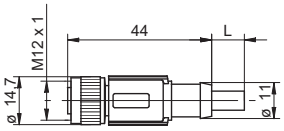
ESG 34 - Connector M12 straight



order reference	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESG 34AH0500	Connector M12, 4 pin, straight, 5 m
ESG 34AH1000	Connector M12, 4 pin, straight, 10 m
ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESG 34CH0500	Connector M12, 5 pin, straight, 5 m
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESG 34SH0500	Connector M12, 3 pin, straight, 5 m
ESG 34SH1000	Connector M12, 3 pin, straight, 10 m

- Connector unshielded
- 3, 4 and 5 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

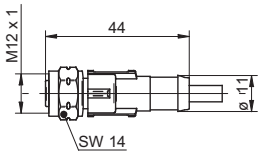
ESG 34G - Connector M12 straight, shielded



order reference	
ESG 34AH0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESG 34AH0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AH1000G	Connector M12, 4 pin, straight, 10 m, shielded
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded
ESG 34CH0500G	Connector M12, 5 pin, straight, 5 m, shielded
ESG 34CH1000G	Connector M12, 5 pin, straight, 10 m, shielded
ESG 34FH0200G	Connector M12, 8 pin, straight, 2 m, shielded
ESG 34FH0500G	Connector M12, 8 pin, straight, 5 m, shielded
ESG 34FH1000G	Connector M12, 8 pin, straight, 10 m, shielded

- Connector shielded, screen connected with cap nut
- 4, 5 and 8 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

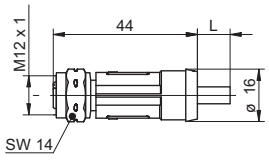
ESG 34F - Connector M12 straight, PVC/V4A



order reference	
ESG 34AF0500	Connector M12, 4 pin, straight, 5 m, V4A-PVC
ESG 34AF1000	Connector M12, 4 pin, straight, 10 m, V4A-PVC

- Connector unshielded
- 4 pin version
- Cable coating PVC
- Cap nut material in stainless steel V4A
- Ecolab certified and FDA conform
- UL listed, number E315836

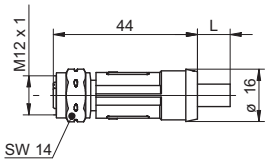
ESG 34 (Outdoor) - Connector M12 straight, PE-X cable



order reference	
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE1000	Connector M12, 4 pin, straight, 10 m

- For outdoor applications
- 4 pin versions unshielded
- Cable coating PE-X
- Halogen-free
- Cap nut material in high grade steel (1.4401)

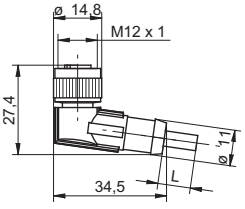
ESG 34G (Outdoor) - Connector M12 straight, shielded, PE-X cable



order reference	
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AE1000G	Connector M12, 4 pin, straight, 10 m, shielded

- For outdoor applications
- 4 pin versions shielded
- Cable coating PE-X
- Halogen-free
- Cap nut material in high grade steel (1.4401)

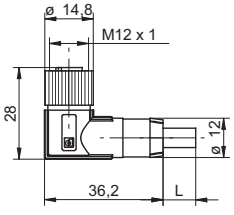
ESW 33 - Connector M12 angular



order reference	
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
ESW 33AH0500	Connector M12, 4 pin, angular, 5 m
ESW 33AH1000	Connector M12, 4 pin, angular, 10 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESW 33SH0500	Connector M12, 3 pin, angular, 5 m
ESW 33SH1000	Connector M12, 3 pin, angular, 10 m

- Connector unshielded
- 3, 4 and 5 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

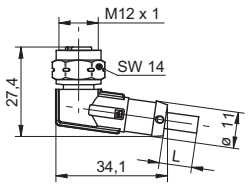
ESW 33G - Connector M12 angular, shielded



order reference	
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded
ESW 33AH0500G	Connector M12, 4 pin, angular, 5 m, shielded
ESW 33AH1000G	Connector M12, 4 pin, angular, 10 m, shielded
ESW 33CH0500G	Connector M12, 5 pin, angular, 5 m, shielded
ESW 33FH0200G	Connector M12, 8 pin, angular, 2 m, shielded
ESW 33FH0500G	Connector M12, 8 pin, angular, 5 m, shielded
ESW 33FH1000G	Connector M12, 8 pin, angular, 10 m, shielded

- Connector shielded, screen connected with cap nut
- 4, 5 and 8 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

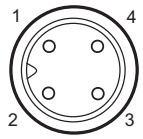
ESW 33F - Connector M12 angular, PVC/V4A



order reference	
ESW 33AF0200	Connector M12, 4 pin, angular, 2 m, V4A-PVC
ESW 33AF0500	Connector M12, 4 pin, angular, 5 m, V4A-PVC
ESW 33AF1000	Connector M12, 4 pin, angular, 10 m, V4A-PVC
ESW 33AF2500	Connector M12, 4 pin, angular, 25 m, V4A-PVC

- Connector unshielded
- 4 pin version
- Cable coating PVC
- Cap nut material in stainless steel V4A
- Ecolab certified and FDA conform
- UL listed, number E315836

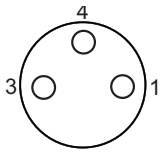
M5 3 pin



1 = BN
2 = n.c.
3 = BU
4 = BK

ESG 05
ESW 05

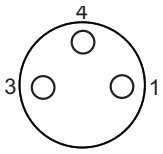
Snap-in 3 pin



1 = BN
3 = BU
4 = BK

ESG 09
ESW 08

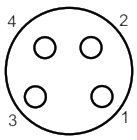
M8 3 pin



1 = BN
3 = BU
4 = BK

ES 21
ES 22
ESG 32S
ESW 31S

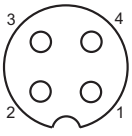
M8 4 pin



1 = BN
2 = WH
3 = BU
4 = BK

ES 21A
ES 22A
ESG 32A
ESG 32G
ESW 31A
ESW 31G

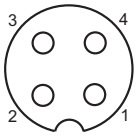
M12 3 pin



1 = BN
2 = n.c.
3 = BU
4 = BK

ESG 34S
ESW 33S

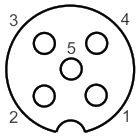
M12 4 pin



1 = BN (+Vs)
2 = WH (output)
3 = BU (0V)
4 = BK (output)

ES 14
ES 18
ESG 34A
ESG 34AF
ESG 34 (Outdoor)
ESW 33A
ESW 33AF

M12 5 pin



1 = BN
2 = WH
3 = BU
4 = BK
5 = GY

ES 14C
ES 18C
ESG 34C
ESW 33C

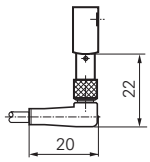
Note

Halogen-free cables

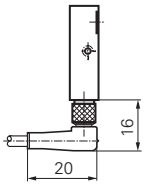
Sheath material	PUR black gray
Special properties	suitable for drag chains silicone-free free from substances that might impair surface wetting in the coating process
Free of halogens	according to DIN VDE 0472 part 815
Flame resistance	according to UL-Style 20549
Oil resistance	according to DIN VDE 60811-2-1

Connectors M5

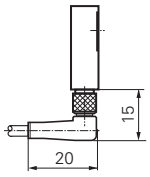
Dimension 06



Dimension 08

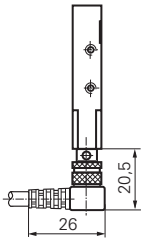


Dimension 12

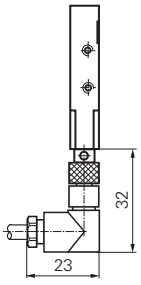


Connectors M8

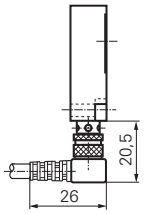
Dimension 08



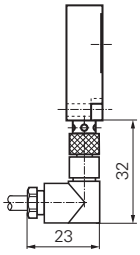
Dimension 08



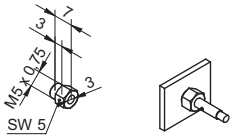
Dimension 20



Dimension 20

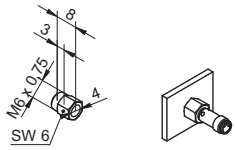


Clamping nut for sensors Ø 3 mm



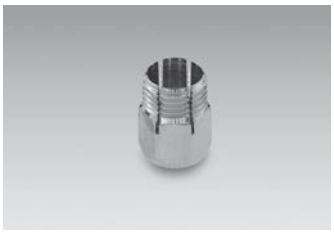
order reference	
10137021	Clamping nut for sensors Ø 3 mm

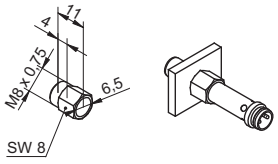
Clamping nut for sensors Ø 4 mm



order reference	
10119345	Clamping nut for sensors Ø 4 mm

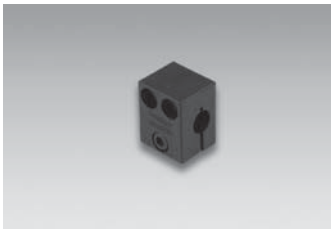
Clamping nut for sensors Ø 6,5 mm

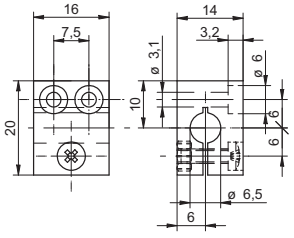




order reference	
10117742	Clamping nut for sensors Ø 6,5 mm

Mounting bracket 6,5 mm



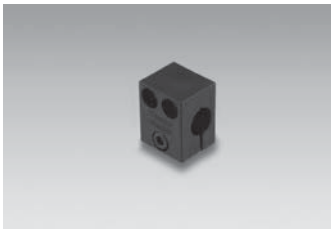


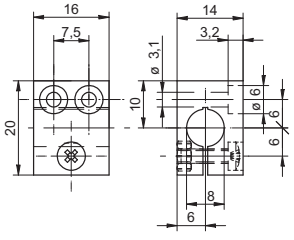
- Material: Plastic (PA6)

For sensors with Ø 6,5 mm

order reference	
10109474	Mounting bracket for sensors Ø 6,5 mm

Mounting bracket 8 mm



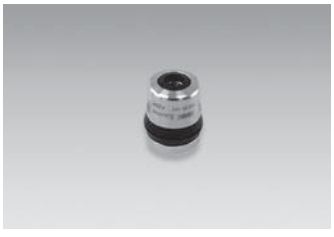


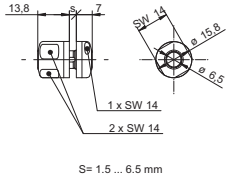
- Material: Plastic (PA6)

For sensors with Ø 8 mm

order reference	
10109475	Mounting bracket for sensors Ø 8 mm

Mounting HI06-1H for sensors in hygienic design Ø 6,5 mm



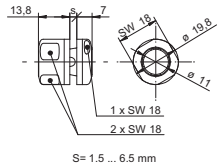


- Material: Stainless steel V4A
- EHEDG-certified

For use with inductive sensors 6,5 mm

order reference	
HI06-1H	Mounting for sensors in hygienic design Ø 6,5 mm

Mounting HI11-1H for sensors in hygienic design Ø 11 mm



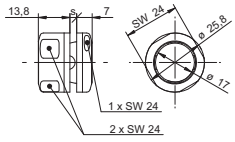
S= 1.5 ... 6.5 mm

- Material: Stainless steel V4A
- EHEDG-certified

For use with inductive sensors 11 mm

order reference	
HI11-1H	Mounting for sensors in hygienic design Ø 11 mm

Mounting HI17-1H for sensors in hygienic design Ø 17 mm



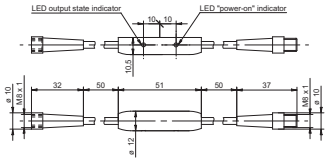
S= 1.5 ... 6.5 mm

- Material: Stainless steel V4A
- EHEDG-certified

For use with inductive sensors 17 mm and photoelectric sensors in hygienic design

order reference	
HI17-1H	Mounting for sensors in hygienic design Ø 17 mm

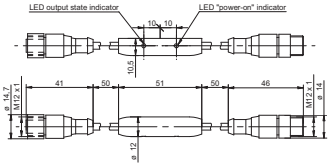
PNP to NPN Converter M8



- PNP/NPN Converter
- For frequencies up to max. 5 kHz
- For connector M8 - 3 pins

order reference	
10161959	Converter PNP/NPN - M8 x 1

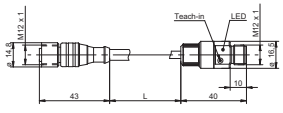
PNP to NPN Converter M12



- PNP/NPN Converter
- For frequencies up to max. 5 kHz
- For connector M12 - 3 pins

order reference	
10161958	Converter PNP/NPN - M12 x 1

Teach-in Adapter M12



order reference	
10141584	Teach-in Adapter M12

Test unit for sensors analog & digital

- Output via display (V or mA) or LED (PNP/NPN)
- Teach-in of sensors with integrated Teach- button
- Connection for plug in power supply (available as accessory)

Test- and configuration device for analog and digital PNP/NPN sensors with 18 VDC supply voltage

order reference	
11084376	Test unit for sensors analog & digital

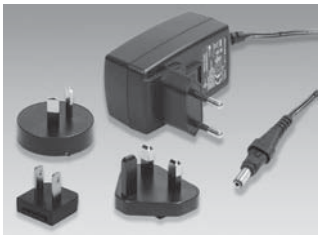
Test unit for sensors digital

- LED (red/green) for digital PNP/NPN signals
- Teach-in of sensors with integrated Teach- button
- Connection for plug in power supply (available as accessory)

Test- and configuration device for digital PNP/NPN sensors with 18 VDC supply voltage

order reference	
11084377	Test unit for sensors digital

Power supply for sensor test unit

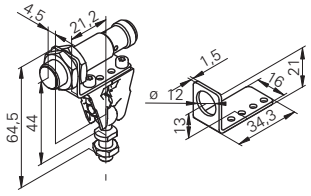


- Input 90-260 VAC
- Output 24 V/0,75 A
- Interchangeable plug-Type A, C, G and I

Protects the batteries of the sensor tester analog & digital for extended lifetime

order reference	
11087165	Test unit for sensors

Sensofix-Mounting kit for sensors series 12 round

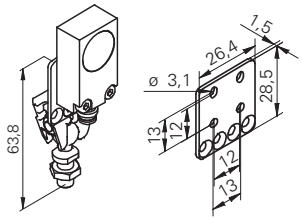


- Clamps made of stainless steel
- Ball pivots made of galvanized steel
- Mounting panel made of stainless steel

For use with all sensors in M12 housing

order reference	
10151720	Sensofix series 12 round

Sensofix-Mounting kit for sensors series 18/20

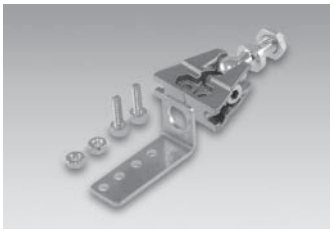


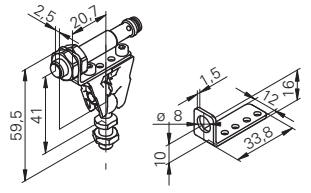
- Clamps made of stainless steel
- Ball pivots made of galvanized steel
- Mounting panel made of stainless steel

For use with inductive sensors series 18/20 in rectangular designs

order reference	
10152385	Sensofix series 18/20 inductive rectangular

Sensofix-Mounting kit for sensors series 08 round



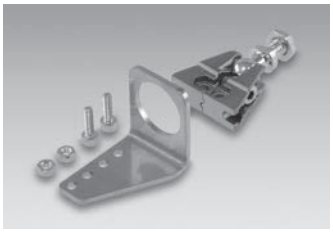


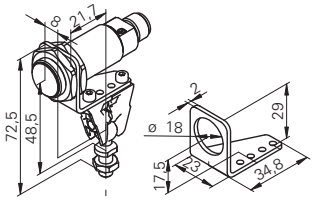
- Clamps made of stainless steel
- Ball pivots made of galvanized steel
- Mounting panel made of stainless steel

For use with all sensors in M8 housing

order reference	
10151719	Sensofix series 08 round

Sensofix-Mounting kit for sensors series 18 round





- Clamps made of stainless steel
- Ball pivots made of galvanized steel
- Mounting panel made of stainless steel

For use with all sensors in M18 housing

order reference	
10151658	Sensofix series 18

order reference	page
E	
ES 14A PG7	208
ES 14C PG7	208
ES 18A PG7	208
ES 18C PG7	208
ES 21	205
ES 21A	205
ES 22	206
ES 22A	206
ESG 05AP0200G	204
ESG 05SP0200	204
ESG 05SP0500	204
ESG 05SP1000	204
ESG 09SH0200	205
ESG 09SH0500	205
ESG 09SH1000	205
ESG 32AH0200	206, 212
ESG 32AH0200G	207
ESG 32AH0500	206, 212
ESG 32AH0500G	207
ESG 32AH1000	206, 212
ESG 32AH1000G	207
ESG 32SF0500	206
ESG 32SF1000	206
ESG 32SH0200	206, 212
ESG 32SH0500	206, 212
ESG 32SH0500G	207
ESG 32SH1000	206, 212
ESG 32SH1000G/T	207
ESG 34AE0500	209
ESG 34AE0500G	210
ESG 34AE1000	209
ESG 34AE1000G	210
ESG 34AF0500	209
ESG 34AF1000	209
ESG 34AH0200	208
ESG 34AH0200G	209
ESG 34AH0500	208
ESG 34AH0500G	209
ESG 34AH1000	208
ESG 34AH1000G	209
ESG 34CH0200	208
ESG 34CH0200G	209
ESG 34CH0500	208
ESG 34CH0500G	209
ESG 34CH1000G	209
ESG 34FH0200G	209
ESG 34FH0500G	209
ESG 34FH1000G	209
ESG 34SH0200	208
ESG 34SH0500	208
ESG 34SH1000	208
ESW 05SP0200	204
ESW 05SP0500	204
ESW 08AH0200	205
ESW 08AH0500	205
ESW 08SH0200	205
ESW 08SH0500	205
ESW 31AH0200	207
ESW 31AH0200G	207
ESW 31AH0500	207
ESW 31AH0500G	207
ESW 31AH1000	207
ESW 31AH1000G	207
ESW 31SH0200	207
ESW 31SH0200G	207
ESW 31SH0500	207
ESW 31SH0500G	207

order reference	page
ESW 31SH1000	207
ESW 33AF0200	211
ESW 33AF0500	211
ESW 33AF1000	211
ESW 33AF2500	211
ESW 33AH0200	210
ESW 33AH0200G	210
ESW 33AH0500	210
ESW 33AH0500G	210
ESW 33AH1000	210
ESW 33AH1000G	210
ESW 33CH0200	210
ESW 33CH0500	210
ESW 33CH0500G	210
ESW 33FH0200G	210
ESW 33FH0500G	210
ESW 33FH1000G	210
ESW 33SH0200	210
ESW 33SH0500	210
ESW 33SH1000	210
H	
HI06-1H	214
HI11-1H	215
HI17-1H	215
I	
IF08.D02S-F16.UA1Z.7WCU	179
IF08.D02S-F16.UA1Z.7WCV	179
IF08.D02S-F16.UA1Z.7WLV	179
IF08.D02S-F16.UA1Z.7WMV	179
IFBR 06N13T1/S14L-9	105
IFBR 06N33T1/S14L-9	105
IFBR 06P13T1/S14L-9	105
IFBR 06P33T1/S14L-9	105
IFBR 11N13T1/L-9	107
IFBR 11N13T1/S14L-9	107
IFBR 11N17T1/L-9	106
IFBR 11N17T1/S14L-9	106
IFBR 11N33T1/L-9	107
IFBR 11N33T1/S14L-9	107
IFBR 11N37T1/L-9	106
IFBR 11N37T1/S14L-9	106
IFBR 11P13T1/L-9	107
IFBR 11P13T1/S14L-9	107
IFBR 11P17T1/L-9	106
IFBR 11P17T1/S14L-9	106
IFBR 11P33T1/L-9	107
IFBR 11P33T1/S14L-9	107
IFBR 11P37T1/L-9	106
IFBR 11P37T1/S14L-9	106
IFBR 17N13T1/L-9	109
IFBR 17N13T1/S14L-9	109
IFBR 17N17T1/L-9	108
IFBR 17N17T1/S14L-9	108
IFBR 17N33T1/L-9	109
IFBR 17N33T1/S14L-9	109
IFBR 17N37T1/L-9	108
IFBR 17N37T1/S14L-9	108
IFBR 17P13T1/L-9	109
IFBR 17P13T1/S14L-9	109
IFBR 17P17T1/L-9	108
IFBR 17P17T1/S14L-9	108
IFBR 17P33T1/L-9	109
IFBR 17P33T1/S14L-9	109
IFBR 17P37T1/L-9	108
IFBR 17P37T1/S14L-9	108
IFF 08.82.05	147
IFFK 10E9101	148

order reference	page
IFFM 04N1501/O1L	87
IFFM 04N3501/O1L	87
IFFM 04P1501/O1L	87
IFFM 04P3501/O1L	87
IFFM 06N15A1/O1L	89
IFFM 06N15A3/O1L	88
IFFM 06N15A3/O1S05L	88
IFFM 06N35A1/O1L	89
IFFM 06N35A3/O1L	88
IFFM 06N35A3/O1S05L	88
IFFM 06P15A1/O1L	89
IFFM 06P15A3/O1L	88
IFFM 06P15A3/O1S05L	88
IFFM 06P35A1/O1L	89
IFFM 06P35A3/O1L	88
IFFM 06P35A3/O1S05L	88
IFFM 08N1701/O1L	93
IFFM 08N1701/O1S35L	95
IFFM 08N1702/O1L	92
IFFM 08N1703/O1L	91
IFFM 08N1703/O2S35L	94
IFFM 08N17A1/O1S35L	93
IFFM 08N17A3/O1S35L	92
IFFM 08N17A5/O1S35L	91
IFFM 08N17A6/KS35L	90
IFFM 08N17A6/L	90
IFFM 08N3701/O1L	93
IFFM 08N3701/O1S35L	95
IFFM 08N3702/O1L	92
IFFM 08N3703/O1L	91
IFFM 08N3703/O2S35L	94
IFFM 08N37A1/O1S35L	93
IFFM 08N37A3/O1S35L	92
IFFM 08N37A5/O1S35L	91
IFFM 08N37A6/KS35L	90
IFFM 08N37A6/L	90
IFFM 08P1701/O1L	93
IFFM 08P1701/O1S35L	95
IFFM 08P1702/O1L	92
IFFM 08P1703/O1L	91
IFFM 08P1703/O2S35L	94
IFFM 08P17A1/O1S35L	93
IFFM 08P17A3/O1S35L	92
IFFM 08P17A5/O1S35L	91
IFFM 08P17A6/KS35L	90
IFFM 08P17A6/L	90
IFFM 08P3701/O1L	93
IFFM 08P3701/O1S35L	95
IFFM 08P3702/O1L	92
IFFM 08P3703/O1L	91
IFFM 08P3703/O2S35L	94
IFFM 08P37A1/O1S35L	93
IFFM 08P37A3/O1S35L	92
IFFM 08P37A5/O1S35L	91
IFFM 08P37A6/KS35L	90
IFFM 08P37A6/L	90
IFFM 12N17A3/S05L	96
IFFM 12N37A3/S05L	96
IFFM 12P17A3/S05L	96
IFFM 12P37A3/S05L	96
IFFM 20N1501/S35L	97
IFFM 20N17A3/S35L	98
IFFM 20N3501/S35L	97
IFFM 20N37A3/S35L	98
IFFM 20P1501/S35L	97
IFFM 20P17A3/S35L	98
IFFM 20P3501/S35L	97
IFFM 20P37A3/S35L	98
IFR 04.82.05	140

order reference	page
IFR 05.82.05	140
IFR 10.82.01	150
IFR 10.82.05	150
IFR 10.82E05	149
IFRD 06N17A1/S35L	127
IFRD 06N17T1/S35	127
IFRD 06N37A1/S35L	127
IFRD 06N37T1/S35	127
IFRD 06P17A1/S35L	127
IFRD 06P17T1/S35	127
IFRD 06P37A1/S35L	127
IFRD 06P37T1/S35	127
IFRD 08N17A1/S35L	128
IFRD 08N17T1/S35	128
IFRD 08N37A1/S35L	128
IFRD 08N37T1/S35	128
IFRD 08P17A1/S35L	128
IFRD 08P17T1/S35	128
IFRD 08P37A1/S35L	128
IFRD 08P37T1/S35	128
IFRD 12N17A3/S14L	129
IFRD 12N17T3/S14	129
IFRD 12N37A3/S14L	129
IFRD 12N37T3/S14	129
IFRD 12P17A3/S14L	129
IFRD 12P17T3/S14	129
IFRD 12P37A3/S14L	129
IFRD 12P37T3/S14	129
IFRD 18N17A3/S14L	131
IFRD 18N17T3/S14	131
IFRD 18N37A3/S14L	131
IFRD 18N37T3/S14	131
IFRD 18P17A3/S14L	131
IFRD 18P17T3/S14	131
IFRD 18P37A3/S14L	131
IFRD 18P37T3/S14	131
IFRH 08P1501/L	135
IFRH 08P3501/L	135
IFRH 12P1501/L	136
IFRH 12P3501/L	136
IFRH 18P1501/L	136
IFRH 18P3501/L	136
IFRM 03N1501/KS35L	30
IFRM 03N1501/L	30
IFRM 03N1503/Q	30
IFRM 03N1505/CS35L	31
IFRM 03N1713/L	32
IFRM 03N1713/QL	32
IFRM 03N3501/KS35L	30
IFRM 03N3501/L	30
IFRM 03N3503/Q	30
IFRM 03N3505/CS35L	31
IFRM 03N3713/L	32
IFRM 03N3713/QL	32
IFRM 03P1501/KS35L	30
IFRM 03P1501/L	30
IFRM 03P1503/Q	30
IFRM 03P1505/CS35L	31
IFRM 03P1713/L	32
IFRM 03P1713/QL	32
IFRM 03P3501/KS35L	30
IFRM 03P3501/L	30
IFRM 03P3503/Q	30
IFRM 03P3505/CS35L	31
IFRM 03P3713/L	32
IFRM 03P3713/QL	32
IFRM 04N15A1/KS35PL	36
IFRM 04N15A1/L	36
IFRM 04N15A3/KS35PL	35
IFRM 04N15A3/L	35
IFRM 04N15A3/S05L	35
IFRM 04N15A3/S35L	37
IFRM 04N15A5/Q	34
IFRM 04N15B1/KS35PL	33
IFRM 04N15B1/L	33
IFRM 04N17A1/KS35PL	39
IFRM 04N17A1/PL	39
IFRM 04N17A1/S35L	40
IFRM 04N17A3/KS35PL	38
IFRM 04N17A3/PL	38
IFRM 04N17A3/S05L	38
IFRM 04N17A3/S35L	40
IFRM 04N35A1/KS35PL	36
IFRM 04N35A1/L	36
IFRM 04N35A3/KS35PL	35
IFRM 04N35A3/L	35
IFRM 04N35A3/S05L	35
IFRM 04N35A3/S35L	37
IFRM 04N35A5/Q	34
IFRM 04N35B1/KS35PL	33
IFRM 04N35B1/L	33
IFRM 04N37A1/KS35PL	39
IFRM 04N37A1/PL	39
IFRM 04N37A1/S35L	40
IFRM 04N37A3/KS35PL	38
IFRM 04N37A3/PL	38
IFRM 04N37A3/S05L	38
IFRM 04N37A3/S35L	40
IFRM 04P15A1/KS35PL	36
IFRM 04P15A1/L	36
IFRM 04P15A1/S35L	37
IFRM 04P15A3/KS35PL	35
IFRM 04P15A3/L	35
IFRM 04P15A3/S05L	35
IFRM 04P15A3/S35L	37
IFRM 04P15A5/Q	34
IFRM 04P15B1/KS35PL	33
IFRM 04P15B1/L	33
IFRM 04P17A1/KS35PL	39
IFRM 04P17A1/PL	39
IFRM 04P17A1/S35L	40
IFRM 04P17A3/KS35PL	38
IFRM 04P17A3/PL	38
IFRM 04P17A3/S05L	38
IFRM 04P17A3/S35L	40
IFRM 04P35A1/KS35PL	36
IFRM 04P35A1/L	36
IFRM 04P35A1/S35L	37
IFRM 04P35A3/KS35PL	35
IFRM 04P35A3/L	35
IFRM 04P35A3/S05L	35
IFRM 04P35A3/S35L	37
IFRM 04P35A5/Q	34
IFRM 04P35B1/KS35PL	33
IFRM 04P35B1/L	33
IFRM 04P37A1/KS35PL	39
IFRM 04P37A1/PL	39
IFRM 04P37A1/S35L	40
IFRM 04P37A3/KS35PL	38
IFRM 04P37A3/PL	38
IFRM 04P37A3/S05L	38
IFRM 04P37A3/S35L	40
IFRM 05N15A1/KS35PL	43
IFRM 05N15A1/L	43
IFRM 05N15A3/KS35PL	42
IFRM 05N15A3/L	42
IFRM 05N15A3/S05L	42
IFRM 05N15A3/S35L	44
IFRM 05N15A5/Q	41
IFRM 05N17A1/PL	46
IFRM 05N17A1/S35L	47
IFRM 05N17A3/PL	45
IFRM 05N17A3/S05L	45
IFRM 05N17A3/S35L	47
IFRM 05N35A1/KS35PL	43
IFRM 05N35A1/L	43
IFRM 05N35A3/KS35PL	42
IFRM 05N35A3/L	42
IFRM 05N35A3/S05L	42
IFRM 05N35A3/S35L	44
IFRM 05N35A5/Q	41
IFRM 05N37A1/PL	46
IFRM 05N37A1/S35L	47
IFRM 05N37A3/PL	45
IFRM 05N37A3/S05L	45
IFRM 05N37A3/S35L	47
IFRM 05P15A1/KS35PL	43
IFRM 05P15A1/L	43
IFRM 05P15A1/S35L	44
IFRM 05P15A3/KS35PL	42
IFRM 05P15A3/L	42
IFRM 05P15A3/S05L	42
IFRM 05P15A3/S35L	44
IFRM 05P15A5/Q	41
IFRM 05P17A1/PL	46
IFRM 05P17A1/S35L	47
IFRM 05P17A3/PL	45
IFRM 05P17A3/S05L	45
IFRM 05P17A3/S35L	47
IFRM 05P35A1/KS35PL	43
IFRM 05P35A1/L	43
IFRM 05P35A1/S35L	44
IFRM 05P35A3/KS35PL	42
IFRM 05P35A3/L	42
IFRM 05P35A3/S05L	42
IFRM 05P35A3/S35L	44
IFRM 05P35A5/Q	41
IFRM 05P37A1/PL	46
IFRM 05P37A1/S35L	47
IFRM 05P37A3/PL	45
IFRM 05P37A3/S05L	45
IFRM 05P37A3/S35L	47
IFRM 06N1701/KS35L	49
IFRM 06N1701/L	49
IFRM 06N1707	132
IFRM 06N1713/KS35L	48
IFRM 06N1713/L	48
IFRM 06N17A1/KS35L	50
IFRM 06N17A1/L	50
IFRM 06N17A1/S35L	50
IFRM 06N17A3/S35L	49
IFRM 06N17A4/L	51
IFRM 06N17A4/S35L	51
IFRM 06N17A5/S35L	48
IFRM 06N3701/KS35L	49
IFRM 06N3701/L	49
IFRM 06N3713/KS35L	48
IFRM 06N3713/L	48
IFRM 06N37A1/KS35L	50
IFRM 06N37A1/L	50
IFRM 06N37A1/S35L	50
IFRM 06N37A3/S35L	49
IFRM 06N37A4/L	51
IFRM 06N37A4/S35L	51
IFRM 06N37A5/S35L	48
IFRM 06P1701/KS35L	49
IFRM 06P1701/L	49

order reference	page
IFRM 06P1707	132
IFRM 06P1713/KS35L	48
IFRM 06P1713/L	48
IFRM 06P17A1/KS35L	50
IFRM 06P17A1/L	50
IFRM 06P17A1/S35L	50
IFRM 06P17A3/S35L	49
IFRM 06P17A4/KS35L	51
IFRM 06P17A4/L	51
IFRM 06P17A4/S35L	51
IFRM 06P17A5/S35L	48
IFRM 06P3701/KS35L	49
IFRM 06P3701/L	49
IFRM 06P3713/KS35L	48
IFRM 06P3713/L	48
IFRM 06P37A1/KS35L	50
IFRM 06P37A1/L	50
IFRM 06P37A1/S35L	50
IFRM 06P37A3/S35L	49
IFRM 06P37A4/KS35L	51
IFRM 06P37A4/L	51
IFRM 06P37A4/S35L	51
IFRM 06P37A5/S35L	48
IFRM 06X9503	141
IFRM 06X9503/P	141
IFRM 08N1701/KS35L	55
IFRM 08N1701/L	55
IFRM 08N1703/S14L	58
IFRM 08N1707	134
IFRM 08N1713/KS35L	54
IFRM 08N1713/L	54
IFRM 08N17A1/KS35L	56
IFRM 08N17A1/L	56
IFRM 08N17A1/S35L	56
IFRM 08N17A3/S35L	55
IFRM 08N17A4/KS35L	57
IFRM 08N17A4/L	57
IFRM 08N17A4/S35L	57
IFRM 08N17A5/S35L	54
IFRM 08N3701/KS35L	55
IFRM 08N3701/L	55
IFRM 08N3703/S14L	58
IFRM 08N3713/KS35L	54
IFRM 08N3713/L	54
IFRM 08N37A1/KS35L	56
IFRM 08N37A1/L	56
IFRM 08N37A1/S35L	56
IFRM 08N37A3/S35L	55
IFRM 08N37A4/KS35L	57
IFRM 08N37A4/L	57
IFRM 08N37A4/S35L	57
IFRM 08N37A5/S35L	54
IFRM 08P1701/KS35L	55
IFRM 08P1701/L	55
IFRM 08P1703/S14L	58
IFRM 08P1707	134
IFRM 08P1713/KS35L	54
IFRM 08P1713/L	54
IFRM 08P17A1/KS35L	56
IFRM 08P17A1/L	56
IFRM 08P17A1/S35L	56
IFRM 08P17A3/S35L	55
IFRM 08P17A4/KS35L	57
IFRM 08P17A4/L	57
IFRM 08P17A4/S35L	57
IFRM 08P17A5/S35L	54
IFRM 08P17T4	133
IFRM 08P3701/KS35L	55
IFRM 08P3701/L	55

order reference	page
IFRM 08P3703/S14L	58
IFRM 08P3707	134
IFRM 08P3713/KS35L	54
IFRM 08P3713/L	54
IFRM 08P37A1/KS35L	56
IFRM 08P37A1/L	56
IFRM 08P37A1/S35L	56
IFRM 08P37A3/S35L	55
IFRM 08P37A4/KS35L	57
IFRM 08P37A4/L	57
IFRM 08P37A4/S35L	57
IFRM 08P37A5/S35L	54
IFRM 08X9103	142
IFRM 08X9501/S35	142
IFRM 08X9503	142
IFRM 08X9503/S35	142
IFRM 12N13T1/PL	120
IFRM 12N13T1/S14L	120
IFRM 12N1701/L	61
IFRM 12N1701/S14L	62
IFRM 12N1701/S35L	64
IFRM 12N1702/L	62
IFRM 12N1703/S14L	61
IFRM 12N1704/L	63
IFRM 12N1704/S14L	63
IFRM 12N1707	134
IFRM 12N17X1/L	144
IFRM 12N17X2/L	145
IFRM 12N33T1/PL	120
IFRM 12N33T1/S14L	120
IFRM 12N3701/L	61
IFRM 12N3701/S14L	62
IFRM 12N3701/S35L	64
IFRM 12N3702/L	62
IFRM 12N3703/S14L	61
IFRM 12N3704/L	63
IFRM 12N3704/S14L	63
IFRM 12N37X1/L	144
IFRM 12N37X2/L	145
IFRM 12P13T1/PL	120
IFRM 12P13T1/S14L	120
IFRM 12P1701/L	61
IFRM 12P1701/S14L	62
IFRM 12P1701/S35L	64
IFRM 12P1702/L	62
IFRM 12P1703/S14L	61
IFRM 12P1704/L	63
IFRM 12P1704/S14L	63
IFRM 12P1707	134
IFRM 12P17X1/L	144
IFRM 12P17X2/L	145
IFRM 12P33T1/PL	120
IFRM 12P33T1/S14L	120
IFRM 12P3701/L	61
IFRM 12P3701/S14L	62
IFRM 12P3701/S35L	64
IFRM 12P3702/L	62
IFRM 12P3703/S14L	61
IFRM 12P3704/L	63
IFRM 12P3704/S14L	63
IFRM 12P37X1/L	144
IFRM 12P37X2/L	145
IFRM 12X9103	143
IFRM 12X9503	143
IFRM 18N13T1/PL	126
IFRM 18N13T1/S14L	126
IFRM 18N1701/S35L	74
IFRM 18N17A3/L	72
IFRM 18N17A3/S14L	72

order reference	page
IFRM 18N17A4/L	73
IFRM 18N17A4/S14L	73
IFRM 18N17A5/L	71
IFRM 18N17A5/S14L	71
IFRM 18N17M1/PL	122
IFRM 18N17M1/S14L	122
IFRM 18N33T1/PL	126
IFRM 18N33T1/S14L	126
IFRM 18N3701/S35L	74
IFRM 18N37A3/L	72
IFRM 18N37A3/S14L	72
IFRM 18N37A4/L	73
IFRM 18N37A4/S14L	73
IFRM 18N37A5/L	71
IFRM 18N37A5/S14L	71
IFRM 18N37M1/PL	122
IFRM 18N37M1/S14L	122
IFRM 18P1301/L	75
IFRM 18P1301/S14L	75
IFRM 18P13T1/PL	126
IFRM 18P13T1/S14L	126
IFRM 18P1701/S35L	74
IFRM 18P17A3/L	72
IFRM 18P17A3/S14L	72
IFRM 18P17A4/L	73
IFRM 18P17A4/S14L	73
IFRM 18P17A5/L	71
IFRM 18P17A5/S14L	71
IFRM 18P17M1/PL	122
IFRM 18P17M1/S14L	122
IFRM 18P33T1/PL	126
IFRM 18P33T1/S14L	126
IFRM 18P3701/S35L	74
IFRM 18P37A3/L	72
IFRM 18P37A3/S14L	72
IFRM 18P37A4/L	73
IFRM 18P37A4/S14L	73
IFRM 18P37A5/L	71
IFRM 18P37A5/S14L	71
IFRM 18P37M1/PL	122
IFRM 18P37M1/S14L	122
IFRM 18X9103	146
IFRM 18X9503	146
IFRM 30P1101/S14L	82
IFRM 30P1201/L	82
IFRM 30P1501/S14L	81
IFRM 30P1601/L	81
IFRM 30P3101/S14L	82
IFRM 30P3201/L	82
IFRM 30P3501/S14L	81
IFRM 30P3601/L	81
IFRP 12P1501/S14	138
IFRP 12P1504/S14	138
IFRP 16P1501/S14	139
IFRP 18P1501/S14	139
IFRR 08N13T1/S14L-9	110, 115
IFRR 08N33T1/S14L-9	110, 115
IFRR 08P13T1/S14L-9	110, 115
IFRR 08P33T1/S14L-9	110, 115
IFRR 12N13T1/L-9	112, 119
IFRR 12N13T1/PL-9	119
IFRR 12N13T1/S14L-9	112, 119
IFRR 12N17T1/L-9	111, 117
IFRR 12N17T1/S14L-9	111, 117
IFRR 12N33T1/L-9	112, 119
IFRR 12N33T1/PL-9	119
IFRR 12N33T1/S14L-9	112, 119
IFRR 12N37T1/L-9	111, 117
IFRR 12N37T1/S14L-9	111, 117

order reference	page
IFRR 12P13T1/L-9	112, 119
IFRR 12P13T1/PL-9	119
IFRR 12P13T1/S14L-9	112, 119
IFRR 12P17T1/L-9	111, 117
IFRR 12P17T1/S14L-9	111, 117
IFRR 12P33T1/L-9	112, 119
IFRR 12P33T1/PL-9	119
IFRR 12P33T1/S14L-9	112, 119
IFRR 12P37T1/L-9	111, 117
IFRR 12P37T1/S14L-9	111, 117
IFRR 18N13T1/L-9	114, 125
IFRR 18N13T1/PL-9	125
IFRR 18N13T1/S14L-9	114, 125
IFRR 18N17T1/L-9	113, 121
IFRR 18N17T1/S14L-9	113, 121
IFRR 18N33T1/L-9	114, 125
IFRR 18N33T1/PL-9	125
IFRR 18N33T1/S14L-9	114, 125
IFRR 18N37T1/L-9	113, 121
IFRR 18N37T1/S14L-9	113, 121
IFRR 18P13T1/L-9	114, 125
IFRR 18P13T1/PL-9	125
IFRR 18P13T1/S14L-9	114, 125
IFRR 18P17T1/L-9	113, 121
IFRR 18P17T1/S14L-9	113, 121
IFRR 18P33T1/L-9	114, 125
IFRR 18P33T1/PL-9	125
IFRR 18P33T1/S14L-9	114, 125
IFRR 18P37T1/L-9	113, 121
IFRR 18P37T1/S14L-9	113, 121
IFRW 12P1501/S14L	137
IFRW 18P1501/S14L	137
IR06.D03L-11174153	185
IR06.D03L-11174154	185
IR06.D03L-11176070	185
IR06.D03S-11137807	167
IR06.D03S-11141032	167
IR06.D03S-11144078	165
IR06.D03S-11144090	166
IR06.P02F-11117730	100
IR06.P02F-11117732	100
IR06.P02F-11119408	100
IR06.P02F-11119421	100
IR06.P02F-11119422	100
IR06.P02F-11119423	100
IR06.P02F-11119424	100
IR06.P02F-11119425	100
IR06.P03S-11148685	52
IR06.P03S-11148689	52
IR06.P03S-11148708	52
IR06.P03S-11148711	52
IR06.P03S-11148719	52
IR06.P03S-11148736	52
IR06.P03S-11148739	52
IR06.P03S-11148740	52
IR06.P06S-11148683	53
IR06.P06S-11148684	53
IR06.P06S-11148702	53
IR06.P06S-11148705	53
IR06.P06S-11148714	53
IR06.P06S-11148717	53
IR06.P06S-11148737	53
IR06.P06S-11148738	53
IR08.D02S-11123872	168
IR08.D02S-11130472	168
IR08.D03L-11141038	186
IR08.D03L-11175999	186
IR08.D03S-11123873	171
IR08.D03S-11130473	171

order reference	page
IR08.D03S-11141034	171
IR08.D03S-11141036	169
IR08.D03S-11141037	170
IR08.P02F-11111235	101
IR08.P02F-11116607	101
IR08.P02F-11119426	101
IR08.P02F-11119427	101
IR08.P02F-11119428	101
IR08.P02F-11119429	101
IR08.P02F-11119430	101
IR08.P02F-11119431	101
IR08.P03S-11148749	59
IR08.P03S-11148757	59
IR08.P03S-11148760	59
IR08.P03S-11148764	59
IR08.P03S-11148766	59
IR08.P03S-11148775	59
IR08.P03S-11148790	59
IR08.P03S-11148791	59
IR08.P06S-11148741	60
IR08.P06S-11148744	60
IR08.P06S-11148758	60
IR08.P06S-11148759	60
IR08.P06S-11148761	60
IR08.P06S-11148763	60
IR08.P06S-11148768	60
IR08.P06S-11148770	60
IR12.D03K-11158152	197
IR12.D03K-11158153	197
IR12.D04L-11130474	187
IR12.D04S-11123876	172
IR12.D04S-11130475	172
IR12.D06L-11135332	190
IR12.D06L-11141090	189
IR12.D06L-11157693	189
IR12.D06S-11123877	173
IR12.D06S-11130476	173
IR12.D06S-11141039	173
IR12.P04F-11111236	102
IR12.P04F-11116610	102
IR12.P04F-11119433	102
IR12.P04F-11119435	102
IR12.P04F-11119436	102
IR12.P04F-11119438	102
IR12.P04F-11119439	102
IR12.P04F-11119496	102
IR12.P04S-11158406	116
IR12.P04S-11158411	116
IR12.P04S-11159790	66
IR12.P04S-11159797	65
IR12.P06S-11148360	68
IR12.P06S-11148362	68
IR12.P06S-11148363	67
IR12.P06S-11148364	67
IR12.P06S-11148441	68
IR12.P06S-11148446	68
IR12.P06S-11148447	67
IR12.P06S-11148466	67
IR12.P06S-11148575	68
IR12.P06S-11148578	68
IR12.P06S-11148580	67
IR12.P06S-11148587	67
IR12.P06S-11148655	68
IR12.P06S-11148656	68
IR12.P06S-11148657	67
IR12.P06S-11148659	67
IR12.P10S-11148324	70
IR12.P10S-11148325	70
IR12.P10S-11148327	69

order reference	page
IR12.P10S-11148328	69
IR12.P10S-11148366	70
IR12.P10S-11148367	70
IR12.P10S-11148436	69
IR12.P10S-11148439	69
IR12.P10S-11148566	70
IR12.P10S-11148572	70
IR12.P10S-11148573	69
IR12.P10S-11148574	69
IR12.P10S-11148588	70
IR12.P10S-11148589	70
IR12.P10S-11148590	69
IR12.P10S-11148654	69
IR18.D03K-11158154	198
IR18.D03K-11158155	198
IR18.D05S-11140166	174
IR18.D08F-11170540	199
IR18.D08L-11130478	192
IR18.D08L-11141092	191
IR18.D08L-11164789	191
IR18.D08S-11123879	175
IR18.D08S-11130479	175
IR18.P06F-11117733	103
IR18.P06F-11117735	103
IR18.P06F-11119456	103
IR18.P06F-11119457	103
IR18.P06F-11119458	103
IR18.P06F-11119459	103
IR18.P06F-11119472	103
IR18.P06F-11119473	103
IR18.P08F-11111237	104
IR18.P08F-11116612	104
IR18.P08F-11119474	104
IR18.P08F-11119475	104
IR18.P08F-11119476	104
IR18.P08F-11119477	104
IR18.P08F-11119478	104
IR18.P08F-11119479	104
IR18.P08S-11184278	76
IR18.P08S-11184279	76
IR18.P10S-11158437	123
IR18.P10S-11174188	123
IR18.P12S-11148329	78
IR18.P12S-11148844	78
IR18.P12S-11148845	78
IR18.P12S-11148846	77
IR18.P12S-11148847	77
IR18.P12S-11148902	78
IR18.P12S-11149098	78
IR18.P12S-11149099	77
IR18.P12S-11149112	77
IR18.P12S-11149142	78
IR18.P12S-11149146	77
IR18.P12S-11149149	77
IR18.P12S-11149166	78
IR18.P12S-11149167	78
IR18.P12S-11149168	77
IR18.P12S-11149169	77
IR18.P15S-11148796	80
IR18.P15S-11148809	79
IR18.P15S-11148813	80
IR18.P15S-11148820	79
IR18.P15S-11148848	80
IR18.P15S-11148849	80
IR18.P15S-11148900	79
IR18.P15S-11148901	79
IR18.P15S-11149115	80
IR18.P15S-11149133	80
IR18.P15S-11149138	79

order reference	page
IR18.P15S-11149140	79
IR18.P15S-11149161	80
IR18.P15S-11149163	80
IR18.P15S-11149164	79
IR18.P15S-11149165	79
IR30.D18L-11179028	193
IR30.D18L-11179029	193
IR30.D18S-11179023	176
IR30.D18S-11179024	176
IR30.D24L-11179050	194
IR30.D24L-11179051	194
IR30.D24S-11179025	177
IR30.D24S-11179026	177
IR30.P18S-11171575	84
IR30.P18S-11174003	84
IR30.P18S-11174004	83
IR30.P18S-11174005	83
IR30.P18S-11174006	84
IR30.P18S-11174007	84
IR30.P18S-11174008	83
IR30.P18S-11174009	83
IR30.P24S-11174030	86
IR30.P24S-11174031	86
IR30.P24S-11174032	85
IR30.P24S-11174033	85
IR30.P24S-11174034	86
IR30.P24S-11174035	86
IR30.P24S-11174036	85
IR30.P24S-11174037	85
IWFK 20Z8704/S35A	196
IWFM 05U9701/S05	178
IWFM 12L9504/S35A	180
IWFM 12L9505/S35A	180
IWFM 12U9501/O1	181
IWFM 18L9504/S35A	182, 195
IWFM 18L9505/S35A	182, 195
IWFM 18U7504/S35A	182, 195
IWFM 20I9501/S35	184
IWFM 20I9503/S35	184
IWFM 20U9501/S35	184
IWFM 20U9503/S35	184
IWFM 20U9509/KS35AP	183
IWRM 04U9701/S05	164
IWRM 12I9704/S14X	202
IWRM 18I97T4/S14	201
IWRR 18I97T4/S14	200

order reference	page

order reference	page

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