GENERAL SPECIFICATIONS OF INDUCTIVE AND CAPACITIVE SENSORS - EN50032

ACTIVE FACE

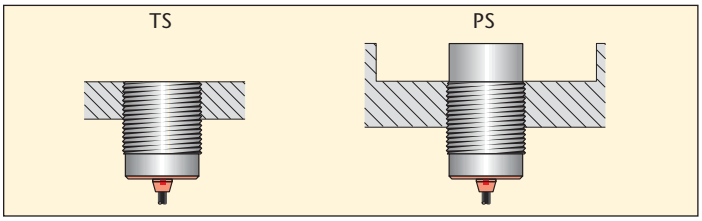
The active face of proximity sensor is the surface from which emits an oscillating field where a metallic object (inductive) or any material (capacitive) results in a change of state of the sensor without entering in contact with it.

EMBEDDABLE (FLUSH MOUNTING) SENSORS (TS)

The metal body covers the sensing area on all sides allows the unit to be installed in metal parts or next to other sensors without causing problems of reciprocal interference.

NOT EMBEDDABLE (NON FLUSH MOUNTING) SENSORS (PS)

The metal body leaves uncovered part of the sensing area resulting in an increased sensing distance. During installation it is important to remember the minimum distances from metallic parts in the case of inductive units and from any type of material in the case of capacitive units.
It is not possible to mount more than one sensor side by side.



INDUCTIVE SENSORS	
Aq 37	1 x Sn
Stainless steel	0,9 x Sn
Brass-bronze	0,5 x Sn
Aluminium	0,4 x Sn
Copper	0,4 x Sn

CAPACITIVE SENSORS		
Metals	≃	1 x Sn
Water	≃	1 x Sn
Plastic	≃	0,5 x Sn
Glass	≃	0,5 x Sn
Wood	≃	0,4 x Sn

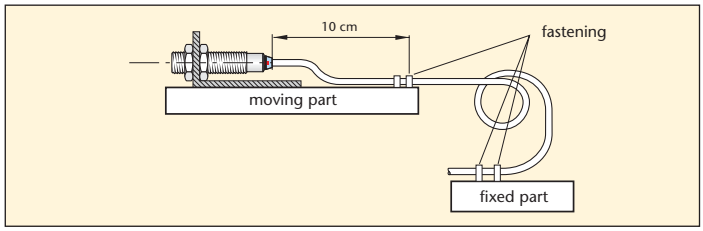
REDUCTION FACTORS IN INDUCTIVE AND CAPACITIVE SENSORS

If the object to be sensed is not Fe37 (inductives) or material other than metal (capacitives) the intervention distance reduces.

Futhermore if the object to be sensed has dimensions and thickness less than those indicated then the intervention distance will be further reduced.

SUGGESTIONS FOR MOUNTING

• Follow the indications listed in the technical characteristics for the various families of sensors.
• Take note of the temperature limits indicated for each family of sensors. Incorrect installation may result in a modification in the switching distance causing a change in equipment performance.
• When using sensors in areas where chemicals are present it is advised that they be installed so as not to come in direct contact with these substances as it may be difficult to establish their corrosiveness. Generally speaking the plastic parts have a high resistance to oil, salts, petrol and other hydrocarbons. It is recommeded that further information be requested from our technical department.
• Do not pull the cable with excessive force and if necessary use protective tubing.
• Avoid repetitive movements between cable and sensor if necessary follow the instructions in the diagram.

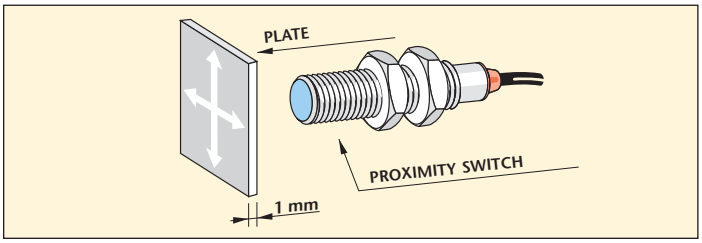


• All AECO sensors, in standard version, are supplied with cable in PVC and can also be supplied with pur or silicon cable.
The standard length of the cable is 2 mtrs, but upon request can also be supplied in lengths of 3.5 - 7.5 - 10 mtrs.
• Pay attention to the protection of the sensing face avoiding shock or mechanical pressure in order to avoid irreparable damage (particularly in the case of inductive sensors).
• Use suitable tools on the sensitivity regulation trimmer.
• Install both inductive and capacitive sensors in such a way as to avoid that any kind of material becomes deposited on the active surface.
• When installing sensor using locknuts do not overtighten them in order to avoid damage to the body of the sensor and the internal circuit. Particular attention should be given to sensors with a diameter equal to or less than 12 mm. Attention should all be given to avoid the installation of a sensor into a hole with the same diameter as this may cause irreparable damage.
• When preparing threaded holes for the fixing of sensors the following diameters should be followed:
M8 x 1 = ø7 o M12 x 1 = ø11 o M18 x 1 = ø17 o M30 x 1.5 = ø28.4

DESCRIPTION OF TECHNICAL TERMS

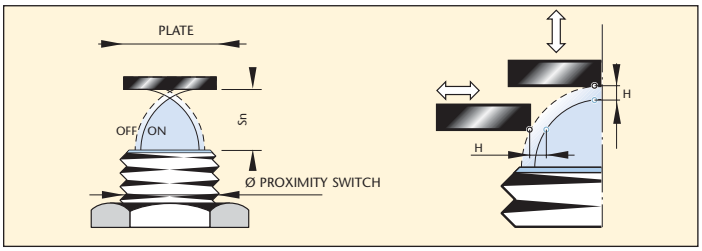
SWITCHING DISTANCE (Sn)

This is the switching distance measured at 20°C and nominal supply voltage, using a square piece of Fe 37 (EN50010) steel of 1 mm. thickness the side of which must be equal to or greater than the diameter of the active surface. In this condition the sensor switches in a Sn range of ± 10% Sn.



HYSTERESIS

Hysteresis is the distance between switching in both directions at nominal voltage and temperature values.
The value is expressed as a percentage of the switching distance.



GENERAL SPECIFICATIONS OF INDUCTIVE AND CAPACITIVE SENSORS - EN50032

REPEATABILITY
This indicates the intervention point variation of the sensor operated at the same conditions and in the same way.

SWITCHING FREQUENCY
The switching frequency is the maximum possible number of impulse repetitions per second. This is determinated by the measurement method according to din EN 50010 (right drawing). The max. values of the switching frequency of each sensor are indicated on the technical characteristics.

RATED VOLTAGE (Vn)
The rated voltage indicates the power supply values where the sensor works perfectly.

RESIDUAL RIPPLE
Ripple is the alternating voltage superimposed on the D.C. voltage (peak-peak) in %.

MAXIMUM OUTPUT CURRENT
Is the maximum current the sensor can generate in continuous operation.

MINIMUM OUTPUT CURRENT
It is the minimum current value which should flow through the sensor in order to guarantee a safe working.

PEAK CURRENT
The peak current indicates the maximum current value that the sensor can bear in a limited period of time.

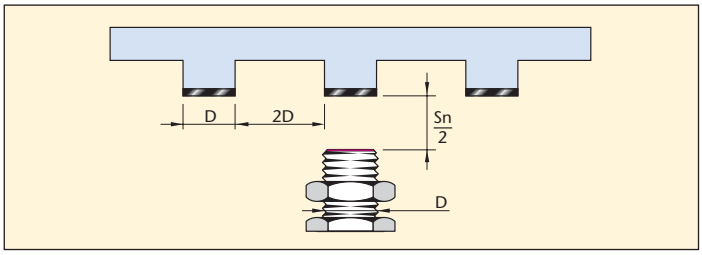
RESIDUAL CURRENT
It is the residual current which flows through the sensor when it is open.

ABSORPTION
Is the maximum current absorption of the sensor in relation to the maximum off load voltage.

VOLTAGE DROP
It is the voltage drop measured across the sensor.

SHORT CIRCUIT PROTECTION
Most of the D.C. sensors have incorporated a protection which prevents the internal circuit from being damaged by a short circuit or overload of the output.
When the short circuit is removed the sensor is automatically reactivated.

PROTECTION AGAINST REVERSAL OF POLARITY
All the sensors are protected against reversal of polarity, this prevents the internal components from being damaged by incorrect power-supply connection.



PROTECTION AGAINST INDUCTIVE PEAKS
All the sensors are protected against damage caused by the disconnection of inductive loads. It is advisable to keep the cable of the power conductors separate.

ISOLATION RESISTANCE
Expressed in ohm between the sensor circuit and the metal body, applying a voltage of 500 VCA.

DEGREE OF PROTECTION
This is the degree of protection of the body which contains the electrical parts expressed in IP followed by two numbers. In the case of inductive and capacitive switches the first is always 6 (complete protection against dust) and the second can be 5 (protected against jets of water) or 7 (protection against immersion for a fixed time).

TEMPERATURE LIMITS
Range of temperature within which the functions is guaranteed as per the technical characteristics.

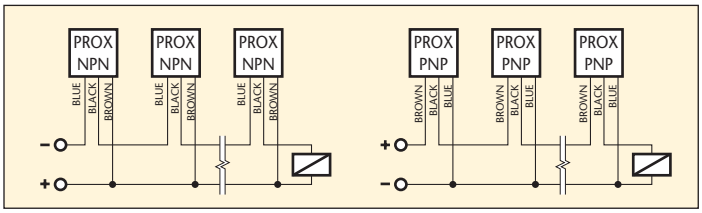
TEMPERATURE VARIATION
Maximum variation in the intervention distance (Sn) within the limits of temperature allowed expressed as a percentage of ± 10% Sn.

TYPE OF OUTPUT
All the inductive and capacitive sensors are of the different types N-B-C-A specified in page 5 and 57.

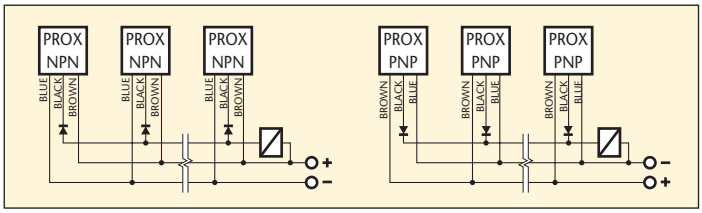
TYPE OF OUTPUT
For all AECO sensors the standard definitions are used N.O. normally open N.C. normally closed. This refers to the state of the sensor in the absence of switching material.
Most sensors can be supplied in the N.O. + N.C. output.

CONNECTION FOR INDUCTIVE AND CAPACITIVE SENSORS

CONNECTION OF D.C. TYPES IN SERIES (AND LOGIC)
In some applications it is necessary to obtain two corresponding signals before an action is carried out. Two sensors connected in this way will activate one output when they are excited simultaneously. When D.C. amplified types are used it is necessary to take into account the voltage drop present at the output of each sensor (<1,8V) the maximum load current of the sensors used and the current absorption of each single sensor (<10mA) as well as the final load.



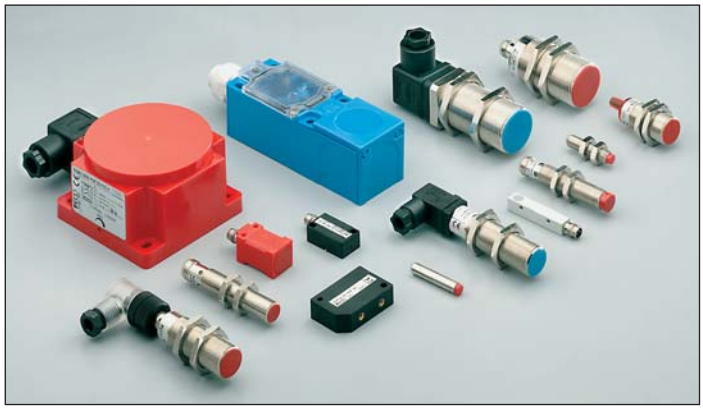
CONNECTION OF D.C. TYPES IN PARALLEL (OR LOGIC)
Connected in this way all sensors can activate the common output independently when excited. When amplified D.C. types are used it is necessary to take into account that each sensor has as an additional load of the resistance of the other sensors (collector resistances). Any incovenience caused by this can be overcome by asking specifically for sensors with the final stage which has an open collector or by adding disconnecting diodes as indicated by the drawing.



CONNECTION OF A.C. TYPES IN SERIES OR IN PARALLEL
A.C. sensors can be connected in series taking into account the voltage drop (≤ 6V) present in the sensor when connected in parallel. The off load current (≤ 4mA) should be summed and attention should be given when in the minimum load condition (high load impedance).
Such connections should in any case not be done as a function anomalous to the sensor can be generated. The "voltage drop" and the "residual current" is important in this type of connection.

24V A.C. POWER SUPPLY
In sensors supplied with 24V A.C. the voltage drop (≤ 6V) existing in the sensor and the possibile voltage drop due to the connecting wires between the sensor and the load should be taken into account.
In order to maintain an adequate voltage it is reccomended that the supply voltage be increased by at least 6V.

INDUCTIVE SENSORS SI SERIES



APPLICATIONS

Inductive sensors have wide uses in many applications, even in the most difficult working conditions for example in the presence of oils, powders, liquids and vibrations which do not have any effect on their secure functioning.
AECO sensors are mounted on machine tools, textile machines, transfer lines, transport systems, packaging equipment, in the automobile industry and in all applications where solutions for automation are required.

STANDARDIZED SENSING PLATE

Its use allows the comparison of the values of sensing distance (see table). The measuring method is defined by the european standard EN 50010. The normalized plate is square and has a thickness of 1 mm, the material of this plate must be steel (Fe37). Other materials mean that different intervention distances are obtained. The length of the sides of the plate must correspond to the diameter of a circle that is the active surface of the sensor. A larger plate does not result in an increase in the nominal intervention distance, however a reduction in the plate reduces the intervention distance.

NOMINAL INTERVENTION DISTANCE Sn

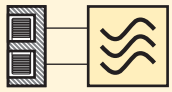
The nominal distance is defined as the switching value where variations due to changes in temperature and voltage are taken into account.

TABLE OF COMPARISON: SENSOR - DISTANCE - PLATE

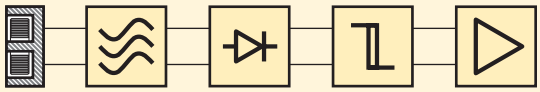
DIAMETER OR SIZE	DISTANCE Sn EMBEDDABLE mm	DISTANCE Sn NOT EMBEDDABLE mm	DOUBLE SWITCH DISTANCE Sn EMBEDDABLE mm	DOUBLE SWITCH DISTANCE Sn NOT EMBEDD. mm	SENSING PLATE Fe 37 SIDE x THICKNESS mm
4 - 5	0.8	-	-	-	5 x 1
6,5 - 8	1	2	2	3	8 x 1
12	2	4	4	8	12 x 1
14	3	5	-	-	14 x 1
18	5	8	8	16	18 x 1
30	10	15	15	20	30 x 1
SIP A8 - C8	2	-	-	-	8 x 1
SIP 10	2	-	-	-	8 x 1
SIP 12	2	4	-	-	12 x 1
SIP 17	-	5	-	-	12 x 1
SIP 25	5	-	-	-	18 x 1
SIP 40	15	20	-	-	45 x 1
SIQ 80	-	50	-		100 x 1

WORKING PRINCIPLE

By applying a voltage to the oscillator coil an alternating inductive field is created in front of the active surface of the unit.
When a metallic object (steel, aluminium, copper, brass etc.) enters this field from any direction and the state of the oscillator is modified until the threshold of the trigger is inverted this induces a change in the final stage and the subsequent command of an external load.
The intervention distance depends on the type of metal and as described earlier, in the reduction factors. All the sensors are protected against inversion of polarity and electrical disturbances of inductive sources and can be supplied with short circuit protection in the D.C. version. The main advantages offered by proximity sensors in relation to normal limit switches are mainly unlimited duration as they have no moving parts (wheels, springs etc.) lack of maintainance requirement and elimination of possible false contacts due to contact movement.



BLOCK DIAGRAM OF NON AMPLIFIED INDUCTIVE SENSOR



BLOCK DIAGRAM OF AMPLIFIED INDUCTIVE SENSOR

REAL INTERVENTION DISTANCE Sr

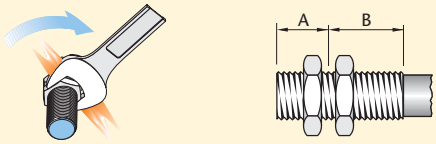
This is the distance measured according to the EN 50010 standard at nominal temperature and voltage: 0,9Sn ≤ Sr ≤ 1,1Sn.

INTERVENTION DISTANCE Su

This is the distance measured according to the EN 50010 standard at a specified temperature and voltage between the allowed limits 0,9Sr ≤ Su ≤ 1,1Sr.

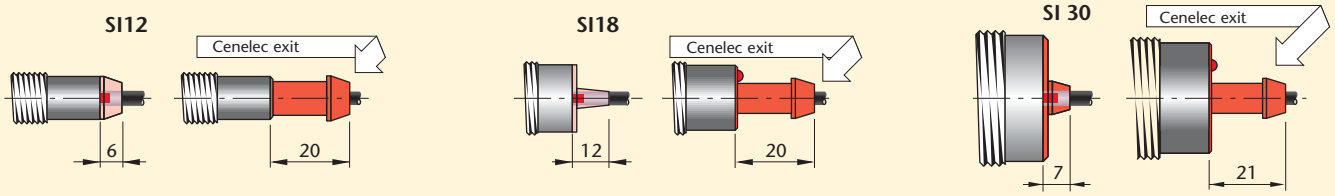
TIGHTENING TORQUES

To prevent mechanical damage to the proximity switch when installing, certain tightening torques on the mounting nuts should not be exceeded.



MODELS	DIM. A (mm)	TIGHTENING TORQUE (Nm) max.	
		A	B
SI5	4	0.5	1.5
SI8	7	8	12
SI12	10	12	28
SI18	10	30	40
SI30	13	35	40

CABLE EXIT - STANDARD AND CENELEC TYPES



N.B.: On request the sensors with standard cable exit type are also availbale with cenelec cable exit type.

INDUCTIVE SENSORS SI SERIES

SENSOR VERSION N IN ACCORDANCE WITH NAMUR STANDARDS - DIN 19234 (2 wire)

These are two-wire non amplified D.C. sensors which contain only the oscillator and are adapted to control an electronic amplified thereshold circuit.
Only a few components are needed, thus inevitably guaranteeing for this type of sensor the maximum operational safety and reliability. Thanks to its low-resistance termination this sensor is not susceptible to inductive or capacitive irradiations into the connecting lead with the amplifier. They can be supplied with EEx ia IIc T4 approval. They can be supplied together with power supplies: ALNC - ALN2 - ALTP.

SENSOR VERSION B FOR DIRECT VOLTAGE (2 wire)

These are two-wire amplified sensors which contain an ouput amplifier with function N.O. or N.C. in addition to the oscillator and can pilot a load connected in series. However due to this system a residual current flows through the load even when in the open state. In addition a voltage drop occurs to the sensor when it is in the closed state. Attention must be paid to these restrictions when selecting the relays or electronic controls required for connections. They are adapted for inputs of programmable controllers.

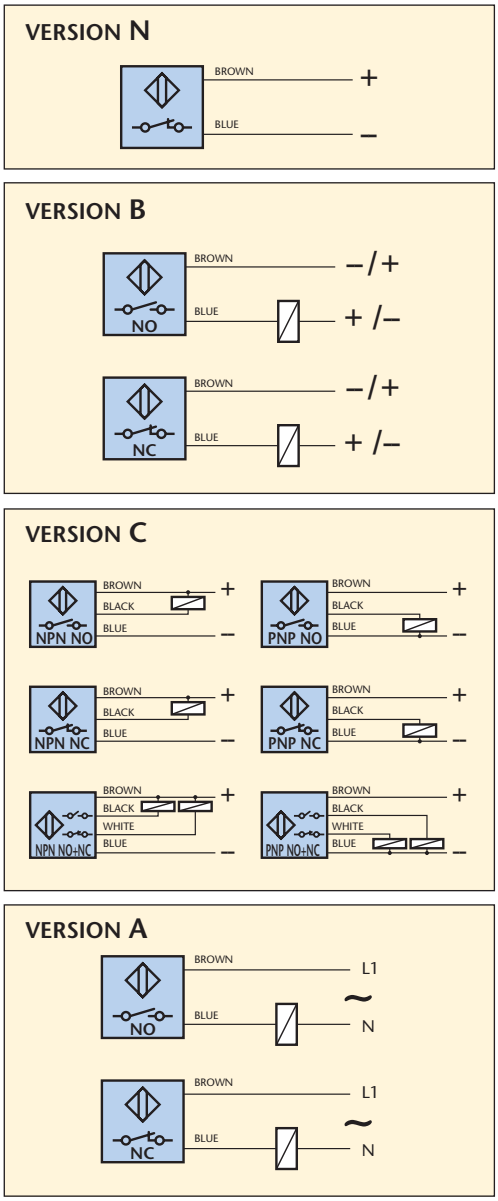
SENSORS VERSION C FOR DIRECT VOLTAGE (3 and 4 wire)

These are amplified D.C. sensors which contain an output amplifier in addition to the oscillator. They are supplied as 3 wires with function N.O. or N.C. and as 4 wire with antiphase outputs in the types NPN and PNP as standard this version of sensor is protected against short circuit, absolutely protected against polarity and peaks created by the disconnection of inductive loads. These sensors can be supplied together with power supplies: ALNC - ALTP. They are adapted for inputs of programmable controllers.

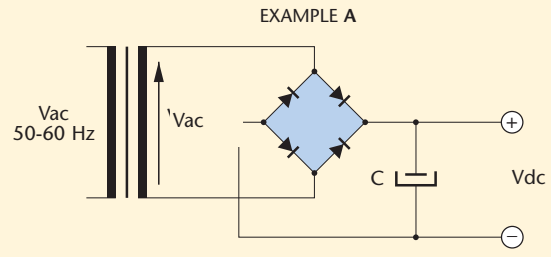
SENSORS VERSION A FOR ALTERNATING VOLTAGE (2 wire)

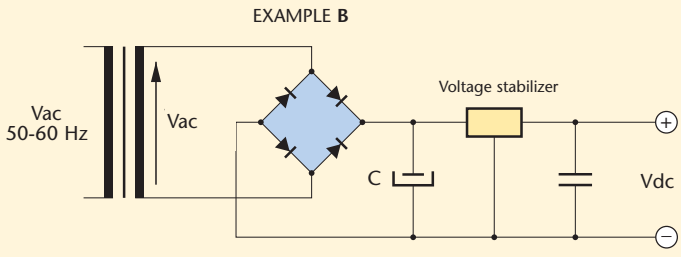
These are two-wire sensors which contain a thyristor output amplifier in addition to the oscillator. The load which is connected in series with the sensor is passed through by the same residual current that it is supplied by. It is particularly important to pay attention to the low consumption relay, in fact it is important to ensure that:
- The required current for the switching of the relay is EQUAL to or SUPERIOR to the minimun output current required by the sensor.
- The current required for the secure releasing of the relay is SUPERIOR to the residual current of the sensor.

If these parameters are not respected there will be an uncertain switching of the relay. Furthermore attention must be given to high impedance imput connections of electronic commands as the residual current in the sensor could be sufficient to cause activation.
In the closed state a voltage drop can be found this should be taken into account especially when there is a low voltage supply.
They are also protected against voltage transients coming from the power supply or generated by the load.
They are compatible with P.L.C. units.



SUGGESTION FOR SUPPLYING VOLTAGE TO INDUCTIVE SENSORS





The supply voltage should be adjusted according to the characteristics of the sensor used. It is recommended to use a trasformer with secondary voltage Vac lower than the direct voltage Vdc required.
The secondary voltage Vac is found as follows:
Vac = (Vdc + 1) : 1,41

The supply voltage Vdc of the sensor should be filtered with a capacity C at least 470 µF for each 200 mA used.
If the supply voltage Vdc is high it is recommended to follow the diagram B with a proper voltage stabilizer.

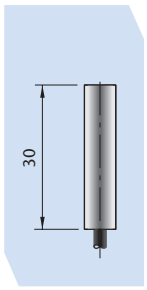
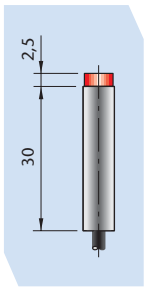
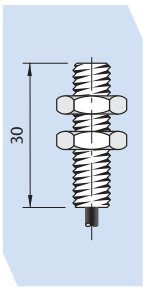
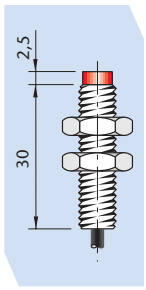
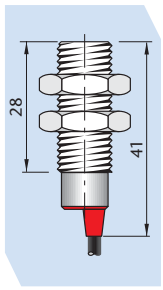
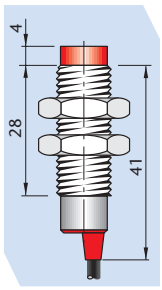
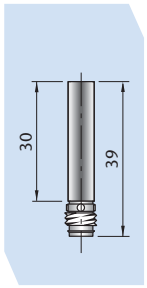
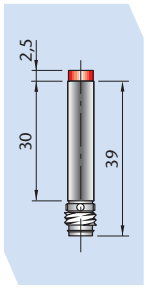
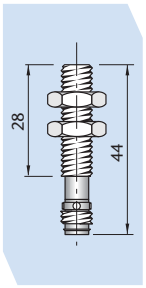
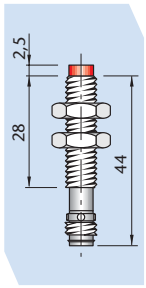
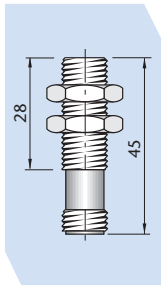
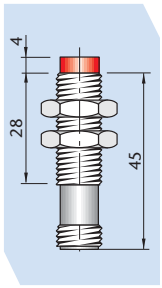
NAMUR INDUCTIVE SENSORS

CYLINDRICAL HOUSING Ø 6.5 - M8-M12-M14-M18-M30
2 WIRES D.C. - VERSION N

▲ **EMBEDDABLE** (FLUSH MOUNTING)
● **NOT EMBEDDABLE**
(NON FLUSH MOUNTING)

TECHNICAL CHARACTERISTICS

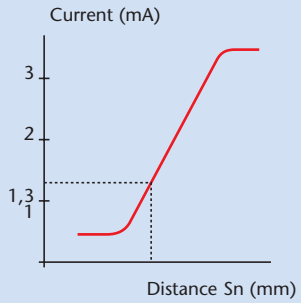
Dimensions mm

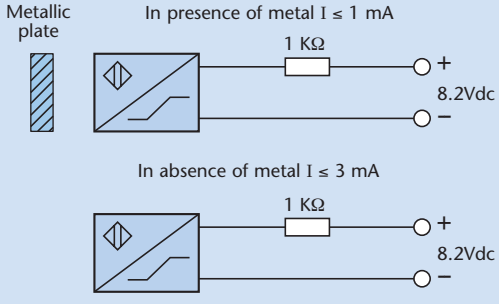
	▲ Ø 6,5	● Ø 6,5	▲ M8 x 1	● M8 x 1	▲ M12 x 1	● M12 x 1
						
MODELS WITH CABLE	**SI 6.5 - N1**	**SI 6.5 - NE2**	**SI 8 - N1**	**SI 8 - NE2**	**SI 12 - N2**	**SI 12 - NE4**
						
MODELS WITH CONNECTOR	**SI 6.5 - N1 H1**	**SI 6.5 - NE2 H1**	**SI 8 - N1 H1**	**SI 8 - NE2 H1**	**SI 12 - N2 H**	**SI 12 - NE4 H**

Switching distance (Sn)	mm	1	2	1	2	2	4
Continuous voltage (residual ripple ≤10%)	V	8,2 ("5 ÷ 30" see note 1)					
Absorption current at 8.2V	mA	In presence of metal ≤ 1 mA - In absence of metal ≥ 3 mA					
Switching frequency	Hz	2000		2000		2000	
Repeatability	% of Sn	≤ 3					
Temperature limits	°C	-25 ÷ +70					
Degree of protection	IP	67 (With H1 - H depending on connector)					
Housing		Nickelled brass					
Cable PUR blue	2 m	2 x 0.25 mm²		2 x 0.25 mm²		2 x 0.25 mm²	
Connector plug		H1		H1		H	

NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 -

WORKING PRINCIPLE



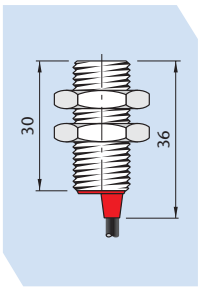
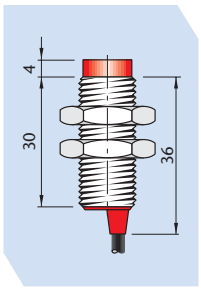
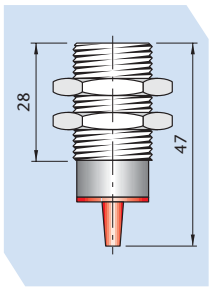
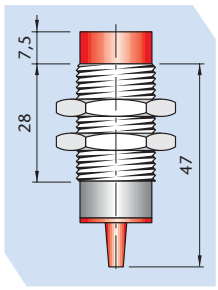
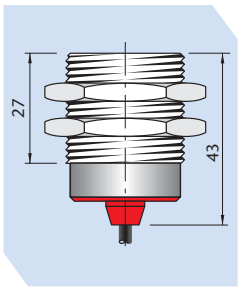
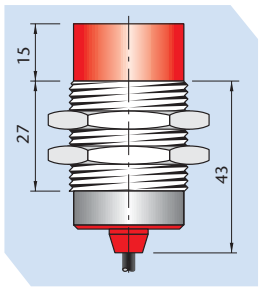
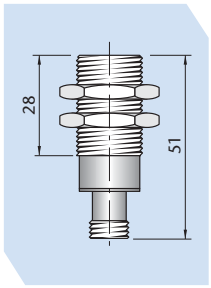
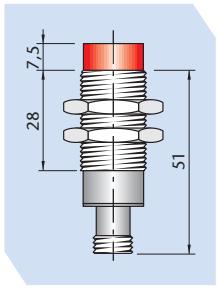
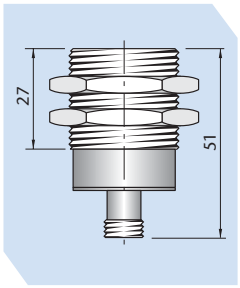
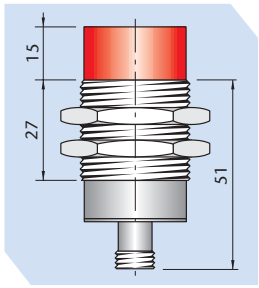


The NAMUR sensors are electronic devices whose absorbed current varies in the presence of a metallic object. The difference between these sensors and traditional sensors is the absence of amplifier trigger stages.

Note 1: In applications outside security conditions the sensors can be used in the 5-30Vdc range.

NAMUR INDUCTIVE SENSORS

CONFORMING TO NAMUR STANDARDS (DIN 19234)
APPROVAL *EEx ia IIc T4**

▲ M14 x 1	● M14 x 1	▲ M18 x 1	● M18 x 1	▲ M30 x 1.5	● M30 x 1.5
					
SI 14 - N3	**SI 14 - NE5**	**SI 18 - N5**	**SI 18 - NE8**	**SI 30 - N10**	**SI 30 - NE15**
					
-	-	**SI 18 - N5 H**	**SI 18 - NE8 H**	**SI 30 - N10 H**	**SI 30 - NE15 H**
3	5	5	8	10	15
8,2 ("5 ÷ 30" see note 1 at page 6)					
In presence of metal ≤ 1 mA - In absence of metal ≥ 3 mA					
2000		1000		500	
≤ 3					
-25 ÷ +70					
67 (With H depending on connector)					
Nickelled brass					
2 x 0.25 mm²		2 x 0.50 mm²		2 x 0.50 mm²	
Non previsto		H		H	

- NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 -

APPLICATIONS

The NAMUR (DIN 19234) proximity switches are electronic sensors whose absorbed current varies in the presence of metallic objects.
The reduced dimensions, the low values of voltage, current and impedance (unaffected by overvoltage and excessive current from inductive or capacitive sources), allows them to be used in various applications in both intrinsically safe and normal areas.

Applications in intrinsically safe areas (explosive atmospheres). *
The sensor must be used with an intrinsically safe relay or an equivalent static input suitable for intrinsically safe applications.

Standard applications (normal atmospheres).
The sensor must be used with AECO supply and amplifier units ALNC, ALN2 or similar.

**** When ordering, add "Ex" (Es. SI8-N1 Ex).***

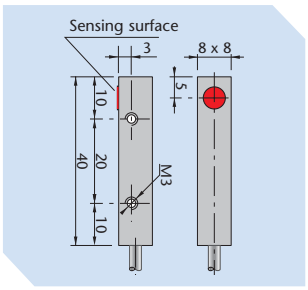
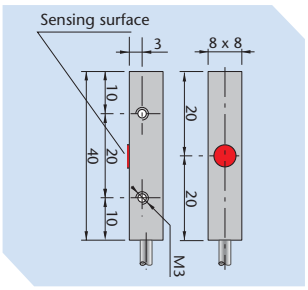
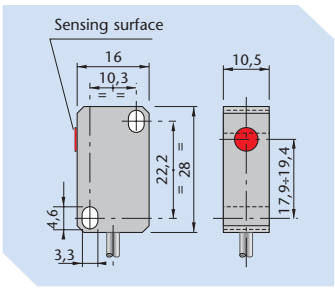
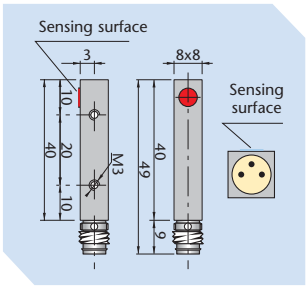
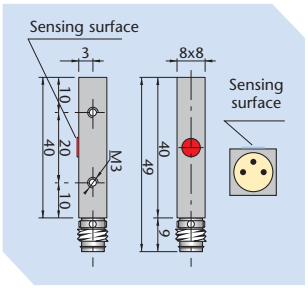
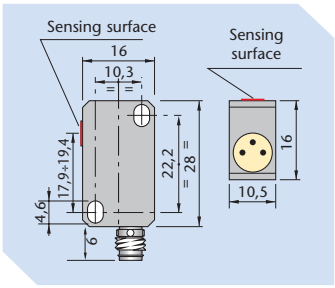
NAMUR INDUCTIVE SENSORS

RECTANGULAR HOUSING SIPA8 - SIPC8 - SIP10 - SIP12 - SIP17 - SIP40 - SIQ80
2 WIRES D.C. - VERSION N

▲ **EMBEDDABLE** (FLUSH MOUNTING)
● **NOT EMBEDDABLE**
(NON FLUSH MOUNTING)

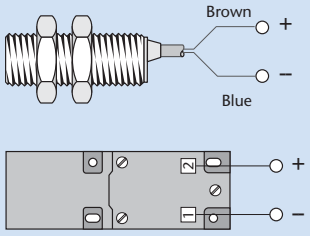
TECHNICAL CHARACTERISTICS

Dimensions mm

MODELS WITH CABLE		SIP A8 - N1.5	SIP C8 - N1.5	SIP 10 - N2
				
MODELS WITH CONNECTOR		SIP A8 - N1.5 H1	SIP C8 - N1.5 H1	SIP 10 - N2 H1
				
Switching distance (Sn)	mm	1.5	1.5	2
Continuous voltage (residual ripple ≤10%)	V	8,2 ("5 ÷ 30" see note 1 at page 6)		
Absorption current at 8.2V	mA	In presence of metal ≤ 1 mA - In absence of metal ≥ 3 mA		
Switching frequency	Hz	2000	2000	1000
Repeatability	% of Sn	≤ 3		
Temperature limits	°C	-25 ÷ +70		
Degree of protection	IP	67 (With H1 depending on connector)		
Housing			Anodized aluminium	Plastic
Cable PUR blue	2 m	2 x 0.25 mm²	2 x 0.25 mm²	2 x 0.25 mm²
Connector plug		H1	H1	H1

NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 -

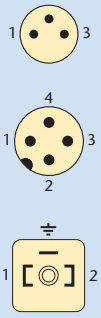
WIRING DIAGRAMS WITH CABLE OR TERMINAL BLOCK



N.B.: On request is available cable for sensors with different length 3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H1 - H - K PLUG

FOR THE CONNECTORS SEE PAGE 85

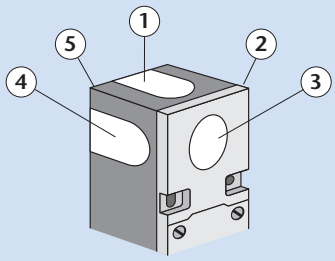


VIEW OF MALE CONNECTOR **H1**
1 = Brown / +
3 = Blue / –

VIEW OF MALE CONNECTOR **H**
1 = Brown / +
3 = Blue / –

VIEW OF MALE CONNECTOR **K**
1 = Blue / –
2 = Brown / +

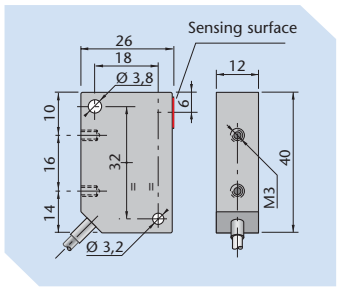
ADJUSTABLE SENSITIVITY SIP 40

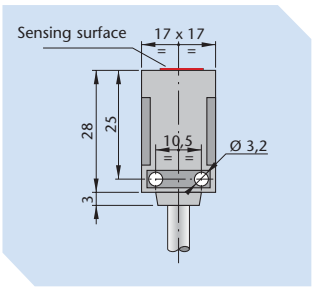


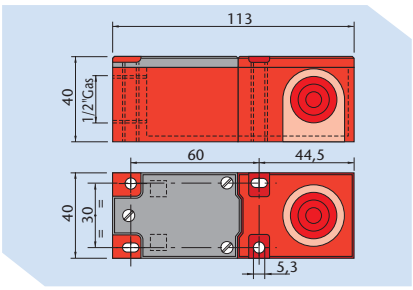
NOTE: In the SIP 40 sensor the oscillator is contained in a module which clips into the body whose surface can then be sensitive on five different positions. The surface chosen can be identified by applying the circular adhesive label.

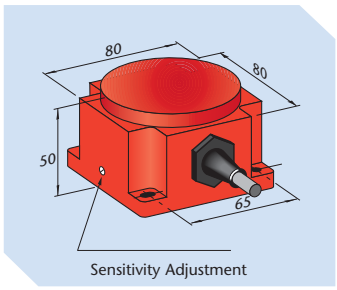
NAMUR INDUCTIVE SENSORS

CONFORMING TO NAMUR STANDARDS (DIN 19234)
APPROVAL *EEx ia IIc T4**

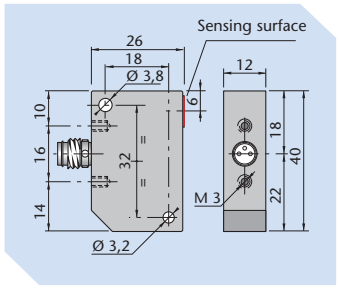


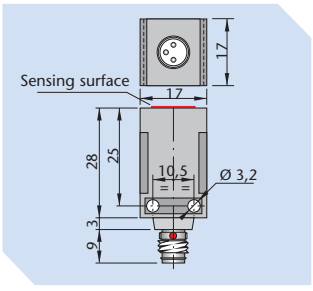


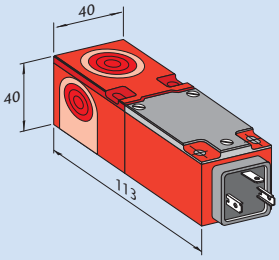


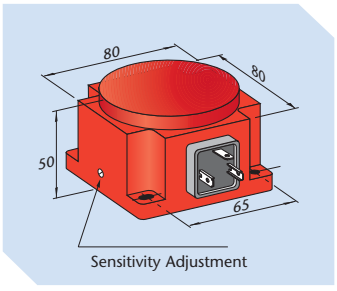


SIP 12 - N2	SIP 12 - NE4	SIP 17 - NE5	SIP 40 - N15	SIP 40 - NE20	SIQ 80 - NE50





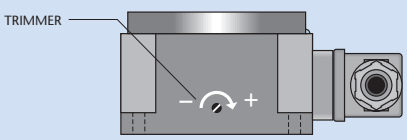




SIP 12 - N2 H1	SIP 12 - NE4 H1	SIP 17 - NE5 H1	SIP 40 - N15 K	SIP 40 - NE20 K	SIQ 80 - NE50 K
2	4	5	15	20	10 ÷ 60 (Adjustable)
8,2 ("5 ÷ 30" see note 1 at page 6)					
In presence of metal ≤ 1 mA - In absence of metal ≥ 3 mA					
2000	2000	500	100		
≤ 3					
-25 ÷ +70					
67 (With H1 depending on connector)		65 (IP67 with cable)			
Plastic					
2 x 0.25 mm²	2 x 0.50 mm²	Terminal block (On request cable)	2 x 0.50 mm²		
H1	H1	K	K		

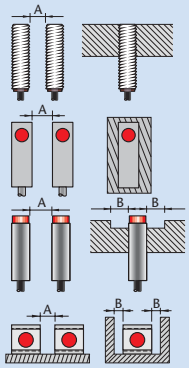
- NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 -

SENSITIVITY ADJUSTMENT



This sensor is supplied with a trimmer for the sensi-tivity adjustment. The sensitivity increases when the trimmer is rotated in the clockwise direction and de-creases in the anti-clockwise direction. Avoid using for a capacity greater than 60 mm referred to a square piece of (FE 37) steel of 1 mm thickness the side of which is equal to 100 mm. When set-ting the sensor keep in consideration all other metallic objects nearby, in fact setting is suggested to be made when the sensor is installed in the normal working conditions.
The sensor is supplied already pre-set to 50 mm sensitivity.

INSTRUCTIONS FOR CORRECT INSTALLATION



Embeddable Cylindrical models

Embeddable Rectangular models

Not embeddable Cylindrical models

Not embeddable Rectangular models

	▲ (A) mm	● (A) mm	● (B) mm
SI 6.5	≥ 4	≥ 16	≥ 8
SI 8	≥ 4	≥ 16	≥ 8
SI 12	≥ 6	≥ 24	≥ 12
SI 14	≥ 7	≥ 28	≥ 14
SI 18	≥ 9	≥ 36	≥ 18
SI 30	≥ 15	≥ 60	≥ 30
SIP A8	≥ 2	-	-
SIP C8	≥ 2	-	-
SIP 10	≥ 10	-	≥ 0
SIP 12	≥ 6	≥ 12	≥ 6
SIP 17	-	≥ 20	≥ 6
SIP 40	≥ 30	≥ 50	≥ 15
SIQ 80	-	≥ 450	≥ 70

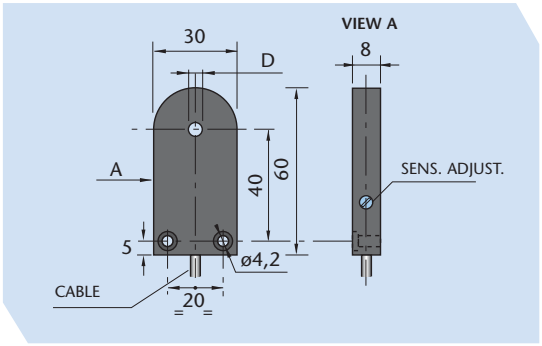
N.B. A = Mutual interference - B = Interference with metallic part

** See page 7 - Applications*

NAMUR INDUCTIVE SENSORS

RING HOUSING SIA05 - SIA12 - SIA15 - SIA22 - SIA30 - SIA44 - SIA63 - SIA100
2 WIRES D.C. - VERSION N

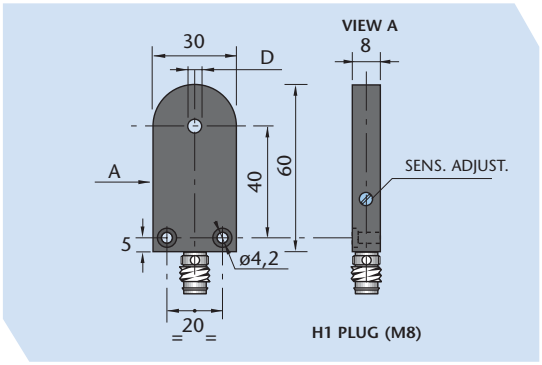
NOT EMBEDDABLE
(NON FLUSH MOUNTING)



TECHNICAL CHARACTERISTICS

Dimensions mm

MODELS WITH CABLE		SIA 05 - NE	SIA 12 - NE	SIA 15 - NE



MODELS WITH CONNECTOR		SIA 05 - NE H1	SIA 12 - NE H1	SIA 15 - NE H1
Hole diameter (D)	mm	5	12	15
Continuous voltage (residual ripple ≤10%)	V	8,2 ("5 ÷ 30" see note 1 at page 6)		
Absorption current at 8.2V	mA	In presence of metal ≤ 1 mA - In absence of metal ≥ 3 mA		
Switching frequency (min-max)	Hz	600 ÷ 1500	600 ÷ 1000	600 ÷ 1000
Repeatability	% of Sn	< 0.3		
Temperature limits	°C	-20 ÷ +60		
Degree of protection	IP	IP 65		
Housing		Plastic		
Cable PUR blue	2 m	2 x 0.25 mm²		
Connector plug		H1	H1	H1

NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 -

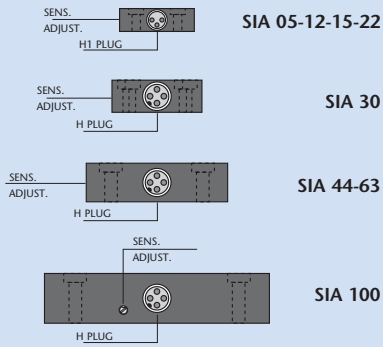
SPECIFICATIONS

In ring sensors, the sensing is carried out inside the ring. The sensor intervenes when a metallic object is introduced.
They are particularly suitable for checking the presence and counting of small metal objects, screws, nuts washers etc. or for any similar operation. Also useful in verifying breakage of metal wires that pass through the ring. The ring sensor's housing is in plastic and electrical attachments can be made by means of a cable or M8 and M12 connectors depending on the model type.

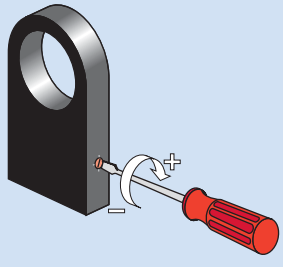
MIN. DIMENSIONS OF THE OBJECT (Fe37) TO DETECT

Model	Length mm	Diameter mm
SIA05	1	0.7
SIA12	2	1.2
SIA15	2	1.2
SIA22	6	3
SIA30	7	4
SIA44	9	5
SIA63	12	6
SIA100	20	12

PLUG H1 - H OUTPUT POSITION VIEW

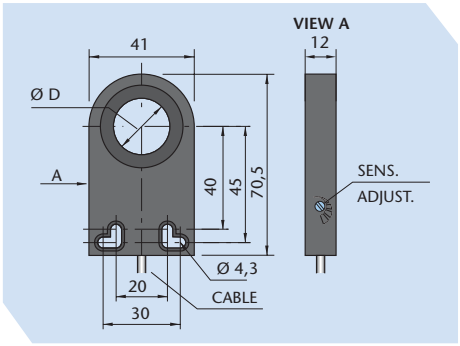


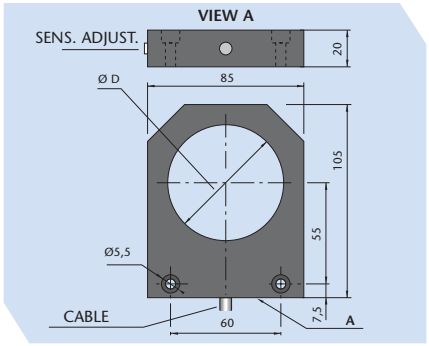
SENSITIVITY ADJUSTMENT

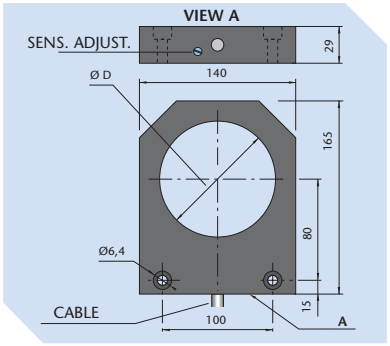


NAMUR INDUCTIVE SENSORS

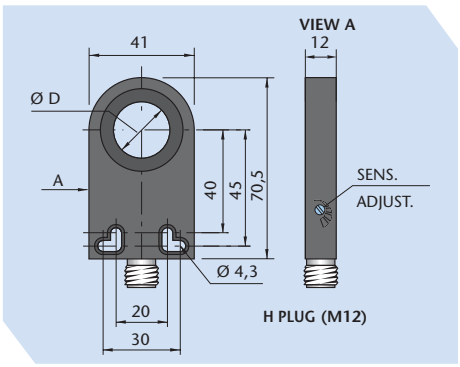
CONFORMING TO NAMUR STANDARDS (DIN 19234)
APPROVAL *EEx ia IIc T4**

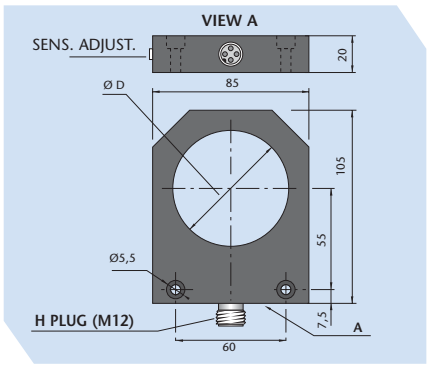


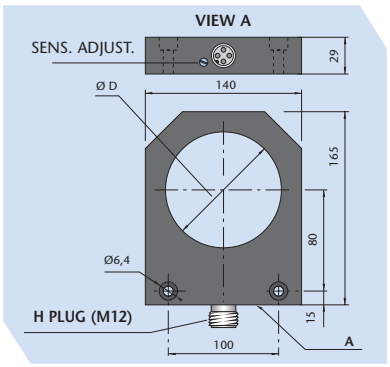




SIA 22 - NE	SIA 30 - NE	SIA 44 - NE	SIA 63 - NE	SIA 100 - NE







SIA 22 - NE H	SIA 30 - NE H	SIA 44 - NE H	SIA 63 - NE H	SIA 100 - NE H
22	30	44	63	100
8,2 ("5 ÷ 30" see note 1 at page 6)				
In presence of metal ≤ 1 mA - In absence of metal ≥ 3 mA				
600 ÷ 1000	600 ÷ 800	250 ÷ 600	100 ÷ 200	100
< 0.3				
-20 ÷ +60				
IP 65				
Plastic				
2 x 0.25 mm²	2 x 0.50 mm²			
H	H	H	H	H

- NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 - NAMUR DIN 19234 - EEx ia IIc T4 -

SELECTION OF RING SENSOR
Selection should be made based on the minimum hole diameter required.
In this way the sensitivity adjustment can be made within normal parameters and need not be pushed to the maximum risking the proper functioning of the unit.
USE WITH A DELAYED AMPLIFIERS
All types of ring sensor can work in combination with a delayed amplifier of the programmable ALTP series or ALNC series which ensures the sensing of small objects in rapid movement.
SENSITIVITY ADJUSTMENT
After having followed the instructions regarding the choice of the most suitable unit it is recommended that the sensitivity adjustment be carried out when the sensor is installed in the final position taking into account how much metal mass is close by which could alter its functioning. The sensitivity increases turning the trimmer clockwise.
EFFECTS OF METAL IN THE CLOSE VICINITY
If a moving metal part is close to the sensing area the functioning can be disturbed.
In order to avoid this, install the units some distance from metallic objects. Ensure that this does not interfere with the functioning. When applying to a metal surface make sure not to apply too close to ring hole otherwise sensor may not-function correctly.
USE OF SENSOR
A distance equal to the width of the sensor should be left between each object that passes through the sensor. If more than one sensor is to be installed in close vicinity, the minimum distance indicated between sensors should be maintained as per chart indications.

INSTRUCTIONS FOR CORRECT INSTALLATION

Fig. 1

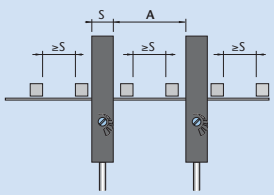
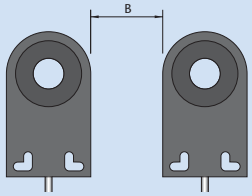


Fig. 2



Model	SIA05	SIA12	SIA15	SIA22	SIA30	SIA44	SIA63	SIA100
A (Fig. 1) mm	25	30	30	60	60	300	300	600
B (Fig. 2) mm	10	10	10	20	20	250	250	650

** See page 7 - Applications*

INDUCTIVE SENSORS Ø 4mm

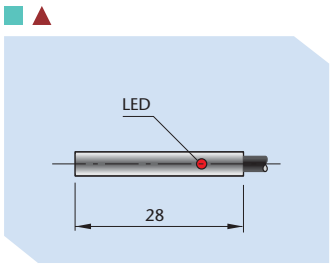
CE

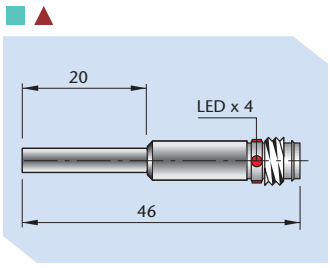
CYLINDRICAL HOUSING
3 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C

■ **STANDARD**
▲ **EMBEDDABLE** (FLUSH MOUNTING)

TECHNICAL CHARACTERISTICS

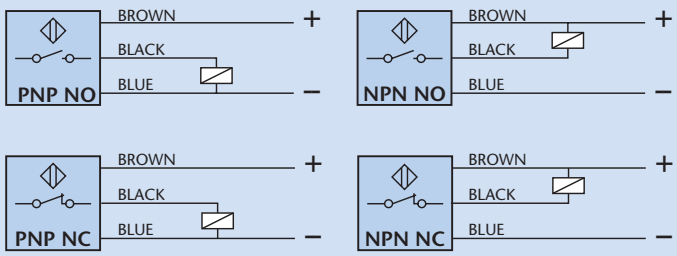
Dimensions mm





			■ ▲	■ ▲
AMPLIFIED 3 WIRES D.C.	NPN	NO	**SI4 - C 0.8 NPN NO**	**SI4 - C 0.8 NPN NO H1**
		NC	**SI4 - C 0.8 NPN NC**	**SI4 - C 0.8 NPN NC H1**
	PNP	NO	**SI4 - C 0.8 PNP NO**	**SI4 - C 0.8 PNP NO H1**
		NC	**SI4 - C 0.8 PNP NC**	**SI4 - C 0.8 PNP NC H1**
Switching distance (Sn)		mm	0.8	0.8
Continuous voltage (residual ripple ≤10%)		V	6 ÷ 30	
Hysteresis (%Sn)		mm	< 10%	
Switching frequency		Hz	2000	
Repeatability		% of Sn	≤ 3	
Max output current		mA	150	
Absorption at 24Vdc		mA	< 10	
Voltage drop (sensor ON)		V	< 1.4	
Short circuit protection			Incorporated	
Led			Incorporated	
Temperature limits		°C	- 25 ÷ + 70	
Degree of protection		IP	67	Depending on connector
Housing			Stainless steel	
Cable SALGUM		2m	3 x 0.14 mm²	
Connector plug				H1

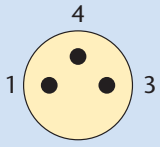
WIRING DIAGRAMS



N.B.: On request is available cable for sensors with different length
3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H1 PLUG

FOR THE CONNECTORS SEE PAGE 85

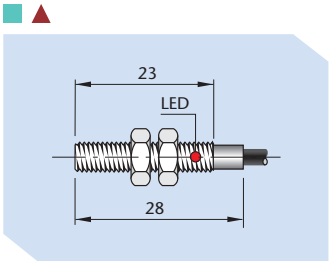


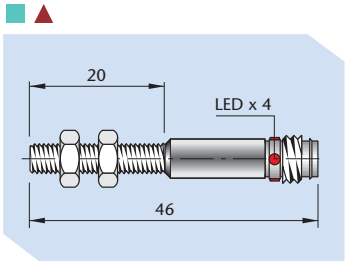
VIEW OF MALE CONNECTOR **H1**:
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO-NC

INDUCTIVE SENSORS M5 x 0.5

CE

CYLINDRICAL HOUSING
3 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C

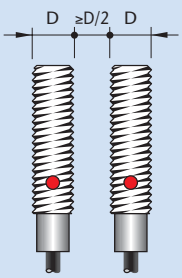




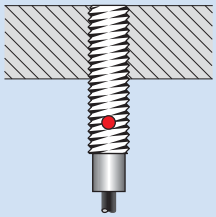
SI5 - C 0.8 NPN NO	SI5 - C 0.8 NPN NO H1
SI5 - C 0.8 NPN NC	SI5 - C 0.8 NPN NC H1
SI5 - C 0.8 PNP NO	SI5 - C 0.8 PNP NO H1
SI5 - C 0.8 PNP NC	SI5 - C 0.8 PNP NC H1
0.8	0.8
6 ÷ 30	
< 10%	
2000	
≤ 3	
150	
< 10	
< 1.4	
Incorporated	
Incorporated	
- 25 ÷ + 70	
67	Depending on connector
Stainless steel	
3 x 0.14 mm²	
	H1

INSTRUCTIONS FOR CORRECT INSTALLATION

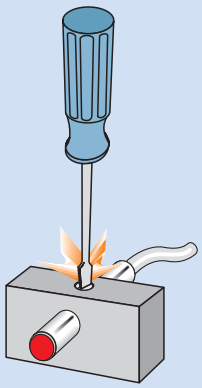
EMBEDDABLE

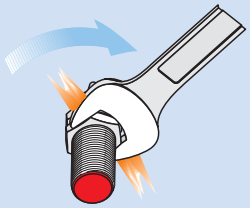


Side by side mounting



Flush mounting





Attention, please use care to prevent mechanical damage.
(See page 4)

INDUCTIVE SENSORS Ø 6.5mm

CE

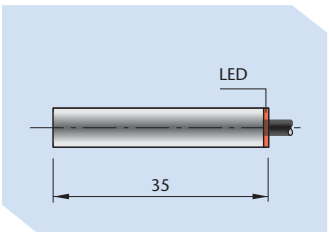
CYLINDRICAL SHORT HOUSING S SERIES
3 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C

★ **EXTENDED SWITCHING DISTANCE**
▲ **EMBEDDABLE** (FLUSH MOUNTING)
● **NOT EMBEDDABLE**
(NON FLUSH MOUNTING)

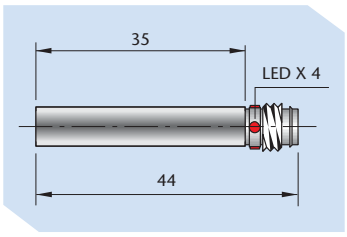
TECHNICAL CHARACTERISTICS

Dimensions mm

★▲



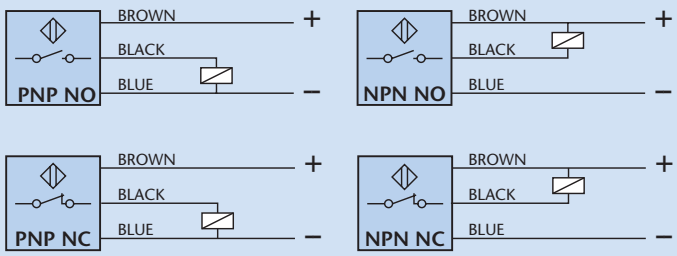
★▲



AMPLIFIED 3 WIRES D.C.	NPN	NO	**SI6.5 - DC 2 NPN NO S**	**SI6.5 - DC 2 NPN NO H1 S**
		NC	**SI6.5 - DC 2 NPN NC S**	**SI6.5 - DC 2 NPN NC H1 S**
	PNP	NO	**SI6.5 - DC 2 PNP NO S**	**SI6.5 - DC 2 PNP NO H1 S**
		NC	**SI6.5 - DC 2 PNP NC S**	**SI6.5 - DC 2 PNP NC H1 S**

Switching distance (Sn)	mm	2	2
Continuous voltage (residual ripple ≤10%)	V	6 ÷ 30	
Hysteresis (%Sn)	mm	< 10%	
Switching frequency	Hz	2000	
Repeatability	% of Sn	≤ 3	
Max output current	mA	200	
Absorption at 24Vdc	mA	< 12	
Voltage drop (sensor ON)	V	< 1.8	
Short circuit protection		Incorporated	
Led		Incorporated	
Temperature limits	°C	- 25 ÷ + 70	
Degree of protection	IP	67	Depending on connector
Housing		Stainless steel	
Cable PVC	2m	3 x 0.14 mm²	
Connector plug			H1

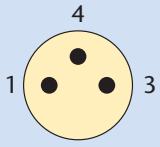
WIRING DIAGRAMS



N.B.: On request is available cable for sensors with different length
3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H1 PLUG

FOR THE CONNECTORS SEE PAGE 85



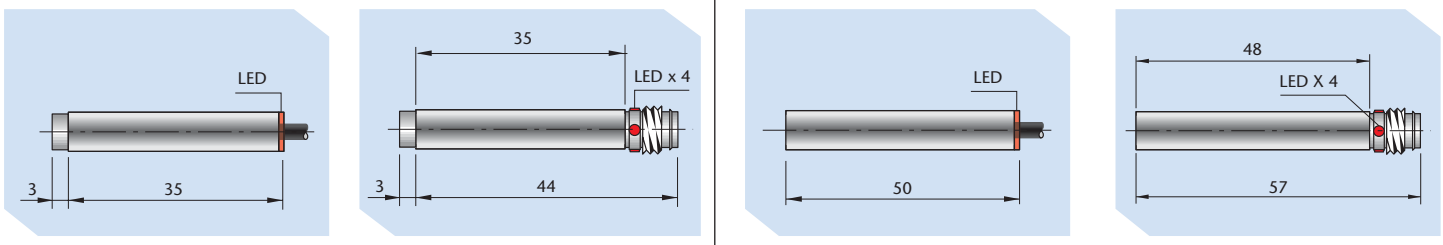
VIEW OF MALE CONNECTOR **H1**:
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO-NC

INDUCTIVE SENSORS Ø 6.5mm

CE

CYLINDRICAL LONG HOUSING
3 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C

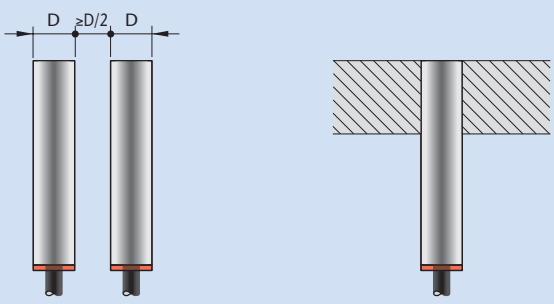
★● ★● ★▲ ★▲



SI6.5 - DCE3 NPN NO S	SI6.5 - DCE3 NPN NO H1 S	SI6.5 - DC2 NPN NO	SI6.5 - DC2 NPN NO H1
SI6.5 - DCE3 NPN NC S	SI6.5 - DCE3 NPN NC H1 S	SI6.5 - DC2 NPN NC	SI6.5 - DC2 NPN NC H1
SI6.5 - DCE3 PNP NO S	SI6.5 - DCE3 PNP NO H1 S	SI6.5 - DC2 PNP NO	SI6.5 - DC2 PNP NO H1
SI6.5 - DCE3 PNP NC S	SI6.5 - DCE3 PNP NC H1 S	SI6.5 - DC2 PNP NC	SI6.5 - DC2 PNP NC H1
3	3	2	2
6 ÷ 30			
< 10%			
2000			
≤ 3			
200			
< 12			
< 1.8			
Incorporated			
Incorporated			
- 25 ÷ + 70			
67	Depending on connector	67	Depending on connector
Stainless steel			
3 x 0.14 mm²		3 x 0.14 mm²	
	H1		H1

INSTRUCTIONS FOR CORRECT INSTALLATION

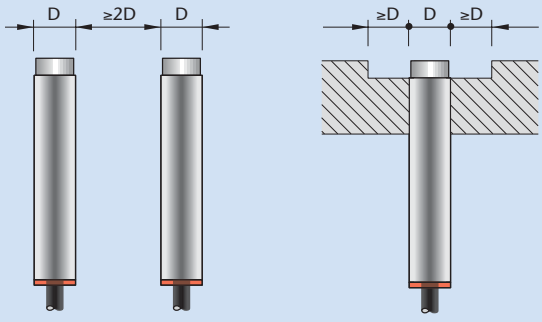
EMBEDDABLE



Side by side mounting

Flush mounting

NOT EMBEDDABLE



Side by side mounting

Flush mounting

INDUCTIVE SENSORS M8 x 1

CE

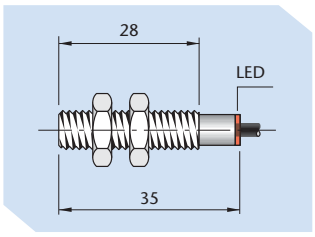
CYLINDRICAL SHORT HOUSING S SERIES
3 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C

■ STANDARD SWITCHING DISTANCE
★ EXTENDED SWITCHING DISTANCE
▲ EMBEDDABLE (FLUSH MOUNTING)
● NOT EMBEDDABLE
(NON FLUSH MOUNTING)

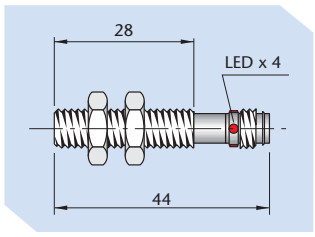
TECHNICAL CHARACTERISTICS

Dimensions mm

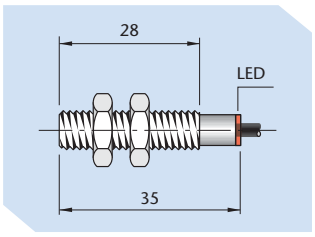
■▲



■▲

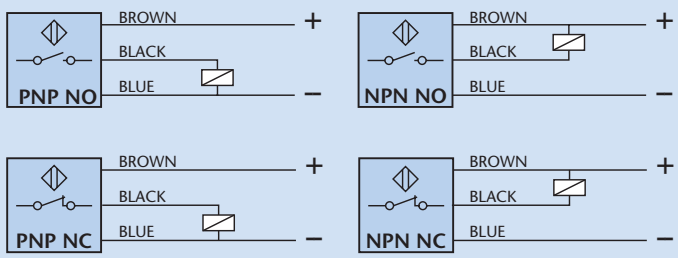


★▲



AMPLIFIED 3 WIRES D.C.	NPN	NO	SI8 - C 1 NPN NO S	SI8 - C 1 NPN NO H1 S	SI8 - DC 2 NPN NO S
		NC	SI8 - C 1 NPN NC S	SI8 - C 1 NPN NC H1 S	SI8 - DC 2 NPN NC S
	PNP	NO	SI8 - C 1 PNP NO S	SI8 - C 1 PNP NO H1 S	SI8 - DC 2 PNP NO S
		NC	SI8 - C 1 PNP NC S	SI8 - C 1 PNP NC H1 S	SI8 - DC 2 PNP NC S
Switching distance (Sn)		mm	1.5	1.5	2
Continuous voltage (residual ripple ≤10%)		V	6 ÷ 30		
Hysteresis (%Sn)		mm	< 10%		
Switching frequency		Hz	2000		
Repeatability		% of Sn	≤ 3		
Max output current		mA	200		
Absorption at 24Vdc		mA	< 12		
Voltage drop (sensor ON)		V	< 1.8		
Short circuit protection			Incorporated		
Led			Incorporated		
Temperature limits		°C	- 25 ÷ + 70		
Degree of protection		IP		Depending on connector	67
Housing			Stainless steel		
Cable PVC		2m	3 x 0.14 mm²		3 x 0.14 mm²
Connector plug				H1	

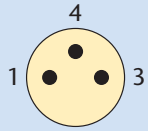
WIRING DIAGRAMS



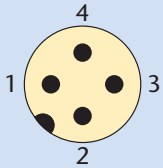
N.B.: On request is available cable for sensors with different length
3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H1 - H PLUG

FOR THE CONNECTORS SEE PAGE 85



VIEW OF MALE CONNECTOR **H1**
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO-NC

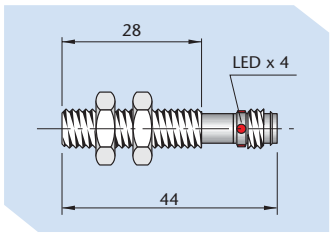


VIEW OF MALE CONNECTOR **H**
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO
2 = Black / output NPN-PNP / NC

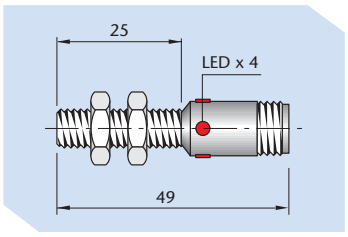
INDUCTIVE SENSORS M8 x 1

CYLINDRICAL SHORT HOUSING S SERIES
3 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C

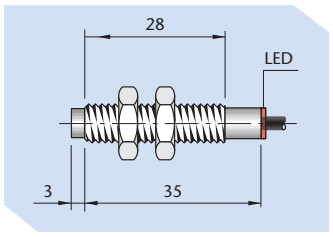
★▲



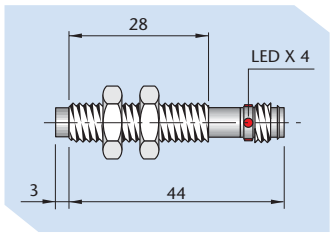
★▲



★●



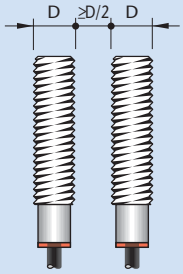
★●



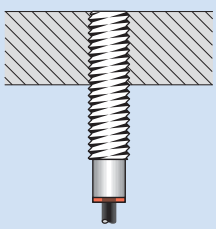
SI8 - DC 2 NPN NO H1 S	SI8 - DC 2 NPN NO H S	SI8 - DCE 3 NPN NO S	SI8 - DCE 3 NPN NO H1 S
SI8 - DC 2 NPN NC H1 S	SI8 - DC 2 NPN NC H S	SI8 - DCE 3 NPN NC S	SI8 - DCE 3 NPN NC H1 S
SI8 - DC 2 PNP NO H1 S	SI8 - DC 2 PNP NO H S	SI8 - DCE 3 PNP NO S	SI8 - DCE 3 PNP NO H1 S
SI8 - DC 2 PNP NC H1 S	SI8 - DC 2 PNP NC H S	SI8 - DCE 3 PNP NC S	SI8 - DCE 3 PNP NC H1 S
2	2	3	3
6 ÷ 30			
< 10%			
2000			
≤ 3			
200			
< 12			
< 1.8			
Incorporated			
Incorporated			
- 25 ÷ + 70			
Depending on connector		67	Depending on connector
Acciaio inox			
		3 x 0.14 mm²	
H1	H		H1

INSTRUCTIONS FOR CORRECT INSTALLATION

EMBEDDABLE

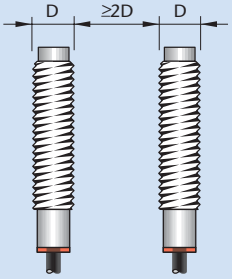


Side by side mounting

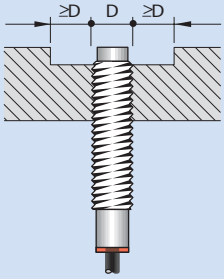


Flush mounting

NOT EMBEDDABLE



Side by side mounting



Flush mounting

INDUCTIVE SENSORS M8 x 1

CE

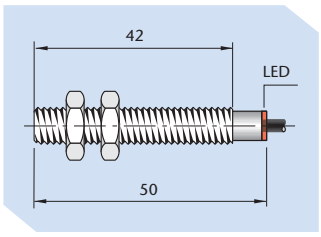
CYLINDRICAL LONG HOUSING
3 WIRES D.C.
CONFORMING TO EN 50008 - EN 50044
VERSION-C

■ **STANDARD SWITCHING DISTANCE**
★ **EXTENDED SWITCHING DISTANCE**
▲ **EMBEDDABLE** (FLUSH MOUNTING)

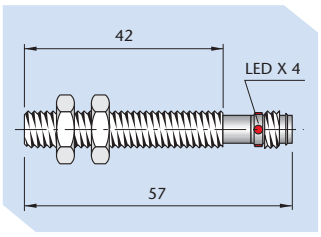
TECHNICAL CHARACTERISTICS

Dimensions mm

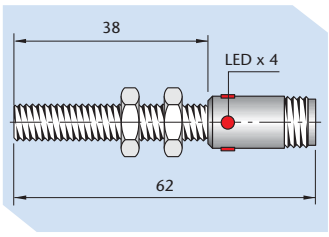
■ ▲



■ ▲

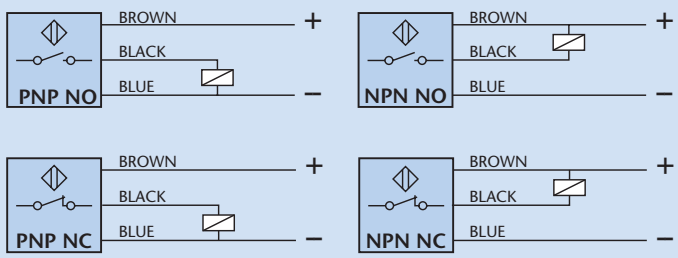


■ ▲



AMPLIFIED 3 WIRES D.C.	NPN	NO	**SI8 - C 1 NPN NO**	**SI8 - C 1 NPN NO H1**	**SI8 - C 1 NPN NO H**
		NC	**SI8 - C 1 NPN NC**	**SI8 - C 1 NPN NC H1**	**SI8 - C 1 NPN NC H**
	PNP	NO	**SI8 - C 1 PNP NO**	**SI8 - C 1 PNP NO H1**	**SI8 - C 1 PNP NO H**
		NC	**SI8 - C 1 PNP NC**	**SI8 - C 1 PNP NC H1**	**SI8 - C 1 PNP NC H**
Switching distance (Sn)		mm	1.5	1.5	1.5
Continuous voltage (residual ripple ≤10%)		V	6 ÷ 30		
Hysteresis (%Sn)		mm	< 10%		
Switching frequency		Hz	2000		
Repeatability		% of Sn	≤ 3		
Max output current		mA	200		
Absorption at 24Vdc		mA	< 12		
Voltage drop (sensor ON)		V	< 1.8		
Short circuit protection			Incorporated		
Led			Incorporated		
Temperature limits		°C	- 25 ÷ + 70		
Degree of protection		IP	67	Depending on connector	Depending on connector
Housing			Stainless steel		
Cable PVC		2m	3 x 0.14 mm²		
Connector plug				H1	H

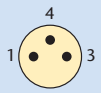
WIRING DIAGRAMS



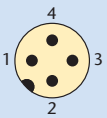
N.B.: On request is available cable for sensors with different length
3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H1 - H - K PLUGS

FOR THE CONNECTORS SEE PAGE 85



VIEW OF MALE CONNECTOR **H1**
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO-NC



VIEW OF MALE CONNECTOR **H**
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO
2 = Black / output NPN-PNP / NC

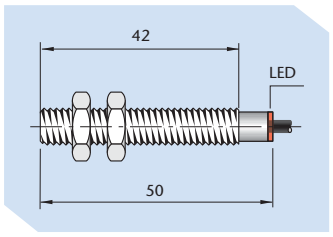
VIEW OF MALE CONNECTOR **K**
2 = Brown / +
1 = Blue / –
⏚ = Black / output NPN-PNP / NO-NC

INDUCTIVE SENSORS M8 x 1

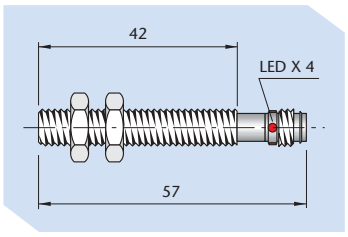
CE

CYLINDRICAL LONG HOUSING
3 WIRES D.C.
CONFORMING TO EN 50008 - EN 50044
VERSION-C

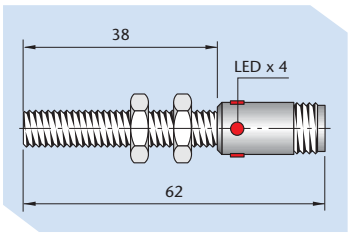
★▲



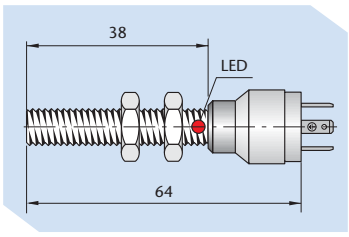
★▲



★▲



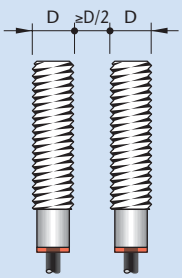
★▲



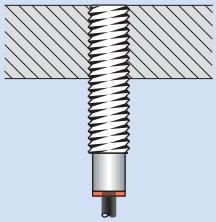
SI8 - DC 2 NPN NO	SI8 - DC 2 NPN NO H 1	SI8 - DC 2 NPN NO H	SI8 - DC 2 NPN NO K
SI8 - DC 2 NPN NC	SI8 - DC 2 NPN NC H 1	SI8 - DC 2 NPN NC H	SI8 - DC 2 NPN NC K
SI8 - DC 2 PNP NO	SI8 - DC 2 PNP NO H 1	SI8 - DC 2 PNP NO H	SI8 - DC 2 PNP NO K
SI8 - DC 2 PNP NC	SI8 - DC 2 PNP NC H 1	SI8 - DC 2 PNP NC H	SI8 - DC 2 PNP NC K
2	2	2	2
6 ÷ 30			
<10%			
2000			
≤ 3			
200			
< 12			
<1.8			
Incorporated			
Incorporated			
- 25 ÷ + 70			
67	Depending on connector	Depending on connector	65
Stainless steel			
3 x 0.14 mm²			
	H1	H1	K (type 11)

INSTRUCTIONS FOR CORRECT INSTALLATION

EMBEDDABLE



Side by side mounting



Flush mounting

INDUCTIVE SENSORS M12 x 1

CE

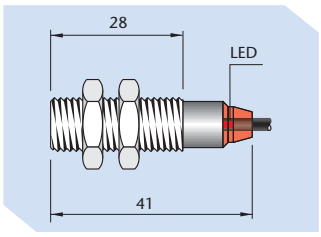
CYLINDRICAL SHORT HOUSING S SERIES
3/4 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C

■ **STANDARD SWITCHING DISTANCE**
★ **EXTENDED SWITCHING DISTANCE**
▲ **EMBEDDABLE** (FLUSH MOUNTING)
● **NOT EMBEDDABLE**
(NON FLUSH MOUNTING)

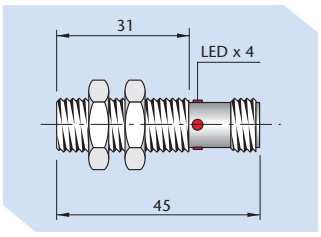
TECHNICAL CHARACTERISTICS

Dimensions mm

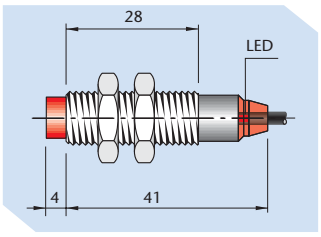
■ ▲



■ ▲

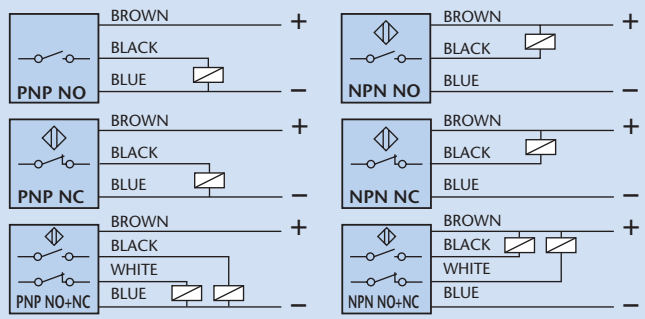


■ ●



AMPLIFIED 3 WIRES D.C.	NPN	NO	SI12 - C2 NPN NO S	SI12 - C2 NPN NO H S	SI12 - CE4 NPN NO S
		NC	SI12 - C2 NPN NC S	SI12 - C2 NPN NC H S	SI12 - CE4 NPN NC S
	PNP	NO	SI12 - C2 PNP NO S	SI12 - C2 PNP NO H S	SI12 - CE4 PNP NO S
		NC	SI12 - C2 PNP NC S	SI12 - C2 PNP NC H S	SI12 - CE4 PNP NC S
AMPLIFIED 4 WIRES D.C. ANTIPHASE	NPN	NO+NC			
	PNP	NO+NC			
Switching distance (Sn)		mm	2	2	4
Continuous voltage (residual ripple ≤10%)		V	10 ÷ 30		
Hysteresis (%Sn)		mm	< 10%		
Switching frequency		Hz	1000		
Repeatability		% of Sn	≤ 3		
Max output current		mA	200		
Absorption at 24Vdc		mA	< 15		
Voltage drop (sensor ON)		V	< 1.8		
Short circuit protection			Incorporated		
Led			Incorporated		
Temperature limits		°C	- 25 ÷ + 70		
Degree of protection		IP	67	Depending on connector	67
Housing			Nickelled brass		
Cable PVC		2m	3 x 0.25 mm²		3 x 0.25 mm²
Connector plug				H	

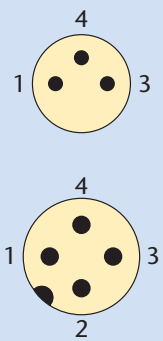
WIRING DIAGRAMS



N.B.: On request is available cable for sensors with different length 3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H1 - H PLUGS

FOR THE CONNECTORS SEE PAGE 85



VIEW OF MALE CONNECTOR **H1**
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO-NC

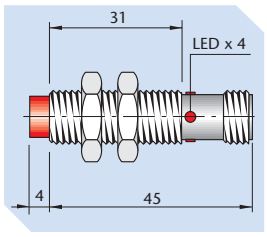
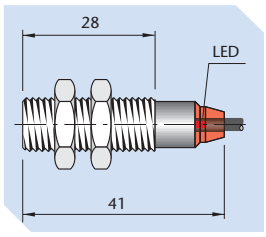
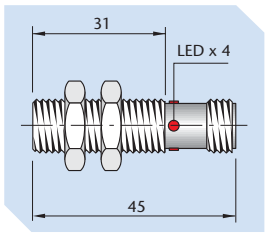
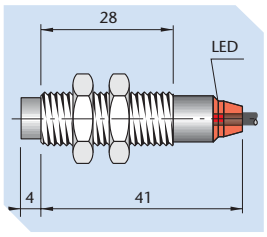
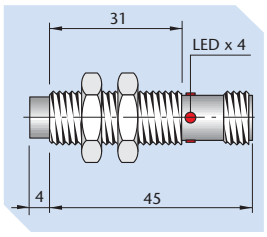
VIEW OF MALE CONNECTOR **H**

3 WIRES
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO
2 = Black / output NPN-PNP / NC

4 WIRES
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO
2 = White / output NPN-PNP / NC

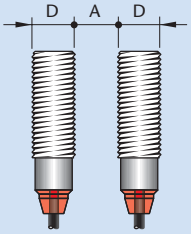
INDUCTIVE SENSORS M12 x 1

CYLINDRICAL SHORT HOUSING S SERIES
3/4 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C

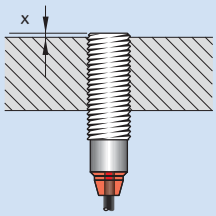
■ ●	★ ▲	★ ▲	★ ●	★ ●
				
SI12 - CE4 NPN NO H S	SI12 - DC4 NPN NO S	SI12 - DC4 NPN NO H S	SI12 - DCE8 NPN NO S	SI12 - DCE8 NPN NO HS
SI12 - CE4 NPN NC H S	SI12 - DC4 NPN NC S	SI12 - DC4 NPN NC H S	SI12 - DCE8 NPN NC S	SI12 - DCE8 NPN NC HS
SI12 - CE4 PNP NO H S	SI12 - DC4 PNP NO S	SI12 - DC4 PNP NO H S	SI12 - DCE8 PNP NO S	SI12 - DCE8 PNP NO HS
SI12 - CE4 PNP NC H S	SI12 - DC4 PNP NC S	SI12 - DC4 PNP NC H S	SI12 - DCE8 PNP NC S	SI12 - DCE8 PNP NC HS
	SI12 - DC4 NPN NO+NC S	SI12 - DC4 NPN NO+NC H S		
	SI12 - DC4 PNP NO+NC S	SI12 - DC4 PNP NO+NC H S		
4	4	4	8	8
10 ÷ 30				
< 10%				
1000	1000		600	
≤ 3				
200				
< 15				
< 1.8				
Incorporated				
Incorporated				
- 25 ÷ + 70				
Depending on connector	67	Depending on connector	67	Depending on connector
Nickelled brass	Stainless steel			
	3 x 0.25 mm² - 4 x 0.25 mm²		3 x 0.25 mm²	
H		H		H

INSTRUCTIONS FOR CORRECT INSTALLATION

EMBEDDABLE

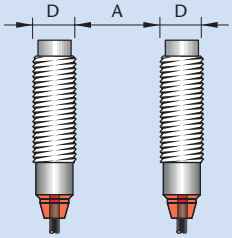


Side by side mounting
SI12-C2 A ≥ D/2
SI12-DC4 A ≥ D/2

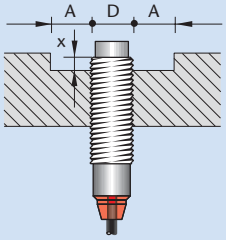


Flush mounting
SI12-C2 X ≥ 0
SI12-DC4 X > 0

NOT EMBEDDABLE



Side by side mounting
SI12-CE4 A ≥ 2D
SI12-DCE8 A ≥ 2D



Non flush mounting
SI12-CE4 A ≥ D X ≥ 0
SI12-DCE8 A ≥ 2D X ≥ 4mm

INDUCTIVE SENSORS M12 x 1

CE

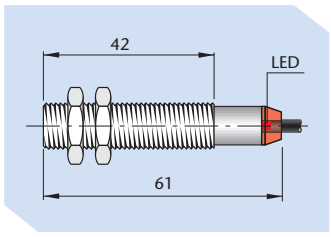
CYLINDRICAL LONG HOUSING
3/4 WIRES D.C.
CONFORMING TO EN 50008 - EN 50044
VERSION-C

■ **STANDARD SWITCHING DISTANCE**
▲ **EMBEDDABLE** (FLUSH MOUNTING)
● **NOT EMBEDDABLE**
(NON FLUSH MOUNTING)

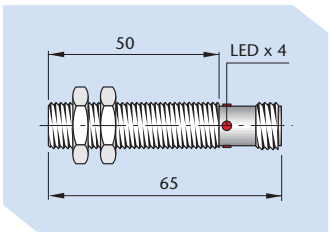
TECHNICAL CHARACTERISTICS

Dimensions mm

■ ▲

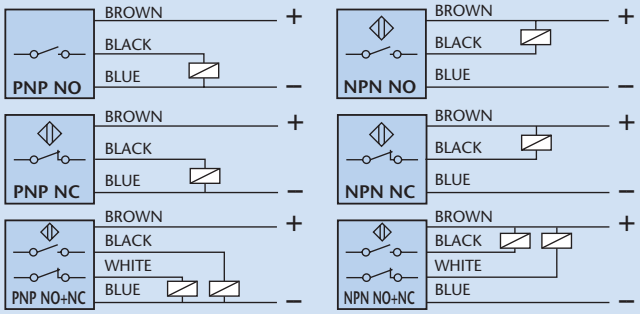


■ ▲



AMPLIFIED 3 WIRES D.C.	NPN	NO	**SI12 - C2 NPN NO**	**SI12 - C2 NPN NO H**
		NC	**SI12 - C2 NPN NC**	**SI12 - C2 NPN NC H**
	PNP	NO	**SI12 - C2 PNP NO**	**SI12 - C2 PNP NO H**
		NC	**SI12 - C2 PNP NC**	**SI12 - C2 PNP NC H**
AMPLIFIED 4 WIRES D.C. ANTIPHASE	NPN	NO+NC	**SI12 - C2 NPN NO + NC**	**SI12 - C2 NPN NO + NC H**
	PNP	NO+NC	**SI12 - C2 PNP NO + NC**	**SI12 - C2 PNP NO + NC H**
Switching distance (Sn)		mm	2	2
Continuous voltage (residual ripple ≤10%)		V	10 ÷ 30	
Hysteresis (%Sn)		mm	< 10%	
Switching frequency		Hz	1000	
Repeatability		% of Sn	≤ 3	
Max output current		mA	200	
Absorption at 24Vdc		mA	< 15	
Voltage drop (sensor ON)		V	< 1.8	
Short circuit protection			Incorporated	
Led			Incorporated	
Temperature limits		°C	- 25 ÷ + 70	
Degree of protection		IP	67	Depending on connector
Housing			Nickelled brass	
Cable PVC		2m	3 x 0.25 mm² - 4 x 0.25 mm²	
Connector plug				H

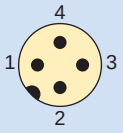
WIRING DIAGRAMS



N.B.: On request is available cable for sensors with different length 3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H - K PLUGS

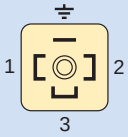
FOR THE CONNECTORS SEE PAGE 85



VIEW OF MALE CONNECTOR H

3 WIRES
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO
2 = BlacK / output NPN-PNP / NC

4 WIRES
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO
2 = White / output NPN-PNP / NC



VIEW OF MALE CONNECTOR K

3 WIRES
1 = Blue / –
2 = Brown / +
4/⏚ = Black / output NPN-PNP / NO-NC

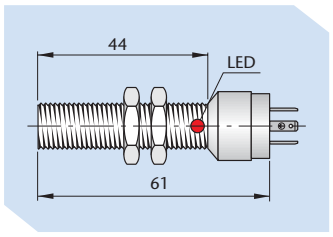
4 WIRES
1 = Blue / –
2 = Brown / +
4/⏚ = Black / output NPN-PNP / NO
3 = White / output NPN-PNP / NC

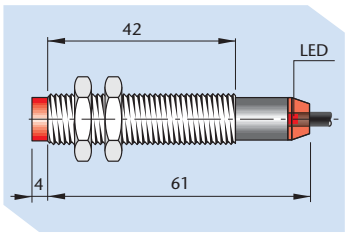
On the 3 wires version with plug K the connector K is supplied with 3 poles.
On the 4 wires version with plug H the connector types 14 - 15 must be ordered with 4 wires.

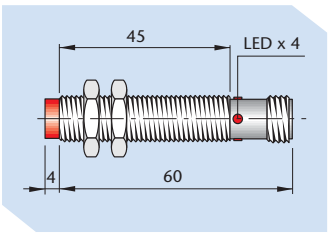
INDUCTIVE SENSORS M12 x 1

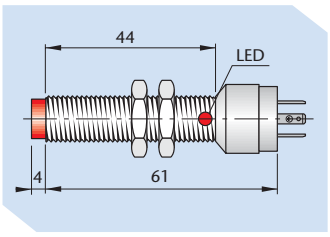
CE

CYLINDRICAL LONG HOUSING
3/4 WIRES D.C.
CONFORMING TO EN 50008 - EN 50044
VERSION-C





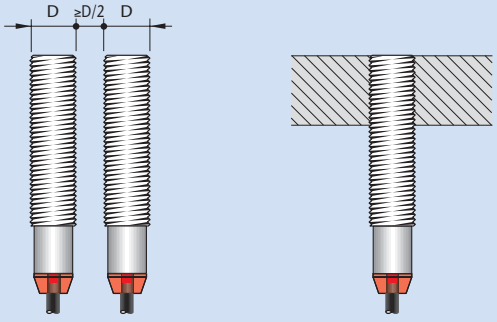




SI12 - C2 NPN NO K	SI12 - CE4 NPN NO	SI12 - CE4 NPN NO H	SI12 - CE4 NPN NO K
SI12 - C2 NPN NC K	SI12 - CE4 NPN NC	SI12 - CE4 NPN NC H	SI12 - CE4 NPN NC K
SI12 - C2 PNP NO K	SI12 - CE4 PNP NO	SI12 - CE4 PNP NO H	SI12 - CE4 PNP NO K
SI12 - C2 PNP NC K	SI12 - CE4 PNP NC	SI12 - CE4 PNP NC H	SI12 - CE4 PNP NC K
SI12 - C2 NPN NO + NC K	SI12 - CE4 NPN NO + NC	SI12 - CE4 NPN NO + NC H	SI12 - CE4 NPN NO + NC K
SI12 - C2 PNP NO + NC K	SI12 - CE4 PNP NO + NC	SI12 - CE4 PNP NO + NC H	SI12 - CE4 PNP NO + NC K
2	4	4	4
10 ÷ 30			
< 10%			
1000			
≤ 3			
200			
< 15			
< 1.8			
Incorporated			
Incorporated			
- 25 ÷ + 70			
65	67	Depending on connector	65
Nickelled brass			
	3 x 0.25 mm² - 4 x 0.25 mm²		
K (type 11)		H	K (type 11)

INSTRUCTIONS FOR CORRECT INSTALLATION

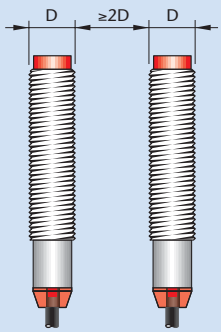
EMBEDDABLE



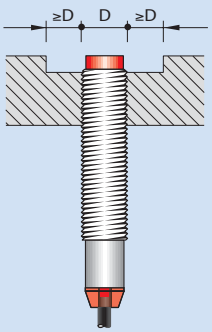
Side by side mounting

Flush mounting

NOT EMBEDDABLE



Side by side mounting



Non flush mounting

INDUCTIVE SENSORS M12 x 1

CE

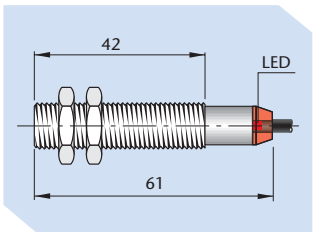
CYLINDRICAL LONG HOUSING
2 WIRES D.C.
CONFORMING TO EN 50040 - EN 50044
VERSION-B

■ **STANDARD SWITCHING DISTANCE**
▲ **EMBEDDABLE** (FLUSH MOUNTING)
● **NOT EMBEDDABLE**
(NON FLUSH MOUNTING)

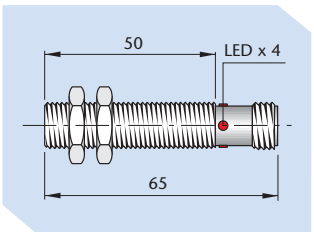
TECHNICAL CHARACTERISTICS

Dimensions mm

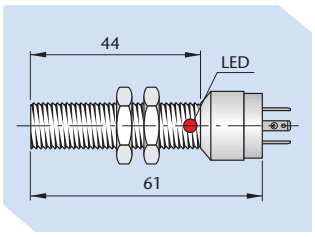
■ ▲



■ ▲

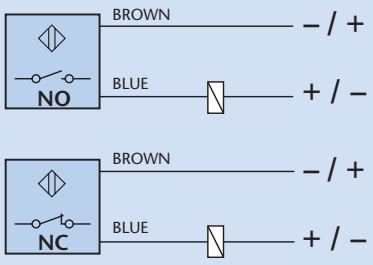


■ ▲



AMPLIFIED 2 WIRES D.C.		NO	SI12 - B2 NO	SI12 - B2 NO H	SI12 - B2 NO K
		NC	SI12 - B2 NC	SI12 - B2 NC H	SI12 - B2 NC K
Switching distance (Sn)	mm		2	2	2
Continuous voltage (residual ripple ≤10%)	V		10 ÷ 55		
Hysteresis (%Sn)	mm		< 10%		
Switching frequency	Hz		1000		
Repeatability	% of Sn		≤ 3		
Max output current	mA		100		
Min. output current	mA		1.5		
Absorption at 24Vdc	mA		< 0.6		
Voltage drop (sensor ON)	V		< 6.5		
Short circuit protection			Incorporated		
Led			Incorporated		
Temperature limits	°C		- 25 ÷ + 70		
Degree of protection	IP		67	Depending on connector	65
Housing			Nickelled brass		
Cable PVC	2m		2 x 0.25 mm²		
Connector plug				H	K (type 11)

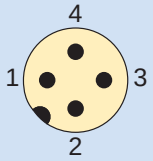
WIRING DIAGRAMS (2 WIRES NON POLARIZED)



N.B.: On request is available cable for sensors with different length
3.5 - 7.5 - 5 - 10 metres.

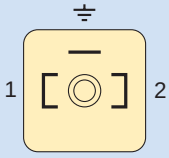
CONNECTION WITH H - K PLUGS

FOR THE CONNECTORS SEE PAGE. 85



VIEW OF MALE CONNECTOR **H**:
3 / 4 = Function NO (black - blue)*
1 / 2 = Function NC (white - brown)*
(Non polarized)

* The wire colour are referred to the connector with cable only.

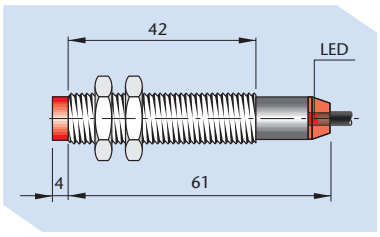


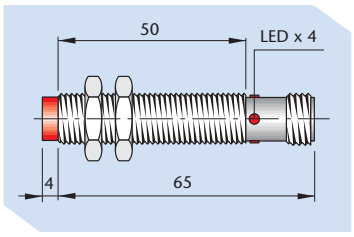
VIEW OF MALE CONNECTOR **K**:
1 / 2 = Function NO
1 / 2 = Function NC
(Non polarized)

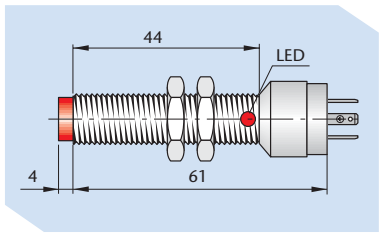
INDUCTIVE SENSORS M12 x 1

CE

CYLINDRICAL LONG HOUSING
2 WIRES D.C.
CONFORMING TO EN 50040 - EN 50044
VERSION-B



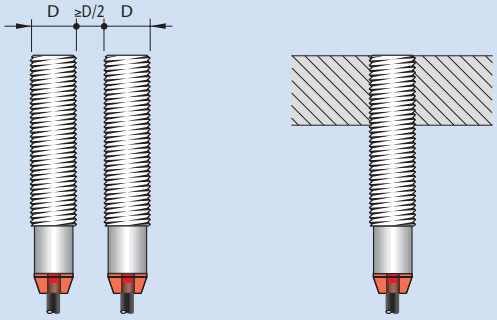




SI12 - BE4 NO SI12 - BE4 NC	SI12 - BE4 NO K SI12 - BE4 NC K	SI12 - BE4 NO K SI12 - BE4 NC K
4	4	4
10 ÷ 55		
< 10%		
1000		
≤ 3		
100		
1.5		
< 0.6		
< 6.5		
Incorporated		
Incorporated		
- 25 ÷ + 70		
67	Depending on connector	65
Nickelled brass		
2 x 0.25 mm²		
	H	K (type 11)

INSTRUCTIONS FOR CORRECT INSTALLATION

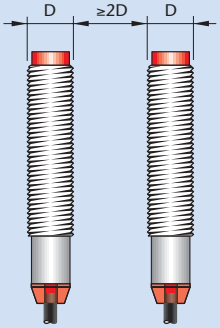
EMBEDDABLE



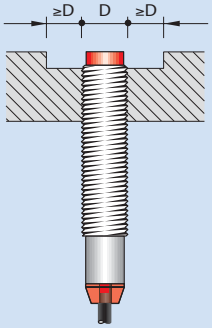
Side by side mounting

Flush mounting

NOT EMBEDDABLE



Side by side mounting



Non flush mounting

INDUCTIVE SENSORS M12 x 1

CE

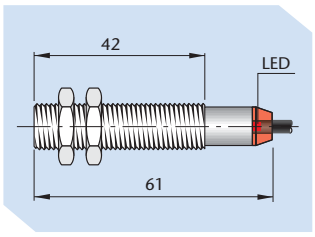
CYLINDRICAL LONG HOUSING
2 WIRES D.C.
CONFORMING TO EN 50036 - EN 50044
VERSION-A

■ **STANDARD SWITCHING DISTANCE**
▲ **EMBEDDABLE** (FLUSH MOUNTING)
● **NOT EMBEDDABLE**
(NON FLUSH MOUNTING)

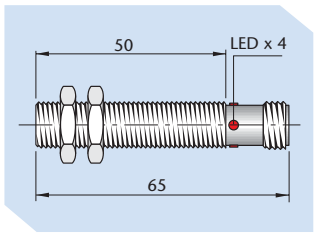
TECHNICAL CHARACTERISTICS

Dimensions mm

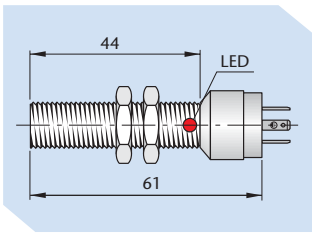
■ ▲



■ ▲

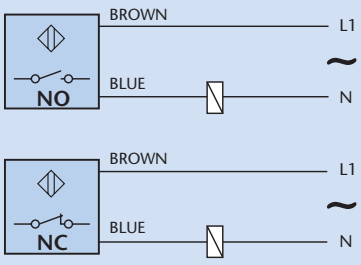


■ ▲



AMPLIFIED 2 WIRES A.C.		NO	SI12 - A2 NO	SI12 - A2 NO H	SI12 - A2 NO K
		NC	SI12 - A2 NC	SI12 - A2 NC H	SI12 - A2 NC K
Switching distance (Sn)	mm		2	2	2
Voltage 50÷ 60 Hz	V		20 ÷ 250		
Hysteresis (%Sn)	mm		< 10%		
Switching frequency	Hz		12		
Repeatability	% of Sn		≤ 3		
Max output current	mA		300		
Min. output current	mA		5		
Max. peak current for 20ms	A		1.5		
Residual current	mA		< 1		
Voltage drop	V		< 6		
Led			Incorporated		
Temperature limits	°C		- 25 ÷ + 70		
Degree of protection	IP		67	Depending on connector	65
Housing			Nickelled brass		
Cable PVC	2m		2 x 0.25 mm²		
Connector plug				H	K (type 11)

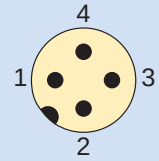
WIRING DIAGRAMS



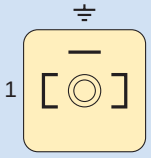
N.B.: On request is available cable for sensors with different length
3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H - K PLUGS

FOR THE CONNECTORS SEE PAGE 85



VIEW OF MALE CONNECTOR **H**
3 / 4 = Function NO (black - blue)*
1 / 2 = Function NC (white - brown)*
* The wire colour are referred to the connector with cable only.

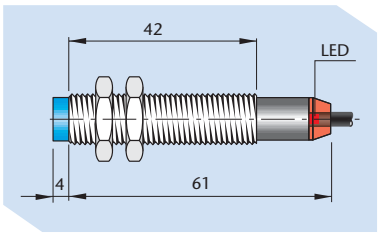


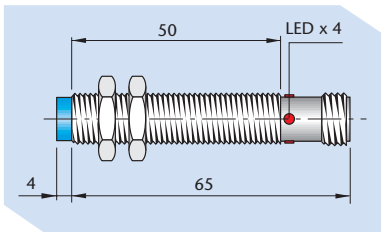
VIEW OF MALE CONNECTOR **K**
1 / 2 = Function NO
1 / 2 = Function NC

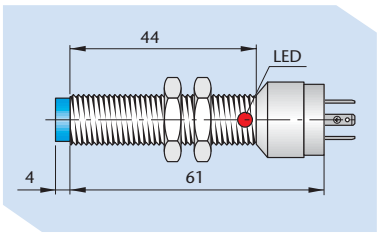
INDUCTIVE SENSORS M12 x 1

CE

CYLINDRICAL LONG HOUSING
2 WIRES D.C.
CONFORMING TO EN 50036 - EN 50044
VERSION-A



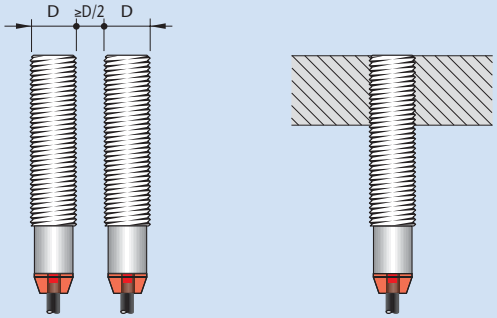




SI12 - AE4 NO SI12 - AE4 NC	SI12 - AE4 NO H SI12 - AE4 NC H	SI12 - AE4 NO K SI12 - AE4 NC K
4	4	4
20 ÷ 250		
< 10%		
12		
≤ 3		
300		
5		
1.5		
< 1		
< 6		
Incorporated		
- 25 ÷ + 70		
67	Depending on connector	65
Nickelled brass		
2 x 0.25 mm²		
	H	K (type 11)

INSTRUCTIONS FOR CORRECT INSTALLATION

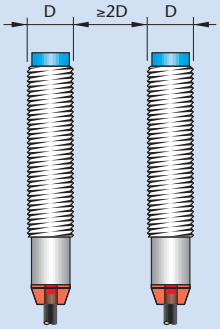
EMBEDDABLE



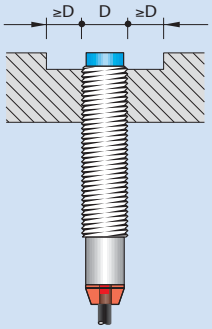
Side by side mounting

Flush mounting

NOT EMBEDDABLE



Side by side mounting



Non flush mounting

INDUCTIVE SENSORS M18 x 1

CE

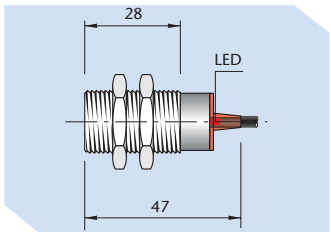
CYLINDRICAL SHORT HOUSING S SERIES
3/4 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C

■ STANDARD SWITCHING DISTANCE
★ EXTENDED SWITCHING DISTANCE
▲ EMBEDDABLE (FLUSH MOUNTING)
● NOT EMBEDDABLE (NON FLUSH MOUNTING)

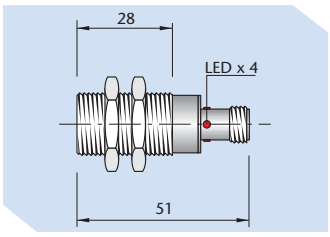
TECHNICAL CHARACTERISTICS

Dimensions mm

■ ▲

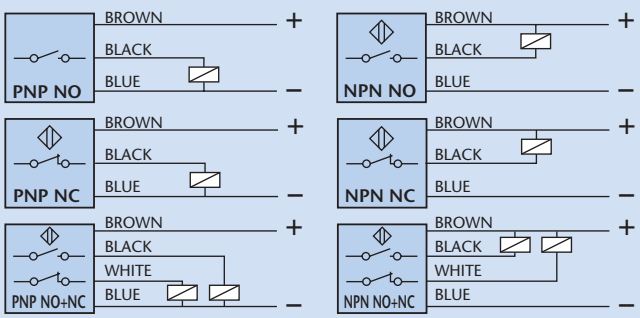


■ ▲



AMPLIFIED 3 WIRES D.C.	NPN	NO	SI18 - C5 NPN NO S	SI18 - C5 NPN NO H S
		NC	SI18 - C5 NPN NC S	SI18 - C5 NPN NC H S
	PNP	NO	SI18 - C5 PNP NO S	SI18 - C5 PNP NO H S
		NC	SI18 - C5 PNP NC S	SI18 - C5 PNP NC H S
AMPLIFIED 4 WIRES D.C. ANTIPHASE	NPN	NO+NC		
	PNP	NO+NC		
Switching distance (Sn)		mm	5	5
Continuous voltage (residual ripple ≤10%)		V	10 ÷ 30	
Hysteresis (%Sn)		mm	< 10%	
Switching frequency		Hz	1000	
Repeatability		% of Sn	≤ 3	
Max output current		mA	200	
Absorption at 24Vdc		mA	< 15	
Voltage drop (sensor ON)		V	< 1.8	
Short circuit protection			Incorporated	
Led			Incorporated	
Temperature limits		°C	- 25 ÷ + 70	
Degree of protection		IP	67	Depending on connector
Housing			Nickelled brass	
Cable PVC		2m	3 x 0.35 mm²	
Connector plug				H

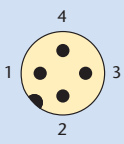
WIRING DIAGRAMS



N.B.: On request is available cable for sensors with different length 3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H PLUGS

FOR THE CONNECTORS SEE PAGE 85



VIEW OF MALE CONNECTOR **H**

3 WIRES
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO
2 = Black / output NPN-PNP / NC

4 WIRES
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO
2 = White / output NPN-PNP / NC

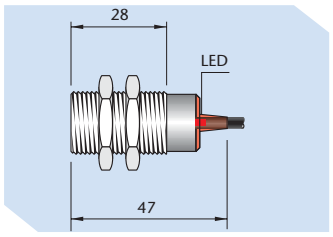
On the 4 wires version with plug H the connector types 14 - 15 must be ordered with 4 wires.

INDUCTIVE SENSORS M18 x 1

CE

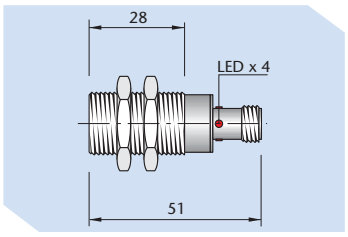
CYLINDRICAL SHORT HOUSING S SERIES
3/4 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C

★▲



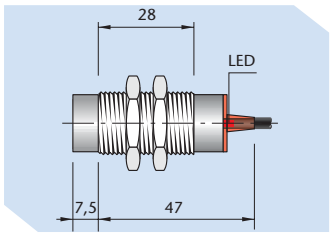
SI18 - DC8 NPN NO S
SI18 - DC8 NPN NC S
SI18 - DC8 PNP NO S
SI18 - DC8 PNP NC S
SI18 - DC8 NPN NO + NC S
SI18 - DC8 PNP NO + NC S
8

★▲



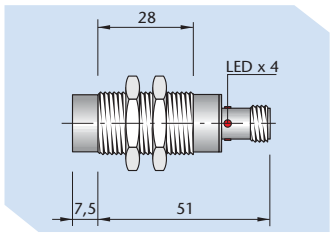
SI18 - DC8 NPN NO H S
SI18 - DC8 NPN NC H S
SI18 - DC8 PNP NO H S
SI18 - DC8 PNP NC H S
SI18 - DC8 NPN NO + NC H S
SI18 - DC8 PNP NO + NC H S
8

★●



SI18 - DCE16 NPN NO + NC S
SI18 - DCE16 PNP NO + NC S
16

★●

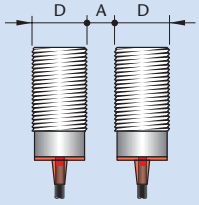


SI18 - DCE16 NPN NO + NC H S
SI18 - DCE16 PNP NO + NC H S
16

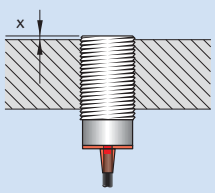
10 ÷ 30			
< 10%			
400		200	
≤ 3			
200			
< 15			
< 1.8			
Incorporated			
Incorporated			
- 25 ÷ + 70			
67	Depending on connector	67	Depending on connector
Stainless steel			
3 x 0.35 mm² - 4 x 0.25 mm²		4 x 0.25 mm²	
	H		H

INSTRUCTIONS FOR CORRECT INSTALLATION

EMBEDDABLE

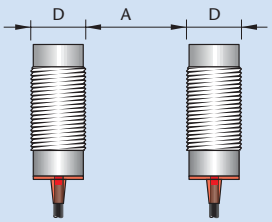


Side by side mounting
SI18-C5 A ≥ D/2
SI18-DC8 A ≥ D/2

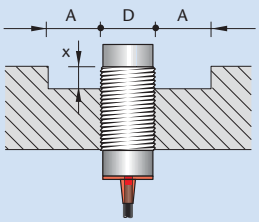


Flush mounting
SI18-C5 X ≥ 0
SI18-DC8 X ≥ 1.5mm

NOT EMBEDDABLE



Side by side mounting
SI18-DCE16 A ≥ 2D



Non flush mounting
SI18-DCE16 A ≥ 2D X ≥ 8mm

INDUCTIVE SENSORS M18 x 1

CE

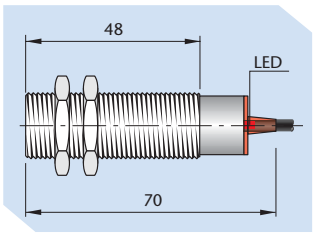
CYLINDRICAL LONG HOUSING
3/4 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C

■ **STANDARD SWITCHING DISTANCE**
▲ **EMBEDDABLE** (FLUSH MOUNTING)
● **NOT EMBEDDABLE**
(NON FLUSH MOUNTING)

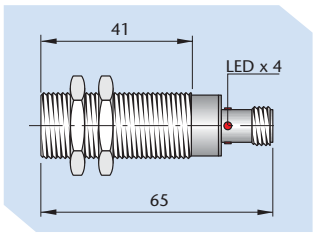
TECHNICAL CHARACTERISTICS

Dimensions mm

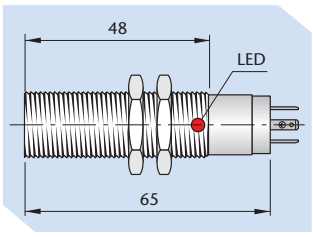
■ ▲



■ ▲

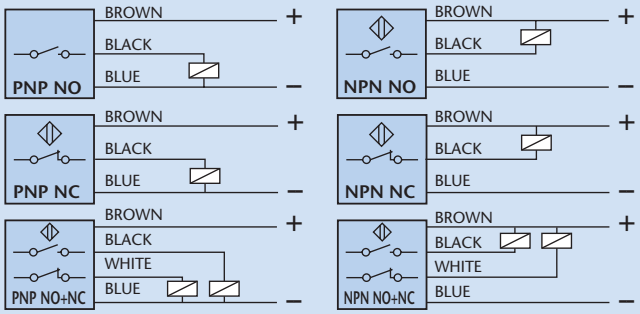


■ ▲



AMPLIFIED 3 WIRES D.C.	NPN	NO	SI18 - C5 NPN NO	SI18 - C5 NPN NO H	SI18 - C5 NPN NO K
		NC	SI18 - C5 NPN NC	SI18 - C5 NPN NC H	SI18 - C5 NPN NC K
	PNP	NO	SI18 - C5 PNP NO	SI18 - C5 PNP NO H	SI18 - C5 PNP NO K
		NC	SI18 - C5 PNP NC	SI18 - C5 PNP NC H	SI18 - C5 PNP NC K
AMPLIFIED 4 WIRES D.C. ANTIPHASE	NPN	NO+NC	SI18 - C5 NPN NO + NC	SI18 - C5 NPN NO + NC H	SI18 - C5 NPN NO + NC K
	PNP	NO+NC	SI18 - C5 PNP NO + NC	SI18 - C5 PNP NO + NC H	SI18 - C5 PNP NO + NC K
Switching distance (Sn)		mm	5	5	5
Continuous voltage (residual ripple ≤10%)		V	10 ÷ 30		
Hysteresis (%Sn)		mm	< 10%		
Switching frequency		Hz	1000		
Repeatability		% of Sn	≤ 3		
Max output current		mA	200		
Absorption at 24Vdc		mA	< 15		
Voltage drop (sensor ON)		V	< 1.8		
Short circuit protection			Incorporated		
Led			Incorporated		
Temperature limits		°C	- 25 ÷ + 70		
Degree of protection		IP	67	Depending on connector	65
Housing			Nickelled brass		
Cable PVC		2m	3 x 0.35 mm² - 4 x 0.25 mm²		
Connector plug				H	K (type 11)

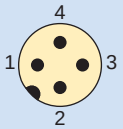
WIRING DIAGRAMS



N.B.: On request is available cable for sensors with different length 3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H - K PLUGS

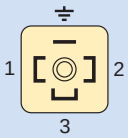
FOR THE CONNECTORS SEE PAGE 85



VIEW OF MALE CONNECTOR H

3 WIRES
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO
2 = Black / output NPN-PNP / NC

4 WIRES
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO
2 = White / output NPN-PNP / NC



VIEW OF MALE CONNECTOR K

3 WIRES
1 = Blue / –
2 = Brown / +
4/⏚ = Black / output NPN-PNP / NO-NC

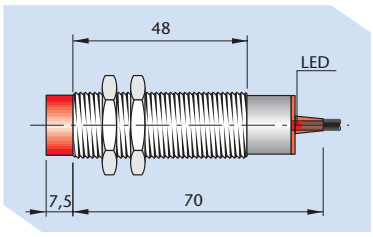
4 WIRES
1 = Blue / –
2 = Brown / +
4/⏚ = Black / output NPN-PNP / NO
3 = White / output NPN-PNP / NC

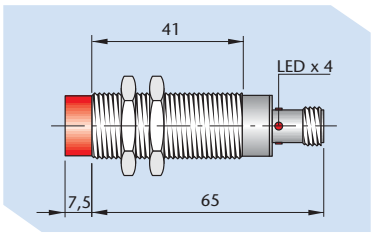
On the 3 wires version with plug K the connector K is supplied with 3 poles.
On the 4 wires version with plug H the connectors types 14 - 15 must be ordered with 4 wires.

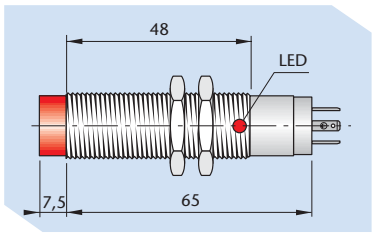
INDUCTIVE SENSORS M18 x 1

CE

CYLINDRICAL LONG HOUSING
3/4 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C



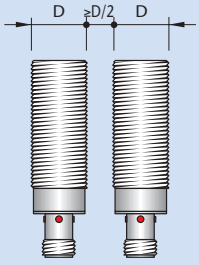




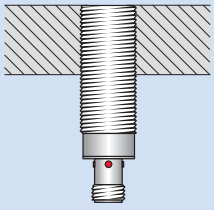
SI18 - CE8 NPN NO	SI18 - CE8 NPN NO H	SI18 - CE8 NPN NO K
SI18 - CE8 NPN NC	SI18 - CE8 NPN NC H	SI18 - CE8 NPN NC K
SI18 - CE8 PNP NO	SI18 - CE8 PNP NO H	SI18 - CE8 PNP NO K
SI18 - CE8 PNP NC	SI18 - CE8 PNP NC H	SI18 - CE8 PNP NC K
SI18 - CE8 NPN NO + NC	SI18 - CE8 NPN NO + NC H	SI18 - CE8 NPN NO + NC K
SI18 - CE8 PNP NO + NC	SI18 - CE8 PNP NO + NC H	SI18 - CE8 PNP NO + NC K
8	8	8
10 ÷ 30		
< 10%		
1000		
≤ 3		
200		
< 15		
< 1.8		
Incorporated		
Incorporated		
- 25 ÷ + 70		
67	Depending on connector	65
Nickelled brass		
3 x 0.35 mm² - 4 x 0.25 mm²		
	H	K (type 11)

INSTRUCTIONS FOR CORRECT INSTALLATION

EMBEDDABLE

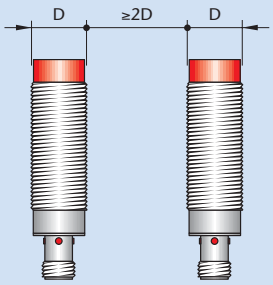


Side by side mounting

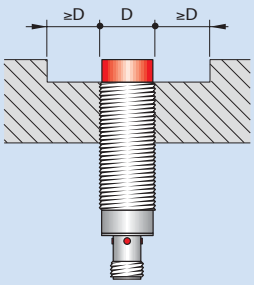


Flush mounting

NOT EMBEDDABLE



Side by side mounting



Non flush mounting

INDUCTIVE SENSORS M18 x 1

CE

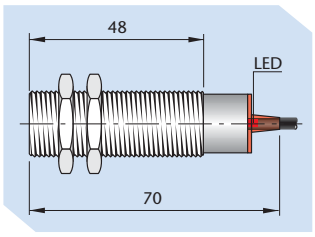
CYLINDRICAL LONG HOUSING
2 WIRES D.C.
CONFORMING TO EN 50040 - EN 50044
VERSION-B

■ **STANDARD SWITCHING DISTANCE**
▲ **EMBEDDABLE** (FLUSH MOUNTING)
● **NOT EMBEDDABLE**
(NON FLUSH MOUNTING)

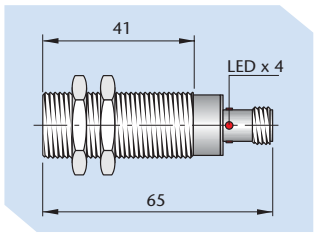
TECHNICAL CHARACTERISTICS

Dimensions mm

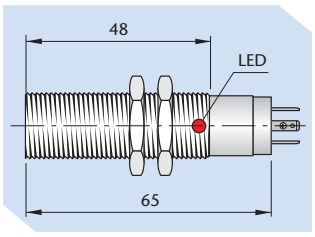
■ ▲



■ ▲

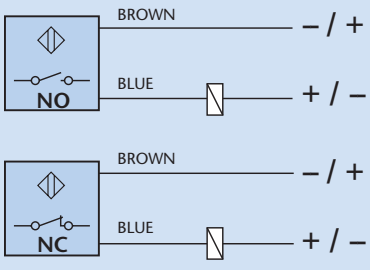


■ ▲



AMPLIFIED 2 WIRES D.C.		NO	SI18 - B5 NO	SI18 - B5 NO H	SI18 - B5 NO K
		NC	SI18 - B5 NC	SI18 - B5 NC H	SI18 - B5 NC K
Switching distance (Sn)	mm		5	5	5
Continuous voltage (residual ripple ≤10%)	V		10 ÷ 55		
Hysteresis (%Sn)	mm		< 10%		
Switching frequency	Hz		1000		
Repeatability	% of Sn		≤ 3		
Max output current	mA		100		
Min. output current	mA		1.5		
Residual current	mA		< 0.6		
Voltage drop (sensor ON)	V		< 6.5		
Short circuit protection			Incorporated		
Led			Incorporated		
Temperature limits	°C		- 25 ÷ + 70		
Degree of protection	IP		67	Depending on connector	65
Housing			Nickelled brass		
Cable PVC	2m		2 x 0.50 mm²		
Connector plug				H	K (type 11)

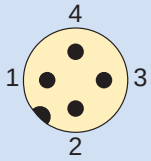
WIRING DIAGRAMS (2 WIRES NON POLARIZED)



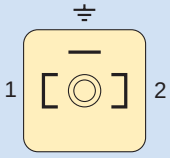
N.B.: On request is available cable for sensors with different length
3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H - K PLUGS

FOR THE CONNECTORS SEE PAGE 85



VIEW OF MALE CONNECTOR **H**
3 / 4 = = Function NO (Black-blue)*
1 / 2 = Function NC (White-brown)*
(Non polarized)
* The wire colour are referred to theconnector with cable only.

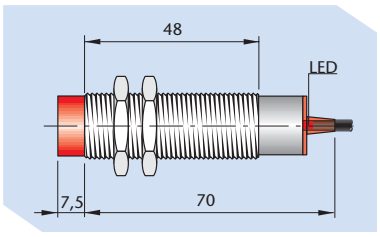


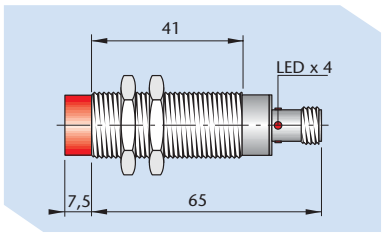
VIEW OF MALE CONNECTOR **K**
1 / 2 = Function NO
1 / 2 = Function NC
(Non polarized)

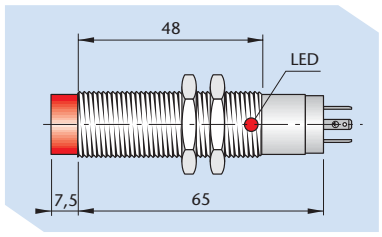
INDUCTIVE SENSORS M18 x 1

CE

CYLINDRICAL LONG HOUSING
2 WIRES D.C.
CONFORMING TO EN 50040 - EN 50044
VERSION-B



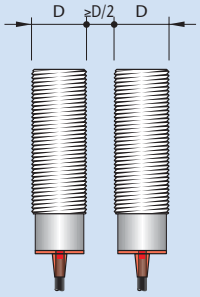




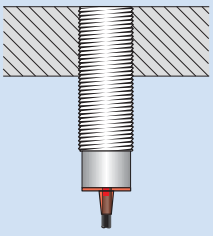
SI18 - BE8 NO SI18 - BE8 NC	SI18 - BE8 NO H SI18 - BE8 NC H	SI18 - BE8 NO K SI18 - BE8 NC K
8	8	8
10 ÷ 55		
< 10%		
1000		
≤ 3		
100		
1.5		
< 0.6		
< 6.5		
Incorporated		
Incorporated		
- 25 ÷ + 70		
67	Depending on connector	65
Nickelled brass		
2 x 0.50 mm²		
	H	K (type 11)

INSTRUCTIONS FOR CORRECT INSTALLATION

EMBEDDABLE

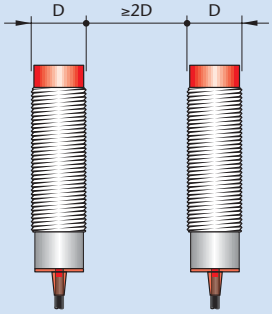


Side by side mounting

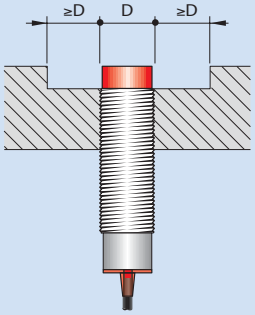


Flush mounting

NOT EMBEDDABLE



Side by side mounting



Non flush mounting

INDUCTIVE SENSORS M18 x 1

CE

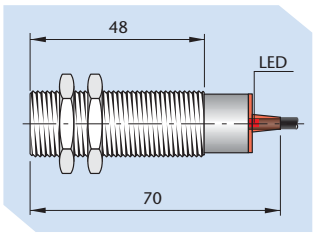
CYLINDRICAL LONG HOUSING
2 WIRES A.C.
CONFORMING TO EN 50036 - EN 50044
VERSION-A

■ **STANDARD SWITCHING DISTANCE**
▲ **EMBEDDABLE** (FLUSH MOUNTING)
● **NOT EMBEDDABLE**
(NON FLUSH MOUNTING)

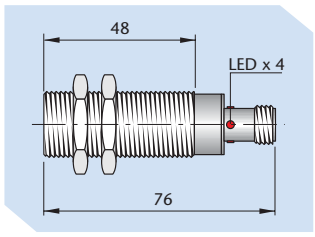
TECHNICAL CHARACTERISTICS

Dimensions mm

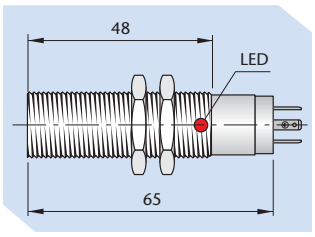
■ ▲



■ ▲

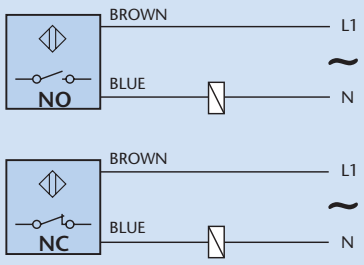


■ ▲



AMPLIFIED 2 WIRES A.C.				
	NO	**SI18 - A5 NO**	**SI18 - A5 NO H**	**SI18 - A5 NO K**
	NC	**SI18 - A5 NC**	**SI18 - A5 NC H**	**SI18 - A5 NC K**
Switching distance (Sn)	mm	5	5	5
voltage 50÷ 60 Hz	V	20 ÷ 250		
Hysteresis (%Sn)	mm	< 10%		
Switching frequency	Hz	12		
Repeatability	% of Sn	≤ 3		
Max output current	mA	300		
Min. output current	mA	5		
Max. peak current for 20ms	A	1.5		
Residual current	mA	< 1		
Voltage drop	V	< 6		
Led		Incorporated		
Temperature limits	°C	- 25 ÷ + 70		
Degree of protection	IP	67	Depending on connector	65
Housing		Nickelled brass		
Cable PVC	2m	2 x 0.50 mm²		
Connector plug			H	K (type 11)

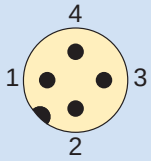
WIRING DIAGRAMS



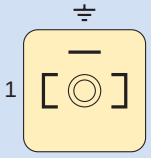
N.B.: On request is available cable for sensors with different length
3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H - K PLUGS

FOR THE CONNECTORS SEE PAGE 85



VIEW OF MALE CONNECTOR **H**
3 / 4 = Function NO (Black-blue)*
1 / 2 = Function NC (White-brown)*
* The wire colour are referred to the connector with cable only.

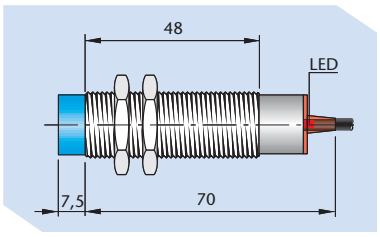


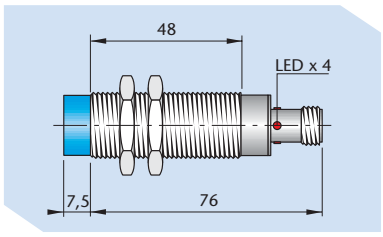
VIEW OF MALE CONNECTOR **K**
1 / 2 = Function NO
1 / 2 = Function NC

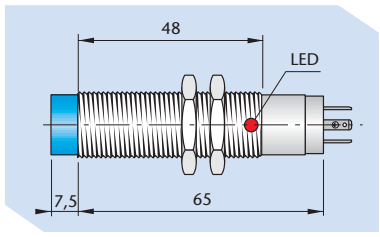
INDUCTIVE SENSORS M18 x 1

CE

CYLINDRICAL LONG HOUSING
2 WIRES A.C.
CONFORMING TO EN 50036 - EN 50044
VERSION-A



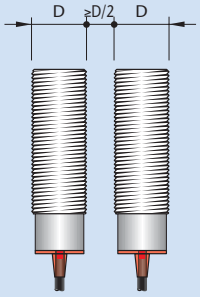




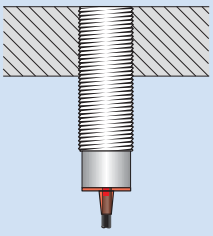
SI18 - AE8 NO SI18 - AE8 NC	SI18 - AE8 NO H SI18 - AE8 NC H	SI18 - AE8 NO K SI18 - AE8 NC K
8	8	8
20 ÷ 250		
< 10%		
12		
≤ 3		
300		
5		
1.5		
< 1		
< 6		
Incorporated		
- 25 ÷ + 70		
67	Depending on connector	65
Nickelled brass		
2 x 0.50 mm²		
	H	K (type 11)

INSTRUCTIONS FOR CORRECT INSTALLATION

EMBEDDABLE

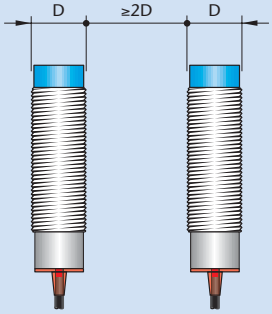


Side by side mounting

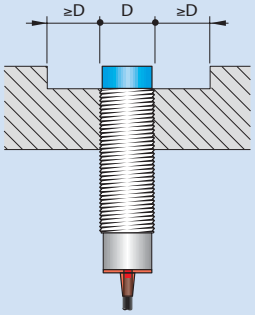


Flush mounting

NOT EMBEDDABLE



Side by side mounting



Non flush mounting

INDUCTIVE SENSORS M30 x 1.5

CE

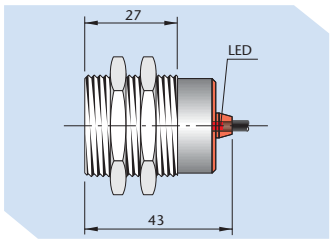
CYLINDRICAL SHORT HOUSING S SERIES
3/4 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C

■ STANDARD SWITCHING DISTANCE
★ EXTENDED SWITCHING DISTANCE
▲ EMBEDDABLE (FLUSH MOUNTING)
● NOT EMBEDDABLE
(NON FLUSH MOUNTING)

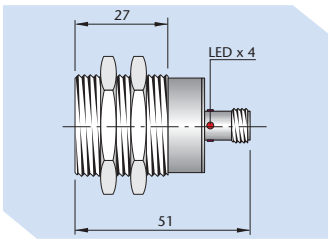
TECHNICAL CHARACTERISTICS

Dimensions mm

■ ▲

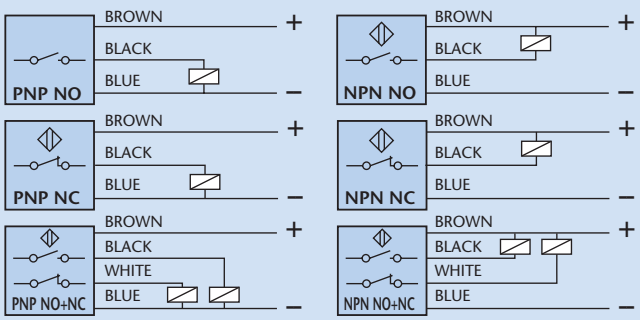


■ ▲



AMPLIFIED 3 WIRES D.C.	NPN	NO	SI30 - C10 NPN NO S	SI30 - C10 NPN NO H S
		NC	SI30 - C10 NPN NC S	SI30 - C10 NPN NC H S
	PNP	NO	SI30 - C10 PNP NO S	SI30 - C10 PNP NO H S
		NC	SI30 - C10 PNP NC S	SI30 - C10 PNP NC H S
AMPLIFIED 4 WIRES D.C. ANTIPHASE	NPN	NO+NC		
	PNP	NO+NC		
Switching distance (Sn)		mm	10	10
Continuous voltage (residual ripple ≤10%)		V	10 ÷ 30	
Hysteresis (%Sn)		mm	< 10%	
Switching frequency		Hz	300	
Repeatability		% of Sn	≤ 3	
Max output current		mA	200	
Absorption at 24Vdc		mA	< 15	
Voltage drop (sensor ON)		V	< 1.8	
Short circuit protection			Incorporated	
Led			Incorporated	
Temperature limits		°C	- 25 ÷ + 70	
Degree of protection		IP	67	Depending on connector
Housing			Nickelled brass	
Cable PVC		2m	3 x 0.35 mm²	
Connector plug				H

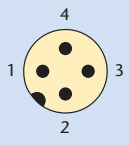
WIRING DIAGRAMS



N.B.: On request is available cable for sensors with different length 3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H PLUG

FOR THE CONNECTORS SEE PAGE 85



VIEW OF MALE CONNECTOR H

3 WIRES
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO
2 = Black / output NPN-PNP / NC

4 WIRES
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO
2 = White / output NPN-PNP / NC

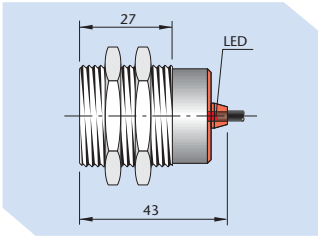
On the 4 wires version with plug H the connector types 14 - 15 must be ordered with 4 wires.

INDUCTIVE SENSORS M30 x 1.5

CE

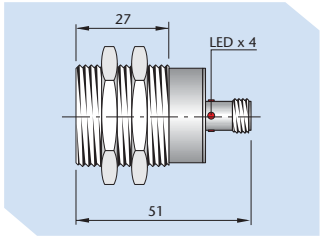
CYLINDRICAL SHORT HOUSING S SERIES
3/4 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C

★▲

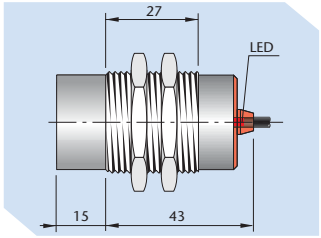


SI30 - DC15 NPN NO S	SI30 - DC15 NPN NO H S		
SI30 - DC15 NPN NC S	SI30 - DC15 NPN NC H S		
SI30 - DC15 PNP NO S	SI30 - DC15 PNP NO H S		
SI30 - DC15 PNP NC S	SI30 - DC15 PNP NC H S		
SI30 - DC15 NPN NO + NC S	SI30 - DC15 NPN NO + NC H S	SI30 - DCE20 NPN NO + NC S	SI30 - DCE20 NPN NO + NC H S
SI30 - DC15 PNP NO + NC S	SI30 - DC15 PNP NO + NC H S	SI30 - DCE20 PNP NO + NC S	SI30 - DCE20 PNP NO + NC H S
15	15	20	20

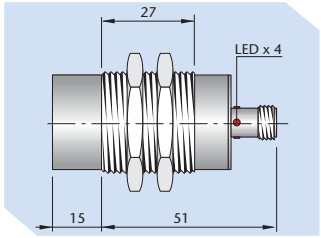
★▲



★●



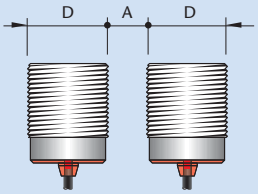
★●



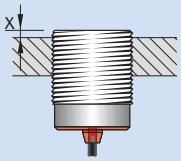
10 ÷ 30			
< 10%			
300		200	
≤ 3			
200			
< 15			
< 1.8			
Incorporated			
Incorporated			
- 25 ÷ + 70			
67	Depending on connector	67	Depending on connector
Nickelled brass			
3 x 0.35 mm² - 4 x 0.25 mm²		4 X 0.25 mm²	
	H		H

INSTRUCTIONS FOR CORRECT INSTALLATION

EMBEDDABLE

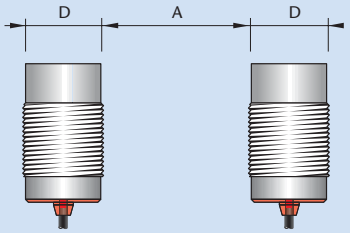


Side by side mounting
SI30-C10 A ≥ D/2
SI30-DC15 A ≥ D

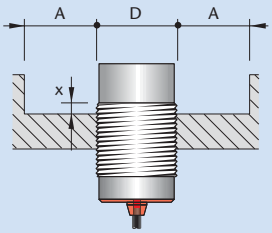


Flush mounting
SI30-C10 X ≥ 0
SI30-DC15 X ≥ 4mm

NOT EMBEDDABLE



Side by side mounting
SI30-DCE20 A ≥ 3D



Non flush mounting
SI30-DCE20 A ≥ 2D X ≥ 10mm

INDUCTIVE SENSORS M30 x 1.5

CE

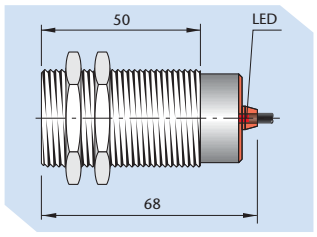
CYLINDRICAL LONG HOUSING
3/4 WIRES D.C.
CONFORMING TO EN 50008 - EN 50044
VERSION-C

■ **STANDARD SWITCHING DISTANCE**
▲ **EMBEDDABLE** (FLUSH MOUNTING)
● **NOT EMBEDDABLE**
(NON FLUSH MOUNTING)

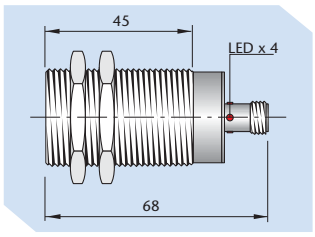
TECHNICAL CHARACTERISTICS

Dimensions mm

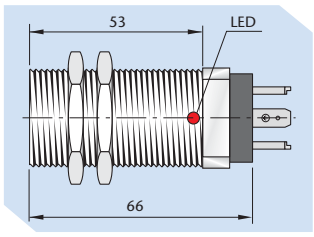
■ ▲



■ ▲

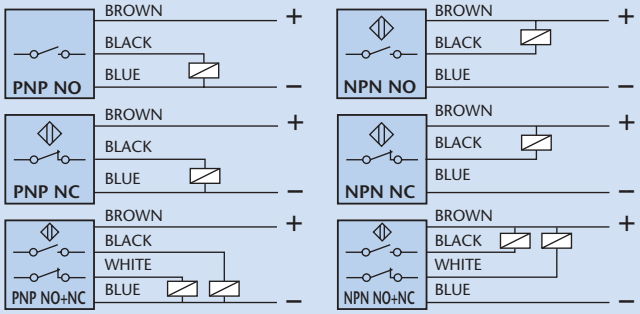


■ ▲



AMPLIFIED 3 WIRES D.C.	NPN	NO	SI30 - C10 NPN NO	SI30 - C10 NPN NO H	SI30 - C10 NPN NO K
		NC	SI30 - C10 NPN NC	SI30 - C10 NPN NC H	SI30 - C10 NPN NC K
	PNP	NO	SI30 - C10 PNP NO	SI30 - C10 PNP NO H	SI30 - C10 PNP NO K
		NC	SI30 - C10 PNP NC	SI30 - C10 PNP NC H	SI30 - C10 PNP NC K
AMPLIFIED 4 WIRES D.C. ANTIPHASE	NPN	NO+NC	SI30 - C10 NPN NO + NC	SI30 - C10 NPN NO + NC H	SI30 - C10 NPN NO + NC K
	PNP	NO+NC	SI30 - C10 PNP NO + NC	SI30 - C10 PNP NO + NC H	SI30 - C10 PNP NO + NC K
Switching distance (Sn)		mm	10	10	10
Continuous voltage (residual ripple ≤10%)		V	10 ÷ 30		
Hysteresis (%Sn)		mm	< 10%		
Switching frequency		Hz	300		
Repeatability		% of Sn	≤ 3		
Max output current		mA	200		
Absorption at 24Vdc		mA	< 15		
Voltage drop (sensor ON)		V	< 1.8		
Short circuit protection			Incorporated		
Led			Incorporated		
Temperature limits		°C	- 25 ÷ + 70		
Degree of protection		IP	67	Depending on connector	65
Housing			Nickelled brass		
Cable PVC		2m	3 x 0.35 mm² - 4 x 0.25 mm²		
Connector plug				H	K (type 12)

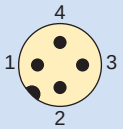
WIRING DIAGRAMS



N.B.: On request is available cable for sensors with different length 3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H - K PLUGS

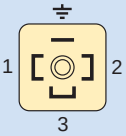
FOR THE CONNECTORS SEE PAGE 85



VIEW OF MALE CONNECTOR H

3 WIRES
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO
2 = Black / output NPN-PNP / NC

4 WIRES
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO
2 = White / output NPN-PNP / NC



VIEW OF MALE CONNECTOR K

3 WIRES
1 = Blue / –
2 = Brown / +
4/⏚ = Black / output NPN-PNP / NO-NC

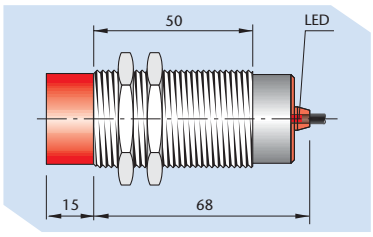
4 WIRES
1 = Blue / –
2 = Brown / +
4/⏚ = Black / output NPN-PNP / NO
3 = White / output NPN-PNP / NC

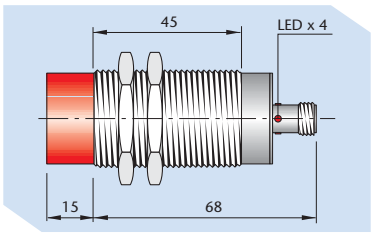
On the 3 wires version with plug K the connector K is supplied with 3 poles.
On the 4 wires version with plug H the connector types 14 - 15 must be ordered with 4 wires.

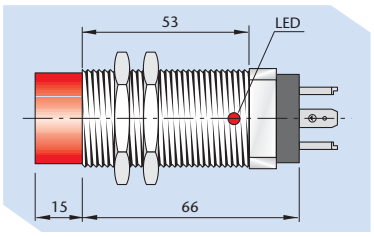
INDUCTIVE SENSORS M30 x 1.5

CE

CYLINDRICAL LONG HOUSING
3/4 WIRES D.C.
CONFORMING TO EN 50008 - EN 50044
VERSION-C



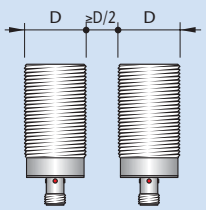




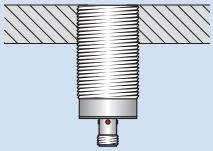
SI30 - CE15 NPN NO	**SI30 - CE15 NPN NO H**	**SI30 - CE15 NPN NO K**
SI30 - CE15 NPN NC	**SI30 - CE15 NPN NC H**	**SI30 - CE15 NPN NC K**
SI30 - CE15 PNP NO	**SI30 - CE15 PNP NO H**	**SI30 - CE15 PNP NO K**
SI30 - CE15 PNP NC	**SI30 - CE15 PNP NC H**	**SI30 - CE15 PNP NC K**
SI30 - CE15 NPN NO + NC	**SI30 - CE15 NPN NO + NC H**	**SI30 - CE15 NPN NO + NC K**
SI30 - CE15 PNP NO + NC	**SI30 - CE15 PNP NO + NC H**	**SI30 - CE15 PNP NO + NC K**
15	15	15
	10 ÷ 30	
	< 10%	
	300	
	≤ 3	
	200	
	< 15	
	< 1.8	
	Incorporated	
	Incorporated	
	- 25 ÷ + 70	
67	Depending on connector	65
	Nickelled brass	
3 x 0.35 mm² - 4 x 0.25 mm²		
	H	K (type 12)

INSTRUCTIONS FOR CORRECT INSTALLATION

EMBEDDABLE

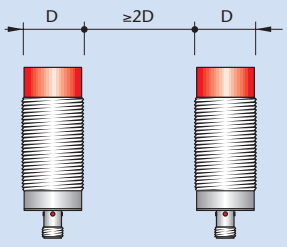


Side by side mounting

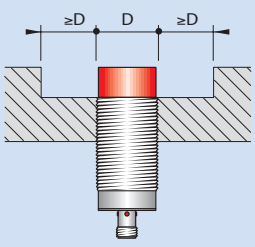


Flush mounting

NOT EMBEDDABLE



Side by side mounting



Non flush mounting

INDUCTIVE SENSORS M30 x 1.5

CE

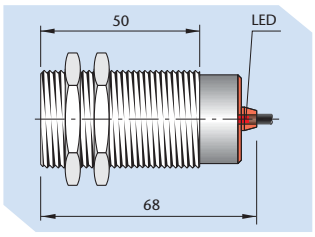
CYLINDRICAL LONG HOUSING
2 WIRES D.C.
CONFORMING TO EN 50040 - EN 50044
VERSION -B

■ **STANDARD SWITCHING DISTANCE**
▲ **EMBEDDABLE** (FLUSH MOUNTING)
● **NOT EMBEDDABLE**
(NON FLUSH MOUNTING)

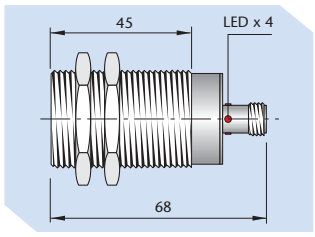
TECHNICAL CHARACTERISTICS

Dimensions mm

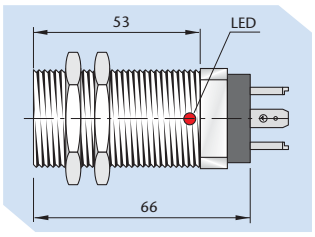
■ ▲



■ ▲

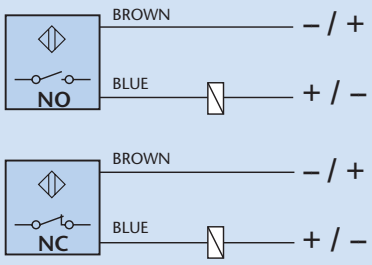


■ ▲



AMPLIFIED 2 WIRES D.C.		NO	SI30 - B10 NO	SI30 - B10 NO H	SI30 - B10 NO K
		NC	SI30 - B10 NC	SI30 - B10 NC H	SI30 - B10 NC K
Switching distance (Sn)	mm		10	10	10
Continuous voltage (residual ripple ≤10%)	V		10 ÷ 55		
Hysteresis (%Sn)	mm		< 10%		
Switching frequency	Hz		300		
Repeatability	% of Sn		≤ 3		
Max output current	mA		100		
Min. output current	mA		1.5		
Residual current	mA		< 0.6		
Voltage drop (sensor ON)	V		< 6.5		
Short circuit protection			Incorporated		
Led			Incorporated		
Temperature limits	°C		- 25 ÷ + 70		
Degree of protection	IP		67	Depending on connector	65
Housing			Nickelled brass		
Cable PVC	2m		2 x 0.50 mm²		
Connector plug				H	K (type 12)

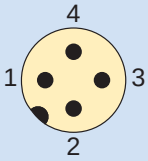
WIRING DIAGRAMS (2 WIRES NON POLARIZED)



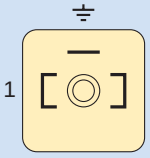
N.B.: On request is available cable for sensors with different length
3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H - K PLUGS

FOR THE CONNECTORS SEE PAGE 85



VIEW OF MALE CONNECTOR **H**
3 / 4 = Function NO (Black-blue)*
1 / 2 = Function NC (White-brown)*
(Non polarized)
* The wire colour are referred to the connector with cable only.

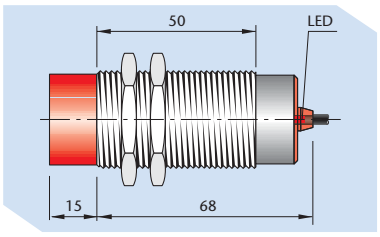


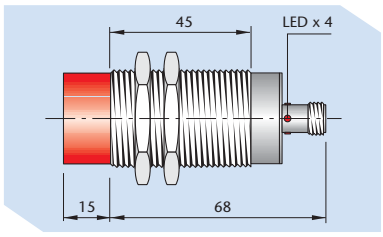
VIEW OF MALE CONNECTOR **K**
1 / 2 = Function NO
1 / 2 = Function NC
(Non polarized)

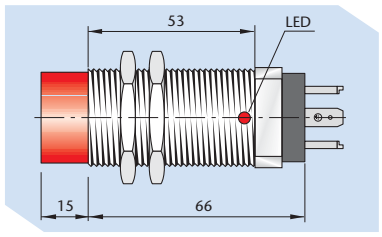
INDUCTIVE SENSORS M30 x 1.5

CE

CYLINDRICAL LONG HOUSING
2 WIRES D.C.
CONFORMING TO EN 50040 - EN 50044
VERSION -B



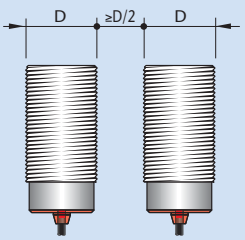




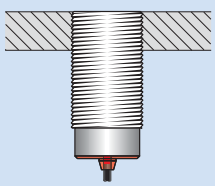
SI30 - BE15 NO SI30 - BE15 NC	SI30 - BE15 NO H SI30 - BE15 NC H	SI30 - BE15 NO K SI30 - BE15 NC K
15	15	15
	10 ÷ 55	
	< 10%	
	300	
	≤ 3	
	100	
	1.5	
	< 0.6	
	< 6.5	
	Incorporated	
	Incorporated	
	- 25 ÷ + 70	
67	Depending on connector	65
	Nickelled brass	
2 x 0.50 mm²		
	H	K (type 12)

INSTRUCTIONS FOR CORRECT INSTALLATION

EMBEDDABLE

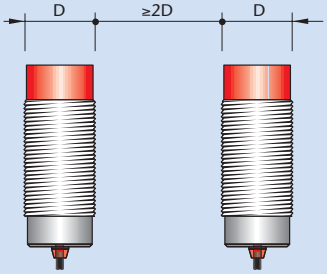


Side by side mounting

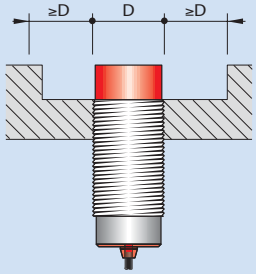


Flush mounting

NOT EMBEDDABLE



Side by side mounting



Non flush mounting

INDUCTIVE SENSORS M30 x 1.5

CE

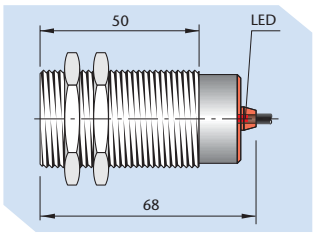
CYLINDRICAL LONG HOUSING
2 WIRES A.C.
CONFORMING TO EN 50036 - EN 50044
VERSION-A

■ **STANDARD SWITCHING DISTANCE**
▲ **EMBEDDABLE** (FLUSH MOUNTING)
● **NOT EMBEDDABLE**
(NON FLUSH MOUNTING)

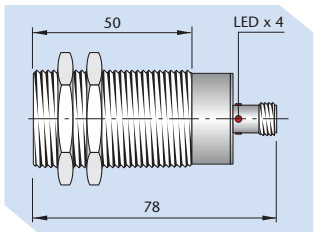
TECHNICAL CHARACTERISTICS

Dimensions mm

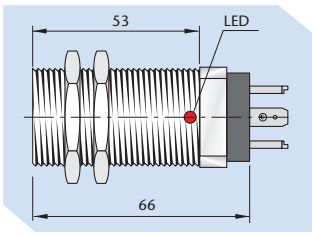
■ ▲



■ ▲

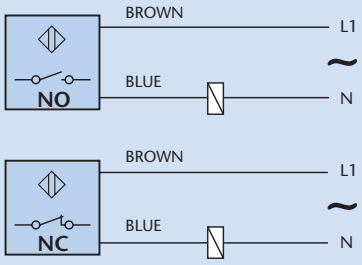


■ ▲



AMPLIFIED 2 WIRES A.C.		NO	SI30 - A10 NO	SI30 - A10 NO H	SI30 - A10 NO K
		NC	SI30 - A10 NC	SI30 - A10 NC H	SI30 - A10 NC K
Switching distance (Sn)	mm		10	10	10
Alternating voltage 50÷ 60 Hz	V		20 ÷ 250		
Hysteresis (%Sn)	mm		< 10%		
Switching frequency	Hz		12		
Repeatability	% of Sn		≤ 3		
Max output current	mA		300		
Min. output current	mA		5		
Max. peak current for 20ms	A		1.5		
Residual current	mA		< 1		
Voltage drop (sensor on)	V		< 6		
Led			Incorporated		
Temperature limits	°C		- 25 ÷ + 70		
Degree of protection	IP		67	Depending on connector	65
Housing			Nickelled brass		
Cable PVC	2m		2 x 0.50 mm²		
Connector plug				H	K (type 12)

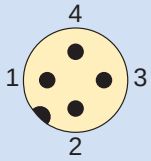
WIRING DIAGRAMS



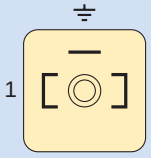
N.B.: On request is available cable for sensors with different length
3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H - K PLUGS

FOR THE CONNECTORS SEE PAGE 85



VIEW OF MALE CONNECTOR **H**
3 / 4 = Function NO (Black-blue)*
1 / 2 = Function NC (White-brown)*
* The wire colour are referred to the connector with cable only.

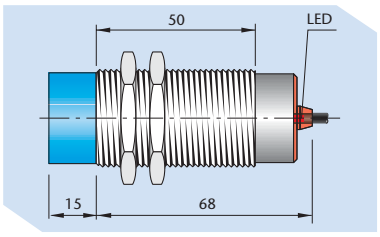


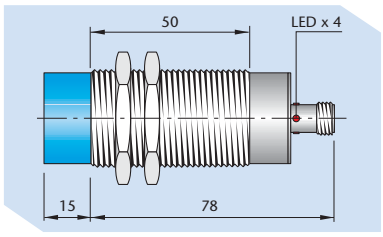
VIEW OF MALE CONNECTOR **K**
1 / 2 = Function NO
1 / 2 = Function NC

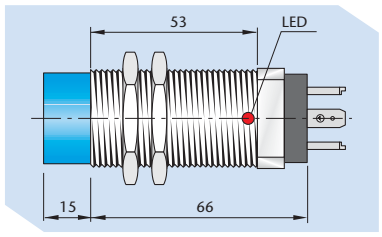
INDUCTIVE SENSORS M30 x 1.5

CE

CYLINDRICAL LONG HOUSING
2 WIRES A.C.
CONFORMING TO EN 50036 - EN 50044
VERSION-A



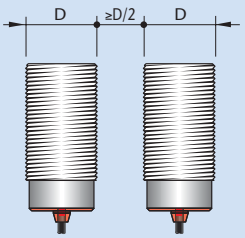




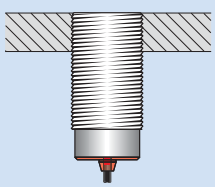
SI30 - AE15 NO SI30 - AE15 NC	SI30 - AE15 NO H SI30 - AE15 NC H	SI30 - AE15 NO K SI30 - AE15 NC K
15	15	15
20 ÷ 250		
< 10%		
12		
≤ 3		
300		
5		
1.5		
< 1		
< 6		
Incorporated		
- 25 ÷ + 70		
67	Depending on connector	65
Nickelled brass		
2 x 0.50 mm²		
	H	K (type 12)

INSTRUCTIONS FOR CORRECT INSTALLATION

EMBEDDABLE

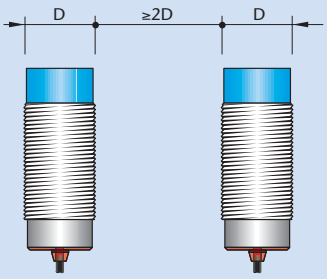


Side by side mounting

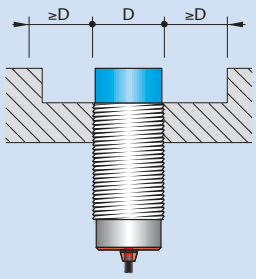


Flush mounting

NOT EMBEDDABLE



Side by side mounting



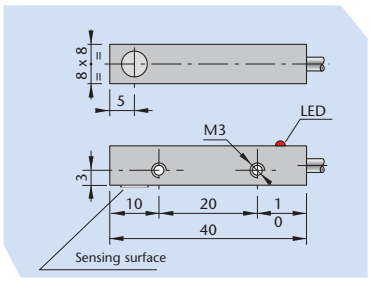
Non flush mounting

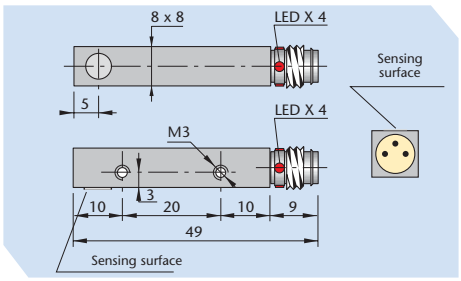
RECTANGULAR INDUCTIVE SENSORS SIPA8 - SIPC8 - SIP10

CE

3 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C

▲ EMBEDDABLE (FLUSH MOUNTING)





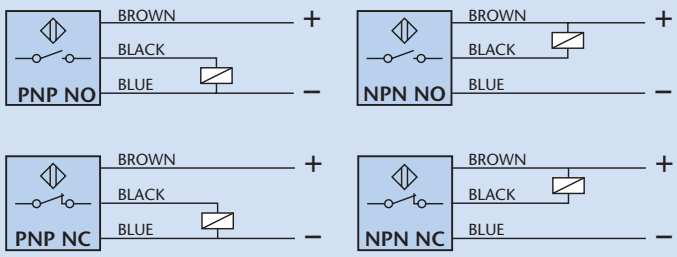
TECHNICAL CHARACTERISTICS

Dimensions mm

			▲	▲
AMPLIFIED 3 WIRES D.C.	NPN	NO	SIPA8 - C2 NPN NO	SIPA8 - C2 NPN NO H 1
		NC	SIPA8 - C2 NPN NC	SIPA8 - C2 NPN NC H 1
	PNP	NO	SIPA8 - C2 PNP NO	SIPA8 - C2 PNP NO H 1
		NC	SIPA8 - C2 PNP NC	SIPA8 - C2 PNP NC H 1

Switching distance (Sn)	mm	2	2
Continuous voltage (residual ripple ≤10%)	V	6 ÷ 30	
Hysteresis (%Sn)	mm	< 10%	
Switching frequency	Hz	2000	
Repeatability	% of Sn	≤ 3	
Max output current	mA	200	
Absorption at 24Vdc	mA	< 12	
Voltage drop (sensor ON)	V	< 1.8	
Short circuit protection		Incorporated	
Led		Incorporated	
Temperature limits	°C	- 25 ÷ + 70	
Degree of protection	IP	67	Depending on connector
Housing		Anodized aluminium	
Cable PVC	2m	3 x 0.14 mm²	
Connector plug			H1

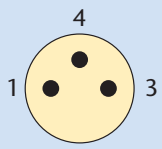
WIRING DIAGRAMS



N.B.: On request is available cable for sensors with different length
3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H1 PLUG

FOR THE CONNECTORS SEE PAGE 85

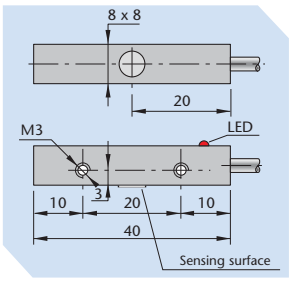


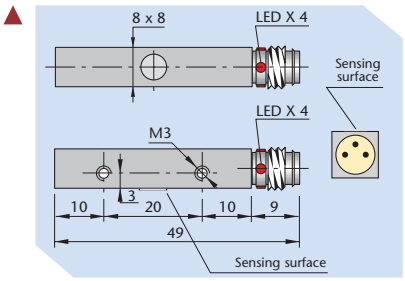
VIEW OF MALE CONNECTOR **H1**:
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO-NC

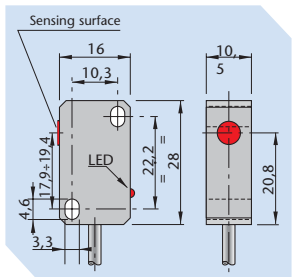
RECTANGULAR INDUCTIVE SENSORS SIPA8 - SIPC8 - SIP10

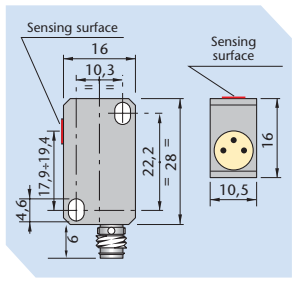
CE

3 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C





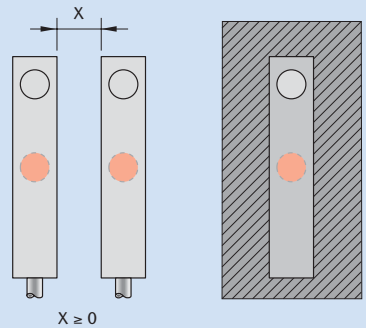




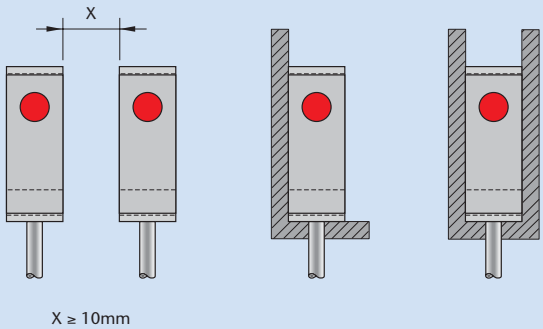
SIPC8 - C2 NPN NO	SIPC8 - C2 NPN NO H1	SIP10 - C2 NPN NO	SIP10 - C2 NPN NO H1
SIPC8 - C2 NPN NC	SIPC8 - C2 NPN NC H1	SIP10 - C2 NPN NC	SIP10 - C2 NPN NC H1
SIPC8 - C2 PNP NO	SIPC8- C2 PNP NO H1	SIP10 - C2 PNP NO	SIP10 - C2 PNP NO H1
SIPC8 - C2 PNP NC	SIPC8 - C2 PNP NC H1	SIP10 - C2 PNP NC	SIP10 - C2 PNP NC H1
2	2	2	2
6 ÷ 30		6 ÷ 30	
<10%		< 10%	
2000		1000	
≤ 3		≤ 3	
200		200	
<12		< 12	
<1.8		< 1.8	
Incorporated		Incorporated	
Incorporated		Incorporated	
- 25 ÷ + 70		- 25 ÷ + 70	
67	Depending on connector	67	Depending on connector
Anodized aluminium		Plastic	
3 x 0.14 mm²		3 x 0.14 mm²	
	H1		H1

INSTRUCTIONS FOR CORRECT INSTALLATION

TYPE **SIPA8 - SIPC8**



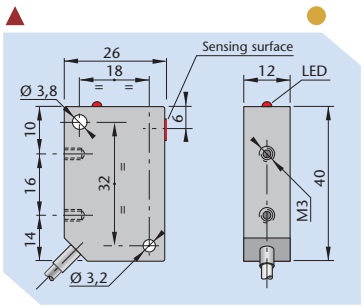
TYPE **SIP10**

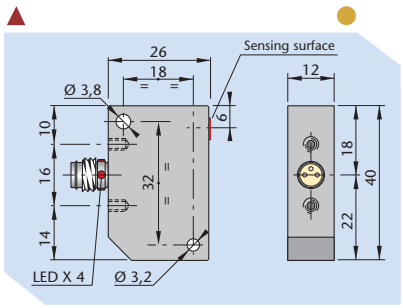


RECTANGULAR INDUCTIVE SENSORS SIP12 - SIP17 - SIP25

3/4 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C

▲ **EMBEDDABLE** (FLUSH MOUNTING)
● **NOT EMBEDDABLE**
(NON FLUSH MOUNTING)



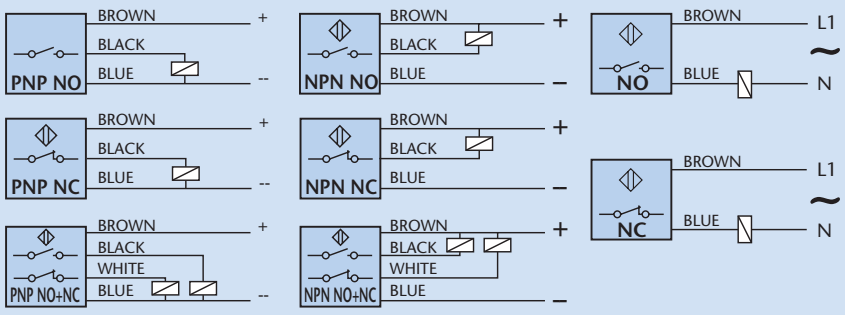


TECHNICAL CHARACTERISTICS

Dimensions mm

			▲	●	▲	●
AMPLIFIED 3 WIRES D.C.	NPN	NO			SIP12 - C2 NPN NO H1	SIP12 - CE4 NPN NO H1
		NC			SIP12 - C2 NPN NC H1	SIP12 - CE4 NPN NC H1
	PNP	NO			SIP12 - C2 PNP NO H1	SIP12 - CE4 PNP NO H1
		NC			SIP12 - C2 PNP NC H1	SIP12 - CE4 PNP NC H1
AMP. 4 WIRES D.C. ANTIPHASE	NPN	NO+NC	SIP12 - C2 NPN NO + NC	SIP12- CE4 NPN NO + NC		
	PNP	NO+NC	SIP12 - C2 PNP NO + NC	SIP12- CE4 PNP NO + NC		
AMPLIFIED 2 WIRES A.C.		NO				
		NC				
Switching distance (Sn)		mm	2	4	2	4
Continuous voltage (residual ripple ≤10%)		V	10 ÷ 30			
Alternating voltage 50÷60 Hz		V				
Hysteresis (%Sn)		mm	<10%			
Switching frequency		Hz	1000			
Repeatability		% of Sn	≤ 3			
Max output current		mA	200			
Min output current		mA				
Max peak current for 20 ms		A				
Absorption at 24Vdc		mA	<15			
Residual current		mA				
Voltage drop (sensor ON)		V	<1.8			
Short circuit protection			Incorporated			
Led			Incorporated			
Temperature limits		°C	- 25 ÷ + 70			
Degree of protection		IP	67			
Housing			Plastic			
Cable PVC		2m	4 x 0.25 mm²			
Connector plug						H1

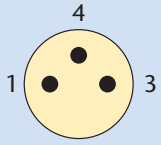
WIRING DIAGRAMS



N.B.: On request is available cable for sensors with different length 3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H1 PLUG

FOR THE CONNECTORS SEE PAGE 85



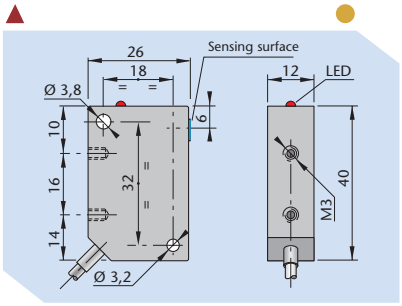
VIEW OF MALE CONNECTOR **H1**:
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO-NC

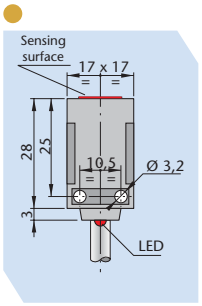
RECTANGULAR INDUCTIVE SENSORS SIP12 - SIP17 - SIP25

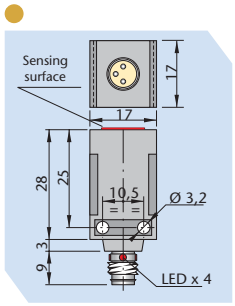
CE

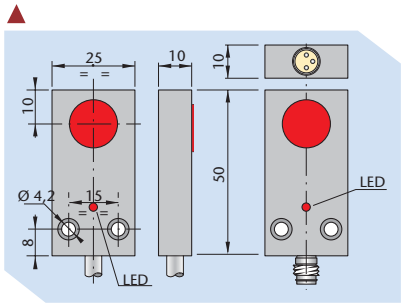
2 WIRES A.C.
CONFORMING TO EN 50044
VERSION-A

3/4 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C





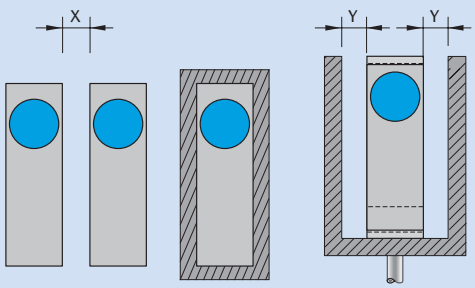




			SIP17 - CE5 NPN NO H1		SIP25 - C5 NPN NO H1
			SIP17 - CE5 NPN NC H1		SIP25 - C5 NPN NC H1
			SIP17 - CE5 PNP NO H1		SIP25 - C5 PNP NO H1
			SIP17 - CE5 PNP NC H1		SIP25 - C5 PNP NC H1
		SIP17 - CE5 NPN NO + NC		SIP25 - C5 NPN NO + NC	
		SIP17 - CE5 PNP NO + NC		SIP25 - C5 PNP NO + NC	
SIP12 - A2 NO SIP12 - A2 NC	SIP12 - AE4 NO SIP12 - AE4 NC				
2	4	5	5	5	5
		10 ÷ 30		10 ÷ 30	
20 ÷ 250					
<10%		<10%		<10%	
12		1000		1000	
≤ 3		≤ 3		≤ 3	
300		200		200	
5					
1.5					
		<15		<15	
<1					
<6		<1.8		<1.8	
		Incorporated		Incorporated	
Incorporated		Incorporated		Incorporated	
- 25 ÷ + 70		- 25 ÷ + 70		- 25 ÷ + 70	
67		67	Depending on connector	67	Depending on connector
Plastic		Plastic		Nickelled brass	
2 x 0.25 mm²		4 x 0.25 mm²		4 x 0.25 mm²	
			H1		H1

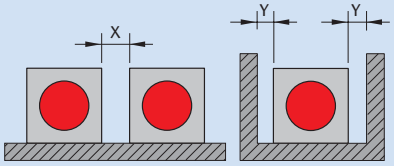
INSTRUCTIONS FOR CORRECT INSTALLATION

TYPE **SIP12**



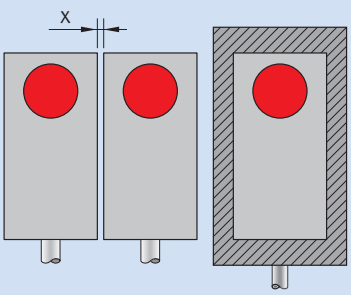
▲ X ≥ 6 mm
● X ≥ 12 mm
▲ = Possible
● = Not possible
▲ Y ≥ 0
● Y ≥ 6 mm

TYPE **SIP17**



● X ≥ 20 mm
● Y ≥ 6 mm

TYPE **SIP25**



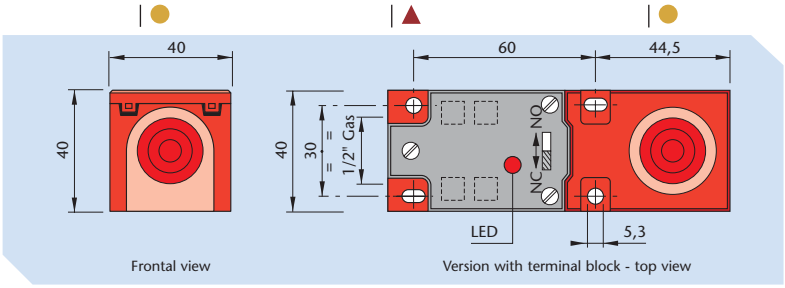
▲ X ≥ 5 mm

RECTANGULAR INDUCTIVE SENSORS SIP40

CE

4 WIRES D.C.
CONFORMING TO EN 50025 - EN 50044
VERSION-C

▲ **EMBEDDABLE** (FLUSH MOUNTING)
● **NOT EMBEDDABLE**
(NON FLUSH MOUNTING)

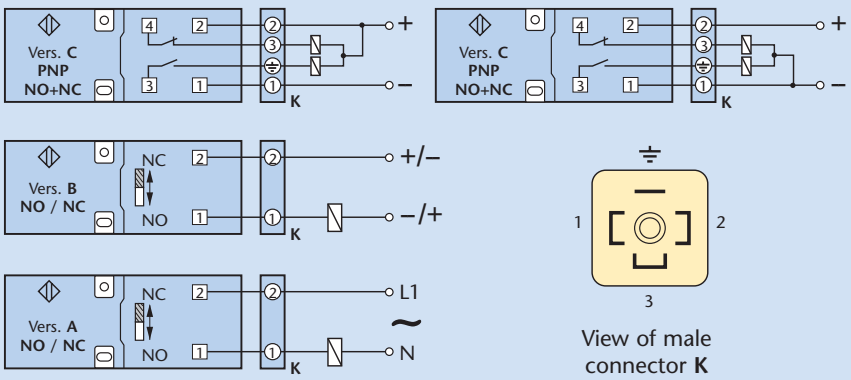


TECHNICAL CHARACTERISTICS

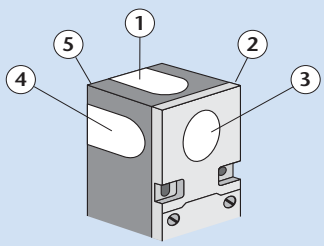
Dimensions mm

AMPLIFIED 4 WIRES D.C. ANTIPHASE	NPN	NO+NC	SIP40 - C15 NPN NO + NC	SIP40 - CE20 NPN NO + NC	SIP40 - C15 NPN NO + NC K	SIP40 - CE20 NPN NO + NC K
	PNP	NO+NC	SIP40 - C15 PNP NO + NC	SIP40 - CE20 PNP NO + NC	SIP40 - C15 PNP NO + NC K	SIP40 - CE20 PNP NO + NC K
AMPLIFIED 2 WIRES D.C. PROGR.		NO/NC				
AMPLIFIED 2 WIRES A.C. PROGR.		NO/NC				
Switching distance Sn		mm	15	20	15	20
Continuous voltage (residual ripple ≤10%)		V	10 ÷ 55			
Alternating voltage 50÷60 Hz		V				
Hysteresis (%Sn)		mm	< 10%			
Switching frequency		Hz	300			
Repeatability		% of Sn	≤ 3			
Max output current		mA	200			
Min output current		mA				
Max peak current for 20 mS		A				
Absorption at 24Vdc		mA	< 10			
Residual current		mA				
Voltage drop (sensor ON)		V	< 1.8			
Short circuit protection			Incorporated			
Led			Incorporated			
Temperature limits		°C	- 25 ÷ + 70			
Degree of protection		IP	65 (Cable version IP67)			
Housing			Red plastic			
Type of connection			Terminal block			
Connector plug					K (type 12)	

TYPES OF CONNECTIONS WITH TERMINAL BLOCK OR CONNECTOR K (type 12 - page 85)



ADJUSTABLE SENSITIVITY



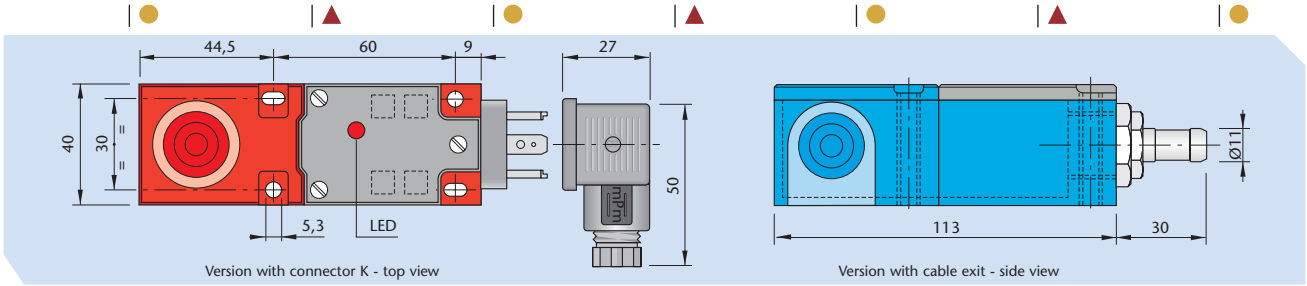
NOTE: In the SIP 40 sensor the oscillator is contained in a module which clips into the body whose surface can then be sensitive on five different positions. The surface chosen can be identified by applying the circular adhesive label.

RECTANGULAR INDUCTIVE SENSORS SIP 40

CE

2 WIRES D.C.
CONFORMING TO EN 50044
VERSION-B

2 WIRES A.C.
CONFORMING TO EN 50037 EN 50044
VERSION-A

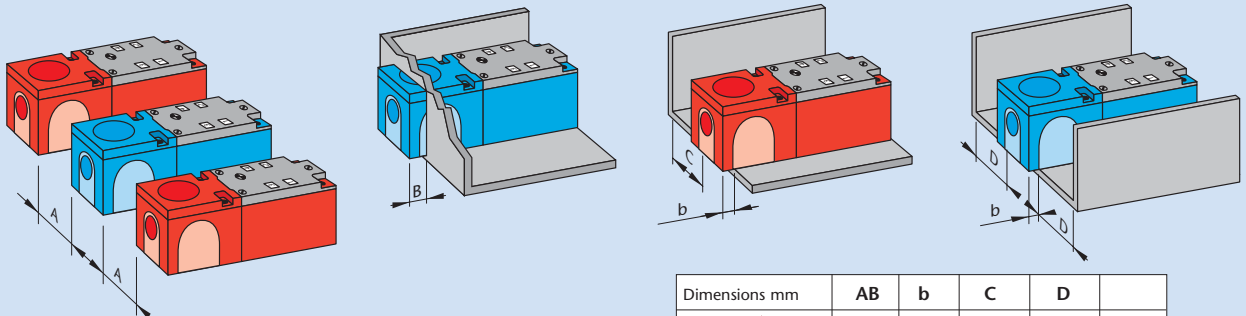


Version with connector K - top view

Version with cable exit - side view

SIP40-B15 NO/NC	SIP40-BE20 NO/NC	SIP40-B15 NO/NC K	SIP40-BE20 NO/NC K				
				SIP40-A15 NO/NC	SIP40-AE20 NO/NC	SIP40-A15 NO/NC K	SIP40-AE20 NO/NC K
15	20	15	20	15	20	15	20
10 ÷ 55							
				20 ÷ 250			
< 10%				< 10%			
300				12			
≤ 3				≤ 3			
100				300			
1.5				5			
				1.5			
< 0.6				< 1			
< 6.5				< 6			
Incorporated							
Incorporated				Incorporated			
- 25 ÷ + 70				- 25 ÷ + 70			
65 (Cable version IP67)				65 (Cable version IP67)			
Red plastic				Blue plastic			
Terminal block				Terminal block			
		K (type 12)				K (type 12)	

INSTRUCTIONS FOR CORRECT INSTALLATION



• The installation example makes reference to the areas marked red.

Dimensions mm	AB	b	C	D	
SIP 40 ▲	≥30	≥6	≥0	≥0	≥0
SIP 40 ●	≥50	≥40	≥15	≥10	≥15

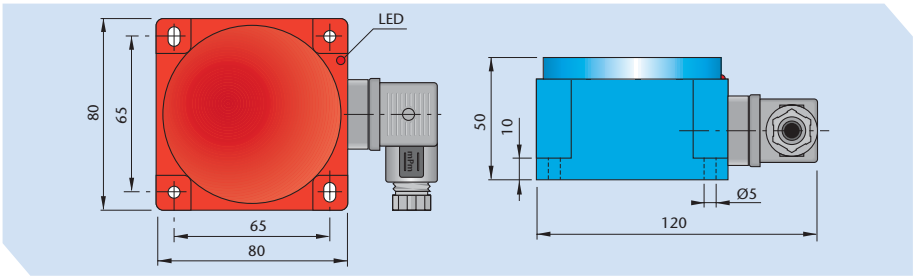
RECTANGULAR INDUCTIVE SENSORS SIQ 80

CE

4 WIRES D.C.
CONFORMING TO EN 50044
VERSION-C

NOT EMBEDDABLE
(NON FLUSH MOUNTING)

VERSION WITH CONNECTOR K



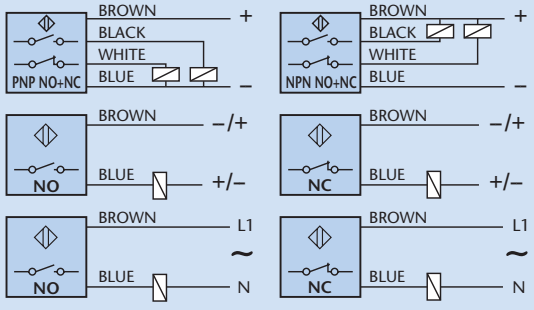
TECHNICAL CHARACTERISTICS

Dimensions mm

AMPLIFIED 4 WIRES D.C. ANTIPHASE	NPN	NO+NC	SIQ 80 - CE50 NPN NO + NC	SIQ 80 - CE50 NPN NO + NC K
	PNP	NO+NC	SIQ 80 - CE50 PNP NO + NC	SIQ 80 - CE50 PNP NO + NC K
AMPLIFIED 2 WIRES D.C.		NO		
		NC		
AMPLIFIED 2 WIRES A.C.		NO		
		NC		

Switching distance Sn	mm	10 ÷ 60 (sensitivity adjustable)	
Continuous voltage (residual ripple ≤10%)	V	10 ÷ 55	
Alternating voltage 50÷60 Hz	V		
Hysteresis (%Sn)	mm	<10% (Sn = 50 mm)	
Switching frequency	Hz	50	
Repeatability	% of Sn	≤ 3	
Max output current	mA	200	
Min output current	mA		
Max peak current for 20 mS	A		
Absorption at 24Vdc	mA	<10	
Residual current	mA		
Voltage drop (sensor ON)	V	<1.8	
Short circuit protection		Incorporated	
Led		Incorporated	
Temperature limits	°C	- 25 ÷ + 70	
Degree of protection	IP	67	65
Housing		Red plastic	
Cable PVC	2m	4 x 0.25 mm²	
Connector plug			K (type 12)

WIRING DIAGRAMS

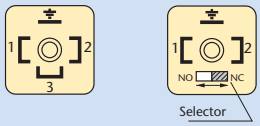


N.B.: On request is available cable for sensors with different length 3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH K PLUG

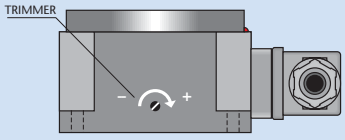
FOR THE CONNECTORS SEE PAGE 85

VIEW OF MALE CONNECTOR **K**



Version	Contact numeration 1	2	3	÷
B	–	+		
C (NO or NC)	–	+		NC/NO
C (Antiphase)	–	+	NC	NO
A	L1	N		

SENSITIVITY ADJUSTMENT



This sensor is supplied with a trimmer for the sensitivity adjustment. The sensitivity increases when the trimmer is rotated in the clockwise direction and decreases in the anti-clockwise direction. Avoid using for a capacity greater than 60 mm referred to a square piece of (FE 37) steel of 1 mm thickness the side of which is equal to 100 mm. When setting the sensor keep in consideration all other metallic objects nearby, in fact setting is suggested to be made when the sensor is installed in the normal working conditions.
The sensor is supplied already preset to 50 mm sensitivity.

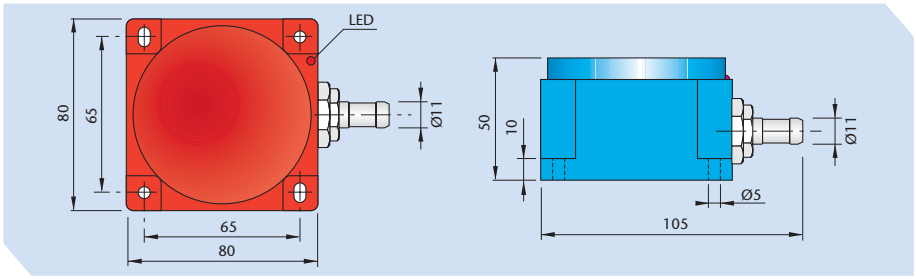
RECTANGULAR INDUCTIVE SENSORS SIQ 80

CE

2 WIRES D.C.
CONFORMING TO EN 50044
VERSION-B

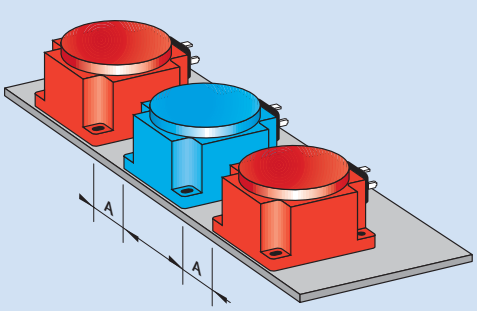
2 WIRES A.C.
CONFORMING TO EN 50044
VERSION-A

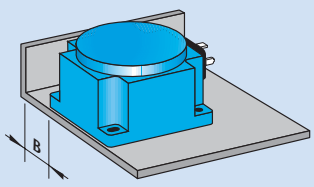
VERSION WITH CABLE EXIT (IP 67)

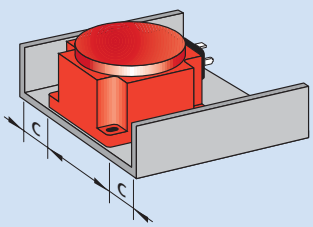


SIQ 80 - BE50 NO	**PROGRAMMABLE**		
SIQ 80 - BE50 NC	**SIQ 80 - BE50 NO/NC K**		
		SIQ 80 - AE50 NO	**PROGRAMMABLE**
		SIQ 80 - AE50 NC	**SIQ 80 - AE50 NO/NC K**
10 ÷ 60 (sensitivity adjustable)		10 ÷ 60 (sensitivity adjustable)	
10 ÷ 55			
		20 ÷ 250	
< 10% (Sn = 50 mm)		< 10% (Sn = 50 mm)	
50		12	
≤ 3		≤ 3	
100		300	
1.5		5	
		1.5	
< 0.6		< 1	
< 6.5		< 6	
Incorporated			
Incorporated		Incorporated	
- 25 ÷ + 70		- 25 ÷ + 70	
67	65	67	65
Red plastic		Blue plastic	
2 x 0.50 mm²		2 x 0.50 mm²	
	K (type 12)		K (type 12)

INSTRUCTIONS FOR CORRECT INSTALLATION



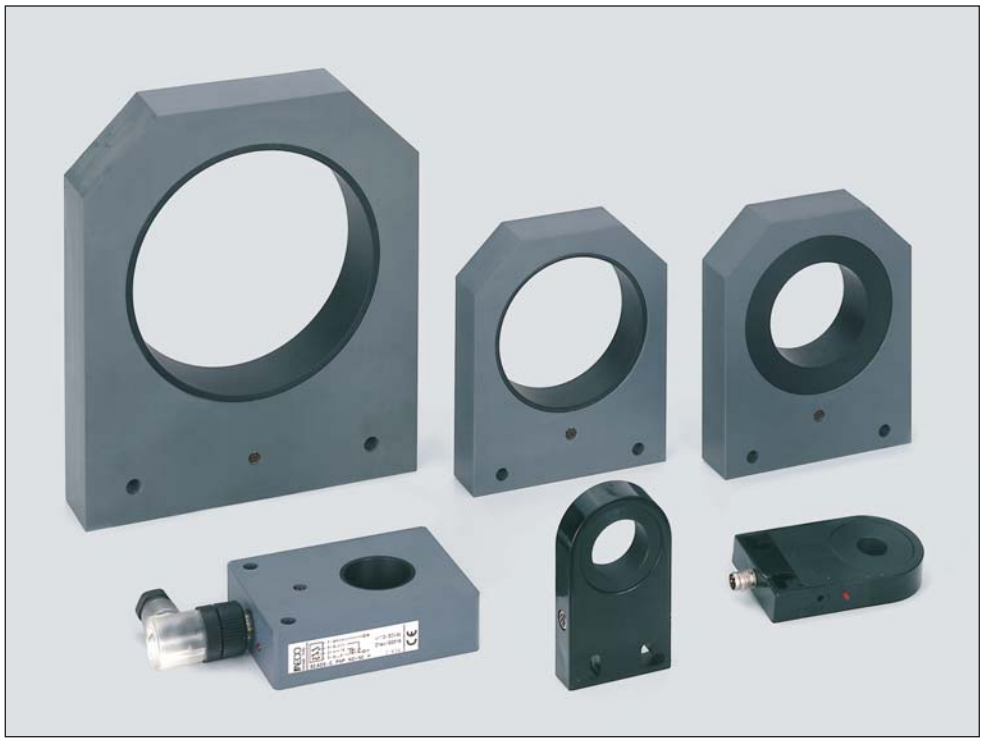




Dimensions mm	A	B	C
SIQ 80	≥450	≥45	≥70

N.B.: A-B-C ratings are referred to Sn = 35 mm. To adjust less or more sensitivity they either must be decreased or increased.

INDUCTIVE RING SENSORS



GENERAL CHARACTERISTICS

In ring sensors, sensing is made within the ring itself. The sensor is activated when a metallic object is introduced within it.
They are particularly suitable for applications where detection of small metal objects such as screws, nuts, washers etc... is requested and also for break detection of continuos metal wires that pass through it. The sensor's housing is made of plastic and the electrical attachments are available by means of a cable or M8 and M12 connectors depending on the models.
They are supplied with fixed timing impulse (100mS) insertable by means of an ON/OFF switch, that makes them ideal for detection of fast moving small metal objects.
They are available with internal diameter of 5-12-15-22-25-30-44-63-100 mm and supplied with NPN or PNP output, sensibility regulation, insertion/disinsertion of impulse retention time and LED state of condition.
All ring sensors have antivalent output (NO+NC) accept for the types with H1 connectors.

SELECTION OF RING SENSOR

Selection should be made based on the minimum hole diameter required.
In this way the sensitivity adjustment can be made within normal parameters and need not be pushed to the maximum risking the proper functioning of the unit.

USE WITH A DELAYED AMPLIFIERS

All types of ring sensor can work in combination with a delayed amplifier of the programmable ALTP series which ensures the sensing of small objects in rapid movement.

SENSITIVITY ADJUSTMENT

After having followed the instructions regarding to the choice of the most suitable unit it is recommended that the sensitivity adjustment be carried out when the sensor is installed in the final position taking into account how much metal mass is close by which could alter its functioning. The sensitivity increases turning the trimmer clockwise and reduces by turning it anti-clockwise.

EFFECTS OF METAL IN THE CLOSE VICINITY

If a moving metal part is close to the sensing area the functioning can be disturbed.
In order to avoid this, install the units some distance from metallic objects. Ensure that this does not interfere with the functioning.

USE OF SENSOR

A distance equal to the width of the sensor should be left between each object that passes through the sensor. If more than one sensor is to be installed in close vicinity, the minimum distance indicated between sensors should be observed.

MINIMUM DISTANCE BETWEEN SENSORS

Type	SIA05	SIA12	SIA15	SIA22	SIA30	SIA44	SIA63	SIA100
A (Fig. 1) mm	25	30	30	60	60	300	300	600
B (Fig. 2) mm	10	10	10	20	20	250	250	650

Fig. 1

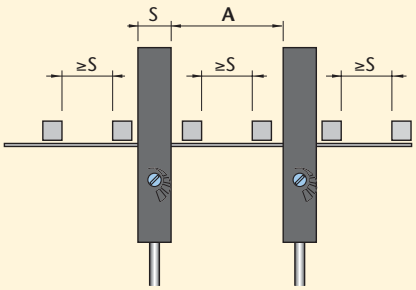
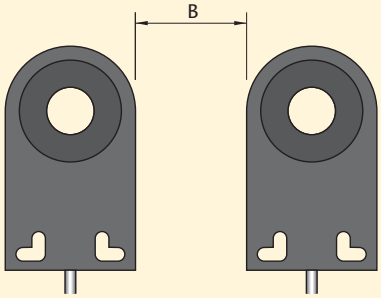


Fig. 2

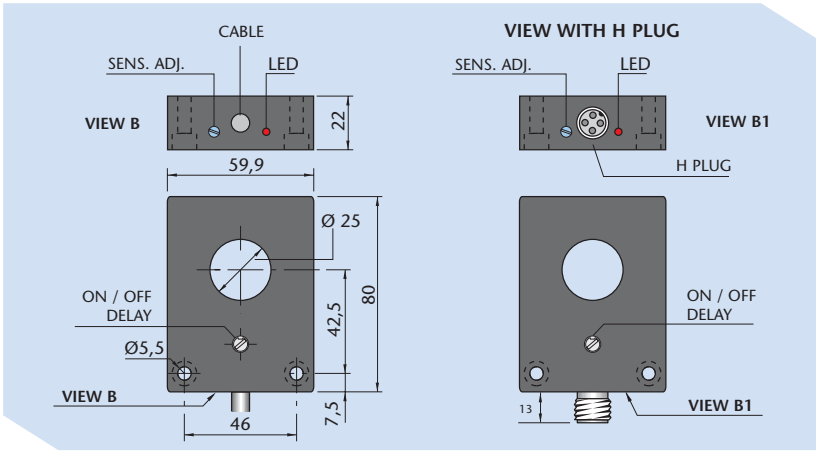


INDUCTIVE RING SENSORS

4 WIRED D.C.
CONFORMING TO EN 50025 - EN 50044
VERSION-C

ON/OFF SWITCH WITH DELAY
ON DE-ENERGIZATION 100mS.
ADJUSTABLE SENSITIVITY ON ALL MODELS

▲ EMBEDDABLE (FLUSH MOUNTING)



TECHNICAL CHARACTERISTICS

Dimensions mm

MODELS WITH CABLE	NPN	NO+NC	SIA25-C NPN NO+NC R
	PNP	NO+NC	SIA25-C PNP NO+NC R
MODELS WITH H PLUG	NPN	NO+NC	SIA25-C NPN NO+NC H R
	PNP	NO+NC	SIA25-C PNP NO+NC H R

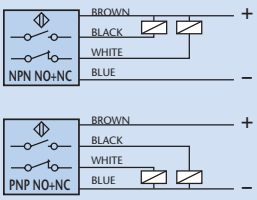
Hole diameter Ø	mm	25
Continuos voltage (residual ripple ≤ 10%)	V	10 ÷ 30
Hysteresis	mm	In relation to Sn
Switching frequency	Hz	See table
Delay on de-energization	ms	100
Repeatability	mm	< 0.3
Max output current	mA	200
Absorption at 24 Vdc (sensor ON)	mA	< 15
Voltage drop (sensor ON)	V	< 1.8
Short circuit protection		Incorporated
Led		Incorporated
Temperature limits	°C	-20 ÷ +60
Degree of protection		IP 65
Housing		Plastic
PVC cable	2m	4 x 0.25 mm²
Plug type		H

TYPE SIA25-C FLUSH MOUNTING

This inductive ring sensor has been created to solve shielding problems caused by other metallic elements.
It is well shielded against multipal interference created by other sensors installed close to each other.
For applications where these sensors have to be installed very close to each other lets say at less than 3 cm it will be necessary to order them with two different frequencies that we can call A and B. When installing these sensors types A and B must be placed in alternating positions.

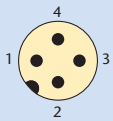
WIRING DIAGRAMS

STANDARD MODEL - 4 WIRE CABLE



N.B.: On request is available cable for sensors with different length 3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H PLUG
FOR THE CONNECTORS SEE PAGE 85



VIEW OF MALE CONNECTOR
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO
2 = White / output NPN-PNP / NC

MIN. DIMENSIONS OF THE OBJECT TO DETECT Fe37

Model		SIA25
Length	mm	7
Diameter	mm	4

SWITCHING FREQUENCY

The switching frequency of inductive ring sensors depends on delayed impulse time **(when inserted)** according to the formula:

$$\text{Switching frequency (Hz)} = \frac{1}{(T \text{ impulse} + 10)\ \text{mS}}$$

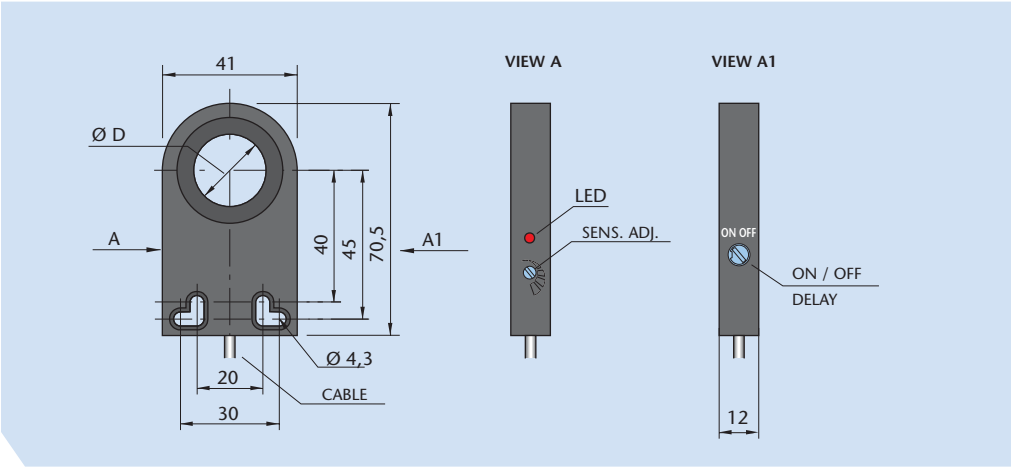
Vice versa, the switching frequency will be between 600÷800 Hz.

INDUCTIVE RING SENSORS

4 WIRED D.C.
CONFORMING TO EN 50025 - EN 50044
VERSION-C

NOT EMBEDDABLE
(NON FLUSH MOUNTING)

Ø D = 5-12-15-22-30



TECHNICAL CHARACTERISTICS

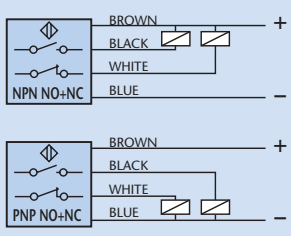
Dimensions mm

MODELS WITH CABLE	NPN	NO+NC	SIA05-CE NPN NO+NC R	SIA12-CE NPN NO+NC R	SIA15-CE NPN NO+NC R	SIA22-CE NPN NO+NC R
	PNP	NO+NC	SIA05-CE PNP NO+NC R	SIA12-CE PNP NO+NC R	SIA15-CE PNP NO+NC R	SIA22-CE PNP NO+NC R
MODELS WITH H PLUG	NPN	NO+NC	SIA05-CE NPN NO+NC H R	SIA12-CE NPN NO+NC H R	SIA15-CE NPN NO+NC H R	SIA22-CE NPN NO+NC H R
	PNP	NO+NC	SIA05-CE PNP NO+NC H R	SIA12-CE PNP NO+NC H R	SIA15-CE PNP NO+NC H R	SIA22-CE PNP NO+NC H R

Hole diameter Ø	mm	5	12	15	22
Continuos voltage (residual ripple ≤ 10%)	V	10 ÷ 30			
Hysteresis	mm	In relation to Sn			
Switching frequency	Hz	See table			
Delay on de-energization	ms	100			
Repeatability	mm	< 0.3			
Max output current	mA	200			
Absorption at 24 Vdc (sensor ON)	mA	< 15			
Voltage drop (sensor ON)	V	< 1.8			
Short circuit protection		Incorporated			
Led		Incorporated			
Temperature limits	°C	-20 ÷ +60			
Degree of protection		IP 65			
Housing		Plastic			
PVC cable	2m	4 x 0.25 mm²			
Plug type		H			

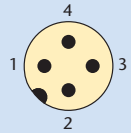
WIRING DIAGRAMS

STANDARD MODEL - 4 WIRE CABLE

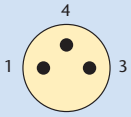


N.B.: On request is available cable for sensors with different length 3.5 - 7.5 - 5 - 10 metres.

CONNECTION WITH H1-H PLUGS
FOR THE CONNECTORS SEE PAGE 85

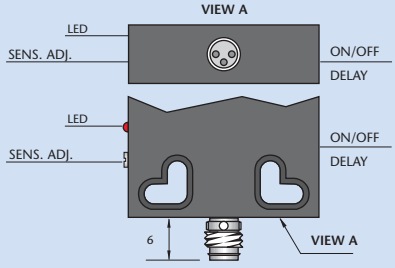


VIEW OF MALE CONNECTOR H
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO
2 = White / output NPN-PNP / NC



VIEW OF MALE CONNECTOR H1
1 = Brown / +
3 = Blue / –
4 = Black / output NPN-PNP / NO-NC

MODELS WITH H1 PLUG (M8)

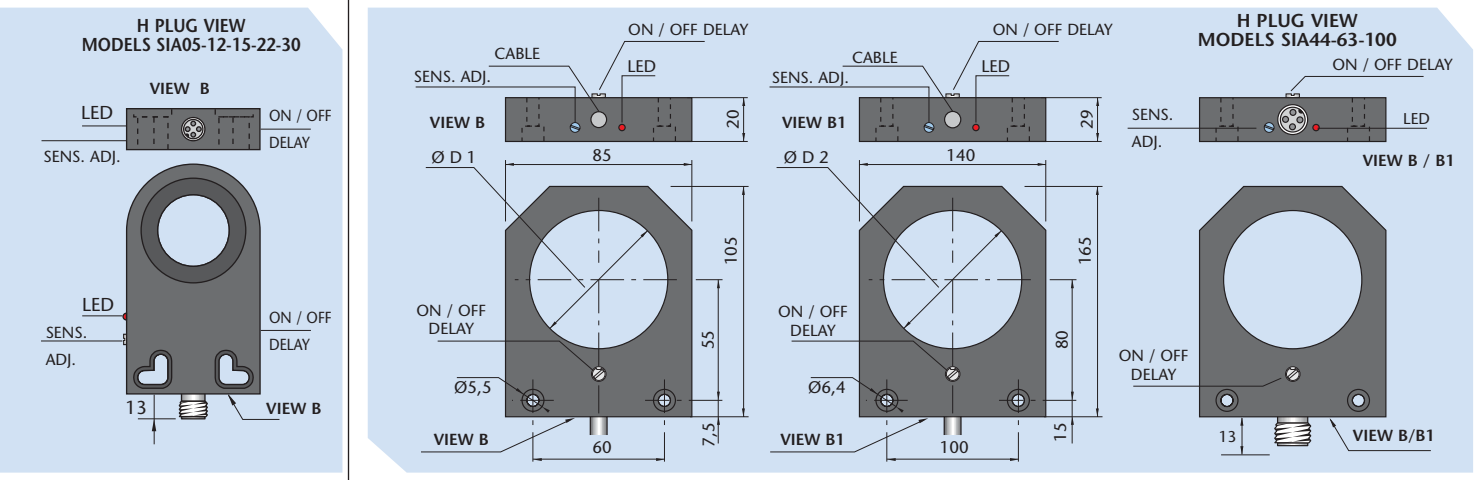


On request is available the H1 plug for SIA05-12-15-22 models. This versions can be supplied with NO or NC output only.

INDUCTIVE RING SENSORS

ON/OFF SWITCH WITH DELAY ON DE-ENERGIZATION 100mS.
ADJUSTABLE SENSITIVITY ON ALL MODELS
MODELS WITH H PLUG FOR CONNECTOR

● Ø D1 = 44-63 Ø D2 = 100



SIA30-CE NPN NO+NC R	SIA44-CE NPN NO+NC R	SIA63-CE NPN NO+NC R	SIA100-CE NPN NO+NC R
SIA30-CE PNP NO+NC R	SIA44-CE PNP NO+NC R	SIA63-CE PNP NO+NC R	SIA100-CE PNP NO+NC R
SIA30-CE NPN NO+NC H R	SIA44-CE NPN NO+NC H R	SIA63-CE NPN NO+NC H R	SIA100-CE NPN NO+NC H R
SIA30-CE PNP NO+NC H R	SIA44-CE PNP NO+NC H R	SIA63-CE PNP NO+NC H R	SIA100-CE PNP NO+NC H R
30	44	63	100
10 ÷ 30			
In relation to Sn			
See table			
100			
< 0.3			
200			
< 15			
< 1.8			
Incorporated			
Incorporated			
-20 ÷ +60			
IP 65			
Plastic			
4 x 0.25 mm²			
H			

MIN. DIMENSION OF THE OBJECT TO DETECT Fe37

Models	SIA05	SIA12	SIA15	SIA22	SIA30	SIA44	SIA63	SIA100
Length mm	1	2	2	6	7	9	12	20
Diameter mm	0.7	1.2	1.2	3	4	5	6	12

SWITCHING FREQUENCY

The switching frequency of inductive ring sensors depends on delayed impulse time **(when inserted)** according to the formula:

$$\text{Switching frequency (Hz)} = \frac{1}{(\text{T impulse} + 10)\ \text{mS}}$$

Vice versa, switching frequency will be as per chart:

Models	SIA05	SIA12	SIA15	SIA22	SIA30	SIA44	SIA63	SIA100
Sw. Frequence Hz	600÷1500	600÷1000	600÷1000	600÷1000	600÷800	250÷600	100÷200	100