



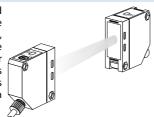
GENERAL SPECIFICATIONS

WORKING PRINCIPLES

A sensor is made up of an irradiating element, a particular type of light (usually infrared, red or green) and an element photosensitive to the irradiated light. The presence or absence of light on the photosensitive element is used as a signal producing a change in the output of the sensor. Thanks to the qualities of transmission and propagation of the light, different types of sensor can be used.

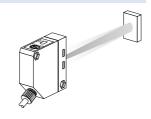
Thru-beam

This type is made up of an emitter and a receiver on the same axis. Every time an object interrupts the light beam, which goes from the emitter to the receiver, a change in the receiver output takes place. This type alows great sensing distances and is particularly suitable for being used in dirty and dusty locations.



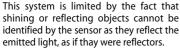
Diffuse reflective

In this case the light source and the photosensitive element are included in the same unit. The emitted light reaches the photosensitive element after being reflected from an object present in the irradiation field. The presence or absence of the light on the receiver causes a change in the output state signaling either the presence or absence of an object in the sensing area.



Retro reflective

As in Diffuse type the light source and the photosensitive element are in the same unit. Differing from the Diffuse type, the reflection of the light emitted is obtained by using a reflector. As a consequence, the detection occurs when the beam of reflected light is interrupted, that is, when there is an object between the reflector and the sensor.

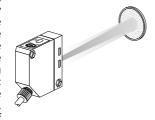




Polarized retro reflective

The working principle is the same as in the retro reflective type. This sensor allows shining or reflecting objects to be sensed. This is due to the fact that reflectors deviate the light radiation of 90°. By using special

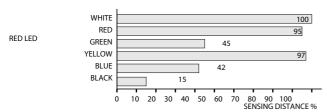
polarizing filters, only the light reflected by the reflector is sensed by the photosensitive element. Therefore common reflecting objects can be sensed because they cannot deviate the light radiation and act as the retroreflector. However if the reflecting surface is of "active material", the light beam through this material may have the same behaviour as the reflector. This is due to the disposition of



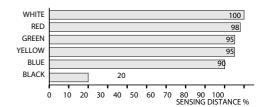
molecules of that particular material. To avoid this, is advisable to rotate the optical axis (photoelectric sensor-reflector) 45° to the surface to scan.

Detecting distance for diffuse reflective sensor

Detecting distance for optical proximity sensors varies according to the material to sense. The parameters that influence the maximum capacity of the sensor are mainly the colour and the brightness or roughness of the surface to be detected. Data below are approximate value and are the result of lab tests with mat paper targets 10×10 wide of the following colours.







Sensing distance for Retro reflective sensor and Thru-beam

It is the maximum distance between photocell and reflector or between emitter and receiver.

Hysteresis

It is the maximum distance between the detected and non detected points. These points are obtained by moving the object towards or away from the photocell axis. Data are expressed in percentage to the value of the sensing distance.



Switching frequency

It shows the maximum number of operations per second perfomed by the photocell.

Response time

It is the time the object takes to cover the optical sensor field to perform a correct switching.

ELECTRICAL PARAMETERS

NOMINAL VOLTAGE

Is indicates the maximum and minimum voltage values within which sensors work correctly.

RESIDUAL RIPPLE

Maximum admissible ripple of the DC supply voltage shown as percentage to its medium value.

MAXIMUM OUTPUT CURRENT

It shows maximum output current a sensor can cope with when working steadly.

MAXIMUM LEAKAGE CURRENT

Existing load current when output stage is stopped and supply voltage is at maximum nominal value.

ABSORPTION

This in the consumption of the photocell referred to the maximum limits of the nominal voltage and without load.

VOLTAGE DROP

Voltage drop on switching circuit when output transistor is conducting.

SHORT CIRCUIT PROTECTION

A protection in case of short circuits or overload to avoid inner circuit damage. Once the short circuit is eliminated the photocell resets.

PROTECTION AGAINST INVERSION OF POLARITY

Available in DC supplied type, it prevents the sensor from being damage when supply cables are incorrectly connected.

INDUCTIVE LOAD PROTECTION

It protects sensor output in presence of high inductive loads. This protection is performed by a diode or zenner diode.

PROTECTION DEGREE

It shows degree of protection of housing conform to IEC 529 regulation.

START UP DELAY

Time interval between sensor supply connection and active output. This time interval is to avoid the switch output beinginan undefined state when the system is switched on.





GENERAL SPECIFICATIONS

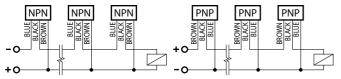
CONNECTION FOR PHOTOELECTRIC SENSORS WITH NPN OR PNP OUTPUT

Connection in series (AND)

Connected in this way sensors activated one output when activated simultaneously. When using this type of connection keep into account as follows:

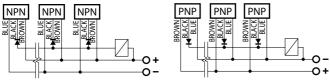
1) drop of voltage for each sensor (<1,5 V);

2) the maximum load current of the sensor used together with the absorption of each sensor (<30mA).



Connection in parallel (OR)

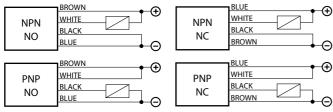
Connected in this way sensors can activate the common output indipendently, when activated. When omitting the diodes indicated in the diagram, use sensors with the final stage which has an open collector (NO).



CONNECTION FOR PHOTOELECTRIC SENSORS WITH PROGRAMMABLE OUTPUT

Thank to the output separated from the rest of circuit, photoelectric sensors so connected provide important advantages, such as the possibility of 4 output configurations (NPN-NO, NPN-NC, PNP-NO, PNP-NC) on the same model and the possibility of connection in series.

OUTPUT DIAGRAM



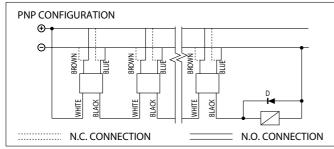
Connection in series (AND)

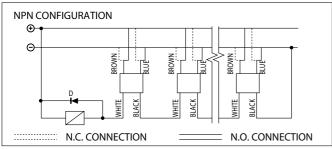
Connected in this way sensors only activate the output when they are energized simultaneously. The maximum number of sensors of this type, connected in this way, is given by the following formula:

n = (V supply - V load) / V residual

where:

- V supply = voltage
- V load = voltage for min. load energization
- V residual = residual voltage in the comulative circuit in ON state.

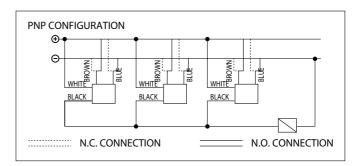


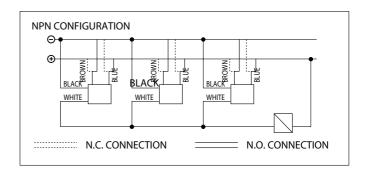


NOTE: In presence of inductive loads, when more sensors are connected in series, diode D should be connected in antiparallel to the load.

Connection in parallel (OR)

When connected in this way sensors can activate the common output independently, when energize. Thanks to the really low leakage current, there is no actual limitation in the number of sensor that can be connected in parallel, providing that the min. current of load accumulated is mA.





POWER SUPPLY FOR SENSORS IN DC CURRENT

A stabilised source of voltage can be obtained using the table indicated below. Use the following example to determine the components :

VAC = (V RMS transformer) =
$$\frac{\text{(V OUT} + 4.5) \times 1.1}{1.41}$$

C1 =
$$\frac{(0.0053) \times I \text{ OUT}}{2}$$
 (value indicated in μF)

 $VL1 = VAC \times 1.41 \times 1.2$

If " ℓ " is bigger than 10 cm, add C4 beside the stabiliser

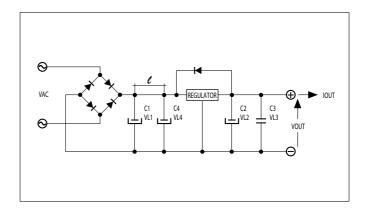
C4 = 100 $\mu f;$ VL4 = VAC x 1.41 x 1.2

 $C2 = 220 \mu f$; $VL2 = VOUT \times 1.2$

 $C3 = 0.1 \mu f$; VL3 = 63V

Note: the regulator must be provided with adequate power or dissipation, it must dissipate:

 $P\ DISS. = \frac{(VAC\ x\ 1.41)\ -\ VOUT}{I\ OUT\ max.}\ Where\ IOUT\ max. is the\ maximum\ available\ (supplied)\ current$







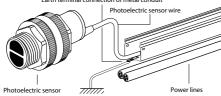
GENERAL SPECIFICATIONS

INSTRUCTIONS FOR CORRECT INSTALLATION

THESE PHOTOELECTRIC SENSORS ARE NOT SAFETY DEVICES, THEREFORE THEY CANNOT BE USED TO PREVENT INJURIES TO PERSONS, DAMAGES, INDUSTRIAL DAMAGES, ACCIDENTS.

- 1) Do not exceed the voltage limits printed on the product label. For DC photoelectric sensors use stable tension.
- 2) Do not connect the photoelectric sensors power supply cables down-steam from other devices and make sure that they are directly connected to the mains
- 3) If the power supply source is a switching voltage regulator, connect the FG (Frame Ground) terminal to the ground.
- Connect to ground the FG (Frame Ground) terminal and all metallic parts of every industrial machinery or not if a photoelectric sensor is used in it.
- 5) Do not use the photoelectric sensor near electromagnetic or high frequency fields.
- 6) The cables of photoelectric sensors must be separate from the power supply cables, from the engines cables, from the inverters cables, or from any other electromagnetic device because induction noise could cause malfunction or damage to the photoelectric sensors. Separate the wires of the photoelectric sensors from the above indicated cables and then insert the wires into an earthed metal conduit.

tion of metal conduit Farth terminal co



- 7) After making all operations mentioned in the above point 6, if inductive interference exists, an adequate transient suppression filter must be used on the power supply line in proximity to the photoelectric sensors.
- 8) When a large distance by the connection wires to the sensor has to be covered, use conductors with a cross-section of a least 0.50 mm² and do not exceed the maximum distance of 100 m.
- 9) The output signal of a photoelectric sensors cannot be used during the start up delay
- 10) Several sensors should not be connected in series, whereas several sensors can be connected in parallel.

Assembly

- 1) For correct assembly and alignment, all the accessories supplied with the sensor must be used
- 2) To regulate the sensitivity adjustment trimmer use a suitable srew-driver without exerting excessive force.
- 3) Do not turn too much fixing screws or nuts to avoid electrical or mechanical damages
- 4) Mounting photoelectric sensors side by side, leave an appropriate place between them to avoid mutual interference.
- 5) When installing two or more emitters and the receivers side by side, alternate the emitter with the receiver or install a light barrier to prevent reciprocal interferences. Avoid reflection coming from the side or back walls or objects.
- 6) Do not expose the photoelectric sensors to direct source of fluorescent light which could prevent the correct working. Do not exceed the immunity limits to external light.
- 7) Do not use organic solvents or corrosive liquids to clean the lenses of the photoelectric sensors. The optical parts must be cleaned with a soft cloth and then dried.
- 8) Do not use the sensors in open air without adequate protection.
 9) Do not use the photoelectric sensors in dusty places, in presence of steam, gases, corrosive steams, corrosive liquids, rain or water jets. Do not let condensation form on the sensor lenses.
- 10) Do not exceed the indicate temperature limits.
- 11) Do not subject the appliance to strong vibrations or to shocks which can damage the sensor or can harm its impermeability.
- 12) Although some range of phtoelectric sensors are protect IP-67, this does not mean that these devices can be used to detect objects in water or in the rain.

Further information

The manufacturer is not liable for the improper use of the product.

Any use and/or application which are not provided for by this instruction sheet must be previously and directly authorized by the same manufacturer.

SETTING OF NON-ADJUSTABLE PHOTOELECTRIC SENSORS

The following regulation procedure is for photoelectric sensors with N.O. output state, for photoelectric sensors with N.C. output state, the LED conditions are the opposite.

Diffuse reflective

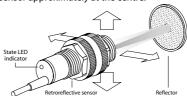
- 1) Mount the photoelectric sensor in working position but do not fasten it completely.
- 2) Supply power to the sensor.
- 3) Position the object to be detected, making sure that the optical axis is perpendicular to the surface of the object. If the surface to be detected is shiny, incline the optical axis by a few degress so that the specular reflection is blocked out.
- 4) Set up the photoelectric sensor in the worst working conditions:
- smaller object to be detected;
- darker object or part of object; - object in the furthest possible
- position in relation to the photoelectric sensor;



- 5) If the state LED indicator is off, move the photoelectric sensor towards the object to be detected until the LED lights up. If the LED is already illuminated, move the photoelectric sensor away until the state LED goes off and then move it nearer again until when it re-lights up (position A).
- 6.0) If there is no background go to point 6.1. If there is background go to point 6.2.
- 6.1) NO BACKGROUND: move the photoelectric sensor nearer to the object by a distance of 15% of the detection distance.
- 6.2) BACKGROUND PRESENT: remove the object to be detected (the LED will go off, if it does not go off, proceed to point 6.3) and move the photoelectric sensor towards the background until the state LED lights up (position B). Position the photoelectric sensor at a distance between position A (determined in point 5) and position B where the LED goes off.
- 6.3) If the photoelectric sensor still detects the background, one solution may be to incline the optical detection axis in relation to the normal of the plane of the background by about 10° and repeat the setting procedure from point 4 onwards. If the LED still does not go off with this procedure, a model of photoelectric sensor with a more restricted range will have to be chosen.
- 7) The system should then be securely fixed in place.

Retro reflective - Polarized retro reflective

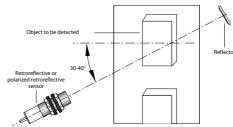
- 1) Fit the photoelectric sensor and the reflector facing each other within the operating range (distance determined by the kind of reflector used; see table at page 35).
- 2) Supply power to the sensor
- 3) Carefully align the photoelectric sensor and reflector unit around the optical axis in order to set limits of the operation area and position the photoelectric sensor approximately at the centre.



- 4) Make sure that when an object is placed between the photoeletric sensor and the reflector, the state LED indicator lights up.
- 5) The photoelectric sensor should switch when an obstacle, placed in proximity to the retroreflective, obscures at least 30/40% of its surface. If switching occurs with less darkness, align the photoelectric sensor and the retroreflective better so that the above condition is achieved.
- 6) The system should then be securely fixed in place.

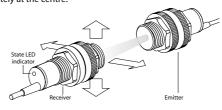
DETECTION OF REFLECTING OBJECTS

When the object to be detected is particularly reflective, polarized retroreflective sensors should be used. In any case, the photoelectric sensor should be orientated as in the diagram in order to avoid false reflections given by the object.



N. B.: The reflex and polarized reflex photoelectric sensors should never be used for maximum range values in the presence of adverse environmental conditions (such as dust, smoke, etc.) which could reduce the efficiency of the sensors.

- 1) Fit the emitter and the receiver facing each other within the indica-ted operating range.
- 2) Supply power to the two photoelectric sensors.
- 3) Align the emitter and receiver carefully: orientate the receiver around the optical axis in order to set the limits of the operation area and position the receiver approximately at the centre.



- 4) Make sure that when an object is placed between the emitter and receiver, the state LED indicator lights up.
- 5) The photoelectric sensor should switch when an obstacle, placed in proximity to the receiver, obscures at least 30/40% of its surface. If switching occurs with less darkness, align the emitter and the receiver better so that the above condition is achieved.
- 6) The system should then be securely fixed in place.
- N. B.: The emitter and receiver barriers should never be used for maximum range values in the presence of adverse environmental conditions (such as dust, smoke, etc.) which could reduce the efficiency of the sensors.





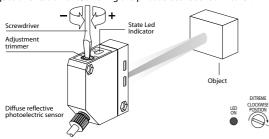
GENERAL SPECIFICATIONS

SETTING OF ADJUSTABLE PHOTOELECTRIC SENSORS

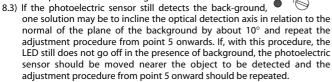
The following regulation procedure is for photoelectric sensors with N.O. output state, for photoelectric sensors with N.C. output state, the LED conditions are the opposite.

Diffuse reflective

- 1) Mount the photoelectric sensor in working position but do not fasten it completely.
- 2) Supply power to the sensor.
- 3) Position the object to be detected, making sure that the optical axis is perpendicular to the surface of the object. If the surface to be detected is shiny, incline the optical axis by a few degrees so that the specular reflection is blocked out.
- 4) Set up the photoelectric sensor in the worst working conditions:
 - smaller object to be detected;
 - darker object or part of object;
 - object in the furthest possible position in relation to the photoelectric sensor;
- 5) Turn the sensitivity adjustment trimmer clockwise (+) until maximum sensitivity is reached: the yellow LED should be illuminated; if this is not the case adjust orientation and/or bring the photoelectric sensor nearer.



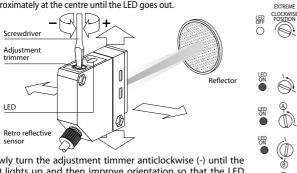
- 6) Turn the adjustment trimmer anticlockwise (-) until the LED goes out.
- 7) Turn the adjustment trimmer clockwise (+) until the LED lights up again (hysteresis recovery); this determines point A.
- 8.0) If there is no background go to point 8.1. If there is background go to point 8.2.
- 8.1) NO BACKGROUND: turn the trimmer to a position bet-ween point A and the extreme clockwise position (determined in point 5).
- 8.2) BACKGROUND PRESENT: remove the object to be dete-cted (the LED will go out: if it does not go out proceed to point 8.3) turn the trimmer clockwise until the state LED lights up (point B). Turn the trimmer to a position between point A and point B where the LED goes out.



9) The system should then be securely fixed in place.

Retro reflective - Polarized retro reflective

- 1) Fit the photoelectric sensor and the reflector facing each other within the operating range (distance determined by the kind of reflector used; see table on page 31).
- 2) Supply power to the sensor.
- 3) Make sure that the sensitivity adjustment trimmer is in the extreme clockwise position (+) and carefully align the photoelectric sensor and reflector around the optical axis in order to set the limits of the operation area and position the photoelectric sensor approximately at the centre until the LED goes out.



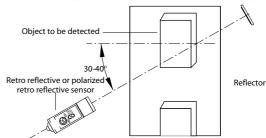
4) Slowly turn the adjustment timmer anticlockwise (-) until the LED lights up and then improve orientation so that the LED goes off. Once better oientation is achieved, turn the trimmer clockwise (+) until the extreme clockwise position.

5) Position the object to be detected between the photo-electric sensor and the reflector and check that the yellow LED is illuminated, if the yellow LED is off, turn the trimmer anticlockwise (-) until the yellow LED lights up: point A.

- 6) Remove the object and gradually turn the trimmer anticlockwise (-) until the yellow LED lights up: point B.
- 7) Position the adjustment trimmer half way between point A and point B in order to achieve the ideal position.
- 8) The system should then be securely fixed in place.

DETECTION OF REFLECTING OBJECTS

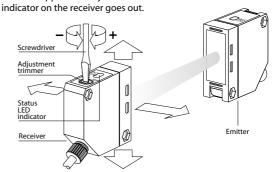
When the object to be detected is particularly reflective, polarized retroreflective sensors should be used. In any case, the photoelectric sensor should be orientated as in the diagram in order to avoid false reflections given by the object.



N. B.: The adjustment obtained in point 7 is the most efficient for shiny and/or semi-transparent objects; if the objects to be detected are opaque and non-reflecting, the trimmer can be brought to the extreme clockwise position which will allow the photoelectric sensor to operate even in very dusty environments.

Emitter - Receiver Thru-beam

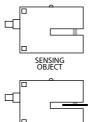
- 1) Fit the emitter and the receiver facing each other within the indica-ted operating range.
- 2) Supply power to the two photoelectric sensors.
- 3) Make sure that the sensitivity adjustment trimmer of the receiver is in the extreme clockwise position (+) and carefully align the emitter and receiver: orientate the receiver around the optical axis in order to set the limits of the operation area and position the receiver approximately at the centre until the state LED



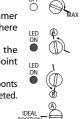
- 4) Position the object to be detected between the emitter and the receiver and check that the yellow LED on the receiver is illuminated, if the yellow LED is off, turn the trimmer anticlockwise (-) until the yellow LED lights up: point A.
- 5) Remove the object and gradually turn the trimmer anticlockwise (-) until the yellow LED lights up: point B.
- 6) Position the trimmer half way between point A and point B in order to complete adjustment.
- 7) The system should then be securely fixed in place.
- **N. B.:** The adjustment obtained in point 6 is the most efficient for obtaining maximum sensitivity in the detection of small and semi-transparent objects; if the objects to be detected are opaque and are larger than the lens, the trimmer should be turned to the extreme clockwise position which will allow the photoelectric sensor to operate even in very dusty environments.

Optical brackets

- 1) Mount the optical brackets in working position and fasten it completely.
- 2) Supply power to the optical brackets.
- 3) NO SÉNSING OBJECT Turn the trimmer clockwise (9 full turns) to con-firm the status (yellow LED is off).



- 4) Position the object to be sensed and check the yellow LED is on.
 If the yellow LED is off, turn the trimmer anti-clockwise and find point "A" where the yellow LED is on.
- 5) Remove the object and turn the trimmer anti-clockwise and find point "B" where the yellow LED is on.
- 6) Set the trimmer to half way between ponts "A" and "B" for the adjustment is completed.



BY OBJECT Further information

Although some ranges of INFRA photoelectric sensors are protected to IP67, this does not mean that our devices can be used to detect objects in water or in the rain.





GENERAL SPECIFICATIONS

DEFINITIONS AND TERMINOLOGY FOR PHOTOELECTRIC SENSORS

n.	Т	THERMINOLOGY		DESCRIPTION
1	PHOTOELECTRIC SENSOR	-	-	Photoelectric Sensor: device sensitive to direct or reflected visible or infra-red light radiation; it can detect the presence of an object (target) in a fixed area (sensing area) by means of the reflection or the interruption of the beam projected in the sensing area.
1.1	PHOTOELECTRIC SENSOR STATUS	NOT SUPPLIED	-	Photoelectric Sensor without electrical power supply and therefore out of order. Solid state outputs are in a not defined condition; relay outputs correspond to the not activated relay condition (relay off).
1.2	PHOTOELECTRIC SENSOR STATUS	SUPPLIED	NOT ACITVATED	Photoelectric Sensor properly supplied and therefore working with no target; particularly: - diffuse reflective sensor with no target in the sensing area; - retro reflective sensor or thru beam with aligned beam and not interrupted beam by a target; the outputs status called "normal" (i.e. output N.O.: output normally open; output N.C.: output normally closed) refers to this photoelectric sensor condition.
1.3	PHOTOELECTRIC SENSOR STATUS	SUPPLIED	ACITVATED	Photoelectric Sensor properly supplied and therefore working with target; particularly: - diffuse reflective sensor with target in the sensing area; - retro reflective sensor or thru beam with not aligned beam or interrupted beam by a target.
1.4	LIGHT ON	-	-	It shows for the photolectric sensor the case of reception of direct or reflected light.
1.5	LIGHT OFF	-	-	It shows for the photolectric sensor the case of failure in receiving the direct or reflected light.
2	OUTPUT	IN SOLID STATE	-	It corresponds to a transistor collector that is to say a triac anode or to a scr anode according to the electrical power supply (d.c. or a.c.).
2.1	OUTPUT	IN SOLID STATE	PNP	Output in solid state with pnp transistor; when it is activated, it supplies a positive voltage whose reading is near the supply positive pole (+).
2.2	OUTPUT	IN SOLID STATE	NPN	Output in solid state with npn transistor; when it is activated, it supplies a negative voltage whose reading is near the supply negative pole (-).
2.3	OUTPUT	IN SOLID STATE	ON (ACTIVATED)	Activated output in solid state, it supplies on the load an output voltage whose reading is near to the voltage power supply of the same Photoelectric Sensor.
2.4	OUTPUT	IN SOLID STATE	OFF (NOT ACTIVATED)	Not activated output in solid state; the load, which is connected to it, does not receive any voltage; a not considerable leakage current can be present.
2.5	OUTPUT	IN SOLID STATE	N.O.	Output in solid state in off status (not activated) when the Photoelectric Sensor is in "normal" condition, that is to say not activated.
2.6	OUTPUT	IN SOLID STATE	N.C.	Output at solid state in on status (activated) when the Photoelectric Sensor is in "normal" condition, that is to say not activated.
3	OUTPUT	RELAY	-	It corresponds to a relay contact isolated from the Photoelectric Sensor power supply.
3.1	OUTPUT	RELAY	N.C.	Closed contact when the Photoelectric Sensor is in "normal" condition, that is to say not activated.
3.2	OUTPUT	RELAY	N.O.	Open contact when the Photoelectric Sensor is in "normal" condition, that is to say not activated.
4	OUTPUT RELAY	NOT ACTIVATED (OFF)	-	Relay in not working condition and therefore not switched.
4.1	OUTPUT RELAY	ACTIVATED (ON)	-	Relay in working condition and therefore switched.

LC 2001 (1 col.) - LC 2004 (4 col.)

CE

• A range of 7 different fibres:

- Tip from de ø1,8 to ø18 mm

- Sensing distance from 2 to 60 mm

• Operating voltage: 24 VDC

Outputs: PNP / NPN

• Response time: 1 ms or 20 ms according to

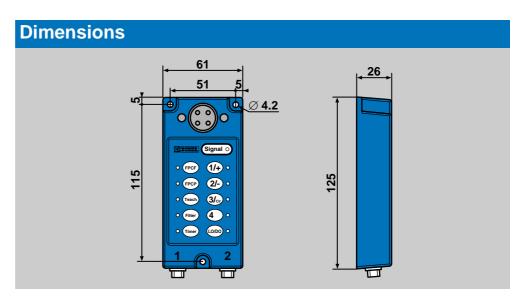
selected mode

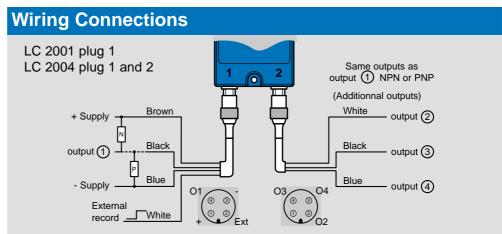
Description:

- Detection of one to four recorded colours
- Fibres: see next page
- Self-teach function: easy and quick adjustment
- External input for selfteach (channel 1)
- 3 sensitivities: fine, medium and low
- · Keyboard locking feature
- Programmable timer
- Four NPN/PNP outputs
- · Light on / dark on selection
- M12 plug
- IP 65 polycarbonate housing

Applications:

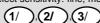
- Detection of marks and coloured tags.
- Quality control:
 - lids colour.
 - presence of labels.
- Detection of coloured wires.
- Detection of coloured liquids.
- Sorting out of colored parts.





Keyboard and Visualisation Programming for FPCF type and FPCP type:

To select sensitivity: fine, medium, large:



(FPCF), (FPCP)

To record colours on output 1, 2, 3 or 4:



To adjust the timer:



To adjust the filter:



To select light on / dark on:



Next to every key, a LED indicates the status of the function.

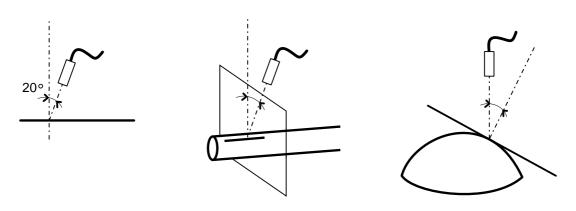
Technical Information	n	
Supply	voltage	24 VDC ±10%
		ripple < 10% within specified limits
	consumption	120 mA
Response time	t _{on} or t _{off}	1 ms (mode FPCF) - 20 ms (mode FPCP)
	switching frequency	500 Hz (mode FPCF) - 25 Hz (mode FPCP)
Outputs	max. nominal intensity	100 mA per output
	voltage drop at 100 mA	< 2,2 V
	voltage drop at 10 mA	< 0,5 V at low level
Emission	LED	red, green, blue
Timer	range	0 to 5 s
	increment duration	first increment : 50 ms, following increments : 250 ms
Temperature	operating	0 to 40 °C
	storage	-20 to 60 °C
External light immunity	incandescent light	3 000 lux
	sunlight	5 000 lux
Protections	supply	inverse polarity protection
	output	permanent short-circuit or over-load protection
	degree of protection	IP 65
External record	on	4 to 24 V, 10 µs minimum
	off	< 1 V
Recording	duration	1 s

Ordering Codes				
Product	Colour sensor	Colour sensor fibres		
Reference	LC 2001 - 1 channel	see hereby		
	LC 2004 - 4 channels			
	2 m connectors (M12), cable included			

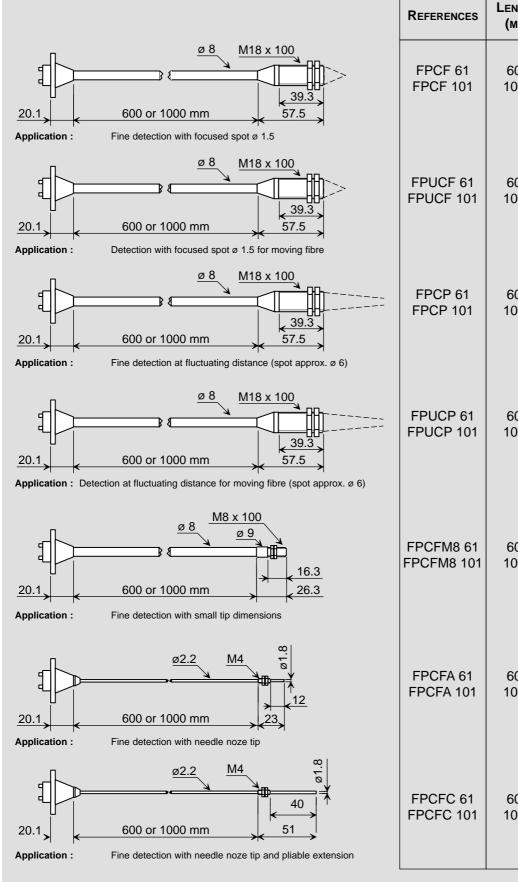
FIBRES FOR COLOUR SENSOR (FPC)

Fibre set-up:

- Comply with advised sensing distance as indicated hereby.
- If the surface is glossy, tilt the tip 20° approximatly from the perpendicular to the surface.
- Plug the fibre polarized adapter in the front side of the sensor and tighten the two M4 screws.

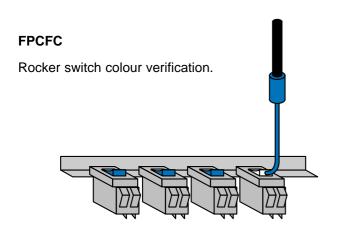


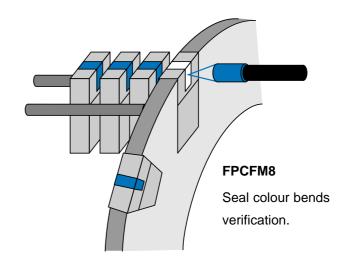
Diffuse Type - P

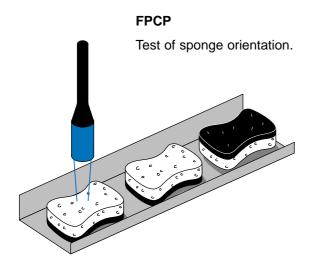


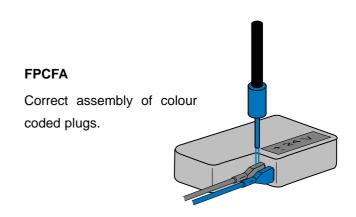
REFERENCES	LENGTH (MM)	SENSING DISTANCE (MM)	Mode / TR
FPCF 61 FPCF 101	600 1000	18	FPCF / 1 ms
FPUCF 61 FPUCF 101	600 1000	18	FPCF / 1 ms
FPCP 61 FPCP 101	600 1000	40 to 60	FPCP / 20 ms
FPUCP 61 FPUCP 101	600 1000	40 to 60	FPCP / 20 ms
FPCFM8 61 FPCFM8 101	600 1000	4 to 6	FPCF / 1 ms
FPCFA 61 FPCFA 101	600 1000	2 to 3	FPCF / 1 ms
FPCFC 61 FPCFC 101	600 1000	2 to 3	FPCF / 1 ms

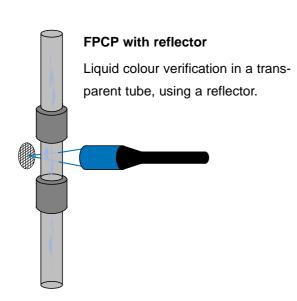
TYPES OF APPLICATIONS

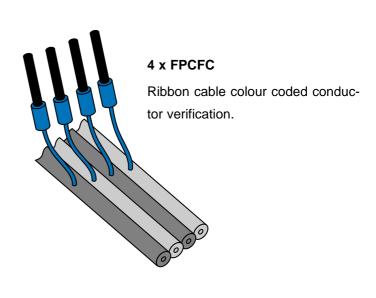












PHOTOELECTRIC SENSORS IN STANDARD HOUSING 12 ÷ 30 V DC NPN O PNP OUTPUT

- Miniature 18 mm tubular
- Operation LED aids installation
- Models w/o pots for simple installation
- Quick connect or integral cable
- 9-turn pot models

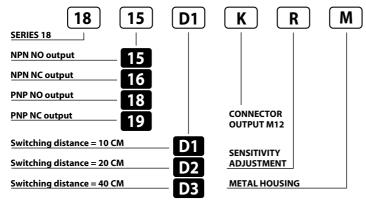
18 Series







Identification code

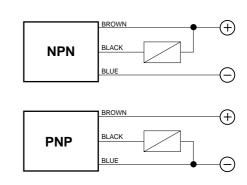


K and R are not available in the same model

AVAILABLE	D1	D2	D3
SWITCHING DISTANCE	10 cm ⁽¹⁾	20 cm ⁽¹⁾	40 cm ⁽¹⁾
HYSTERESIS	10%		
EMISSION	EMISSION Infrared (875 ηm))
NOMINAL VOLTAGE	12 ÷	- 30VDC (-15 /+1	0%)
RESIDUAL RIPPLE		≤ 10%	
MAX. OUTPUT CURRENT		200 mA	
ABSORPTION AT 30 VDC		30 mA	
VOLTAGE DROP (Sensor ON)	<u> </u>	1.5V (I = 200 m/	A)
OPERATION LED		Yellow	
SWITCHING FREQUENCY		200 Hz	
RESPONSE TIME		5 mS	
START UP DELAY		100 mS	
SHORT CIRCUIT PROTECTION	Pre	sent (self-resetti	ng)
ELECTRIC PROTECTIONS	Againts pola	rity reversal - ind	uctive loads
TEMPERATURE LIMITS		-10 ÷ +60 °C	
LIGHT IMMUNITY		5000 Lux (2)	
PROTECTION DEGREE	IP 67 (IP 65 for n	nodels with sensiti	vity adjustment)
CABLE LENGTH		2 m	
CABLE SECTION		3 x 0.25 mm ²	
HOUSING MATERIAL	Housing: nylon lo	aded with fiberglass -	Lenses: methacrylate
WEIGHT - cable output - (connector output)		- 110 g - (55 g)	

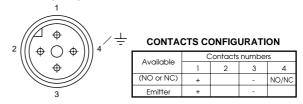
Determined with a white mat paper (cm 10 x 10).

Wiring diagrams



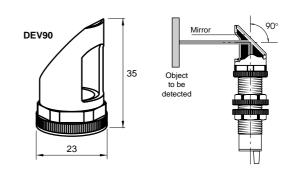
Connection with connector M12 (K)

View of quadripole male connector.



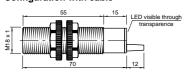
Note: the K plug is compatible with the following connectors: VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Accessories

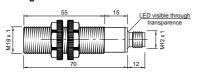


Dimensions (mm)

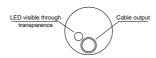
Configuration with cable



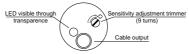
Configuration with connector K

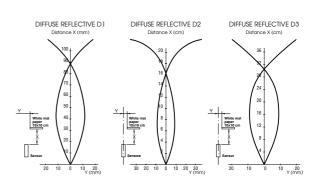


Configuration with cable - Back view



Configuration with sensitivity adjustment





 $^{^{(2)}}$ Determined with halogen tungsten lamp 3000 $^{\circ}\text{K}.$ Note: for a proper use see norms at pages 6, 7 and 8.

PHOTOELECTRIC SENSORS IN LONG HOUSING 24 ÷ 230 V AC TRIAC AND NC OUTPUT

- Short AC housing, only 80 mm
- Leakage < 1.5 mA @ 220 V DC
- · Models w/o pots for simple installation
- · Models with 9-turn pot

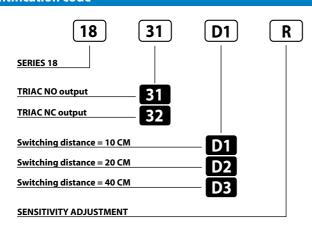
18 Series







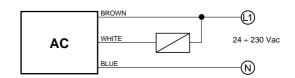
Identification code



AVAILABLE	D1	D2	D3
SWITCHING DISTANCE	10 cm ⁽¹⁾ 20 cm ⁽¹⁾ 40 cm ⁽¹⁾		40 cm ⁽¹⁾
HYSTERESIS		10%	
EMISSION	I	nfrared (875 ηm)	
NOMINAL VOLTAGE	24 ÷	230VAC (-15 /+1	0%)
MAINS FREQUENCY		50 ÷ 60 Hz	
MAX. OUTPUT CURRENT		150 mA	
LEAKAGE CURRENT	≤	1.5mA (at 220VA	C)
ABSORPTION		1 W	
VOLTAGE DROP (Sensor ON)		< 2.5 V	
OPERATION LED		Yellow	
SWITCHING FREQUENCY		10 Hz	
RESPONSE TIME		100 mS	
START UP DELAY		300 mS	
ELECTRIC PROTECTIONS	Aga	aints inductive lo	ads
TEMPERATURE LIMITS		-10 ÷ +60 °C	
LIGHT IMMUNITY		5000 Lux	
PROTECTION DEGREE	IP 67 (IP 65 for r	nodels with sensitiv	vity adjustment)
CABLE LENGTH		2 m	
CABLE SECTION		3 x 0.35 mm ²	
HOUSING MATERIAL	Housing: nylon lo	aded with fiberglass -	Lenses: methacrylate
WEIGHT - cable output -		120 g	

Determined with a white mat paper (cm 10 x 10).

Wiring diagrams



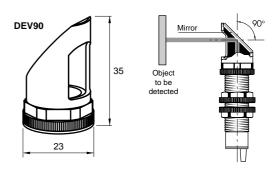
WARNING: Short circuit in the output is not possible. Wrong supply cables connections can irreparably damage the detector. Therefore sensors whose output status is short-circuited will not be substituted under warranty.

CONNECTIONS IN PARALLEL

In parallel connections with multiple outputs, the maximum leakage current (<1,5 mA at 220 VAC) referring to the load and the supply should be taken into account when calculating the max. quantity of connectable sensors.

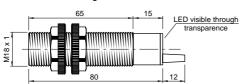
It is important in this connection that the sensors are connected at the same phase.

Accessories

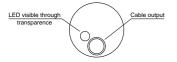


Dimensions (mm)

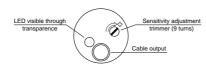
Configuration with cable

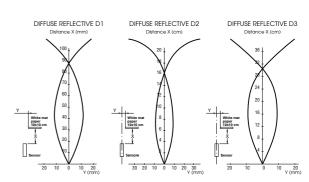


Configuration with cable - Back view



Configuration with sensitivity adjustment





 $^{^{(2)}}$ Determined with halogen tungsten lamp 3000 $^{\circ}\text{K}.$ Note: for a proper use see norms at pages 6, 7 and 8.



PHOTOELECTRIC SENSORS IN STANDARD HOUSING 12 ÷ 30 V DC PROGRAMMABLE OUTPUT

- Programmable outputs, NPN or PNP, N.C. or N.O.
- · Simpke one-turn sensitivity
- M12 quick connect or integral cable
- 2 msec ON/OFF

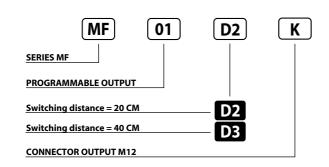








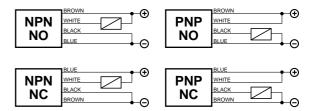
Identification code



AVAILABLE	D2	D3
SWITCHING DISTANCE	20 cm ⁽¹⁾	40 cm ⁽¹⁾
HYSTERESIS	10	0%
EMISSION	Infrared	(875 ηm)
NOMINAL VOLTAGE	12 ÷ 30VDC	(-15 /+10%)
RESIDUAL RIPPLE	≤1	0%
OUTPUT	NPN or PNP (m	ay be selected)
CONTACT	NO or NC (ma	y be selected)
MAX. OUTPUT CURRENT	200	mA
ABSORPTION AT 30 VDC	40	mA
VOLTAGE DROP (Sensor ON)	≤ 2 V (I =	100 mA)
STATUS LED	Yel	low
SENSITIVITY ADJUSTEMENT	Trimme	er 1 turn
SWITCHING FREQUENCY	500) Hz
RESPONSE TIME	21	mS
START UP DELAY	100	mS
SHORT CIRCUIT PROTECTION	Present (se	lf-resetting)
ELECTRIC PROTECTIONS	Againts polarity rever	sal - inductive loads
TEMPERATURE LIMITS	-10 ÷	+60 °C
LIGHT IMMUNITY	> 10.00	0 Lux (2)
PROTECTION DEGREE	IP	65
CABLE LENGTH	2	m
CABLE SECTION	4 x 0.2	5 mm ²
HOUSING MATERIAL	Housing: ABS - L	enses: methacrylate
WEIGHT - cable output - (connector output)	- 130 g -	(70 g)

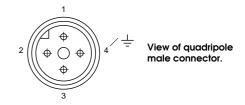
⁽¹⁾ Determined with a white mat paper (cm 10 x 10).

Wiring diagrams



Note: For series or parallel connections see notes at page 6.

Connection with connector M12 (K)

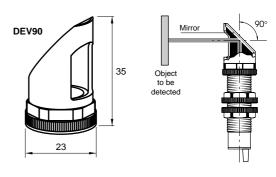


CONTACTS CONFIGURATION

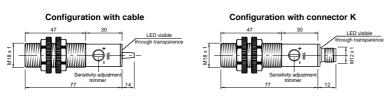
Output		Contacts	numbers	
Oulpui	1	2	3	4
NPN NO	+	NO	_	_
NPN NC	_	NC	+	_
PNP NO	+	+	_	NO
PNP NC		+	+	NC

Note: the K plug is compatible with the following connectors: VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Accessories



Dimensions (mm)



Sensitivity adjustment

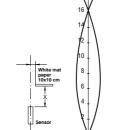
1) SENSITIVITY INCREASE

Screw the trimmer towards right towards position "+"

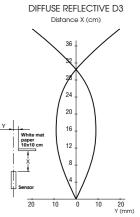
2) SENSITIVITY DECREASE

Screw the trimmer towards left towards position "-

Note: the trimmer just needs one turn.



30 20 10



Characteristic curves

DIFFUSE REFLECTIVE D2

Distance X (cm)

 $^{^{(2)}}$ Determined with halogen tungsten lamp 3000 $^{\circ}\text{K}.$ Note: for a proper use see norms at pages 6, 7 and 8.

PHOTOELECTRIC SENSORS IN SQUARE HOUSING 12 ÷ 30 V DC PROGRAMMABLE OUTPUT

- Compact size, output and stability indicators
- Cost effective
- M12 quick connect or integral cable
- 5 msec ON/OFF

FQ Series

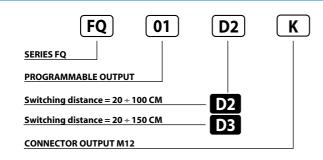






NO

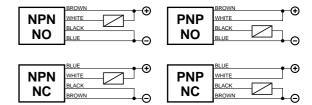
Identification code



AVAILABLE	D2	D3
SWITCHING DISTANCE	20 ÷ 100 cm ⁽¹⁾	20 ÷ 150 cm ⁽¹⁾
HYSTERESIS	10)%
EMISSION	Infrared	(875 ηm)
NOMINAL VOLTAGE	12 ÷ 30VDC	(-15 /+10%)
RESIDUAL RIPPLE	≤1	0%
OUTPUT	NPN or PNP (p	rogrammable)
CONTACT	NO or NC (pr	ogrammable)
MAX. OUTPUT CURRENT	200	mA
ABSORPTION AT 30 VDC	40	mA
VOLTAGE DROP (Sensor ON)	≤ 1.8 V (I =	= 100 mA)
YELLOW LED	Output i	indicator
GREEN LED	Stability	indicator
SENSITIVITY ADJUSTEMENT	Trimme	er 1 turn
SWITCHING FREQUENCY	200) Hz
RESPONSE TIME	5 ו	mS
START UP DELAY	100	mS
SHORT CIRCUIT PROTECTION	Present (se	lf-resetting)
ELECTRIC PROTECTIONS	Againts polarity rever	sal - inductive loads
TEMPERATURE LIMITS	-20 ÷	+60 °C
LIGHT IMMUNITY	> 10.00	0 Lux (2)
PROTECTION DEGREE	IP	65
CABLE LENGTH	2	m
CABLE SECTION	4 x 0.2	5 mm ²
HOUSING MATERIAL	Housing: ABS - L	enses: methacrylate
WEIGHT - cable output - (connector output)	- 160 g -	(120 g)

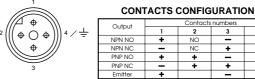
⁽¹⁾ Determined with a white mat paper (cm 10 x 10).

Wiring diagrams



Note: For series or parallel connections see notes at page 6.

Connection with connector M12 (K)

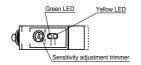


View of quadripole male connector.

Note: the K plug is compatible with the following connectors: VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

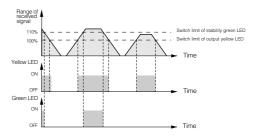
Sensitivity adjustment

- SENSITIVITY INCREASE
 Screw the trimmer towards
 right towards position "+"
- 2) SENSITIVITY DECREASE Screw the trimmer towards left towards position "-"



Note: the trimmer just needs one turn.

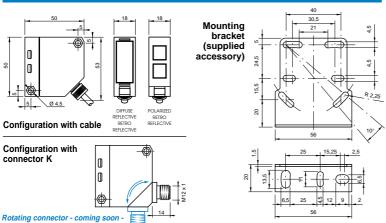
Stability signal led

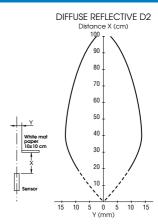


The stability signal LED shows the range of received signal and helps the photoelectric sensor to line up.

A photoelectric sensor works in "stability" condition when the received light signal range is 10% ahead the switching limit of output.

Dimensions (mm)





 $^{^{(2)}}$ Determined with halogen tungsten lamp 3000° K. Note: for a proper use see norms at pages 6, 7 and 8.



PHOTOELECTRIC SENSORS IN SQUARE HOUSING 18 ÷ 230 V AC - DC REPLAY OUTPUT

- Wide input voltage
- 3A relay SPDT
- M12 quick connect or integral cable
- Output and Supply indicators

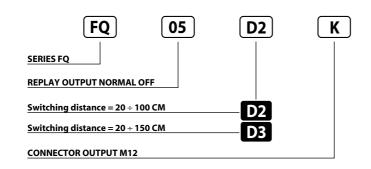
FQ Series







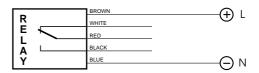
Identification code



AVAILABLE	D2	D3
SWITCHING DISTANCE	20 ÷ 100 cm ⁽¹⁾	20 ÷ 150 cm ⁽¹⁾
HYSTERESIS	10)%
EMISSION	Infrared	(875 ηm)
NOMINAL VOLTAGE	18 ÷ 230V AC -	DC (-15 /+10%)
MAINS FREQUENCY	50 ÷	60 Hz
OUTPUT	Relay (10 x 1	0 ⁶ ops. min.)
MAX. OUTPUT CURRENT	3A 30 V AC - 1A	220 V AC (90W, 360 VA)
ABSORPTION	2.5	VA
YELLOW LED	Output i	indicator
GREEN LED	Supply i	ndicator
SENSITIVITY ADJUSTEMENT	Trimme	er 1 turn
SWITCHING FREQUENCY	10	Hz
RESPONSE TIME	100	mS
START UP DELAY	≤30	0 mS
TEMPERATURE LIMITS	- 20 ÷	+60° C
LIGHT IMMUNITY	> 10.00	0 Lux (2)
PROTECTION DEGREE	IP	65
CABLE LENGTH	2	m
CABLE SECTION	5 x 0.3	0 mm ²
HOUSING MATERIAL	Housing: ABS - L	enses: methacrylate
WEIGHT - cable output - (connector output)	- 180 g -	(125 g)

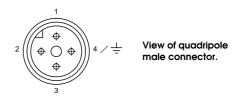
⁽¹⁾ Determined with a white mat paper (cm 10 x 10).

Wiring diagrams



Note: in case of inductive loads it is necessary to connect one diode in antiparallel at the edges of the load.

Connection with connector M12 (K)



CONTACTS CONFIGURATION

Output	Contacts numbers			
Oulpui	1	2	3	4
Relay	L	COM	N	NO
Emitter	L	_	N	_

Note: the K plug is compatible with the following connectors: VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

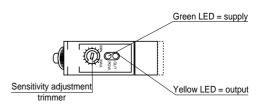
Sensitivity adjustment

1) SENSITIVITY INCREASE

Screw the trimmer towards right towards position "+"

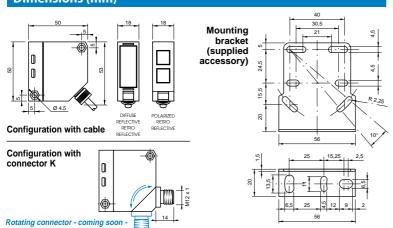
2) SENSITIVITY DECREASE

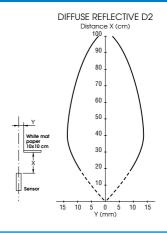
Screw the trimmer towards left towards position "-"



Note: the trimmer just needs one turn.

Dimensions (mm)





⁽²⁾ Determined with halogen tungsten lamp 3000° K.

Note: for a proper use see norms at pages 6, 7 and 8.

PHOTOELECTRIC SENSORS IN RECTANGULAR HOUSING 12 ÷ 30 V DC WITH TIMER NPN OR PNP OUTPUT

- Rectangle compact size
- Multi-function timer
- ON/OFF delay
- · One shot-four functions
- NPN or PNP outputs
- Conduit wiring terminal block

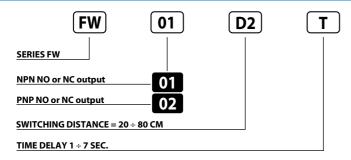
FW Series





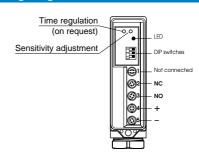


Identification code



AVAII ABI F	D2
SWITCHING DISTANCE	20 - 80 cm ⁽¹⁾
HYSTERESIS	10%
EMISSION	
NOMINAL VOLTAGE	Infrared (875 ηm)
	12 ÷ 30VDC (-15 /+10%)
RESIDUAL RIPPLE	≤10%
OUTPUT	NPN or PNP
MAX OUTPUT CURRENT	200 mA
ABSORPTION	≤ 40 mA
VOLTAGE DECREASE	≤ 2.5 VDC
YELLOW LED	Present
SENSITIVITY ADJUSTEMENT	Timmer 1 turn
TIME REGULATION	$0.1 \div 7 \text{ s} \pm 2 \text{ s}$ (only models with timer)
SWITCHING FREQUENCY	100 Hz
RESPONSE TIME	10 mS
START UP DELAY	≤ 300 ms
PROTECTION AGAINTS SHORT-CIRCUIT	Present (self-resetting)
TEMPERATURE LIMITS	-25° ÷ +55°C
LIGHT IMMUNITY	5.000 Lux ⁽²⁾
PROTECTION DEGREE	IP 67
CONNECTIONS	Screw
CABLE GUIDE	PG 13.5
HOUSING MATERIAL	Polycarbonate
WEIGHT (Approximately)	110 g
· · · · · · · · · · · · · · · · · · ·	·

Wiring diagrams



Timing diagrams

MODELS WITHOUT TIMER

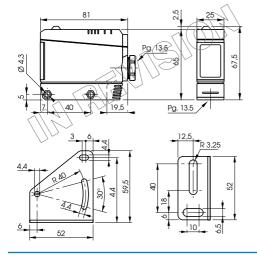
N.	DIP. SWITCHES POSITION	OBJECT	OUTPUT DIAGRAM		
		Light impulse			
1	Output ON (2=NO; 3=NC)	Outoput status			
2	Output OFF (2=NC; 3=NO)	Outoput status			

MODELS WITH TIMER

N.	DIP. SWITCHES POSITION	OBJECT	OUTPUT DIAGRAM		
		Light impulse			
1	On operate output ON	Outoput status	<u> </u>		
2	On operate output OFF	Outoput status			
3	On release output ON	Outoput status			
4	On release output OFF	Outoput status			
5	One shot trailing edge output ON	Outoput status			
6	One shot trailing edge output OFF	Outoput status			
7	One shot leading edge output ON	Outoput status	_++++		
8	One shot leading edge output OFF	Outoput status			

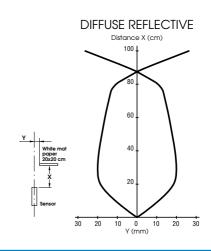
T = Fixed delay

Dimensions (mm)



PHOTOELECTRIC SENSOR

MOUNTING BRACKET (SUPPLIED ACCESSORY)



 $^{^{(1)}}$ Determined with a white mat paper cm 20 x 20.

⁽²⁾ Determined with halogen tungsten lamp 3000° K. Note: for a proper use see norms at pages 6, 7 and 8.

PH. SENSORS IN RECTANGULAR HOUSING 12 \div 240 V DC 24 \div 240 V AC WITH TIMER RELAY OUTPUT

- Wide range World Wide Power Supply
- Rectangular compact size
- Multi-function timer: ON/OFF delay - One shot-four functions
- 3A relay SPDT - Terminal block wiring

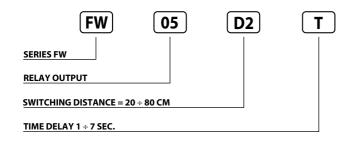
FW Series





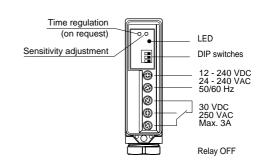


Identification code



AVAILABLE	D2	
SWITCHING DISTANCE	20 -80 cm ⁽¹⁾	
HYSTERESIS	10%	
EMISSION	Infrared (875 ηm)	
NOMINAL VOLTAGE	12 ÷ 240VDC / 24 ÷ 240 VAC (-15 /+10%)	
NET FREQUENCY	45 ÷ 60 Hz	
OUTPUT	Relay (40 x 10 ⁶ mec. op5 x 10 ⁶ elect. op.)	
MAX OUTPUT CURRENT	3A 250VAC - 3A 30VDC	
ABSORPTION	≤ 2W (2.5 VA)	
YELLOW LED	Present	
GREEN LED	-	
SENSITIVITY ADJUSTEMENT	Present	
TIME REGULATION	$0.1 \div 7 \text{ s} \pm 2 \text{ s}$ (only models with timer)	
SWITCHING FREQUENCY	20 Hz	
RESPONSE TIME	50 ms	
START UP DELAY	≤ 300 ms	
TEMPERATURE LIMITS	-25° ÷ +55°C	
LIGHT IMMUNITY	5.000 Lux ⁽²⁾	
PROTECTION DEGREE	IP 67	
CONNECTIONS	Screw	
CABLE GUIDE	PG 13.5	
HOUSING MATERIAL	Polycarbonate	
WEIGHT (Approximately)	110 g	

Wiring diagrams



Timing diagrams

MODELS WITHOUT TIMER

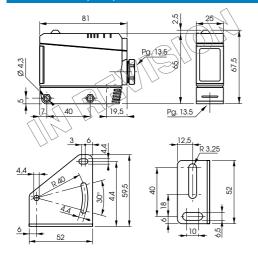
N	. DIP. SWITCHES POSITION	OBJECT	OUTPUT DIAGRAM	
		Light impulse		
1	Output ON (2=NO; 3=NC)	Outoput status		
2	Output OFF (2=NC; 3=NO)	Outoput status		

MODELS WITH TIMER

N.	DIP. SWITCHES POSITION	OBJECT	OUTPUT DIAGRAM		
		Light impulse			
1	On operate output ON	Outoput status	<u> </u>		
2	On operate output OFF	Outoput status			
3	On release output ON	Outoput status			
4	On release output OFF	Outoput status			
5	One shot trailing edge output ON	Outoput status			
6	One shot trailing edge output OFF	Outoput status			
7	One shot leading edge output ON	Outoput status			
8	One shot leading edge output OFF	Outoput status			

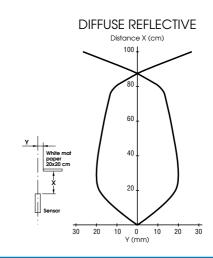
T = Fixed delay

Dimensions (mm)



PHOTOELECTRIC SENSOR

MOUNTING BRACKET (SUPPLIED ACCESSORY)



 $^{^{\}left(1\right)}$ Determined with a white mat paper cm 20 x 20.

⁽²⁾ Determined with halogen tungsten lamp 3000° K. Note: for a proper use see norms at pages ? and ?.

P 952 S / R

(E

• Sensing: 4 m on white sheet 300 x 300 mm

Supply :10 to 30 VDC or 20 to 250 V AC/DC

Output: PNP / NPN or relay

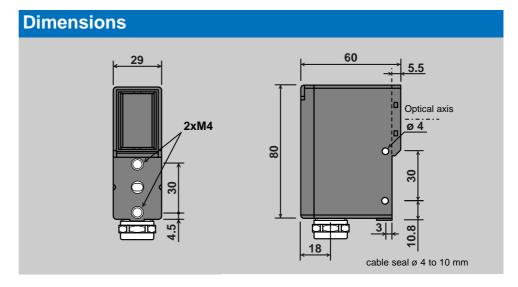
ON-delay + OFF-delay timer

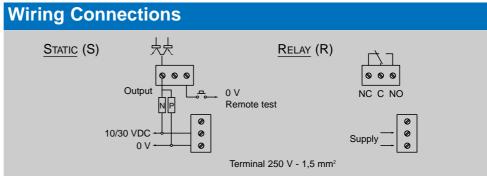


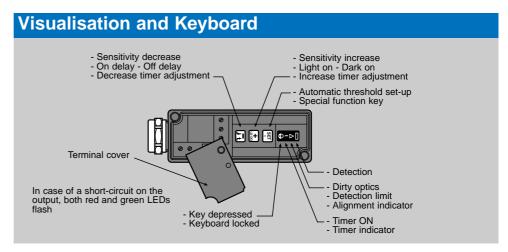
Description:

- Simple and quick set-up for self-teach (standard and sensitive mode)
- Double adjustable timer
- · Alignment indicator
- · Dirty optics indicator
- Keyboard lock
- Remote test input (S type) simulate the beam cut-off
- · Direct or inverse output
- · Output : static or relay
- Connection on screw terminal
- Polycarbonate strong housing

- · Strip tearing sensing.
- · Handling.
- · Admittance control.







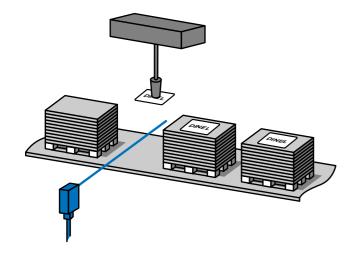
Technical Information	ı	S	R
Supply	voltage	10 / 30 VDC ripple < 10% within specified limits	20 / 250 V AC/DC
	consumption	50 mA	2 VA
Response time	t _{on} or t _{off}	8 ms	20 ms
	switching frequency	60 Hz	25 Hz
Output	max. nominal intensity	100 mA	change over type relay
	residual voltage at 100 mA	< 2 V	U nominal : 250 V AC
	residual voltage at 10 mA	< 1 V	permanent max. I: 3 A
Emission	LED	infra-red	
	modulation frequency	400 Hz	400 Hz
Timer	type	retriggerable - ON-delay / OFF-delay	
	range - increment duration	o to 11s in 23 steps of 50ms, then 0.5s steps	
Temperature	operating	0 to 60° C	
	storage	-20 to 80° C	
External light immunity	incandescent light	10 000 lux from optical axis	
	sunlight	20 000 lux 5° from optical axis	
Protections	supply	inverse polarity protection	_
	output	short-circuit or over-load	_
	degree of protection	IP 65 and IP 67	
Remote input	on	voltage < 1,4 V	_
	off	voltage > 3 V	_

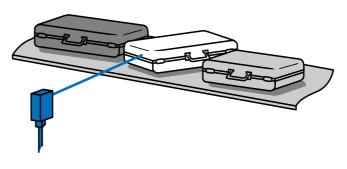
To Place Order				
Product	Diffuse reflection sensor			
Reference	P - 952 ()			
Type (S) : static - 10 / 30 VDC				
	(R) : relay - 20 / 250 V AC/DC			

TYPES OF APPLICATIONS

Example 1

Positionning for sticking, stapling or labelling operations.





Example 2

Jam control on a parcels conveyor.

P 318

Sensing distance on 100x100 mm

white sheet: 0,10 m
• Supply: 10 to 30 V

• Output : PNP / NPN

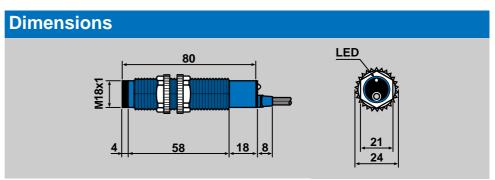


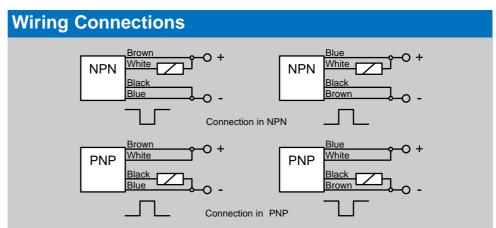


Description:

- · Function indicator
- Direct or inverse output
- Output: PNP / NPN
- M12 plug or cable
- · Polyamid housing

- Detection of various parts (plastic or metallic).
- Control of position or presence of parts on a conveyor.





Technical Information					
Supply	voltage	10 / 30 VDC			
		ripple < 10% within specified limits			
	consumption	20 mA			
Response time	switching frequency	80 Hz			
Output	nominal intensity	100 mA			
	residual voltage at 100 mA	1,2 V max.			
Emission	LED	infra-red			
Temperature	operating	-25 à 70 °C			
	storage	-20 à 80 °C			
External light immunity	incandescent light	3 000 lux			
	sunlight	10 000 lux			
Protections	output	short-circuit			
	degree of protection	IP 67			

To Place Order					
Туре	P 318 (C) - cable				
	PK 318 (C) - M12 plug				
	Туре				

P 328

• Sensing distance on 100x100 mm

white sheet: 0,40 m
• Supply: 10 to 30 V
• Output: PNP / NPN





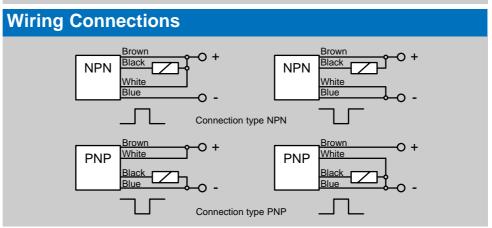
Description:

- · Function indicator
- Direct or inverse output
- Output: PNP / NPN
- M12plug or cable at 90°
- · Polyamid housing

Applications:

- Detection of various parts (plastic or metallic).
- Control of position or presence of parts on a conveyor.

Dimensions 80 LED 1 LED 2 Trimmer 4 58 12 6



Technical Information		
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	20 mA
Response time	switching frequency	1 KHz
	t _{on} or t _{off}	<500 μs
Output	nominal intensity	100 mA
	residual voltage at 100 mA	1,2 V max.
Emission	LED	infra-red modulated
Temperature	operating	-25 à 70 °C
	storage	-20 à 80 °C
External light immunity	incandescent light	3 000 lux
	sunlight	10 000 lux
Protections	output	short-circuit
	degree of protection	IP 65

To Place Order						
Product	Diffuse reflection sensor	Туре	P 328 (CP) or PK 328 (CP) output PNP with M12 plug			
Référence	P 328		P 328 (CN) or PK 328 (CN) output NPN with M12 plug			

P 954 S / R

(E

• Sensing: 1,5 m on 300x300 mm white sheet

Supply :10 to 30 VDC or 20 to 250 V AC/DC

Output: PNP / NPN or relay

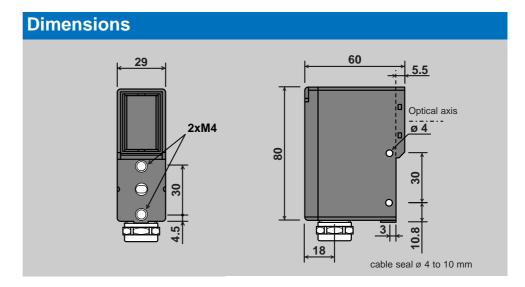
ON-delay + OFF-delay timer

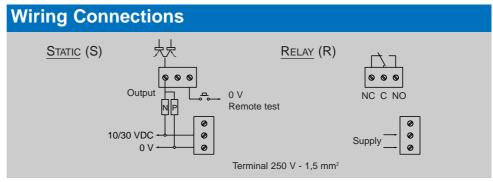


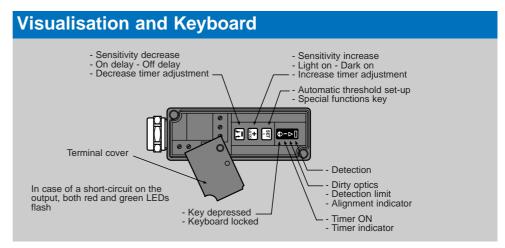
Description:

- Simple and quick set-up for self-teach (standard and sensitive mode)
- Double adjustable timer
- · Alignment indicator
- · Dirty optics indicator
- Keyboard lock
- Remote test input (S type) simulate the beam cut-off
- Direct or inverse output
- · Output : static or relay
- Connection on screw terminal
- Polycarbonate strong housing

- · Strip tearing sensing.
- · Handling.
- · Admittance control.







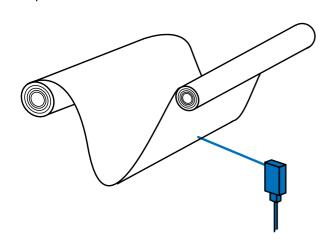
Technical Information	ı	S	R
Supply	voltage	10 / 30 VDC ripple < 10% within specified limits	20 / 250 V AC/DC
	consumption	50 mA	2 VA
Response time	t _{on} or t _{off}	500 µs	20 ms
	switching frequency	1 KHz	25 Hz
Output	max. nominal intensity	100 mA	change over type relay
	residual voltage at 100 mA	< 2 V	U nominal : 250 V AC
	residual voltage at 10 mA	< 1 V	permanent max. I: 3 A
Emission	LED	infra-red	
	modulation frequency	8 KHz	400 Hz
Timer	type	retriggerable - ON-delay / OFF-delay	
	range - increment duration	o to 11s in 23 steps of 50ms, then 0.5s steps	
Temperature	operating	0 to 60° C	
	storage	-20 to 80° C	
External light immunity	incandescent light	10 000 lux 5° from optical axis	
	sunlight	20 000 lux 5° from optical axis	
Protections	supply	inverse polarity protection	_
	output	short-circuit or over-load	_
	degree of protection	IP 65 and IP 67	
Remote input	on	voltage < 1,4 V	_
	off	voltage > 3 V	_

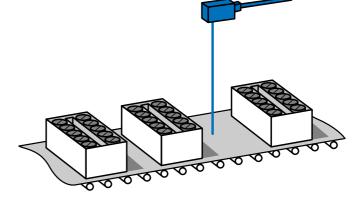
To Place Order	
Product	Diffuse reflection sensor
Reference	P - 954 ()
Туре	(S) : static - 10 / 30 VDC
	(R) : relay - 20 / 250 V AC/DC

TYPES OF APPLICATIONS

Example 1

Strip slack control.





Example 2

Control of presence on a conveyor.

P 989 S

(E

Adjustable sensing distance from 3 to 25 cm
 On white sheet 92% from 100 x 100 mm

• Supply: 10 to 30 VDC

• Output: PNP or NPN

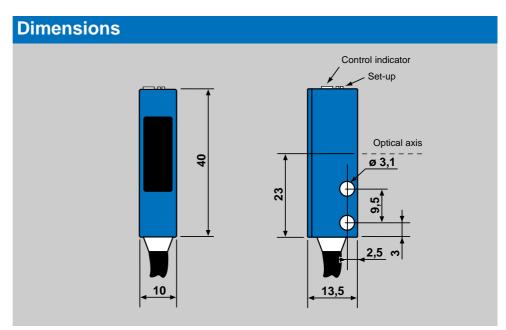
• Trimmer sensibility set-up

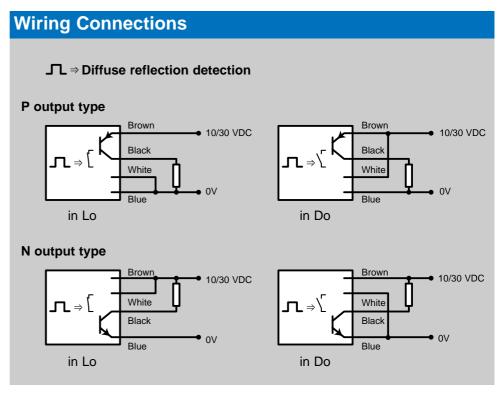


Description:

- Miniaturised
- Integrated amplifier
- Detection indication by LED
- · Lateral beam
- Direct / inverse output
- Red pulsed visible light
- 2 m cable or M8 plug
- · Strong housing
- Economical

- Control of position or presence of parts on assembly machine.
- Detection of opaque or transparent objects.
- Small spaces positionning sensors.



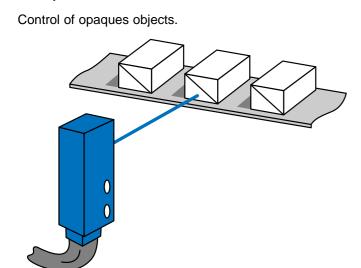


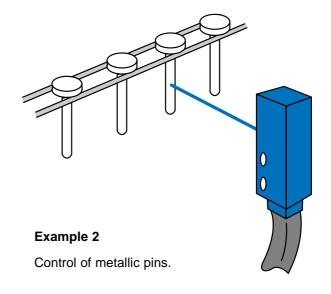
Tecnical Information				
Supply	voltage	10 / 30 VDC		
		ripple < 10% within specified limits		
	consumption	< 25 mA		
Response time	t _{on} or t _{off}	1 mS		
	switching frequency	500 Hz		
Output	max. nominal frequency	100 mA		
	residual voltage at 100 mA	< 2 V		
	residual voltage at 10 mA	< 1 V		
Emission	LED	red pulsed		
	modulation frequency	6 KHz		
Temperature	operating	0 to 50° C		
	storage	- 20° to 80° C		
External light immunity	incandescent light	5 000 lux		
	sunlight	10 000 lux		
Protections	supply	inverse polarity protection		
	output	permanent short-circuit or over-load protection		
	degree	IP 65 and IP 67		
Directe / inverse function		by cable, see "Wiring Connections"		

To Place Order	
Product	Miniature diffuse reflection sensor
Reference	P 989 SN - 2 m cable output (NPN)
	P 989 SP - 2m cable ouput (PNP)
	P (C0) 989 SN - plug output (NPN)
	P (C0) 989 SP - plug output (PNP)

TYPE OF APPLICATIONS

Example 1





CE

PA 946 S

Adjustable sensing distance
 0 to 50 cm

On 100x100 mm white sheet 92%

Supply: 10 / 30 VDCOutput: PNP / NPN

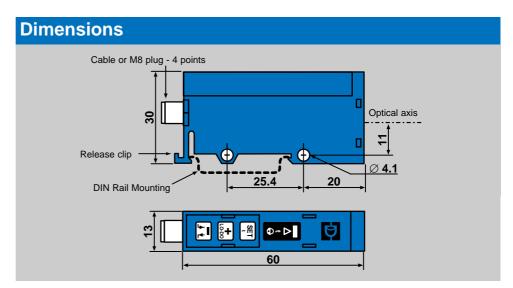
· On-delay or off-delay timer standard

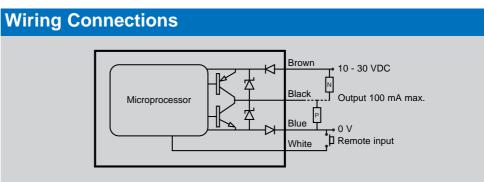


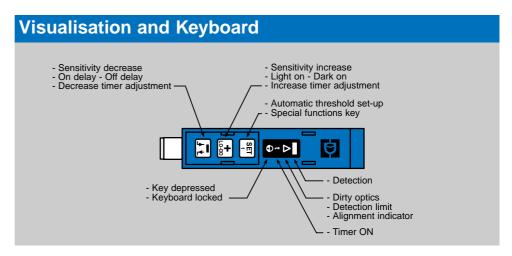
Description:

- Simple and quick set-up for self-teach (standard and sensitive mode)
- Adjustable timer
- · Alignment indicator
- · Dirty optics indicator
- Keyboard lock
- Remote input for selfteach (sensitive mode)
- · Direct or inverse output
- Output: PNP / NPN
- · Cable or M8 plug
- Polycarbonate strong housing

- Position or presence control of parts on assembly or conditioning machipo
- Detection of opaque or transparent parts.
- Control of presence of parts in a container.







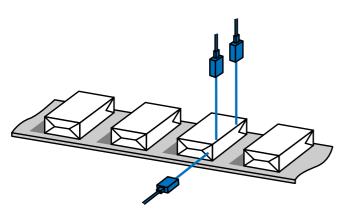
Technical Information	n			
Supply	voltage	10 / 30 VDC		
		ripple < 10% within specified limits		
	consumption	< 40 mA		
Response time	t _{on} or t _{off}	< 500 μs		
	switching frequency	< 1 KHz		
Output	max. nominal intensity	100 mA		
	residual voltage at 100 mA	< 2 V		
	residual voltage at 10 mA	< 1 V		
Emission	LED	infra red		
	modulation frequency	8 KHz		
Timer	range	0 to 5 s with 11 increments		
	increment duration	first increment : 40 ms, following increments : 500 ms		
Temperature	operating	0 to 60 °C		
	storage	-20 to 80 °C		
External light immunity	incandescent light	10 000 lux		
	sunlight	20 000 lux		
Protections	supply	inverse polarity protection		
	output	permanent short-circuit or over-load protection		
	degree of protection	IP 65		
Remote input	on	voltage < 1,4 V		
	off	voltage > 3 V		

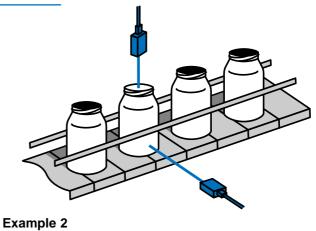
To Place Order	
Product	Diffuse reflection axial sensor
Reference	PA - () - 946 S () output with cable 2m (C0) output M8 plug without cable
Cable for M8 plug if necessary, please order together with the amplifier	CM 82 - cordon 2m CM 85 - cordon 5m

TYPES OF APPLICATIONS

Example 1

Boxes alignment control on a packaging line.





Cap presence control on a bottle.

CE

PA 966 S

Adjustable sensing distance
 Adjustable sensing distance

maximum: 50 cm

On 100x100 mm white sheet 92%

Supply: 10 / 30 VDCOutput: PNP / NPN

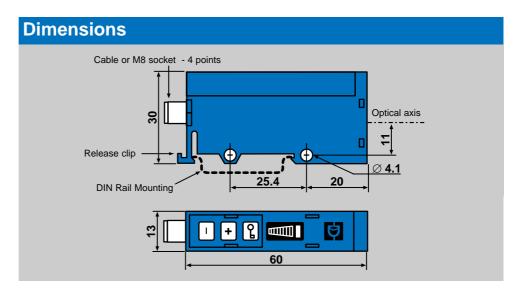
• Friendly adjustment by key + / -

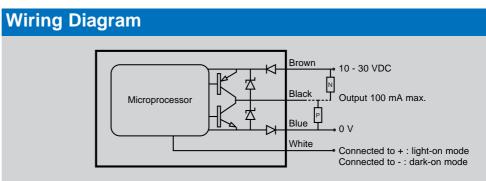
Bargraph

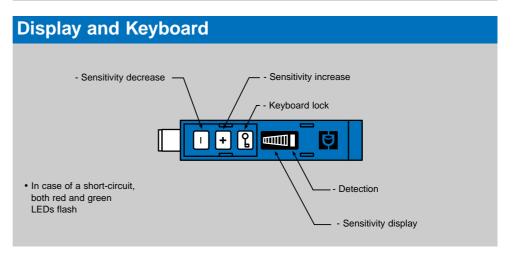
Description:

- Simple adjustment
- · Sensitivity bargraph
- Maximum and minimum sensitivity indication
- Keyboard lock
- · Direct or inverse output
- Output: PNP / NPN
- · Cable or M8 socket
- Polycarbonate strong housing

- Position or presence control of parts on assembly or conditioning machine.
- Detection of opaque or transparent parts.
- Control of presence of parts in a container.







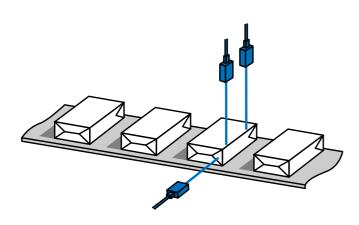
Technical Information		
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	< 40 mA
Response time	t _{on} or t _{off}	< 500 μs
	switching frequency	< 1 KHz
Output	max. nominal intensity	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Emission	LED	infra-red
	modulation frequency	8 KHz
Temperature	operating	0 to 60 °C
	storage	-20 to 80 °C
External light immunity	incandescent light	10 000 lux
	sunlight	20 000 lux
Protections	supply	inverse polarity protection
	output	permanent short-circuit or over-load protection
	degree of protection	IP 65
Light-on / dark-on function		see wiring diagram

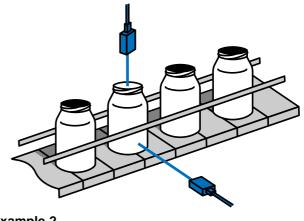
To Place Order	
Product	Diffuse reflection axial sensor
Reference	PA - () - 966 S
	() output with cable 2m
	(C0) output M8 socket without cable
Cable with M8 plug if required, please order together with the sensor	CM 82 - cable 2m CM 82 C - cable 2m with right angle connector CM 85 - cable 5m

TYPES OF APPLICATIONS

Example 1

Boxes alignment on a packaging line.





Example 2

Cap presence on a bottle.



High Performance Detection





PAV 2000

Vision-Assisted Proximity Detection

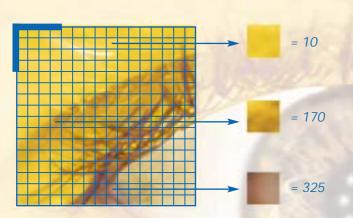
PAV 2000 A vision of quality.



Vision-Assisted Proximity Detection PAV 2000

PAV 2000 is innovative and easy to use. It combines the simplicity of a proximity detector with built-in computerized image processing. The **PAV 2000** can be used in all situations of simple quality control and compliance. It is an effective solution for all industries aiming to simplify the problem of vision.

Operating Principle



The reference image is divided into 256 zones defined by a 16 row x 16 column grid of the image.

For each box, the PAV 2000 calculates a coefficient that depends on the brightness of this part of the image.

When the image is memorized as reference, these 256 coefficients are stored.

In the analysis process, the 256 coefficients of the new image are recalculated and compared to the reference image that was learned previously.

The level of non-compliance of the image is the sum of the defective boxes.

Viewing the reference image

When a view is demanded by the user or automatically, the PAV 2000 imager progressively constructs an image.

The resulting image is continuous, even in movement: lines are not interlaced and there is no ripple effect.

A state of the art product

With "standard" and "zero fault" being the scope of requirements and target point, industry must ensure reliable and effective quality control.

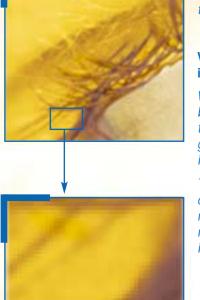
Simple and effective technology

The PAV 2000 is a simple proximity detector whose performance is based on a camera and built-in image processing system. It analyzes and compares the brightness of an image to that of a calibration image in 256 zones at rate of more than 1000 images/minute.

The **PAV 2000** responds in real time and according to a tolerance scale that can be set. Using self-learning and with no focal length adjustment required, it precisely detects the **level of non-compliance** of a product in comparison to the reference product.

A quality solution for industry

Fulfilling the requirements of reliable detection in quality control, the PAV 2000 is fully applicable in all sectors of industries whose target is to simplify the problem of optical control: packaging, pharmaceuticals, cosmetics, automobiles, metallurgy, agribusiness and many more.





CE

PAV 2000

 Observation distance: 20 to 400 mm depending on the model

• Size of image analyzed:

20 x 12 mm to 300 x 250 mm

Power supply: 10 to 30 VDCOutput signal: NPN/PNP

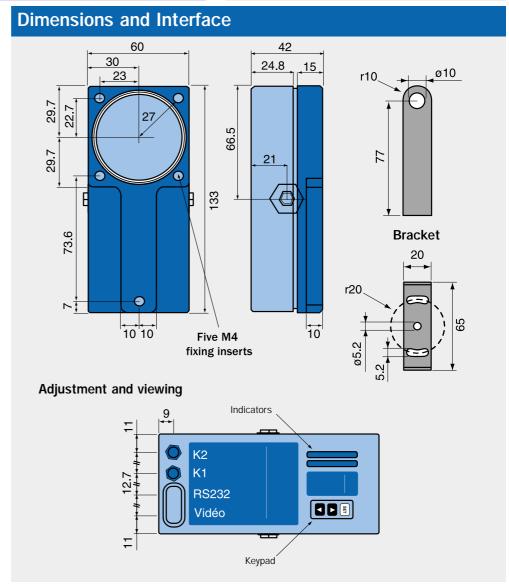
Processing speed: 1000 images/minute

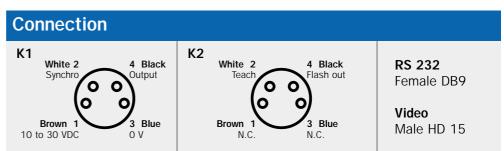


Description

- Built-in camera and processing system
- · LASER centering pointer
- · Built-in flash
- Simple and rapid adjustment by learning
- · External learning possible
- External imaging intervals
- Synchronous or asynchronous mode
- M8 connectors
- Monitor and RS 232 connections available as options
- Resistant polycarbonate housing

- · Packaging:
 - control of presence and positioning
 - control of presence of printing
- · Agribusiness:
 - verification of appearance of tins of canned foods (swelling)
- · Automobiles:
 - control of presence or absence of continuous band (of glue, e.g.)





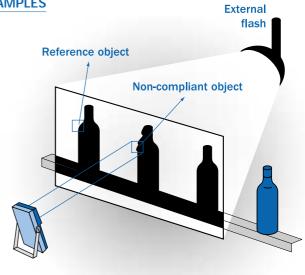
Technical Characterist	tics	
Power supply	operating voltage	10/30 VDC ripple < 10% within the authorized voltage range
	consumption	3 VA
Response time	ton Or toff	60 ms
	switching frequency	1000/mn
Outputs: flash and signal	max. rated current	100 mA
	residual V at 100 mA	< 2 V
	residual V at 10 mA	< 1 V
Time interval		0 to 8 seconds
Optical adjustments		none
Flash	characteristics	white LEDs
	working distance	20 to 100 mm
Temperature	working	10° to 40°
	storage	-20° to 80°
Resistance to stray light		200 lux (casing recommended)
Protection	tightness	IP 65

Observation Dis	stance	PAV 2050		PAV 2100			PAV 2300				
Model			50 mm			100 mm			300	mm*	
Observation distance	(mm)	20	50	100	50	100	150	150	200	300	400
Surface observed	dX mm	20	53	86	53	86	120	120	156	224	298
	dY mm	12	41	69	41	69	97	97	127	185	244

^{*} for these distances, the built-in flash is not effective

To order	PAV 2050	PAV 2100	PAV 2300		
Product	Vision-Assisted Proximity Detector				
Product No. two CM 82 cords supplied	PAV 2050 PAV 2100 PAV 2300				
With VGA + RS 232 option	PAV 2050 RV	PAV 2100 RV	PAV 2300 RV		

APPLICATION EXAMPLES Example 1 Verification of label position on canned food tin. Non-compliant object Reference object



Example 2

Recognition of form as shadow cast on a screen.

CE

PL 946 S

Adjustable sensing distance
 0 to 45 cm

On 100x100 mm white sheet 92%

Supply: 10 to 30 VDCOutput: PNP / NPN

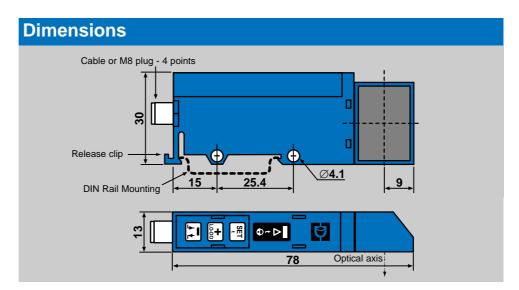
· On-delay or off-delay timer standard

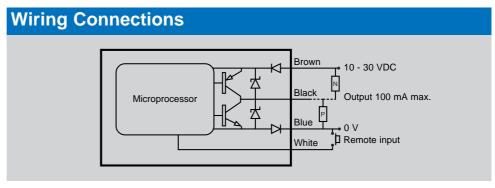


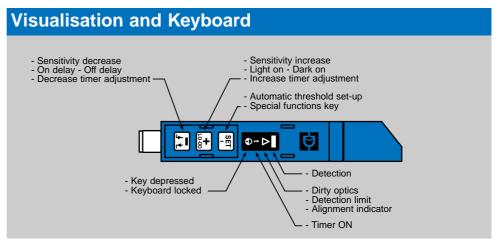
Description:

- Thickness reduced to 13 mm
- Simple and quick set-up for self-teach (standard and sensitive mode)
- Adjustable timer
- · Alignment indicator
- · Dirty optics indicator
- Keyboard lock
- Remote input for selfteach (sensitive mode)
- · Direct or inverse output
- Output: PNP / NPN
- · Cable or M8 plug
- Polycarbonate strong housing

- Position or presence control of parts on conditioning machine.
- Detection of opaque or translucent parts.
- Detection of presence of parts in a container.







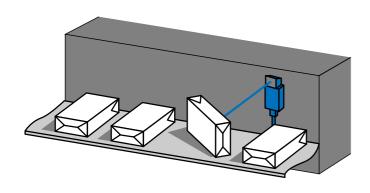
Technical Information	n			
Supply	voltage	10 / 30 VDC		
		ripple < 10% within specified limits		
	consumption	< 40 mA		
Response time	t _{on} or t _{off}	< 500 μs		
	switching frequency	< 1 KHz		
Output	max. nominal intensity	100 mA		
	residual voltage at 100 mA	< 2 V		
	residual voltage at 10 mA	< 1 V		
Emission	LED	infra red		
	modulation frequency	8 KHz		
Timer	range	0 to 5 s with 11 increments		
	increment duration	first increment : 40 ms, following increments : 500 ms		
Temperature	operating	0 to 60 °C		
	storage	-20 to 80 °C		
External light immunity	incandescent light	10 000 lux		
	sunlight	20 000 lux		
Protections	supply	inverse polarity protection		
	output	permanent short-circuit or over-load protection		
	degree of protection	IP 65		
Remote input	on	voltage < 1,4 V		
	off	voltage > 3 V		

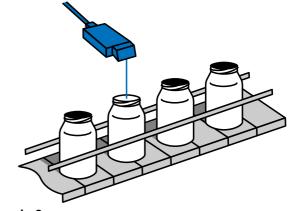
To Place Order	
Product	Diffuse reflection lateral sensor
Reference	PL - () - 946 S () output with cable 2m (C0) output M8 plug without cable
Cable for M8 plug if necessary, please order together with the amplifier	CM 82 - cordon 2m CM 85 - cordon 5m

TYPES OF APPLICATIONS

Example 1

Detection of presence of boxes on a packaging line.





Example 2

Detection of lids presence.

CE

PL 966 S

 Adjustable sensing distance maximum: 45 cm

On 100x100 mm white sheet 92%

Supply: 10 / 30 VDCOutput: PNP / NPN

• Friendly adjustment by key + / -

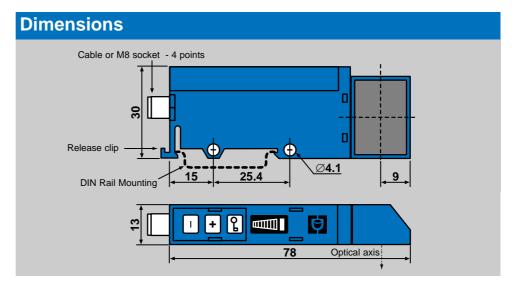
Bargraph

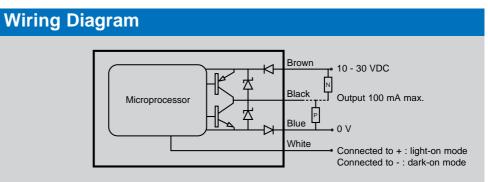
y + 1 -

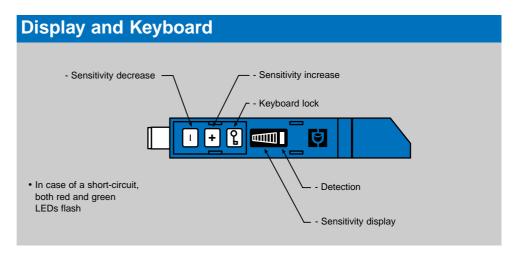
Description:

- Thickness reduced to 13 mm
- Simple adjustment
- · Sensitivity bargraph
- Maximum and minimum sensitivity indication
- Keyboard lock
- Direct or inverse output
- Output: PNP / NPN
- · Cable or M8 socket
- Polycarbonate strong housing

- Position or presence control of parts on conditioning machine.
- Detection of opaque or transparent parts.
- Detection of presence of parts in a container.







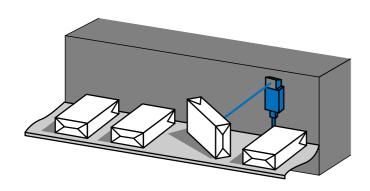
Technical Information		
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	< 40 mA
Response time	t _{on} or t _{off}	< 500 μs
	switching frequency	< 1 KHz
Output	max. nominal intensity	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Emission	LED	infra-red
	modulation frequency	8 KHz
Temperature	operating	0 to 60 °C
	storage	-20 to 80 °C
External light immunity	incandescent light	10 000 lux
	sunlight	20 000 lux
Protections	supply	inverse polarity protection
	output	permanent short-circuit or over-load protection
	degree of protection	IP 65
Light-on / dark-on function		see wiring diagram

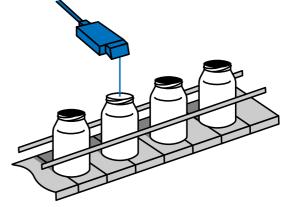
To Place Order		
Product	Diffuse reflection lateral sensor	
Reference	PL - () - 966 S	
	() output with cable 2m	
	(C0) output M8 socket without cable	
Cable with M8 plug if required, please order together with the sensor	CM 82 - cable 2m CM 82 C - cable 2m with right angle connector CM 85 - cable 5m	

TYPES OF APPLICATIONS

Example 1

Detection of boxes on a packaging line.





Example 2

Detection of lids presence.

CE

PS1 L 965 S

• Sensing distance adjustable from :

50 to 300 mm

Supply: 10 / 30 VDCOutputs: PNP / NPN

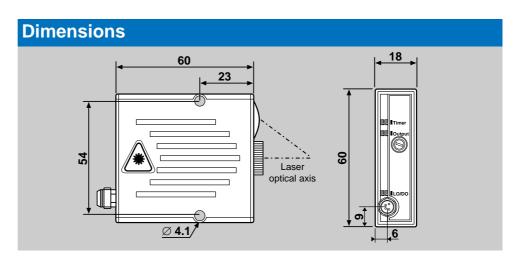
Timer standardHigh accuracy

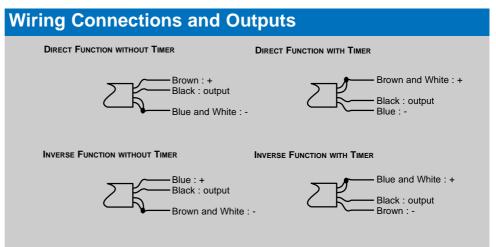


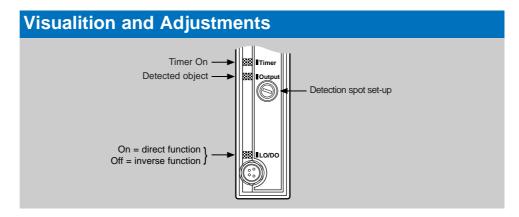
Description:

- Emission by visible red light
- Spot size by adjustable focus
- Distance adjustment by precision screw
- Direct and inverse function
- Programmable timer to 40 ms max.
- 3a class laser
- On / Off function

- Control of small parts on a production machine.
- Detection of components on a printed circuit.
- Presence control of crack in a part.
- · Level control.
- Elimination of background.







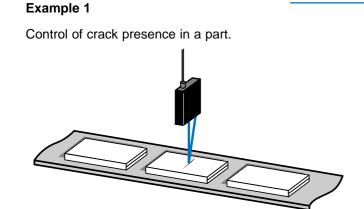
Technical Information		
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	35 mA
Response time	t _{on} or t _{off}	< 150 µs
	switching frequency	5 KHz
Minimum object size		< 0,5 mm
Outputs	max. nominal intensity	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Emission	pulsed laser LED	T pulse = 6 µs, T period < 50 µs
		wavelength = 675 nm
Timer	40 ms	presence or absence of the object switches the output
Temperature	operating	0 to 50 °C
	storage	-20 to 80 °C
External light immunity	incandescent light	> 50 cm with a 100 W / 230 Vac bulb
	sunlight	> 50 cm with a 55 W / 12 Vdc iodine bulb
Protections	output	permanent short-circuit or over-load protection
	degree of protection	IP 65
Programming		by wiring
Distance set-up		precision screw 30 rotations

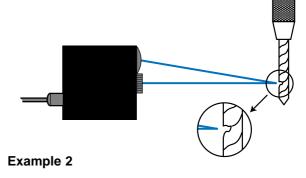


Laser Radiation : do not look at the beam with naked eye, nor with an optical instrument. 3a class laser appliance

To Place Order	
Product	Laser diffuse detection sensor with simple triangulation
Reference	PS1 L - () - 965 S () output by cable 2m (C0) output M8 plug without cable
Cable for M8 plug if necessary, please order together with the sensor	CM 82 - cable 2m CM 85 - cable 5m

TYPES OF APPLICATIONS





Break control of a drill on a tool-machine.

PS2 945 S

((

 Sensing distance adjustable from : 50 to 600 mm

Supply: 10 / 30 VDCOutputs: PNP / NPN

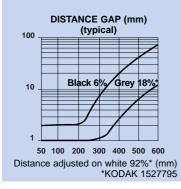
Timer standardHigh accuracy

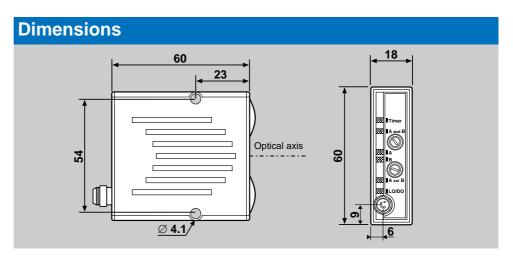


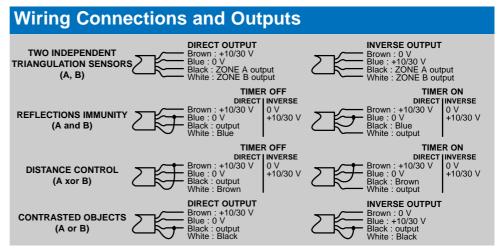
Description: Four operating modes: - two independent triangulation sensors (A, B) detected zones - reflections immunity (A and B) mirror detected zone - distance control (A xor B) detected zone - contrasted objects (A or B)

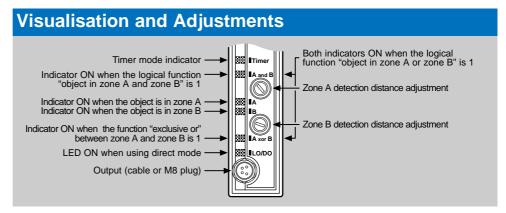
- Timer
- Direct or inverse output
- Output: PNP / NPN
- Cable or M8 plug

- Filling control (A xor B).
- Detection on a conveyor with reflective background (A and B).









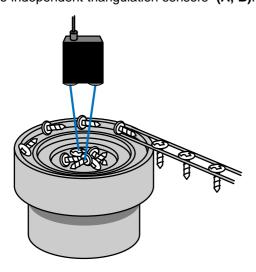
Technical Information		
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	< 1,5 watts
Response time	t _{on} or t _{off}	< 1,8 ms
	switching frequency	370 Hz
Outputs	max. nominal intensity	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Emission	LED	infra-red, beam ø 15 mm
Timer	A and B / A xor B modes	minimum signal duration 40 ms
Temperature	operating	0 to 50 °C
	storage	-20 to 80 °C
External light immunity	incandescent light	> 30 cm with a 100 W / 220 Vac bulb
	sunlight	> 50 cm with a 75 W / 12 Vdc iodine bulb
Protections	output	permanent short-circuit or over-load protection
	degree of protection	IP 65
Programming		by wiring
Distance set-up		precision screw 30 rotations

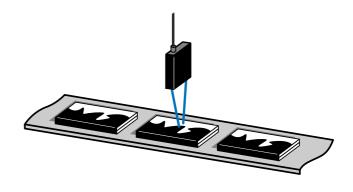
To Place Order		
Product	Diffuse detection sensor with double triangulation	
Reference	PS2 - () - 945 S	
	() output by cable 2m	
	(C0) output M8 plug without cable	
Cable for M8 plug if necessary, please order together with the sensor	CM 82 - cable 2m CM 85 - cable 5m	

TYPES OF APPLICATIONS

Example 1

Level detection in a bowl feeder (empty or full) using mode "two independent triangulation sensors" (A, B).





Example 2

Black and white pads detection on a conveyor using mode "contrasted objects" (A or B).

 $C \in$

PS 989 S

• Adjustable sensing distance : 1,5 to 8 cm

• Supply: 10 to 30 VDC

• Output: PNP or NPN

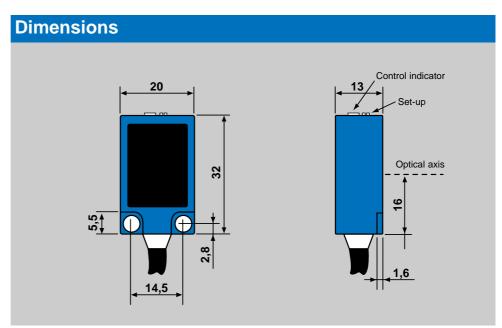
Set-up by precision screw

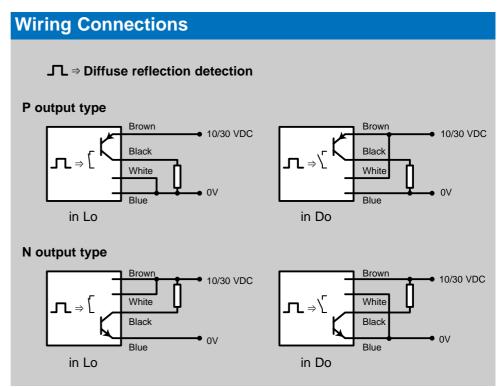


Description:

- Miniaturised
- · Integrated amplifier
- Detection indication by LED
- Indication of short-circuit on the output by blinking LED
- · Lateral beam
- · Back-ground suppression
- Direct / inverse output
- · Red pulsed visible light
- 2 m cable or M8 plug

- Control of position or presence of parts with back-ground suppression.
- Detection of object hight on a conveyor.
- Detection of solid granulates level.



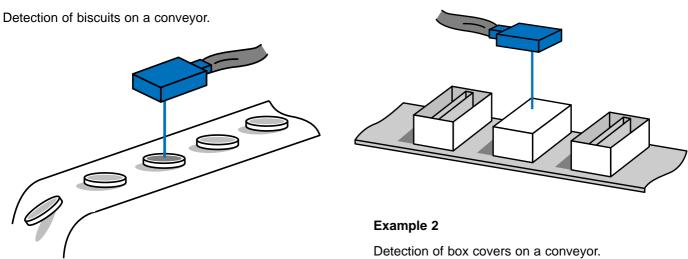


Technical Information		
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	< 25 mA
Response time	t _{on} or t _{off}	1 mS
	switching frequency	500 Hz
Output	max. nominal frequency	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Emission	LED	red pulsed
	modulation frequency	6 KHz
Temperature	operating	0 to 50° C
	storage	- 20° to 80° C
External light immunity		insensitive
Protections	supply	inverse polarity protection
	output	permanent short-circuit or over-load protection
	degree	IP 65 and IP 67
Directe / inverse function		by cable, see "Wiring Connections"
Difference black/white		2 cm at maximum sensing distance

Pour Commander		
Product	Miniature sensor with back-ground suppression	
Reference	PS 989 SN - 2 m cable output (NPN)	
	PS 989 SP - 2m cable ouput (PNP)	
	PS (C0) 989 SN - plug output (NPN)	
	PS (C0) 989 SP - plug output (PNP)	

TYPE OF APPLICATIONS

Example 1



F 95 S

Spread : 2 to 120 mmSupply : 10 to 30 VDCOutput : PNP / NPN

- High sensitivity
- High speed
- Built-in amplifier

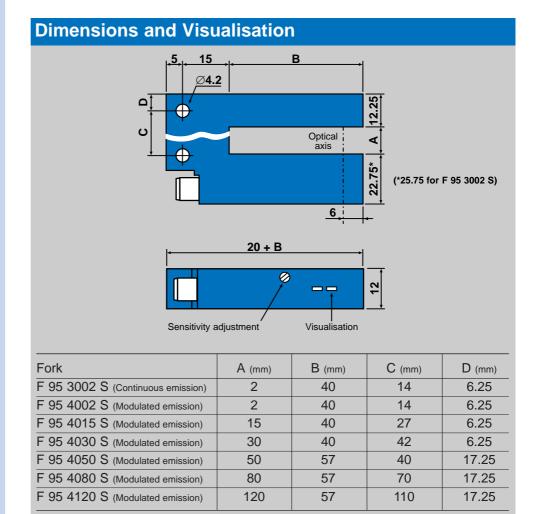
CE

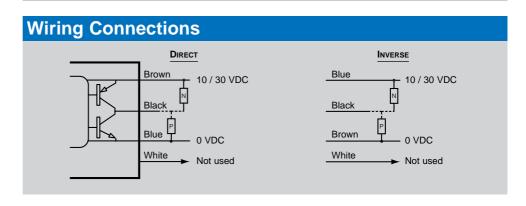


Description:

- Simple and accurate adjustment by potentiometre (25 rotations)
- Output indicator
- Direct / inverse output
- Output: PNP / NPN
- M8 plug
- Painted aluminium strong housing

- Lateral shift control of a belt.
- Detection on a labelling machine.
- Handling : control of tools travel.
- Detection of sheets overlapping.
- Detection of marks on a translucent film.
- Lift cage position control.





Technical information		Modulated emission	Continuous emission	
Supply	Supply voltage		10 / 30 VDC	
		ripple < 10% within specified limits		
	consumption	30 mA	40 mA	
Response time	t _{on} or t _{off}	1 ms	30 µs	
	switching frequency	500 Hz	10 KHz	
Output	max. nominal intensity	10	0 mA	
	residual voltage at 100 mA	< 2 V		
	residual voltage at 10 mA	<	1 V	
Emission	LED	infra-red		
	modulation frequency	7.7 KHz	continuous	
Temperature	operating	-20 to 60 °C		
	storage	-20 to	0 80 °C	
External light immunity	incandescent light	3 000 lux	3 000 lux	
	sunlight	10 000 lux	3 000 lux	
Protections	supply	inverse polarity protection		
	output	permanent short-circuit or over-load protection		
	degree of protection	IF	P 65	

To Place Order		
Product	Fork sensor	
Reference	F 95 () - S - 10 / 30 VDC	
Туре	Cf. "Dimensions table"	
	(C0) output M8 plug without cable	
	(C2) output M8 plug with cable 2m	
	(C5) output M8 plug with cable 5m	

TYPES OF APPLICATIONS

Example 1

Detection of sheets position on a conveyor.

IEL DINEL DI

Example 2

Detection of labels on a strip.

FA 98 S

• Spread : 3 mm

• Supply: 10 to 30 VDC • Output: PNP / NPN

- Teach-in automatic set-up
- High speed of detection
- Integrated amplifier

CE



Description:

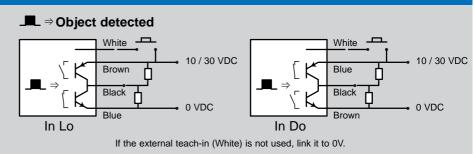
- Simple and quick teach-in set-up
- · Set-up on the fork or by external input
- Set-up lock
- Output indicator
- Direct/inverse output
- Output: PNP / NPN
- M8 plug
- Anodised aluminium strong housing

Applications:

- · Position control on a moving belt.
- · Detection of tags on a conveyor.
- Detection of "double sheet".
- · Mark detection on a translucid film.

Dimensions <u>15</u> 60 Optical axis 6 80 Visualisation LED

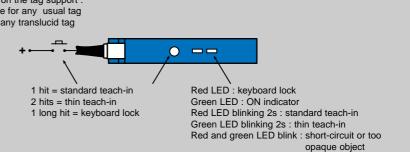
Wiring Connections



Display and Keyboard

Teach-in made on the tag support :

- standard mode for any usual tag
- thin mode for any translucid tag



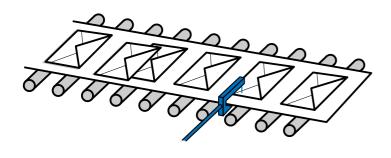
Technical Information		
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	40 mA
Response time	t _{on} or t _{off}	50 μs
	switching frequency	10 KHz
Output	max. nominal intensity	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Emission	LED	continued infra-red
Temperature	operating	-20 à 60 °C
External light immunity	incandescent light	3 000 lux
	sunlight	3 000 lux
Protections	supply	inverse polarity protection
	output	permanent short-circuit or over-load protection
	degree of protection	IP 65

To Place Order		
Product	Teach-in fork sensor	
Reference	FA (C0) 98 3003 S	
Cable with M8 plug	CM 82 - cable 2 m	
if required, please order	CM 85 - cable 5 m	
together with the sensor	CM 82C - cable 2 m coudé	

TYPES OF APPLICATIONS

Example 1

Detection of envelops superposition.



IEL DINEL DINEL DIN

Example 2

Detection of tags on a belt.

CAD 120 / CAD 180 / CAD 250

CE

• Spread: 120 to 250 mm

• Supply: 24 VDC

• Outputs : PNP / NPN

Adjustable timer

• Built-in amplifier



Description:

- · Simple and quick adjustment by potentiometre
- · Adjustable timer
- · Dirty optic indicator
- Output indicator
- · Faulty supply indicator
- · Mechanical protection of the optics
- Direct or inverse output
- Static output
- M12 plug
- Painted aluminium strong housing

Applications:

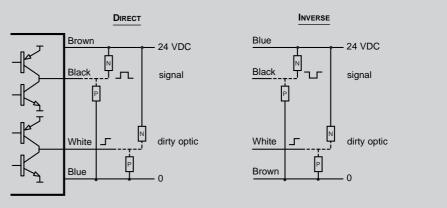
- · Dynamic detection of parts of various material (plastic or metal), various shape and colour.
- · Count of parts.
- · Tools protection by ejection control of parts from a press.

Dimensions and Visualisation 85 4 x Ø5 Sensitivity Timer В Visualisation: signal (green) 230 dirty optic indicator (red) 60 25 M12 plug Mechanical protection of the optics

- In case of a faulty supply, the red LED flashes.
 In case of a short-circuit on an output, the red and green LEDs flash.

TYPE	A (mm)	B (mm): spread
CAD 250	335	250
CAD 180	265	180
CAD 120	205	120

Wiring Connections



Technical Information		
Supply	voltage	18 to 30 VDC
		ripple < 10% within specified limits
	consumption	400 mA
Response time	t _{on} or t _{off}	1 ms
	switching frequency	500 Hz
Outputs	max. nominal intensity	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Emission	LED	infra-red
Timer	retriggerable OFF-delay	max. 5 s
Temperature	operating	0 to 60 °C
	storage	-20 to 80 °C
External light immunity	incandescent light	400 lux
	sunlight	4 000 lux
Protections	output	permanent short-circuit or over-load protection
	degree of protection	IP 65
Minimum size of detection		ø 4 mm
Object speed	minimum	10 cm/s ø 4 mm
	maximum	15 m/s ø 4 mm

To Place Order	
Product	Frame sensor
Reference	CAD - () - S - 24 VDC
Туре	
spread 120 x 200 mm	(120)
spread 180 x 200 mm	(180)
spread 250 x 200 mm	(250)

Example 1 Detection of parts at the output of a bowl feeder. Example 2 Ejection control at the output of a press.

CE

CAD 30 / CAD 60

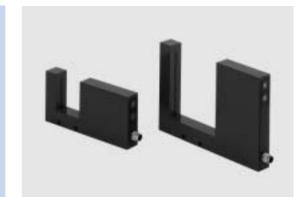
• Spread: 30 x 30 or 60 x 60 mm

• Supply: 24 VDC

• Outputs: PNP / NPN

Adjustable timer

· Built-in amplifier



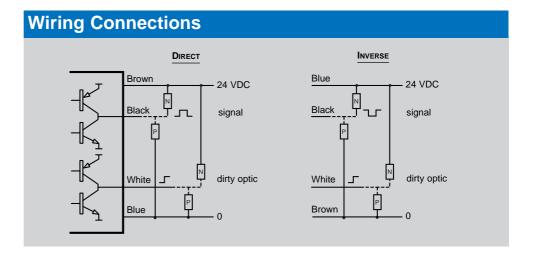
Description:

- Simple and quick adjustment by potentiometre
- · Adjustable timer
- · Dirty optic indicator
- · Output indicator
- · Faulty supply indicator
- · Direct or inverse output
- Static output
- M8 plug
- Painted aluminium strong housing

Applications:

- Dynamic detection of parts of various material (plastic or metal), various shape and colour.
- · Count of parts.
- Tools protection by ejection control of parts from press.

Dimension and Visualisation CAD 30 M8 plug Visualisation: signal (green) dirty optic (red) 50 0 30 Sensitivity 16 108 **CAD 60** M8 plug Visualisation: signal (green) dirty optic (red) 86 60 Sensitivity 16 131 • In case of faulty supply, the red LED flashes. • In case of short-circuit on an output, the red and green LEDs flash.



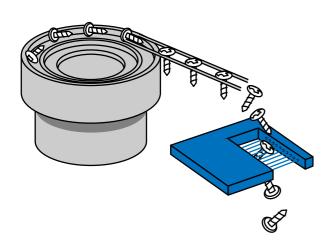
Technical Information			
Supply	voltage	18 to 30 VDC	
		ripple < 10% within specified limits	
	consumption	120 mA	
Response time	t _{on} or t _{off}	1 ms	
	switching frequency	500 Hz	
Outputs	max. nominal intensity	100 mA	
	residual voltage at 100 mA	< 2 V	
	residual voltage at 10 mA	< 1 V	
Emission	LED	infra-red	
Timer	retriggerable OFF-delay	max. 5 s	
Temperature	operating	0 to 60 °C	
	storage	-20 to 80 °C	
External light immunity	incandescent light	400 lux	
	sunlight	4 000 lux	
Protections	output	permanent short-circuit or over-load protection	
	degree of protection	IP 65	
Minimum size of detection		ø 2 mm	
Object speed	minimum	10 cm/s ø 2 mm	
	maximum	15 m/s ø 2 mm	

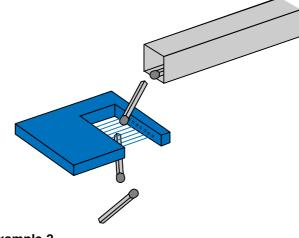
To Place Order	
Product	Frame sensor
Reference	CAD - () - S - 24 VDC
Туре	
spread 30 x 30 mm	(30)
spread 60 x 60 mm	(60)

TYPES OF APPLICATIONS

Example 1

Detection of parts at the output of a bowl feeder.





Example 2

Counting and packaging application.

FRS 120 / FRS 180 / FRS 250

CE

• Spread: 120 to 250 mm

• Supply: 24 VDC

• Outputs: PNP / NPN

• Minimum object size detected : 10 mm



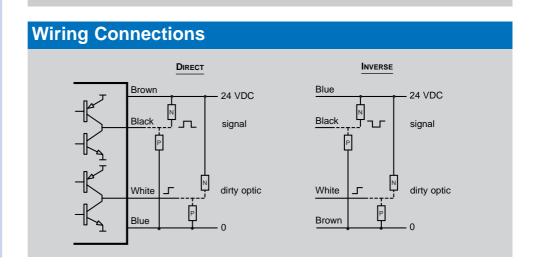
Description:

- Cheap product designed to detect any part in a spread from 120 x 200 mm to 250 x 200 mm
- Minimum object size detected : 10 mm
- Output:PNP / NPN / LO / DO
- Painted aluminium strong housing

Applications:

- · Count of parts.
- Ejection safety control from a plastic press.
- Parts detection through a transluscent pipe.
- Detection of parts by gravity.

Dimensions and Visualisation 85 4 x Ø5 Sensitivity Timer В Visualisation: signal (green) 230 dirty optic indicator (red) 25 60 M12 plug Mechanical protection of the optics • In case of a faulty supply, the red LED flashes. • In case of a short-circuit on an output, the red and green LEDs flash. **TYPE** B (mm): spread A (mm) 335 FRS 250 250 FRS 180 265 180 FRS 120 205 120



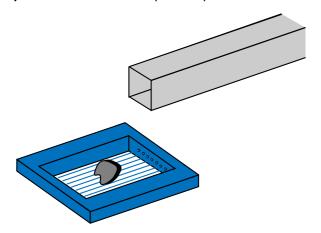
Technical Information	1	
Supply	voltage	18 to 30 VDC
		ripple < 10% within specified limits
	consumption	400 mA
Response time	t _{on} or t _{off}	1 ms
	switching frequency	500 Hz
Outputs	max. nominal intensity	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Emission	LED	infra-red
Timer	retriggerable OFF-delay	max. 5 s
Temperature	operating	0 to 60 °C
	storage	-20 to 80 °C
External light immunity	incandescent light	400 lux
	sunlight	4 000 lux
Protections	output	permanent short-circuit or over-load protection
	degree of protection	IP 65
Minimum size of detection		ø 10 mm
Object speed	minimum	10 cm/s ø 10 mm
	maximum	15 m/s ø 10 mm

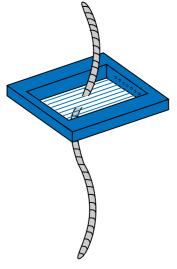
To Place Order	
Product	Frame sensor
Reference	FRS - () - S - 24 VDC
Туре	
spread 120 x 200 mm	(120)
spread 180 x 200 mm	(180)
spread 250 x 200 mm	(250)

TYPES OF APPLICATIONS

Example 1

Ejection control at the output of a press.





Example 2

Break detection of a string or a rope.

CE

L 618

Sensing distance

With focal FL 12: 12 mm With focal FL 25: 25 mm With focal FL 50: 50 mm

• Supply: 10 to 30 VDC

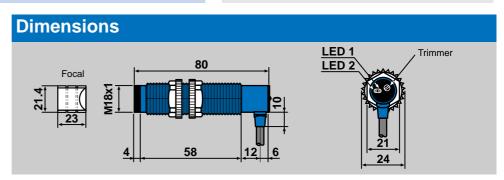
• Output : PNP

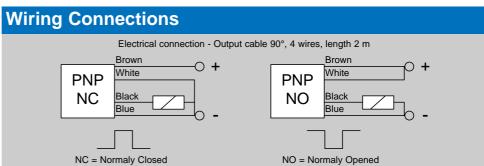


Description:

- · Function indicator
- Direct / inverse output
- PNP output
- Cable at 90°
- · Polyamid housing

- Detection of printed marks in packaging and conditionning.
- · Detection of small parts.
- · Detection of contrasts.





Technical Information				
Supply	voltage	10 / 30 VDC		
		ripple < 10% within specified limits		
	consumption	20 mA		
Response time	t _{on} or t _{off}	0.5 ms		
	switching frequency	1 KHz		
Output	nominal intensity	100 mA		
	residual voltage at 100 mA	1.2 V max.		
Emission	LED	red modulated		
	modulation frequency	8 KHz		
Temperature	operating	-25 to 70 °C		
External light immunity	incandescent light	3 000 lux		
	sunlight	10 000 lux		
Protections	supply	inverse polarity		
	output	permanent short-circuit		
	degree of protection	IP 65		

To Place Order			
Product	Marks and contrasts sensor	Type of focal	FL (12) - sensing dist.12 mm FL (25) - sensing dist.25 mm
Reference	L 618 (C) - FL ()		FL (50) - sensing dist.50 mm

CE

MC 97

• 1 to 6 sensors connections

• Supply: 12 to 30 VDC

• Output: PNP or NPN

• Use in mode "AND" or "OR"

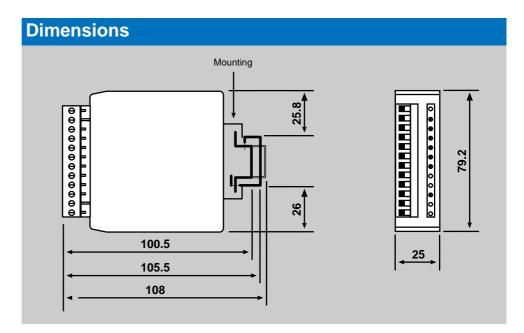
• Dimensions: 79 x 25 x 100 mm

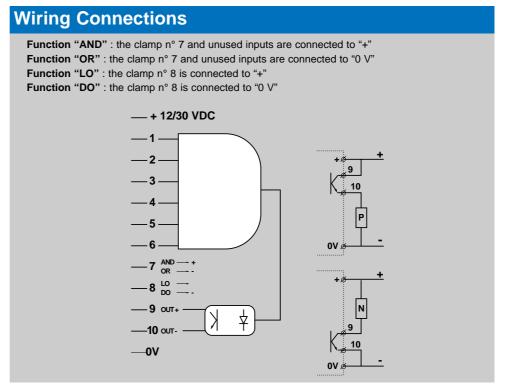


Description:

- · Compatible connections for :
 - any PNP sensor
 - any DINEL sensor
 - any dry contact
- Usable output in P or in N
- Programmable logical "AND" or "OR", "LO/DO" function by wiring
- Visualisation of inputs and the output by LEDs
- Socket terminal
- · DIN rail mounting
- Plastic housing

- · Remote control.
- · Wiring saving money.
- PLC connection simplification.





Technical Informat	ion	
Supply	voltage	12 / 30 VDC
		ripple < 10% within specified limits
	consumption	100 mA
Response time	input to output	< 50 μs
	switching frequency	330 Hz
Entrance	low level	0 to 3 V or not connected
	high level	6 to 30 V
Output	maximum voltage	30 V
Out characteristics	maximum amperage	20 mA
	residual voltage at 20 mA	2,4 V
	residual voltage at 10 mA	2 V
Temperature	operating	0 à 50 °C
	stockage	-20 à 80 °C
Protections	supply	inverse polarity protection
	entrance	negative voltage
	output	permanent short-circuit or over-load protection

To Place Order	
Product	multisensors logical module
Reference	MC 97

WIRING ANG PROGRAMMING FUNCTIONS

LO/DO	And/Or (see Wiring Connect.)	Input clamps				Output		
clamp 8	clamp 7	1	2	3	4	5	6	
1	1	1	1	1	1	1	1	ON
1	1	Any other combination				OFF		
0	1	1	1	1	1	1	1	OFF
0	1		Any other combination				ON	
1	0	0	0	0	0	0	0	OFF
1	0	Any other combination			ON			
0	0	0	0	0	0	0	0	ON
0	0	Any other combination			OFF			

PHOTOELECTRIC SENSORS IN STANDARD PLASTIC HOUSING 12 \div 30 V DC NPN OR PNP OUTPUT

- Miniature 18 mm tubular
- · Operation LED aids installation
- Models w/o pots for simple installation
- · Quick connect or integral cable
- 9-turn pot models

New

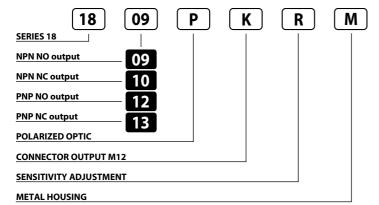






18 Series

Identification code

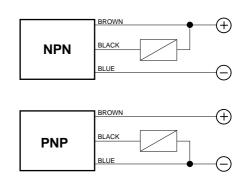


K and R are not available in the same model

AVAILABLE	POLARIZED	STANDARAD		
SWITCHING DISTANCE	1 m ⁽¹⁾	3 m ⁽¹⁾		
HYSTERESIS	10%			
EMISSION	Red (660 ηm)	Infrared (875 ηm)		
NOMINAL VOLTAGE	12 ÷ 30VDC	(-15 /+10%)		
RESIDUAL RIPPLE	≤1	0%		
MAX. OUTPUT CURRENT	200	mA		
ABSORPTION AT 30 VDC	30	mA		
VOLTAGE DROP (Sensor ON)	≤ 1.5V (I =	= 200 mA)		
OPERATION LED	Yellow			
SWITCHING FREQUENCY	200 Hz			
RESPONSE TIME	5 mS			
START UP DELAY	100 mS			
SHORT CIRCUIT PROTECTION	Present (self-resetting)			
ELECTRIC PROTECTIONS	Againts polarity reversal - inductive loads			
TEMPERATURE LIMITS	-10 ÷	+60 °C		
LIGHT IMMUNITY	5000 Lux ⁽²⁾			
PROTECTION DEGREE	IP 67 (IP 65 for models with sensitivity adjustmen			
CABLE LENGTH	2 m			
CABLE SECTION	3 x 0.2	5 mm ²		
HOUSING MATERIAL	Housing: nylon loaded with fiberglass - Lenses: methacrylate			
WEIGHT - cable output - (connector output)	- 110 g - (55 g)			

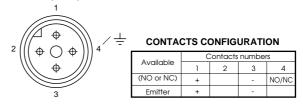
⁽¹⁾ Determined with CT04S reflector.

Wiring diagrams



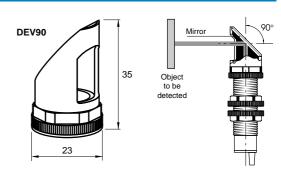
Connection with connector M12 (K)

View of quadripole male connector.



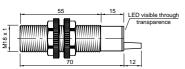
Note: the K plug is compatible with the following connectors: VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Accessories

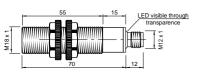


Dimensions (mm)

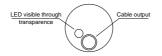
Configuration with cable



Configuration with connector K

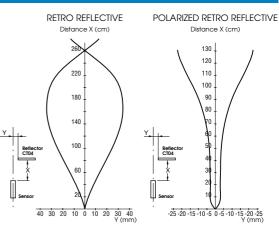


Configuration with cable - Back view



Configuration with sensitivity adjustment





 $^{^{(2)}}$ Determined with halogen tungsten lamp 3000 $^{\circ}\text{K}.$ Note: for a proper use see norms at pages 6, 7 and 8.



PHOTOELECTRIC SENSORS IN LONG HOUSING 24 ÷ 230 V AC TRIAC NO AND NC OUTPUT

- · Short AC housing, only 80 mm
- Leakage < 1.5 mA @ 220 V DC
- Models w/o pots for simple installation
- · Models with 9-turn pot

18 Series

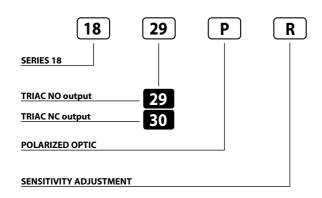








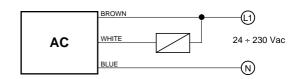
Identification code



POLARIZED	STANDARD			
1 m ⁽¹⁾	3 m ⁽¹⁾			
10	0%			
Red (660 ηm)	Infrared (875 ηm)			
24 ÷ 230VAC	C (-15 /+10%)			
50 ÷	60 Hz			
150	mA			
≤ 1.5mA (a	at 220VAC)			
1	W			
< 2	.5 V			
Yel	Yellow			
10 Hz				
100 mS				
300 mS				
Againts inductive loads				
-10 ÷ -	+60 °C			
5000	Lux (2)			
IP 67 (IP 65 for models wi	IP 67 (IP 65 for models with sensitivity adjustment)			
2 m				
3 x 0.3	3 x 0.35 mm ²			
Housing: nylon loaded with fiberglass - Lenses: methacrylate				
120 g				
	1 m (1) Red (660 ηm) 24 ÷ 230VAC 50 ÷ 150 ≤ 1.5mA (a 1 < 2 Yel 10 300 Againts ind -10 ÷ 5000 IP 67 (IP 65 for models with Housing: nylon loaded with			

⁽¹⁾ Determined with CT04S reflector.

Wiring diagrams



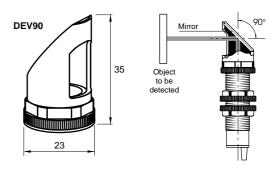
WARNING: Short circuit in the output is not possible. Wrong supply cables connections can irreparably damage the detector. Therefore sensors whose output status is short-circuited will not be substituted under warranty.

CONNECTIONS IN PARALLEL

In parallel connections with multiple outputs, the maximum leakage current (<1,5 mA at 220 VAC) referring to the load and the supply should be taken into account when calculating the max. quantity of connectable sensors.

It is important in this connection that the sensors are connected at the same phase.

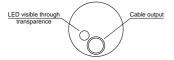
Accessories



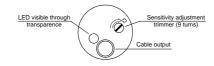
Dimensions (mm)

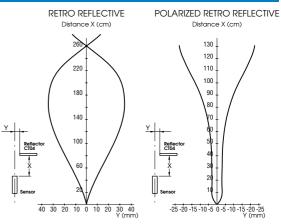
Configuration with cable 65 15 LED visible through transparence

Configuration with cable - Back view



Configuration with sensitivity adjustment





⁽²⁾ Determined with halogen tungsten lamp 3000 °K.

Note: for a proper use see norms at pages 6, 7 and 8.



PHOTOELECTRIC SENSORS IN STANDARD HOUSING 12 ÷ 30 V DC PROGRAMMABLE OUTPUT

- Programmable outputs, NPN or PNP, N.C. or N.O.
- · Simpke one-turn sensitivity
- M12 quick connect or integral cable
- 2 msec ON/OFF

MF Series

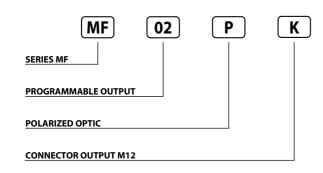








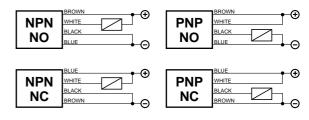
Identification code



AVAILABLE	POLARIZED	STANDARD
SWITCHING DISTANCE	1 m ⁽¹⁾	3 m ⁽¹⁾
HYSTERESIS	10%	
EMISSION	Red (660 ηm)	Infrared (875 ηm)
NOMINAL VOLTAGE	12 ÷ 30VDC	(-15 /+10%)
RESIDUAL RIPPLE	≤1	0%
OUTPUT	NPN or PNP (m	ay be selected)
CONTACT	NO or NC (ma	y be selected)
MAX. OUTPUT CURRENT	200	mA
ABSORPTION AT 30 VDC	30 mA	40 mA
VOLTAGE DROP (Sensor ON)	\leq 2 V (I = 100 mA)	
STATUS LED	Yellow	
SENSITIVITY ADJUSTEMENT	Trimmer 1 turn	
SWITCHING FREQUENCY	500 Hz	
RESPONSE TIME	21	mS
START UP DELAY	100	mS
SHORT CIRCUIT PROTECTION	Present (se	lf-resetting)
ELECTRIC PROTECTIONS	Againts polarity rever	sal - inductive loads
TEMPERATURE LIMITS	-10 ÷ ·	+60 °C
LIGHT IMMUNITY	> 10.00	0 Lux (2)
PROTECTION DEGREE	IP 65	
CABLE LENGTH	2 m	
CABLE SECTION	4 x 0.25 mm ²	
HOUSING MATERIAL	Housing: ABS - Lenses: methacrylate	
WEIGHT - cable output - (connector output)	EIGHT - cable output - (connector output) - 130 g - (70 g)	

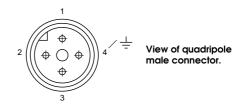
⁽¹⁾ Determined with CT04S reflector.

Wiring diagrams



Note: For series or parallel connections see notes at page 6.

Connection with connector M12 (K)

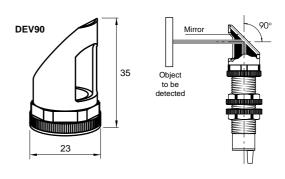


CONTACTS CONFIGURATION

Output	Contacts numbers				
Oulpui	1	2	3	4	
NPN NO	+	NO	_	_	
NPN NC	_	NC	+	_	
PNP NO	+	+	_	NO	
PNP NC	_	+	+	NC	

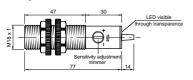
Note: the K plug is compatible with the following connectors: VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Accessories



Dimensions (mm)

Configuration with cable



Configuration with connector K

Sensitivity adjustment

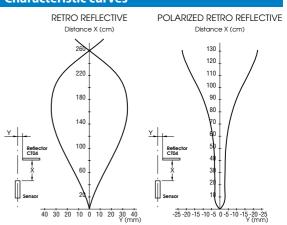
1) SENSITIVITY INCREASE

Screw the trimmer towards right towards position "+"

2) SENSITIVITY DECREASE

Screw the trimmer towards left towards position "-"

Note: the trimmer just needs one turn.



 $^{^{(2)}}$ Determined with halogen tungsten lamp 3000° K. Note: for a proper use see norms at pages 6, 7 and 8.

PHOTOELECTRIC SENSORS IN SQUARE HOUSING 12 \div 30 V DC PROGRAMMABLE OUTPUT

- Compact size, output and stability indicators
- Cost effective
- M12 quick connect or integral cable
- 5 msec ON/OFF

FQ Series

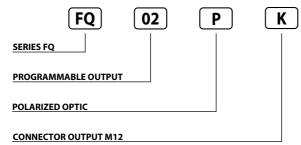








Identification code

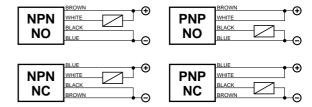


AVAILABLE	POLARIZED	STANDARD	
SWITCHING DISTANCE	4 m ⁽¹⁾	9 m ⁽¹⁾	
HYSTERESIS	10	0%	
EMISSION	Red (660 ηm)	Infrared (875 ηm)	
NOMINAL VOLTAGE	12 ÷ 30VDC	(-15 /+10%)	
RESIDUAL RIPPLE	≤1	0%	
OUTPUT	NPN or PNP (p	rogrammable)	
CONTACT	NO or NC (pro	ogrammable)	
MAX. OUTPUT CURRENT	200	mA	
ABSORPTION AT 30 VDC	30	mA	
VOLTAGE DROP (Sensor ON)	≤ 1.8 V (I = 100 mA)		
YELLOW LED	Output indicator		
GREEN LED	Stability indicator		
SENSITIVITY ADJUSTEMENT	Trimmer 1 turn		
SWITCHING FREQUENCY	200	200 Hz	
RESPONSE TIME	5 r	mS	
START UP DELAY	100	mS	
SHORT CIRCUIT PROTECTION	Present (se	lf-resetting)	
ELECTRIC PROTECTIONS	Againts polarity rever	sal - inductive loads	
TEMPERATURE LIMITS	-20 ÷ -	+60 °C	
LIGHT IMMUNITY	> 10.00	0 Lux (2)	
PROTECTION DEGREE	IP	65	
CABLE LENGTH	2 m		
CABLE SECTION	4 x 0.2	4 x 0.25 mm ²	
HOUSING MATERIAL	Housing: ABS - Lenses: methacrylate		

⁽¹⁾ Determined with CT04S reflector.

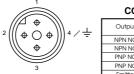
WEIGHT - cable output - (connector output)

Wiring diagrams



Note: For series or parallel connections see notes at page 6.

Connection with connector M12 (K)

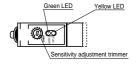


View of quadripole male connector.

Note: the K plug is compatible with the following connectors: VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

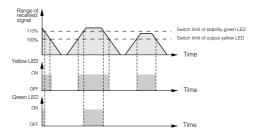
Sensitivity adjustment

- SENSITIVITY INCREASE
 Screw the trimmer towards
 right towards position "+"
- 2) SENSITIVITY DECREASE Screw the trimmer towards left towards position "—"



Note: the trimmer just needs one turn.

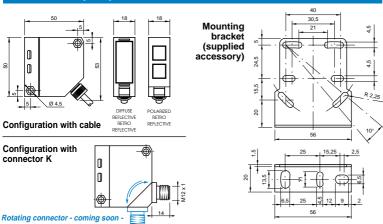
Stability signal led



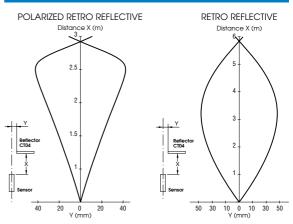
The stability signal LED shows the range of received signal and helps the photoelectric sensor to line up.

A photoelectric sensor works in "stability" condition when the received light signal range is 10% ahead the switching limit of output.

Dimensions (mm)



- 160 g - (120 g)



 $^{^{(2)}}$ Determined with halogen tungsten lamp 3000° K. Note: for a proper use see norms at pages 6, 7 and 8.



PHOTOELECTRIC SENSORS IN SQUARE HOUSING 18 \div 230 V AC - DC RELAY OUTPUT

- Wide input voltage
- 3A relay SPDT
- M12 quick connect or integral cable
- Output and Supply indicators

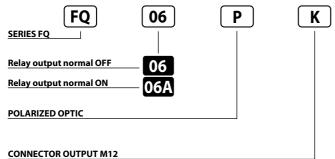






FQ Series

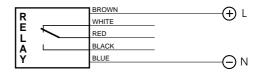
Identification code



AVAILABLE	POLARIZED	STANDARD
SWITCHING DISTANCE	4 m ⁽¹⁾	9 m ⁽¹⁾
HYSTERESIS	10)%
EMISSION	Red (660 ηm)	Infrared (875 ηm)
NOMINAL VOLTAGE	18 ÷ 230V AC -	DC (-15 /+10%)
MAINS FREQUENCY	50 ÷	60 Hz
OUTPUT	Relay (10 x 1	0 ⁶ ops. min.)
MAX. OUTPUT CURRENT	3A 30 V AC - 1A 220	V AC (90W, 360 VA)
ABSORPTION	2.5	VA
YELLOW LED	Output	ndicator
GREEN LED	Supply indicator	
SENSITIVITY ADJUSTEMENT	Trimmer 1 turn	
SWITCHING FREQUENCY	10	Hz
RESPONSE TIME	100	mS
START UP DELAY	≤30	0 mS
TEMPERATURE LIMITS	- 20 ÷	+60° C
LIGHT IMMUNITY	> 10.00	0 Lux (2)
PROTECTION DEGREE	IP	65
CABLE LENGTH	2 m	
CABLE SECTION	5 x 0.3	0 mm ²
HOUSING MATERIAL Housing: ABS - Lenses: methacryl		enses: methacrylate
WEIGHT - cable output - (connector output) - 180 g - (125 g)		(125 g)

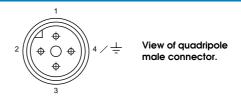
⁽¹⁾ Determined with CT04S reflector.

Wiring diagrams



Note: in case of inductive loads it is necessary to connect one diode in antiparallel at the edges of the load.

Connection with connector M12 (K)



CONTACTS CONFIGURATION

Output	Contacts numbers				
	1	2	3	4	
Relay	L	COM	N	NO	
Emitter	L	_	N	_	

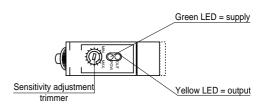
Note: the K plug is compatible with the following connectors: VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Sensitivity adjustment

1) SENSITIVITY INCREASE Screw the trimmer towards right towards position "+"

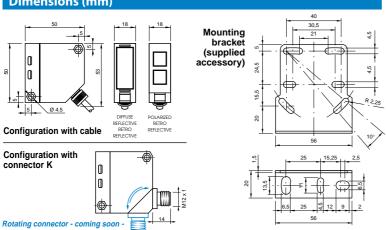
2) SENSITIVITY DECREASE

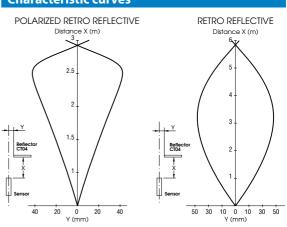
Screw the trimmer towards left towards position "-"



Note: the trimmer just needs one turn.

Dimensions (mm)





⁽²⁾ Determined with halogen tungsten lamp 3000° K. Note: for a proper use see norms at pages 6, 7 and 8.

PHOTOELECTRIC SENSORS IN RECTANGULAR HOUSING 12 \div 30 V DC WITH TIMER NPN OR PNP OUTPUT

- Rectangle compact size
- Multi-function timer
- ON/OFF delay
- · One shot-four functions
- NPN or PNP outputs
- Conduit wiring terminal block

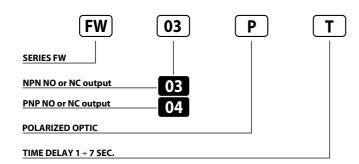
FW Series





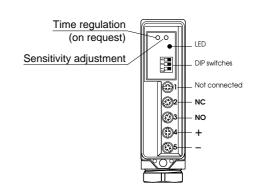


Identification code



AVAILABLE	POLARIZED	STANDARD	
SWITCHING DISTANCE	6 m ⁽¹⁾	10 m ⁽¹⁾	
HYSTERESIS	10%		
EMISSION	Red (660 ηm)	Infrared (875 ηm)	
NOMINAL VOLTAGE	12 ÷ 30VD0	(-15 /+10%)	
RESIDUAL RIPPLE	≤	10%	
OUTPUT	NPN	or PNP	
MAX OUTPUT CURRENT	200) mA	
ABSORPTION	≤ 4	0 mA	
VOLTAGE DECREASE	≤ 2	5 VDC	
YELLOW LED	Present		
SENSITIVITY ADJUSTEMENT	-		
TIME REGULATION	$0.1 \div 7 \text{ s} \pm 2 \text{ s}$ (only models with timer)		
SWITCHING FREQUENCY	100 Hz		
RESPONSE TIME	10	mS	
START UP DELAY	≤ 30	00 ms	
PROTECTION AGAINTS SHORT-CIRCUIT	Present (se	elf-resetting)	
TEMPERATURE LIMITS	-25° ÷	- +55°C	
LIGHT IMMUNITY	5.000) Lux (2)	
PROTECTION DEGREE	IF	67	
CONNECTIONS	Sc	rew	
CABLE GUIDE	PG 13.5		
HOUSING MATERIAL	Polyca	rbonate	
WEIGHT (Approximately)	110 a		

Wiring diagrams



Timing diagrams

MODELS WITHOUT TIMER

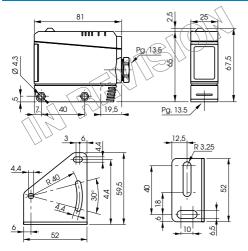
N.	DIP. SWITCHES POSITION	OBJECT	OUTPUT DIAGRAM	
		Light impulse		
1	Output ON (2=NO; 3=NC)	Outoput status		
2	Output OFF (2=NC; 3=NO)	Outoput status		

MODELS WITH TIMER

N.	DIP. SWITCHES POSITION	OBJECT	OUTPUT DIAGRAM
		Light impulse	125;;
1	On operate output ON	Outoput status	<u> </u>
2	On operate output OFF	Outoput status	
3	On release output ON	Outoput status	
4	On release output OFF	Outoput status	
5	One shot trailing edge output ON	Outoput status	
6	One shot trailing edge output OFF	Outoput status	
7	One shot leading edge output ON	Outoput status	
8	One shot leading edge output OFF	Outoput status	

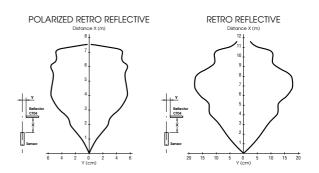
T = Fixed delay

Dimensions (mm)



PHOTOELECTRIC SENSOR

MOUNTING BRACKET (SUPPLIED ACCESSORY)



⁽¹⁾ Determined with CT04 reflector.

 $^{^{(2)}}$ Determined with halogen tungsten lamp 3000° K. Note: for a proper use see norms at pages 6, 7 and 8.

PH. SENSORS IN RECTANGULAR HOUSING 12 \div 240 V DC 24 \div 240 V AC WITH TIMER RELAY OUTPUT

- Wide range World Wide Power Supply
- Rectangular compact size
- Multi-function timer:
- ON/OFF delay -
- One shot-four functions
- 3A relay SPDT
- Terminal block wiring

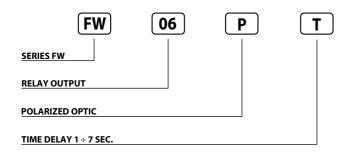
FW Series





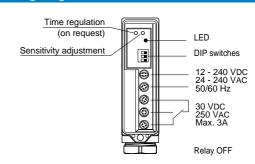


Identification code



AV/AU ADI E	DOLADIZED	CTANDADD	
AVAILABLE	POLARIZED	STANDARD	
SWITCHING DISTANCE	6 m ⁽¹⁾	10 m ⁽¹⁾	
HYSTERESIS	10	0%	
EMISSION	Red (660 ηm)	Infrared (875 ηm)	
NOMINAL VOLTAGE	12 ÷ 240VDC / 2	4 ÷ 240 VAC (-15 /+10%)	
NET FREQUENCY	45 ÷ (60 Hz	
OUTPUT	Relay (40 x 10 ⁶ me	c. op5 x 10 ⁶ elect. op.)	
MAX OUTPUT CURRENT	3A 250VAC	- 3A 30VDC	
ABSORPTION	≤ 2W (2.5 VA)	
YELLOW LED	Present		
GREEN LED	-		
SENSITIVITY ADJUSTEMENT	-		
TIME REGULATION	$0.1 \div 7 \text{ s} \pm 2 \text{ s}$ (only models with timer)		
SWITCHING FREQUENCY	20	Hz	
RESPONSE TIME	50	ms	
START UP DELAY	≤ 30	0 ms	
TEMPERATURE LIMITS	-25° ÷	+55°C	
LIGHT IMMUNITY	5.000	Lux (2)	
PROTECTION DEGREE	IP	67	
CONNECTIONS	Screw		
CABLE GUIDE	PG 13.5		
HOUSING MATERIAL	Polycarbonate		
	110 g		

Wiring diagrams



Timing diagrams

MODELS WITHOUT TIMER

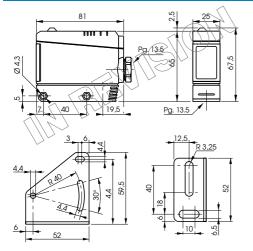
Ī	N.	DIP. SWITCHES POSITION	OBJECT	OUTPUT DIAGRAM	
			Light impulse		
	1	Output ON (2=NO; 3=NC)	Outoput status		
	2	Output OFF (2=NC; 3=NO)	Outoput status		

MODELS WITH TIMER

N.	DIP. SWITCHES POSITION	OBJECT	OUTPUT DIAGRAM
		Light impulse	
1	On operate output ON	Outoput status	<u>+T+</u> <u>+</u> T+
2	On operate output OFF	Outoput status	
3	On release output ON	Outoput status	
4	On release output OFF	Outoput status	
5	One shot trailing edge output ON	Outoput status	
6	One shot trailing edge output OFF	Outoput status	
7	One shot leading edge output ON	Outoput status	
8	One shot leading edge output OFF	Outoput status	

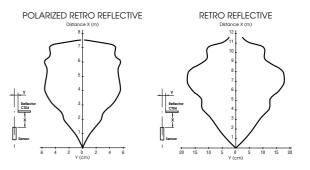
T = Fixed delay

Dimensions (mm)



PHOTOELECTRIC SENSOR

MOUNTING BRACKET (SUPPLIED ACCESSORY)



 $^{^{\}left(1\right) }$ Determined with CT04 reflector.

 $^{^{(2)}}$ Determined with halogen tungsten lamp 3000° K. Note: for a proper use see norms at pages 6, 7 and 8.

B 952 S / R

(E

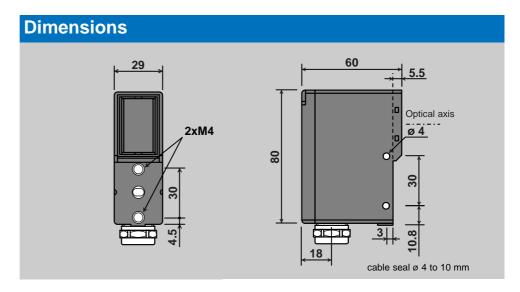
- Sensing distance on reflector ø 84 : 10 m
- Supply :10 to 30 VDC or 20 to 250 V AC/DC
- Output: PNP / NPN or relay
- ON-delay + OFF-delay timer

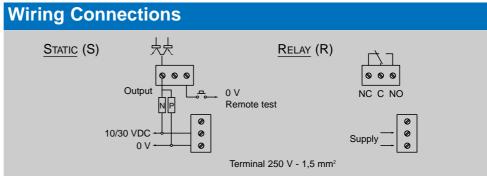


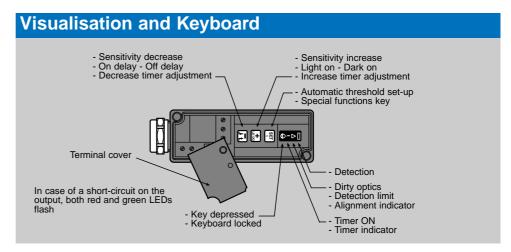
Description:

- Simple and quick set-up for self-teach (standard and sensitive mode)
- Double adjustable timer
- · Alignment indicator
- · Dirty optics indicator
- Keyboard lock
- Remote test input (S type) simulate the beam cut-off
- · Direct or inverse output
- · Output : static or relay
- Connection on screw terminal
- Polycarbonate strong housing

- · Parcels jam control.
- Detection of shiny parts on material handling.
- · Admittance control.







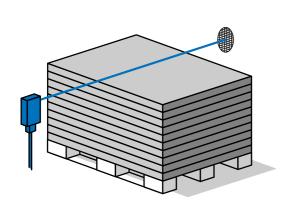
Technical Information	n	S	R	
Supply	voltage	10 / 30 VDC ripple < 10% within specified limits	20 / 250 V AC/DC	
	consumption	50 mA	2 VA	
Response time	t _{on} or t _{off}	8 ms	20 ms	
	switching frequency	60 Hz	25 Hz	
Output	max. nominal intensity	100 mA	change over type relay	
	residual voltage at 100 mA	< 2 V	U nominal : 250 V AC	
	residual voltage at 10 mA	< 1 V	permanent max. I: 3 A	
Emission	LED	re	ed	
	modulation frequency	400 Hz	400 Hz	
Timer	type	retriggerable - ON	-delay / OFF-delay	
	range - increment duration	o to 11s in 23 steps of	50ms, then 0.5s steps	
Temperature	operating	0 to 6	60° C	
	storage	-20 to 80° C		
External light immunity	incandescent light	10 000 lux 5° from optical axis		
	sunlight	20 000 lux 5° fr	om optical axis	
Protections	supply	inverse polarity protection	_	
	output	short-circuit or over-load	_	
	degree of protection	IP 65 ar	nd IP 67	
Remote input	on	voltage < 1,4 V —		
	off	voltage > 3 V	_	

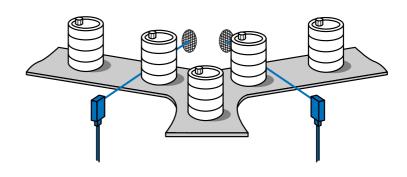
To Place Order	
Product	Retro-reflex polarised sensor
Reference	B - 952 ()
Туре	(S) : static - 10 / 30 VDC
	(R) : relay - 20 / 250 V AC/DC

TYPES OF APPLICATIONS

Example 1

Control of palettes height.





Example 2

Flow control, sorting or other incident control on a conveyor.

B 955 R

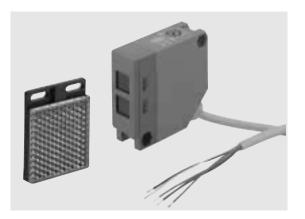
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• Sensing distance on reflector 50x50 : 3,5 m

• Dead zone: 4 cm

• Supply: 18 / 250 V AC/DC

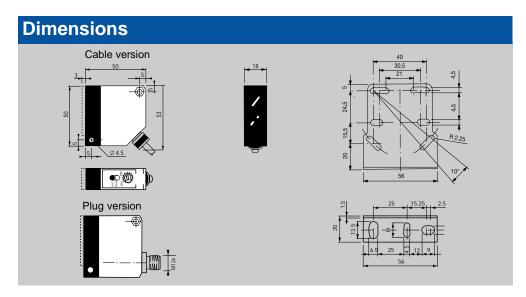
• Cable 2 m or plug M12

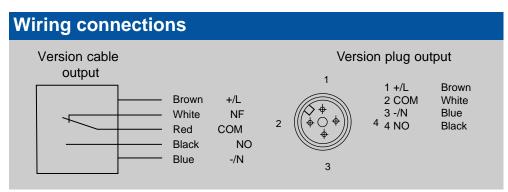


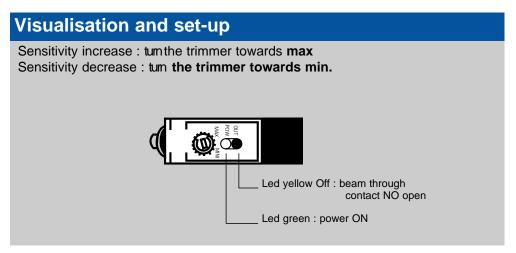
Description:

- Simple set-up by one round potentiometer
- Output relay
- Power ON indicator
- · Signal indicator
- Cable 2m or M12 connector (NO contact only)
- · ABS housing

- Shiny objects detection on a conveyor
- · Handling conveyor
- Admittance control





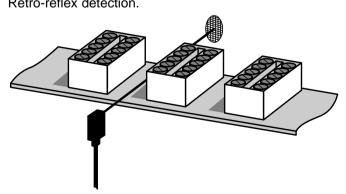


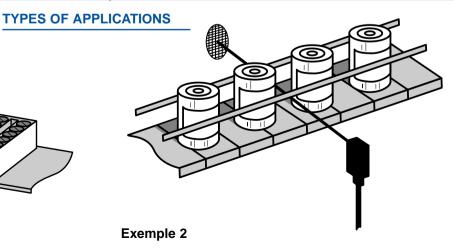
Technical information		Cable 2 m	Plug M12
Supply	voltage	18 /250 V AC/DC	
	consumption	2,5 VA	
Response time	Ton, Toff	25 r	ms
	Switching frequency	20 H	Hz
Relay output	Туре	NO /NC	NO
	Coilstatus	At ease whe	en beam is cut
		(inversely on	request)
	Voltage	125 VDC 2	250 VAC
	Max.nominal intensity	3 .	A
	Cut offpower	90 W 360 VA	
Detection	On reflector ø 84	3 m	
distance	ø 42	1,8 m	
	50x50	3,5	m
	With scotchlite polarised	1,6	m
	50x50		
Dead zone		4 c	m
Emission	Led	rouge	
	Modulation frequency	55	Hz
Temperature	operating	- 20° н	- 60°
	storage	- 20° +	+ 80°
External light	Incandescent light	10 000) Lux
immunity			
Protection	Degree ofprotection		IP 65

To place order		
Product	Reference	
Retro-reflex polarised, cable output 2 m	B 955 R	
Retro-reflex polarised, plug output M12	B CO 955 R	
Delivered with 1 reflector 50	x50, ref. 1111 and bracket	
Cable M12 length 2 m	CM 122	
Cable M12 length 5 m	CM 125	

Exemple 1

Retro-reflex detection.





Détection of metallic shiny parts

CE

B 989 S

· Sensing distance:

On reflector 50 x 50 : 1 m On reflector \emptyset 84 : 1,5 m

Supply: 10 to 30 VDCOutput: PNP or NPN

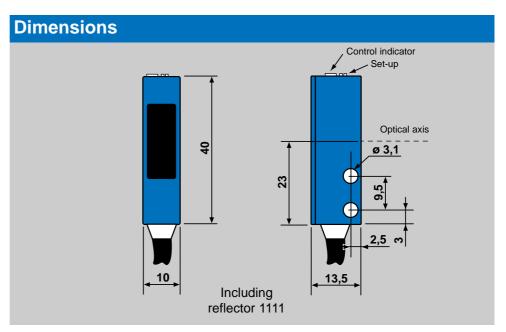
· Trimmer sensibility set-up

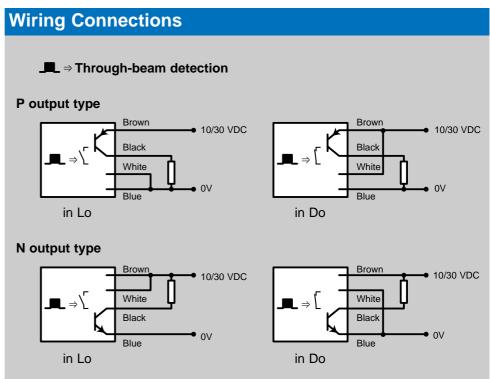


Description:

- Miniaturised
- · Integrated amplifier
- Detection indication by LED
- · Lateral beam
- Reflector inclus 50 x 50 (réf.1111)
- Direct / inverse output
- · Polarised visible light
- 2 m cable or M8 plug
- · Strong housing
- · Cheap product

- Control of position or presence of parts on machine, small conveyor, robot.
- Detection of small parts, even shiny.
- Small space positionning sensor.



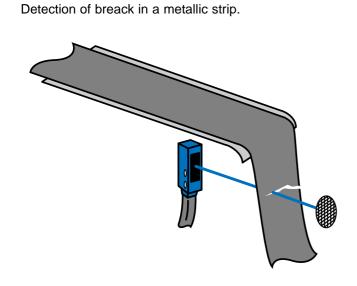


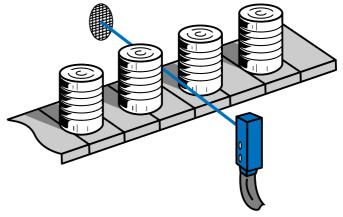
Tecnical Information		
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	< 25 mA
Response time	t _{on} or t _{off}	1 mS
	switching frequency	500 Hz
Output	max. nominal frequency	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Emission	LED	red pulsed
	modulation frequency	6 KHz
Temperature	operating	0 to 50° C
	storage	- 20° to 80° C
External light immunity	incandescent light	5 000 lux
	sunlight	10 000 lux
Protections	supply	inverse polarity protection
	output	permanent short-circuit or over-load protection
	degree	IP 65 and IP 67
Directe / inverse function		by cable, see "Wiring Connections"

To Place Order	
Product	Miniature retro-reflex polarised sensor
Reference	B 989 SN - 2 m cable output (NPN)
	B 989 SP - 2m cable ouput (PNP)
	B (C0) 989 SN - plug output (NPN)
	B (C0) 989 SP - plug output (PNP)

TYPE OF APPLICATIONS

Example 1





Example 2

Detection of metallic cans on a conveyor.

BA 598

CE

• Sensing distance on reflector ø 84 : 3 m

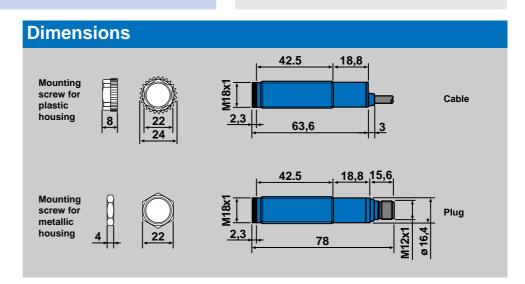
• Supply: 10 to 30 V

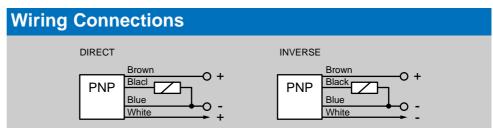
• Output : PNP

Description:

- · Function indicator
- · Direct or inverse output
- Output : PNP
- M12 plug or cable
- Polyamid or short cylindric metallic M18 housing

- Detection of opaque parts on a conveyor.
- Control of position or presence of parts on assembly or conditionning machine.





Technical Information		
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	30 mA
Response time	switching frequency	250 Hz
Output	nominal intensity	100 mA
	residual voltage at 100 mA	1,2 V max.
Emission	LED	red
Temperature	operating	-25 to 70 °C
	storage	-20 to 70 °C
External light immunity	incandescent light	3 000 lux
	sunlight	10 000 lux
Protections	output	short-circuit, inverse polarity protection
	degree of protection	IP 67

To Place Order			
Product (Please, enquire for other types)	Retro-reflex polarised axial sensor	Туре	BAP 598 (S) - cable - plastic BAP C0 598 (S) - M12 plug - plastic
Reference	BA 598		BAM C0 598 (S) - M12 plug - metal

BL 598

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• Sensing distance on reflector ø 84 : 3 m

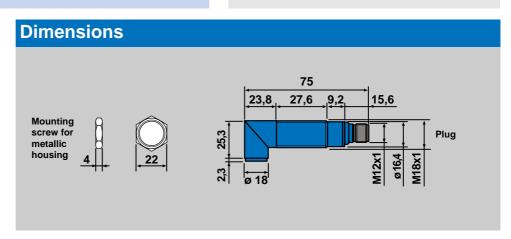
• Supply: 10 to 30 V

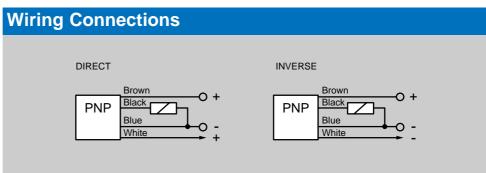
• Output : PNP

Description:

- · Right angle optic
- Function indicator
- Direct or inverse output
- Output : PNP
- M12 plug or cable
- Polyamid or short cylindric metallic M18 housing

- Detection of reflecting or shiny parts.
- Detection of parts on a conveyor.





Technical Information		
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	30 mA
Response time	switching frequency	250 Hz
Output	nominal intensity	100 mA
	residual voltage at 100 mA	1,2 V max.
Emission	LED	red
Temperature	operating	-25 to 70 °C
	storage	-20 to 70 °C
External light immunity	incandescent light	3 000 lux
	sunlight	10 000 lux
Protections	output	short-circuit, inverse polarity protection
	degree of protection	IP 67

To Place Order			
Product (Please, enquire for other types)	Retro-reflex polarised lateral sensor	Туре	BLM C0 598 (S) - PNP output - M12 plug - metal
Reference	BLM 598		

CE

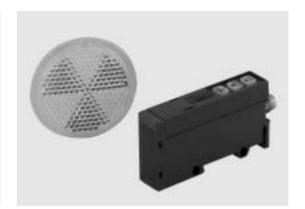
BA 946 S

Sensing distance

On reflector ø 46 : 1m On reflector ø 84 : 2m

Supply: 10 / 30 VDCOutput: PNP / NPN

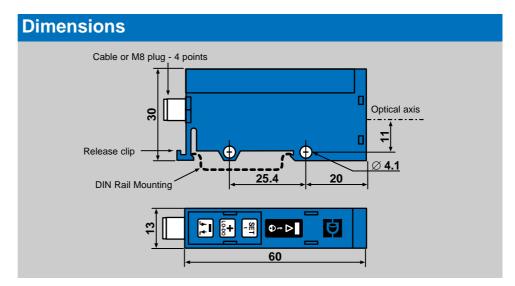
· On-delay or off-delay timer standard

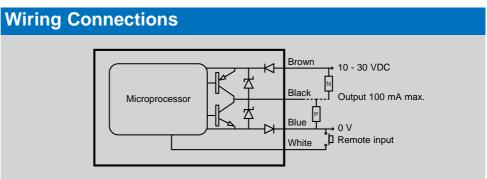


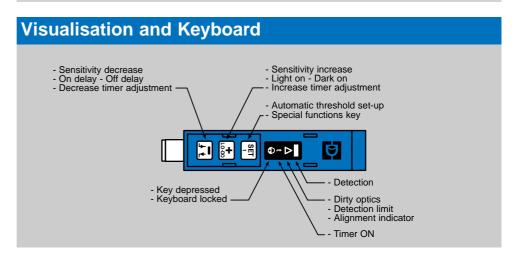
Description:

- Insensitivity to reflections interferences
- Simple and quick set-up for self-teach (standard and sensitive mode)
- Adjustable timer
- · Alignment indicator
- · Dirty optics indicator
- Keyboard lock
- Remote input for selfteach (sensitive mode)
- Direct or inverse output
- Output: PNP / NPN
- · Cable or M8 plug
- Polycarbonate strong housing

- Position or presence control of parts on conditioning machine.
- Through-beam on a conveyor.
- Detection of shiny parts.







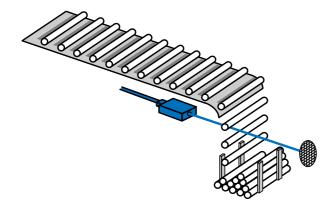
$\begin{tabular}{c c} Supply & voltage & 10 / 30 VDC \\ \hline ripple < 10\% within specified limits \\ \hline consumption & < 40 mA \\ \hline Response time & t_{on} \ or \ t_{off} & < 500 \ \mu s \\ \hline \end{tabular}$	
ripple < 10% within specified limits consumption < 40 mA	
Response time t_{on} or t_{off} < 500 μ s	
switching frequency < 1 KHz	
Output max. nominal intensity 100 mA	
residual voltage at 100 mA < 2 V	
residual voltage at 10 mA < 1 V	
Emission LED red	
modulation frequency 8 KHz	
Timer range 0 to 5 s with 11 increments	
increment duration first increment : 40 ms, following increment	ents : 500 ms
Temperature operating 0 to 60 °C	
storage -20 to 80 °C	
External light immunity incandescent light 10 000 lux	
sunlight 20 000 lux	
Protections supply inverse polarity protection	
output permanent short-circuit or over-load pro	tection
degree of protection IP 65	
Remote input on voltage < 1,4 V	
off voltage > 3 V	

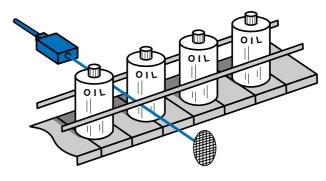
To Place Order	
Product	Retro-reflex polarised axial sensor
Reference	BA - () - 946 S () output with cable 2m (C0) output M8 plug without cable
Cable for M8 plug if necessary, please order together with the amplifier	CM 82 - cordon 2m CM 85 - cordon 5m

TYPES OF APPLICATIONS

Example 1

Pieces count at a conveyor output.





Example 2

Detection of shiny metallic cans.

BA 966 S

Sensing distance

On reflector Ø 46 : 10 cm to 1m On reflector Ø 84 : 10 cm to 2m

Supply: 10 / 30 VDCOutput: PNP / NPN

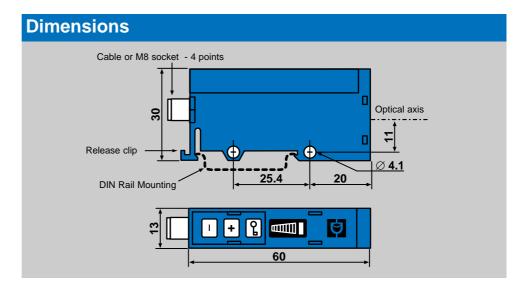
• Friendly adjustment by key + / -

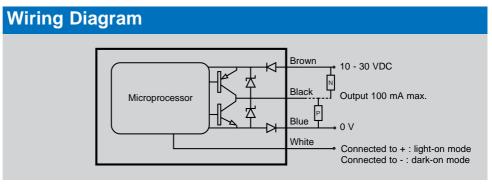
Bargraph

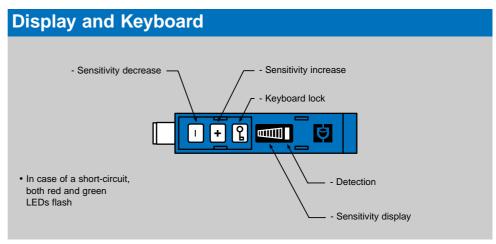
Description:

- · Immunity to reflection
- · Simple adjustment
- Sensitivity bargraph
- Maximum and minimum sensitivity indication
- Keyboard lock
- Direct or inverse output
- Output: PNP / NPN
- Cable or M8 socket
- Polycarbonate strong housing

- Position or presence control of parts on conditioning machine.
- Through-beam on a conveyor.
- · Detection of shiny parts.





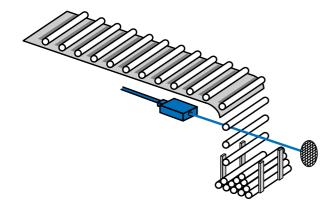


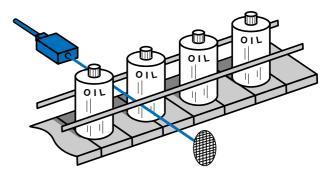
Technical Information				
Supply	voltage	10 / 30 VDC ripple < 10% within specified limits		
	consumption	< 40 mA		
Response time	t _{on} or t _{off}	< 500 μs		
	switching frequency	< 1 KHz		
Output	max. nominal intensity	100 mA		
	residual voltage at 100 mA	< 2 V		
	residual voltage at 10 mA	< 1 V		
Emission	LED	red		
	modulation frequency	8 KHz		
Temperature	operating	0 to 60 °C		
	storage	-20 to 80 °C		
External light immunity	incandescent light	10 000 lux		
	sunlight	20 000 lux		
Protections	supply	inverse polarity protection		
	output	permanent short-circuit or over-load protection		
	degree of protection	IP 65		
Light-on / dark-on function		see wiring diagram		

To Place Order			
Product	Retro-reflex polarised axial sensor		
Reference	BA - () - 966 S		
	() output with cable 2m		
	(C0) output M8 socket without cable		
Cable with M8 plug if required, please order together with the sensor	CM 82 - cable 2m CM 82 C - cable 2m with right angle connector CM 85 - cable 5m		

Example 1

Pieces count at a conveyor output.





Example 2

Detection of shiny metallic cans.

BL 946 S

Sensing distance

On reflector ø 46 : 1m On reflector ø 84 : 2m

Supply: 10 to 30 VDCOutput: PNP / NPN

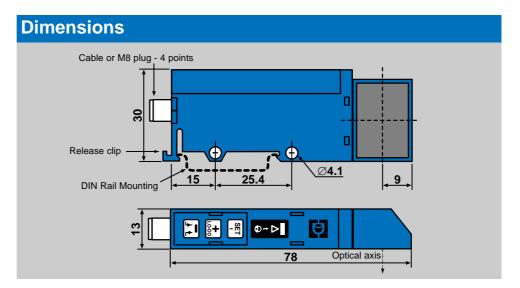
· On-delay or off-delay timer standard

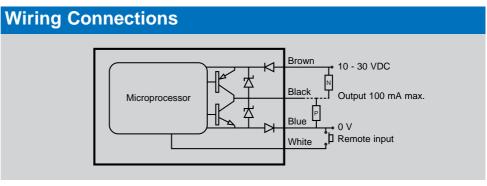


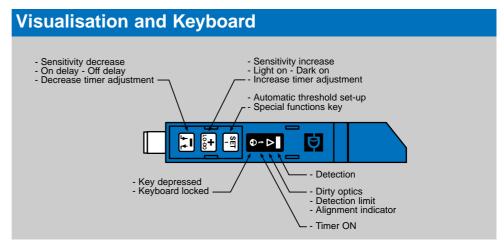
Description:

- Thickness reduced to 13 mm
- Reflections immunity
- Simple and quick set-up for self-teach (standard and sensitive mode)
- · Adjustable timer
- · Alignment indicator
- · Dirty optics indicator
- Keyboard lock
- Remote input for selfteach (sensitive mode)
- Direct or inverse output
- Output: PNP / NPN
- · Cable or M8 plug
- Polycarbonate strong housing

- Position or presence control of parts on conditioning machine.
- Through-beam on a conveyor.
- · Detection of shiny parts.







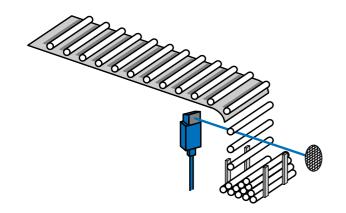
В	a	1	6	Ç
	.71	4		•

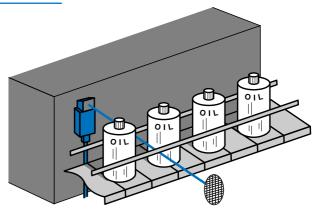
Technical Information			
Supply	voltage	10 / 30 VDC	
		ripple < 10% within specified limits	
	consumption	< 40 mA	
Response time	t _{on} or t _{off}	< 500 μs	
	switching frequency	< 1 KHz	
Output	max. nominal intensity	100 mA	
	residual voltage at 100 mA	< 2 V	
	residual voltage at 10 mA	< 1 V	
Emission	LED	red	
	modulation frequency	8 KHz	
Timer	range	0 to 5 s with 11 increments	
	increment duration	first increment : 40 ms, following increments : 500 ms	
Temperature	operating	0 to 60 °C	
	storage	-20 to 80 °C	
External light immunity	incandescent light	10 000 lux	
	sunlight	20 000 lux	
Protections	supply	inverse polarity protection	
	output	permanent short-circuit or over-load protection	
	degree of protection	IP 65	
Remote input	on	voltage < 1,4 V	
	off	voltage > 3 V	

To Place Order	
Product	Retro-reflex polarised lateral sensor
Reference	BL - () - 946 S () output with cable 2m (C0) output M8 plug without cable
Cable for M8 plug if necessary, please order together with the amplifier	CM 82 - cordon 2m CM 85 - cordon 5m

Example 1

Pieces count at a conveyor output.





Example 2

Detection of shiny metallic cans.

BL 966 S

• Sensing distance

On reflector Ø 46 : 2 cm to 1m On reflector Ø 84 : 2 cm to 2m

Supply: 10 / 30 VDCOutput: PNP / NPN

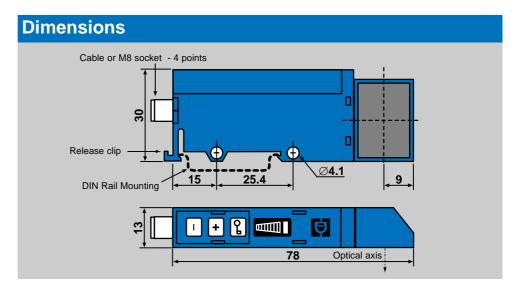
• Friendly adjustment by key + / -

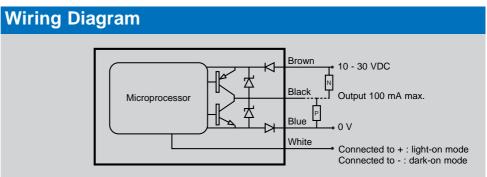
Bargraph

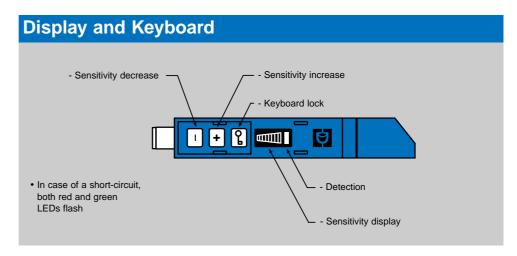
Description:

- Thickness reduced to 13 mm
- · Immunity to reflections
- Simple adjustment
- · Sensitivity bargraph
- Maximum and minimum sensitivity indication
- Keyboard lock
- Direct or inverse output
- Output: PNP / NPN
- Cable or M8 socket
- Polycarbonate strong housing

- Position or presence control of parts on conditioning machine.
- Through-beam on a conveyor.
- Detection of shiny parts.





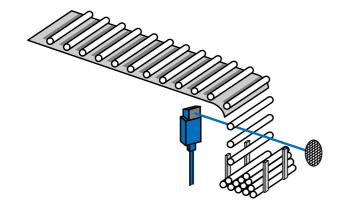


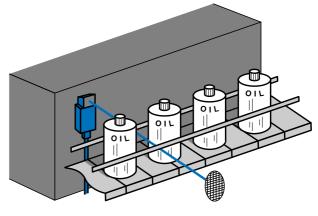
Technical Information				
Supply	voltage	10 / 30 VDC		
		ripple < 10% within specified limits		
	consumption	< 40 mA		
Response time	t _{on} or t _{off}	< 500 μs		
	switching frequency	< 1 KHz		
Output	max. nominal intensity	100 mA		
	residual voltage at 100 mA	< 2 V		
	residual voltage at 10 mA	< 1 V		
Emission	LED	red		
	modulation frequency	8 KHz		
Temperature	operating	0 to 60 °C		
	storage	-20 to 80 °C		
External light immunity	incandescent light	10 000 lux		
	sunlight	20 000 lux		
Protections	supply	inverse polarity protection		
	output	permanent short-circuit or over-load protection		
	degree of protection	IP 65		
Light-on / dark-on function		see wiring diagram		

To Place Order			
Product	Retro-reflex polarised lateral sensor		
Reference	BL - () - 966 S		
	() output with cable 2m		
	(C0) output M8 socket without cable		
Cable with M8 plug if required, please order together with the sensor	CM 82 - cable 2m CM 82 C - cable 2m with right angle connector CM 85 - cable 5m		

Example 1

Pieces count at a conveyor output.





Example 2

Detection of shiny metallic cans.

PHOTOELECTRIC SENSORS IN STANDARD HOUSING 12 ÷ 30 V DC NPN O PNP OUTPUT

- Miniature 18 mm tubular
- · Operation LED aids installation
- Models w/o pots for simple installation
- · Quick connect or integral cable
- · 9-turn pot models

18 Series

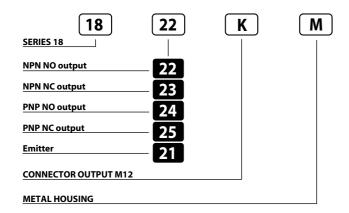








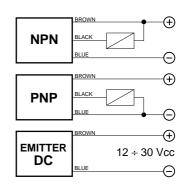
Identification code



AVAILABLE	RECEVEIR	EMITTER	
SWITCHING DISTANCE	25 m		
HYSTERESIS	10)%	
EMISSION	-	Infrared (875 ηm)	
NOMINAL VOLTAGE	12 ÷ 30VDC	(-15 /+10%)	
RESIDUAL RIPPLE	≤1	0%	
MAX. OUTPUT CURRENT	200 mA	-	
ABSORPTION AT 30 VDC	15	mA	
VOLTAGE DROP (Sensor ON)	≤ 1.5V (I = 200 mA)		
OPERATION LED	Yellow		
SWITCHING FREQUENCY	200 Hz		
RESPONSE TIME	5 mS		
START UP DELAY	100 mS		
SHORT CIRCUIT PROTECTION	Present (self-resetting)		
ELECTRIC PROTECTIONS	Againts polarity reversal - inductive loads		
TEMPERATURE LIMITS	-10 ÷ +60 °C		
LIGHT IMMUNITY	10000 Lux ⁽²⁾		
PROTECTION DEGREE	IP 67 (IP 65 for models with sensitivity adjustment)		
CABLE LENGTH	2 m		
CABLE SECTION	3 x 0.25 mm ²	2x 0.25 mm ²	
HOUSING MATERIAL	Housing: nylon loaded with fiberglass - Lenses: methacrylate		
WEIGHT - cable output - (connector output)	- 110 g - (55 g)		

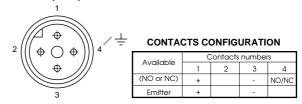
Note: for a proper use see norms at pages 6, 7 and 8.

Wiring diagrams



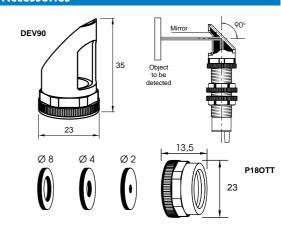
Connection with connector M12 (K)

View of quadripole male connector.



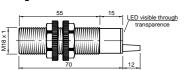
Note: the K plug is compatible with the following connectors: VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Accessories

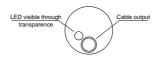


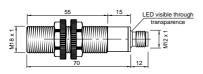
Dimensions (mm)

Configuration with cable



Configuration with cable - Back view





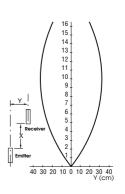
Configuration with connector K

Configuration with sensitivity adjustment



Characteristic curves

THRU BEAM Distance X (m)



PHOTOELECTRIC SENSORS IN LONG HOUSING 24 \div 230 V ACTRIAC NO AND NC OUTPUT

- · Short AC housing, only 80 mm
- Leakage < 1.5 mA @ 220 V DC
- Models w/o pots for simple installation
- · Models with 9-turn pot

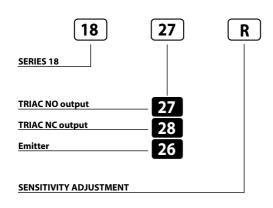
18 Series







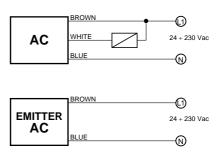
Identification code



AVAILABLE	RECEIVER EMITTER			
SWITCHING DISTANCE	5	5 m		
HYSTERESIS	10	9%		
EMISSION	-	Infrared (875 ηm)		
NOMINAL VOLTAGE	24 ÷ 230VAC	(-15 /+10%)		
MAINS FREQUENCY	50 ÷	60 Hz		
MAX. OUTPUT CURRENT	150 mA	-		
LEAKAGE CURRENT	≤ 1.5mA (at 220VAC)	-		
ABSORPTION	1 W	-		
VOLTAGE DROP (Sensor ON)	< 2	< 2.5 V		
OPERATION LED	Yellow			
SWITCHING FREQUENCY	10 Hz			
RESPONSE TIME	100 mS			
START UP DELAY	300 mS			
ELECTRIC PROTECTIONS	Againts ind	uctive loads		
TEMPERATURE LIMITS	-10 ÷ -	+60 °C		
LIGHT IMMUNITY	2000) Lux		
PROTECTION DEGREE	IP 67 (IP 65 for models with	sensitivity adjustment)		
CABLE LENGTH	2 m			
CABLE SECTION	3 x 0.35 mm ²	2 x 0.25 mm ²		
HOUSING MATERIAL	Housing: nylon loaded with fi	berglass - Lenses: methacrylate		
WEIGHT - cable output -	120 g			

Note: for a proper use see norms at pages 6, 7 and 8.

Wiring diagrams



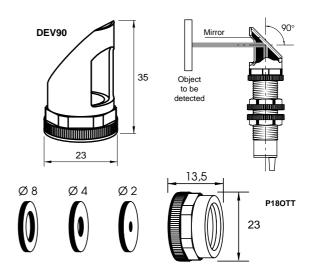
WARNING: Short circuit in the output is not possible. Wrong supply cables connections can irreparably damage the detector. Therefore sensors whose output status is short-circuited will not be substituted under warranty.

CONNECTIONS IN PARALLEL

In parallel connections with multiple outputs, the maximum leakage current (<1,5 mA at 220 VAC) referring to the load and the supply should be taken into account when calculating the max. quantity of connectable sensors.

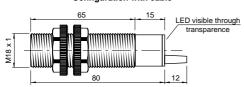
It is important in this connection that the sensors are connected at the same phase.

Accessories



Dimensions (mm)

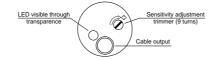
Configuration with cable



Configuration with cable - Back view

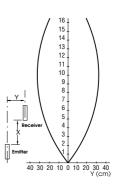


Configuration with sensitivity adjustment



Characteristic curves

THRU BEAM Distance X (m)



PHOTOELECTRIC SENSORS IN SQUARE HOUSING 12 ÷ 30 V DC PROGRAMMABLE OUTPUT

- Compact size, output and stability indicators
- Cost effective
- M12 quick connect or integral cable
- 5 msec ON/OFF

New

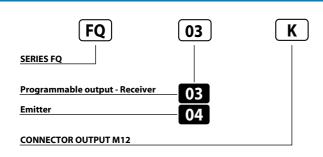






FQ Series

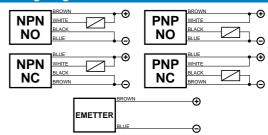
Identification code



AVAILABLE	RECEIVER	EMITTER	
SWITCHING DISTANCE	20 m		
HYSTERESIS	10	1%	
EMISSION	-	Infrared (875 ηm)	
NOMINAL VOLTAGE	12 ÷ 30VDC	(-15 /+10%)	
RESIDUAL RIPPLE	≤1	0%	
OUTPUT	NPN or PNP (programmable)	-	
CONTACT	NO or NC (programmable)	-	
MAX. OUTPUT CURRENT	200 mA	-	
ABSORPTION AT 30 VDC	25	mA	
VOLTAGE DROP (Sensor ON)	\leq 1.8 V (I = 100 mA)	-	
YELLOW LED	Output indicator	-	
GREEN LED	Stability indicator	Supply indicator	
SENSITIVITY ADJUSTEMENT	Trimmer 1 turn	•	
SWITCHING FREQUENCY	200 Hz		
RESPONSE TIME	5 mS		
START UP DELAY	100 mS		
SHORT CIRCUIT PROTECTION	Present (sel	f-resetting)	
ELECTRIC PROTECTIONS	Againts polarity reve	rsal - inductive loads	
TEMPERATURE LIMITS	-20 ÷ -	+60 °C	
LIGHT IMMUNITY	> 10.000 Lux (1)		
PROTECTION DEGREE	IP 65		
CABLE LENGTH	2 m		
CABLE SECTION	4 x 0.25 mm ² 2 x 0.25 mm ²		
HOUSING MATERIAL	Housing: ABS - Lenses: methacrylate		
WEIGHT - cable output - (connector output)	- 160 g - (120 g)		

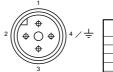
⁽¹⁾ Determined with halogen tungsten lamp 3000° K. Note: for a proper use see norms at pages 6, 7 and 8.

Wiring diagrams



Note: For series or parallel connections see notes at page 6.

Connection with connector M12 (K)



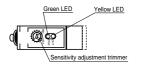
View of quadripole male connector.

| CONTACTS CONFIGURATION | Output | Contacts numbers | 1 2 3 4 | 1 NPN NO + NO - - NPN NC + NC + NO PNPN NC - NC + NO PNPN NC - + N NO PNP NC - + N NC PNP NC - + N NC

Note: the K plug is compatible with the following connectors: VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

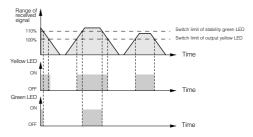
Sensitivity adjustment

- SENSITIVITY INCREASE
 Screw the trimmer towards
 right towards position "+"
- SENSITIVITY DECREASE
 Screw the trimmer towards
 left towards position "-"



Note: the trimmer just needs one turn.

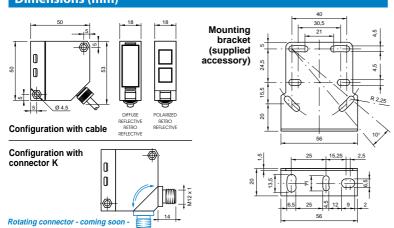
Stability signal led



The stability signal LED shows the range of received signal and helps the photoelectric sensor to line up.

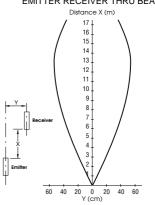
A photoelectric sensor works in "stability" condition when the received light signal range is 10% ahead the switching limit of output.

Dimensions (mm)



Characteristic curves

EMITTER RECEIVER THRU BEAM





PHOTOELECTRIC SENSORS IN SQUARE HOUSING 18 ÷ 230 V AC - DC RELAY OUTPUT

- Wide input voltage
- 3A relay SPDT
- M12 quick connect or integral cable
- Output and Stability indicators

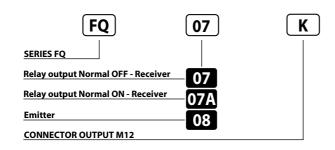
FQ Series







Identification code



AVAILABLE	RECEIVER	EMITTER	
SWITCHING DISTANCE	15 m		
HYSTERESIS	10	%	
EMISSION	-	Infrared (875 ηm)	
NOMINAL VOLTAGE	18 ÷ 230V AC -	DC (-15 /+10%)	
MAINS FREQUENCY	50 ÷ 6	50 Hz	
OUTPUT	Relay (10 x 10 ⁶ ops. min.)	-	
MAX. OUTPUT CURRENT	3A 30 V AC - 1A 220 V AC (90W, 360 VA)	•	
ABSORPTION	2.5	VA	
YELLOW LED	Output indicator -		
GREEN LED	Supply indicator		
SENSITIVITY ADJUSTEMENT	Trimmer 1 turn -		
SWITCHING FREQUENCY	10 Hz		
RESPONSE TIME	100 mS		
START UP DELAY	≤ 300	O mS	
TEMPERATURE LIMITS	- 20 ÷ -	+60° C	
LIGHT IMMUNITY	> 10.00	0 Lux ⁽¹⁾	
PROTECTION DEGREE	IP 65		
CABLE LENGTH	2 m		
CABLE SECTION	5 x 0.30 mm ² 2 x 0.25 mm ²		
HOUSING MATERIAL	Housing: ABS	- Lenses: methacrylate	
WEIGHT - cable output - (connector output)	- 180 g - (125 g)		

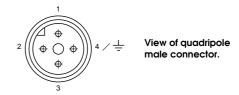
 $^{^{(1)}}$ Determined with halogen tungsten lamp 3000° K. Note: for a proper use see norms at pages 6, 7 and 8.

Wiring diagrams



Note: in case of inductive loads it is necessary to connect one diode in antiparallel at the edges of the load.

Connection with connector M12 (K)



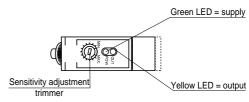
CONTACTS CONFIGURATION

Ι	Output	Contacts numbers			
١	Oulpui	1	2	3	4
ſ	Relay	L	COM	N	NO
I	Emitter	L	_	N	_

Note: the K plug is compatible with the following connectors: VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

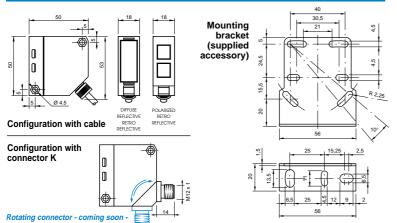
Sensitivity adjustment

- 1) SENSITIVITY INCREASE Screw the trimmer towards right towards position "+"
- 2) SENSITIVITY DECREASE
 Screw the trimmer towards left towards position "-"



Note: the trimmer just needs one turn.

Dimensions (mm)



Characteristic curves

PH. SENSORS IN RECTANGULAR HOUSING 12 \div 240 V DC 24 \div 240 V AC WITH TIMER RELAY OUTPUT

- Wide range World Wide Power Supply
- Rectangular compact size
- Multi-function timer:
 - ON/OFF delay One shot-four
- 3A relay SPDT Te

- One shot-four functions - Terminal block wiring

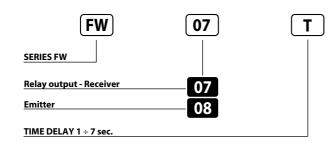
FW Series





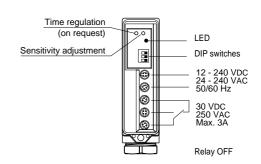


Identification code



AVAILABLE	RECEIVER EMITTER			
SWITCHING DISTANCE	20 m ⁽¹⁾			
HYSTERESIS	10%			
EMISSION	-	Infrared (875 ηm)		
NOMINAL VOLTAGE	12 ÷ 240VDC / 2	4 ÷ 240 VAC (-15 /+10%)		
NET FREQUENCY	45 ÷ 6	60 Hz		
OUTPUT	Relay (40 x 106 mec. op5 x 106 elect. op.)	-		
MAX OUTPUT CURRENT	3A 250VAC - 3A 30VDC	-		
ABSORPTION	≤ 2W (2	2.5 VA)		
YELLOW LED	Present	-		
GREEN LED	-	Present		
SENSITIVITY ADJUSTEMENT	Present	-		
TIME REGULATION	$0.1 \div 7 \text{ s} \pm 2 \text{ s}$ (only models with timer)	-		
SWITCHING FREQUENCY	20 Hz			
RESPONSE TIME	50 ms	-		
START UP DELAY	≤ 300 ms	-		
TEMPERATURE LIMITS	-25° ÷	+55°C		
LIGHT IMMUNITY	5.000	Lux (2)		
PROTECTION DEGREE	IP 67			
CONNECTIONS	Screw			
CABLE GUIDE	PG 13.5			
HOUSING MATERIAL	Polycarbonate			
WEIGHT (Approximately)	110 g			

Wiring diagrams



Timing diagrams

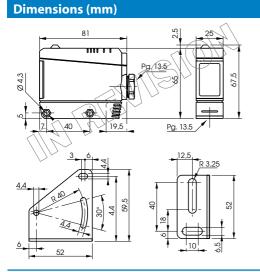
MODELS WITHOUT TIMER

N.	DIP. SWITCHES POSITION	OBJECT	OUTPUT DIAGRAM	
		Light impulse		
1	Output ON (2=NO; 3=NC)	Outoput status		
2	Output OFF (2=NC; 3=NO)	Outoput status		

MODELS WITH TIMER

N.	DIP. SWITCHES POSITION	OBJECT	OUTPUT DIAGRAM
		Light impulse	
1	On operate output ON	Outoput status	<u> </u>
2	On operate output OFF	Outoput status	4
3	On release output ON	Outoput status	─ <u></u> <u> </u>
4	On release output OFF	Outoput status	
5	One shot trailing edge output ON	Outoput status	
6	One shot trailing edge output OFF	Outoput status	
7	One shot leading edge output ON	Outoput status	_+++
8	One shot leading edge output OFF	Outoput status	

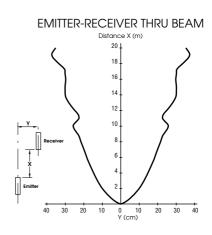
T = Fixed delay



PHOTOELECTRIC SENSOR

MOUNTING BRACKET (SUPPLIED ACCESSORY)

Characteristic curves



⁽¹⁾ Determined with a white mat paper cm 20 x 20.

⁽²⁾ Determined with halogen tungsten lamp 3000° K.

Note: for a proper use see norms at pages 6, 7 and 8.

BAT 1 956 S - BAT 2 956 S

 ϵ

Sensing distance on reflector 50x50 mm :

BAT 1: 0-80 cm - Reflector at 80 cm max.

BAT 2: 0-140 cm - Reflector between

40 cm and 140 cm

Supply: 10 / 30 VDCOutput: PNP / NPN

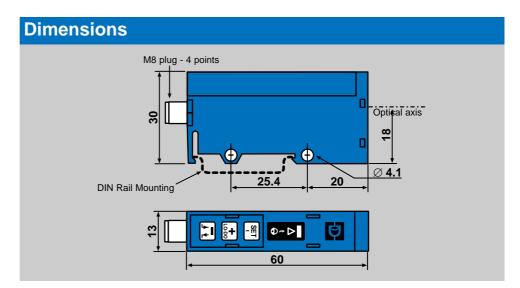
On-delay or off-delay timer

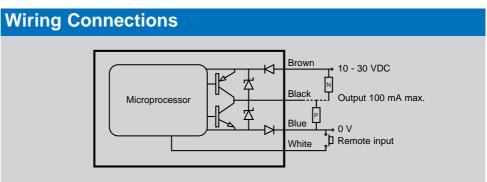


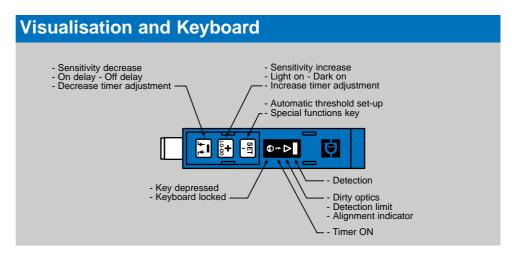
Description:

- Simple and quick set-up for self-teach
- Coaxial emitter-receiver
- Immunity to reflections interferences
- Adjustable timer
- Alignment indicator
- · Dirty optics indicator
- Keyboard lock
- Remote input for selfteach
- Direct or inverse output
- Output: PNP / NPN
- M8 plug
- Polycarbonate strong housing

- Through-beam on a conveyor : glass
- Detection of transparent parts (glass, PET,...).
- Bottle detection on blow moulding machinery (PET, glass, ...).





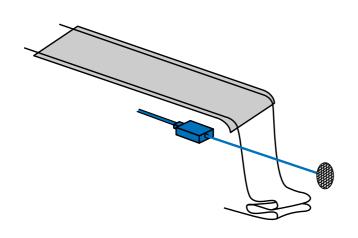


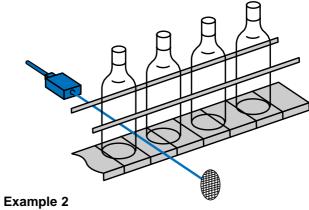
Technical Information	1	
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	< 45 mA
Response time	t _{on} or t _{off}	< 500 μs
	switching frequency	< 1 KHz
Output	max. nominal intensity	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Emission	LED	red
	modulation frequency	8 KHz
Timer	range	0 to 5 s with 11 increments
	increment duration	first increment : 40 ms, following increments : 500 ms
Temperature	operating	0 to 50 °C
	storage	-20 to 80 °C
External light immunity	incandescent light	10 000 lux
	sunlight	20 000 lux
Protections	supply	inverse polarity protection
	output	permanent short-circuit or over-load protection
	degree of protection	IP 67 (connector on place)
Remote input	on	voltage < 1.4 V
	off	voltage > 3 V

To Place Order	
Product	Sensor for transparent products
Reference	BAT 1 - () - 956 S
	BAT 2 - () - 956 S
Туре	(C0) output M8 plug without cable
(cable on request)	(C2) output M8 plug with cable 2m
	(C5) output M8 plug with cable 5m

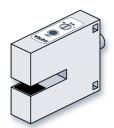
Example 1

Detection of a plastic film.





Detection of transparent bottles (glass, PET,...).



Optical Bracket Photoelectric Sensors

OPTICAL BRACKETS 12 ÷ 30 V DC NPN OR PNP NO - NC OUTPUT

- 5 mm wide X 29 mm deep slot
- 9-turn sensitivity adjuster
- Operation LED indicator
- 2 m integral cable
- Plastic housing
- Infrared emitter

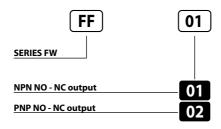
FF Series





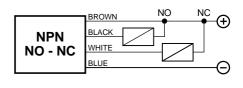


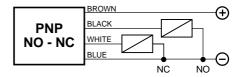
Identification code



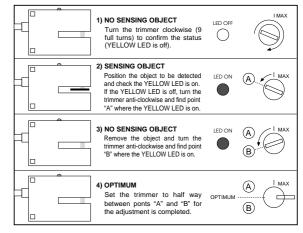
CLEF	5 mm
EMISSION	Infrared (875 ηm)
NOMINAL VOLTAGE	12 ÷ 30V DC (-15 /+10%)
RESIDUAL RIPPLE	≤ 10%
MAX. OUTPUT CURRENT	200 mA
ABSORPTION AT 30 V DC	30 mA
VOLTAGE DROP (Sensor ON)	< 1.5 V (I = 100 A)
OPERATION LED	Present
SENSITIVITY ADJUSTEMENT	Trimmer 9 turns
SWITCHING FREQUENCY	200 Hz
RESPONSE TIME	5 mS
START UP DELAY	200 mS
SHORT CIRCUIT PROTECTION	Present (self-resetting)
ELECTRIC PROTECTIONS	Againts polarity reversal - inductive loads
TEMPERATURE LIMITS	- 10 ÷ +60° C
LIGHT IMMUNITY	2.000 Lux
PROTECTION DEGREE	IP 65
CABLE LENGTH	2 m
CABLE SECTION	4 x 0.25 mm ²
HOUSING MATERIAL	Housing: nylon loaded with fiberglass - Lenses: methacrylate
WEIGHT (Approximatevy)	110 g

Wiring diagrams



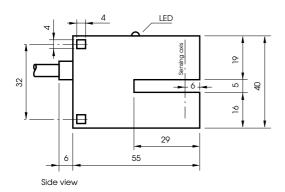


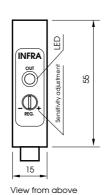
Adjustment



Note: for proper use see norms at pages 6, 7 and 8.

Dimensions (mm)





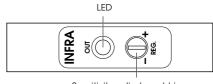
Sensitivity adjustment

1) SENSITIVITY INCREASE

Screw the trimmer towards right toward position "+"

2) SENSITIVITY DECREASE

Screw the trimmer towards left toward position "-"



Sensitivity adjustment trimmer

Note: the trimmer needs 9 turns.



tical Bracket Photoelectric Sensors

TEACH-IN OPTICAL BRACKETS 12 ÷ 30 V DC PROGRAMMABLE OUTPUT

- 3 mm gap X 60 mm deep for flexible installation
- Teach-in standard or sensitive calibration automatically sets sensitivity values
- Fast response time: 10 K Hz switching frequency
- Remote Teach-in allows fast target changeover by the host
- Applications include: Translucent material Double detection Edge detection

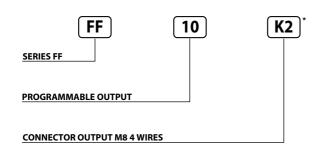






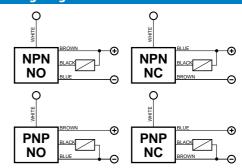


Identification code



Available only with K2 connector output	
CLEF	3 mm
EMISSION	Infrared (875 ηm)
NOMINAL VOLTAGE	12 ÷ 30V DC (-15 /+10%)
RESIDUAL RIPPLE	≤ 10%
OUTPUT	Programmable NPN or PNP
MAX OUTPUT CURRENT	100 mA
ABSORPTION AT 30 V DC	≤ 40 mA
VOLTAGE DROP (Sensor ON)	\leq 2 V (I = 100 mA)
RED LED	Memorization - Standard teach-in
GREEN LED	Object presence/absence - Thin teach-in
SWITCHING FREQUENCY	10.000 Hz
RESPONSE TIME	100 μS
START UP DELAY	≤ 100 mS
SHORT CIRCUIT PROTECTION	Present (self-resetting)
ELECTRIC PROTECTIONS	Againts polarity reversal
TEMPERATURE LIMITS	-20 ÷ +60°C
LIGHT IMMUNITY	3.000 Lux
PROTECTION DEGREE	IP 65
CABLE SECTION	M8 4 wires connector
HOUSING MATERIAL	Anodised aluminium
WEIGHT (Approximatevy)	85 g

Wiring diagrams



Note: If the white wire is not used for external teach-in, connect it to ground.

Wiring diagrams with M8 connector (K)



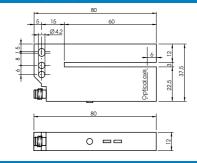
View of quadripole male connector.

CONTACTS CONFIGURATION

Output -	Contacts numbers			
	1	2	3	4
NPN/PNP NO	_	White	+	Out
NPN/PNP NC	+	White	_	Out

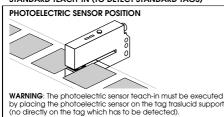
Note: Use only the female connector type K2FDV. If the contact n. 3 (white wire) is not used for external teach-in, connect it to ground.

Dimensions (mm)



Adjustment

STANDARD TEACH-IN (TO DETECT STANDARD TAGS)



1) Set the optical bracket on the tag support. 2) Push once the button: the red led light will be blinking through 2 seconds.

3) Push again the adjustment button and keep it pushed till the definitive switching of the red led (memorization achieved).

Warning: if during the adjustment the red led and the green led are blinking at the same moment, it means that a short-circuit occurs at the output or that the tag support is too opaque.

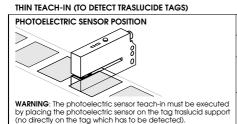
LED DI STATO







LED DI STATO



1) Set the optical bracket on the tag support. 2) Push twice the button: the green led light will be blinking through 2 seconds.

3) Push again the adjustment button and keep it pushed till the definitive switching of the red led (memorization achieved)

Warning: if during the adjustment the red led and the green led are blinking at the same moment, it means that a short-circuit occurs at the output or that

GREEN LED BLINKING THROUGH 2 SECONDS ()RED LED ON

RED AND GREEN LEDS BLINKING

The same teach-in mode achieved by pushing the button can be also obtained by connecting the white wire to the positive (external teach-in), following the same steps envisaged for teach-in through the button. For a correct installation see norms at pages 6, 7 and 8.

Optical Fibers Photoelectric Sensors

OPTICAL FIBERS PHOTOELECTRIC SENSORS 12÷30 VDC 3 WIRES PROGRAMMABLE OUTPUT



- · Hight sensing distance
- Supply 10÷30 VDC
- Programmable output NPN-PNP
- Friendly adjustment by KEY +/-



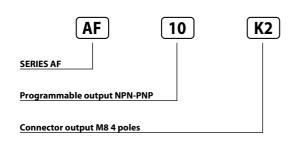




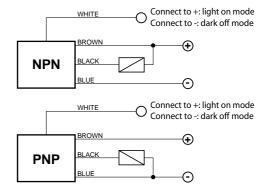


AF Series

Identification code



Wiring diagrams



Product description

==	
EMISSION	Red
NOMINAL VOLTAGE	12÷30VDC
RESIDUAL RIPPLE	< 10%
OUTPUT	NPN - PNP (PROGRAMMABLE)
MAX OUTPUT CURRENT	100 mA
ABSORPTION AT 30 VDC	< 40 mA
VOLTAGE DROP (Sensor ON)	< 2 V (I= 100 mA)
YELLOW LED	present
SENSITIVITY ADJUSTMENT	by key +/-
SWITCHING FREQUENCY	1000 Hz
RESPONSE TIME	≤ 500 μS
START UP DELAY	≤ 300 ms
SHORT CIRCUIT PROTECTION	present (self resetting)
ELECTRIC PROTECTION	Againts polarity reversal - inductive loads
TEMPERATURE LIMITS	0 ÷ +60 °C
LIGHT IMMUNITY	10000 Lux (1)
PROTECTION DEGREE	IP 65
CABLE LENGTH	2 m
CABLE SECTION	3 x 0.25 mm ²
HOUSING MATERIAL	ABS
WEIGHT	100 g

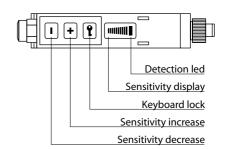
Connection with connector M8 (K2)



CONTACTS CONFIGURATION

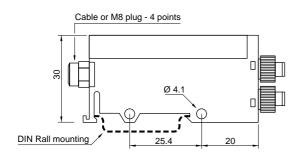
Output	Contacts numbers			
	1	2	3	4
NPN/PNP light NO	-	+	+	Out
NPN/PNP dark OFF	-	-	+	Out

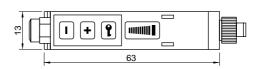
Visualisation and keyboard



Dimensions

(1) Determined with halogen tungsten lamp 3000 °K.





AFV 946 S

 Sensing distance with glass fibre See technical informations on sheet "Glass Fibre Optics"

Supply: 10 / 30 VDCOutput: PNP / NPN

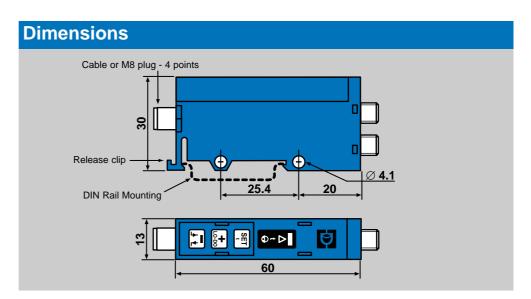
• On-delay or off-delay timer standard

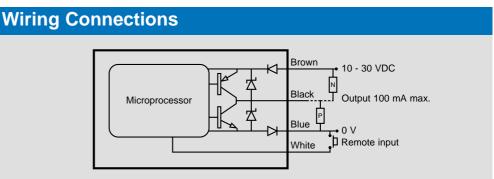


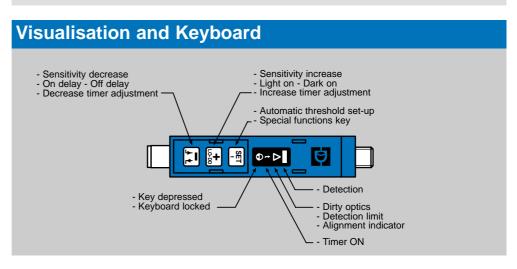
Description:

- Simple and quick set-up for self-teach (standard and sensitive mode)
- Adjustable timer
- · Alignment indicator
- · Dirty optics indicator
- Keyboard lock
- Remote input for selfteach (sensitive mode)
- Direct or inverse output
- Output: PNP / NPN
- Cable or M8 plug
- Polycarbonate strong housing

- Position or presence control of parts on assembling or conditionning machine.
- Detection of presence of parts in a plastic mould.
- Detection under extreme conditions.
- Glass fibre use in hightemperatured surroundings (output of furnace).





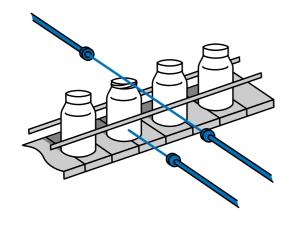


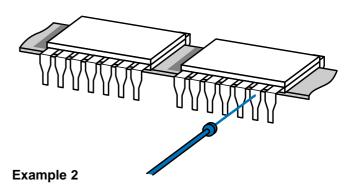
Technical Information		
Supply	voltage	10 / 30 VDC ripple < 10% within specified limits
	aanaumntian	< 40 mA
	consumption	
Response time	t _{on} or t _{off}	< 500 μs
	switching frequency	< 1 KHz
Output	max. nominal intensity	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Emission	LED	red
	modulation frequency	8 KHz
Timer	range	0 to 5 s with 11 increments
	increment duration	first increment : 40 ms, following increments : 500 ms
Temperature	operating	0 to 60 °C
	storage	-20 to 80 °C
External light immunity	incandescent light	10 000 lux
	sunlight	20 000 lux
Protections	supply	inverse polarity protection
	output	permanent short-circuit or over-load protection
	degree of protection	IP 65
Remote input	on	voltage < 1,4 V
	off	voltage > 3 V

To Place Order	
Product	Glass fibre optic sensor
Reference	AFV 946 S : cable 2m AFV CO 946 S : output M8 plug
Cable with M8 plug if required, please order together with the sensor	CM 82 - cable 2m CM 82 C - cable 2m with right angle connector CM 85 - cable 5m CM 85 C - cable 2m with right angle connector

Example 1

Detection of presence of parts (here, lids) on a conveyor.





Detection by glass fibre of small parts.

AFV 954 R

 Sensing distance with glass fibre See technical information on sheet "Glass Fibre Optics"

• Supply: 20 to 250 V AC/DC

· Output : relay

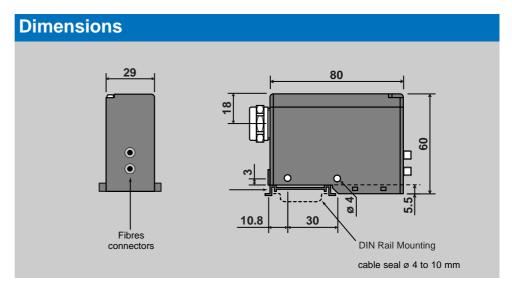
ON-delay + OFF-delay timer

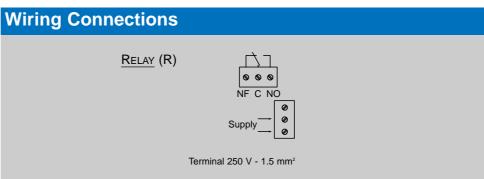


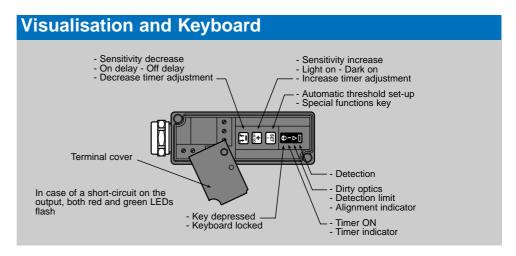
Description:

- Simple and quick set-up for self-teach (standard and sensitive mode)
- · Double adjustable timer
- · Alignment indicator
- · Dirty optics indicator
- · Keyboard lock
- · Direct or inverse output
- · Output : relay
- Connection on screw terminal
- Polycarbonate strong housing

- Position or presence control of parts on assembling or conditionning machine.
- Detection of presence of parts in a plastic mould.
- Detection under extreme conditions.
- Glass fibre use in hightemperatured surroundings (furnace output).





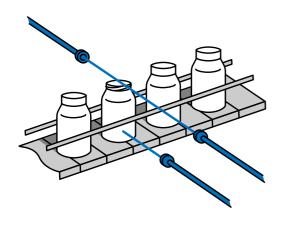


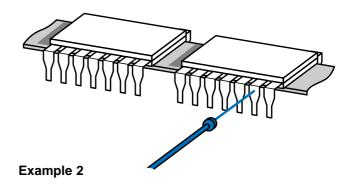
Technical Informatio	n	
Supply	voltage	20 / 250 V AC/DC
	consumption	2 VA
Response time	t _{on} or t _{off}	20 ms
	switching frequency	25 Hz
Output	relay	change over type
		U nominal : 250 V
		permanent max. I: 3 A
Emission	LED	red
	modulation frequency	400 Hz
Timer	type	rettriggerable - ON-delay / OFF-delay
	range - increment duration	0 to11s in 23 steps of 50ms, then 0.5s steps
Temperature	operating	0 to 60 °C
	storage	-20 to 80 °C
External light immunity	incandescent light	10 000 lux
	sunlight	10 000 lux
Protections	supply	_
	output	_
	degree of protection	IP 65 and IP 67
Remote input	on	_
	off	_

To Place Order	
Product	Glass fibre optic sensor
Reference	AFV - 954 R - 20 / 250 V AC/DC

Example 1

Detection of presence of parts (here, lids) on a conveyor.





Detection by glass fibre of small parts.

AFV 966 S

 Sensing distance with glass fibre See technical information on sheet "Glass Fibre Optics"

Supply: 10 / 30 VDCOutput: PNP / NPN

• Friendly adjustment by key + / -

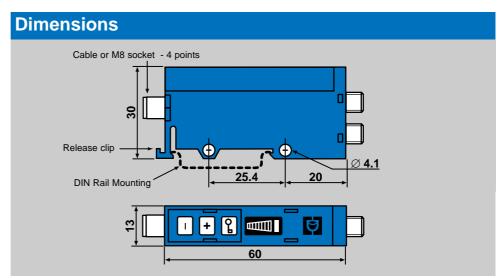
Bargraph

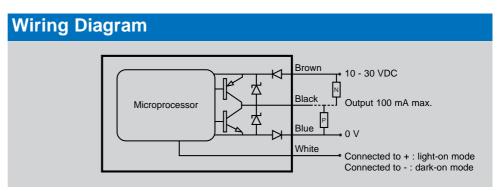
/ + *I* -

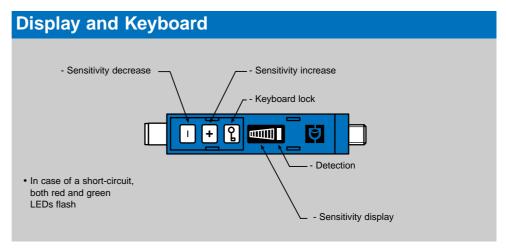
Description:

- · Simple adjustment
- · Sensitivity bargraph
- Maximum and minimum sensitivity indication
- Keyboard lock
- · Direct or inverse output
- Output: PNP / NPN
- · Cable or M8 socket
- Polycarbonate strong housing

- Position or presence control of parts on assembling or conditionning machine.
- Detection of presence of parts in a plastic mould.
- Detection under extreme conditions.
- Glass fibre use in hightemperatured surroundings (output of furnace).



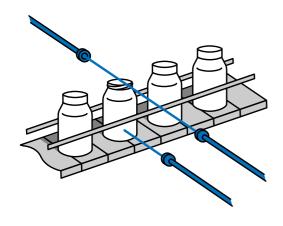


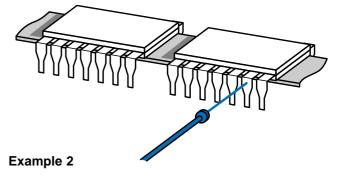


Technical Information		
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	< 40 mA
Response time	t _{on} or t _{off}	< 500 µs
	switching frequency	< 1 KHz
Output	max. nominal intensity	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Emission	LED	red
	modulation frequency	8 KHz
Temperature	operating	0 to 60 °C
	storage	-20 to 80 °C
External light immunity	incandescent light	10 000 lux
	sunlight	20 000 lux
Protections	supply	inverse polarity protection
	output	permanent short-circuit or over-load protection
	degree of protection	IP 65
Light-on / dark-on function		see wiring diagram

To Place Order	
Product	Glass fibre optic sensor
Reference	AFV - () - 966 S
	() output by cable 2m
	(C0) output M8 socket without cable
Cable with M8 plug if required, please order together with the sensor	CM 82 - cable 2m CM 82 C - cable 2m with right angle connector CM 85 - cable 5m

Example 1Detection of presence of parts (here, lids) on a conveyor.





Detection by glass fibre of small parts.

FV

• Sensing distance: 80 mm in reflective mode

Sensing distance: 200 mm in through-beam mode

• Usable amplifiers : AFV 954 R

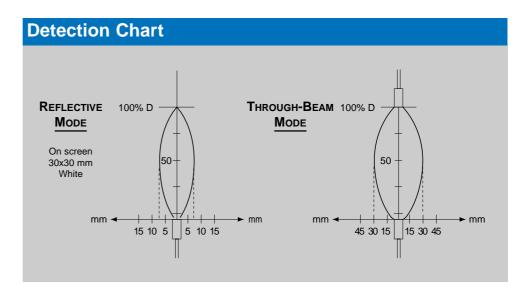
AFV 946 S AFV 966 S

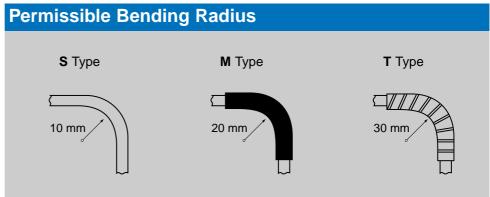


Description:

- Glass fibre 400 strands per mm²
- Useful diametre of the fibre 1,2 mm
- Sensing distances given for a fibre length up to 1 metre

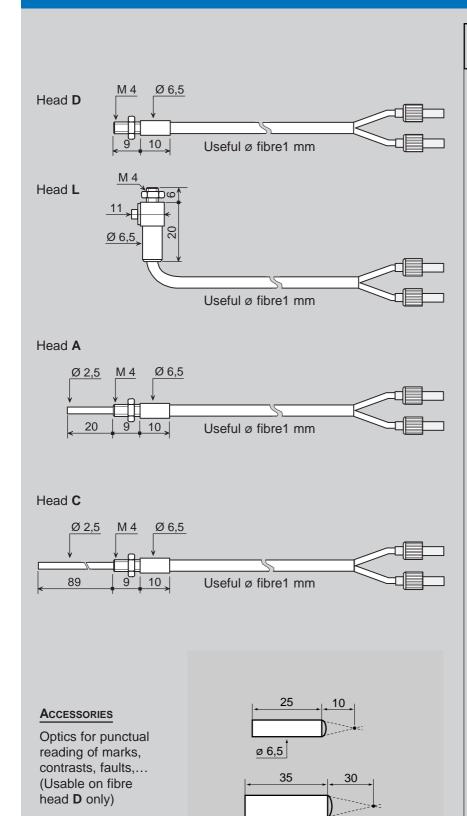
- Detection in a high-temperatured environment (up to 250°).
- Detection in corrosive environment.
- Application requiring high performances.





Technical Informations		
Fibre FV	400 strands	50 μ glass
Sheath	standard (S)	PVC + thermo polyolefine
	reinforced metal (M)	metallic spiral+ polyolefine
	high-temperature (T)	flexible INOX
Detection tips		nickel brass
Operating temperature	S Type	-25° to +60°
	M Type	-25° to +120°
	T Type	-25° to +250°

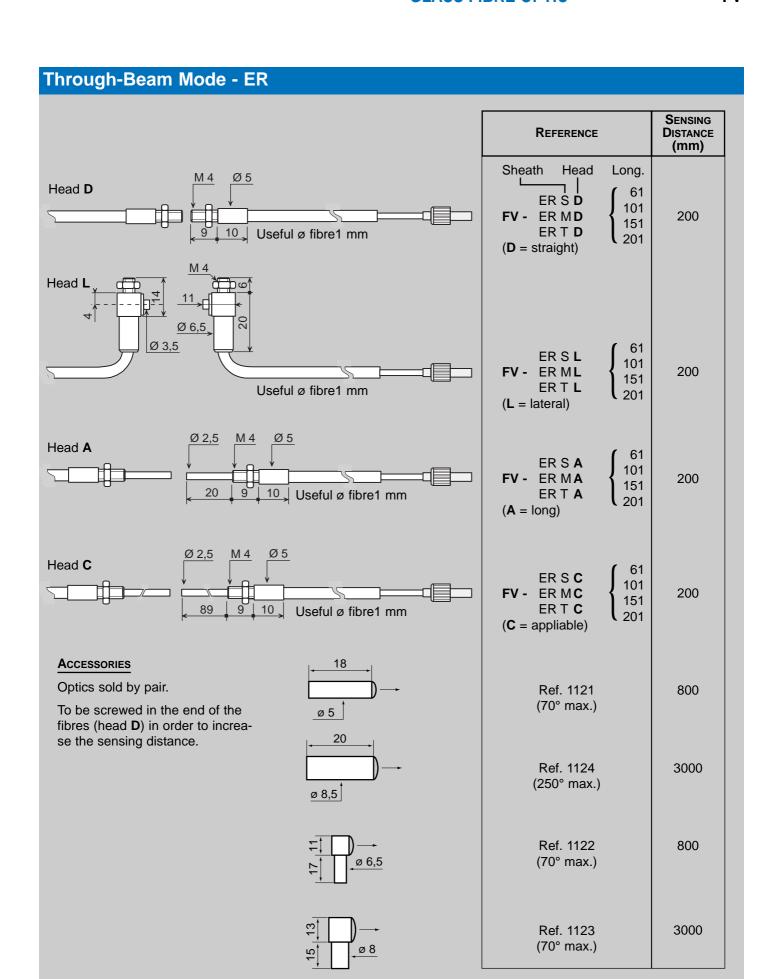
Reflective Mode - P

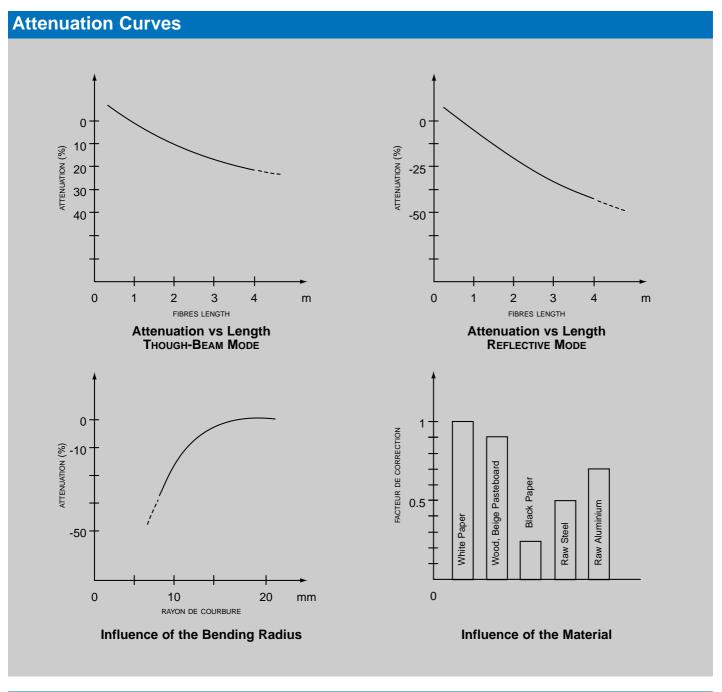


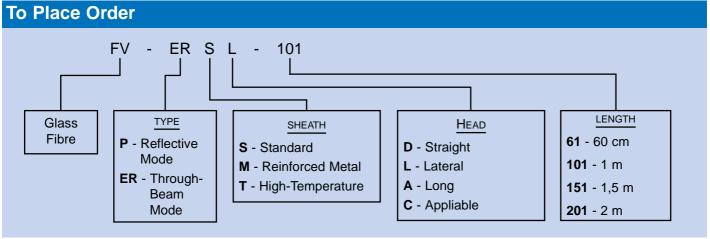
ø 8,5

Material : Anodized aluminium Glass lens

Reference	SENSING DISTANCE (mm)
Sheath Head Long. PSD FV - PMD PTD (D = straight) D = straight P = D P	80
PSL FV - PML PTL (L = lateral) 61 101 151 201	80
PSA FV-PMA PTA (A = long) 61 101 151 201	80
PSC	80
Ref. 1120	10
Ref. 1125	30

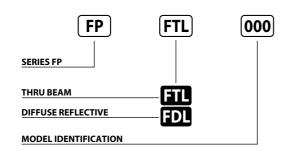






- Sensing distance: 80 mm Diffuse Reflective
- · Sensing distance: 200 mm Thru Beam
- Use with amplifier AF10

Identification code



Diffuse reflective selection table

CODE	CABLE LENGTH	DIMENSIONS	SWITCHING DISTANCE	TYPE OF FIBER
FPFDL010	2000	M6 2 x Ø 2,2 Lenght 2 m Useful Ø fibre 1 mm	80 mm	0
FPFDL110	2000	M 2,5 M3 2 x Ø 1 Lenght 2 m Useful Ø fibre 0,5 mm	30 mm	0
FPFDL100	2000	Ø 1,5 Lenght 2 m Useful Ø fibre 0,25 mm	10 mm	0
FPFDL310	2000	Ø 1,8 M3 2x Ø 1 Lenght 2 m Useful Ø fibre 0,5 mm	30 mm	

Thru Beam selection table				
CODE	CABLE LENGTH	DIMENSIONS	SWITCHING DISTANCE	TYPE OF FIBER
FPFTL000	2000	M 2,5 M4 Ø 2,2 Lenght 2 m Useful Ø fibre 1 mm	200 mm	0
FPFTL200	2000	Ø 1,5 Ø 1 Lenght 2 m Useful Ø fibre 0,5 mm	100 mm	0
FPFTL301	2000	Ø 1,8 M4 Ø 2,2 S Lenght 2 m Useful Ø fibre 1 mm	200 mm	0

New

FP Series

Optical fibers adjustment procedures

1) SENSITIVITY ADJUSTMENT

- Even after the tuning, sensitivity may be slightly changed by the object to be sensed and by environmental factors.
- Since the reflectivity changes according to the object, adjustment must be carried out using the object to be detected.
- Once the adjustment is completed, do not change the fixing or the bending radius.
- · Make sure adjustment has been carried out correctly.

2) OPTICAL FIBERS

- Plastic fibers can be cut with the proper fiber cutter in the desired length.
- Cut the fiber before connecting them, and be sure that the cut is perfect in order to avoid decrease of sensitivity.
- Do not use the same cutting hole for more than one cut.

3) FIBER FIXING

 Use the supplied nuts and washers. When screwing pay attention not to damage the fiber with excessive forcing.

	FIXING TOROUE
M 3	CK C MANY
M 4	6 Kgf - cm MAX.
M 5	10 Kgf - cm MAX.

 When fixing the smooth (not threaded) type of fiber, use a M3 max. screw and do not exceed torque force of kg/cm 2 max.

Screen

4) BENDING RADIUS

• Bending radius must not be less than

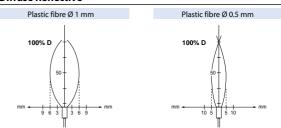
25 mm in order to avoid a reduction of sensibility.

Fibers must not bear excessive mechanical, tension or compression loads. Do not let them be dirty or scratched, should it happen, clean them with a clean tissue to prevent defects in the functioning do not set photoelectric sensors and fibers in the following locations:

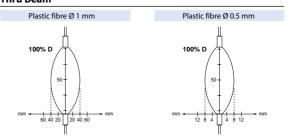
- dusty locations
- corrosive atmosphere
- locations where oil, water or chemicals are present
- where sunlight or foreign light may directly reach the receiver.

Caracteristic curves

Diffuse Reflective



Thru Beam



Accessory (lens for Thru Beam fibres)

Code: **FPFTLLEN**

Used with FP FTL 000 increase range up to 1200 mm



AF 400

((

 Sensing distance with plastic fibre See technical information on sheet "Plastic Fibre Optics"

• Supply: 115 / 230 VAC

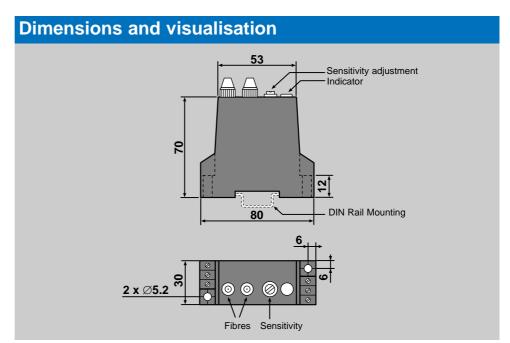
• Output : relay

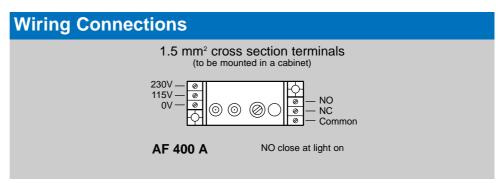


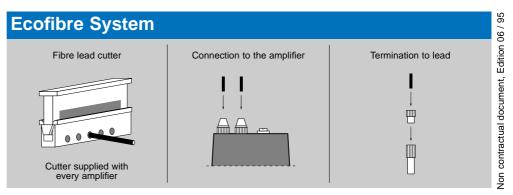
Description:

- Plastic fiber: you cut it to your needs
- · Economical device
- Quick assembly of building blocks modules
- · Choice of six optics
- Plastic fibre sold by the metre
- Output : relay
- · Connecting block terminal
- · ABS strong housing

- Control of objects in small and medium handling (conveyor, lift,...).
- Detection of parts with remote amplifier.
- Packaging, conditionning.





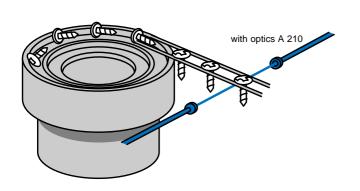


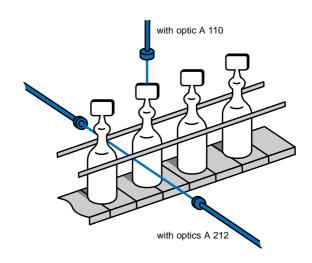
Technical Information		
Supply	voltage	115 / 230 V AC
	consumption	4 VA
Response time	t _{on} or t _{off}	20 ms
	switching frequency	25 Hz
Output	relay	change over type
		U nominal : 250 V
		permanent max. I: 3 A
Emission	LED	red
	modulation frequency	3 Kz
Temperature	operating	0 to 60 °C
	storage	-20 to 80 °C
External light immunity	incandescent lamp	10 000 lux
	sunlight	10 000 lux
Protections	supply	_
	output	_
	degree of protection	_
Remote input	on	_
	off	_

To Place Order	
Product	Plastic fibre optic sensor
Reference	AF 400 - A - 115 / 230 VAC

Example 1

Through-beam application with a bowl feeder and optics.





Example 2

Through-beam application in a pharmaceutical plant with optics.

AFL 966 S

Supply: 10 / 30 VDC

• Output: PNP / NPN

· On-delay or off-delay timer

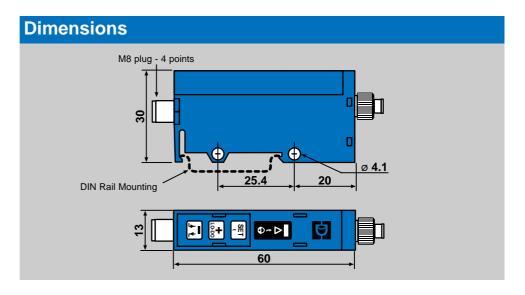


Description:

- Simple and quick set-up for self-teach (standard and sensitive mode)
- · Adjustable timer
- · Positioning indicator
- Detection limit indicator
- Keyboard lock
- Remote input for selfteach (sensitive mode)
- · Direct or inverse output
- Output: PNP / NPN
- M8 plug
- Polycarbonate strong housing

Applications:

- Functionnal test of signal lamps on domestic appliances.
- Head-lights tests on assembly line.



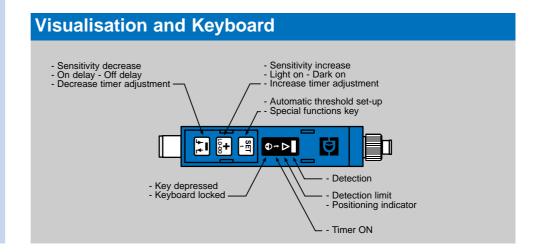
Wiring Connections

Brown 10 - 30 VDC

Microprocessor Black Output 100 mA max.

Blue 0 \

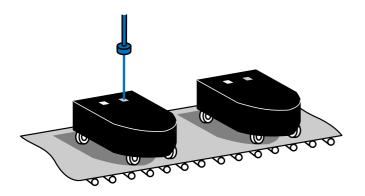
White Remote input

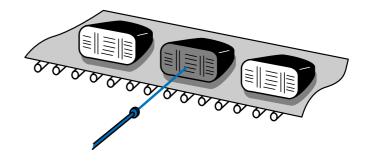


Technical Information		
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	< 40 mA
Response time	t _{on} or t _{off}	< 100 ms
	switching frequency	< 5 Hz
Output	max. nominal intensity	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Timer	range	0 to 5 s with 11 increments
	increment duration	first increment : 40 ms, following increments : 500 ms
Temperature	operating	0 to 60 °C
	storage	-20 to 80 °C
Protections	supply	inverse polarity protection
	output	permanent short-circuit or over-load protection
	degree of protection	IP 65
Remote input	on	voltage < 1,4 V
	off	voltage > 3 V

To Place Order				
Product	Plastic fibre optic brightness sensor	Plastic fibre optic	Tips	
Reference	AFL - () - 966 S (C0) output M8 plug without cable	A 005	See doc. "Plastic Fibre"	
Cable for M8 plug if necessary, please order together with the sensor	CM 82 - cable 2m CM 85 - cable 5m			

Example 1 Fonctionnal test on domestic appliances.





Example 2

Car head-light test on an assembly line.

AFP 946 S

 Sensing distance with plastic fibre See technical informations on sheet "Plastic Fibre Optics"

Supply: 10 / 30 VDCOutput: PNP / NPN

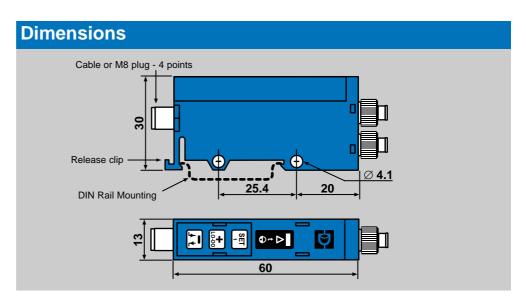
· On-delay or off-delay timer standard

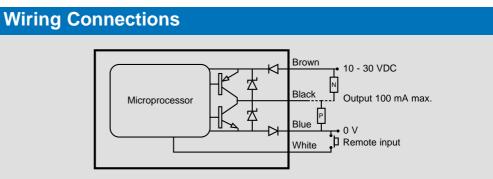


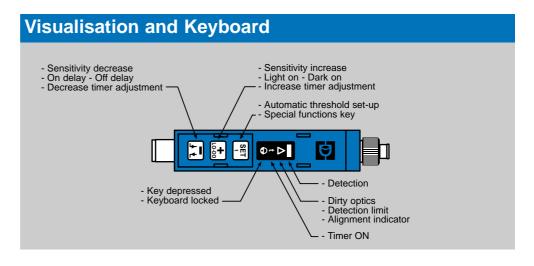
Description:

- Simple and quick set-up for self-teach (standard and sensitive mode)
- Adjustable timer
- · Alignment indicator
- · Dirty optics indicator
- · Keyboard lock
- Remote input for selfteach (sensitive mode)
- Direct or inverse output
- Output: PNP / NPN
- Cable or M8 plug
- Polycarbonate strong housing

- Position or presence control of parts on assembling or conditionning machine.
- Marks and contrasts sensors for packaging.
- Detection of translucent parts on little conveyor.
- Plastic fibre use in vibrating surroundings.





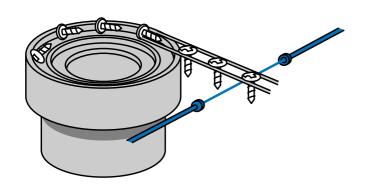


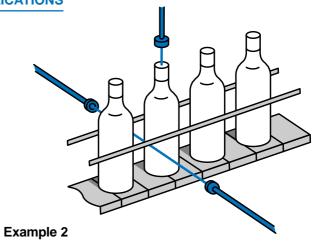
Technical Information		
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	< 40 mA
Response time	t _{on} or t _{off}	< 500 μs
	switching frequency	< 1 KHz
Output	max. nominal intensity	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Emission	LED	red
	modulation frequency	8 KHz
Timer	range	0 to 5 s with 11 increments
	increment duration	first increment : 40 ms, following increments : 500 ms
Temperature	operating	0 to 60 °C
	storage	-20 to 80 °C
External light immunity	incandescent light	10 000 lux
	sunlight	20 000 lux
Protections	supply	inverse polarity protection
	output	permanent short-circuit or over-load protection
	degree of protection	IP 65
Remote input	on	voltage < 1,4 V
	off	voltage > 3 V

To Place Order	
Product	Plastic fibre optic sensor
Reference	AFP 946 S : cable 2m AFP CO 946 S : output M8 plug
Cable with M8 plug if required, please order together with the sensor	CM 82 - cable 2m CM 82 C - cable 2m with right angle connector CM 85 - cable 5m CM 85 C - cable 2m with right angle connector

Example 1

Through-beam application with self-teach, STANDARD MODE.





Through-beam application with self-teach, SENSITIVE MODE (weak alleviation).

AFP 954 R

 Sensing distance with plastic fibre See technical information on sheet "Plastic Fibre Optics"

• Supply: 20 to 250 V AC/DC

Output : relay

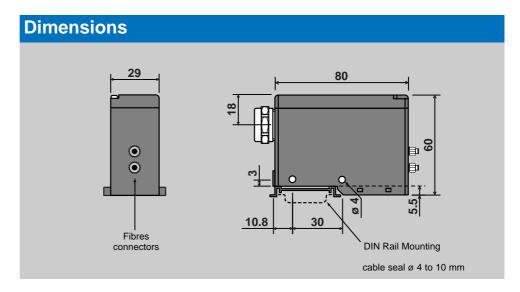
• ON-delay + OFF-delay timer

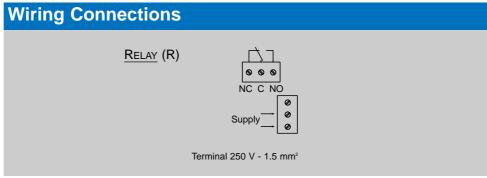
Description:

- Simple and quick set-up for self-teach (standard and sensitive mode)
- · Double adjustable timer
- · Alignment indicator
- · Dirty optics indicator
- Keyboard lock
- · Direct or inverse output
- · Output : relay
- Connection on screw terminal
- Polycarbonate strong housing

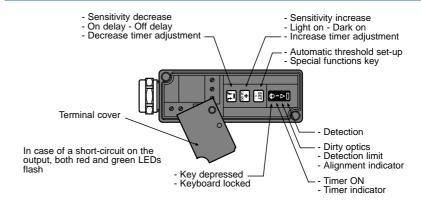
Applications:

- Position or presence control of parts on assembling or conditionning machine.
- Marks and contrasts sensing for packaging.
- Detection of translucent parts on little conveyor.
- Plastic fibre use in vibrating surroundings.





Visualisation and Keyboard

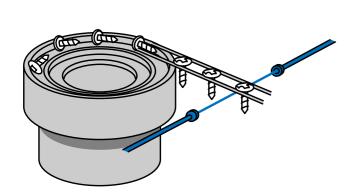


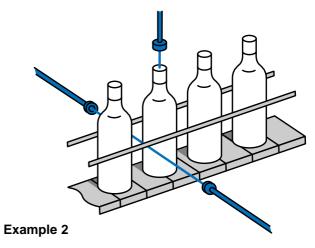
Technical Informatio	n	
Supply	voltage	20 / 250 V AC/DC
	consumption	2 VA
Response time	t _{on} or t _{off}	20 ms
	switching frequency	25 Hz
Output	relay	change over type
		U nominal : 250 V
		permanent max. I: 3 A
Emission	LED	red
	modulation frequency	400 Hz
Timer	type	rettriggerable - ON-delay / OFF-delay
	range - increment duration	0 to11s in 23 steps of 50ms, then 0.5s steps
Temperature	operating	0 to 60 °C
	storage	-20 to 80 °C
External light immunity	incandescent light	10 000 lux
	sunlight	10 000 lux
Protections	supply	_
	output	_
	degree of protection	IP 65 and IP 67
Remote input	on	_
	off	_

To Place Order	
Product	Plastic fibre optic sensor
Reference	AFP - 954 R - 20 / 250 V AC/DC

Example 1

Through-beam application with self-teach.





Through-beam and direct sensing application with self-teach.

AFP 966 S

 Sensing distance with plastic fibre See technical information on sheet "Plastic Fibre Optics"

Supply: 10 / 30 VDCOutput: PNP / NPN

• Friendly adjustment by key + / -

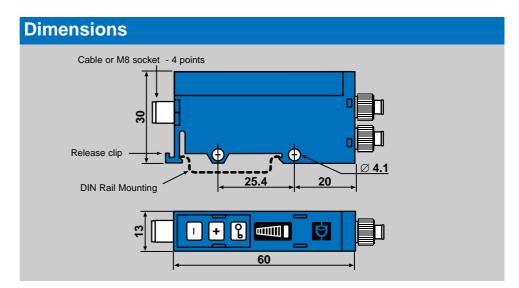
Bargraph

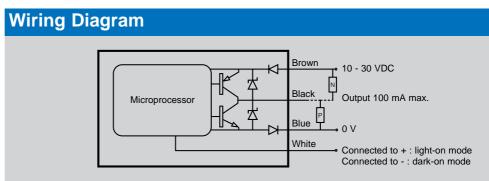
Description:

- · Simple adjustment
- · Sensitivity bargraph
- Maximum and minimum sensitivity indication
- Keyboard lock
- Direct or inverse output
- Output: PNP / NPN
- · Cable or M8 socket
- Polycarbonate strong housing

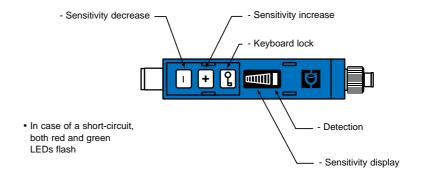
Applications:

- Position or presence control of parts on assembling or conditionning machine.
- Marks and contrasts sensors for packaging.
- Detection of translucent parts on little conveyor.
- Plastic fibre use in vibrating surroundings.





Display and Keyboard



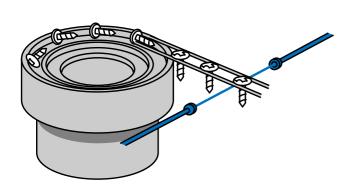
Technical Information		
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	< 40 mA
Response time	t _{on} or t _{off}	< 500 μs
	switching frequency	< 1 KHz
Output	max. nominal intensity	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Emission	LED	red
	modulation frequency	8 KHz
Temperature	operating	0 to 60 °C
	storage	-20 to 80 °C
External light immunity	incandescent light	10 000 lux
	sunlight	20 000 lux
Protections	supply	inverse polarity protection
	output	permanent short-circuit or over-load protection
	degree of protection	IP 65
Light-on / dark-on function		see wiring diagram

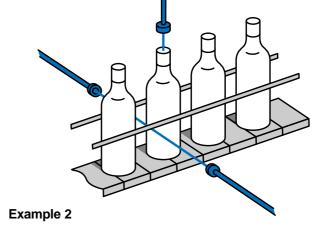
To Place Order	
Product	Plastic fibre optic sensor
Reference	AFP - () - 966 S
	() output by cable 2m
	(C0) output M8 socket without cable
Cable with M8 plug if required, please order together with the sensor	CM 82 - cable 2m CM 82 C - cable 2m with right angle connector CM 85 - cable 5m

TYPES OF APPLICATIONS

Example 1

Through-beam application: detection of small parts





Through-beam and diffuse detection application

AFP 989 S

 Sensing distance with glass fibre See technical information on sheet "Plastic Fibre Optics"

Supply: 10 to 30 VDCOutput: PNP or NPN

• Trimmer sensibility set-up

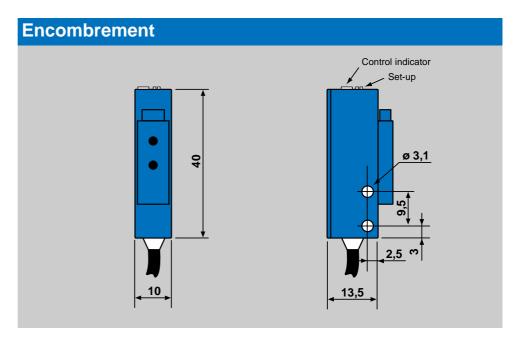


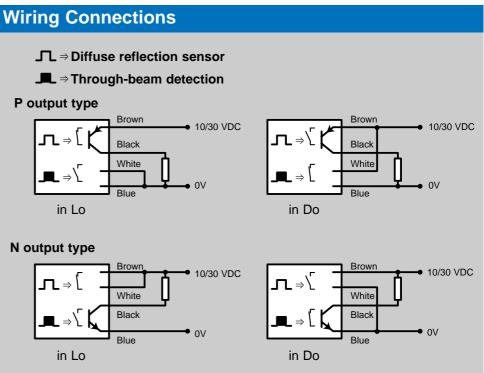
Description:

- Miniaturised
- · Integrated amplifier
- Quick set-up of the plastic fibre
- Detection indication by LED
- Direct / inverse output
- · Red pulsed visible light
- 2 m cable or M8 plug
- · Cheap product

Applications:

- Detection of parts in a difficult access.
- Plastic fibre use in vibrating surroundings.
- Small spaces conditionning sensors.





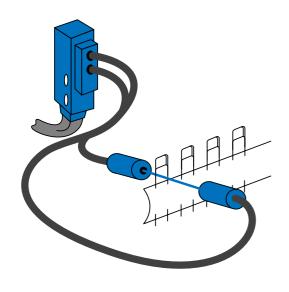
Tecnical Information		
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	< 25 mA
Response time	t _{on} or t _{off}	1 mS
	switching frequency	500 Hz
Output	max. nominal frequency	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Emission	LED	red pulsed
	modulation frequency	6 KHz
Temperature	operating	0 to 50° C
	storage	- 20° to 80° C
External light immunity	incandescent light	5 000 lux
	sunlight	10 000 lux
Protections	supply	inverse polarity protection
	output	permanent short-circuit or over-load protection
	degree	IP 65
Directe / inverse function		by cable, see "Wiring Connections"

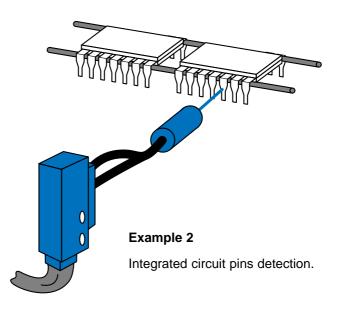
To Place Order	
Product	Plastic fibre miniature optic sensor
Reference	AFP 989 SN - 2 m cable output (NPN)
	AFP 989 SP - 2m cable ouput (PNP)
	AFP (C0) 989 SN - plug output (NPN)
	AFP (C0) 989 SP - plug output (PNP)

TYPE OF APPLICATIONS

Example 1

Pins detection on electronic circuits.





DCF 966 S

CE

Marks detection sensor with teach-in

Supply: 10 to 30 VDCOutput: PNP / NPN

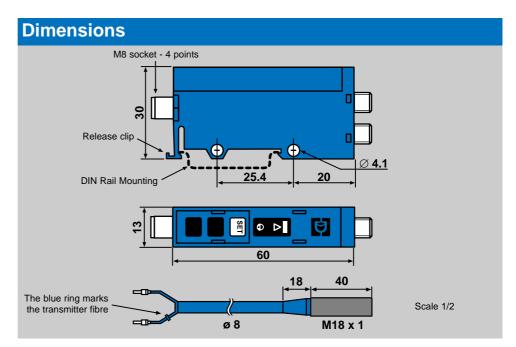
White light spot: Ø 1,5 mmVery high speed: 20 kHz

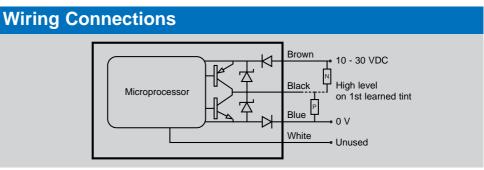
Description:

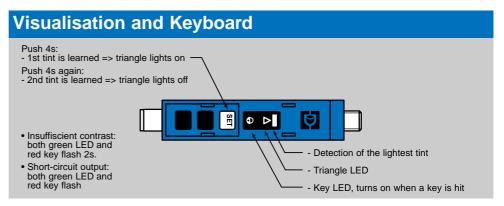
- Set-up by learning background and mark
- Detection by optic fibre with coaxial lens
- Indicator of contrast default
- · Short-circuit indicator
- Direct or inverse output
- Output: PNP / NPN
- M8 plug
- Polycarbonate strong housing

Applications:

- Detection of marks:
 - on packagings
 - on labels
 - in printing machinery
 - detection on difficult access area







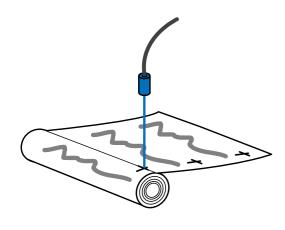
Technical Informatio	n	
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
<u></u>	consumption	50 mA
Response time	stability t _{on} / t _{off}	25 μs
	switching frequency	20 KHz
Output	max. nominal intensity	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Detection distance		18 mm (+/- 2 mm)
Emission	LED	white
	Spot diametre	1,5 mm
	modulation frequency	40 KHz
Temperature	operating	0 to 40 °C
	storage	-20 to 80 °C
External light immunity	incandescent light	10 000 lux
	sunlight	20 000 lux
Protections	supply	inverse polarity protection
	output	permanent short-circuit or over-load protection
	degree of protection	IP 65

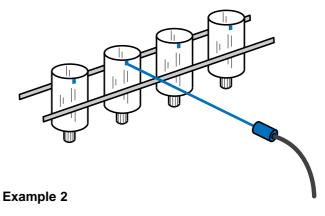
To Place Order	
Product	Plastic fibre sensor for contrast detection
Reference	DCF (C0) 966 S
Cable with M8 plug if required, please order together with the amplifier	CM 82 - ccable 2m CM 85 - cable 5m
Integrated optic fibre if required, please order together with the amplifier	FPDC 61 - fibre 60 cm FPDC 101 - fibre 100 cm

TYPES OF APPLICATIONS

Example 1

Detection of marks in a packaging machine.





Detection of marks on tubes.

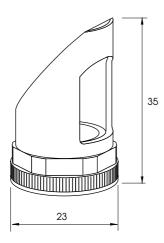




Accessories

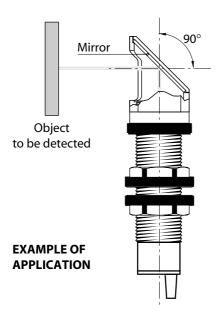
ACCESSORIES FOR PHOTOELECTRIC SENSORS M18

Accessory for reading at 90° (Art. DEV90)



Ray turner for 90° sensing of cylindrical photoelectric sensors M 18. It can be used for DIFFUSE REFLECTIVE, RETRO REFLECTIVE, POLARIZED RETRO REFLECTIVE, EMITTERS AND RECEIVERS THRU BEAM system.

Weight 7 g



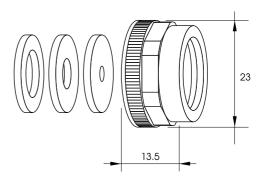
WARNING

The ray turner determines an attenuation of the switching distance that can be computed as follows:

$$DR = \frac{D-2}{100} \times 80$$

where "D" is the sensor switching distance indicated in cm and "DR" is the real switching distance indicated in cm.

Shutter for emitter-receiver Thru Beam (Art. P180TT)



WARNING:

each package contains three shutter disks

- Weight 5 g

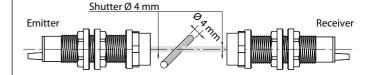
Accessory to detect small size objects with emitter-receiver cylindrical thru beam M18.

SHUTTII DIAM.	NG	MIN. OBJECT TO BE DETECTED	DISTANCE ATTENUATION
0	2 mm	≥ 2 mm	97 %
0	4 mm	≥ 4 mm	84 %
	8 mm	≥ 8 mm	54%

WARNING:

the datum "Minimum object to be sensed" refers to the condition of shutter mounted on emitter receiver.

EXAMPLE OF APPLICATION





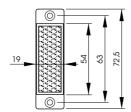


Accessories

REFLECTORS CODES AND DIMENSIONS

Rectangular type (Art. CT05)

Rectangular type (Art. CT07)



Thickness: 8,4 mm Weight 10 g

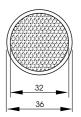
Thickness: 8 mm Weight 10 g

Round type (Art. CT01)

Thickness: 5 mm

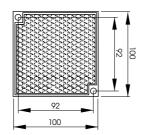


Round type (Art. CT02)



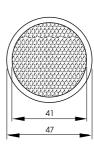
Thickness: 5.5 mm Weight 4 g

Rectangular type (Art. CT100)



Thickness: 9 mm Weight 40 g

Round type (Art. CT03)



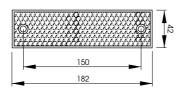
Thickness: 5 mm Weight 1 g

Rectangular type (Art. CT150)

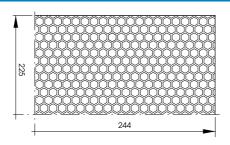


Thickness: 1 mm

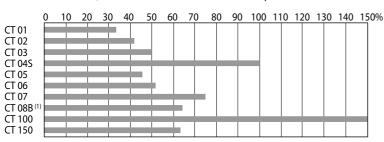
Weight 32 g



Adhesive type (Art. CT08B)

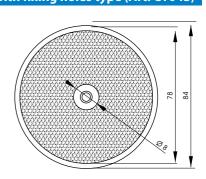


The reflection distance for all models is referred to CT04S as 100%. When other models or reflectors are used, the distance results different. See the picture.



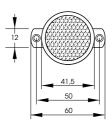
Note: (1) 80 x 80 mm

Round type with fixing holes type (Art. CT04S)

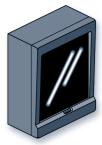


Thickness: 8 mm Weight 25 g

Round type with fixing holes type (Art. CT06)



Thickness: 6,5 mm Weight 6 g



THRU BEAM PHOTOELECTRIC SENSORS P 41 FOR EXTERNAL WALL MOUNTING

- · Low voltage AC/DC thru beam sensors
- 35 m range
- Wide beam diameter-easy to align
- Output LED indicator
- 1A relay SPDT
- Plastic housing

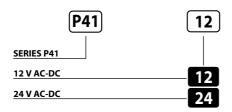
P 41 Series







Identification code

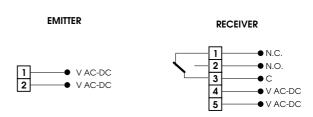


Note: Each package includes emitter and receiver.

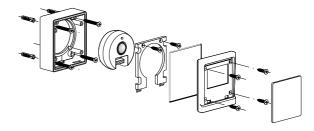
AVAILABLE	RECEIVER EMITTER	
SWITCHING DISTANCE	35 m	
EMISSION	Infrared ((875 ηm)
NOMINAL VOLTAGE	12 VDC or 24 VAC-DC	(see selection table)
FREQUENCY	50 ÷ 6	50 Hz
OUTPUT	2 Relay UNI 8612 norms	-
N° OF OPERATIONS	Mec.=5x10 ⁶ ops min. Elect. 3x10 ⁵ ops min. (1A 28 VDC) 1x10 ⁵ ops min. (0.5A 120 VAC)	
MAX OUTPUT CURRENT	1A 28 VDC - 0.5A 120 VAC (28 W, 60 VA) -	
ABSORPTION	70 mA	
YELLOW LED	Output indicator -	
GREEN LED	Supply indicator -	
SWITCHING FREQUENCY	5 Hz	
START UP DELAY	≤ 300 mS	
TEMPERATURE LIMITS	-20 ÷ +60°C	
LIGHT IMMUNITY	> 5000 Lux ⁽¹⁾	
PROTECTION DEGREE	IP 54	
CONNECTIONS	with connectors	
HOUSING MATERIAL	Housing: nylon loaded with fiberglass - Filter: methacrylate	
WEIGHT (Approximately)	315 g	

 $^{^{(1)}}$ Determined with halogen tungsten lamp 3000 $^{\circ}$ K.

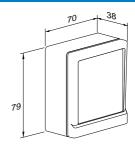
Wiring diagrams



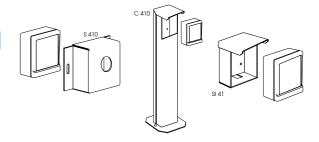
Detailed sight



Dimensions (mm)



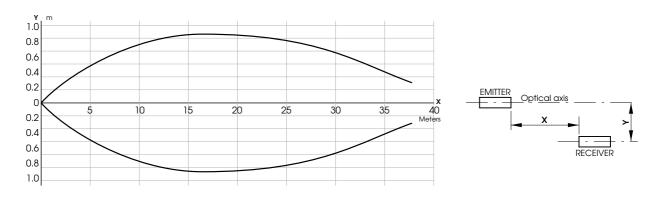
Use with accessories

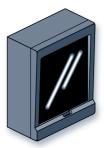


Important warning

The thru beam photoelectric sensor can be used as a sensor to detect the presence of an obstacle if the sensing beam gets interrupted.

In no case this device can substituted the obbligatory safety devices that must be applied on all dangerous equipments.





THRU BEAM PHOTOELECTRIC SENSORS WITH BATTERY SUPPLY P 44 FOR EXTERNAL WALL MOUNTING

- Low voltage 12 or 24 V AC/V DC receiver
- Battery-operated 9V emitter 150 day minimum
- 1 Hz switching frequency
- Wall mounting
- Solar cell power supply on request

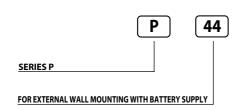
P 44 Series







Identification code



Note: Each package includes emitter, receiver and the alkaline battery for the emitter.

AVAILABLE	RECEIVER	EMITTER	
SWITCHING DISTANCE	15 m		
EMISSION	Infrared (875 ηm)		
NOMINAL VOLTAGE	12-24 VAC-DC (selectable)	9V alkaline battery	
FREQUENCY	50 ÷ 60 Hz	-	
OUTPUT	2 Relay UNI 8612 norms	-	
N° OF OPERATIONS	(5x10 ⁶ mec. op 100x10 ³ elect. op.)	-	
MAX OUTPUT CURRENT	1A 24 VDC - 0.5A 120 VAC	-	
BATTERY LIFE		150 days (min.)	
ABSORPTION	70 mA	-	
YELLOW LED	Output indicator		
GREEN LED	Supply indicator		
SWITCHING FREQUENCY	1 Hz		
RESPONSE TIME	≤ 900 mS		
START UP DELAY	≤ 300 mS		
TEMPERATURE LIMITS	-20 ÷ +60°C		
LIGHT IMMUNITY	> 5000 Lux ⁽¹⁾		
PROTECTION DEGREE	IP 54		
CONNECTIONS	with connectors		
HOUSING MATERIAL	Housing: nylon loaded with fiberglass - Filter: methacrylate		
WEIGHT (Approximately)	340 g		

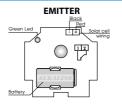
⁽¹⁾ Determined with halogen tungsten lamp 3000° K.

Important warning

The thru beam photoelectric sensor can be used as a sensor to detect the presence of an obstacle if the sensing beam gets interrupted.

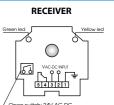
In no case this device can substituted the obbligatory safety devices that must be applied on all dangerous equipments.

Wiring diagrams



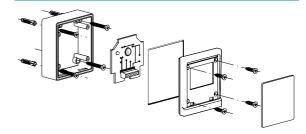
Connect the connectors 1 and 2 to the sensitive edge output contact to activate the beam emission.

WARNING: Do not connect other supply sources to the connectors 1 and 2 or to the battery plug. The device could be irreparably damaged.

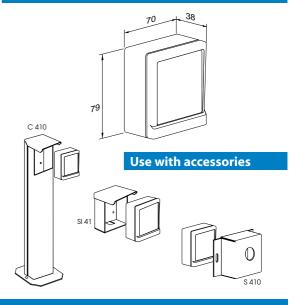


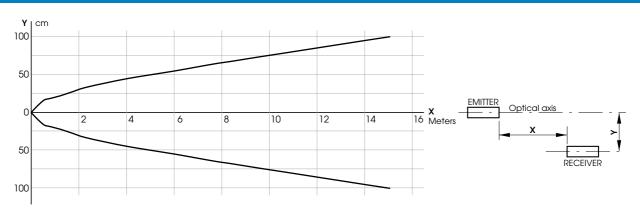
Note: Connect to ground the connector 1.

Detailed sight



Dimensions (mm)





THRU BEAM PHOTOELECTRIC SENSORS P 45 FOR EXTERNAL WALL MOUNTING

- Low voltage 12-24 VAC-DC
- 15 m range
- User friendly
- 1A relay SPDT
- Plastic housing

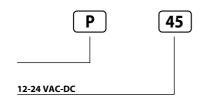
New







Identification code



Note: each package includes emitter and receiver

A) (A) AD E	25.650 (52	E1 1177E0
AVAILABLE	RECEIVER EMITTER	
SWITCHING DISTANCE	15 m	
EMISSION	Infrared	(950ηm)
NOMINAL VOLTAGE	12÷24\	/AC-DC
FREQUENCY	50 ÷ 6	50 Hz
OUTPUT	2 Relay UNI 8612 norms	-
N° OF OPERATIONS	Mec.=5x10 ⁶ ops min. Elect. 100x10 ³ ops mir	ı.
N OF OPERATIONS	(1A 24 VDC) 1x10 ⁵ ops min. (0.5A 120 VAC)	
MAX OUTPUT CURRENT	-	
ABSORPTION	40 mA	
YELLOW LED	not present	
GREEN LED	not present	
SWITCHING FREQUENCY	5 Hz	
START UP DELAY	≤ 300 mS	
TEMPERATURE LIMITS	-10 ÷ +65°C	
LIGHT IMMUNITY	> 5000 Lux ⁽¹⁾	
PROTECTION DEGREE	IP 54	
CONNECTIONS	with connectors	
HOUSING MATERIAL	Housing: nylon - Filter: methacrylate	
WEIGHT (Approximately)	160 g	

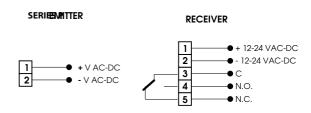
 $^{^{(1)}}$ Determined with halogen tungsten lamp 3000° K.

Important warning

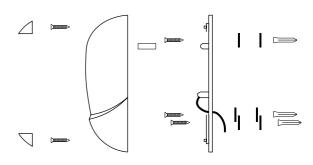
The thru beam photoelectric sensor can be used as a sensor to detect the presence of an obstacle if the sensing beam gets interrupted.

In no case this device can substituted the obbligatory safety devices that must be applied on all dangerous equipments.

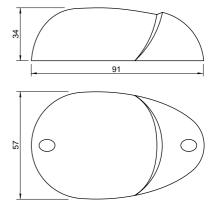
Wiring diagrams

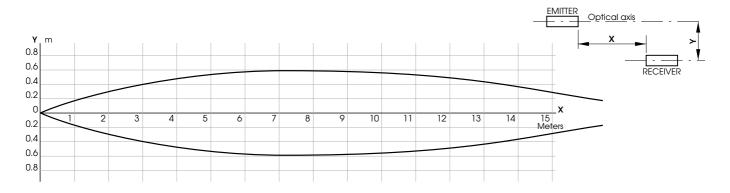


Detailed sight



Dimensions (mm)





CE

E/R 989 S

• Sensing distance: 4 m

• Supply: 10 à 30 VDC

• Output: PNP ou NPN

• Trimmer sensibility set-up

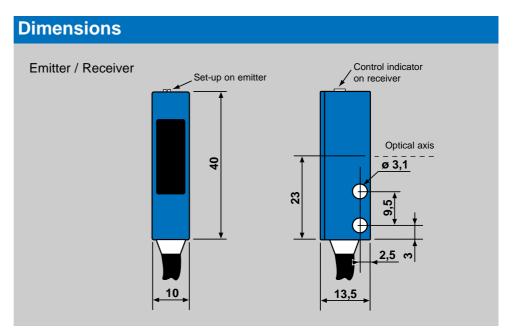


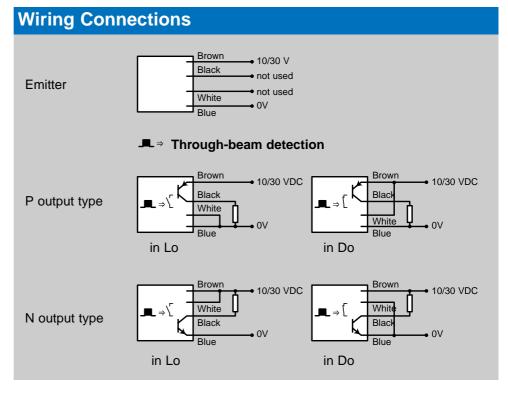
Description:

- Miniaturised
- · High sensing distance
- Integrated amplifier
- Detection indication by LED
- Direct / inverse output
- 2 m cable or M8 plug
- · Strong housing

Applications:

- Detection of opaque parts on a conveyor.
- Detection of opaque parts far away.
- Control of parts position on a robot.





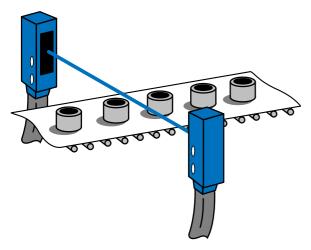
Tecnical Information		
Supply	voltage	10 / 30 VDC
		ripple < 10% within specified limits
	consumption	< 25 mA
Response time	t _{on} or t _{off}	1 mS
	switching frequency	500 Hz
Output	max. nominal frequency	100 mA
	residual voltage at 100 mA	< 2 V
	residual voltage at 10 mA	< 1 V
Emission	LED	red pulsed
	modulation frequency	6 KHz
Temperature	operating	0 to 50° C
	storage	- 20° to 80° C
External light immunity	incandescent light	5 000 lux
	sunlight	10 000 lux
Protections	supply	inverse polarity protection
	output	permanent short-circuit or over-load protection
	degree	IP 65 and IP 67
Directe / inverse function		by cable, see "Wiring Connections"

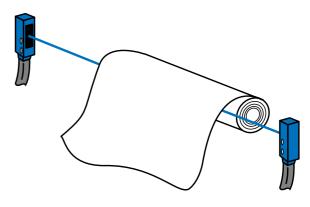
To Place Order		
Product	Miniature sensor in through-beam mode	
Reference	E 989 - cable output	R 989 SN - 2 m cable output (NPN)
	E (C0) 989 - plug output	R 989 SP - 2 m cable output (PNP)
		R (C0) SN - plug output (NPN)
		R (C0) SP - plug outpout (PNP)

TYPE OF APPLICATIONS

Example 1

Detection of rubber parts.





Exemple 2

Control of bobine end.



THRU BEAM PHOTOELECTRIC SENSORS P 40 FOR PANEL MOUNTING

- Low voltage AC/DC thru beam sensors
- Long range Sensor: 55 m range
- · User friendly, wide beam alignment
- Output LED indicator
- 1A relay SPDT
- Plastic housing

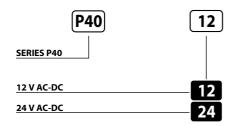
P 40 Series







Identification code

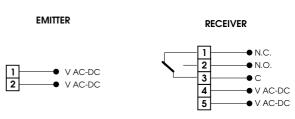


Note: Each package includes emitter and receiver.

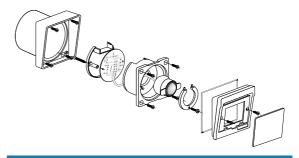
AVAILABLE	RECEIVER	EMITTER	
SWITCHING DISTANCE	55	m	
EMISSION	Infrared	(875 nm)	
NOMINAL VOLTAGE		-DC (see selection table)	
FREQUENCY	50 ÷ (60 Hz	
OUTPUT	2 Relay UNI 8612 norms	-	
N° OF OPERATIONS	Mec.=5x10 ⁶ ops min. Elect. 3x10 ⁵ ops min. (1A 28 VDC) 1x10 ⁵ ops min. (0.5A 120 VAC)		
MAX OUTPUT CURRENT	1A 28 VDC - 0.5A 120 VAC (28 W, 60 VA)	-	
ABSORPTION	70 mA		
YELLOW LED	Output indicator -		
GREEN LED	Supply indicator	-	
SWITCHING FREQUENCY	5 Hz		
START UP DELAY	≤ 300 mS		
TEMPERATURE LIMITS	-20 ÷ +60°C		
LIGHT IMMUNITY	> 5000 Lux ⁽¹⁾		
PROTECTION DEGREE	IP 54		
CONNECTIONS	with connectors		
HOUSING MATERIAL	Housing: nylon loaded with fiberglass - Filter: methacrylate		
WEIGHT (Approximately)	425 g		

 $^{^{(1)}}$ Determined with halogen tungsten lamp 3000° K.

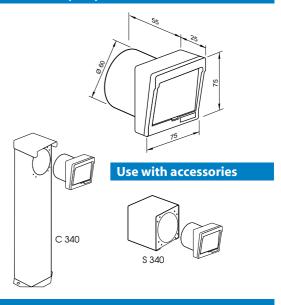
Wiring diagrams



Detailed sight



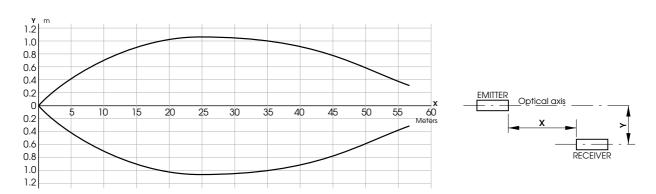
Dimensions (mm)



Important warning

The thru beam photoelectric sensor can be used as a sensor to detect the presence of an obstacle if the sensing beam gets interrupted.

In no case this device can substituted the obbligatory safety devices that must be applied on all dangerous equipments.



THRU BEAM PHOTOELECTRIC SENSORS BP 1012- BP 1024 FOR AUTOMATIC DOORS RELAY OUTPUT



- Thrubeam door sensor with separate amplifier
- 12 or 24 V AC/V DC input
- 5 Hz switching frequency
- 1A relay SPDT
- Sensitivity adjustment
- 6 m long integral cables

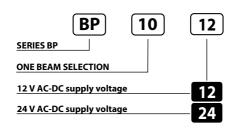
BP Series







Identification code



Note: Each package includes 1 pair of projectors.

AVAILABLE	ONE BEAM SELECTION
SWITCHING DISTANCE	10 m
EMISSION	Infrared (875 ηm)
NOMINAL VOLTAGE	12 or 24 VAC DC (-15 / +10%)
FREQUENCY	50 ÷ 60 Hz
OUTPUT	2 Relay UNI 8612 norms
N° OF OPERATIONS	(5x10 ⁶ mec. op3x10 ⁵ elect. op.)
MAX OUTPUT CURRENT	1A 24 VDC - 0.5A 120 VAC
ABSORPTION	70 mA
YELLOW LED	Output and activated thru beam indicator
GREEN LED	Supply indicator
SENSITIVITY ADJUSTMENT	Present
SWITCHING FREQUENCY	5 Hz
RESPONSE TIME	200 mS
START UP DELAY	≤ 300 mS
TEMPERATURE LIMITS	-20 ÷ +60°C
LIGHT IMMUNITY	5000 Lux ⁽¹⁾
PROTECTION DEGREE Amplifiers	IP 54
PROTECTION DEGREE Projectors	IP 65
CONNECTIONS	with connectors
HOUSING MATERIAL Amplifiers	ABS
HOUSING MATERIAL Projectors	Body - Lenses: methacrylate
WEIGHT (Approximately)	300 g

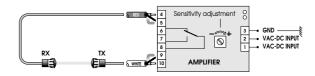
 $^{^{(1)}}$ Determined with halogen tungsten lamp 3000° K.

Important warning

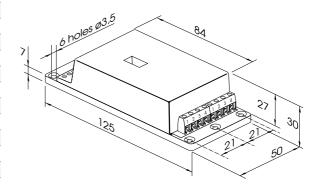
The thru beam photoelectric sensor can be used as a sensor to detect the presence of an obstacle if the sensing beam gets interrupted.

In no case this device can substituted the obbligatory safety devices that must be applied on all dangerous equipments.

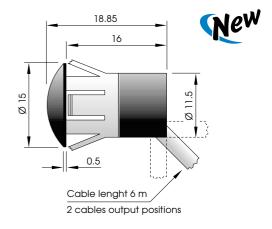
Wiring diagrams

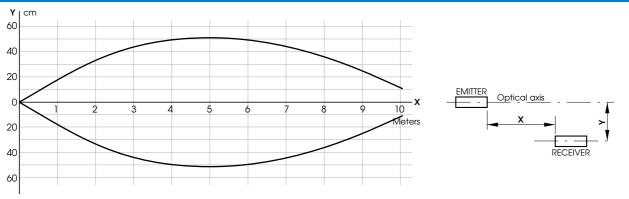


Amplifier dimensions (mm)



Projector dimensions (mm)





THRU BEAM PHOTOELECTRIC SENSORS BP 10220 FOR AUTOMATIC DOORS RELAY OUTPUT



- Thrubeam door sensors with separate amplifier
- 230 V AC/V DC input
- 5 Hz frequency/response
- 8 A relay SPDT
- Sensitivity adjustment
- 6 m long integral cables

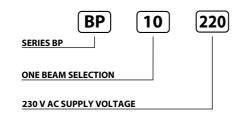
BP Series







Identification code



Note: Each package includes 1 pair of projectors.

AVAILABLE	ONE BEAM SELECTION
SWITCHING DISTANCE	10 m
EMISSION	Infrared (875 ηm)
NOMINAL VOLTAGE	230V AC DC (-15 / +10%)
FREQUENCY	50 ÷ 60 Hz
OUTPUT	Relay
N° OF OPERATIONS	Relay (5x10 ⁷ mec. op1x10 ⁵ elect. op.)
MAX OUTPUT CURRENT	8A 250 VAC
ABSORPTION	17 mA
YELLOW LED	Output and activated thru beam indicator
GREEN LED	Supply indicator
SENSITIVITY ADJUSTMENT	Present
SWITCHING FREQUENCY	5 Hz
RESPONSE TIME	200 mS
START UP DELAY	≤ 300 mS
TEMPERATURE LIMITS	-20 ÷ +60°C
LIGHT IMMUNITY	5000 Lux ⁽¹⁾
PROTECTION DEGREE Amplifiers	IP 54
PROTECTION DEGREE Projectors	IP 65
CONNECTIONS	with connectors
HOUSING MATERIAL Amplifiers	ABS
HOUSING MATERIAL Projectors	Body - Lenses: methacrylate
WEIGHT (Approximately)	350 g

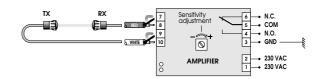
 $^{^{(1)}}$ Determined with halogen tungsten lamp 3000° K.

Important warning

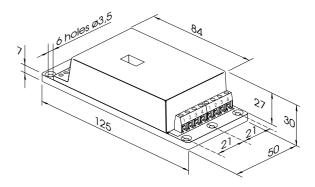
The thru beam photoelectric sensor can be used as a sensor to detect the presence of an obstacle if the sensing beam gets interrupted.

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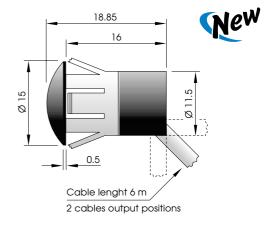
Wiring diagrams

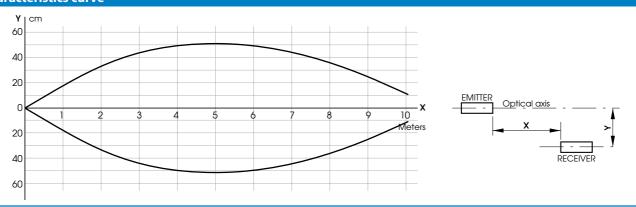


Amplifier dimensions (mm)



Projector dimensions (mm)





THRU BEAM PH. SENSORS BP 20-30 FOR AUTOMATIC DOORS WITH TIMER RELAY OUTPUT DOUBLE BEAM

- THRU BEAM PH. SEN
- Double beam thrubeam sensors-single or dual channel
- 1A relay SPDT
- Relay output: Single channel: 1A SPDT Dual channel: 1A SPDT
- 1 sec OFF delay timer, selectable
- 12-24 V AC/V ĎC input
- Sensitivity adjustment
 6 m long integral cables



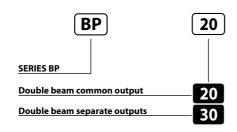






BP Series

Identification code

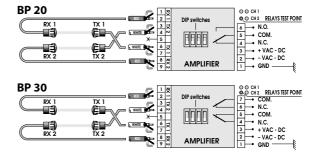


Note: Each package includes 1 pair of projectors.

AVAILABLE	DOUBLE BEAM SELECTION
SWITCHING DISTANCE	0.3 ÷ 10 m
EMISSION	Infrared (875 ηm)
NOMINAL VOLTAGE	12 ÷ 24 V AC DC ± (-15 / +10%)
FREQUENCY	50 ÷ 60 Hz
OUTPUT	2 Relay UNI 8612 norms
N° OF OPERATIONS	Mec. = $5x10^6$ ops min Elect. = $3x10^5$ ops min; (1A 28 VDC) $1x10^5$ ops min. (0.5A 120VAC)
MAX OUTPUT CURRENT	1A 28 VDC - 0.5A 120 VAC (28W 60V A)
ABSORPTION	80 mA
YELLOW LED	Output and activated thru beam indicator
GREEN LED	Supply indicator
SWITCHING FREQUENCY	5 Hz
START UP DELAY	≤ 300 mS
TEMPERATURE LIMITS	-20 ÷ +60°C
LIGHT IMMUNITY	> 5000 Lux ⁽¹⁾
PROTECTION DEGREE Amplifiers	S IP 50
PROTECTION DEGREE Projectors	IP 65
CONNECTIONS	with connectors
HOUSING MATERIAL Amplifiers	ABS
HOUSING MATERIAL Projectors	Body - Lenses: methacrylate
WEIGHT (Approximately)	430 g

 $^{^{(1)}}$ Determined with halogen tungsten lamp 3000° K.

Wiring diagrams



One beam selection

DIP 3



In case the photoelectric thru beam is used with just one emitter or one receiver, chek that the selection DIP-Switch 3 (DIP 3) is in position ON.



Duoble beam selection

DIP :



In case the photoelectric thru beam is used with two emitters and two receivers, check that the selection DIP-Switch (DIP 3) is in position OFF.



Reduced working distance (BP20 mod.)

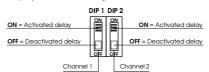
DIP 4



In order to reduce the working (switching) distance to 50% set the dip switch "DIP 4" in position ON.

Delay at sensor deactivation

Operating on the suitable DIP-Switches it is possible to select on each channel a delay to the sensor deactivation, it permits to keep the sensor excited for abaut 1 second once the obstacle has passed the active area. Regulating the DIP-Switches (DIP 1 and DIP 2) in position ON, the delay is activated.

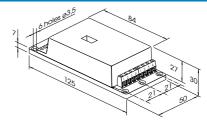


Important warning

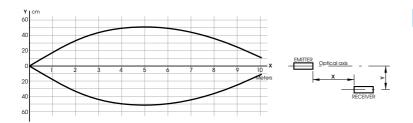
The thru beam photoelectric sensor can be used as a sensor to detect the presence of an obstacle if the sensing beam gets interrupted.

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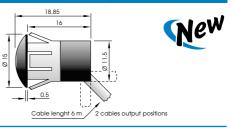
Amplifier dimensions (mm)



Characteristics curve



Projector dimensions (mm)

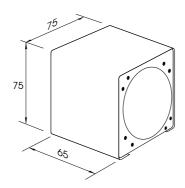








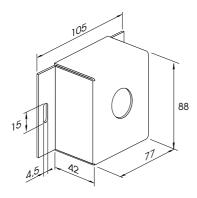
Box for P 40 (Art. S 340)



Metal box for wall mounting of model P40. Epossidic painted. Colour grey. Material: zinc-coated iron.

Weight 270 g

Anti-vandalism box for P 41 (Art. S 410)

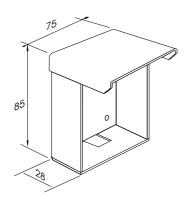


Anti-vandalic metal box for model P41. Colour grey.

Material: zinc-coated iron.

- Weight 240 g

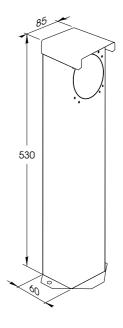
Box for P 41 (Art. SI 41)



Metal box for wall mounting of model P41. Epossidic painted. Colour grey. Material: zinc-coated iron.

Weight 160 g

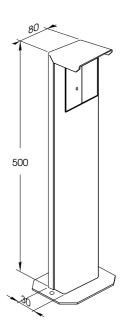
Post for P 40 (Art. C 340)



Metal post to support the model P40. Epossidic painted. Colour grey. Material: zinc-coated iron.

— Weight 1600 g

Post for P 41 (Art. C 410)



Metal post to support the model P41. Epossidic painted. Colour grey.

Material: zinc-coated iron.

Weight 1200 g





Inductive And Capacitive Sensors

GENERAL SPECIFICATIONS

WORKING PRINCIPLES

Inductive sensors

Voltage to the device creates an alternate inductive field through an oscillator coil before its active surface. If a metallic object (iron, alluminium, cooper, brass etc.) enters this field, it damps the oscillator and reverses the trigger threshold and causes a change in the output stage state.

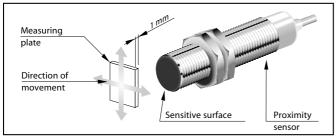
Capacitive sensors

 $\label{lem:capacitive sensors contain an oscillator by transistor in the frontal section.$

The oscillating circuit R - C (Resistor - Capacitor) is influenced by variations in capacity, infact when any material, solid or liquid (water, wood, metal, caffee, ponders, etc) comes into contact with the active surface of the sensor the capacitance increases putting into action the oscillator up until the threshold of trigger inverts. By introducing a change in the condition of the final stage and therefore in the command of the external load a potentiometer makes fine adjustment to switching distance.

Nominal switching distance (Sn) According to EN 60947-5-2

It is the conventional distance at which the diffuse sensor switches when approching standard targets with axial movement. Such target (conform to the EN 500 10 regulation) should be of steel Fe37, square and 1mm thick. Targets should be the same as the sensor diameter.



Usable operating distance (Su) According to EN 60947-5-2

It is the assured operating distance during the specified voltage, functionning and temperature intervals it is included between 81% and 121% of the nominal switching distance Sn (0,81Sn \leq Su \leq 1,21Sn) for inductive sensors, and between 72% and 132% of the nominal switching distance (0,72Sn \leq Su \leq 1,32Sn) for capacitive sensors.

Assured operating distance (Sa) According to EN 60947-5-2

It is the distance at which the proximity sensor works safely in all the temperature and voltage intervals as specified for the same sensor. The assured operating distance is included between \emptyset and I'81% of Sn ($\emptyset \le Sa \le 0.81Sn$) for inductive sensors, and \emptyset and 72% of Sn ($\emptyset \le Sa \le 0.72Sn$) for capacitive sensors.

Reducing factors

When the element to be detected is different from Fe37, reduction factors are:

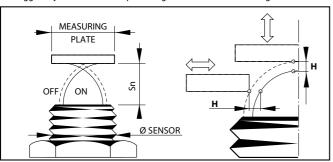
INDUCTIVE SENSORS		
Fe37	1 x Sn*	
Stainless-steel	0,9 x Sn	
Brass-Bronze	0,5 x Sn	
Alluminium	0,4 x Sn	
Copper	0,4 x Sn	

CAPACITIVE SENSORS		
Metal	1 x Sn*	
Water	1 x Sn	
P.V.C.	0,5 x Sn	
Glass	0,5 x Sn	
Wood	0,4 x Sn	

*Sn = Nominal switching distance

Hysteresis (H)

It is the distance between the point of switching on and the point of switching off of the trigger object. The value is a percentage of the nominal switching distance Sn.



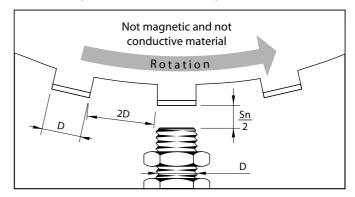
Repeatability (R) According to EN 60947-5-2

It is the precision by which the sensor switching commutation distance is repeated at the maximum supply voltage, at the temperature of 23 $^{\circ}$ C \pm 5 $^{\circ}$ C with a load current = 100 mA, during a 8 hours period.

The value expresses the percentage of the difference between the maximum and the minimum measure related to the average value of the switching distance Sn.

Switching frequency

It is the maximum possible number of impulse repetition per second. This value is obtained by measurement with a cogged wheel in which cogs are of triggering material. The cogs are as large as the diameter of the sensor and the distance between two cogs is twice the diameter (according to the EN 60947-5-2).



ELECTRICAL PARAMETERS

RATED VOLTAGE

It indicates the power supply where the sensor works perfectly.

RESIDUAL RIPPLE

Maximum ripple allowed on supply DC voltage. It is shown in percentage referring to the medium value.

MAXIMUM OUTPUT CURRENT

The maximum output current of the sensor in continuous operation.

MINIMUM OUTPUT CURRENT

 $\label{lem:minimum} \mbox{Minimum output current through the sensor to maintain normal operation.}$

MAXIMUM PEAK CURRENT

The maximum current the sensor can sustain in a limited period of time.

ABSORPTION

Current consumption of the sensor referred to the maximum value of the nominal voltage and without load.

VOLTAGE DROP

Voltage drop measured on switching circuit when output transistor is activated.

SHORT CIRCUIT PROTECTION

It takes place in presence of short circuit or overload to avoid any damage to inner circuits. When the short circuit is removed, the sensor is automatically reactivated.

PROTECTION AGAINST REVERSAL OF POLARITY

All the sensor with DC supply are protected against reversal of polarity, this prevents the internal components from being damaged by incorrect power supply connection.

PROTECTION AGAINST INDUCTIVE LOADS

It protects sensor output in presence of high inductive loads. This protection is performed by a diode or zenner diod. If possible keep the power conductors separate.

PROTECTION DEGREE

The degree of protection of the housing and conform to the IEC 529 regulation.

START UP DELAY

Time interval between sensor supply connection and active output.





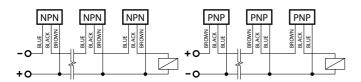
Inductive And Capacitive Sensors

GENERAL SPECIFICATIONS

SERIES AND PARALLEL CONNECTIONS FOR NPN O PNP SENSORS

With this kind of connection take into account as follow:

- 1) voltage drop (C.D.T.) for each sensor (<1,8 V);
- 2) maximum load current of sensors reffering to self consumption of each sensor (< 10 mA) at output load.

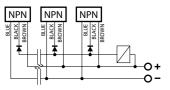


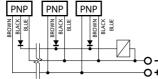
NPN CONFIGURATION WHO WAS AND THE STREET OF THE STREET OF

NOTE: In presence of inductive loads, when more sensors are connected in series, diode D should be connected in antiparallel to the load.

Connection in parallel (OR)

When omitting the diodes shown in the chart, use sensors with output stage, open collector type.

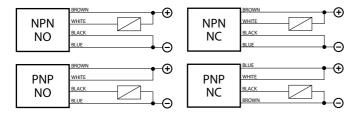




AMPLIFIED SENSORS 10-30 VDC 4 WIRES PROGRAMMABLE OUTPUT

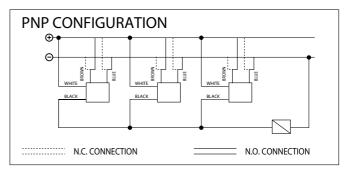
Thanks to the output separated from the rest of circuit, sensors so connected provide important advantages, such as the possibility of 4 output configurations (NPN-NO, NPN-NC, PNP-NO, PNP-NC) on the same model and the possibility of connection in series.

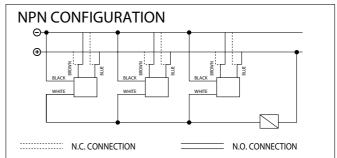
OUTPUT DIAGRAM



Connection in parallel (OR)

When connected in this way sensors can activate the common output independently, when energized. Thank to the real low leaking current, there is no actual limitation in the number of sensor that can be connected in parallel, providing that the min. current of load energized is mA.



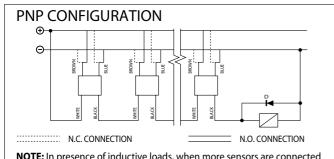


Connection in series (AND)

Connected in this way sensors activate only output when they are energized simultaneously. The maximum number of connectable sensors in connections of this type is given by the following formula:

n = (V supply - V load) / V residual

where: • V supply = voltage • V load = voltage for min. load energized • V residual = residual voltage in the commutative circuit in ON state.



NOTE: In presence of inductive loads, when more sensors are connected in series, diode D should be connected in antiparallel to the load.

SERIES AND PARALLEL CONNECTIONS FOR AC SENSORS

Alternate current sensors can be connected in parallel, but voltage drop ($<6\,V$) at the sensor end must be taken into account.

When connecting in parallel, and current (without load) (<4 mA) of all sensors. Be careful at the minimum load (high load impedence).

These connections are not advisable as they may cause anomalities.

NOTICE FOR 24 VAC SUPPLY

In sensor with 24VAC supply it is important to pay attention to the voltage drop (<6 V) at the ends of the sensor and a possible drop in the connection cables between sensor and load.

In order to have a proper voltage on the load, it is advisable to encrease supply voltage by at least 6V.





Inductive And Capacitive Sensors

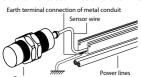
GENERAL SPECIFICATIONS

INSTRUCTIONS FOR CORRECT INSTALLATION

THESE SENSORS ARE NOT MADE FOR SAFETY APPLICATIONS AND FOR SAFETY DEVICES. THEREFORE THEY CANNOT BE USED TO PREVENT INJURIES TO PERSONS, DAMAGES, INDUSTRIAL DAMAGES, ACCIDENT.

Connections

- Do not exceed the voltage limits printed on the product label. For DC sensors, use stable tension.
- Do not connect the sensors power supply cables down-stream from other devices and make sure they are directly connected to the mains.
- 3) If the power supply source is a switching voltage regulator, connect the FG (Frame Ground) terminal to the ground.
- 4) Connect to the ground the FG (Frame Ground) terminal and all metallic parts of every industrial machinery or not if a sensor is used in it.
- 5) Do not use the sensors near electromagnetic or high frequency fields.
- 6) The cables of sensors must be separate from the power supply cables, from the engines cables, from the inverters cables, or from any other electromagnetic device because induction noise could cause malfunction or damage to the inductive sensors. Separate the wires of the sensor from the above indicated lines and then insert the wires into an earthed metal conduit.



7) After making all operations mentioned in the above point 6, if inductive interference exists, an adequate transient suppression filter must be used on the power supply line in proximity to the sensor.

sensor mill power lines 8) When a large distance by the connection wires to the sensor has to be covered, use conductors with a cross-

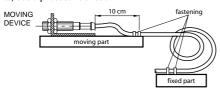
section of at least $0.50\,\mathrm{mm^2}$ and do not exceed the maximum distance of 100 m. 9) The output signal of a sensor cannot be used during the start up delay (not

more than 300 mS). 10) Several sensors should not be connected in series, whereas several sensors

10) Several sensors should not be connected in series, whereas several sensors can be connected in parallel.

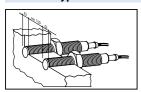
Assembly

- 1) For correct assembly and alignment, all the accessories supplied with the sensor must be used.
- 2) To regulate the sensitivity adjustment trimmer use a suitable screw-driver without exerting excessive force.
- 3) Do not turn too much fixing screws or nuts to avoid electrical or mechanical damages.
- 4) Mounting sensors side by side, leave an appropriate place between them to avoid mutual interference.
- 5) Do not pull the connection cable of the sensor. When the conditions of use result to be too hard (in places not protected from shocks or subjected to movements) use a protective sheath.



- 6) Avoid continuous movements between the sensor and its cable and follow the instructions given in the drawing.
- Protect the sensitive surface of the sensor from shocks, mechanical pressures to avoid irreparable damages.
- 8) Install the sensor being careful that metallic (or of any other material) shavings shall not settle on the sensitive part of the sensor.
- 9) Do not use the sensors in presence of organic or liquid solvents or of any kind of acid.
- 10) Do not use the sensors outdoors without an adequate protection.
- 11) Do not exceed the indicated temperature limits.
- 12) Do not subject the appliance to strong vibrations or to shocks which can damage the sensor or can harm its impermeability.
- 13) Although some ranges of INFRA proximity sensors are protected to IP67, this does not mean that our devices can be used to detect objects in water or in the rain.

Shielded types



These sensors are not effected by the surrounding metal and therefore the unit can be embedded in it. In order to avoid reciprocal interfe-rance when more sensors are installed side by side, the minimum distance between two sensors must be D/2 (D = sensor diameter).

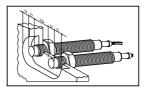
Shielded types double switching distance



For assembly in contact with the metal surface, observe the following values:

Ø	6,5	8	12	18	30
(mm) X	≥1	≥1	≥2	≥ 3,5	≥5

Not shielded types



As these sensors are effected by metal, the area close to the active surface should be free. This area can be of air, non-magnetic or non-conductive material. When sensors are installed side by side, the distance between two sensors should be 2D (D = sensor diameter).

Torque setting for fastening nuts

Avoid over-tightening the fastening nuts in order not to damage the container and to avoid breaking the internal circuit as a result.

Take particular care with the models which have a diameter less than 12 mm.

SENSITIVITY ADJUSTMENT FOR CAPACITIVE SENSORS

Sensitivity adjustment should be carried out when the sensor is installed in a definitive and stable position. Adjustment should be carried out in an intermediate position between minimum and maximum because, since air is a dielectric, a strong variation in humidity could cause inappropriate energising of the sensor (if adjustment is very fine).

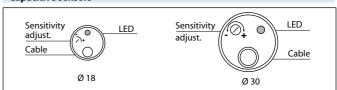
The intervention range of the sensor depends on the type of material to be detected and its dimensions (see reduction factor table).

The distance can vary depending on the temperature variation by about $\pm\,10\%$ in a range of -20 to +70 $^{\circ}\text{C}$.

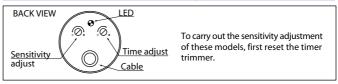
To increase sensitivity, turn the trimmer clockwise, to decrease sensitivity, turn it anti-clockwise.

To gain access to the trimmer, remove the plastic protection screw located at the back of the sensor.

Capacitive sensors



Capacitive sensors with ON/OFF time delay



Further information

The manufacturer is not liable for the improper use of the product. Any use and/or application which are not provided for by this instructions sheet must be previously and directly authorized by the same manufacturer.

POWER SUPPLY FOR SENSORS IN DC CURRENT

A stabilised source of voltage can be obtained using the table indicated beside. Use the following ways to dimension the components:

VAC = (V RMS transformer) =
$$\frac{\text{(V OUT + 4.5) x 1.1}}{1.41}$$

C1 = $\frac{\text{(0.0053) x I OUT}}{\text{(value indicated in } \mu\text{F})}$

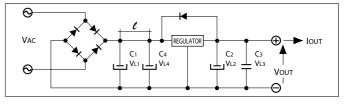
VL1 = VAC x 1.41 x 1.2

If " ℓ " is bigger than 10 cm, add C4 beside the stabiliser

 $C4 = 100 \, \mu F \, ; \, VL4 = VAC \, x \, 1.41 \, x \, 1.2$ $C2 = 220 \, \mu F \, ; \, VL2 = VOUT \, \, x \, 1.2$

 $C3=0.1~\mu F$; VL3 = 63 V Note: the regulator must provide adequate power dissipation as:

P DISS. = $\frac{(VAC \times 1.41) - VOUT}{I \text{ OUT max}}$ Where IOUT max. is the maximum available (supplied) current



Amplified Capacitive Sensors I 18

AMPLIFIED CAPACITIVE SENSORS IN METAL HOUSING 12÷30 VDC NPN OR PNP OUTPUT

- Four wires, 12-30 VDC
- NPN NO and NC
 PNP NO and NC
- · Adjustable range, 9-turn trimmer
- Nickel-plated brass
- Hight noise immunity
- Hight temperature stability

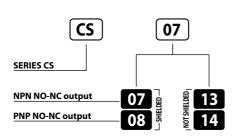
CS Series





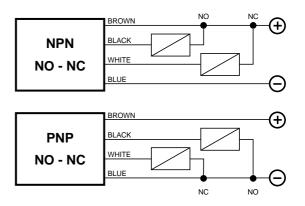


Identification code



	SHIELDED	NOT SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	1÷5 mm	1÷10 mm
NOMINAL VOLTAGE	12 ÷ 30 VDC	(-15/+10%)
RESIDUAL RIPPLE	≤1	0%
HYSTERESIS	Depending on the	e sensing distance
MAX. CURRENT OUTPUT	200	mA
ABSORPTION AT 24 VDC	≤ 20) mA
VOLTAGE DROP (Sensor ON)	≤ 1.8 V (I =	= 100 mA)
OPERATION LED	Yel	low
SENSITIVITY ADJUSTMENT	Trimmer 9 turns	
SWITCHING FREQUENCY	10 Hz	
START UP DELAY	≤ 100 mS	
REPEATABILITY (at even temperature)	≤5%	
SHORT CIRCUIT PROTECTION	Present	
ELECTRIC PROTECTIONS	Against polarity reversal - inductive loads	
TEMPERATURE LIMITS	- 25 ÷ +70 °C	
PROTECTION DEGREE	IP 67	
CABLE LENGTH	2 m	
CABLE SECTION	4 x 0.25 mm2	
HOUSING MATERIAL	Nickel-plated brass	
WEIGHT (Approximately)	160 g	

Wiring diagrams



Sensitivity adjustment

The sensitivity adjustment must be done when the sensor is installed in a definite and steady position.

The regulation must be done in a position half way between minimum and maximum, because, being air dielectric, a strong humidity variation could cause, if the regulation is very light, nuisance tripping.

The sensing distance of the sensor depends on the kind of material to detect and on its dimensions (see table about reduction factors).

The distance could change according to temperature variations. To increase the sensitivity twist the trimmer clock-wise, to decrease do it anti clock-wise.

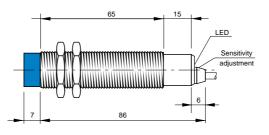
Models with cable output dimensions (mm)

SHIELDED MODELS

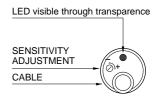
Sensitivity adjustment

LED

NOT SHIELDED MODELS



Ø 18 BACK VIEW



Amplified Capacitive Sensors 930

AMPLIFIED CAPACITIVE SENSORS IN METAL HOUSING 12÷30 VDC NPN OR PNP OUTPUT

- Four wires, 12-30 VDC
- NPN NO and NC
- PNP NO and NC
- Adjustable range, 9-turn trimmer
- Nickel-plated brass
- Hight noise immunity
- Hight temperature stability

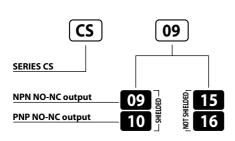
CS Series





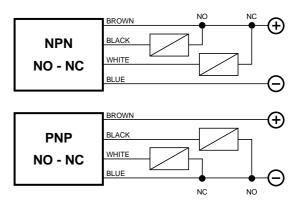


Identification code



	SHIELDED	NOT SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	1÷20 mm	1÷25 mm
NOMINAL VOLTAGE	12 ÷ 30 VDC	(-15/+10%)
RESIDUAL RIPPLE	≤1	0%
HYSTERESIS	Depending on the	e sensing distance
MAX. CURRENT OUTPUT	200	mA
ABSORPTION AT 24 VDC	≤20) mA
VOLTAGE DROP (Sensor ON)	≤ 1.8 V (I =	= 100 mA)
OPERATION LED	Yellow	
SENSITIVITY ADJUSTMENT	Trimmer 9 turns	
SWITCHING FREQUENCY	10 Hz	
START UP DELAY	≤ 100 mS	
REPEATABILITY (at even temperature)	≤5%	
SHORT CIRCUIT PROTECTION	Present	
ELECTRIC PROTECTIONS	Against polarity reversal - inductive loads	
TEMPERATURE LIMITS	- 25 ÷ +70 °C	
PROTECTION DEGREE	IP 67	
CABLE LENGTH	2 m	
CABLE SECTION	4 x 0.25 mm2	
HOUSING MATERIAL	Nickel-plated brass	
WEIGHT (Approximately)	250 g	

Wiring diagrams



Sensitivity adjustment

The sensitivity adjustment must be done when the sensor is installed in a definite and steady position.

The regulation must be done in a position half way between minimum and maximum, because, being air dielectric, a strong humidity variation could cause, if the regulation is very light, nuisance tripping.

The sensing distance of the sensor depends on the kind of material to detect and on its dimensions (see table about reduction factors).

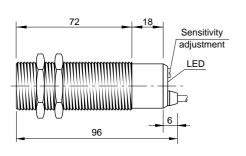
The distance could change according to temperature variations. To increase the sensitivity twist the trimmer clock-wise, to decrease do it anti clock-wise.

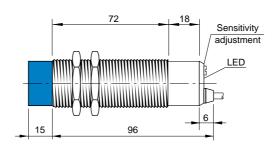
Models with cable output dimensions (mm)

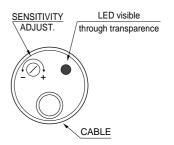
SHIELDED MODELS

NOT SHIELDED MODELS

Ø 30 BACK VIEW







Amplified Capacitive Sensors I 30

AMPLIFIED CAPACITIVE SENSORS IN METAL HOUSING 18+230 VAC-DC WITH TIMER RELAY OUTPUT

- Wide imput voltage, 18-230 VA/DC
- Relay SPDT output: 3A@30VAC, 1A@220VAC
- Timer, adjustable 1sec 5 min
- Adjustable range
- Hight noise immunity
- Hight temperature stability

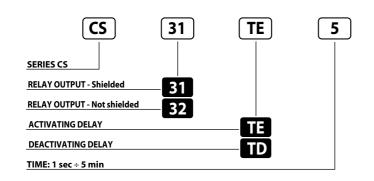
CS Series







Identification code



	SHIELDED	NOT SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	1 ÷ 20 mm	2 ÷ 30 mm
NOMINAL VOLTAGE	18 ÷ 230 VAC-	DC (-15/+10%)
NET FREQUENCY	50 ÷	60 Hz
HYSTERESIS	Depending on the	e sensing distance
OUTPUT	Relay (10 x1	06 ops. min.)
MAX. CURRENT OUTPUT	3A 30VAC - 1A 220	VAC (90 W, 360 VA)
ABSORPTION	2.5	VA
OPERATION LED	Yellow	
SENSITIVITY ADJUSTMENT	Trimmer 9 turns	
START UP DELAY	≤ 300 mS	
SWITCHING FREQUENCY	10 Hz	
REPEATABILITY (at even temperature)	≤ 5%	
TEMPERATURE LIMITS	- 25 ÷ +70 °C	
PROTECTION DEGREE	IP 65	
CABLE LENGTH	2 m	
CABLE SECTION	6 x 0.30 mm2	
HOUSING MATERIAL	Nickel-plated brass	
WEIGHT (Approximately)	250 g	

Wiring diagrams

		BROWN	
lь		BROWN	———(+)
R E		WHITE	0 L
15	1	RED	
		BLACK	
≎		BLUE	———— N
Ŀ			

Sensitivity adjustment

The sensitivity adjustment must be done when the sensor is installed in a definite and steady position.

The regulation must be done in a position half way between minimum and maximum, because, being air dielectric, a strong humidity variation could cause, if the regulation is very light, nuisance tripping.

The sensing distance of the sensor depends on the kind of material to detect and on its dimensions (see table about reduction factors).

The distance could change according to temperature variations. To increase the sensitivity twist the trimmer clock-wise, to decrease do it anti clock-wise.

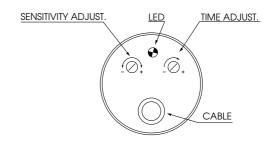
Time delay

To regulate the sensitivity of these models, reset the time delay trimmer before.

The available range of delay is:

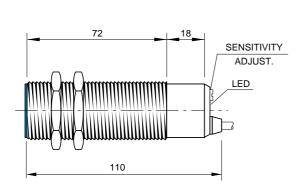
1 SEC. ÷ 5 MIN.

BACK VIEW

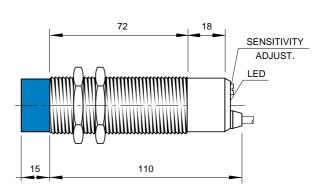


Models with cable output dimensions (mm)

SHIELDED



NOT SHIELDED



AMPLIFIED INDUCTIVE SENSORS 10÷30 V DC 3 WIRES NPN OR PNP OUTPUT

- Three-wire, amplified, shielded sensors
 10 to 30 VDC, NPN or PNP
- NO select

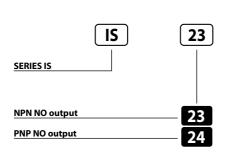








Identification code



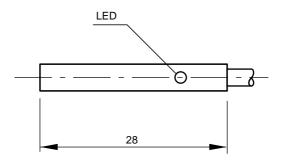
	BROWN	— ⊕
NPN	BLACK	
	BLUE	—Θ
	BROWN	—(+)
PNP	BLACK	
	BLUE	— ⊝

Wiring diagrams

	SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	0,8 mm
NOMINAL VOLTAGE	10 ÷ 30 VDC (-15 / +10%)
RESIDUAL RIPPLE	≤ 10%
HYSTERESIS	< 10%
MAX. OUTPUT CURRENT	100 mA
RESIDUAL CURRENT	≤ 10 mA
VOLTAGE DROP	< 1 V (I = 100 mA)
OPERATION LED	Present
SWITCHING FREQUENCY	800 Hz
START UP DELAY	≤ 50 mS
REPEATABILITY	≤ 1%
SHORT CIRCUIT PROTECTION	Present (self-resetting)
ELECTRIC PROTECTIONS	Against polarity reversal - inductive loads
TEMPERATURE LIMITS	- 25 ÷ +60 °C
PROTECTION DEGREE	IP 67
CABLE LENGTH	2 m
CABLE SECTION	3 x 0.14 mm ²
HOUSING MATERIAL	Stainless-steel
WEIGHT - Cable output -	50 g
WEIGHT - K connector output -	-

Dimensions (mm)

CONFIGURATION WITH CABLE



AMPLIFIED INDUCTIVE SENSORS 10÷30 V DC 3 WIRES NPN OR PNP OUTPUT

- Three-wire, amplified, shielded sensors
- 10 to 30 VDC, NPN or PNP
- NO select
- M8 quick connect models

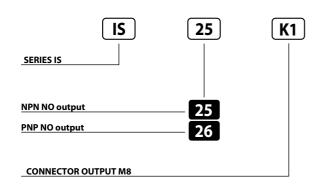
IS Series





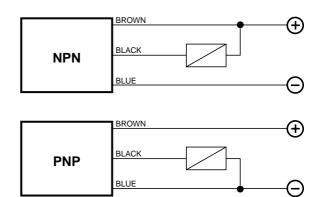


Identification code

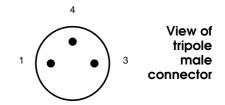


	SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	0,8 mm
NOMINAL VOLTAGE	10 ÷ 30 VDC (-15 / +10%)
RESIDUAL RIPPLE	≤ 10%
HYSTERESIS	< 10%
MAX. OUTPUT CURRENT	100 mA
RESIDUAL CURRENT	≤ 10 mA
VOLTAGE DROP	< 1 V (I = 100 mA)
OPERATION LED	Present
SWITCHING FREQUENCY	800 Hz
START UP DELAY	≤ 50 mS
REPEATABILITY	≤ 1%
SHORT CIRCUIT PROTECTION	Present (self-resetting)
ELECTRIC PROTECTIONS	Against polarity reversal - inductive loads
TEMPERATURE LIMITS	- 25 ÷ +60 °C
PROTECTION DEGREE	IP 67
CABLE LENGTH	2 m
CABLE SECTION	3 x 0.14 mm ²
HOUSING MATERIAL	Stainless-steel
WEIGHT - Cable output -	50 g
WEIGHT - K connector output -	40 g

Wiring diagrams



Connection with connector M8 (K1)

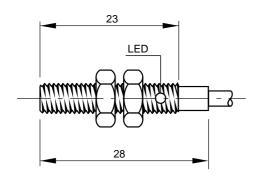


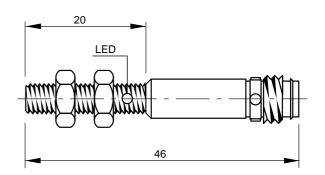
CONTACTS CONFIGURATION

Available	Contacts numbers		
] BROWN	3 BLUE	4 BLACK
NPN/PNP	+	_	NO/NC

Dimensions (mm)

CONFIGURATION WITH CABLE





AMPLIFIED INDUCTIVE SENSORS 12÷30 VDC 4 WIRES PROGRAMMABLE OUTPUT

- · Four-wire, amplified sensors
- Programmable outputs: NPN/PNP, NO or NC
- · Cable or M12 quick-connect
- Nickel plated brass
- 12-30 VDC

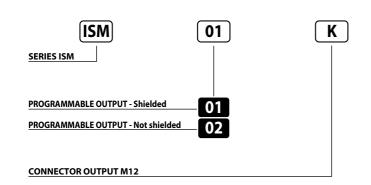
ISM Series





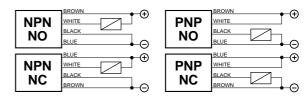


Identification code



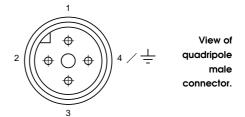
	CLUEL DED	NOT CHIEF DED
	SHIELDED	NOT SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	2 mm	4 mm
NOMINAL VOLTAGE	12 ÷ 30 VDC	(-15/+10%)
RESIDUAL RIPPLE	≤ 10	%
HYSTERESIS	< 10	%
OUTPUT	NPN or PNP (ma	y be selected)
CONTACT	NO or NC (may	be selected)
MAX. CURRENT OUTPUT	200 r	mA
ABSORPTION AT 24 VDC	< 1.2	mA
VOLTAGE DROP (Sensor ON)	< 1,8 V (I =	100 mA)
OPERATION LED	Yellow	
SWITCHING FREQUENCY	1000 Hz	
START UP DELAY	≤ 50 mS	
REPEATABILITY	≤ 3%	
SHORT CIRCUIT PROTECTION	Present (self	-resetting)
ELECTRIC PROTECTIONS	Against polarity rever	sal - inductive loads
TEMPERATURE LIMITS	- 25 ÷ +	70 °C
PROTECTION DEGREE	IP 6	7
CABLE LENGTH	2 n	n
CABLE SECTION	4 x 0.25 mm2	
HOUSING MATERIAL	Nickel-plat	ed brass
WEIGHT - Cable output -	110 g	
WEIGHT - K connector output -	60	g

Wiring diagrams



Thanks to the output status which is not paired with the rest of the circuit, the sensors of this kind of availability give enormous advantages, such as the possibility of obtaining the four output configurations (NPN-NO, NPN-NC, PNP-NO, PNP-NC), on the same model and the possibility of obtaining serial or parallel connections without any practical numerical limit.

Connection with connector M12 (K)



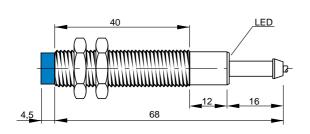
CONTACTS CONFIGURATION

Output	Contacts numbers			
Output	1	2	3	4
NPN NO	+	NO	_	-
NPN NC	_	NC	+	1
PNP NO	+	+	_	NO
PNP NC	_	+	+	NC

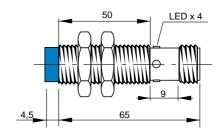
Note: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CABLE



Note: the front part in blue refers to not shielded models.



AMPLIFIED INDUCTIVE SENSORS INCREASED RANGE 12÷30 VDC 4 WIRES PROGRAMMABLE OUTPUT

- Four-wire, shielded sensors
- Increased range, shielded, not shielded Range, 4 mm to 8 mm
- Programmable outputs: NPN/PNP, NO or NC
 Cable or M12 quick-connect
 Nickel plated brass

- Operation LED
 200 mA max output

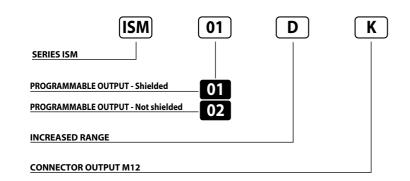




ISM Series

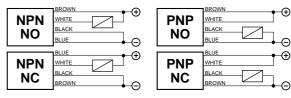


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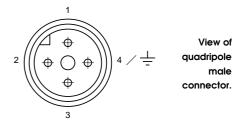
	SHIELDED	NOT SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	4 mm	8 mm
NOMINAL VOLTAGE	12 ÷ 30 VDC	(-15/+10%)
RESIDUAL RIPPLE	≤10	9%
HYSTERESIS	< 10	9%
OUTPUT	NPN or PNP (ma	y be selected)
CONTACT	NO or NC (may	be selected)
MAX. CURRENT OUTPUT	200 ו	mA
ABSORPTION AT 24 VDC	< 1.2	mA
VOLTAGE DROP (Sensor ON)	< 1,8 V (I =	100 mA)
OPERATION LED	Yello	ow
SWITCHING FREQUENCY	500 Hz	
START UP DELAY	≤ 50 mS	
REPEATABILITY	≤ 3'	%
SHORT CIRCUIT PROTECTION	Present (self	-resetting)
ELECTRIC PROTECTIONS	Against polarity rever	sal - inductive loads
TEMPERATURE LIMITS	- 25 ÷ +	70 °C
PROTECTION DEGREE	IP 6	7
CABLE LENGTH	2 r	n
CABLE SECTION	4 x 0.25	mm2
HOUSING MATERIAL	Nickel-plat	ed brass
WEIGHT - Cable output -	110	g
WEIGHT - K connector output -	60	g

Wiring diagrams



Thanks to the output status which is not paired with the rest of the circuit, the sensors of this kind of availability give enormous advantages, such as the possibility of obtaining the four output configurations (NPN-NO, NPN-NC, PNP-NO, PNP-NC,) on the same model and the possibility of obtaining serial or parallel connections without any practical numerical limit.

Connection with connector M12 (K)



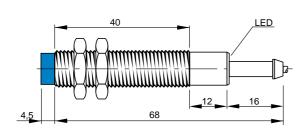
CONTACTS CONFIGURATION

Output	Contacts numbers			
Output	1	2	3	4
NPN NO	+	NO	_	_
NPN NC	_	NC	+	_
PNP NO	+	+	_	NO
PNP NC	_	+	+	NC

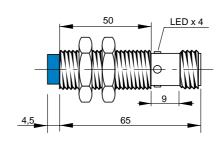
Note: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CABLE



Note: the front part in blue refers to not shielded models.



AMPLIFIED INDUCTIVE SENSORS 12÷30 VDC 4 WIRES PROGRAMMABLE OUTPUT

- · Four-wire, amplified sensors
- Programmable outputs: NPN/PNP, NO or NC
- Cable or M12 quick-connect
- Nickel plated brass
- 12-30 VDC

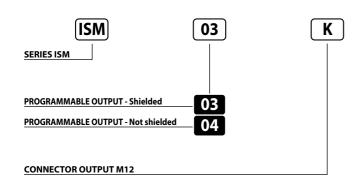
ISM Series





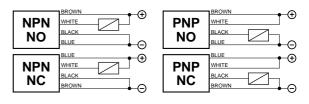


Identification code



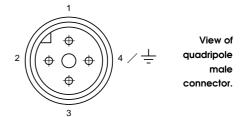
	SHIELDED	NOT SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	5 mm	8 mm
NOMINAL VOLTAGE	12 ÷ 30 VDC	(-15/+10%)
RESIDUAL RIPPLE	≤ 10	9%
HYSTERESIS	< 10	0%
OUTPUT	NPN or PNP (ma	y be selected)
CONTACT	NO or NC (may	be selected)
MAX. CURRENT OUTPUT	200 i	mA
ABSORPTION AT 24 VDC	< 1.2	mA
VOLTAGE DROP (Sensor ON)	< 1,8 V (I =	100 mA)
OPERATION LED	Yello	ow
SWITCHING FREQUENCY	1000 Hz	
START UP DELAY	≤ 50 mS	
REPEATABILITY	≤ 3%	
SHORT CIRCUIT PROTECTION	Present (self	resetting)
ELECTRIC PROTECTIONS	Against polarity rever	sal - inductive loads
TEMPERATURE LIMITS	- 25 ÷ +	70 °C
PROTECTION DEGREE	IP 6	57
CABLE LENGTH	2 n	n
CABLE SECTION	4 x 0.25 mm2	
HOUSING MATERIAL	Nickel-plat	ted brass
WEIGHT - Cable output -	145 g	
WEIGHT - K connector output -	95	g

Wiring diagrams



Thanks to the output status which is not paired with the rest of the circuit, the sensors of this kind of availability give enormous advantages, such as the possibility of obtaining the four output configurations (NPN-NO, NPN-NC, PNP-NO, PNP-NC), on the same model and the possibility of obtaining serial or parallel connections without any practical numerical limit.

Connection with connector M12 (K)



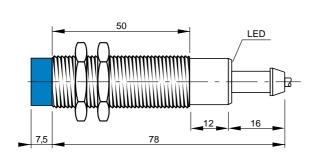
CONTACTS CONFIGURATION

Output	Contacts numbers			
Output	1	2	3	4
NPN NO	+	NO	_	_
NPN NC	_	NC	+	
PNP NO	+	+	_	NO
PNP NC	_	+	+	NC

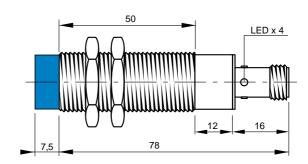
Note: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CABLE



CONFIGURATION WITH CONNECTOR K



Note: the front part in blue refers to not shielded models

AMPLIFIED INDUCTIVE SENSORS INCREASED RANGE 12÷30 VDC 4 WIRES PROGRAMMABLE OUTPUT

- Four-wire
- Increased range, shielded, not shielded
 Range, 8 mm to 14 mm
 Programmable outputs: NPN/PNP, NO or NC

- Cable or M12 quick-connect Nickel plated brass Operation LED
- 200 mA max output

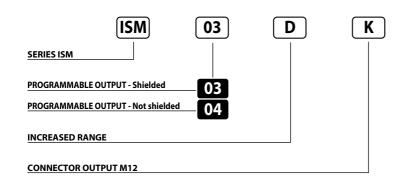




ISM Series

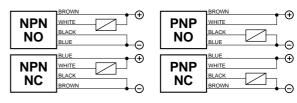


Identification code



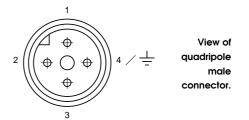
	SHIELDED	NOT SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	8 mm	14 mm
NOMINAL VOLTAGE	12 ÷ 30 VDC	(-15/+10%)
RESIDUAL RIPPLE	≤10	9%
HYSTERESIS	< 10	9%
OUTPUT	NPN or PNP (ma	y be selected)
CONTACT	NO or NC (may	be selected)
MAX. CURRENT OUTPUT	200 ו	mA
ABSORPTION AT 24 VDC	< 1.2	mA
VOLTAGE DROP (Sensor ON)	< 1,8 V (I =	100 mA)
OPERATION LED	Yellow	
SWITCHING FREQUENCY	400 Hz	
START UP DELAY	≤ 50 mS	
REPEATABILITY	≤ 3%	
SHORT CIRCUIT PROTECTION	Present (self-resetting)	
ELECTRIC PROTECTIONS	Against polarity rever	sal - inductive loads
TEMPERATURE LIMITS	- 25 ÷ +	70 °C
PROTECTION DEGREE	IP 6	7
CABLE LENGTH	2 r	n
CABLE SECTION	4 x 0.25 mm2	
HOUSING MATERIAL	Nickel-pla	ted brass
WEIGHT - Cable output -	145	g
WEIGHT - K connector output -	95	g

Wiring diagrams



Thanks to the output status which is not paired with the rest of the circuit, the sensors of this kind of availability give enormous advantages, such as the possibility of obtaining the four output configurations (NPN-NO, NPN-NC, PNP-NO, PNP-NC,) on the same model and the possibility of obtaining serial or parallel connections without any practical numerical limit.

Connection with connector M12 (K)



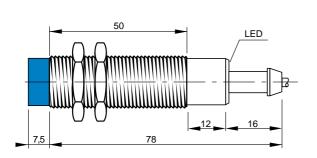
CONTACTS CONFIGURATION

Output	Contacts numbers			
Output	1	2	3	4
NPN NO	+	NO	_	_
NPN NC	_	NC	+	_
PNP NO	+	+	_	NO
PNP NC	1	+	+	NC

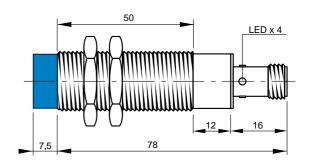
Note: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CARLE



CONFIGURATION WITH CONNECTOR K



Note: the front part in blue refers to not shielded models

AMPLIFIED INDUCTIVE SENSORS 12+30 VDC 4 WIRES PROGRAMMABLE OUTPUT

- Four-wire, amplified sensors
- Programmable outputs: NPN/PNP, NO or NC
- · Cable or M12 quick-connect
- Nickel plated brass
- 12-30 VDC

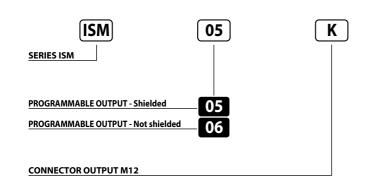
ISM Series





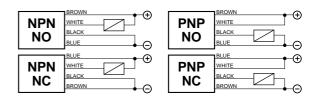


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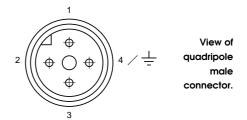
	CLUELDED	NOTCHIELDED
	SHIELDED	NOT SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	10 mm	15 mm
NOMINAL VOLTAGE	12 ÷ 30 VDC	(-15/+10%)
RESIDUAL RIPPLE	≤10	0%
HYSTERESIS	< 10	0%
ОИТРИТ	NPN or PNP (ma	y be selected)
CONTACT	NO or NC (may	be selected)
MAX. CURRENT OUTPUT	200 ו	mA
ABSORPTION AT 24 VDC	< 1.2	mA
VOLTAGE DROP (Sensor ON)	< 1,8 V (I = 100 mA)	
OPERATION LED	Yellow	
SWITCHING FREQUENCY	300 Hz	
START UP DELAY	≤ 50 mS	
REPEATABILITY	≤3%	
SHORT CIRCUIT PROTECTION	Present (self	resetting)
ELECTRIC PROTECTIONS	Against polarity rever	sal - inductive loads
TEMPERATURE LIMITS	- 25 ÷ +	-70 °C
PROTECTION DEGREE	IP 6	57
CABLE LENGTH	2 r	n
CABLE SECTION	4 x 0.25	mm2
HOUSING MATERIAL	Nickel-pla	ted brass
WEIGHT - Cable output -	210 g	
WEIGHT - K connector output -	170	g

Wiring diagrams



Thanks to the output status which is not paired with the rest of the circuit, the sensors of this kind of availability give enormous advantages, such as the possibility of obtaining the four output configurations (NPN-NO, NPN-NC, PNP-NO, PNP-NC), on the same model and the possibility of obtaining serial or parallel connections without any practical numerical limit.

Connection with connector M12 (K)



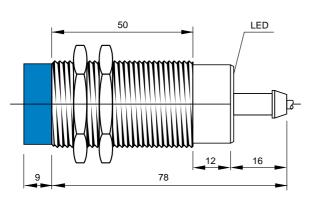
CONTACTS CONFIGURATION

Output	Contacts numbers			
Output	1	2	3	4
NPN NO	+	NO	_	_
NPN NC	_	NC	+	_
PNP NO	+	+	_	NO
PNP NC	_	+	+	NC

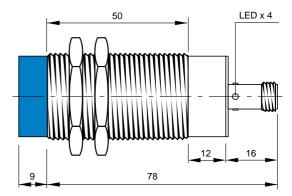
Note: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CABLE



Note: the front part in blue refers to not shielded models



AMPLIFIED INDUCTIVE SENSORS INCREASED RANGE 12÷30 VDC 4 WIRES PROGRAMMABLE OUTPUT

- Four-wire
- Increased range, shielded, not shielded Range, 15 mm to 20 mm
- Programmable outputs: NPN/PNP, NO or NC
- Cable or M12 quick-connect Nickel plated brass
- Operation LED200 mA max output

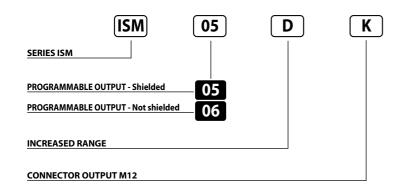




ISM Series

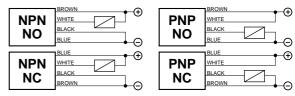


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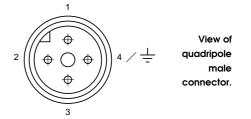
	SHIELDED	NOT SHIELDED	
NOMINAL SWITCHING DISTANCE (Sn)	15 mm	20 mm	
NOMINAL VOLTAGE	12 ÷ 30 VDC	(-15/+10%)	
RESIDUAL RIPPLE	≤ 10	%	
HYSTERESIS	< 10	%	
OUTPUT	NPN or PNP (ma	y be selected)	
CONTACT	NO or NC (may	be selected)	
MAX. CURRENT OUTPUT	200 r	mA	
ABSORPTION AT 24 VDC	< 1.2	mA	
VOLTAGE DROP (Sensor ON)	< 1,8 V (I = 100 mA)		
OPERATION LED	Yellow		
SWITCHING FREQUENCY	200 Hz		
START UP DELAY	≤ 50 mS		
REPEATABILITY	≤3	%	
SHORT CIRCUIT PROTECTION	Present (self	-resetting)	
ELECTRIC PROTECTIONS	Against polarity rever	sal - inductive loads	
TEMPERATURE LIMITS	- 25 ÷ +	70 °C	
PROTECTION DEGREE	IP 6	7	
CABLE LENGTH	2 m		
CABLE SECTION	4 x 0.25 mm2		
HOUSING MATERIAL	Nickel-plat	ed brass	
WEIGHT - Cable output -	210 g		
WEIGHT - K connector output -	170 g		

Wiring diagrams



Thanks to the output status which is not paired with the rest of the circuit, the sensors of this kind of availability give enormous advantages, such as the possibility of obtaining the four output configurations (NPN-NO, NPN-NC, PNP-NO, PNP-NC,) on the same model and the possibility of obtaining serial or parallel connections without any practical numerical limit.

Connection with connector M12 (K)



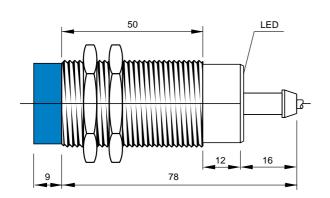
CONTACTS CONFIGURATION

Output	Contacts numbers			
Output	1	2	3	4
NPN NO	+	NO	_	_
NPN NC	_	NC	+	_
PNP NO	+	+	_	NO
PNP NC	_	+	+	NC

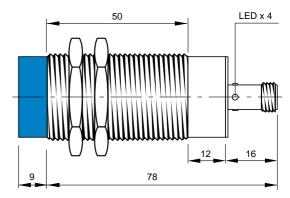
Note: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CABLE



CONFIGURATION WITH CONNECTOR K



Note: the front part in blue refers to not shielded models

Inductive Sensors I 6.5

INDUCTIVE SENSORS CONFORMING TO NAMUR RULES

- Two-wire sensors
- 5-24 VAC/VDC input
- Nickel plated brass
- Shielded versions up to 1 mm
- Not shielded versions up to 2 mm

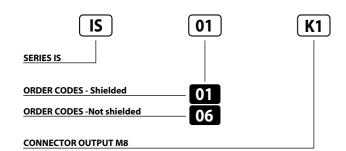
IS Series

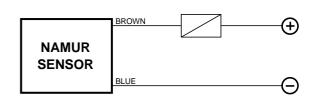






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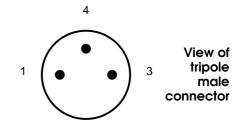




	SHIELDED	NOT SHIELDED	
NOMINAL SWITCHING DISTANCE (Sn)	1 mm	2 mm	
NOMINAL VOLTAGE (Load resistence 1 K)	7.7 ÷	9 V DC	
DC SUPPLY VOLTAGE	5 ÷ 24	4 V DC	
RESIDUAL RIPPLE	≤1	0%	
HYSTERESIS	≤1	0%	
OUTPUT CURRENT (Metal present)	≤1 mA		
OUTPUT CURRENT (Metal absent)	≤ 3 mA		
SWITCHING FREQUENCY	2000 Hz		
REPEATABILITY	≤ 3%		
TEMPERATURE LIMITS	-25 ÷	+60 °C	
PROTECTION DEGREE	IP	67	
CABLE LENGTH	2	m	
CABLE SECTION	2 x 0.25 mm ²		
HOUSING MATERIAL	Nickel-plated brass		
WEIGHT - Cable output -	80 g		
WEIGHT - K1 connector output -	35 g		
WEIGHT - K connector output -	-		

Connection with connector M8 (K1)

Wiring diagrams

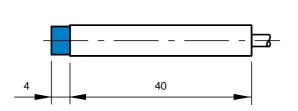


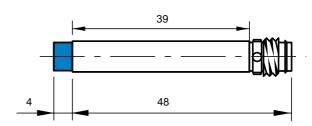
CONTACTS CONFIGURATION

Available	Con	itacts num	bers
	1	3	4
NAMUR	+	_	

Dimensions (mm)

CONFIGURATION WITH CABLE





AMPLIFIED INDUCTIVE SENSORS 10÷30 V DC 3 WIRES NPN OR PNP OUTPUT

- Three-wire, amplified, shielded sensors
- 10 to 30 VDC, NPN or PNP
- NO or NC select
- M8 quick connect models
- 6.5mm unshielded model 2mm Sn

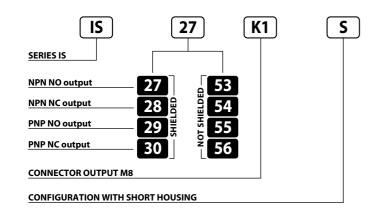
IS Series





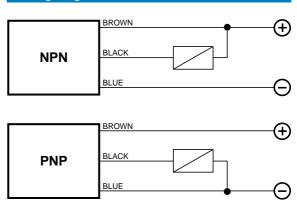


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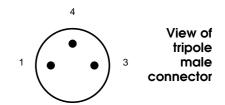


	SHIELDED	NOT SHIELDED		
NOMINAL SWITCHING DISTANCE (Sn)	1,5 mm 2 mm			
NOMINAL VOLTAGE	10 ÷ 30 VDC	(-15 / +10%)		
RESIDUAL RIPPLE	≤ 10	0%		
HYSTERESIS	< 10	0%		
MAX. OUTPUT CURRENT	200	mA		
RESIDUAL CURRENT	< 10	mA		
VOLTAGE DROP	< 1.2 V (I = 100 mA)			
OPERATION LED	Present			
SWITCHING FREQUENCY	1000 Hz			
START UP DELAY	≤ 50 mS			
REPEATABILITY	≤ 3%			
SHORT CIRCUIT PROTECTION	Present (sel	f-resetting)		
ELECTRIC PROTECTIONS	Against polarity reve	rsal - inductive loads		
TEMPERATURE LIMITS	- 25 ÷ +	+70 °C		
PROTECTION DEGREE	IP 6	57		
CABLE LENGTH	2 m			
CABLE SECTION				
HOUSING MATERIAL	Stainles	s-steel		
WEIGHT - Cable output -	80 g			
WEIGHT - K connector output -	40 g			

Wiring diagrams



Connection with connector M8 (K1)



CONTACTS CONFIGURATION

Available	Contacts numbers		
] BROWN	3 BLUE	4 BLACK
NPN/PNP	+	1	NO/NC

Dimensions (mm)

CONFIGURATION WITH CABLE

CONFIGURATION WITH CONNECTOR K1

SHORT HOUSING S

LED X 4

LED X 4

4

60 (48)*

4

40

AMPLIFIED INDUCTIVE SENSORS INCREASED RANGE 10÷30 VDC 3 WIRES NPN OR PNP OUTPUT

- Three-wire
- Increased range, shielded, not shielded
- Range, 2mm to 3mm
 Short housing cable models
- 200mA NPN or PNP

Stainless steel Operation LED

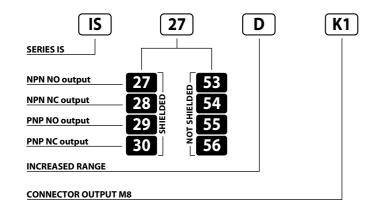






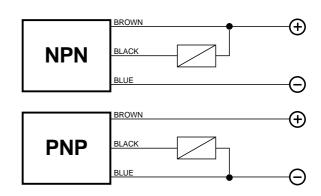
IS Series

Identification code

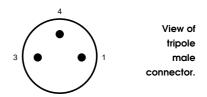


	SHIELDED	NOTSHIELDED	
NOMINAL SWITCHING DISTANCE (Sn)	2 mm	3 mm	
NOMINAL VOLTAGE	10 ÷ 30 VDC	(-15 / +10%)	
RESIDUAL RIPPLE	≤1	0%	
HYSTERESIS	<1	0%	
MAX. OUTPUT CURRENT	200	mA	
RESIDUAL CURRENT	< 10) mA	
VOLTAGE DROP	< 1.2 V (I =	= 100 mA)	
OPERATION LED	Yellow		
SWITCHING FREQUENCY	500 Hz		
START UP DELAY	≤ 75 mS		
REPEATABILITY	≤3%		
SHORT CIRCUIT PROTECTION	Present (sel	f-resetting)	
ELECTRIC PROTECTIONS	Against polarity reve	rsal - inductive loads	
TEMPERATURE LIMITS	- 25 ÷	+70 °C	
PROTECTION DEGREE	IP	67	
CABLE LENGTH	2	m	
CABLE SECTION	3 x 0,1	4 mm ²	
HOUSING MATERIAL	Stainless-steel		
WEIGHT - Cable output -	80	g	
WEIGHT - K1 connector output -	40 g		
WEIGHT - K connector output -	-		

Wiring diagrams



Connection with connector M8 (K1)

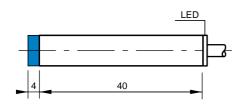


CONTACTS CONFIGURATION

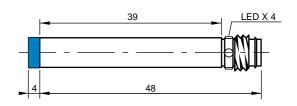
	Available	Contacts numbers		
		1	3	4
	(NO or NC)	+	_	NO/NC

Dimensions (mm)

CONFIGURATION WITH CABLE



CONNECTOR K1



Note: the front part in blue refers to not shielded models

Inductive Sensors I 8

INDUCTIVE SENSORS CONFORMING TO NAMUR RULES

- Two-wire sensors
- 5-24 VAC/VDC input
- Nickel plated brass
- Shielded versions up to 1 mm
- Not shielded versions up to 2 mm

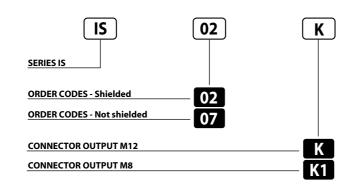
IS Series





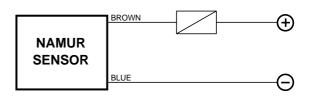


Identification code

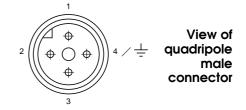


	SHIELDED	NOT SHIELDED	
NOMINAL SWITCHING DISTANCE (Sn)	1 mm	2 mm	
NOMINAL VOLTAGE (Load resistence 1 K)	7.7 ÷	9 V DC	
DC SUPPLY VOLTAGE	5 ÷ 2	4 V DC	
RESIDUAL RIPPLE	≤1	0%	
HYSTERESIS	≤1	0%	
OUTPUT CURRENT (Metal present)	≤1	mA	
OUTPUT CURRENT (Metal absent)	≤3 mA		
SWITCHING FREQUENCY	2000 Hz		
REPEATABILITY	≤ 3%		
TEMPERATURE LIMITS	-25 ÷	+60 °C	
PROTECTION DEGREE	IP	67	
CABLE LENGTH	2	m	
CABLE SECTION	2 x 0.2	25 mm ²	
HOUSING MATERIAL	Nickel-plated brass		
WEIGHT - Cable output -	80 g		
WEIGHT - K1 connector output -	35 g		
WEIGHT - K connector output -	55 g		

Wiring diagrams



Connection with connector M12 (K)

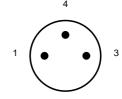


CONTACTS CONFIGURATION

Available	Contacts numbers			
	1	2	3	4
NAMUR	+		_	

NOTE: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG and AMPHENOL-TUCHEL.

Connection with connector M8 (K1)



View of tripole male connector

CONTACTS CONFIGURATION

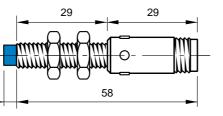
1	Available	Contacts numbers		
1		1	3	4
	NAMUR	+	_	

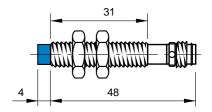
Dimensions (mm)

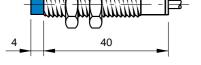
CONFIGURATION WITH CABLE

31

CONFIGURATION WITH CONNECTOR K







AMPLIFIED INDUCTIVE SENSORS 10÷30 V DC 3 WIRES NPN OR PNP OUTPUT

- Three-wire, amplified, sensors
- M8 stainless steel models
- · Short housing models
- M8 and M12 quick connect models
- Operation LED

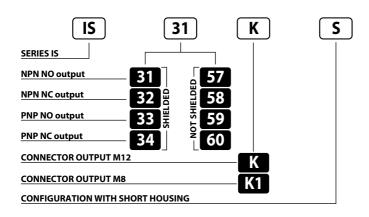
IS Series





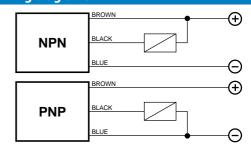


Identification code

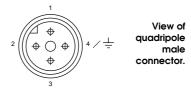


	SHIELDED	NOT SHIELDED		
NOMINAL SWITCHING DISTANCE (Sn)	1,5 mm	2 mm		
NOMINAL VOLTAGE	10 ÷ 30 VDC (-15 / +10%)			
RESIDUAL RIPPLE	≤ 10%			
HYSTERESIS	< 10%			
MAX. OUTPUT CURRENT	200 mA			
RESIDUAL CURRENT	< 10 mA			
VOLTAGE DROP	< 1.2 V (I = 100 mA)			
OPERATION LED	Yellow			
SWITCHING FREQUENCY	1000 Hz			
START UP DELAY	≤ 50 mS			
REPEATABILITY	≤ 3%			
SHORT CIRCUIT PROTECTION	Present (self-resetting)			
ELECTRIC PROTECTIONS	Against polarity reversal - inductive loads			
TEMPERATURE LIMITS	- 25 ÷ +70 °C			
PROTECTION DEGREE	IP	IP 67		
CABLE LENGTH	2 m			
CABLE SECTION	3 x 0,14 mm ²			
HOUSING MATERIAL	Stainless-steel			
WEIGHT - Cable output -	80 g			
WEIGHT - K1 connector output -	40 g			
WEIGHT - K connector output -	55 g			

Wiring diagrams



Connection with connector M12 (K)

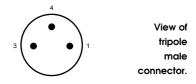


Note: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

CONTACTS CONFIGURATION

Available	Contacts numbers			
Available	1	2	3	4
(NO or NC)	+		_	NO/NC

Connection with connector M8 (K1)



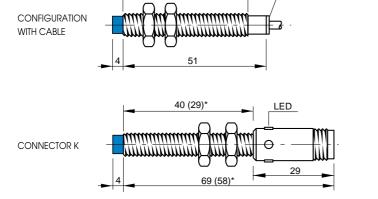
CONTACTS CONFIGURATION

	Available	Contacts numbers		
		1	3	4
	(NO or NC)	+	_	NO/NC

LED

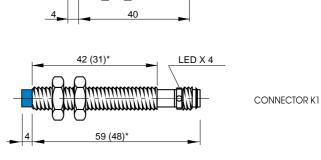
SHORT HOUSING

Dimensions (mm)



42

LED



(*) The dimensions into brackets reter to short housing models

AMPLIFIED INDUCTIVE SENSORS INCREASED RANGE 10+30 VDC 3 WIRES NPN OR PNP OUTPUT Three-wire

- Increased range, shielded, not shielded
- Range, 2 mm to 3 mm Short housing cable models 200mA NPN or PNP
- Housing stainless steel Operation LED

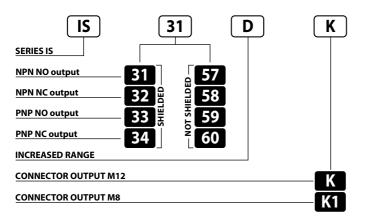






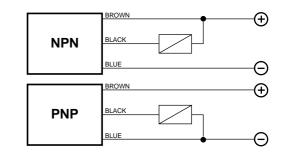
IS Series

Identification code

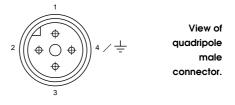


	SHIELDED	NOT SHIELDED	
NOMINAL SWITCHING DISTANCE (Sn)	2 mm	3 mm	
NOMINAL VOLTAGE	10 ÷ 30 VDC	(-15 / +10%)	
RESIDUAL RIPPLE	≤1	0%	
HYSTERESIS	<1	0%	
MAX. OUTPUT CURRENT	200	mA	
RESIDUAL CURRENT	< 10) mA	
VOLTAGE DROP	< 1.2 V (I =	= 100 mA)	
OPERATION LED	Yel	low	
SWITCHING FREQUENCY	500 Hz		
START UP DELAY	≤75 mS		
REPEATABILITY	≤ 3%		
SHORT CIRCUIT PROTECTION	Present (self-resetting)		
ELECTRIC PROTECTIONS	Against polarity reversal - inductive loads		
TEMPERATURE LIMITS	- 25 ÷	+70 °C	
PROTECTION DEGREE	IP	67	
CABLE LENGTH	2	m	
CABLE SECTION	3 x 0,14 mm ²		
HOUSING MATERIAL	Stainle	ss-steel	
WEIGHT - Cable output -	80) g	
WEIGHT - K1 connector output -	40 g		
WEIGHT - K connector output -	55 g		

Wiring diagrams



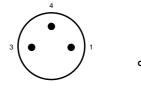
Connection with connector M12 (K)



CONTACTS CONFIGURATION

Available	Contacts numbers			
Available	1	2	3	4
(NO or NC)	+		_	NO/NC

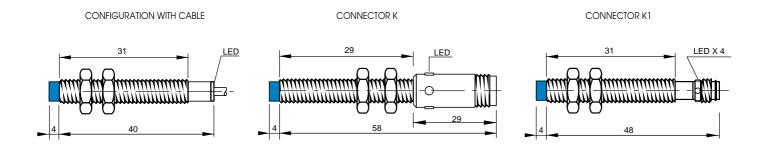
Connection with connector M8 (K1)



View of tripole male connector.

CONTACTS CONFIGURATION

Available	Cor	itacts num	bers
Available	1	3	4
(NO or NC)	+	_	NO/NC



Inductive Sensors I 12



INDUCTIVE SENSORS CONFORMING TO NAMUR RULES

- Two-wire sensors
- 5-24 VAC/VDC input
- Nickel plated brass
- Shielded versions up to 2 mm
- Not shielded versions up to 4 mm

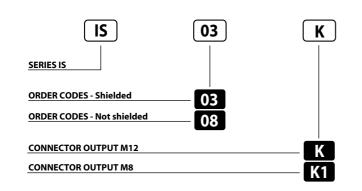
IS Series





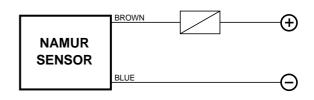


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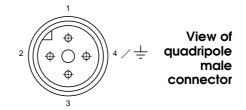


	SHIELDED	NOT SHIELDED	
NOMINAL SWITCHING DISTANCE (Sn)	2 mm	4 mm	
NOMINAL VOLTAGE (Load resistence 1 K)	7.7 ÷ 9	9 V DC	
DC SUPPLY VOLTAGE	5 ÷ 24	I V DC	
RESIDUAL RIPPLE	≤1	0%	
HYSTERESIS	≤1	0%	
OUTPUT CURRENT (Metal present)	≤1	mA	
OUTPUT CURRENT (Metal absent)	≤3	mA	
SWITCHING FREQUENCY	2000 Hz		
REPEATABILITY	≤ 3%		
TEMPERATURE LIMITS	-25 ÷ +60 °C		
PROTECTION DEGREE	IP	67	
CABLE LENGTH	2	m	
CABLE SECTION	2 x 0.2	5 mm ²	
HOUSING MATERIAL	Nickel-plated brass		
WEIGHT - Cable output -	11	0 g	
WEIGHT - K1 connector output -	60 g		
WEIGHT - K connector output -	60 g		

Wiring diagrams



Connection with connector M12 (K)

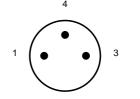


CONTACTS CONFIGURATION

Available	Contacts numbers			
Available	1	2	3	4
NAMUR	+		_	

NOTE: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG and AMPHENOL-TUCHEL.

Connection with connector M8 (K1)



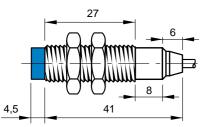
View of tripole male connector

CONTACTS CONFIGURATION

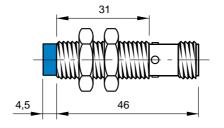
Available	Contacts numbers		
Avdilable	1	3	4
NAMUR	+	_	

Dimensions (mm)

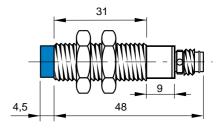
CONFIGURATION WITH CABLE



CONFIGURATION WITH CONNECTOR K



CONFIGURATION WITH CONNECTOR K1





AMPLIFIED INDUCTIVE SENSORS 10÷30 V DC 2 WIRES NO-NC PROGRAMMABLE OUTPUT

- Two-wire 10/30 VDC
- M12 quick connect or integral cable
- Shielded models up to 2 mm
- · Not shielded models up to 4 mm
- Nickel plated brass

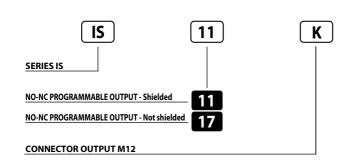
IS Series





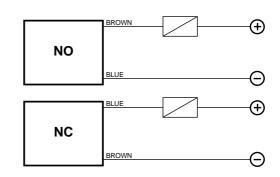


Identification code



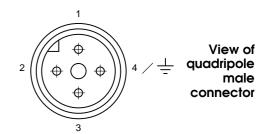
	CLUEL DED	NOTCHELDED	
	SHIELDED	NOT SHIELDED	
NOMINAL SWITCHING DISTANCE (Sn)	2 mm	4 mm	
NOMINAL VOLTAGE	10 ÷ 30 VDC	(-15 / +10%)	
RESIDUAL RIPPLE	≤10	0%	
HYSTERESIS	< 10	0%	
MAX. OUTPUT CURRENT	100 ו	mA	
MIN. OUTPUT CURRENT	> 1,6	mA	
RESIDUAL CURRENT	< 1,6	mA	
VOLTAGE DROP	< 6,5 V (I = 100 mA)		
OPERATION LED	Yellow		
SWITCHING FREQUENCY	1000 Hz		
START UP DELAY	≤ 50 mS		
REPEATABILITY	≤ 3%		
SHORT CIRCUIT PROTECTION	Present (self	resetting)	
ELECTRIC PROTECTIONS	Against polarity rever	sal - inductive loads	
TEMPERATURE LIMITS	- 25 ÷ +	-70 °C	
PROTECTION DEGREE	IP 6	57	
CABLE LENGTH	2 r	n	
CABLE SECTION	2 x 0.25	mm2	
HOUSING MATERIAL	Nickel-pla	ted brass	
WEIGHT - Cable output -	110	g	
WEIGHT - K connector output -	60 g		

Wiring diagrams



WARNING: The load can be indifferently connected in series to the blue wire or to the brown wire to simulate NPN or PNP functionning logic.

Connection with connector M12 (K)



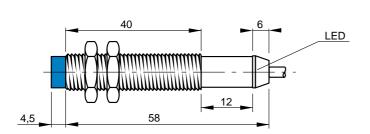
CONTACTS CONFIGURATION

Available	Contacts numbers			
Available	1	2	3	4
NO	+		_	
NC	_		+	

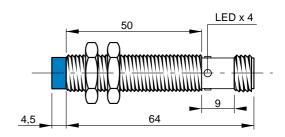
NOTE: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CABLE



CONFIGURATION WITH CONNECTOR K



AMPLIFIED INDUCTIVE SENSORS INCREASED RANGE 10÷30 V DC 2 WIRES NO-NC PROGRAMMABLE OUTPUT

- · Two-wire, amplified
- Increased range, shielded, not shielded
- 10 to 30 VDC
- Range, 4 mm to 8 mm
- NO or NC select
- M12 quick connect or integral cable
- Nickel plated brass

New

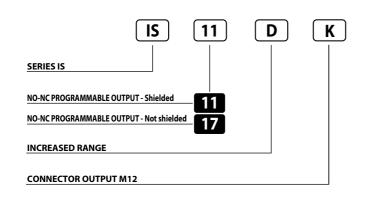






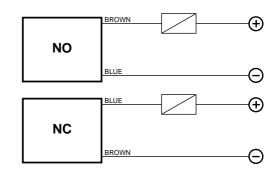
IS Series

Identification code



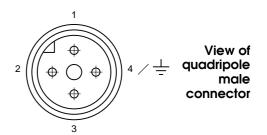
	SHIELDED	NOT SHIELDED	
NOMINAL SWITCHING DISTANCE (Sn)	4 mm	8 mm	
NOMINAL VOLTAGE	10 ÷ 30 VDC	(-15 / +10%)	
RESIDUAL RIPPLE	≤1	0%	
HYSTERESIS	< 1	0%	
MAX. OUTPUT CURRENT	100	mA	
MIN. OUTPUT CURRENT	> 1,	6 mA	
RESIDUAL CURRENT	< 1,6	5 mA	
VOLTAGE DROP	< 6,5 V (I :	= 100 mA)	
OPERATION LED	Yellow		
SWITCHING FREQUENCY	500 Hz		
START UP DELAY	≤ 50 mS		
REPEATABILITY	≤ 3%		
SHORT CIRCUIT PROTECTION	Present (self-resetting)		
ELECTRIC PROTECTIONS	Against polarity reve	ersal - inductive loads	
TEMPERATURE LIMITS	- 25 ÷	+70 °C	
PROTECTION DEGREE	IP	67	
CABLE LENGTH	2	m	
CABLE SECTION	2 x 0.2	5 mm2	
HOUSING MATERIAL	Nickel-pla	ated brass	
WEIGHT - Cable output -	11	0 g	
WEIGHT - K connector output -	60 g		

Wiring diagrams



WARNING: The load can be indifferently connected in series to the blue wire or to the brown wire to simulate NPN or PNP functionning logic.

Connection with connector M12 (K)



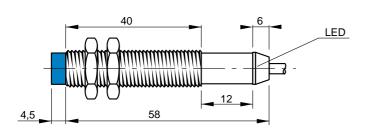
CONTACTS CONFIGURATION

Available	Contacts numbers			Contacts numbers			
Available	1	2	3	4			
NO	+		_				
NC	_		+				

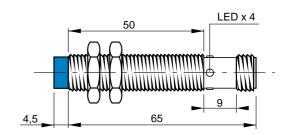
NOTE: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CABLE



CONFIGURATION WITH CONNECTOR K



AMPLIFIED INDUCTIVE SENSORS 10÷30 V DC 3 WIRES NPN OR PNP OUTPUT

- Three-wire, amplified, sensors
- Short housing models
- M8 and M12 quick connect models
- Operation LED

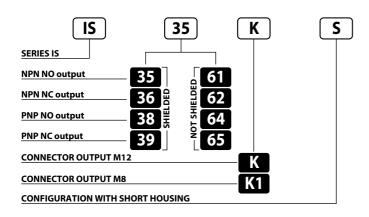
IS Series





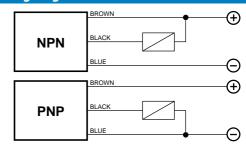


Identification code

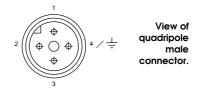


	SHIELDED	NOT SHIELDED	
NOMINAL SWITCHING DISTANCE (Sn)	2 mm	4 mm	
NOMINAL VOLTAGE	10 ÷ 30 VDC	(-15 / +10%)	
RESIDUAL RIPPLE	≤1	,	
HYSTERESIS	<1	0%	
MAX. OUTPUT CURRENT	200	mA	
RESIDUAL CURRENT	< 10) mA	
VOLTAGE DROP	< 1.8 V (I =	= 100 mA)	
OPERATION LED	Yell	ow	
SWITCHING FREQUENCY	1000 Hz		
START UP DELAY	≤ 50 mS		
REPEATABILITY	≤ 3%		
SHORT CIRCUIT PROTECTION	Present (self-resetting)		
ELECTRIC PROTECTIONS	Against polarity reversal - inductive loads		
TEMPERATURE LIMITS	- 25 ÷ +60 °C		
PROTECTION DEGREE	IP	67	
CABLE LENGTH	2	m	
CABLE SECTION	3 x 0,2	5 mm²	
HOUSING MATERIAL	Nickel-pla	ited brass	
WEIGHT - Cable output -	110) g	
WEIGHT - K1 connector output -	60	g	
WEIGHT - K connector output -	60 g		

Wiring diagrams



Connection with connector M12 (K)

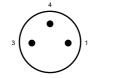


Note: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

CONTACTS CONFIGURATION

Available	Contacts numbers			
Available	1 2 3 4			
(NO or NC)	+		_	NO/NC

Connection with connector M8 (K1)

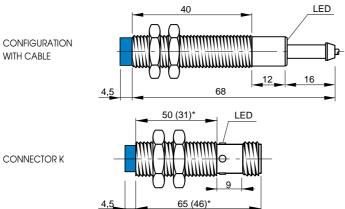


CONTACTS CONFIGURATION

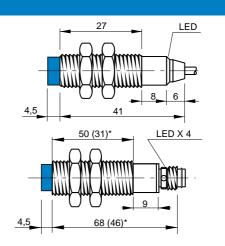
View of tripole male connector.

Available	Contacts numbers		
Avallable	1	3	4
(NO or NC)	+	_	NO/NC

Dimensions (mm)



(*) The dimensions into brackets reter to short housing models **Note:** the front part in blue refert to not shielded models.



SHORT HOUSING

CONNECTOR K1

AMPLIFIED INDUCTIVE SENSORS INCREASED RANGE 10÷30 VDC 4 WIRES NPN OR PNP OUTPUT

- Four wire
- Increased range, shielded, not shielded
- Range, 4mm to 8mm Short housing cable models 200mA NPN or PNP Operation LED

IS Series

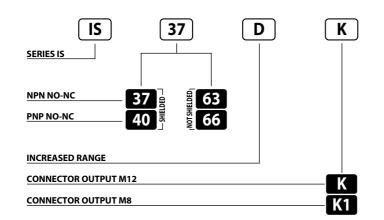






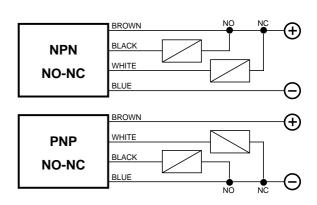


Identification code

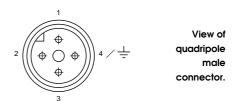


	SHIELDED	NOT SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	4 mm	8 mm
NOMINAL VOLTAGE	10 ÷ 30 VDC	(-15 / +10%)
RESIDUAL RIPPLE	≤1	0%
HYSTERESIS	< 1	0%
MAX. OUTPUT CURRENT	200	mA
RESIDUAL CURRENT	< 10) mA
VOLTAGE DROP	< 1.2 V (I :	= 100 mA)
OPERATION LED	Yel	low
SWITCHING FREQUENCY	500) Hz
START UP DELAY	≤ 75 mS	
REPEATABILITY	≤:	3%
SHORT CIRCUIT PROTECTION	Present (se	lf-resetting)
ELECTRIC PROTECTIONS	Against polarity reve	rsal - inductive loads
TEMPERATURE LIMITS	- 25 ÷	+70 °C
PROTECTION DEGREE	IP	67
CABLE LENGTH	2	m
CABLE SECTION	3 x 0,25 mm ²	
HOUSING MATERIAL	Nickel-pla	ated brass
WEIGHT - Cable output -	11	0 g
WEIGHT - K connector output -	60 g	

Wiring diagrams



Connection with connector M12 (K)

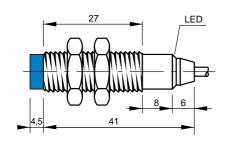


CONTACTS CONFIGURATION

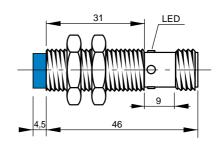
Available	Contacts numbers				
Available	1	2	3	4	
(NO or NC)	+	NC	_	NO	

Dimensions (mm)

CONFIGURATION WITH CABLE



CONNECTOR K



AMPLIFIED INDUCTIVE SENSORS 24+230 VAC 2 WIRES NO OR NC OUTPUT

- Two wires, 24-230 VAC
- Cable or M12 quick-connect
- Mini output current 20mA
- Maxpeak (20ms) 1.5A
- 300mA max output

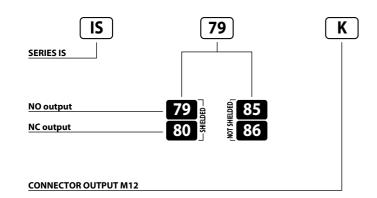
IS Series





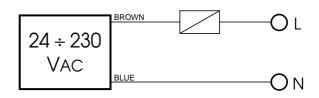


Identification code



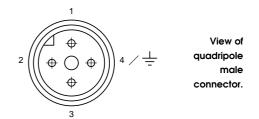
	SHIELDED	NOT SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	2 mm	4 mm
NOMINAL VOLTAGE	24 ÷ 230 VAC	(-15/+10%)
NET FREQUENCY	50 ÷ 6	0 Hz
HYSTERESIS	< 10	0%
MAX. OUTPUT CURRENT	300 i	mA
MIN. OUTPUT CURRENT	20 r	mA
MAX. CURRENT PEAK (20 mS)	1,5	A
RESIDUAL CURRENT	<1r	mA
VOLTAGE DROP (Sensor ON)	< 6 V (I =	100 mA)
OPERATION LED	Yellow	
SWITCHING FREQUENCY	12 Hz	
START UP DELAY	≤300	mS
REPEATABILITY	≤ 3'	%
TEMPERATURE LIMITS	-25 ÷ +	70 °C
PROTECTION DEGREE	IP 6	57
CABLE LENGTH	2 r	n
CABLE SECTION	2 x 0.25 mm2	
HOUSING MATERIAL	Nickel-pla	ted brass
WEIGHT - Cable output -	110 g	
WEIGHT - K connector output -	60 g	

Wiring diagrams



Warning: Short circuit in the output is not possible. Wrong supply cables connections can irreparably damage the detector. Therefore sensors whose output status is short-circuited will not be substituted under warranty.

Connection with connector M12 (K)



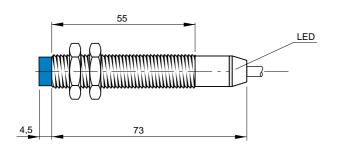
CONTACTS CONFIGURATION

Available	Contacts numbers				
Available	1	4			
(NO or NC)	L		N		

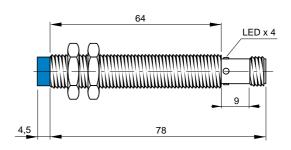
 $\begin{tabular}{ll} \textbf{Note:} The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL. \end{tabular}$

Dimensions (mm)

CONFIGURATION WITH CABLE



CONFIGURATION WITH CONNECTOR K



AMPLIFIED INDUCTIVE SENSORS INCREASED RANGE 24÷230 VAC 2 WIRES NO OR NC OUTPUT

Two wires, 24-230 VAC Increased range, shielded, not shielded Range, 4 mm to 8 mm Cable or M12 quick-connect

- Mini output current 20mA Maxpeak (20ms) 1.5A
- 300mA max output

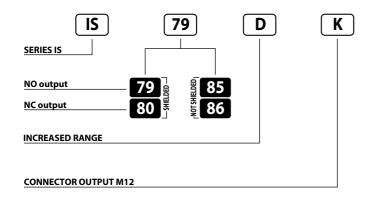






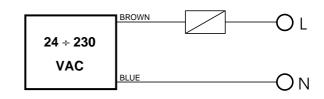
IS Series

Identification code



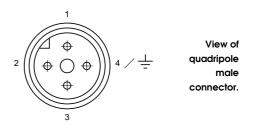
	SHIELDED	NOT SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	4 mm	8 mm
NOMINAL VOLTAGE	24 ÷ 230 VAC	(-15/+10%)
NET FREQUENCY	50 ÷ 6	0 Hz
HYSTERESIS	< 10	0%
MAX. OUTPUT CURRENT	300 i	mA
MIN. OUTPUT CURRENT	20 r	nA
MAX. CURRENT PEAK (20 mS)	1,5	A
RESIDUAL CURRENT	< 1 r	mA
VOLTAGE DROP (Sensor ON)	< 6 V (I = 100 mA)	
OPERATION LED	Yellow	
SWITCHING FREQUENCY	12 Hz	
START UP DELAY	≤300	mS
REPEATABILITY	≤ 3'	%
TEMPERATURE LIMITS	-25 ÷ +	70 °C
PROTECTION DEGREE	IP 6	57
CABLE LENGTH	2 n	n
CABLE SECTION	2 x 0.25 mm2	
HOUSING MATERIAL	Nickel-plated brass	
WEIGHT - Cable output -	110	g
WEIGHT - K connector output -	60 g	

Wiring diagrams



Warning: Short circuit in the output is not possible. Wrong supply cables connections can irreparably damage the detector. Therefore sensors whose output status is short-circuited will not be substituted under warranty.

Connection with connector M12 (K)



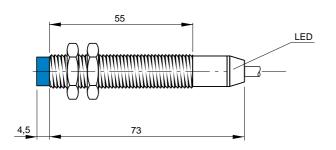
CONTACTS CONFIGURATION

Available	Contacts numbers				
Available	1	2	3	4	
(NO or NC)	L		N		

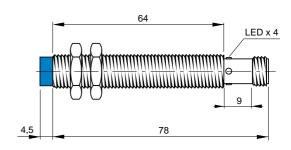
Note: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CABLE



CONFIGURATION WITH CONNECTOR K



Inductive Sensors I 18



INDUCTIVE SENSORS CONFORMING TO NAMUR RULES

- Two-wire sensors
- 5-24 VAC/VDC input
- Nickel plated brass
- · Shielded versions up to 5 mm
- Not shielded versions up to 8 mm

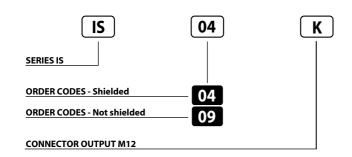
IS Series







Identification code

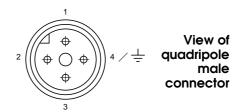


NAMUR SENSOR	BROWN	—
	BLUE	———

	SHIELDED	NOT SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	5 mm 8 mm	
NOMINAL VOLTAGE (Load resistence 1 K)	7.7 ÷	9 V DC
DC SUPPLY VOLTAGE	5 ÷ 24	4 V DC
RESIDUAL RIPPLE	≤1	0%
HYSTERESIS	≤1	0%
OUTPUT CURRENT (Metal present)	≤1	mA
OUTPUT CURRENT (Metal absent)	≤3	mA
SWITCHING FREQUENCY	1000 Hz	
REPEATABILITY	≤3%	
TEMPERATURE LIMITS	-25 ÷	+60 °C
PROTECTION DEGREE	IP	67
CABLE LENGTH	2	m
CABLE SECTION	2 x 0.2	5 mm ²
HOUSING MATERIAL	Nickel-plated brass	
WEIGHT - Cable output -	145 g	
WEIGHT - K1 connector output -	-	
WEIGHT - K connector output -	95	5 g

Connection with connector M12 (K)

Wiring diagrams



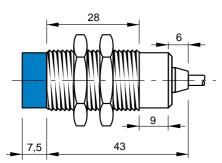
CONTACTS CONFIGURATION

Available	Contacts numbers			
Available	1 2 3		4	
NAMUR	+		_	

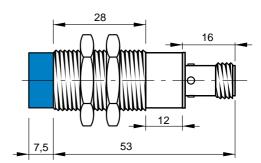
NOTE: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG and AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CABLE



Note: The front part in blue refers to not shielded models



AMPLIFIED INDUCTIVE SENSORS 10÷30 V DC 2 WIRES NO-NC PROGRAMMABLE OUTPUT

- Two-wire 10/30 VDC
- M12 quick connect or integral cable
- · Shielded models up to 5 mm
- · Not shielded models up to 8 mm
- Nickel plated brass

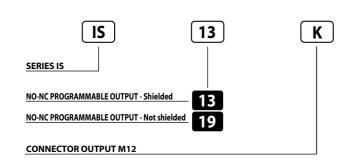
IS Series





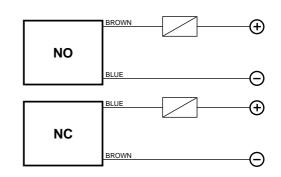


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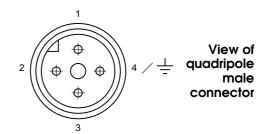
	SHIELDED	NOT SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	5 mm	8 mm
NOMINAL VOLTAGE	10 ÷ 30 VDC	(-15 / +10%)
RESIDUAL RIPPLE	≤ 10	0%
HYSTERESIS	< 1	0%
MAX. OUTPUT CURRENT	100	mA
MIN. OUTPUT CURRENT	> 1,6	5 mA
RESIDUAL CURRENT	< 1,6	mA
VOLTAGE DROP	< 6,5 V (I =	= 100 mA)
OPERATION LED	Yell	ow
SWITCHING FREQUENCY	1000) Hz
START UP DELAY	≤ 50	mS
REPEATABILITY	≤3	3%
SHORT CIRCUIT PROTECTION	Present (sel	f-resetting)
ELECTRIC PROTECTIONS	Against polarity reve	rsal - inductive loads
TEMPERATURE LIMITS	- 25 ÷ -	+70 °C
PROTECTION DEGREE	IP	67
CABLE LENGTH	2 ו	m
CABLE SECTION	2 x 0.25 mm2	
HOUSING MATERIAL	Nickel-pla	ted brass
WEIGHT - Cable output -	145	5 g
WEIGHT - K connector output -	95 g	

Wiring diagrams



WARNING: The load can be indifferently connected in series to the blue wire or to the brown wire to simulate NPN or PNP functionning logic.

Connection with connector M12 (K)



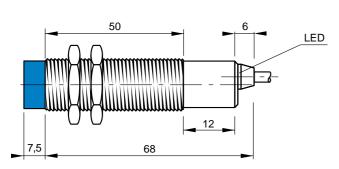
CONTACTS CONFIGURATION

Available		Contacts	numbers	
Available	1	2	3	4
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NC	_		+	

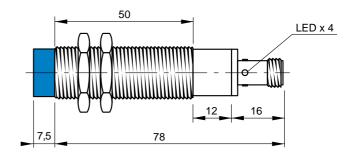
NOTE: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CABLE



CONFIGURATION WITH CONNECTOR K



AMPLIFIED INDUCTIVE SENSORS INCREASED RANGE 10÷30 V DC 2 WIRES NO-NC PROGRAMMABLE OUTPUT

- Two-wire, amplified Increased range, shielded, not shielded
- 10 to 30 VDC
- Range, 8 mm to 14 mm
- NO or NC select
- M12 quick connect or integral cable
- Nickel plated brass

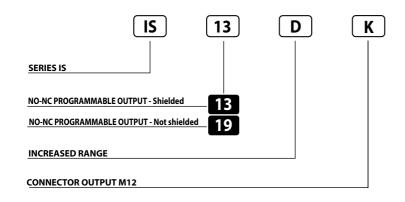






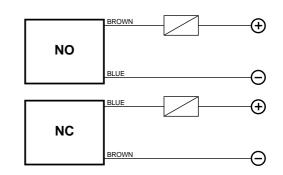
IS Series

Identification code



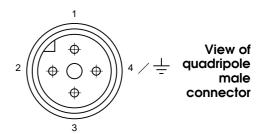
	SHIELDED	NOT SHIELDED	
NOMINAL SWITCHING DISTANCE (Sn)	8 mm	14 mm	
NOMINAL VOLTAGE	10 ÷ 30 VDC	(-15 / +10%)	
RESIDUAL RIPPLE	≤1	0%	
HYSTERESIS	<1	0%	
MAX. OUTPUT CURRENT	100	mA	
MIN. OUTPUT CURRENT	> 1,	6 mA	
RESIDUAL CURRENT	< 1,6	5 mA	
VOLTAGE DROP	< 6,5 V (I :	= 100 mA)	
OPERATION LED	Yellow		
SWITCHING FREQUENCY	400 Hz		
START UP DELAY	≤ 50 mS		
REPEATABILITY	≤ 3%		
SHORT CIRCUIT PROTECTION	Present (self-resetting)		
ELECTRIC PROTECTIONS	Against polarity reve	ersal - inductive loads	
TEMPERATURE LIMITS	- 25 ÷	+70 °C	
PROTECTION DEGREE	IP 67		
CABLE LENGTH	2 m		
CABLE SECTION	2 x 0.25 mm2		
HOUSING MATERIAL	Nickel-plated brass		
WEIGHT - Cable output -	145 g		
WEIGHT - K connector output -	95	5 g	

Wiring diagrams



WARNING: The load can be indifferently connected in series to the blue wire or to the brown wire to simulate NPN or PNP functionning logic.

Connection with connector M12 (K)



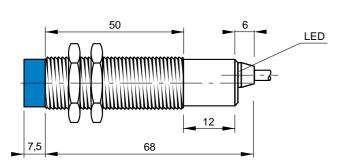
CONTACTS CONFIGURATION

ĺ	Available	Contacts numbers				Contacts		
	Avallable	1	2	3	4			
ĺ	NO	+		_				
ĺ	NC	_		+				

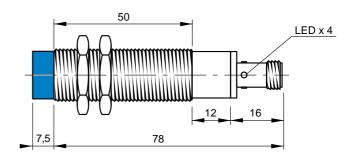
NOTE: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CABLE



CONFIGURATION WITH CONNECTOR K



AMPLIFIED INDUCTIVE SENSORS 10÷30 V DC 3 WIRES NPN OR PNP OUTPUT

- Three-wire, amplified, sensors
- · Short housing models
- M12 quick connect models
- Operation LED

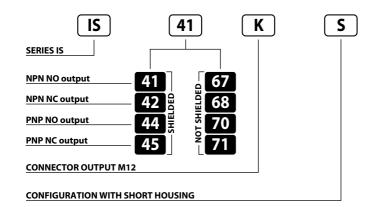
IS Series





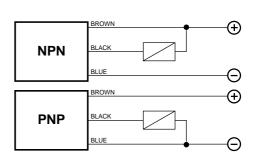


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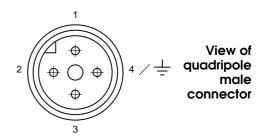


NOMINAL SWITCHING DISTANCE (Sn)5 mm8 mmNOMINAL VOLTAGE $10 \div 30 \text{ VDC } (-15 / +10\%)$ RESIDUAL RIPPLE $\leq 10\%$ HYSTERESIS $< 10\%$ MAX. OUTPUT CURRENT 200 mA RESIDUAL CURRENT $< 10 \text{ mA}$ VOLTAGE DROP $< 1.8 \text{ V (I} = 100 \text{ mA})$ OPERATION LEDYellowSWITCHING FREQUENCY 1000 Hz START UP DELAY $\leq 50 \text{ mS}$ REPEATABILITY $\leq 3\%$ SHORT CIRCUIT PROTECTIONPresent (self-resetting)ELECTRIC PROTECTIONSAgainst polarity reversal - inductive loadsTEMPERATURE LIMITS $-25 \div +60 \degree \text{C}$ PROTECTION DEGREE $1P 67$			
NOMINAL VOLTAGE $10 \div 30 \text{ VDC } (-15 / +10\%)$ RESIDUAL RIPPLE $\leq 10\%$ HYSTERESIS $< 10\%$ MAX. OUTPUT CURRENT 200 mA RESIDUAL CURRENT $< 10 \text{ mA}$ VOLTAGE DROP $< 1.8 \text{ V (I} = 100 \text{ mA})$ OPERATION LEDYellowSWITCHING FREQUENCY 1000 Hz START UP DELAY $\leq 50 \text{ mS}$ REPEATABILITY $\leq 3\%$ SHORT CIRCUIT PROTECTIONPresent (self-resetting)ELECTRIC PROTECTIONSAgainst polarity reversal - inductive loadsTEMPERATURE LIMITS $-25 \div +60 ^{\circ}\text{C}$ PROTECTION DEGREEIP 67		SHIELDED	NOT SHIELDED
RESIDUAL RIPPLE $\leq 10\%$ HYSTERESIS $< 10\%$ MAX. OUTPUT CURRENT 200 mA RESIDUAL CURRENT $< 10 \text{ mA}$ VOLTAGE DROP $< 1.8 \text{ V (I} = 100 \text{ mA})$ OPERATION LED Yellow SWITCHING FREQUENCY 1000 Hz START UP DELAY $\leq 50 \text{ mS}$ REPEATABILITY $\leq 3\%$ SHORT CIRCUIT PROTECTION Present (self-resetting) ELECTRIC PROTECTIONS Against polarity reversal - inductive loads TEMPERATURE LIMITS $-25 \div +60 ^{\circ}\text{C}$ PROTECTION DEGREE	NOMINAL SWITCHING DISTANCE (Sn)	5 mm	8 mm
HYSTERESIS A 10% MAX. OUTPUT CURRENT RESIDUAL CURRENT VOLTAGE DROP C1.8 V (I = 100 mA) OPERATION LED SWITCHING FREQUENCY TOMA SWITCHING FREQUENCY TOMA START UP DELAY SHORT CIRCUIT PROTECTION ELECTRIC PROTECTIONS Against polarity reversal - inductive loads TEMPERATURE LIMITS PROTECTION DEGREE IP 67	NOMINAL VOLTAGE	10 ÷ 30 VDC	(-15 / +10%)
MAX. OUTPUT CURRENT RESIDUAL CURRENT VOLTAGE DROP C1.8 V (I = 100 mA) OPERATION LED SWITCHING FREQUENCY START UP DELAY START UP DELAY SHORT CIRCUIT PROTECTION ELECTRIC PROTECTIONS TEMPERATURE LIMITS PROTECTION DEGREE PROTECTION DEGREE PROTECTION DEGREE	RESIDUAL RIPPLE	≤10	0%
RESIDUAL CURRENT VOLTAGE DROP <1.8 V (I = 100 mA) OPERATION LED SWITCHING FREQUENCY TOOM HZ START UP DELAY SHORT CIRCUIT PROTECTION ELECTRIC PROTECTIONS TEMPERATURE LIMITS PROTECTION DEGREE	HYSTERESIS	< 1	0%
VOLTAGE DROP <1.8 V (I = 100 mA)	MAX. OUTPUT CURRENT	200	mA
OPERATION LED Yellow SWITCHING FREQUENCY 1000 Hz START UP DELAY ≤ 50 mS REPEATABILITY ≤ 3% SHORT CIRCUIT PROTECTION Present (self-resetting) ELECTRIC PROTECTIONS Against polarity reversal - inductive loads TEMPERATURE LIMITS - 25 ÷ +60 °C PROTECTION DEGREE IP 67	RESIDUAL CURRENT	< 10	mA
SWITCHING FREQUENCY START UP DELAY SEPEATABILITY SHORT CIRCUIT PROTECTION ELECTRIC PROTECTIONS Against polarity reversal - inductive loads TEMPERATURE LIMITS PROTECTION DEGREE IP 67	VOLTAGE DROP	< 1.8 V (I =	= 100 mA)
$\begin{array}{lll} \text{START UP DELAY} & \leq 50 \text{ mS} \\ \text{REPEATABILITY} & \leq 3\% \\ \text{SHORT CIRCUIT PROTECTION} & \text{Present (self-resetting)} \\ \text{ELECTRIC PROTECTIONS} & \text{Against polarity reversal - inductive loads} \\ \text{TEMPERATURE LIMITS} & -25 \div +60 ^{\circ}\text{C} \\ \text{PROTECTION DEGREE} & \text{IP 67} \\ \end{array}$	OPERATION LED	Yell	ow
REPEATABILITY $\leq 3\%$ SHORT CIRCUIT PROTECTION Present (self-resetting) ELECTRIC PROTECTIONS Against polarity reversal - inductive loads TEMPERATURE LIMITS $-25 \div +60 ^{\circ}\text{C}$ PROTECTION DEGREE IP 67	SWITCHING FREQUENCY	1000 Hz	
SHORT CIRCUIT PROTECTION Present (self-resetting) ELECTRIC PROTECTIONS Against polarity reversal - inductive loads TEMPERATURE LIMITS - 25 ÷ +60 °C PROTECTION DEGREE IP 67	START UP DELAY	≤ 50 mS	
ELECTRIC PROTECTIONS Against polarity reversal - inductive loads TEMPERATURE LIMITS - 25 ÷ +60 °C PROTECTION DEGREE IP 67	REPEATABILITY	≤ 3%	
TEMPERATURE LIMITS - 25 ÷ +60 °C PROTECTION DEGREE IP 67	SHORT CIRCUIT PROTECTION	Present (self-resetting)	
PROTECTION DEGREE IP 67	ELECTRIC PROTECTIONS	Against polarity reversal - inductive loads	
	TEMPERATURE LIMITS	- 25 ÷ +60 °C	
CARLELENCTU	PROTECTION DEGREE	IP	67
CABLE LENGTH 2 m	CABLE LENGTH	2 m	
CABLE SECTION 3 x 0,25 mm ²	CABLE SECTION	3 x 0,25 mm ²	
HOUSING MATERIAL Nickel-plated brass	HOUSING MATERIAL	Nickel-plated brass	
WEIGHT - Cable output - 145 g	WEIGHT - Cable output -	145 g	
WEIGHT - K1 connector output -	WEIGHT - K1 connector output -	-	
WEIGHT - K connector output - 95 g	WEIGHT - K connector output -	95	g

Wiring diagrams



Connection with connector M12 (K)



CONTACTS CONFIGURATION

Available	Contacts numbers			
Available	1	2	3	4
NO or NC	+		_	NO/NC

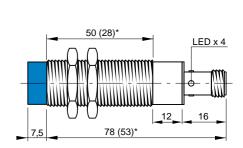
NOTE: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

50 LED 7,5 7,8

CONFIGURATION WITH CABLE

SHORT HOUSING



CONNECTOR K

(*) The dimensions into brackets reter to short housing models **Note:** the front part in blue refers 40 mt shielded models

AMPLIFIED INDUCTIVE SENSORS INCREASED RANGE 10÷30 VDC 4 WIRES NPN OR PNP OUTPUT

- Four-wire, aplified sensors
- Increased range, shielded, not shielded
- Range, 8mm to 14mm
- Short housing cable models
- 200mA NPN or PNP
- Operation LED

New

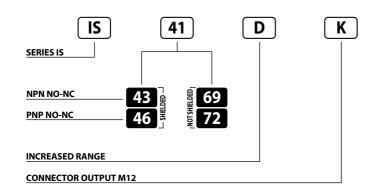






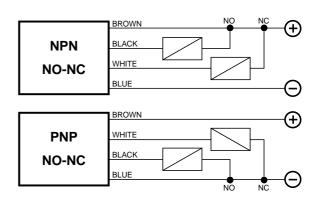
IS Series

Identification code

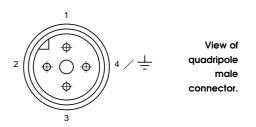


	SHIELDED	NOT SHIELDED	
NOMINAL SWITCHING DISTANCE (Sn)	8 mm	14 mm	
NOMINAL VOLTAGE	10 ÷ 30 VDC	(-15 / +10%)	
RESIDUAL RIPPLE	≤1	0%	
HYSTERESIS	< 1	0%	
MAX. OUTPUT CURRENT	200	mA	
RESIDUAL CURRENT	< 10	0 mA	
VOLTAGE DROP	< 1.2 V (I :	= 100 mA)	
OPERATION LED	Yel	low	
SWITCHING FREQUENCY	400 Hz		
START UP DELAY	≤75 mS		
REPEATABILITY	≤ 3%		
SHORT CIRCUIT PROTECTION	Present (self-resetting)		
ELECTRIC PROTECTIONS	Against polarity reversal - inductive loads		
TEMPERATURE LIMITS	- 25 ÷ +70 °C		
PROTECTION DEGREE	IP	67	
CABLE LENGTH	2 m		
CABLE SECTION	3 x 0,2	5 mm ²	
HOUSING MATERIAL	Nickel-plated brass		
WEIGHT - Cable output -	145 g		
WEIGHT - K1 connector output -		-	
WEIGHT - K connector output -	95		

Wiring diagrams



Connection with connector M12 (K)



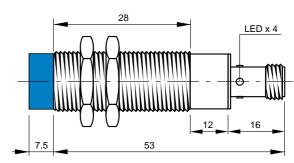
CONTACTS CONFIGURATION

Available	Contacts numbers			
Available	1 2		3	4
(NO or NC)	+	NC	-	NO

Dimensions (mm)

CONFIGURATION WITH CABLE

CONNECTOR K



AMPLIFIED INDUCTIVE SENSORS 24÷230 VAC 2 WIRES NO OR NC OUTPUT

- Two wires, 24-230 VAC
- Cable or M12 quick-connect
- Mini output current 20mA
- Maxpeak (20ms) 1.5A
- 300mA max output

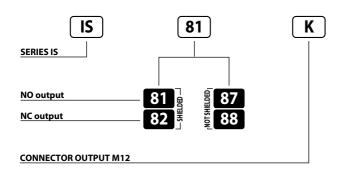
IS Series





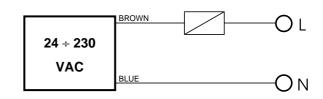


Identification code



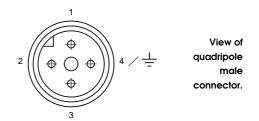
	CLUELDED	NOT CHIEF DED
	SHIELDED	NOT SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	5 mm	8 mm
NOMINAL VOLTAGE	24 ÷ 230 VAC	(-15/+10%)
NET FREQUENCY	50 ÷ 6	0 Hz
HYSTERESIS	< 10	9%
MAX. OUTPUT CURRENT	300 i	mA
MIN. OUTPUT CURRENT	20 r	nA
MAX. CURRENT PEAK (20 mS)	1,5	A
RESIDUAL CURRENT	< 1 r	nA
VOLTAGE DROP (Sensor ON)	< 6 V (I = 100 mA)	
OPERATION LED	Yellow	
SWITCHING FREQUENCY	12 Hz	
START UP DELAY	≤ 300 mS	
REPEATABILITY	≤ 3%	
TEMPERATURE LIMITS	-25 ÷ +	-70 °C
PROTECTION DEGREE	IP 6	7
CABLE LENGTH	2 m	
CABLE SECTION	2 x 0.25 mm2	
HOUSING MATERIAL	Nickel-plat	ed brass
WEIGHT - Cable output -	145	g
WEIGHT - K connector output -	95	g

Wiring diagrams



Warning: Short circuit in the output is not possible. Wrong supply cables connections can irreparably damage the detector. Therefore sensors whose output status is short-circuited will not be substituted under warranty.

Connection with connector M12 (K)



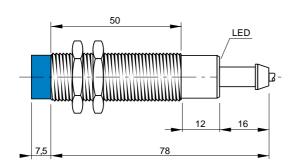
CONTACTS CONFIGURATION

Available	Contacts numbers			
Available	1	2	3	4
(NO or NC)	L		N	

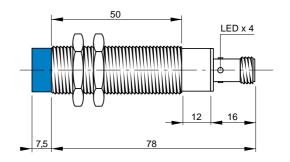
Note: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CABLE



Note: the front part in blue refers to not shielded models



AMPLIFIED INDUCTIVE SENSORS INCREASED RANGE 24+230 VAC 2 WIRES NO OR NC OUTPUT

- Two wires, 24-230 VAC
 Increased range, shielded, not shielded
 Range, 8 mm to 14 mm
 Cable or M12 quick-connect

- Mini output current 20mA Maxpeak (20ms) 1.5A
- 300mA max output

IS Series

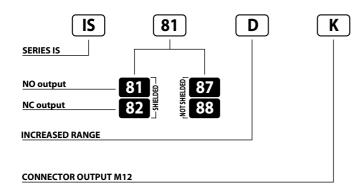






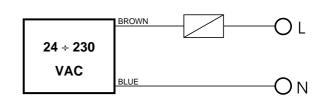


Identification code



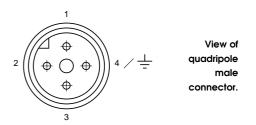
	SHIELDED	NOT SHIELDED
NOMINAL SWITCHING DISTANCE (Sn)	8 mm	14 mm
NOMINAL VOLTAGE	24 ÷ 230 VAC	(-15/+10%)
NET FREQUENCY	50 ÷ 6	0 Hz
HYSTERESIS	< 10	9%
MAX. OUTPUT CURRENT	1 006	mA
MIN. OUTPUT CURRENT	20 r	nA
MAX. CURRENT PEAK (20 mS)	1,5	A
RESIDUAL CURRENT	<1r	mA
VOLTAGE DROP (Sensor ON)	< 6 V (I = 100 mA)	
OPERATION LED	Yellow	
SWITCHING FREQUENCY	12 Hz	
START UP DELAY	≤ 300 mS	
REPEATABILITY	≤ 3%	
TEMPERATURE LIMITS	-25 ÷ +70 °C	
PROTECTION DEGREE	IP 6	57
CABLE LENGTH	2 n	n
CABLE SECTION	2 x 0.25 mm2	
HOUSING MATERIAL	Nickel-plat	ted brass
WEIGHT - Cable output -	145	g
WEIGHT - K connector output -	95	g

Wiring diagrams



Warning: Short circuit in the output is not possible. Wrong supply cables connections can irreparably damage the detector. Therefore sensors whose output status is short-circuited will not be substituted under warranty.

Connection with connector M12 (K)



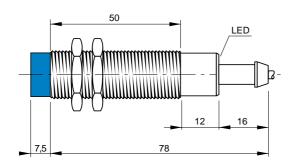
CONTACTS CONFIGURATION

Available	Contacts numbers				
Available	1 2		3	4	
(NO or NC)	L		N		

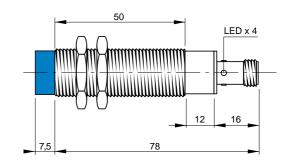
Note: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CABLE



CONFIGURATION WITH CONNECTOR K



Inductive Sensors I 30

INDUCTIVE SENSORS CONFORMING TO NAMUR RULES

- Two-wire sensors
- 5-24 VAC/VDC input
- Nickel plated brass
- · Shielded versions up to 10 mm
- Not shielded versions up to 15 mm

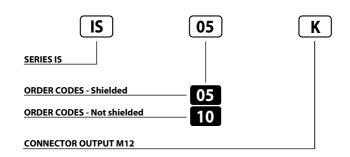
IS Series







Identification code

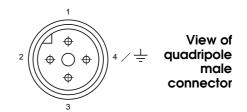


NAMUR SENSOR	BROWN	—
	BLUE	—Θ

	SHIELDED	NOT SHIELDED	
NOMINAL SWITCHING DISTANCE (Sn)	10 mm	15 mm	
NOMINAL VOLTAGE (Load resistence 1 K)	7.7 ÷	9 V DC	
DC SUPPLY VOLTAGE	5 ÷ 2	4 V DC	
RESIDUAL RIPPLE	≤	10%	
HYSTERESIS	≤	10%	
OUTPUT CURRENT (Metal present)	≤1	mA	
OUTPUT CURRENT (Metal absent)	≤ 3 mA		
SWITCHING FREQUENCY	500 Hz		
REPEATABILITY	≤ 3%		
TEMPERATURE LIMITS	-25 ÷ +60 °C		
PROTECTION DEGREE	IP 67		
CABLE LENGTH	2 m		
CABLE SECTION	2 x 0.25 mm ²		
HOUSING MATERIAL	Nickel-plated brass		
WEIGHT - Cable output -	210 g		
WEIGHT - K1 connector output -	-		
WEIGHT - K connector output -	170 g		

Connection with connector M12 (K)

Wiring diagrams



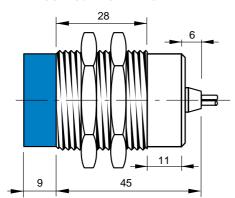
CONTACTS CONFIGURATION

Available	Available Contacts numbers			S
Available	1 2		3	4
NAMUR	+		_	

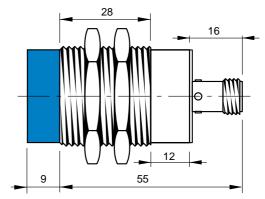
NOTE: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG and AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CABLE



Note: the front part in blue refers to not shielded models



AMPLIFIED INDUCTIVE SENSORS 10÷30 V DC 2 WIRES NO-NC PROGRAMMABLE OUTPUT

- Two-wire 10/30 VDC
- M12 quick connect or integral cable
- Shielded models up to 10 mm
- Not shielded models up to 15 mm
- Nickel plated brass

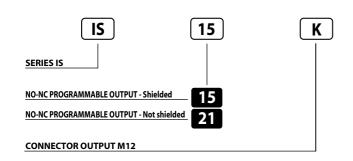
IS Series





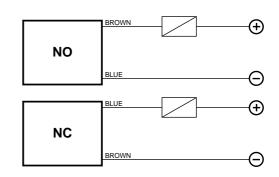


Identification code



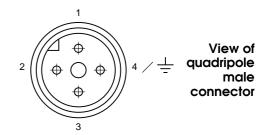
	SHIELDED	NOT SHIELDED	
NOMINAL SWITCHING DISTANCE (Sn)	10 mm	15 mm	
NOMINAL VOLTAGE	10 ÷ 30 VDC	(-15 / +10%)	
RESIDUAL RIPPLE	≤1	0%	
HYSTERESIS	<1	0%	
MAX. OUTPUT CURRENT	100	mA	
MIN. OUTPUT CURRENT	> 1,6	i mA	
RESIDUAL CURRENT	< 1,6	mA	
VOLTAGE DROP	< 6,5 V (I = 100 mA)		
OPERATION LED	Yellow		
SWITCHING FREQUENCY	300 Hz		
START UP DELAY	≤ 50 mS		
REPEATABILITY	≤3	9%	
SHORT CIRCUIT PROTECTION	Present (sel	f-resetting)	
ELECTRIC PROTECTIONS	Against polarity reve	rsal - inductive loads	
TEMPERATURE LIMITS	- 25 ÷ -	+70 °C	
PROTECTION DEGREE	IP	67	
CABLE LENGTH	2	m	
CABLE SECTION	2 x 0.2	5 mm2	
HOUSING MATERIAL	Nickel-pla	ted brass	
WEIGHT - Cable output -	210 g		
WEIGHT - K connector output -	170 g		

Wiring diagrams



WARNING: The load can be indifferently connected in series to the blue wire or to the brown wire to simulate NPN or PNP functionning logic.

Connection with connector M12 (K)



CONTACTS CONFIGURATION

Available	Contacts numbers				
Available	1	2	3	4	
NO	+		_		
NC	_		+		

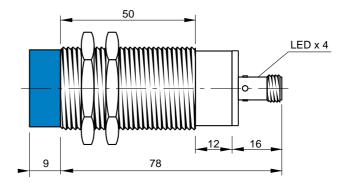
NOTE: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

50 LED 9 68

CONFIGURATION WITH CABLE

Note: the front part in blue refers to not shielded models



AMPLIFIED INDUCTIVE SENSORS INCREASED RANGE 10÷30 V DC 2 WIRES NO-NC PROGRAMMABLE OUTPUT

- Two-wire, amplified Increased range, shielded, not shielded
- 10 to 30 VDC
- Range, 15 mm to 20 mm
- NO or NC select
- M12 quick connect or integral cable
- Nickel plated brass

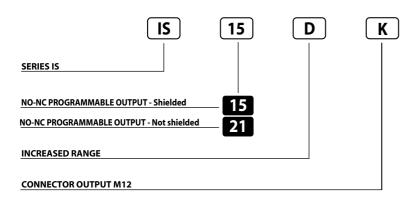






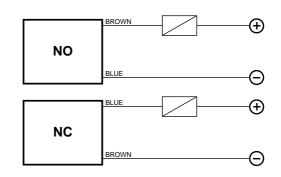
IS Series

Identification code



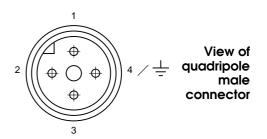
	SHIELDED	NOT SHIELDED	
NOMINAL SWITCHING DISTANCE (Sn)	15 mm	20 mm	
NOMINAL VOLTAGE	10 ÷ 30 VDC	(-15 / +10%)	
RESIDUAL RIPPLE	≤1	0%	
HYSTERESIS	<1	0%	
MAX. OUTPUT CURRENT	100	mA	
MIN. OUTPUT CURRENT	> 1,6	5 mA	
RESIDUAL CURRENT	< 1,6	i mA	
VOLTAGE DROP	< 6,5 V (I =	= 100 mA)	
OPERATION LED	Yellow		
SWITCHING FREQUENCY	200	Hz	
START UP DELAY	≤ 50 mS		
REPEATABILITY	≤3	3%	
SHORT CIRCUIT PROTECTION	Present (sel	f-resetting)	
ELECTRIC PROTECTIONS	Against polarity reve	rsal - inductive loads	
TEMPERATURE LIMITS	- 25 ÷ -	+70 °C	
PROTECTION DEGREE	IP	67	
CABLE LENGTH	2	m	
CABLE SECTION	2 x 0.25 mm2		
HOUSING MATERIAL	Nickel-pla	ited brass	
WEIGHT - Cable output -	210 g		
WEIGHT - K connector output -	170 g		

Wiring diagrams



WARNING: The load can be indifferently connected in series to the blue wire or to the brown wire to simulate NPN or PNP functionning logic.

Connection with connector M12 (K)



CONTACTS CONFIGURATION

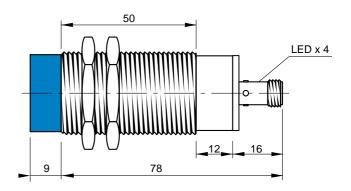
Available	Contacts numbers			
Available	1	2	3	4
NO	+		_	
NC	_		+	

NOTE: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CABLE LED 12 68

Note: the front part in blue refers to not shielded models



AMPLIFIED INDUCTIVE SENSORS 10÷30 V DC 3 WIRES NPN OR PNP OUTPUT

- Three-wire, amplified, sensors
- Short housing models
- M12 quick connect models
- Operation LED

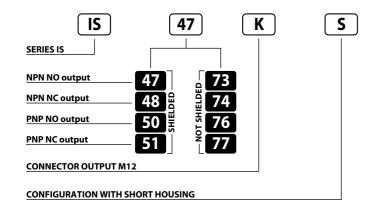
IS Series





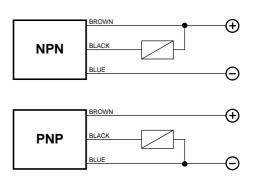


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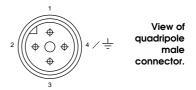


	SHIELDED	NOT SHIELDED		
NOMINAL SWITCHING DISTANCE (Sn)	10 mm	15 mm		
NOMINAL VOLTAGE	10 ÷ 30 VDC (-15 / +10%)			
RESIDUAL RIPPLE	≤ 10	0%		
HYSTERESIS	< 1	0%		
MAX. OUTPUT CURRENT	200	mA		
RESIDUAL CURRENT	< 10	mA		
VOLTAGE DROP	< 1.8 V (I =	= 100 mA)		
OPERATION LED	Yellow			
SWITCHING FREQUENCY	300 Hz			
START UP DELAY	≤ 50 mS			
REPEATABILITY	≤3%			
SHORT CIRCUIT PROTECTION	Present (sel	f-resetting)		
ELECTRIC PROTECTIONS	Against polarity reve	rsal - inductive loads		
TEMPERATURE LIMITS	- 25 ÷ -	+60 °C		
PROTECTION DEGREE	IP (67		
CABLE LENGTH	2 ו	m		
CABLE SECTION	3 x 0,2	5 mm ²		
HOUSING MATERIAL	Nickel-plated brass			
WEIGHT - Cable output -	210) g		
WEIGHT - K1 connector output -	-			
WEIGHT - K connector output -	170 g			

Wiring diagrams



Connection with connector M12 (K)

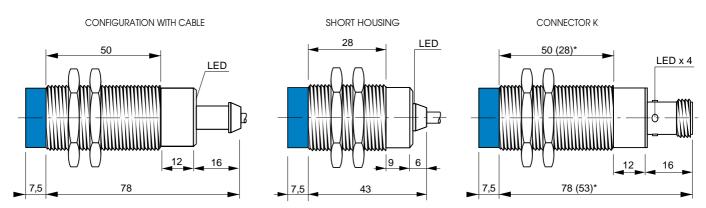


Note: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

CONTACTS CONFIGURATION

Available	Contacts numbers			
Available	1 2	3	4	
(NO or NC)	+		ı	NO/NC

Dimensions (mm)



(*) The dimensions into brackets reter to short housing models **Note:** the front part in blue refers to not shielded models

AMPLIFIED INDUCTIVE SENSORS INCREASED RANGE 10÷30 VDC 4 WIRES NPN OR PNP OUTPUT

- Four-wire
- Increased range, shielded, not shielded Range, 15mm to 20 mm
- Short housing
- 200mA NPN or PNP
- **Operation LED**

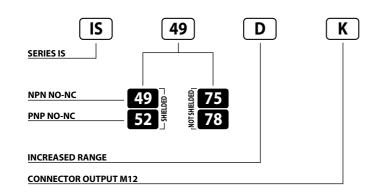






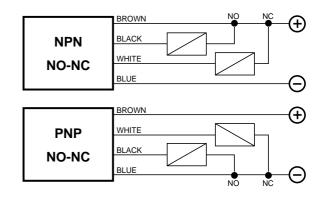
IS Series

Identification code

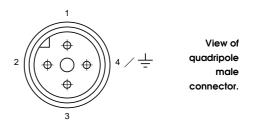


	SHIELDED	NOT SHIELDED		
NOMINAL SWITCHING DISTANCE (Sn)	15 mm	20 mm		
NOMINAL VOLTAGE	10 ÷ 30 VDC	(-15 / +10%)		
RESIDUAL RIPPLE	≤1	0%		
HYSTERESIS	<1	0%		
MAX. OUTPUT CURRENT	200	mA		
RESIDUAL CURRENT	< 10) mA		
VOLTAGE DROP	< 1.2 V (I =	= 100 mA)		
OPERATION LED	Yellow			
SWITCHING FREQUENCY	200 Hz			
START UP DELAY	≤ 75 mS			
REPEATABILITY	≤ 3%			
SHORT CIRCUIT PROTECTION	Present (self-resetting)			
ELECTRIC PROTECTIONS	Against polarity reversal - inductive loads			
TEMPERATURE LIMITS	- 25 ÷	+70 °C		
PROTECTION DEGREE	IP	67		
CABLE LENGTH	2	m		
CABLE SECTION	3 x 0,2	5 mm ²		
HOUSING MATERIAL	Nickel-plated brass			
WEIGHT - Cable output -	21	0 g		
WEIGHT - K1 connector output -	-			
WEIGHT - K connector output -	170 g			

Wiring diagrams



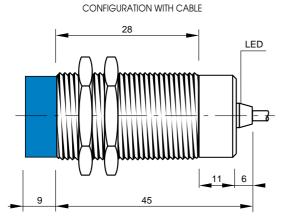
Connection with connector M12 (K)

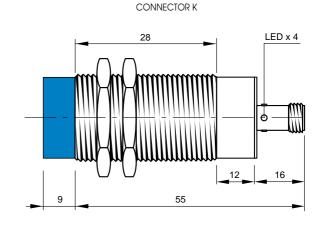


CONTACTS CONFIGURATION

Available	Contacts numbers			
Available	1	2	3	4
(NO or NC)	+	NC	_	NO

Dimensions (mm)





AMPLIFIED INDUCTIVE SENSORS 24÷230 VAC 2 WIRES NO OR NC OUTPUT

- Two wires, 24-230 VAC
- Cable or M12 quick-connect
- · Mini output current 20mA
- Maxpeak (20ms) 1.5A
- 300mA max output

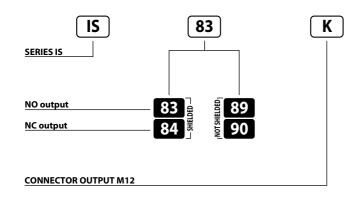
IS Series





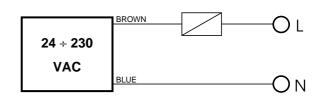


Identification code



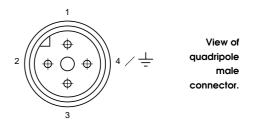
	SHIELDED	NOT SHIELDED	
NOMINAL SWITCHING DISTANCE (Sn)	10 mm	15 mm	
NOMINAL VOLTAGE	24 ÷ 230 VAC	(-15/+10%)	
NET FREQUENCY	50 ÷ 6	0 Hz	
HYSTERESIS	< 10)%	
MAX. OUTPUT CURRENT	300 ı	mA	
MIN. OUTPUT CURRENT	20 r	nA	
MAX. CURRENT PEAK (20 mS)	1,5	A	
RESIDUAL CURRENT	< 1 r	nA	
VOLTAGE DROP (Sensor ON)	< 6 V (I = 100 mA)		
OPERATION LED	Yellow		
SWITCHING FREQUENCY	12 Hz		
START UP DELAY	≤ 300 mS		
REPEATABILITY	≤3	%	
TEMPERATURE LIMITS	-25 ÷ +	70 °C	
PROTECTION DEGREE	IP 6	7	
CABLE LENGTH	2 r	n	
CABLE SECTION	2 x 0.25	mm2	
HOUSING MATERIAL	Nickel-pla	ted brass	
WEIGHT - Cable output -	210 g		
WEIGHT - K connector output -	170 g		

Wiring diagrams



Warning: Short circuit in the output is not possible. Wrong supply cables connections can irreparably damage the detector. Therefore sensors whose output status is short-circuited will not be substituted under warranty.

Connection with connector M12 (K)



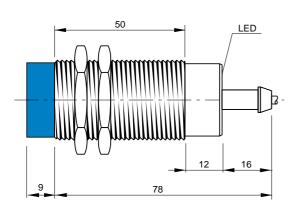
CONTACTS CONFIGURATION

Available	Contacts numbers 1 2 3 4			
Available				
(NO or NC)	L		N	

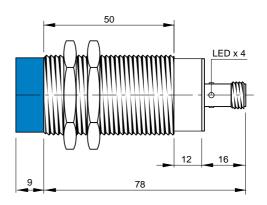
 $\begin{tabular}{ll} \textbf{Note:} The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL. \end{tabular}$

Dimensions (mm)

CONFIGURATION WITH CABLE



Note: the front part in blue refers to not shielded models



AMPLIFIED INDUCTIVE SENSORS INCREASED RANGE 24÷230 VAC 2 WIRES NO OR NC OUTPUT

- Two wires, 24-230 VAC Increased range, shielded, not shielded Range, 15mm to 20mm Cable or M12 quick-connect

- Mini output current 20mA Maxpeak (20ms) 1.5A
- 300mA max output

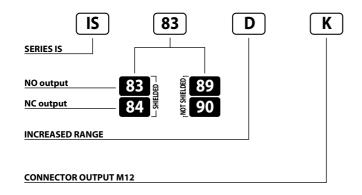






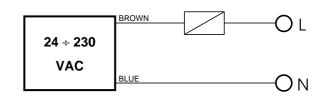
IS Series

Identification code



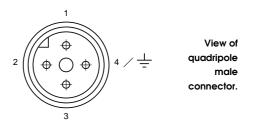
	SHIELDED	NOT SHIELDED	
NOMINAL SWITCHING DISTANCE (Sn)	15 mm	20 mm	
NOMINAL VOLTAGE	24 ÷ 230 VAC	(-15/+10%)	
NET FREQUENCY	50 ÷ 6	0 Hz	
HYSTERESIS	< 10	9%	
MAX. OUTPUT CURRENT	300 ı	mA	
MIN. OUTPUT CURRENT	20 r	nA	
MAX. CURRENT PEAK (20 mS)	1,5	A	
RESIDUAL CURRENT	< 1 r	nA	
VOLTAGE DROP (Sensor ON)	< 6 V (I = 100 mA)		
OPERATION LED	Yellow		
SWITCHING FREQUENCY	12 Hz		
START UP DELAY	≤ 300 mS		
REPEATABILITY	≤3	%	
TEMPERATURE LIMITS	-25 ÷ +	70 °C	
PROTECTION DEGREE	IP 6	7	
CABLE LENGTH	2 n	n	
CABLE SECTION	2 x 0.25 mm2		
HOUSING MATERIAL	Nickel-plat	ed brass	
WEIGHT - Cable output -	210 g		
WEIGHT - K connector output -	170 g		

Wiring diagrams



Warning: Short circuit in the output is not possible. Wrong supply cables connections can irreparably damage the detector. Therefore sensors $% \left(1\right) =\left(1\right) \left(1\right)$ whose output status is short-circuited will not be substituted under warranty.

Connection with connector M12 (K)



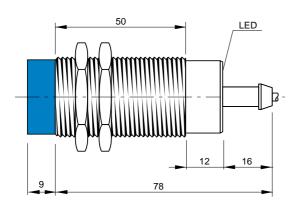
CONTACTS CONFIGURATION

Available	Contacts numbers			
Available	1	2	3	4
(NO or NC)	L		N	

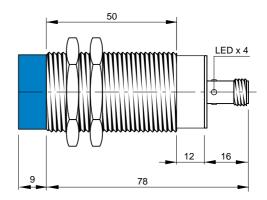
Note: The K plug is compatible with the following connectors VAUDEHA, BINDER, HIRSCHMANN, LUMBERG, AMPHENOL-TUCHEL.

Dimensions (mm)

CONFIGURATION WITH CABLE



Note: the front part in blue refers to not shielded models



Hall Effect Magnetic Sensors I 9

HALL EFFECT MAGNETIC PROXIMITY SENSORS 12÷30 VDC PNP OUTPUT

- Three-wire sensors
- Fast 50 µS ON/OFF
- Sensing models: Front end travel
 Bilateral side travel
 Choice of magnet targets

• PNP NC or NO

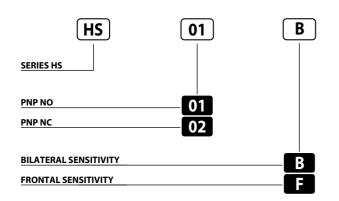
HS Series





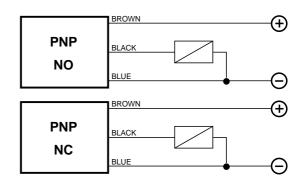


Identification code



MAGNETIC FLUX (Gauss)	
• SENSOR ON	≥ 25 (Tip. 15 at 25°C)
• SENSORE OFF	≥ 5 (Tip. 11 at 25°C)
• HYSTERESIS	Max. diff. 7 (Tip. 4 at 25°C)
NOMINAL VOLTAGE	12 ÷ 30 VDC (-15/+10%)
RESIDUAL RIPPLE	≤ 10%
MAX. CURRENT OUTPUT	200 mA
ABSORPTION AT 30 VDC	≤ 10 mA
VOLTAGE DROP (Sensor ON)	< 1.8 V
YELLOW LED	Output indicator
GREEN LED	Supply indicator
SWITCHING FREQUENCY (max.)	10 kHz
TIME RESPONSE	100 μS
START UP DELAY	50 mS
SHORT CIRCUIT PROTECTION	Present (self-resetting)
ELECTRIC PROTECTIONS	Against reversal polarity - inductive loads
TEMPERATURE LIMITS	- 20 ÷ +60 °C
PROTECTION DEGREE	IP 67
CABLE LENGTH	2 m
CABLE SECTION	3 x 0.25 mm2
HOUSING MATERIAL	Nickel-plated brass
WEIGHT (Approximately)	50 g

Wiring diagrams

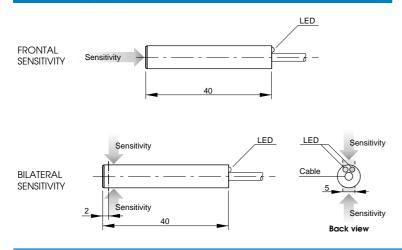


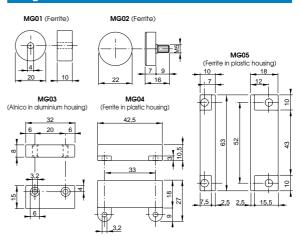
Hall effect sensor / magnet switching distance (mm)

	ETER 9 Hysteresis	
33	4	MG01
30	4	MG02
18	5	MG03
41	6,5	MG04
35	7	MG05

WARNING: The data specified in this table have an approximate value because they depend on the magnet position, on the material on which it is applied (ferromagnetic or not) and because they are related to the magnet during the frontal approach.

Dimensions (mm)





Hall Effect Magnetic Sensors I 12

HALL EFFECT MAGNETIC PROXIMITY SENSORS 12÷30 VDC PNP OUTPUT

- Three-wire sensors
- Fast 50 µS ON/OFF
- Sensing models: Front end travel Bilateral side travel Choice of magnet targets

• PNP NC or NO

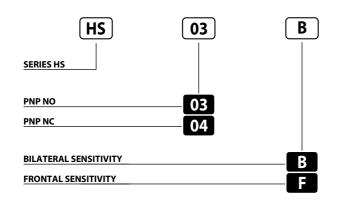
HS Series





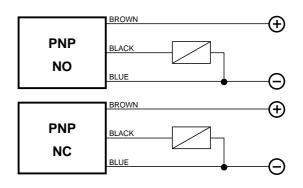


Identification code



MAGNETIC FLUX (Gauss)	
• SENSOR ON	≥ 25 (Tip. 15 at 25°C)
• SENSORE OFF	≥ 5 (Tip. 11 at 25°C)
• HYSTERESIS	Max. diff. 7 (Tip. 4 at 25°C)
NOMINAL VOLTAGE	12 ÷ 30 VDC (-15/+10%)
RESIDUAL RIPPLE	≤ 10%
MAX. CURRENT OUTPUT	200 mA
ABSORPTION AT 30 VDC	≤ 10 mA
VOLTAGE DROP (Sensor ON)	< 1.8 V
YELLOW LED	Output indicator
GREEN LED	Supply indicator
SWITCHING FREQUENCY (max.)	10 kHz
TIME RESPONSE	100 μS
START UP DELAY	50 mS
SHORT CIRCUIT PROTECTION	Present (self-resetting)
ELECTRIC PROTECTIONS	Against reversal polarity - inductive loads
TEMPERATURE LIMITS	- 20 ÷ +60 °C
PROTECTION DEGREE	IP 67
CABLE LENGTH	2 m
CABLE SECTION	3 x 0.25 mm2
HOUSING MATERIAL	Nickel-plated brass
WEIGHT (Approximately)	110 g

Wiring diagrams

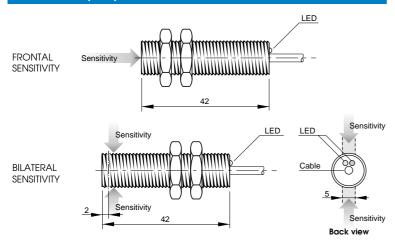


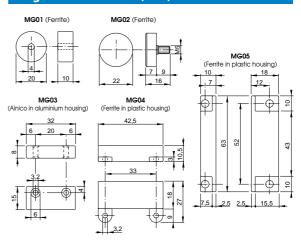
Hall effect sensor / magnet switching distance (mm)

	ETER 12 Hysteresis	
33	4	MG01
30	4	MG02
18	5	MG03
41	6,5	MG04
35	7	MG05

WARNING: The data specified in this table have an approximate value because they depend on the magnet position, on the material on which it is applied (ferromagnetic or not) and because they are related to the magnet during the frontal approach.

Dimensions (mm)





Hall Effect Magnetic Sensors I 18

HALL EFFECT MAGNETIC PROXIMITY SENSORS 12÷30 VDC PNP OUTPUT

- Three-wire sensors
- Fast 50 µS ON/OFF
- Sensing models: Front end travel
 Bilateral side travel
 Choice of magnet targets

• PNP NC or NO

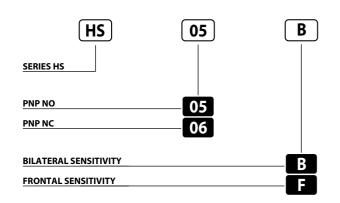
HS Series





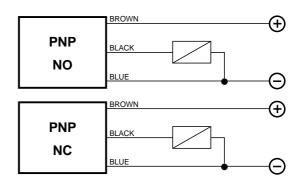


Identification code



MAGNETIC FLUX (Gauss)	
• SENSOR ON	≥ 25 (Tip. 15 at 25°C)
• SENSORE OFF	≥ 5 (Tip. 11 at 25°C)
• HYSTERESIS	Max. diff. 7 (Tip. 4 at 25°C)
NOMINAL VOLTAGE	12 ÷ 30 VDC (-15/+10%)
RESIDUAL RIPPLE	≤ 10%
MAX. CURRENT OUTPUT	200 mA
ABSORPTION AT 30 VDC	≤ 10 mA
VOLTAGE DROP (Sensor ON)	< 1.8 V
YELLOW LED	Output indicator
GREEN LED	Supply indicator
SWITCHING FREQUENCY (max.)	10 kHz
TIME RESPONSE	100 μS
START UP DELAY	50 mS
SHORT CIRCUIT PROTECTION	Present (self-resetting)
ELECTRIC PROTECTIONS	Against reversal polarity - inductive loads
TEMPERATURE LIMITS	- 20 ÷ +60 °C
PROTECTION DEGREE	IP 67
CABLE LENGTH	2 m
CABLE SECTION	3 x 0.25 mm2
HOUSING MATERIAL	Nickel-plated brass
WEIGHT (Approximately)	145 g

Wiring diagrams

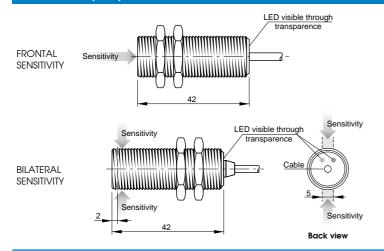


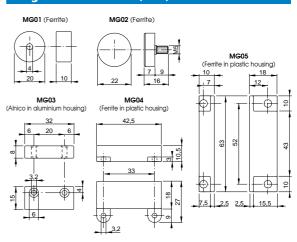
Hall effect sensor / magnet switching distance (mm)

	ETER 18 Hysteresis	
33	4	MG01
30	4	MG02
18	5	MG03
41	6,5	MG04
35	7	MG05

WARNING: The data specified in this table have an approximate value because they depend on the magnet position, on the material on which it is applied (ferromagnetic or not) and because they are related to the magnet during the frontal approach.

Dimensions (mm)





REED CONTACT MAGNETIC PROXIMITY SENSORS

- Metal housing
- 2 µS delay on activation
- 2 m integral cable
- · Choiche of magnets

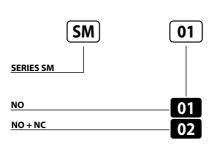
SM Series







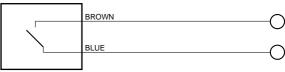
Identification code



MAX. VOLTAGE	230 V AC
MAX. CURRENT	0.5 A
POWER	10 W/VA
SWITCHING FREQUENCY	200 Hz
DELAY ON ACTIVATION	2 mS
REPEATABILITY	± 0.3 mm
TEMPERATURE LIMITS	-25 ÷ +70°C
PROTECTION DEGREE	IP 67
CABLE LENGTH	2m
CABLE SECTION	3 x 0.50 mm ²
HOUSING MATERIAL	Nickel-plated brass

Wiring diagrams

NO CONTACT



NO + NC CONTACT

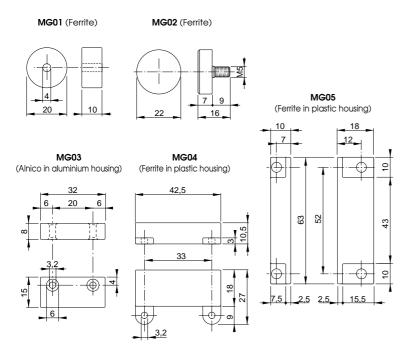
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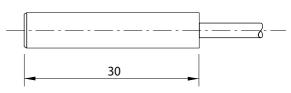
Reed contact sensor / magnet switching distance (mm)

DIAMETER 6 Distance Hysteresis 5 24 MG01 22 5 MG02 6 2,5 5 32 MG04 29 5 MG05

WARNING: The data specified in this table have an approximate value because they depend on the magnet position, on the material on which it is applied (ferromagnetic or not) and because they are related to the magnet during the frontal approach. Reed contact sensors can be also activated laterally considering that switching distances are always influenced by the magnet position and orientation besides the material on which it is applied (ferromagnetic or not).

Magnets dimensions (mm)





REED CONTACT MAGNETIC PROXIMITY SENSORS

- Metal housing
- 2 µS delay on activation
- 2 m integral cable
- · Choiche of magnets

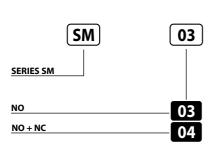
SM Series







Identification code



MAX. VOLTAGE	230 V AC
MAX. CURRENT	0.5 A
POWER	10 W/VA
SWITCHING FREQUENCY	200 Hz
DELAY ON ACTIVATION	2 mS
REPEATABILITY	\pm 0.3 mm
TEMPERATURE LIMITS	-25 ÷ +70°C
PROTECTION DEGREE	IP 67
CABLE LENGTH	2m
CABLE SECTION	3 x 0.50 mm ²
HOUSING MATERIAL	Nickel-plated brass

Wiring diagrams

NO CONTACT



NO + NC CONTACT

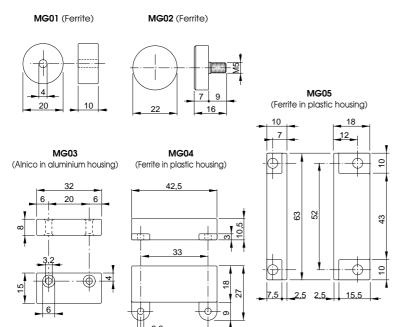
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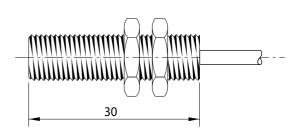
Reed contact sensor / magnet switching distance (mm)

	ETER 8 Hysteresis	
24	5	MG01
22	5	MG02
6	2,5	MG03
32	5	MG04
29	5	MG05

WARNING: The data specified in this table have an approximate value because they depend on the magnet position, on the material on which it is applied (ferromagnetic or not) and because they are related to the magnet during the frontal approach. Reed contact sensors can be also activated laterally considering that switching distances are always influenced by the magnet position and orientation besides the material on which it is applied (ferromagnetic or not).

Magnets dimensions (mm)





REED CONTACT MAGNETIC PROXIMITY SENSORS

- Metal housing
- 2 µS delay on activation
- 2 m integral cable
- · Choiche of magnets

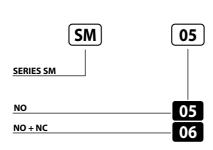
SM Series







Identification code



MAX. VOLTAGE	230 V AC
MAX. CURRENT	0.5 A
POWER	10 W/VA
SWITCHING FREQUENCY	200 Hz
DELAY ON ACTIVATION	2 mS
REPEATABILITY	± 0.3 mm
TEMPERATURE LIMITS	-25 ÷ +70°C
PROTECTION DEGREE	IP 67
CABLE LENGTH	2m
CABLE SECTION	3 x 0.50 mm ²
HOUSING MATERIAL	Nickel-plated brass

Wiring diagrams

NO CONTACT



NO + NC CONTACT

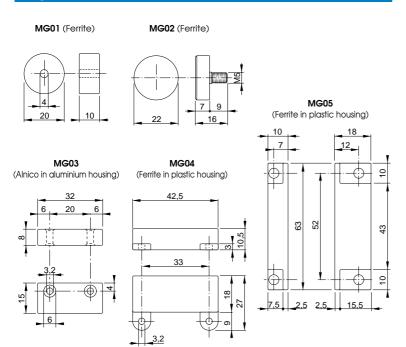
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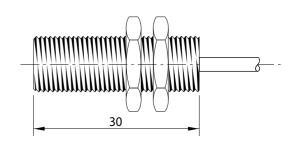
Reed contact sensor / magnet switching distance (mm)

DIAMI Distance	ETER 10 Hysteresis	
24	5	MG01
22	5	MG02
6	2,5	MG03
32	5	MG04
29	5	MG05

WARNING: The data specified in this table have an approximate value because they depend on the magnet position, on the material on which it is applied (ferromagnetic or not) and because they are related to the magnet during the frontal approach. Reed contact sensors can be also activated laterally considering that switching distances are always influenced by the magnet position and orientation besides the material on which it is applied (ferromagnetic or not).

Magnets dimensions (mm)





REED CONTACT MAGNETIC PROXIMITY SENSORS

- Metal and plastic housing
- 2 µS delay on activation
- 2 m integral cable
- · Choiche of magnets

SM Series







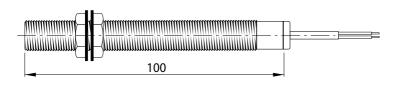
Identification code

SERIES SM	07
NO - Length 30mm	07
NO + NC - Length 30mm	- 08
POWER NO - Length 30mm	09 (2)
POWER NO - Length 70mm	13 (1)
POWER NO+NC - Length 30mm	- 14 (3)
NO - Length 100mm - plastic	19 (2)
POWER NO - Length 100mm - plastic	21
BISTABLE - Length 100mm - plastic	22 (3)

MAX. VOLTAGE	230 V AC
MAX. CURRENT	0.5 A
POWER	10 W/VA
SWITCHING FREQUENCY	200 Hz
DELAY ON ACTIVATION	2 mS
REPEATABILITY	± 0.3 mm
TEMPERATURE LIMITS	-25 ÷ +70°C
PROTECTION DEGREE	IP 67
CABLE LENGTH	2m
CABLE SECTION	3 x 0.50 mm ²
HOUSING MATERIAL	Nickel-plated brass

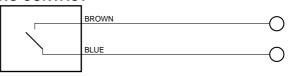
(1) Power: 100W; I=3A (2) Power: 50W; I=1A (3) Power: 60W; I=3A

Plastic housing models dimensions (mm)



Wiring diagrams

NO CONTACT



NO + NC CONTACT

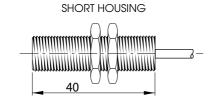
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Reed contact sensor / magnet switching distance (mm)

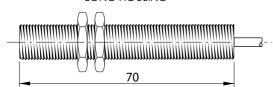
DIAME Distance	ETER 12 Hysteresis	
24 12 (Power)	5 7 (Power)	MG01
22 10 (Power)	5 6 (Power)	MG02
6 0 (Power)	2.5 0 (Power)	MG03
22 22 (Power)	9 9 (Power)	MG04
20 20 (Power)	9 9 (Power)	MG05

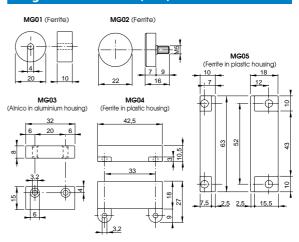
WARNING: The data specified in this table have an approximate value because they depend on the magnet position, on the material on which it is applied (ferromagnetic or not) and because they are related to the magnet during the frontal approach. Reed contact sensors can be also activated laterally considering that switching distances are always influenced by the magnet position and orientation besides the material on which it is applied (ferromagnetic or not).

Metal housing models dimensions (mm)



LONG HOUSING





REED CONTACT MAGNETIC PROXIMITY SENSORS

- Metal housing
- 2 µS delay on activation
- 2 m integral cable
- · Choiche of magnets

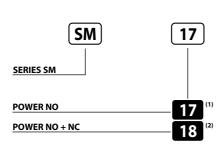
SM Series







Identification code



MAX. VOLTAGE	230 V AC
MAX. CURRENT	0.5 A
POWER	10 W/VA
SWITCHING FREQUENCY	200 Hz
DELAY ON ACTIVATION	2 mS
REPEATABILITY	± 0.3 mm
TEMPERATURE LIMITS	-25 ÷ +70°C
PROTECTION DEGREE	IP 67
CABLE LENGTH	2m
CABLE SECTION	3 x 0.50 mm ²
HOUSING MATERIAL	Nickel-plated brass

(1) Power: 100W; I=3A (2) Power: 60W; I=3A

Wiring diagrams

NO CONTACT



NO + NC CONTACT

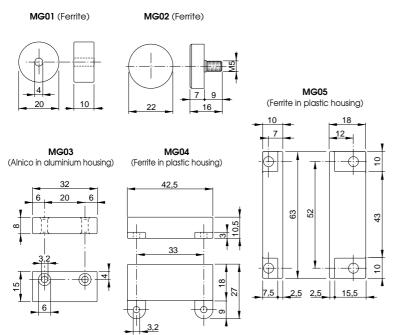
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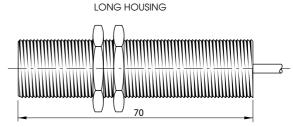
Reed contact sensor / magnet switching distance (mm)

	ETER 18 Hysteresis	
12	7	MG01
10	6	MG02
-	-	MG03
22	9	MG04
20	9	MG05

WARNING: The data specified in this table have an approximate value because they depend on the magnet position, on the material on which it is applied (ferromagnetic or not) and because they are related to the magnet during the frontal approach. Reed contact sensors can be also activated laterally considering that switching distances are always influenced by the magnet position and orientation besides the material on which it is applied (ferromagnetic or not).

Magnets dimensions (mm)





LS 150 Luminescence Scanner

Industrial Automation Sensor



FEATURES

- Scan in visible blue light for detecting fluorescent objects and markings.
- Small die cast zinc housing with glass lens. Protection class IP 65 industrial application rated.
- M 12 connector and non threaded mounting holes for fast mounting.
- Circular beam spot.
- Various filtering
- High speed switching frequency.
- Digital sensitivity adjustment
- Large scanning range
- Long life light source
- Short response time







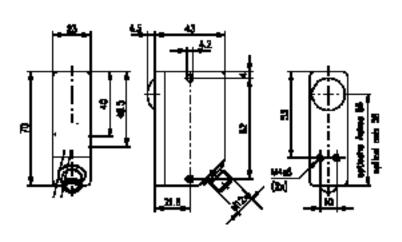


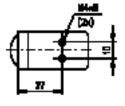


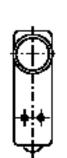




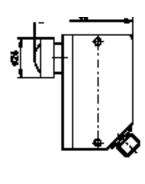








50mm 30-100mm 70-150mm





15437 Neo Parkway Cleveland, Ohio 44128

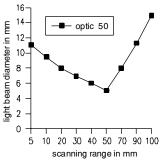
Toll-Free: 800-426-9912 / Phone: 216-518-9888 Fax: 216-518-9884

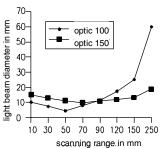
Web: www.emxinc.com / Email: sensors@emxinc.com

LS 150 Luminescence Scanner

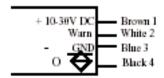
Industrial Automation Sensor

TABLES





ELECTRICAL CONNECTION



SPECIFICATIONS

OPTICAL DATA

Scanning Range (Note 1) Light Source Wavelength

Light Beam Diameter Average Life (Note 2)

TIMINO

Switching Frequency Response Time Delay before start up

ELECTRICAL DATA

Operating Voltage UB Residual Ripple Bias Current Switching Output Function Characteristics Signal Voltage High/Low Output Current Sensitivity

INDICATORS

LED Yellow

MECHANICAL DATA

Housing Optics Cover Weight Connection Type

ENVIRONMENTAL DATA

Ambient Temp. (operation/storage)
Protection Class
VDE Safety Class
Extraneous Light Limit
Protective Circuit (Note 3)
Impact Resistance
Vibration Resistance
Electromagnetic Compatibility
OPTIONS
Warning Output (warn)

Signal Voltage High / Low

Signal Voltage High/Low Output Current

50, 30-100, 70-150 mm

LED

370...450 nm (visible blue light) Depending on filtering Circular (see tables)

≥ 100,000 hours

2 kHz 250 µs ≤ 200 ms

10...30 V DC (incl. Residual ripple)

≤ 15% of UB ≤ 40 mA

PNP transistor output

Light switched ≥ (UB -2 V) / 2V Max. 200 mA

Adjustable using potentiometer 270°

Reflection

Die cast zinc Glass

250 g

M 12 dia. Connector, stainless steel,

5 pole

-20° C - +60° C / -40° C - + 70° C

.. . III

≥ 20 kLux accord. To EN 60947-5-2

2,3

Accord to EN 60947-5-2

Accord to EN 60947-5-2

Accord to EN 60947-5-2

PNP transistor output, low for

Function failure ≥ (UB -2 V) / ≤ 2V

≥ (UB -2 V) / ≤ 2V Max 100 mA

(Note 1) Scanning range: recommended range

(Note 2) At + 25° C

(Note 3) 2 = polarity reversal protection, 3 = short circuit protection for all outputs



15437 Neo Parkway Cleveland, Ohio 44128

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Web: www.emxinc.com / Email: sensors@emxinc.com