Schlüter high-value sensors

Inductive
Capacitive
Photoelectric
Ultrasonic

Schlüter
SENSOR GROUP
Melviri AG SENSOR SOLUTIONS · Schlüter Automation and Sensors · Locon Sensor Systems, Inc. · Melviri GmbH SENSORS MADE IN GERMANY

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Inductive proximity sensor

Inductive Proximity Switches operate by using an L/C resonant oscillator which generates, with the aid of a coil located in the open pot core, a high frequency alternating electromagnetic field. This field emerges from the active face of the switch.

When an electrically conductive material (for example a steel plate)moves into the electromagnetic field, an induced eddy current occurs.This eddy current extracts energy form the L/C resonant circuit in the switch, and produces a reduction in the oscillation amplitude. This reduction in the amolitude is converted by the associated electronic circuitry into a clear electronic signal, and changes the state of the switch.

When the electrically conductive material is removed from the alternating field the oscillation amplitude increases which, by way of the electronic circuitry, will restore the switch to the original unswitched state.

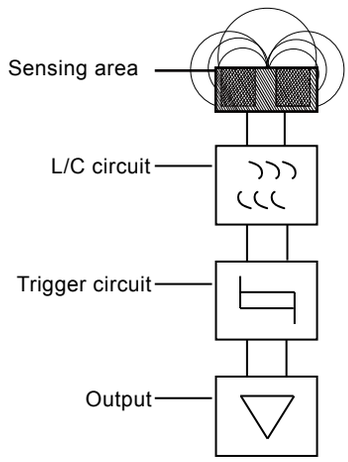


Fig.1
Block Diagram - Inductive Switch

Normal operating distance

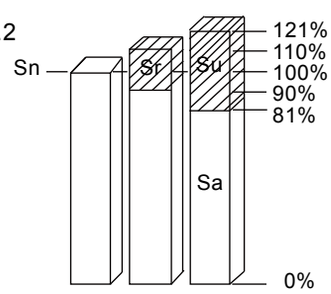
The normal operating distance is defined as the distance between the detector and the target when the change(switching) in the logic state of the proximity switch occurs. This distance and the tests associated in obtaining this distance are outline in CENELEC EN 50010 Standards. From this standard the target for establishing Normal Operating Distance is an iron (Fe 360) square 1 mm thick, and for cylindrical switches, the size is as showen in Table 1. The normal sensing distance Sn and Sr, Su, Sa information see Fig.2 .

Table 1

Diameter (mm)	Nominal distance SN (mm)	Fe 360 actuator (mm)
8	1	8X8x1
8	2	8X8x1
12	2	12X12x1
12	4	12X12x1
18	5	18X18x1
18	8	24X24x1
30	10	30X30x1
30	15	45X45x1

Table 1: Actuator dimensions as function of the diameter and of the operating distance

Fig.2



Sn = nominal sensing distance
Sr = effective operating distance
0.9 Sn <= Sr <= 1.1 Sn
Su = useful sensing distance
0.9 Sr <= Su <= 1.1 Sr
Sa = operating zone
0 < Sa <= 0.9 x 0.9 x Sn

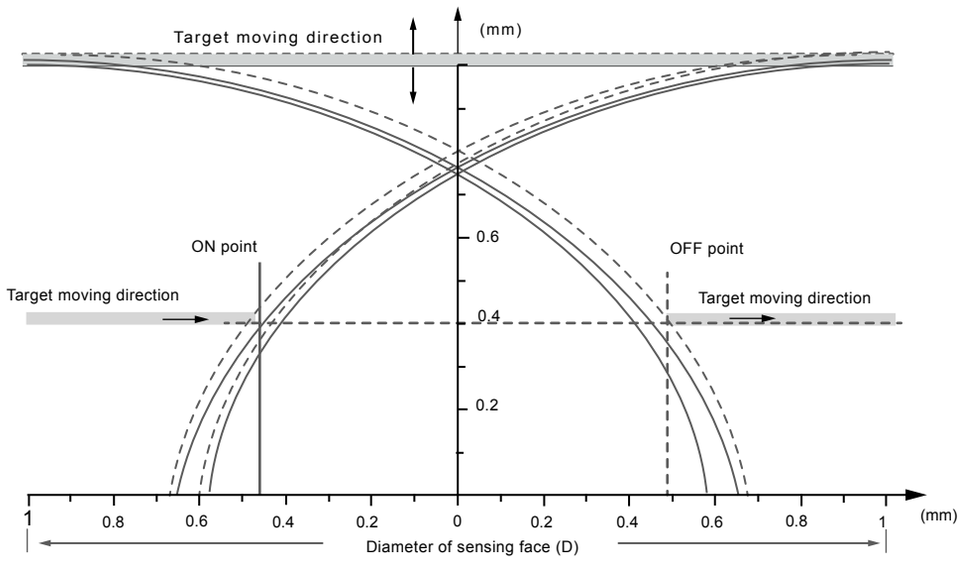
Correction Factor

When using inductive proximity switches with non-ferrous metals it is nescessary to apply a correction factor to the operating distance (sensing range), see Table 2.

Correction Factor:	
Non-ferrous metal	Factor
Fe 360	1
Aluminum	0.35-0.45
Brass	0.35-0.5
Copper	0.25-0.45
Stainless Steel	0.6-1.0
Cast Iron	0.93-1.05
Nickel	0.65-0.75

(Table 2)

Sensor response curve (Fig.3)



(Fig. 3)

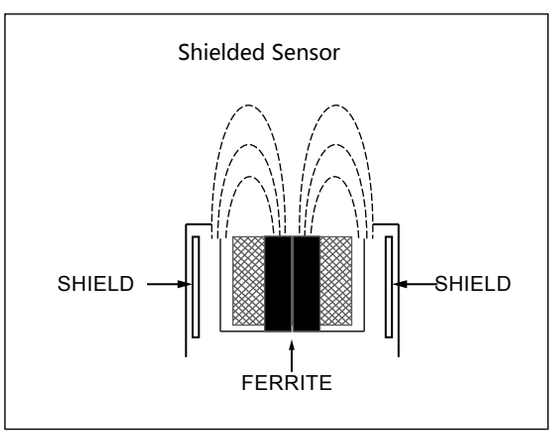
Repeatability

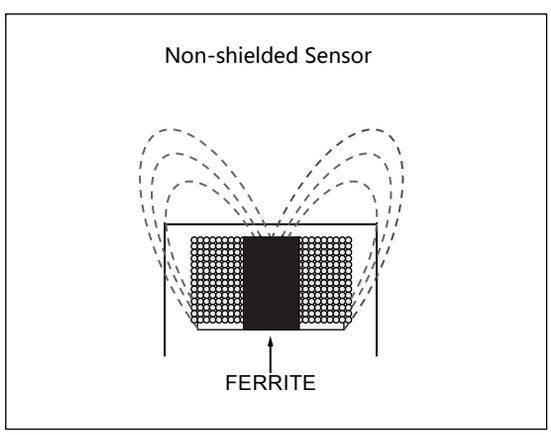
Variation in sensing distance for successive operations under specified conditions (specified sensing range,temperature at 23±5℃, humidity ≤90% specified operating voltage, circyle is 8 hours).

Shielded & Non-shielded

Shielded construction includes a metal band which surrounds the ferrite core and coil arrangement. This helps to direct the electro-magnetic field to the front of the sensor.

Non-shielded sensors do not have this metal band, therefore they can be side sensitive.

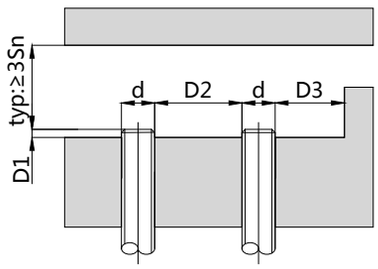




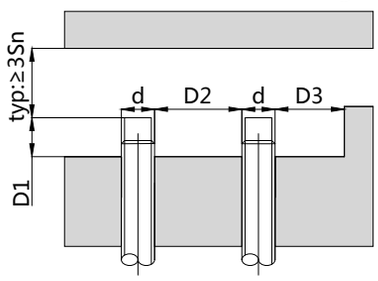
Product is installed in metal material

Standard distance	flush mounting	D1≥0		
		D2≥d		
		D3≥d		
	non-flush mounting	D1	ϕ6.5≥6mm	M8≥6mm
			M12≥9mm	M18≥16mm
			M30≥22mm	
		D2≥2d		
		D3≥d		
	opposite mounting	D4≥3d		
Medium distance	flush mounting	D1	M8≥0mm	M12≥1mm
			M18≥2.5mm	M30≥3.5mm
		D2≥d		
		D3≥d		
	non-flush mounting	D1	ϕ6.5≥8mm	M8≥8mm
			M12≥12mm	M18≥25mm
			M30≥40mm	
		D2≥2d		
		D3≥d		
	opposite mounting	D4≥4d		
Over a long distance	flush mounting	D1	ϕ6.5≥2mm	
			M8≥2mm	M12≥2.5mm
			M18≥4mm	M30≥8mm
		D2≥3d		
		D3≥d		
	non-flush mounting	D1	ϕ6.5≥8mm	M8≥8mm
			M12≥12mm	M18≥25mm
			M30≥40mm	
		D2≥3d		
		D3≥d		
	opposite mounting	D4≥5d		

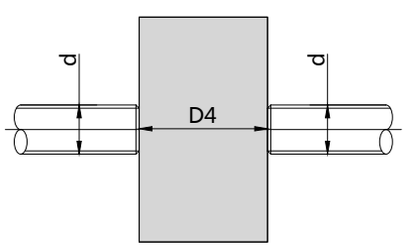
(Flush/Quasi-flush mounting)



(Non-flush mounting)



Opposite Mounting



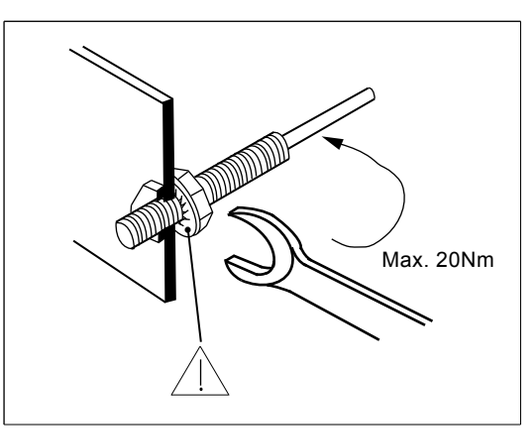
Maximum torque for proximity sensor threads in Nm:

For metal housing :

M5	1.5Nm	(Stainless steel)
M8	10Nm	(Stainless steel)
M12	10Nm	(Brass)
	30Nm	(Stainless steel)
M18	20Nm	(Brass)
M30	40Nm	(Metal)

For plastic housing :

M12	1Nm	(POM)
M18	1.5Nm	(POM)
M30	1.5Nm	(POM)



These values are based on using the nuts supplied with the sensors.

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Hysteresis

Hystersis is the travel of the target between the "switch-on" point and the "switch-off" point. This distance is required to allow the switch to properly detect the target, and reduces the possibillity of false trips. See the Fig.4and Fig.5.

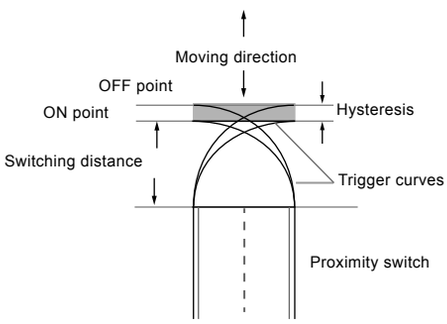


Fig.4

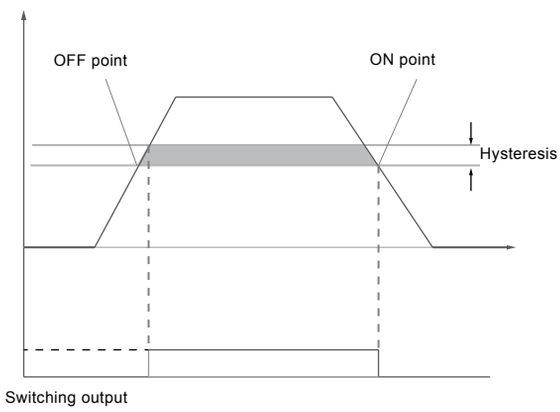
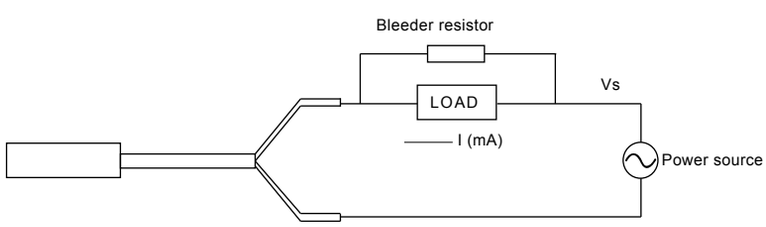


Fig.5

Leakage current

A leakage current flows through the proximity switches even when the output is turned off. Because of this the voltage remaining in the load may result in accidental operation or chattering, depending upon the load. If this occurs, connect a bleeder resister parallel to the load in order to decrease the residual voltage across the load.See Fig.6.



$R \leq \frac{Vs - 3.6}{5(mA) - 1 (mA)}$ (kΩ) DC 2-WIRE type

$R \leq \frac{Vs}{5(mA) - 1 (mA)}$ (kΩ) AC 2-WIRE type

$P > \frac{Vs^2}{R} \times 0.001(w)$

Fig.6

Load impedance

Instead of a maximum output current, a minimum load impedance may be specified.

A minimum load of 120 Ohms e.g. Translates into a maximum output current of 100mA at 12V or 200mA at 24V.On the other hand, if the maximum output current is 200mA, the lowest acceptable load impedance at 24V is120 Ohms.

Short circuit protection

Pulsing short circuit protection.In case of overload or short circuit,the output transistor is rapidly switched on and off.This tests whether the short has been removed or not.

See Fig.7.

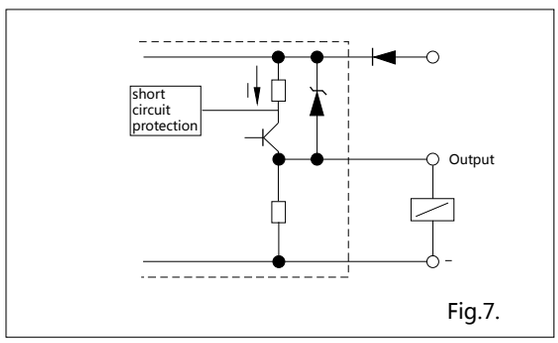


Fig.7.

Switching frequency,maximum

This frequency indicates the maximum number of pulses per second, this for an on/off ratio of 1:2 and at one half the nominal switching distance sn.

See Fig.8.

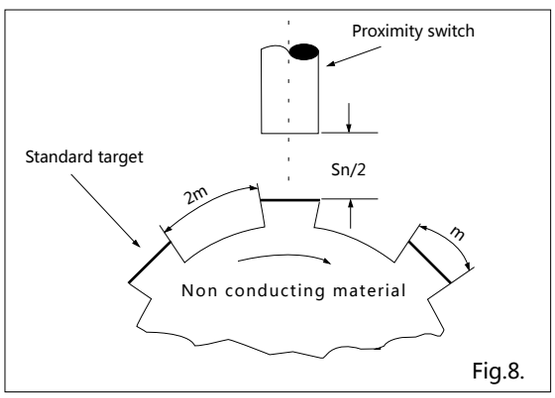


Fig.8.

Temperature drift of Sn

The switching distance is specified for an ambient temperature of 20 ℃。The following diagram gives the switching distance as a function of ambient temperature.

See Fig.9.

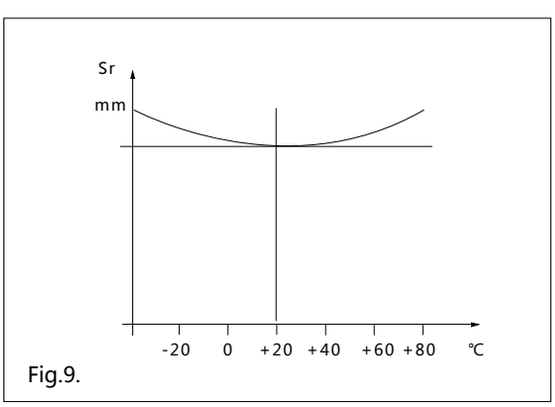
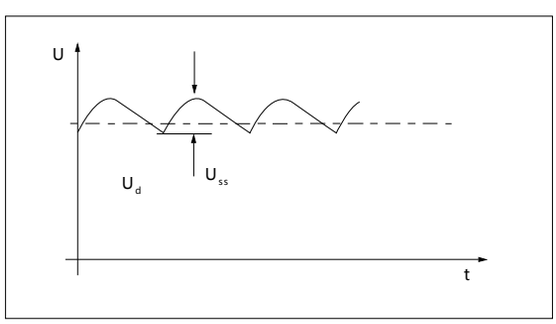


Fig.9.

Ripple content,maximum



$W = \frac{U_{ss}}{U_d} X100(\%)$

Too much ripple content causes an undefined switching behaviour. Remedy:increase the smoothing capacitor or use a stabilized power supply.

Protection class

The international electrotechnical commission(IEC)has defined a classification system for specifying the enclosures of electrical equipment on the basis of the degree of protection(IP)provided by the enclosure.The standard includes two characteristic numerals which follow the letters IP,and are defined as follows.

1st Characteristic Numeral

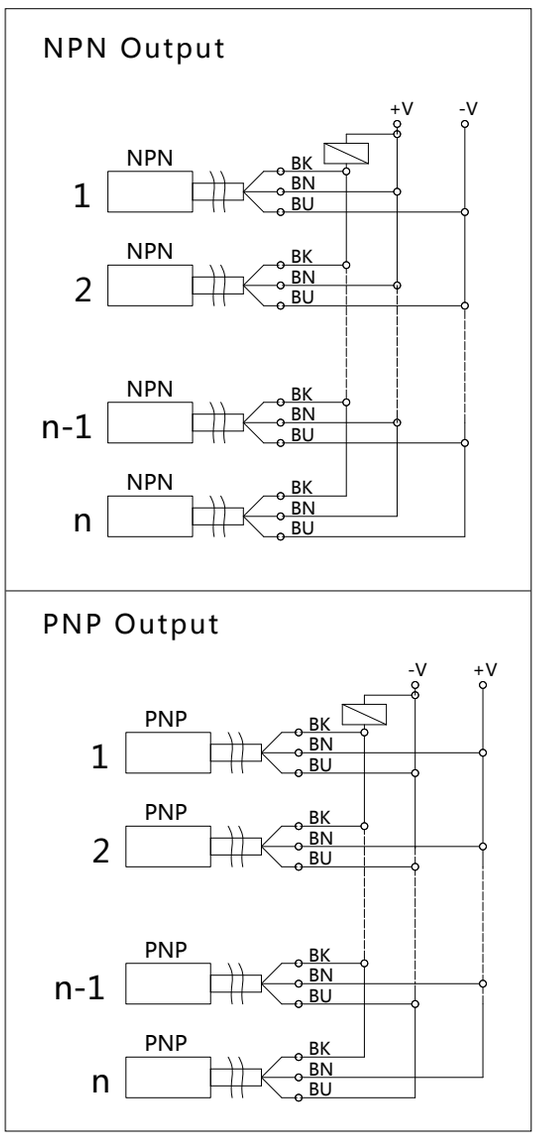
1 protection against solid objects greater than 50 mm
2 protection against solid objects greater than 12 mm
3 protection against solid objects greater than 2.5 mm
4 protection against solid objects greater than 1 mm
5 dust protected
6 dust tight

2nd Characteristic Numeral

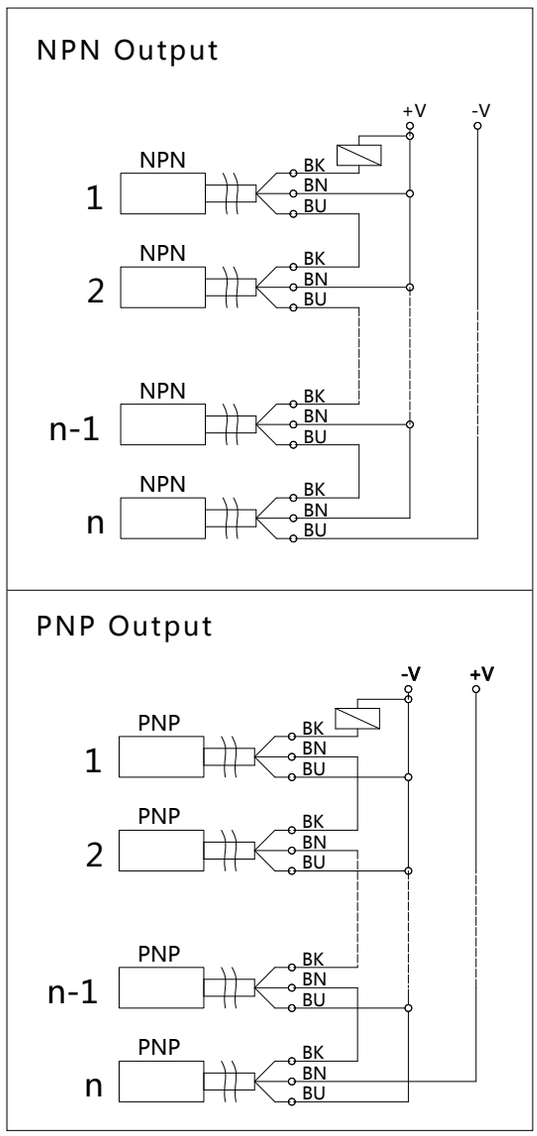
1 protection against dripping water
2 protection against dripping water when tilted up to 15°
3 protection against spraying water
4 protection against splashing water
5 protection against water jets
6 protection against heavy seas
7 protection against the effects of immersion
8 protection against submersion

Example:IP67 is defined as a dust tight enclosure and protected against the effects of immersion.

Parallel connection



Series connection



Logic functions with DC proximity sensors:

Self-contained proximity sensors can be wired in series or paralled to perform such logic functions as AND,OR, NAND,NOR.The wiring diagrams show the connection of four sensors with NPN and PNP outputs.Take into account the accumulating voltage drop per sensor added in the series-string.

Parallel-connection:

N.O.sensors:OR Function(any one sensor or all made:load"on")
N.C.sensors:NAND Function((all sensors open:load"off")

Series-connection:

N.O.sensors:AND Function(all sensors made: Load"on")
N.C. sensors:NOR Function(any one sensor open:load"off")

DC NPN output type

DC NPN output proximity switches consist of the following circuit(Fig.10.)In N.O.operation,with no sensing,the transistor is in the OFF mode.When sensing,the load current passes through the transistor.In N.C. operation,the function is opposite.In N.O. operation,as the load current passes 200mA(capacitive version over 300mA),the load short circuit protection is activated.

Remarks:Voltage drop<1V,it is tested in the max.load current, 200mA,Capacitive proximity switch is tested in 300mA.

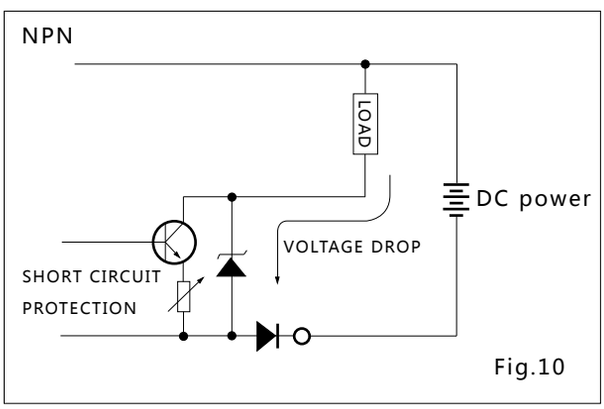


Fig.10

DC PNP output type

DC PNP output type proximity switches are designed with the following output circuit(Fig.11)In N.O.operation without sensing status,the transistor is in the OFF mode,with sensing status the transistor is in the ON mode,as the load current passes through the transistor;in the N.C.mode,the operation is opposite in the N.O.operation.AS the load current passes 200mA(capacitive proximity switch over 300mA),the load short circuit protection circuit is activated.

Remark:Voltage drop<1V is tested at the max. load current,200mA. Capacitive Proximity switches are tested at 300mA.

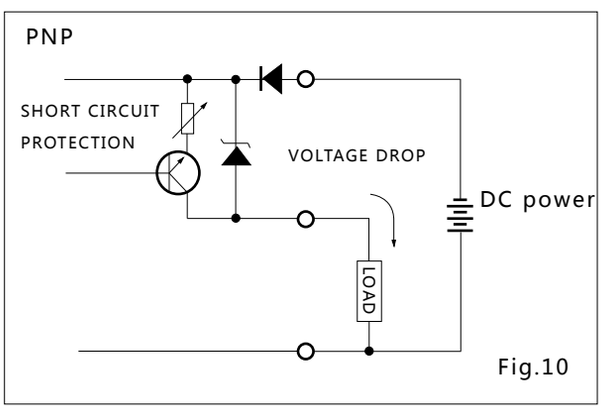


Fig.10

DC 2 wire proximity switch

The devices operate exactly like mechanical switches,with the connected load being switched in series.They can be used into PLC inputs like relays.Notice should be taken on the influence of minimum load current,leakage current and voltage drop.See following Fig.12.In the “off” condition,only the leakage current (the no load current)flows through the externalload.In the “on” conditionthe amplifiers’ output transistor conducts.

Between the connections of the proximity switch there is now a voltage drop created by the internal Z-diode(<6V)and this should be allowed for within the supply voltage.The voltage applied to the external load is lower than the supply voltage by an amount equal to the voltage drop.The output amplifier is short circuit proof and voerload protected.

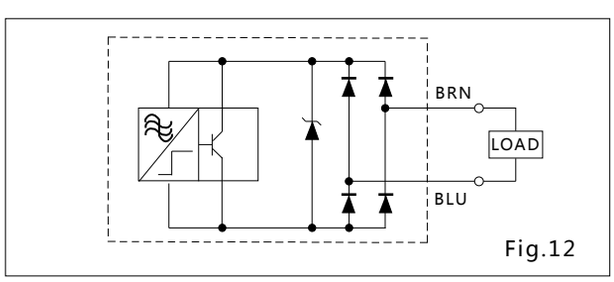


Fig.12

DC 4 wire proximity switch

N.O.,N.C.changeover 4 wire devices are shown in the following Fig.13.When the proximity switch is in the sensing mode transistor 1 is in the OFF mode;transistor 2 is in ON mode.

The max.load current is 200mA with short circuit protection. Output terminal N.O. and N.C. may be connected to the load at the same time.

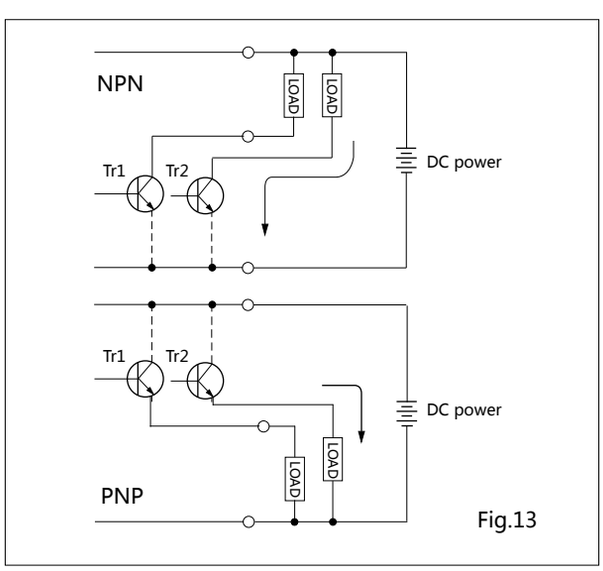


Fig.13

AC 2 wire proximity switch

AC output two wire proximity switches have output circuits with SCR.In the N.O. operation and non-sensing mode, the SCR appears OFF,in the sensed mode the SCR is ON.Load current passes through the SCR and to form feed circuit With extend load.In N.C. operation, the operation is opposite the N.O. operation. SCR in OFF mode, (it needs by the operation internal circuit for proximity switch).The small current passing through the load is called leakage current. When the SCR is in ON mode internal circuit of proximity switch operates).This small voltage is called dropping voltage.The max. load current is 500mA.Leakage voltage is below 5V(load current is over 20mA)leakage current is below 2.5mA.See Fig.14.

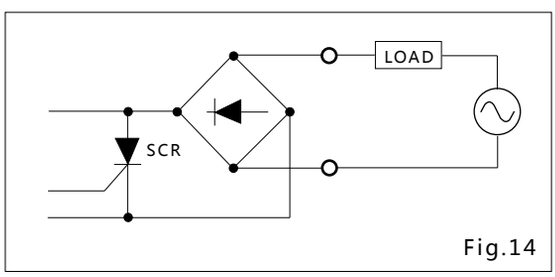


Fig.14

AC/DC outputs

These proximity switches are used as pilot devices for AC-operated loads such as relays,contactors,solenoids,etc.The solid state output permits the use of the proximity switches directly on the line in series with an appropriate load.They,therefore,replace mechanical limit switches without alteration of circuitry,where operating speed or environmental conditions require the application of solid state proximity switches.See following Fig.15.

These proximity switches are typically available in a voltage range of 20-250V AC or DC.All models are available with either N.O./N.C., or with programmable outputs(from N.O. to N.C.).

Proximity switches with AC/DC outputs are not recommended for use with 24V DC programmable controller inputs.

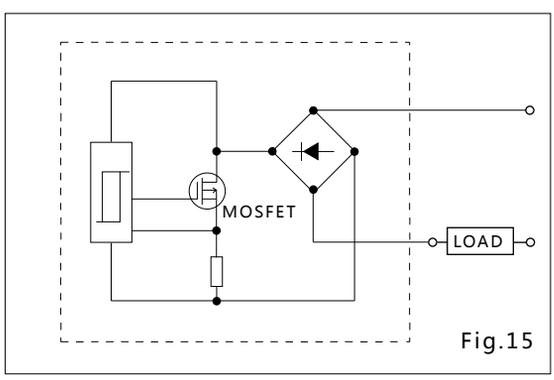


Fig.15

NAMUR-Sensors to DIN 19234

NAMUR-Sensors are polarized 2-wire-sensors which change their internal resistance depending on the distance to the target.They are designed for use with external amplifiers,which convert the current changes into a digital signal.Please see Fig.16.

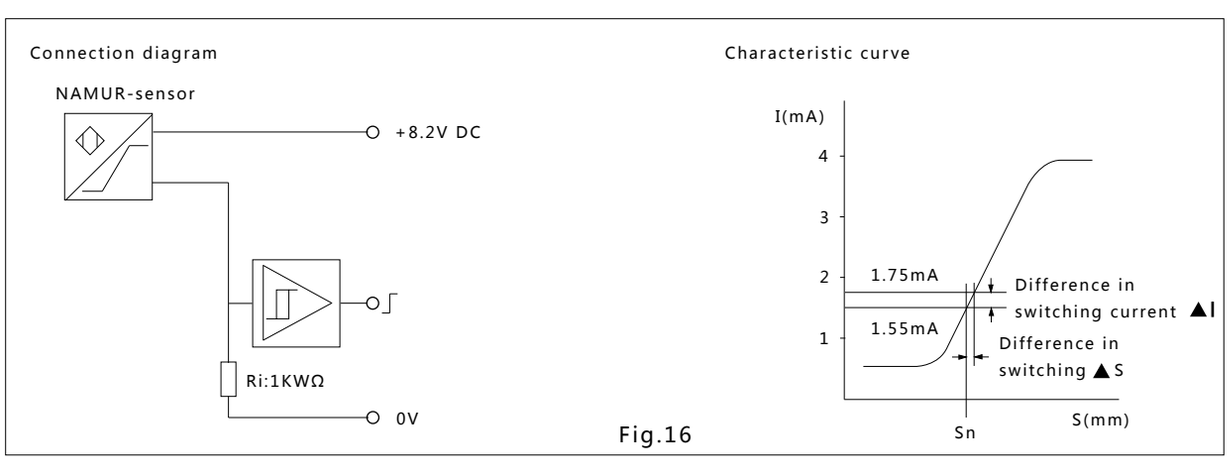


Fig.16

Connection diagram

NAMUR-sensors operate with a supply voltage from 5 to 25V DC.It is possible to work directly into logic circuits such as CMOS etc.

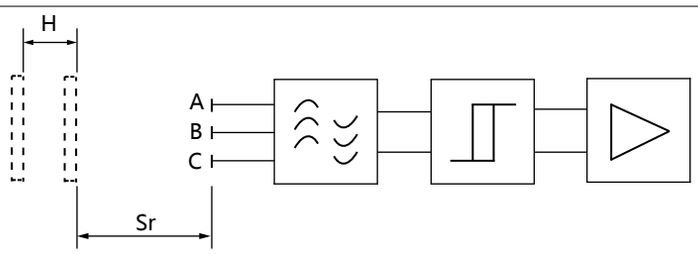
Note:different operating values(V,Ri)will counteract a change of the switching distance.Within the admissible voltage range it is necessary to adopt the resistance Ri,as well as the current in the switching point I(Sn). The following table shows typical values.

Capacitive proximity sensor

Capacitive proximity sensors consist of an RC-oscillator with a special multi-part sensing electrode.The electrode and the oscillator circuit have a tube connected with earth potential for lateral shielding. This enables flush mounting of the sensor in metal, since the electrial field is only present in front of the sensing electrode. This field is the active zone of the sensor. See Fig.17.

When the conductive material is removed from the active zone,the oscillator is undamped and the oscillation amplitude decreases. The amplifier of the oscillator voltage and the sensitivity of the sensor can be altered ty the built-in potentiometer.

The middle electrode together with the built-in re-coupling gives very effective compensation under conditions of humidity, dust or icing. Special circuitry automatically compensates for these influences. The preset sensing distance remains nearly constant. The electrode design, along with the compensating circuitry of capacitive sensors, is a unique design, and provides performance advantages far superior to other capacitive sensors.



A indicates sensor electrode
B and C indicates compensation electrodes

Fig. 17

Applications

The capacitive sensors may be used to limit the level in tanks and containers. The contents may be fluids, pulverized or granulated materials such as PVC powder,dyes,flour,sugar,powdered milk etc. Further applications are as end and limit switches for checking and regulating machinery setting,(even if the materials are non-metallic as in conveyor belt positioning and material stacking); checking drive belts and paper reels for sag and tear.Additionally they may be used as detectors for counting metal and non-metal components. Areas of application for capacitive sensors.

Shielded configuration

Sensors with a straight-line electrical field.These units scan solids(e.g.wafers,components,PCB’ s,hybrids, cartons,paper piles, bottles, plastic blocks and stacks of paper at a distance, or liquids through a separating wall (glass or plastic up to a max of 4 mm thick).

Non-shielded configuration

Sensors with a spherical electrical field. These units are designed to touch the product, bulk goods or liquids (e.g.granulate,sugar, flour, corn, sand, or oil and water) with their active surface.

Sensing distance

The data was obtained using a 1 mm thick square steel plate (st37) as an actuator, with a side length equal to 3×Sn. The steel plate was grounded. Ambient temperature was 25℃.The largest possible sensing distance is defined as the nominal sensing distance with a tolerance ±10% Sn.
The sensing distance depends upon shape, size and nature of the object concerned. If the plate is made from a different material or has a smaller diameter, the sensing distance will be reduced.

Material correction factor

If the material of the object in question is not metal or water,the sensing distance is reduced.
The reduction factors for the different materials are shown as the table below.

Actuating Material	Sensing-distance Compared to a surface of water			
	20mm	10mm	15mm	10mm
Hand	20	10	15	10
Square steel plate(100X100X1)	20	10	15	10
Round steel plate(30ΦX1)	11	6	4	2
Stone(marble)	18	8.5	8	5
Wood	13	5	5	3
Glass	12	4	6	2.5
Carbon	19	9	12	9
PVC-BLOCK(30x30x5)	8	4	1.5	-
Lupulin granulate 1800H	8	3	2.5	Head approx.2mm immersed
Polystyrene 454H	9.5	3	4	1
Hostalen GC 8960H	8.2	1.5	2	Head approx.1mm immersed
Vestyron 719-50	7.9	1.2	2	Head approx.3mm immersed
Hostyren	8.2	3	3	Head approx.1mm immersed
BM scrap material(Z)	6.7	1.4	1	Head surrounded
Hostalen GC coarse powder	8	2	1.5	Head approx.3mm immersed
Lupulin fine granulate	7.7	1.5	1	Head approx.3mm immersed
HostaformC	9.8	3.5	4	1
Hostyren(polystyrene)	7.4	2	2.5	Head approx.2mm immersed
Hostalit S	7.5	2	1.5	Head surrounded
Hostalen PP	5	1.5	1.5	Head surrounded
Hostalit E	7.2	1	1	Head approx.4mm immersed
Styropor unfoamed	8.1	3	3	0.5
Styropor Φ 1.5	-	-	-	-
Antimony-trioxide	6.2	0.9	2.5	Direct contact
Oil	9	3	5	3
Maximum sensing-distance Critical point	55		110	

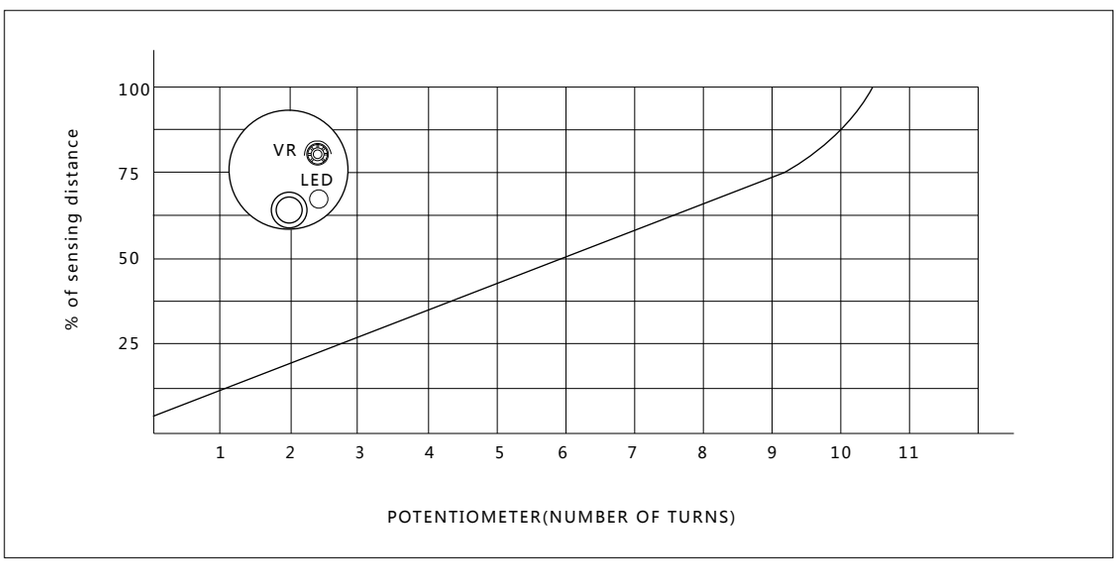
Conditions:

Tu=25℃ ; V_A=24V DC

In each case,the measurements were made from a level surface.

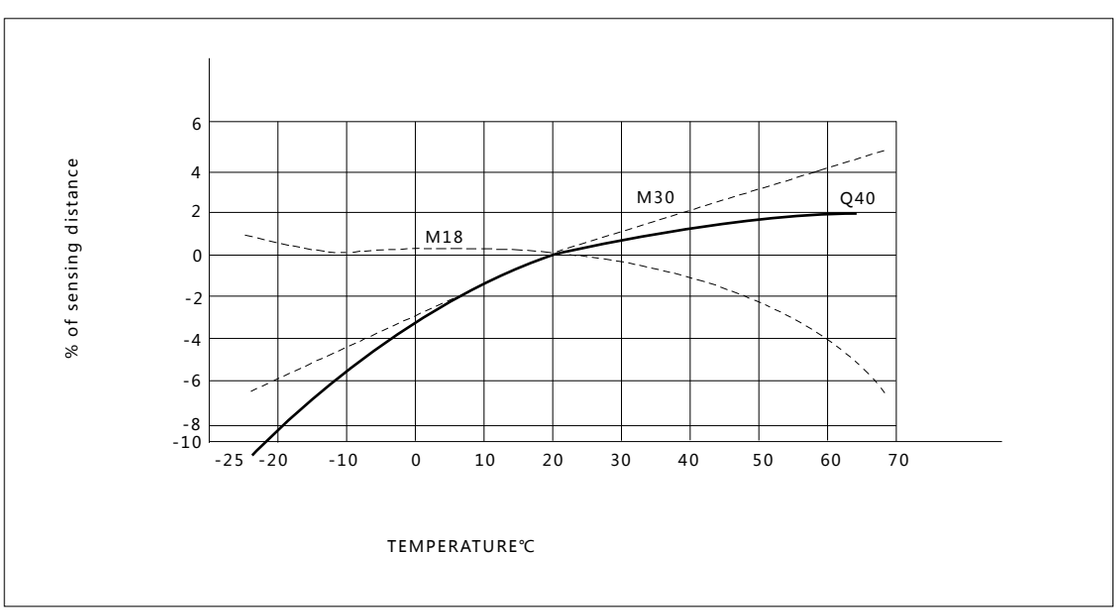
Sensitivity adjustment

Capacitive proximity sensors have a fourteen turn potentiometer.The potentiometer must be adjusted to suit most applications.Turn clockwise to increase sensitivity.From the original setting of 0.7-0.8xSn(Sn=nominal range),the nominal sensing range is reached after 2-3 clockwise turns. This, however,leads to nonlinearity of the curve and oversensitivity,which may lock on the sensor.If this occurs,decrease sensitivity by turning the potentiometer 2-3 turns counterclockwise.



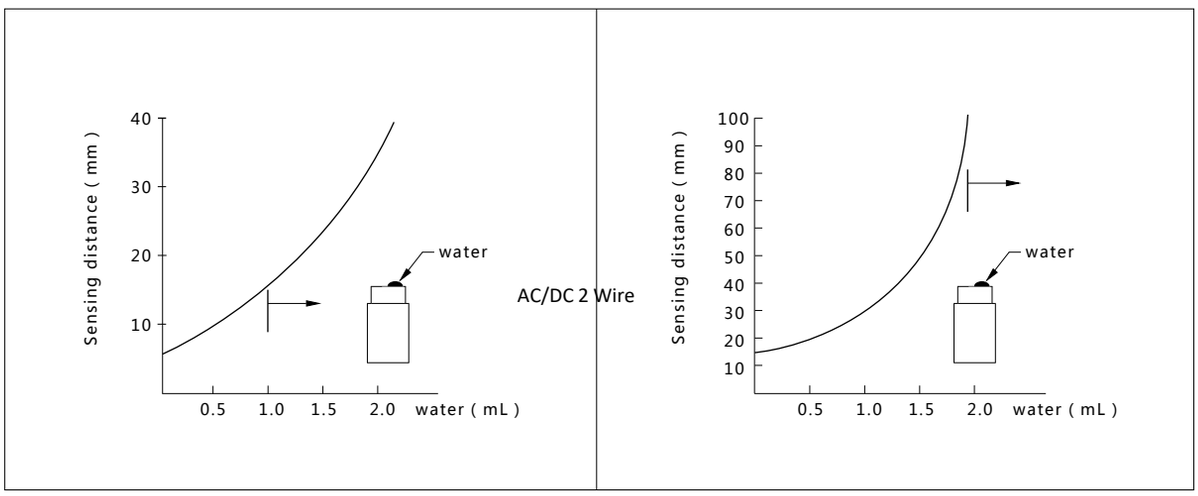
Temperature

Capacitive proximity switches will function within a temperature range of -25℃ to +70℃.The switching distance deviation is 20% provided that the switching distance is not greater than the nominal switching distance(taking into consideration the reduction factors of the material).



Influence to sensing face covered with drops of water

The following figures show the changes to operating distance caused by drops of water on the sensing face of capacitive proximity switches.If the water drops are 0.2 mL(about 2-3 drops),the operating distance will be increased about 20%,as the attached water drops on the sensing face cover the surface and is flowing operating distance is increased over 300%.,



Caution

If ice,frost,moisture,oil or dust is on the active surface,it will cause faultly operation.

The detecting of liquid or powder on non-metallic tanks,if the liquids or powders are attached to tank wall like as Fig.19,it will cause faulty operation.

The application of a DC capacitive proximity switch,connectted to a heavy load current (current over 200 mA),(electric motor,electrical-magnetic contact)the output transistor will break down.It should be connected through a relay.

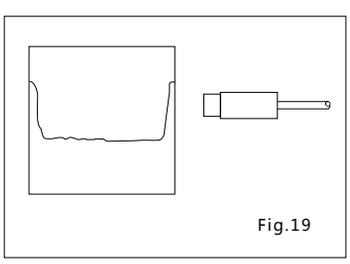


Fig.19

Selction Guide

1	-	2	3	4	-	5	6	-	7	8	9	-	10	11	-	12

1 Type

SP	Schlüter Photoelectric

2 Shape

M	Threaded barrel
H	Smooth barrel
Q	Square housing

3 Dimension

4 Sensing mode

T	Diffuse
R	Retro-reflective
L	Through-beam
F	Optical Fiber Amplifier
H	Background Suppression

5 Sensing range (mm)

015	150 mm
02	200 mm
05	500 mm
15M	15 m
...	

6 Output Function

P	PNP 3/4 Wire
N	NPN 3/4 Wire
D	DC 2 Wire
A	AC 2 Wire
U	AC/DC 2 Wire

7 Housing material

C	Brass, nickel hosuing
V	Stainless-steel housing
P	Plastic rectangular housing
F	PTFE

8 Output mode

1	Light On
2	Dark On
3	Dark On/Light On
4	SPDT relay
5	Emitter

9 Operating Output

1	DC 10-30V
2	DC 18-30V
3	DC 10-60V
4	AC 24-240V
5	24-240V AC/DC

10 Connection

PV	PVC Cable
PUR	PUR Cable
PTFE	PTFE Cable
0.3 M8	0.3m Cable with M8 Connector
M8	M8 Connector
M12	M12 Connector
T	Terminal

11 Cable length

2	2m
3	3m
5	5
...	

12 Various

F	With polarizing filter
D	With time delay

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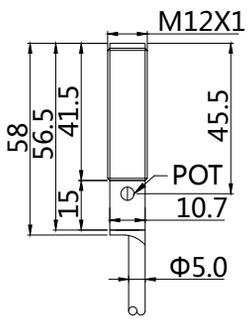
Features:

- Diffuse type,DC4-wire discrete output;
- Cable & connector versions;
- M12*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

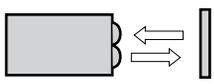


Model No.

Housing material	PBT	Brass, nickel-plated
NPN Light/Dark-on	SP-M12T-02N-P31-PV2	SP-M12T-02N-C31-PV2
PNP Light/Dark-on	SP-M12T-02P-P31-PV2	SP-M12T-02P-C31-PV2

Type diagram

Diffuse type sensors



Diffuse reflection type photoelectric sensor principle and the principle of mirror reflection type photoelectric sensor is the same,but it doesn' t take reflective lenses,The light emitted by the transmitter is directly reflected by the measured object back to the receiver.The light reflected by the measured object is estimated by the receiver, and the positioning of the object is not very strict.When object under test enterinto effective light rays area,output state changes.The detection distance depends on the size, shape, color and surface characteristics of the measured object.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	≤150mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²

Wiring

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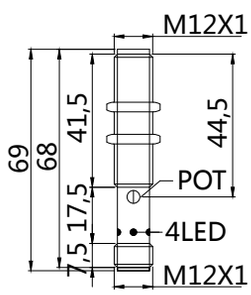
Features:

- Diffuse type,DC4-wire discrete output;
- Cable & connector versions;
- M12*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

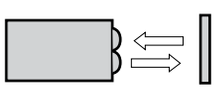


Model No.

Housing material	PBT	Brass, nickel-plated
NPN Light/Dark-on	SP-M12T-02N-P31-M12	SP-M12T-02N-C31-M12
PNP Light/Dark-on	SP-M12T-02P-P31-M12	SP-M12T-02P-C31-M12

Type diagram

Diffuse type sensors



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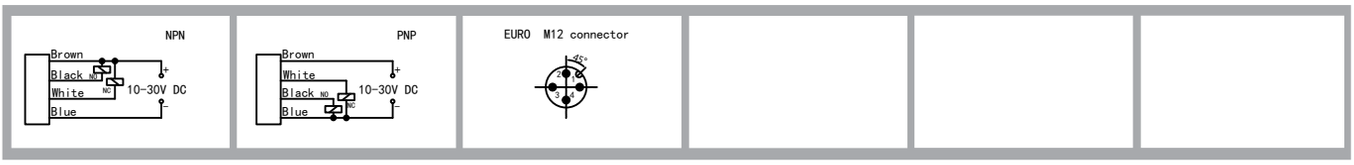
Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	≤150mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	M12 connector

Wiring



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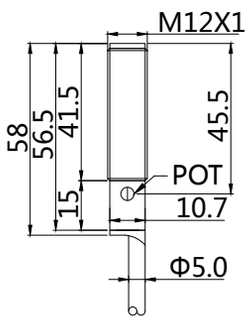
Features:

- Retro-reflective,DC4-wire discrete output;
- Cable & connector versions;
- M12*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

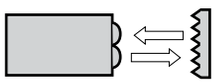


Model No.

Housing material	PBT	Brass, nickel-plated
NPN Light/Dark-on	SP-M12R-2N-P31-PV2	SP-M12R-2N-C31-PV2
PNP Light/Dark-on	SP-M12R-2P-P31-PV2	SP-M12R-2P-C31-PV2

Type diagram

Retro-reflective sensors



Retro-reflective sensor put transmitter andreceiver encapsulated into same shell,in the opposite install aspeculum,the light emitted by the reflector is reflected therough the reflector back to the receiver.

When the beam is occlusion,generate a switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	≤150mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
	Blind distance	<30cm
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²

Wiring

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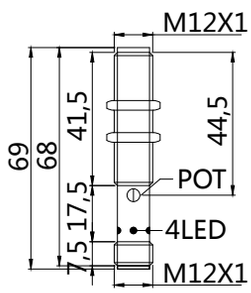
Features:

- Retro-reflective,DC4-wire discrete output;
- Cable & connector versions;
- M12*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

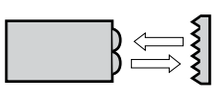


Model No.

Housing material	PBT	Brass, nickel-plated
NPN Light/Dark-on	SP-M12R-2N-P31-M12	SP-M12R-2N-C31-M12
PNP Light/Dark-on	SP-M12R-2P-P31-M12	SP-M12R-2P-C31-M12

Type diagram

Retro-reflective sensors



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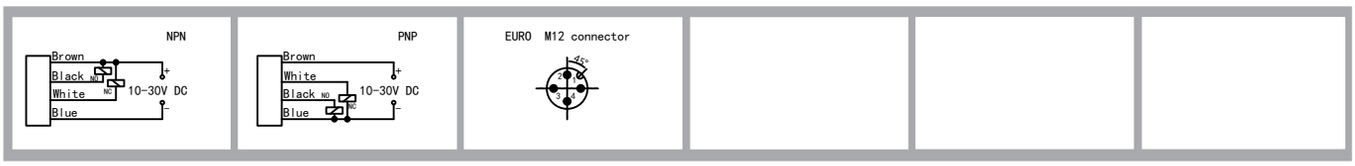
When the beam is occlusion,generate a switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	≤150mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
	Blind distance	<30cm
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	M12 connector

Wiring



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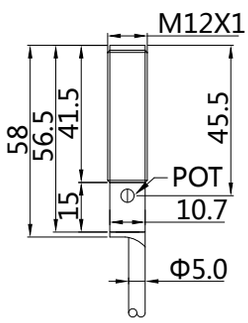
Features:

- Through-beam,Emitter/receiver set,DC3-wire discrete output;
- Cable & connector versions;
- M12*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

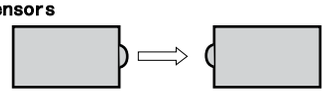


Model No.

Housing material	PBT	Brass, nickel-plated
Transmitter	SP-M12L-52D-P51-PV2	SP-M12L-52D-C51-PV2
NPN Dark-on	SP-M12L-52N-P11-PV2	SP-M12L-52N-C11-PV2
NPN Light-on	SP-M12L-52N-P21-PV2	SP-M12L-52N-C21-PV2
PNP Dark-on	SP-M12L-52P-P11-PV2	SP-M12L-52P-C11-PV2
PNP Light-on	SP-M12L-52P-P21-PV2	SP-M12L-52P-C21-PV2

Type diagram

Through-beam sensors

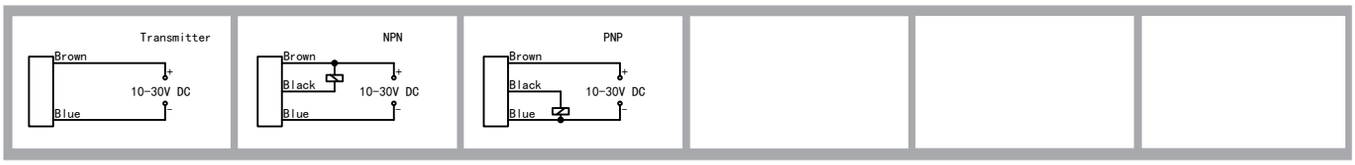


Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	≤150mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	PVC cable/2m;3*0.35mm²

Wiring



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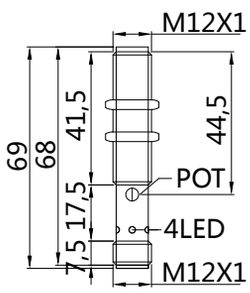
Features:

- Through-beam,Emitter/receiver set,DC3-wire discrete output;
- Cable & connector versions;
- M12*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

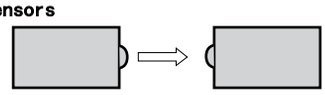


Model No.

Housing material	PBT	Brass, nickel-plated
Transmitter	SP-M12L-52D-P51-M12	SP-M12L-52D-C51-M12
NPN Dark-on	SP-M12L-52N-P11-M12	SP-M12L-52N-C11-M12
NPN Light-on	SP-M12L-52N-P21-M12	SP-M12L-52N-C21-M12
PNP Dark-on	SP-M12L-52P-P11-M12	SP-M12L-52P-C11-M12
PNP Light-on	SP-M12L-52P-P21-M12	SP-M12L-52P-C21-M12

Type diagram

Through-beam sensors

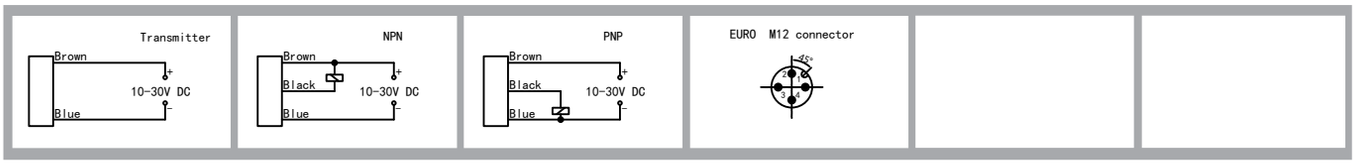


Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	≤150mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	M12 connector

Wiring



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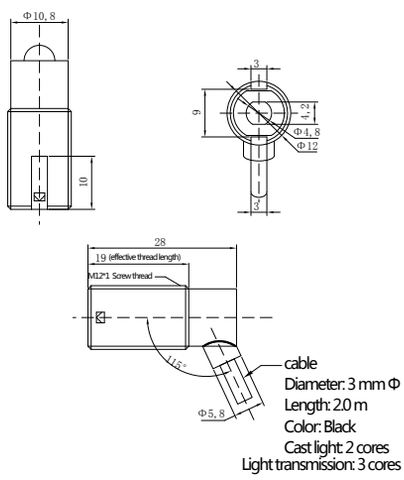
Features:

- Through-beam,Emitter/receiver set,DC3-wire discrete output;
- Cable versions;
- M12*1mm,plastic housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing



Model No.

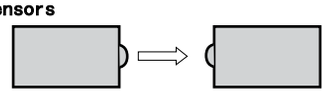
Sensing range	Sn: 5 m
Transmitter	SP-M12L-05MD-P51-PV2
NPN Dark-on	SP-M12L-05MN-P11-PV2
NPN Light-on	SP-M12L-05MN-P21-PV2

Technical data

Electrical data	Operating voltage	12-24V DC (±10%)
	Switching frequency	500Hz
	Light source	Infrared light(850 nm)
	Response time	≤2ms
	Load current	≤100mA
	Consumption current	Transmitter below 25mA, receiver below 15mA
	Short circuit protection	Yes
	Type of display	Yellow : output/Green:power supply
	Output function	NPN Dark-on/Light-on
	Pressure resistance	AC1,000V for 1 minute (between power cord and case)
Environment	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
	Environmental pollution level	3 (Industrial environment)
	Ingress protection	IP67
	Insulation resistance	DC 250V high resistance meter above 20MΩ
Mechanical data	Housing material	PC
	Lens material	PMMA
Electrical connection	Connectors	PVC cable/2m

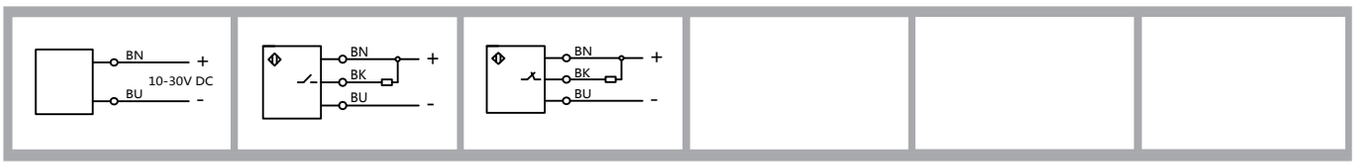
Type diagram

Through-beam sensors



Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Wiring



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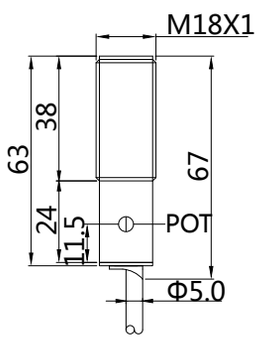
Features:

- Diffuse type,DC4-wire discrete output;
- Cable & connector versions;
- M18*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing



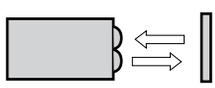
Model No.

Sensing range	Sn: 150 mm	Sn: 150 mm
Housing material	PBT	Brass, nickel-plated
NPN Light/Dark-on	SP-M18T-015N-P31-PV2	SP-M18T-015N-C31-PV2
PNP Light/Dark-on	SP-M18T-015P-P31-PV2	SP-M18T-015P-C31-PV2

Sensing range	Sn: 500 mm	Sn: 500 mm
Housing material	PBT	Brass, nickel-plated
NPN Light/Dark-on	SP-M18T-05N-P31-PV2	SP-M18T-05N-C31-PV2
PNP Light/Dark-on	SP-M18T-05P-P31-PV2	SP-M18T-05P-C31-PV2

Type diagram

Diffuse type sensors



Diffuse reflection type photoelectric sensor principle and the principle of mirror reflection type photoelectric sensor is the same,but it doesn’ t take reflective lenses,The light emitted by the transmitter is directly reflected by the measured object back to the receiver.The light reflected by the measured object is estimated by the receiver, and the positioning of the object is not very strict.When object under test enterinto effective light rays area,output state changes.The detection distance depends on the size, shape, color and surface characteristics of the measured object.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²

Wiring

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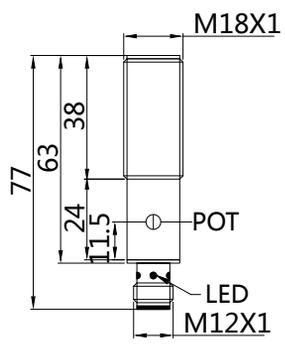
Features:

- Diffuse type,DC4-wire discrete output;
- Cable & connector versions;
- M18*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing



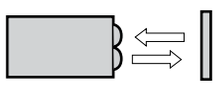
Model No.

Sensing range	Sn: 150 mm	Sn: 150 mm
Housing material	PBT	Brass, nickel-plated
NPN Light/Dark-on	SP-M18T-015N-P31-M12-E	SP-M18T-015N-C31-M12-E
PNP Light/Dark-on	SP-M18T-015P-P31-M12-E	SP-M18T-015P-C31-M12-E

Sensing range	Sn: 500 mm	Sn: 500 mm
Housing material	PBT	Brass, nickel-plated
NPN Light/Dark-on	SP-M18T-05N-P31-M12-E	SP-M18T-05N-C31-M12-E
PNP Light/Dark-on	SP-M18T-05P-P31-M12-E	SP-M18T-05P-C31-M12-E

Type diagram

Diffuse type sensors

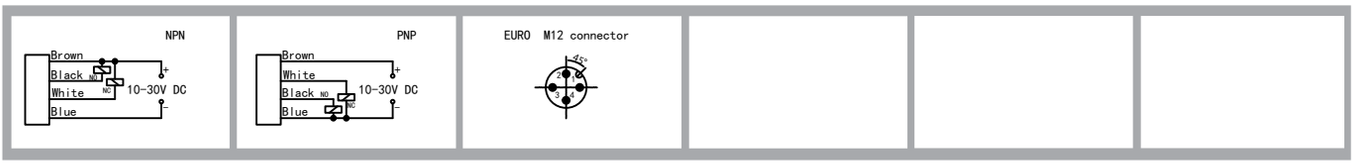


Diffuse reflection type photoelectric sensor principle and the principle of mirror reflection type photoelectric sensor is the same,but it doesn' t take reflective lenses,The light emitted by the transmitter is directly reflected by the measured object back to the receiver.The light reflected by the measured object is estimated by the receiver, and the positioning of the object is not very strict.When object under test enterinto effective light rays area,output state changes.The detection distance depends on the size, shape, color and surface characteristics of the measured object.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	M12 connector

Wiring



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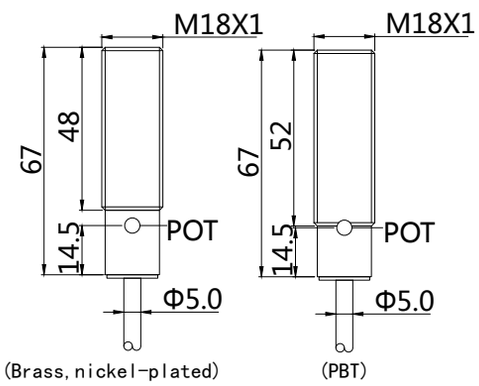
Features:

- 100mm,Background suppression,DC4-wire discrete output;
- Cable & connector versions;
- M18*1mm,plastic/brass,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

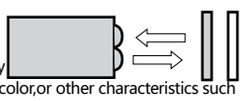
Dimensioned drawing



Model No.

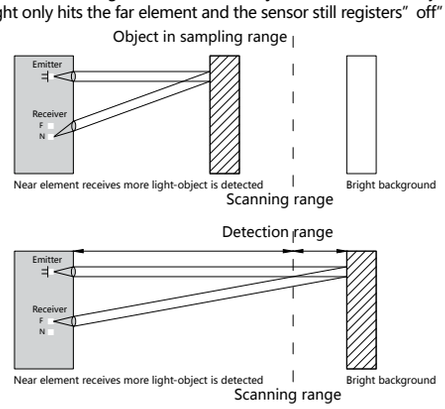
Housing material	PBT	Brass,nickel-plated
NPN Light/Dark-on	SP-M18H-01N-P31-PV2	SP-M18H-01N-C31-PV2
PNP Light/Dark-on	SP-M18H-01P-P31-PV2	SP-M18H-01P-C31-PV2

Background suppression



Background suppression sensors were developed to reach a defined detection range for any object,regardless of its brightness,color,or other characteristics such as the brightness of the background.The following figure illustrates the functional principle of a background suppression sensor.The light emitted by the emitter is directed by the lens and hits the object.If the boject is located within the detection range,a portion of the reflected light,bundled by the receiver lens,is mapped to th

As the object’ s distance increases,this light spot moves in the direction of the far element(F).At the detection range limit,one half of the light spot is on the near element,the other on the far element and the sensor registers” off” .IF the object moves further away,the light only hits the far element and the sensor still registers” off” .



Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	1000Hz
	Light type	Red light 624nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
	Blind distance	<1cm
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²

Wiring

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FM18 Series Background-suppression Sn 10-100mm

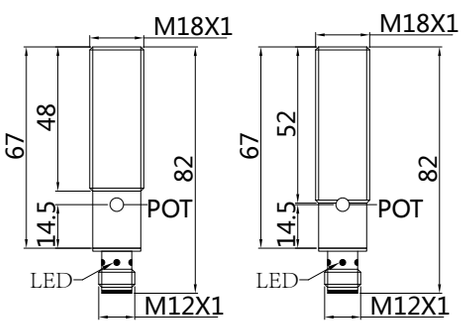
Photoelectric sensors

Features:

- 100mm,Background suppression,DC4-wire discrete output;
- Cable & connector versions;
- M18*1mm,plastic/brass,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

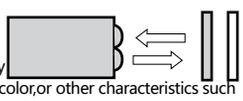


(Brass, nickel-plated) (PBT)

Model No.

Housing material	PBT	Brass,nickel-plated
NPN Light/Dark-on	SP-M18H-01N-P31-M12	SP-M18H-01N-C31-M12
PNP Light/Dark-on	SP-M18H-01P-P31-M12	SP-M18H-01N-C31-M12

Background suppression



Background suppression sensors were developed to reach a defined detection range for any object,regardless of its brightness,color,or other characteristics such as the brightness of the background.The following figure illustrates the functional principle of a background suppression sensor.The light emitted by the emitter is directed by the lens and hits the object.If the boject is located within the detection range,a portion of the reflected light,bundled by the receiver lens,is mapped to th

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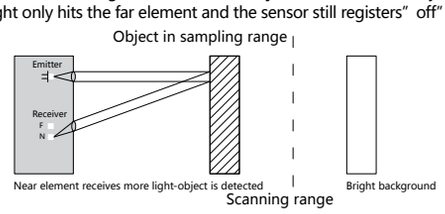
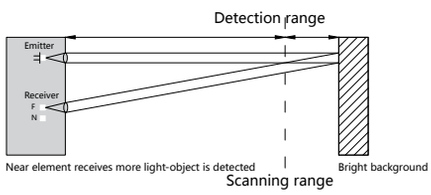
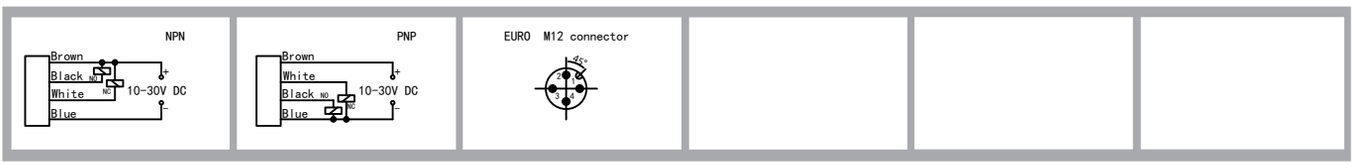




Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	1000Hz
	Light type	Red light 624nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
	Blind distance	<1cm
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	M12 connector

Wiring



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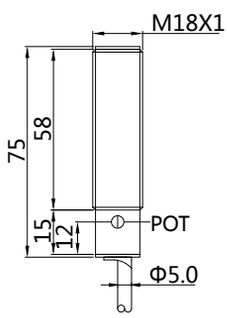
Features:

- Diffuse type,AC 3-wire discrete output;
- Cable & connector versions;
- M18*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing



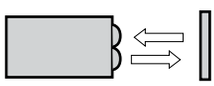
Model No.

Sensing range	Sn: 150 mm	Sn: 150 mm
Housing material	PBT	Brass, nickel-plated
Light/Dark-on	SP-M18T-15A-P14-PV2	SP-M18T-15A-C14-PV2
Light/Dark-on	SP-M18T-15A-P24-PV2	SP-M18T-15A-C24-PV2

Sensing range	Sn: 500 mm	Sn: 500 mm
Housing material	PBT	Brass, nickel-plated
Light/Dark-on	SP-M18T-05A-P14-PV2	SP-M18T-05A-C14-PV2
Light/Dark-on	SP-M18T-05A-P24-PV2	SP-M18T-05A-C24-PV2

Type diagram

Diffuse type sensors



Diffuse reflection type photoelectric sensor principle and the principle of mirror reflection type photoelectric sensor is the same,but it doesn’ t take reflective lenses,The light emitted by the transmitter is directly reflected by the measured object back to the receiver.The light reflected by the measured object is estimated by the receiver, and the positioning of the object is not very strict.When object under test enterinto effective light rays area,output state changes.The detection distance depends on the size, shape, color and surface characteristics of the measured object.

Technical data

Electrical data	Operating voltage	24-240V AC
	Switching frequency	25Hz
	Light type	Infrared light 880nm
	Response time	<5ms
	Load current	300mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	PVC cable/2m;3*0.35mm²

Wiring

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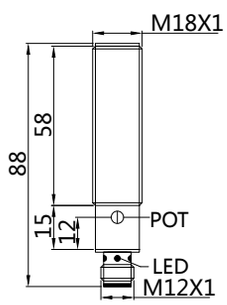
Features:

- Diffuse type,AC 3-wire discrete output;
- Cable & connector versions;
- M18*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing



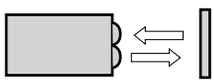
Model No.

Sensing range	Sn: 150 mm	Sn: 150 mm
Housing material	PBT	Brass, nickel-plated
Light/Dark-on	SP-M18T-015A-P14-M12	SP-M18T-015A-C14-M12
Light/Dark-on	SP-M18T-015A-P24-M12	SP-M18T-015A-C24-M12

Sensing range	Sn: 500 mm	Sn: 500 mm
Housing material	PBT	Brass, nickel-plated
Light/Dark-on	SP-M18T-05A-P14-M12	SP-M18T-05A-C14-M12
Light/Dark-on	SP-M18T-05A-P24-M12	SP-M18T-05A-C24-M12

Type diagram

Diffuse type sensors



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Technical data

Electrical data	Operating voltage	24-240V AC
	Switching frequency	25Hz
	Light type	Infrared light 880nm
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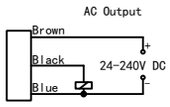
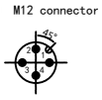
	Load current	300mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	M12 connector

Wiring





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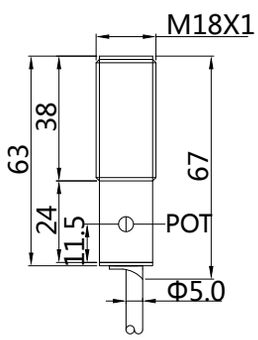
Features:

- Retro-reflective,DC4-wire discrete output;
- Cable & connector versions;
- M18*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

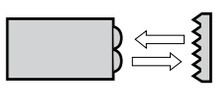


Model No.

Housing material	PBT	Brass, nickel-plated
NPN Light/Dark-on	SP-M18R-3N-P31-PV2	SP-M18R-3N-C31-PV2
PNP Light/Dark-on	SP-M18R-3P-P31-PV2	SP-M18R-3P-C31-PV2

Type diagram

Retro-reflective sensors



Retro-reflective sensor put transmitter andreceiver encapsulated into same shel,in the opposite install aspeculum,the light emitted by the reflector is reflected therough the reflector back to the receiver.

When the beam is occlusion,generate a switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
	Blind distance	<10cm
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²

Wiring

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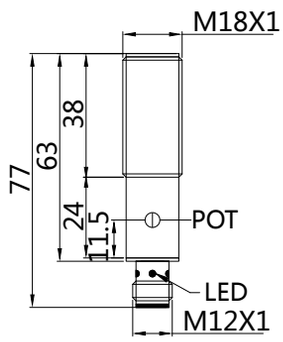
Features:

- Retro-reflective,DC4-wire discrete output;
- Cable & connector versions;
- M18*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

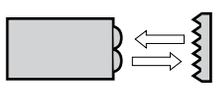


Model No.

Housing material	PBT	Brass, nickel-plated
NPN Light/Dark-on	SP-M18R-3N-P31-M12-E	SP-M18R-3N-C31-M12-E
PNP Light/Dark-on	SP-M18R-3P-P31-M12-E	SP-M18R-3P-C31-M12-E

Type diagram

Retro-reflective sensors



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Technical data

Electrical data	Operating voltage	10-30V DC
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	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
	Blind distance	<10cm
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	M12 connector

Wiring

Schlüter Automation und Sensorik GmbH
Bergstrasse 2
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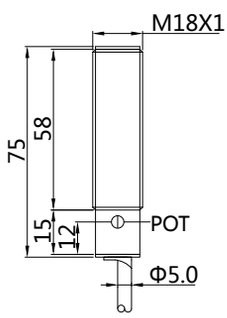
Features:

- Retro-reflective,AC 3-wire discrete output;
- Cable & connector versions;
- M18*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

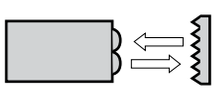


Model No.

Housing material	PBT	Brass, nickel-plated
Light/Dark-on	SP-M18R-3A-P14-PV2	SP-M18R-3A-C14-PV2
Light/Dark-on	SP-M18R-3A-P24-PV2	SP-M18R-3A-C24-PV2

Type diagram

Retro-reflective sensors



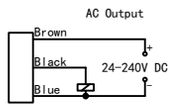
Retro-reflective sensor put transmitter andreceiver encapsulated into same shel,in the opposite install aspeculum,the light emitted by the reflector is reflected therough the reflector back to the receiver.

When the beam is occlusion,generate a switch changes.

Technical data

Electrical data	Operating voltage	24-240V AC
	Switching frequency	25Hz
	Light type	Infrared light 880nm
	Response time	<5ms
	Load current	300mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
	Blind distance	<10cm
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	PVC cable/2m;3*0.35mm²

Wiring



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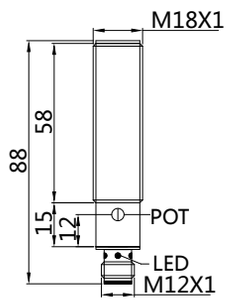
Features:

- Retro-reflective,AC 3-wire discrete output;
- Cable & connector versions;
- M18*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

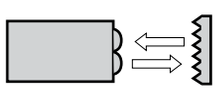


Model No.

Housing material	PBT	Brass, nickel-plated
Light/Dark-on	SP-M18R-3A-P14-M12	SP-M18R-3A-C14-M12
Light/Dark-on	SP-M18R-3A-P24-M12	SP-M18R-3A-C24-M12

Type diagram

Retro-reflective sensors



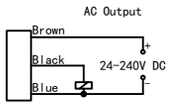
Retro-reflective sensor put transmitter andreceiver encapsulated into same shel,in the opposite install aspeculum,the light emitted by the reflector is reflected therough the reflector back to the receiver.

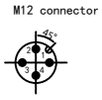
When the beam is occlusion,generate a switch changes.

Technical data

Electrical data	Operating voltage	24-240V AC
	Switching frequency	25Hz
	Light type	Infrared light 880nm
	Response time	<5ms
	Load current	300mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
	Blind distance	<10cm
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	M12 connector

Wiring





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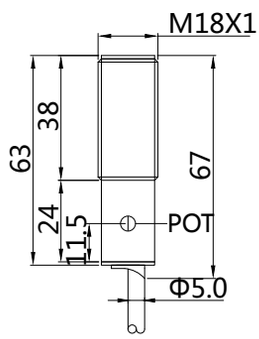
Features:

- Through-beam,Emitter/receiver set,DC4-wire discrete output;
- Cable & connector versions;
- M18*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

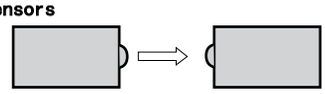


Model No.

Housing material	PBT	Brass, nickel-plated
Transmitter	SP-M18L-15MD-P51-PV2	SP-M18L-15MD-C51-PV2
NPN Light/Dark-on	SP-M18L-15MN-P31-PV2	SP-M18L-15MN-C31-PV2
PNP Light/Dark-on	SP-M18L-15MP-P31-PV2	SP-M18L-15MP-C31-PV2

Type diagram

Through-beam sensors

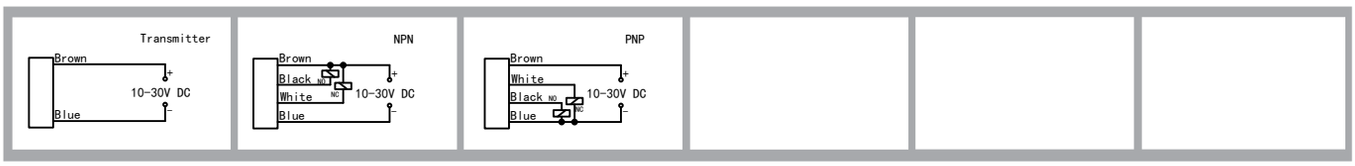


Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	PVC cable/2m;2*0.5mm²/4*0.25mm²

Wiring



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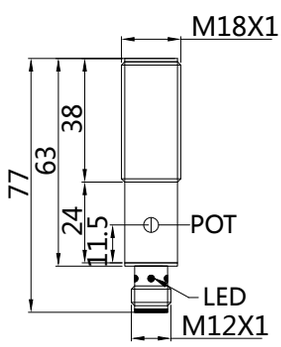
Features:

- Through-beam,Emitter/receiver set,DC4-wire discrete output;
- Cable & connector versions;
- M18*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

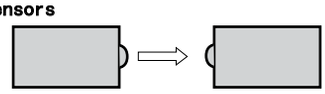


Model No.

Housing material	PBT	Brass, nickel-plated
Transmitter	SP-M18L-15MD-P51-M12-E	SP-M18L-15MD-C51-M12-E
NPN Light/Dark-on	SP-M18L-15MN-P31-M12-E	SP-M18L-15MN-C31-M12-E
PNP Light/Dark-on	SP-M18L-15MP-P31-M12-E	SP-M18L-15MP-C31-M12-E

Type diagram

Through-beam sensors

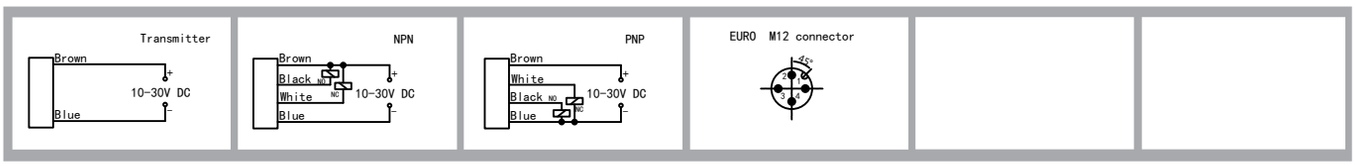


Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	M12 connector

Wiring

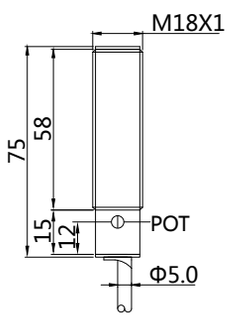


Features:

- Through-beam,Emitter/receiver set,AC 3-wire discrete output;
- Cable & connector versions;
- M18*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

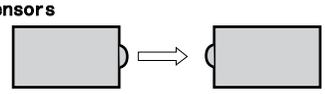


Model No.

Housing material	PBT	Brass, nickel-plated
Transmitter	SP-M18L-15MD-P54-PV2	SP-M18L-15MD-C54-PV2
Light/Dark-on	SP-M18L-15MA-P14-PV2	SP-M18L-15MA-C14-PV2
Light/Dark-on	SP-M18L-15MA-P24-PV2	SP-M18L-15MA-C24-PV2

Type diagram

Through-beam sensors



Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Electrical data	Operating voltage	24-240V AC
	Switching frequency	50Hz
	Light type	Infrared light 880nm
	Response time	<5ms
	Load current	300mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	PVC cable/2m;3*0.35mm²

Wiring

Schlüter Automation und Sensorik GmbH
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Germany

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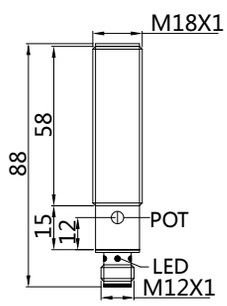
Features:

- Through-beam,Emitter/receiver set,AC 3-wire discrete output;
- Cable & connector versions;
- M18*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

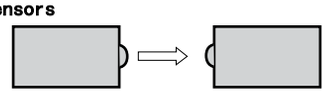


Model No.

Housing material	PBT	Brass, nickel-plated
Transmitter	SP-M18L-15MD-P54-M12	SP-M18L-15MD-C54-M12
Light/Dark-on	SP-M18L-15MA-P14-M12	SP-M18L-15MA-C14-M12
Light/Dark-on	SP-M18L-15MA-P24-M12	SP-M18L-15MA-C24-M12

Type diagram

Through-beam sensors



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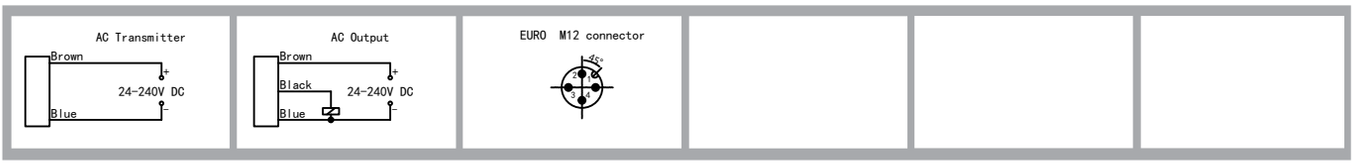
Technical data

Electrical data	Operating voltage	24-240V AC
	Switching frequency	50Hz
	Light type	Infrared light 880nm
	Response time	<5ms
	Load current	300mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	M12 connector

Wiring



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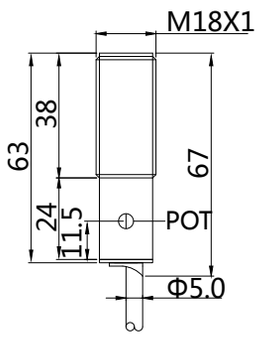
Features:

- Diffuse type,DC4-wire discrete output;
- Cable & connector versions;
- M18*1mm,plastic/Brass ,nickel-plated housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

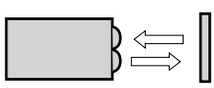


Model No.

Sensing range	Sn: 100 mm	Sn: 100 mm
Housing material	PBT	Brass, nickel-plated
NPN Light/Dark-on	SP-M18T-01N-P31-PV2	SP-M18T-01N-C31-PV2
PNP Light/Dark-on	SP-M18T-01P-P31-PV2	SP-M18T-01P-C31-PV2

Type diagram

Diffuse type sensors



Diffuse reflection type photoelectric sensor principle and the principle of mirror reflection type photoelectric sensor is the same,but it doesn’ t take reflective lenses,The light emitted by the transmitter is directly reflected by the measured object back to the receiver.The light reflected by the measured object is estimated by the receiver, and the positioning of the object is not very strict.When object under test enterinto effective light rays area,output state changes.The detection distance depends on the size, shape, color and surface characteristics of the measured object.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	Brass,nickel-plated/PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²

Wiring

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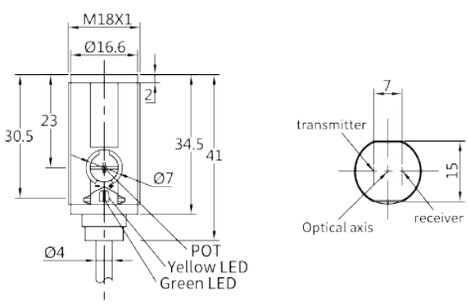
Features:

- 100mm,Diffuse type,DC4-wire discrete output;
- M18*1 Small and easy to install (embedded installation is optional)
- Cable versions;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing



Model No.

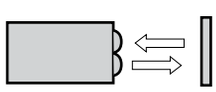
Sensing range	Sn: 100 mm
NPN Light/Dark-on	SP-M18T-01N-P31-PV2
PNP Light/Dark-on	SP-M18T-01P-P31-PV2

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	1000Hz
	Light type	Red light 650nm
	Response time	0.5ms
	Load current	100mA
	Load current	≤25mA
	Adjustment	Single-turn protentiometer
	Protection circuit	Output short circuit protection and power
		polarity reverse connection protection
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Yellow:output/Green:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²

Type diagram

Diffuse type sensors



Diffuse reflection type photoelectric sensor principle and the principle of mirror reflection type photoelectric sensor is the same,but it doesn’ t take reflective lenses,The light emitted by the transmitter is directly reflected by the measured object back to the receiver.The light reflected by the measured object is estimated by the receiver, and the positioning of the object is not very strict.When object under test enterinto effective light rays area,output state changes.The detection distance depends on the size, shape, color and surface characteristics of the measured object.

Wiring

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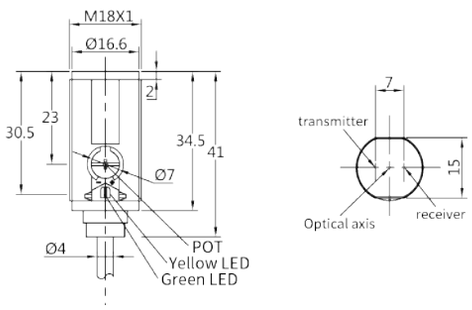
Features:

- 3m,Retro-reflective,DC4-wire discrete output;
- M18*1 Small and easy to install (embedded installation is optional)
- Cable versions;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

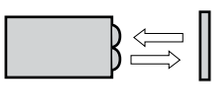


Model No.

Sensing range	Sn: 3m
NPN Light/Dark-on	SP-M18R-3N-P31-PV2
PNP Light/Dark-on	SP-M18R-3P-P31-PV2

Type diagram

Diffuse type sensors



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Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	1000Hz
	Light type	Red light 650nm
	Response time	0.5ms
	Load current	100mA
	Load current	≤25mA
	Adjustment	Single-turn protentiometer
	Protection circuit	Output short circuit protection and power polarity reverse connection protection
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Yellow:output/Green:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²

Wiring

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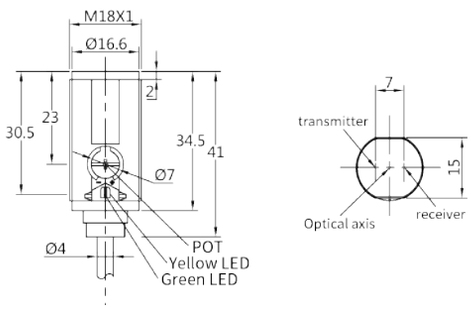
Features:

- Through-beam,Emitter/receiver,DC4-wire discrete output;
- Cable&connector versions;
- M18 plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing



Model No.

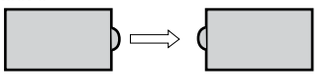
Housing material	PBT
Transmitter	SP-M18L-15MD-P51-PV2
NPN Light/Dark-on	SP-M18L-15MN-P31-PV2
PNP Light/Dark-on	SP-M18L-15MP-P31-PV2

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	1000Hz
	Light type	Red light 650nm
	Response time	0.5ms
	Load current	100mA
	Load current	≤25mA
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Yellow:output/Green:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²

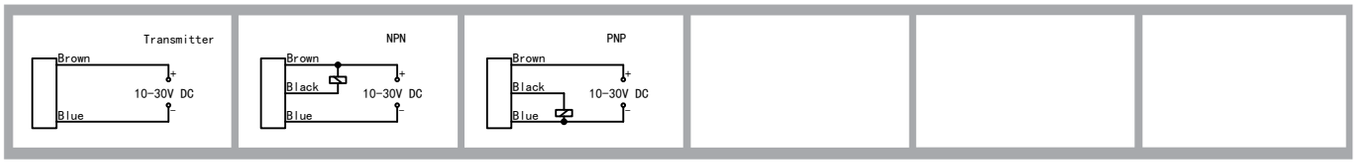
Type diagram

Through-beam sensors



Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Wiring



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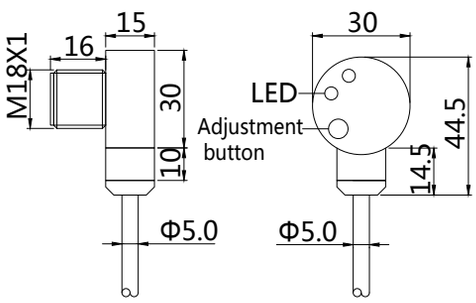
Features:

- Diffuse type,DC4-wire discrete output;
- Cable & connector versions;
- M18*1mm,Right-angle plastic housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

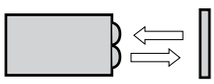


Model No.

Sensing range	Sn: 150 mm	Sn: 500 mm
NPN Light/Dark-on	SP-Q18T-015N-P31-PV2	SP-Q18T-05N-C31-PV2
PNP Light/Dark-on	SP-Q18T-015P-P31-PV2	SP-Q18T-05P-C31-PV2

Type diagram

Diffuse type sensors



Diffuse reflection type photoelectric sensor principle and the principle of mirror reflection type photoelectric sensor is the same,but it doesn’ t take reflective lenses,The light emitted by the transmitter is directly reflected by the measured object back to the receiver.The light reflected by the measured object is estimated by the receiver, and the positioning of the object is not very strict.When object under test enterinto effective light rays area,output state changes.The detection distance depends on the size, shape, color and surface characteristics of the measured object.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²

Wiring

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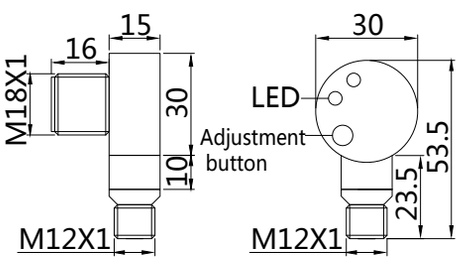
Features:

- Diffuse type,DC4-wire discrete output;
- Cable & connector versions;
- M18*1mm,Right-angle plastic housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

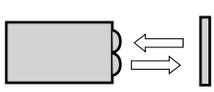


Model No.

Sensing range	Sn: 150 mm	Sn: 500 mm
NPN Light/Dark-on	SP-Q18T-015N-P13-M12-E	SP-Q18T-05N-P13-M12-E
PNP Light/Dark-on	SP-Q18T-015P-P13-M12-E	SP-Q18T-05P-P13-M12-E

Type diagram

Diffuse type sensors



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Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	M12 connector

Wiring

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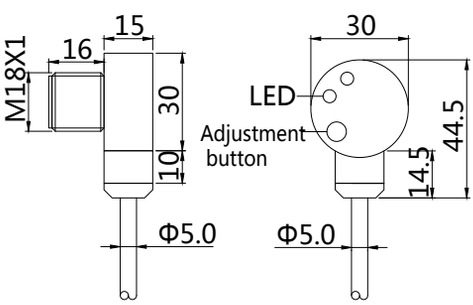
Features:

- Retro-reflective,DC4-wire discrete output;
- Cable & connector versions;
- M18*1mm,Right-angle plastic housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

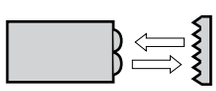


Model No.

Sensing range	Sn: 0.1-3 m
NPN Light/Dark-on	SP-Q18R-3N-P31-PV2
PNP Light/Dark-on	SP-Q18R-3P-P31-PV2

Type diagram

Retro-reflective sensors



Retro-reflective sensor put transmitter andreceiver encapsulated into same shel,in the opposite install aspeculum,the light emitted by the reflector is reflected therough the reflector back to the receiver.

When the beam is occlusion,generate a switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²

Wiring

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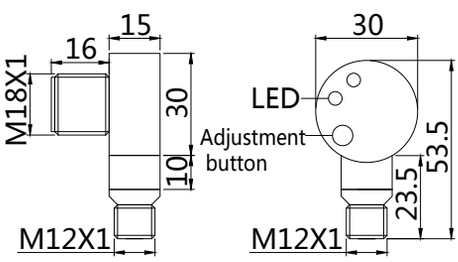
Features:

- Retro-reflective,DC4-wire discrete output;
- Cable & connector versions;
- M18*1mm,Right-angle plastic housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

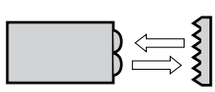


Model No.

Sensing range	Sn: 0.1-3 m
NPN Light/Dark-on	SP-Q18R-3N-P31-M12-E
PNP Light/Dark-on	SP-Q18R-3P-P31-M12-E

Type diagram

Retro-reflective sensors



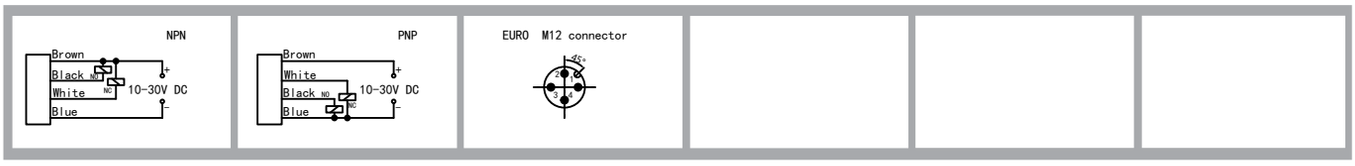
Retro-reflective sensor put transmitter andreceiver encapsulated into same shel,in the opposite install aspeculum,the light emitted by the reflector is reflected therough the reflector back to the receiver.

When the beam is occlusion,generate a switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	M12 connector

Wiring



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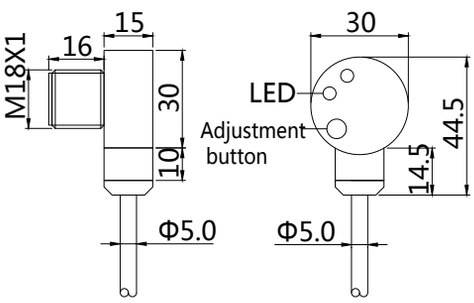
Features:

- Through-beam,Emitter/receiver set,DC4-wire discrete output;
- Cable & connector versions;
- M18*1mm,Right-angle plastic housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

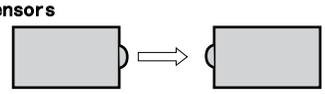


Model No.

Sensing range	Sn: 15 m
Transmitter	SP-Q18L-15MD-P51-PV2
NPN Light/Dark-on	SP-Q18L-15MN-P31-PV2
PNP Light/Dark-on	SP-Q18L-15MP-P31-PV2

Type diagram

Through-beam sensors

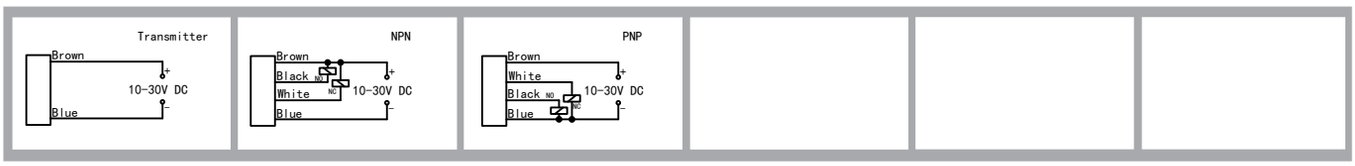


Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²/2*0.5mm²

Wiring



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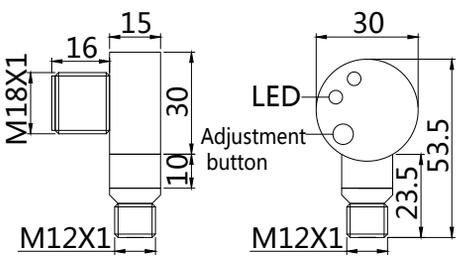
Features:

- Through-beam,Emitter/receiver set,DC4-wire discrete output;
- Cable & connector versions;
- M18*1mm,Right-angle plastic housing;
- VDE safety class:III;
- Ingress protection:IP66

RoHS CE

Dimensioned drawing

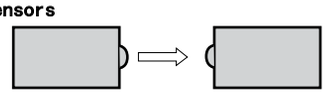


Model No.

Sensing range	Sn: 15 m
Transmitter	SP-Q18L-15MD-P51-M12-E
NPN Light/Dark-on	SP-Q18L-15MN-P31-M12-E
PNP Light/Dark-on	SP-Q18L-15MP-P31-M12-E

Type diagram

Through-beam sensors

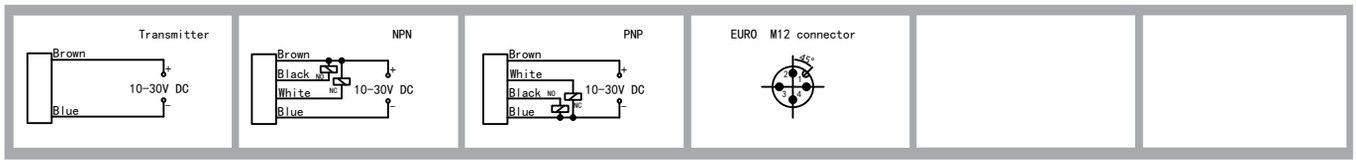


Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow
Electrical connection	Connectors	M12 connector

Wiring



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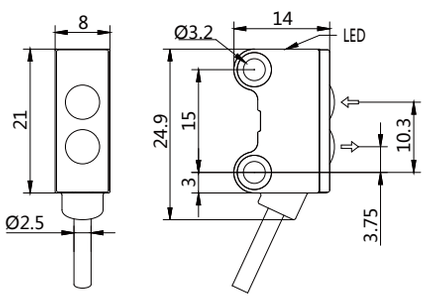
Features:

- 85mm,Background suppression,DC4-wire discrete ouptut;
- Cable & connector versions;
- Q21,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

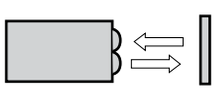


Model No.

Housing material	Sn: 15-85 mm
NPN Light/Dark-on	SP-Q21H-008N-P11-PV2
PNP Light/Dark-on	SP-Q21H-008P-P21-PV2

Type diagram

Diffuse type sensors

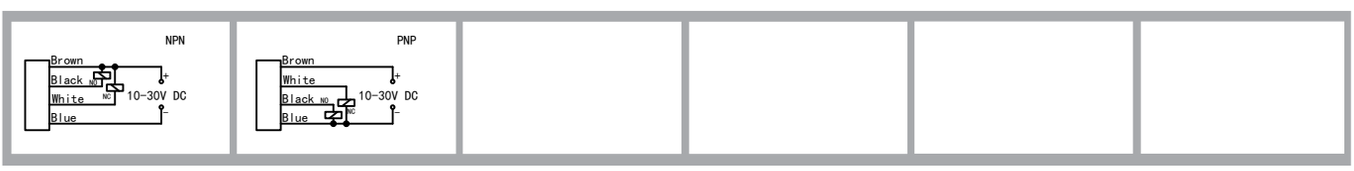


Diffuse reflection type photoelectric sensor principle and the principle of mirror reflection type photoelectric sensor is the same,but it doesn’ t take reflective lenses,The light emitted by the transmitter is directly reflected by the measured object back to the receiver.The light reflected by the measured object is estimated by the receiver, and the positioning of the object is not very strict.When object under test enterinto effective light rays area,output state changes.The detection distance depends on the size, shape, color and surface characteristics of the measured object.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	100mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Red:output/Yellow:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.18mm²

Wiring



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FQ31 Series DC 4-Wire Sn 110/350/800mm

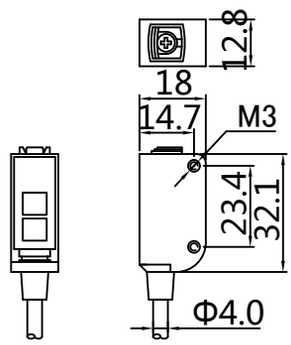
Photoelectric sensors

Features:

- Diffuse type,DC4-wire discrete output;
- Cable & connector versions;
- Q31,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

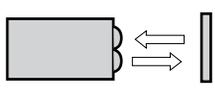


Model No.

Sensing range	Sn: 110 mm	Sn: 350 mm
NPN Light/Dark-on	SP-Q31T-011N-P31-PV2	SP-Q31T-035N-P31-PV2
PNP Light/Dark-on	SP-Q31T-011P-P31-PV2	SP-Q31T-035P-P31-PV2
Sensing range	Sn: 800 mm	
NPN Light/Dark-on	SP-Q31T-08N-P31-PV2	
PNP Light/Dark-on	SP-Q31T-08P-P31-PV2	

Type diagram

Diffuse type sensors



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Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	100mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Red:output/Yellow:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.18mm²

Wiring

FQ31 Series DC 4-Wire Sn 110/350/800mm

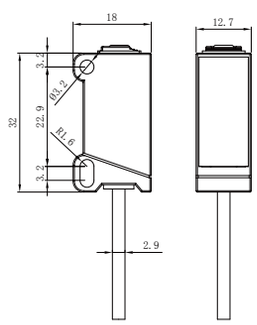
Photoelectric sensors

Features:

- Diffuse type,DC4-wire discrete output;
- Cable & connector versions;
- Q31,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

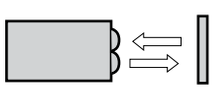


Model No.

Sensing range	Sn: 110 mm	Sn: 350 mm
NPN Light/Dark-on	SP-Q31T-011N-P31-PV2	SP-Q31T-035N-P31-PV2
PNP Light/Dark-on	SP-Q31T-011P-P31-PV2	SP-Q31T-035P-P31-PV2
Sensing range	Sn: 800 mm	
NPN Light/Dark-on	SP-Q31T-08N-P31-PV2	
PNP Light/Dark-on	SP-Q31T-08P-P31-PV2	

Type diagram

Diffuse type sensors



Diffuse reflection type photoelectric sensor principle and the principle of mirror reflection type photoelectric sensor is the same,but it doesn' t take reflective lenses,The light emitted by the transmitter is directly reflected by the measured object back to the receiver.The light reflected by the measured object is estimated by the receiver, and the positioning of the object is not very strict.When object under test enterinto effective light rays area,output state changes.The detection distance depends on the size, shape, color and surface characteristics of the measured object.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	100mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Red:output/Yellow:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.18mm²

Wiring

Schlüter Automation und Sensorik GmbH
Bergstrasse 2
D-79674 Todtnau
Germany

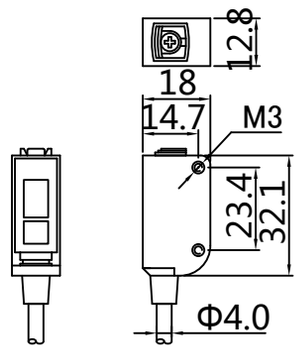
www.schlueter-automation.de
anfragen@schlueter-automation.de

Features:

- 200mm,Background suppression,DC4-wire discrete output;
- Cable & connector versions;
- Q31,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

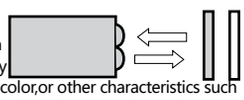
Dimensioned drawing



Model No.

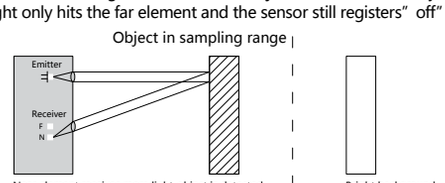
Sensing range	Sn:10-200mm
NPN Light/Dark-on	SP-Q31H-02N-P31-PV2
PNP Light/Dark-on	SP-Q31H-02P-P31-PV2

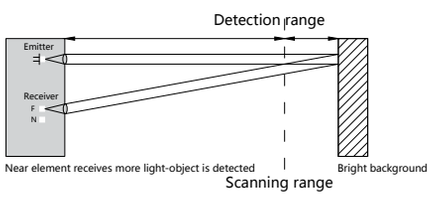
Background suppression



Background suppression sensors were developed to reach a defined detection range for any object,regardless of its brightness,color,or other characteristics such as the brightness of the background.The following figure illustrates the functional principle of a background suppression sensor.The light emitted by the emitter is directed by the lens and hits the object.If the boject is located within the detection range,a portion of the reflected light,bundled by the receiver lens,is mapped to th

As the object' s distance increases,this light spot moves in the direction of the far element(F).At the detection range limit,one half of the light spot is on the near element,the other on the far element and the sensor registers" off" .IF the object moves further away,the light only hits the far element and the sensor still registers" off" .

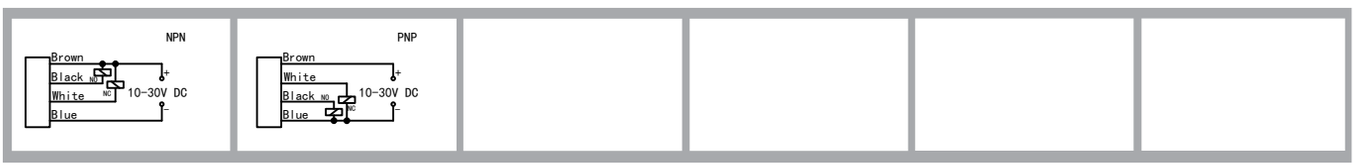




Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	1000Hz
	Light type	Red light 650nm
	Response time	<2ms
	Load current	100mA
	Power-up delay	<300ms
	Adjustment	Multi-turn potentiometer
	Blind distance	<1cm
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Red:output/Yellow:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²

Wiring



FQ31 Series Background-suppression Sn 10-200mm

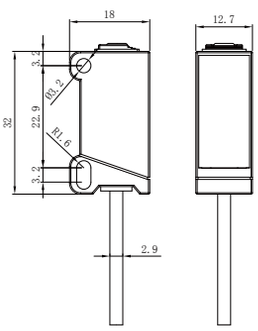
Photoelectric sensors

Features:

- 200mm,Background suppression,DC4-wire discrete output;
- Cable & connector versions;
- Q31,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

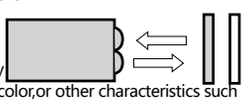
Dimensioned drawing



Model No.

Sensing range	Sn:10-200mm
NPN Light/Dark-on	SP-Q31H-02N-P31-PV2
PNP Light/Dark-on	SP-Q31H-02P-P31-PV2

Background suppression



Background suppression sensors were developed to reach a defined detection range for any object,regardless of its brightness,color,or other characteristics such as the brightness of the background.The following figure illustrates the functional principle of a background suppression sensor.The light emitted by the emitter is directed by the lens and hits the object.If the boject is located within the detection range,a portion of the reflected light,bundled by the receiver lens,is mapped to th

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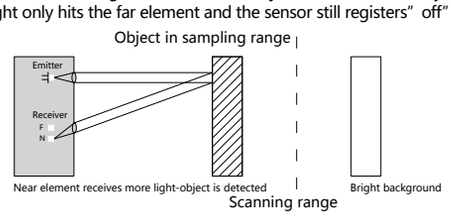
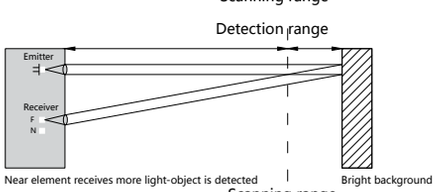
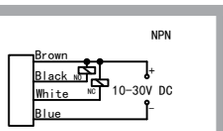


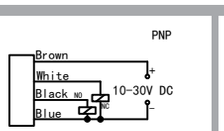


Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	1000Hz
	Light type	Red light 650nm
	Response time	<2ms
	Load current	100mA
	Power-up delay	<300ms
	Adjustment	Multi-turn potentiometer
	Blind distance	<1cm
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Red:output/Yellow:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²

Wiring





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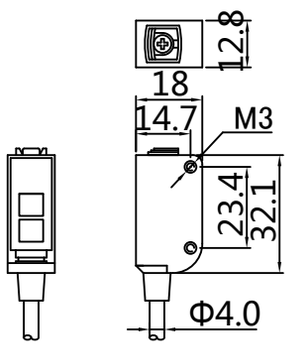
Features:

- Retro-reflective,DC4-wire discrete output;
- Cable versions;
- Q31,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

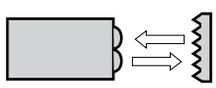


Model No.

Sensing range	**Sn: 2 m**
NPN Light/Dark-on	SP-Q31R-2N-P31-PV2
PNP Light/Dark-on	SP-Q31R-2P-P31-PV2

Type diagram

Retro-reflective sensors



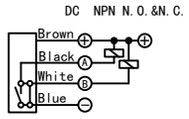
Retro-reflective sensor put transmitter andreceiver encapsulated into same shel,in the opposite install aspeculum,the light emitted by the reflector is reflected therough the reflector back to the receiver.

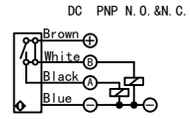
When the beam is occlusion,generate a switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	100mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
	Blind distance	No photosensitivity/<25cm
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Red:output/Yellow:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.18mm²

Wiring





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Germany

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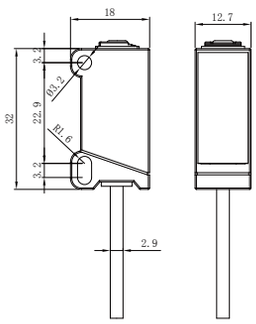
anfragen@schlueter-automation.de

Features:

- Retro-reflective,DC4-wire discrete output;
- Cable versions;
- Q31,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

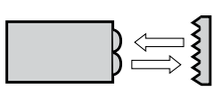


Model No.

Sensing range	Sn: 2 m
NPN Light/Dark-on	SP-Q31R-2N-P31-PV2
PNP Light/Dark-on	SP-Q31R-2P-P31-PV2

Type diagram

Retro-reflective sensors



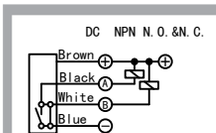
Retro-reflective sensor put transmitter andreceiver encapsulated into same shel,in the opposite install aspeculum,the light emitted by the reflector is reflected therough the reflector back to the receiver.

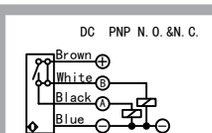
When the beam is occlusion,generate a switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	100mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
	Blind distance	No photosensitivity/<25cm
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Red:output/Yellow:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.18mm²

Wiring





Schlüter Automation und Sensorik GmbH
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Germany

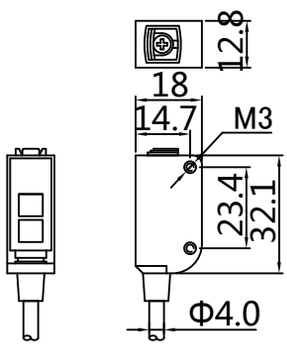
www.schlueter-automation.de
anfragen@schlueter-automation.de

Features:

- Through-beam,Emitter/receiver set,DC4-wire discrete output;
- Cable versions;
- Q31,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

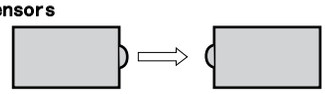


Model No.

Sensing range	Sn: 5 m	Sn: 15 m
Transmitter	SP-Q31L-5D-P51-PV2	SP-Q31L-15MD-P51-PV2
NPN Light/Dark-on	SP-Q31L-5N-P31-PV2	SP-Q31L-15MN-P31-PV2
PNP Light/Dark-on	SP-Q31L-5P-P31-PV2	SP-Q31L-15MP-P31-PV2

Type diagram

Through-beam sensors

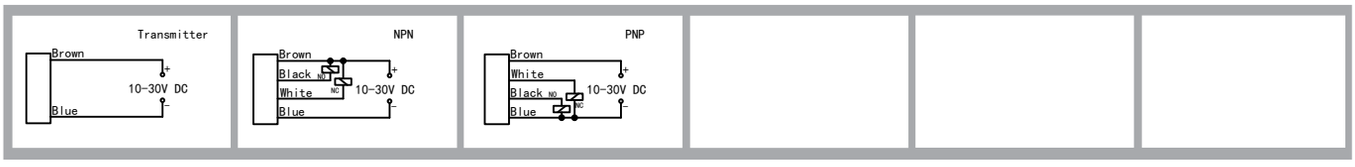


Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any object blocking the light,the voltage of the receiver drops,switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	100mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Red:output/Yellow:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.18mm²/2*0.25mm²

Wiring



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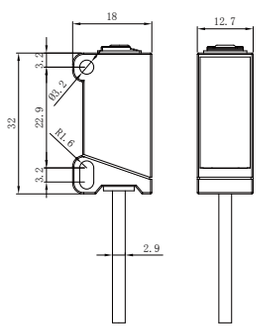
Features:

- Through-beam,Emitter/receiver set,DC4-wire discrete output;
- Cable versions;
- Q31,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

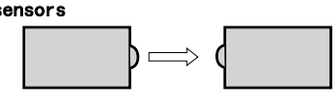


Model No.

Sensing range	Sn: 5 m	Sn: 15 m
Transmitter	SP-Q31L-5D-P51-PV2	SP-Q31L-15MD-P51-PV2
NPN Light/Dark-on	SP-Q31L-5N-P31-PV2	SP-Q31L-15MN-P31-PV2
PNP Light/Dark-on	SP-Q31L-5P-P31-PV2	SP-Q31L-15MP-P31-PV2

Type diagram

Through-beam sensors



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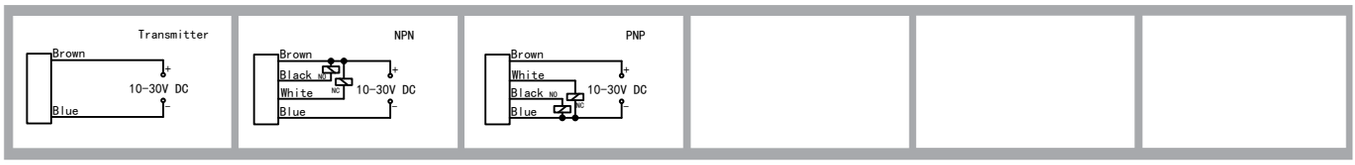
Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	100mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Red:output/Yellow:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.18mm²/2*0.25mm²

Wiring



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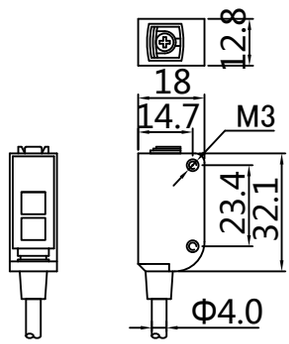
Features:

- Compact design;
- Detect transparent objects;
- All metal thread installation;
- Large light spot makes the device insensitive to object vibration and tilt

RoHS CE

Dimensioned drawing

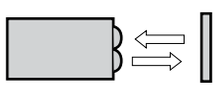


Model No.

Sensing range	Sn: 200 mm (adjustable)
NPN Light/Dark-on	SP-Q31T-02N-P31-PV2
PNP Light/Dark-on	SP-Q31T-02P-P31-PV2

Type diagram

Diffuse type sensors



Diffuse reflection type photoelectric sensor principle and the principle of mirror reflection type photoelectric sensor is the same,but it doesn' t take reflective lenses,The light emitted by the transmitter is directly reflected by the measured object back to the receiver.The light reflected by the measured object is estimated by the receiver, and the positioning of the object is not very strict.When object under test enterinto effective light rays area,output state changes.The detection distance depends on the size, shape, color and surface characteristics of the measured object.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Red light 650nm
	Response time	<2ms
	Load current	100mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
	Spot diameter	About 200mm at a distance of about 200mm
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Red:output/Yellow:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.18mm²
Accessories	Accessories	NO
	(to be ordered separately)	

Wiring

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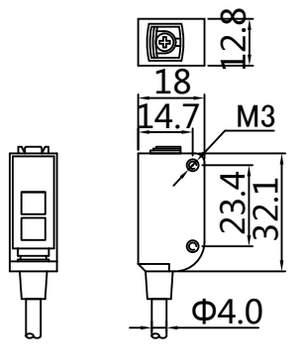
Features:

- Compact design;
- Detect transparent objects;
- All metal thread installation;
- Large light spot makes the device insensitive to object vibration and tilt

RoHS CE

Dimensioned drawing

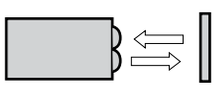


Model No.

Sensing range	Sn: 200 mm (adjustable)
NPN Light/Dark-on	SP-Q31T-02N-P31-PV2
PNP Light/Dark-on	SP-Q31T-02P-P31-PV2

Type diagram

Diffuse type sensors



Diffuse reflection type photoelectric sensor principle and the principle of mirror reflection type photoelectric sensor is the same,but it doesn' t take reflective lenses,The light emitted by the transmitter is directly reflected by the measured object back to the receiver.The light reflected by the measured object is estimated by the receiver, and the positioning of the object is not very strict.When object under test enterinto effective light rays area,output state changes.The detection distance depends on the size, shape, color and surface characteristics of the measured object.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Red light 650nm
	Response time	<2ms
	Load current	100mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
	Spot diameter	About 200mm at a distance of about 200mm
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Red:output/Yellow:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.18mm²

Wiring

Schlüter Automation und Sensorik GmbH
Bergstrasse 2
D-79674 Todtnau
Germany

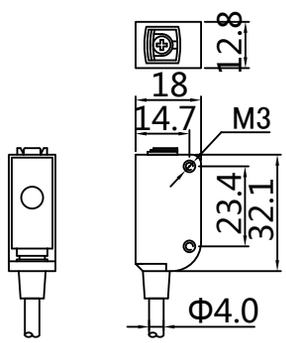
www.schlueter-automation.de
anfragen@schlueter-automation.de

Features:

- No blind spots;
- Visible red light;
- Push-button distance adjustment;
- Adopting the same optical axis design, suitable for detecting transparent objects and highly reflective objects

RoHS CE

Dimensioned drawing



Model No.

Sensing range	Sn: 2 m
NPN Dark-on& PNP Light-on	SP-Q31R-2D-P31-PV2

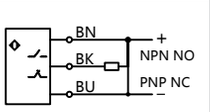
Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	500Hz
	Light type	Red light 650nm
	Response time	1ms
	Load current	100mA
	Power-up delay	<300ms
	Sensitive adjustment	Align the lens and double-click the button
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Red:output/Yellow:power supply
Electrical connection	Connectors	PVC cable/2m;3*0.35mm²

Features

1.No blind spots
2.Visible red light
3.Push-button distance adjustment
4. Adopting the same optical axis design, suitable for detecting transparent objects and highly reflective objects.

Wiring

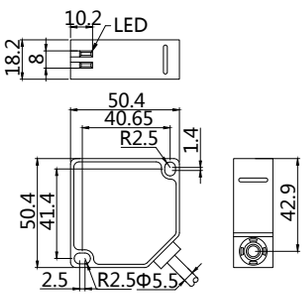


Features:

- Diffuse type,DC4-wire discrete output;
- Cable & connector versions;
- Q50,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

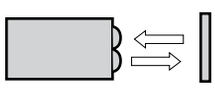


Model No.

Sensing range	Sn: 0.2-1 m	Sn: 0.3-2 m
NPN Light/Dark-on	SP-Q50T-1N-P31-PV2	SP-Q50T-2N-P31-PV2
PNP Light/Dark-on	SP-Q50T-1P-P31-PV2	SP-Q50T-2P-P31-PV2

Type diagram

Diffuse type sensors



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Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	200Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<100ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<10000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow:output/Red:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²

Wiring

Schlüter Automation und Sensorik GmbH
Bergstrasse 2
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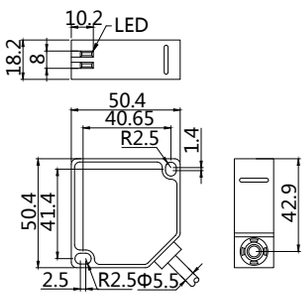
anfragen@schlueter-automation.de

Features:

- Diffuse type,AC/DC5-wire;
- Cable & connector versions;
- Q50,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

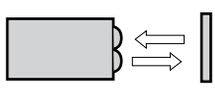


Model No.

Sensing range	Sn: 0.2-1 m	Sn: 0.3-2 m
Light/Dark-on	SP-Q50T-1U-P45-PV2	SP-Q50T-2U-P45-PV2

Type diagram

Diffuse type sensors



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Technical data

Electrical data	Operating voltage	24-240V AC/DC
	Switching frequency	10Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<5ms
	Load current	3A/30VDC;1A/220VAC
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<10000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow:output/Red:power supply
Electrical connection	Connectors	PVC cable/2m;5*0.25mm²

Wiring

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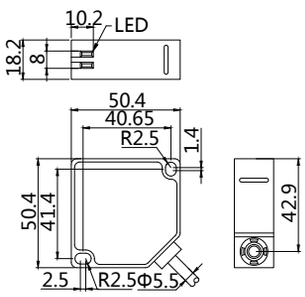
Features:

- Retro-reflective,DC4-wire discrete output;
- Cable & connector versions;
- Q50,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

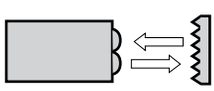


Model No.

Sensing range	Sn: 5 m	Sn: 5 m
NPN Light/Dark-on	SP-Q50R-5N-P31-PV2	SP-Q50R-5N-P31-PV2
PNP Light/Dark-on	SP-Q50R-5P-P31-PV2	SP-Q50R-5P-P31-PV2

Type diagram

Retro-reflective sensors



Retro-reflective sensor put transmitter andreceiver encapsulated into same shel,in the opposite install aspeculum,the light emitted by the reflector is reflected therough the reflector back to the receiver.

When the beam is occlusion,generate a switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	200Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<100ms
	Adjustment	Single-turn protentiometer
	Blind distance	No photosensitivity
Environment	Light immunity	<10000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow:output/Red:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²

Wiring

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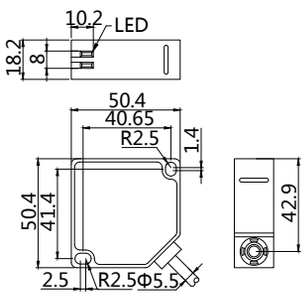
Features:

- Retro-reflective,AC/DC5-wire;
- Cable & connector versions;
- Q50,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

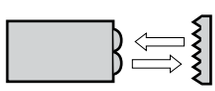


Model No.

Sensing range	Sn: 5 m
Light/Dark-on	SP-Q50R-5U-P45-PV2
Light/Dark-on	SP-Q50R-5U-P45-PV2

Type diagram

Retro-reflective sensors



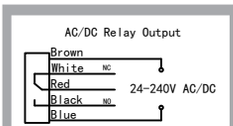
Retro-reflective sensor put transmitter andreceiver encapsulated into same shel,in the opposite install aspeculum,the light emitted by the reflector is reflected therough the reflector back to the receiver.

When the beam is occlusion,generate a switch changes.

Technical data

Electrical data	Operating voltage	24-240V AC/DC
	Switching frequency	10Hz
	Light type	Red light 650nm
	Response time	<5ms
	Load current	3A/30VDC;1A/220VAC
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
	Blind distance	No photosensitivity
Environment	Light immunity	<10000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow:output/Red:power supply
Electrical connection	Connectors	PVC cable/2m;5*0.25mm²

Wiring



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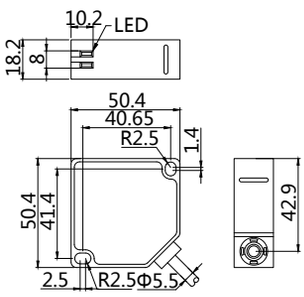
Features:

- Through-beam,Emitter/receiver set,DC4-wire discrete output;
- Cable & connector versions;
- Q50,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

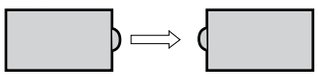


Model No.

Sensing range	Sn: 20 m	Sn: 40 m
Transmitter	SP-Q50L-20MD-P51-PV2	SP-Q50L-40MD-P51-PV2
NPN Light/Dark-on	SP-Q50L-20MN-P31-PV2	SP-Q50L-40MN-P31-PV2
PNP Light/Dark-on	SP-Q50L-20MP-P31-PV2	SP-Q50L-40MP-P31-PV2

Type diagram

Through-beam sensors

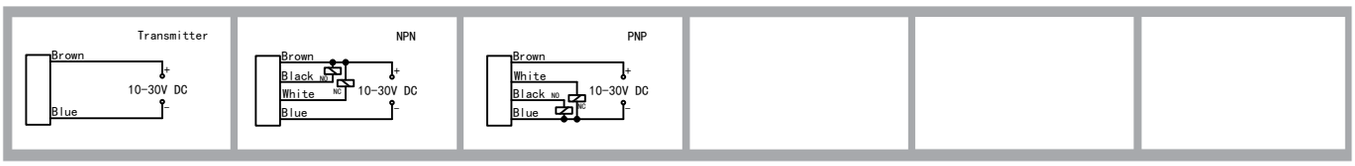


Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	200Hz
	Light type	Infrared light 880nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<100ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<10000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow:output/Red:power supply
Electrical connection	Connectors	PVC cable/2m;4*0.25mm²

Wiring



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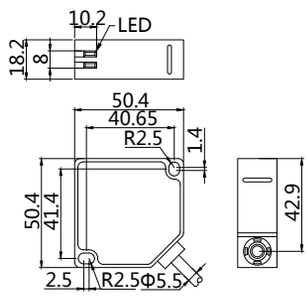
Features:

- Through-beam,Emitter/receiver set,AC/DC5-wire;
- Cable & connector versions;
- Q50,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

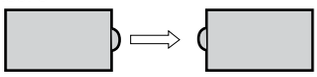


Model No.

Sensing range	Sn: 20 m	Sn: 40 m
Transmitter	SP-Q50L-20MU-P55-PV2	SP-Q50L-40MU-P55-PV2
NPN/PNP Light/Dark-on	SP-Q50L-20MU-P45-PV2	SP-Q50L-40MU-P45-PV2

Type diagram

Through-beam sensors



Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Electrical data	Operating voltage	24-240V AC/DC
	Switching frequency	10Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<5ms
	Load current	3A/30VDC;1A/220VAC
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<10000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow:output/Red:power supply
Electrical connection	Connectors	PVC cable/2m;5*0.25mm²/2*0.5mm²

Wiring

Schlüter Automation und Sensorik GmbH
Bergstrasse 2
D-79674 Todtnau
Germany

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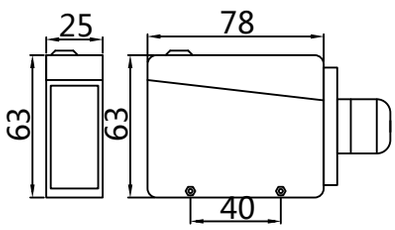
Features:

- Diffuse type,DC3-wire discrete output;
- Cable & connector versions;
- Q78,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

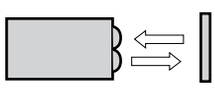


Model No.

Sensing range	Sn: 2 m	Sn: 2 m
NPN Light/Dark-on	SP-Q78T-2N-P31-T	SP-Q78T-2N-P31-T-D
PNP Light/Dark-on	SP-Q78T-2P-P31-T	SP-Q78T-2P-P31-T-D

Type diagram

Diffuse type sensors



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Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	200Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<100ms
	Adjustment	Single-turn protentiometer
	Time control	0.1s-7s±2s
Environment	Light immunity	<10000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow:output/Green:power supply
Electrical connection	Connectors	Terminal up to 2.5mm²

Wiring

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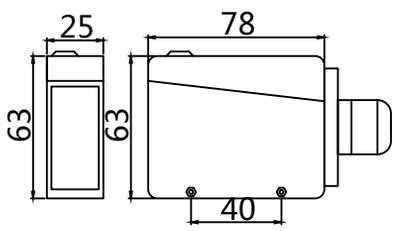
Features:

- Diffuse type,AC/DC5-wire;
- Cable & connector versions;
- Q78,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

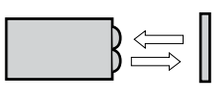


Model No.

Sensing range	Sn: 2 m	Sn: 2 m
AC/DC Relay Output	SP-Q78T-T2U-P45-T	SP-Q78T-T2U-P45-T-D

Type diagram

Diffuse type sensors



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Technical data

Electrical data	Operating voltage	24-240VAC/DC
	Switching frequency	10Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<5ms
	Load current	5A/30VDC;5A/220VAC
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
	Time control	0.1s-7s±2s
Environment	Light immunity	<10000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow:output/Green:power supply
Electrical connection	Connectors	Terminal up to 2.5mm²
Accessories	Accessories	NO
	(to be ordered separately)	

Wiring

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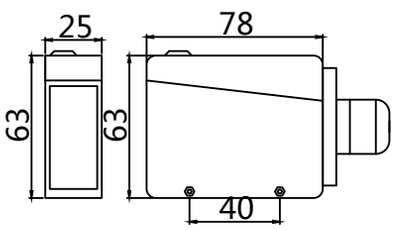
Features:

- Retro-reflective,DC3-wire discrete output;
- Cable & connector versions;
- Q78,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

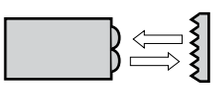


Model No.

Sensing range	Sn: 10 m	Sn: 10 m
NPN Light/Dark-on	SP-Q78R-10MN-P31-T-F	SP-Q78R-10MN-P31-T-FD
PNP Light/Dark-on	SP-Q78R-10MP-P31-T-F	SP-Q78R-10MP-P31-T-FD

Type diagram

Retro-reflective sensors



Retro-reflective sensor put transmitter andreceiver encapsulated into same shel,in the opposite install aspeculum,the light emitted by the reflector is reflected therough the reflector back to the receiver.

When the beam is occlusion,generate a switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	200Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<100ms
	Adjustment	Single-turn protentiometer
	Time control	0.1s-7s±2s
Environment	Light immunity	<10000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow:output/Green:power supply
Electrical connection	Connectors	Terminal up to 2.5mm²

Wiring

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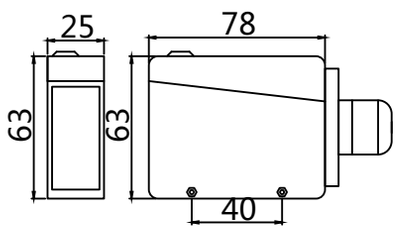
Features:

- Retro-reflective,AC-DC5-wire;
- Cable & connector versions;
- Q78,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

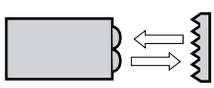


Model No.

Sensing range	Sn: 10 m	Sn: 10 m
AC/DC Relay Output	SP-Q78R-10MU-P45-T-F	SP-Q78R-10MU-P45-T-FD

Type diagram

Retro-reflective sensors



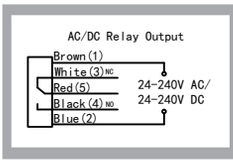
Retro-reflective sensor put transmitter andreceiver encapsulated into same shel,in the opposite install aspeculum,the light emitted by the reflector is reflected therough the reflector back to the receiver.

When the beam is occlusion,generate a switch changes.

Technical data

Electrical data	Operating voltage	24-240VAC/DC
	Switching frequency	10Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<5ms
	Load current	5A/30VDC;5A/220VAC
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
	Time control	0.1s-7s±2s
Environment	Light immunity	<10000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow:output/Green:power supply
Electrical connection	Connectors	Terminal up to 2.5mm²

Wiring



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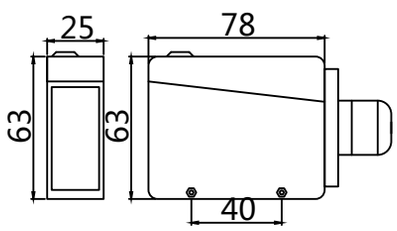
Features:

- Through-beam,Emitter/receiver set,DC3-wire discrete output;
- Cable & connector versions;
- Q78,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

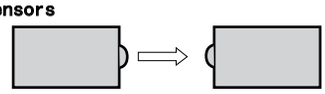


Model No.

Sensing range	Sn: 50 m	Sn: 50 m
Transmitter	SP-Q78L-50MD-P51-T	SP-Q78L-50MD-P51-T-D
NPN Light/Dark-on	SP-Q78L-50MN-P31-T	SP-Q78L-50MN-P31-T-D
PNP Light/Dark-on	SP-Q78L-50MP-P31-T	SP-Q78L-50MP-P31-T-D

Type diagram

Through-beam sensors

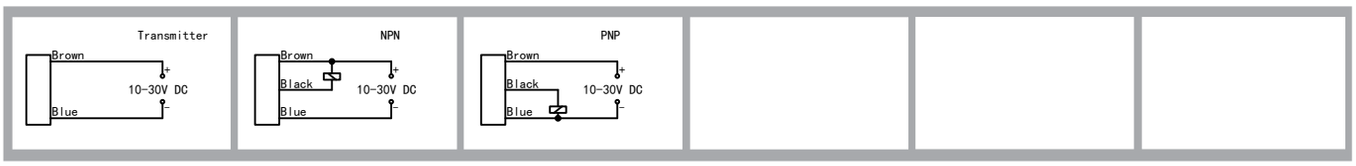


Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Electrical data	Operating voltage	10-30V DC
	Switching frequency	200Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	200mA
	Power-up delay	<100ms
	Adjustment	Single-turn protentiometer
	Time control	0.1s-7s±2s
Environment	Light immunity	<10000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow:output/Green:power supply
Electrical connection	Connectors	Terminal up to 2.5mm²

Wiring



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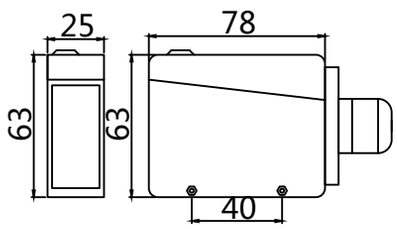
Features:

- Through-beam,Emitter/receiver set,AC/DC5-wire;
- Cable & connector versions;
- Q78,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing

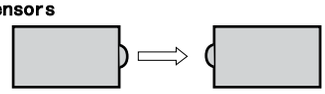


Model No.

Sensing range	Sn: 50 m	Sn: 50 m
Transmitter	SP-Q78L-50MU-P55-T	SP-Q78L-50MU-P55-T-D
AC/DC Relay Output	SP-Q78L-50MU-P45-T	SP-Q78L-50MU-P45-T-D

Type diagram

Through-beam sensors



Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Electrical data	Operating voltage	24-240VAC/DC
	Switching frequency	10Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<5ms
	Load current	5A/30VDC;5A/220VAC
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
	Time control	0.1s-7s±2s
Environment	Light immunity	<10000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PBT
	Lens material	PMMA
	Operating indicator	Yellow:output/Green:power supply
Electrical connection	Connectors	Terminal up to 2.5mm²

Wiring

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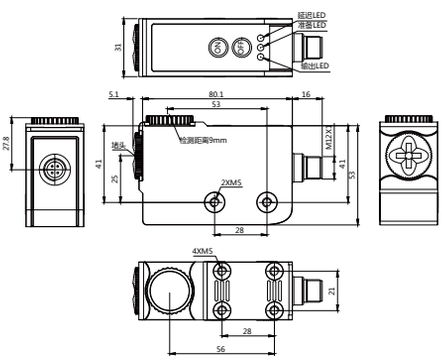
Features:

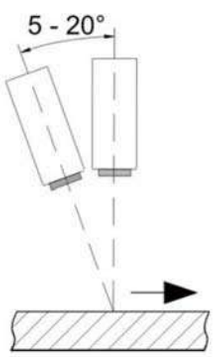
- Through-beam,Emitter/receiver set,AC/DC5-wire;
- connector versions;
- Q80,plastic housing;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing



- The sensor can be positioned using threaded M5 holes, up to 6mm deep ;
- Do not apply excessive torque when adjusting (Max. 2.2nm) ;
- Measuring the working distance from the front surface of the sensor optical element ;
- The reading direction can be changed by reversing the cover and lens ;
- Mark detection on the reflected surface is improved by adjusting the beam direction to 5°-20° from the surface axis



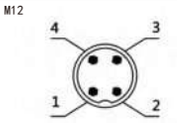
Model No.

Sensing range	Sn: 9 m
NPN/PNP N.O/N.C	SP-Q80-9D

Technical data

Operating voltage	210-30V DC
Ripple	2V/pp Max
Current consumption (excluding output current)	50mA@ 24Vcc Max
output	NPN output /pnp output
Output current	100mA Max
Output and voltage	≤2V
response time	33us
Switching frequency	15k/Hz
delay	0/20ms optional (default configuration without delay)
On / off selection	Dark / light automatic selection
indicator light	Output LED (yellow) / ready LED (green) / delay LED (Orange)
Button	On/off button
working temperature	-10...55℃
Storage temperature	-20...70℃
Dielectric strength	500 VAC for 1 minute, between the electronics and the enclosure
insulation resistance	>20 MΩ 500Vdc Between electronic components and housing
Operating distance	9mm
Working distance	±3mm
minimal beam size	1.5x5 mm@9mm
Emission type	Blue(465nm)/green(520nm)/red(630nm) Automatic selection
Ambient light suppression	According to EN 60947-5-2
Vibration	0.5 amplitude,10...55Hzfrequency,each axis(EN60068-2-6)
impact resistance	11 ms(30G) 6 shocks per shaft(EN60068-2-27)
Housing material	ABS
Lens material	PMMA
Mechanical protection	IP67
connect	M12 4-core connector

Wiring



1.+V
2.NPN
3.0V
4.PNP

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Directions for use

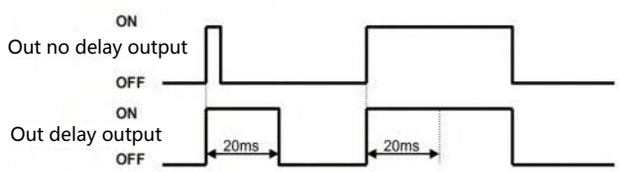
- Yellow LED indicates output status
- Ready LED (green)
- During operation, the green LED is always on,indicating the normal operation state
- Delay LED (Orange)
- The orange led illuminates to indicate that the time delay function on the digital output is activated
- On button
- The marking detection program is activated by pressing the on button
- Off button
- Activate the background detection program by pressing the off button
- For instructions on the setup procedure, see the- "setup" paragraph

Setting (Mark -- background)

- Place the mark in front of the light spot of the sensor and press the on button until the ready LED (green) goes out , The sensor detects red, green and blue alternating emission marks Avoid marking movement at this stage
- Position the background in front of the sensor spot and press the off button. The sensor detects red, green and blue , Alternating emission marks Avoid background movement at this stage
- The dak/light operation mode is automatically selected by the sensor
- Dark marker - light background = dark mode
- Light mark - dark background = light mode
- If the ready LED (green) is always on, the test is successful If the LED flashes slowly, it means that the detection fails due to insufficient contrast
- By pressing one of the two buttons, the sensor returns to the previous setting Delay extends the minimum duration of a valid output to 20 milliseconds
- Allow the slower interface system to detect shorter pulses The activation delay is signaled by the illumination of the corresponding orange led

Delayed activation

- Press the on and off buttons simultaneously for- 2 seconds Until the delay orange LED lights up Delay deactivation and press the on and off buttons simultaneously for 2 seconds Until the delayed orange led goes out



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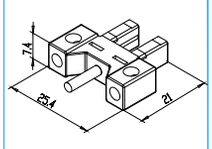
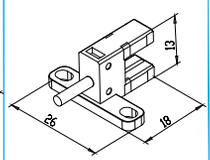
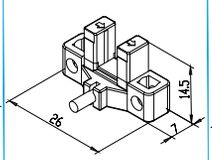
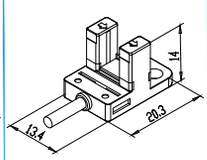
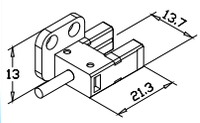
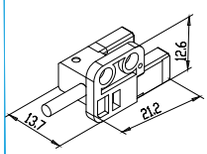
Small-type • Cable type

NPN	Incoming light indicator ON	SP-G15N-K	SP-G15N-T	SP-G15N-L	SP-G15N-Y	SP-G15N-F	SP-G15N-R
	Incoming light indicator OFF	SP-G25N-K	SP-G25N-T	SP-G25N-L	SP-G25N-Y	SP-G25N-F	SP-G25N-R
PNP	Incoming light indicator ON	SP-G15P-K	SP-G15P-T	SP-G15P-L	SP-G15P-Y	SP-G15P-F	SP-G15P-R
	Incoming light indicator OFF	SP-G25P-K	SP-G25P-T	SP-G25P-L	SP-G25P-Y	SP-G25P-F	SP-G25P-R
Appearance		k Type	T Type	L Type	Y Type	F Type	R Type
Outward appearance							

Compliance with CE Marking Directive	EMC Directive, ROHS Directive	
Detecting distance	6mm fixed	
Minimum detection object	0.8mm×1.2mm Opaque body	
Hysteresis	0.05mm below	
Repeatability accuracy	0.01mm below	
Supply voltage	5V DC~24V DC±10% Ripple P-P below 10%	
Consumption current	Below 15 mA	
Output	NPN open-circuit collector transistor External voltage: below 30V DC (between output and 0V) PNP open-circuit collector transistor External voltage: below 30V DC (between output and + V)	NPN/PNP Maximum inflow current：50mA Pressure drop：<2V
Output action	Light-on ON/Light-shade ON Two outputs	
Short circuit protection	NPN has, PNP no	
Response time	Light-on:Below 20us Light-shade: Below 80us(The maximum response frequency is 3KHz)	
Working status indicator light	Red LED(Light-on ON)	
Protective structure	IP66	
Use ambient temperature	-25℃~ + 55℃(Note that no condensation, freezing) storage: : - 30℃~ + 80℃	
Use ambient humidity	5%RH~85%RH、 Storage：5%RH~95%RH	
Use ambient illumination	Fluorescent lighting: illuminated surface illumination below 1000 lx	
Resistance voltage	AC 1000V 1 minute Between all power connection terminals and the housing	
Insulation resistance	Between all power connect terminals and the housing,above 20M,High Resistance Meter based on DC250V	
Resistance vibration	Frequency 10Hz~2000Hz Double amplitude 1.5mm (maximum acceleration 196m/s) 2 hours in X,Y,Z directions	
Resistance attack	Acceleration 15000m / s² (about 1500G) 3 times in X, Y, Z directions	
Cast light element	Infrared LED(Wavelength of projection peak: 940 nm, non-modulated)	
Material	Housing：PC+ABS、 display cover：ABS	
Cable	0.09mm² 4 core with rubber insulated cable PVC 1m	
Extension cable	Cables over 0.3mm² can be extended to 100m	
Quality	Body weight: about 10g Package weight: about 15g	

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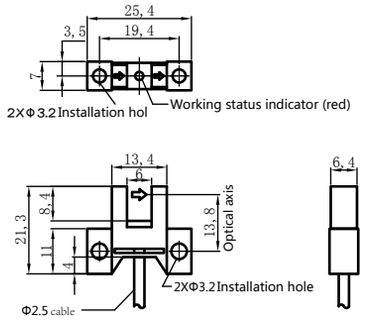
Unit: mm

Size specification

K



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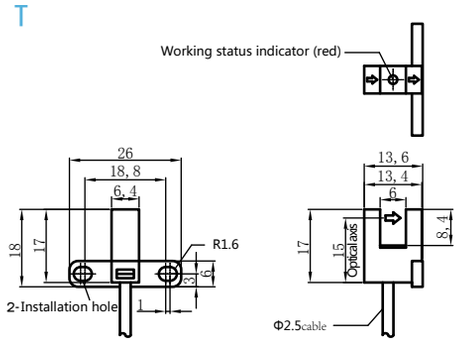

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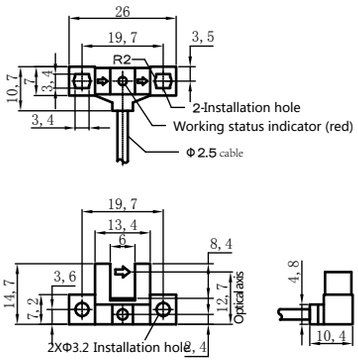

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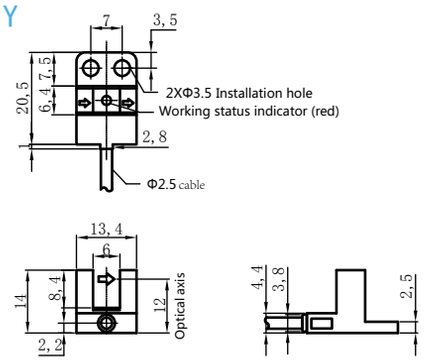

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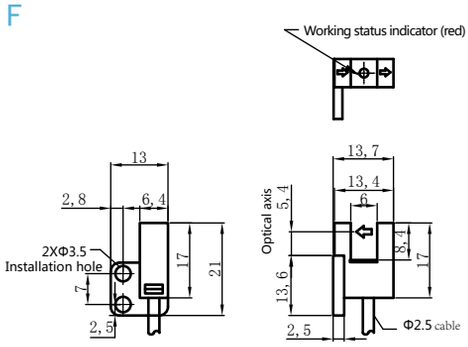

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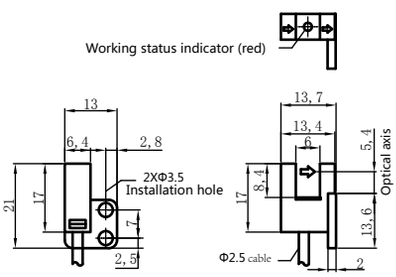


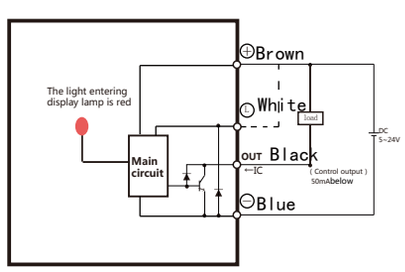
Circuit diagram

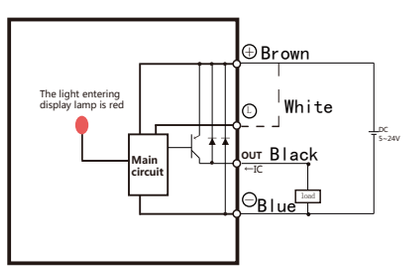
Light-on indicator light ON DC4 wire NPN/PNP

Type		Action state	Time chart	Connection terminal	Output circuit
SP-G15N-K SP-G15N-T SP-G15N-L SP-G15N-Y SP-G15N-F SP-G15N-R	SP-G15P-K SP-G15P-T SP-G15P-L SP-G15P-Y SP-G15P-F SP-G15P-R	Light-on ON	Light-on indicator light(red) Output Transistor Load 1 (Relay) Light-on Light-shade Light on Light off ON OFF Action Reset	L ～ + Interval Short Circuit	NPN
		Light-shade ON	Light-on indicator light(red) Output Transistor Load 1 (Relay) Light-on Light-shade Light on Light off ON OFF Action Reset	L ～ + Interval Open *1	

Light-on indicator light OFF DC4 wireNPN/PNP

Type		Action state	Time chart	Connection terminal	Output circuit
SP-G25N-K SP-G25N-T SP-G25N-L SP-G25N-Y SP-G25N-F SP-G25N-R	SP-G25P-K SP-G25P-T SP-G25P-L SP-G25P-Y SP-G25P-F SP-G25P-R	Light-on ON	Light-on indicator light(red) Output Transistor Load 2 (Relay) Light-on Light-shade Light on Light off ON OFF Action Reset	L ～ + Interval Short Circuit	PNP
		Light-shade ON	Light-on indicator light(red) Output Transistor Load 2 (Relay) Light-on Light-shade Light on Light off ON OFF Action Reset	L ～ + Interval Open *1	





Note: If it is light-shade ON , please do not short circuit the L terminal to 0V.

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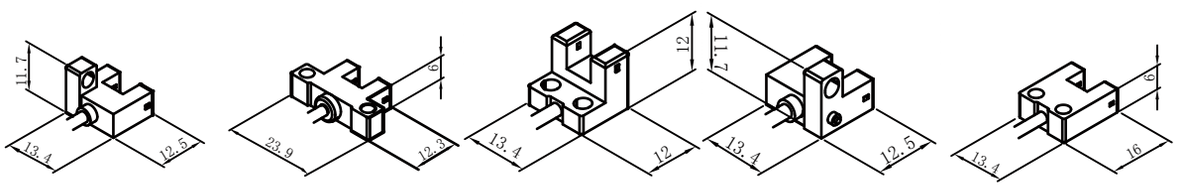
Small-type • Cable type

NPN	Incoming light indicator ON	SP-G35N-F	SP-G35N-L	SP-G35N-K	SP-G35N-R	SP-G35N-U
	Incoming light indicator OFF	SP-G45N-F	SP-G45N-L	SP-G45N-K	SP-G45N-R	SP-G45N-U
PNP	Incoming light indicator ON	SP-G35P-F	SP-G35P-L	SP-G35P-K	SP-G35P-R	SP-G35P-U
	Incoming light indicator OFF	SP-G45P-F	SP-G45P-L	SP-G45P-K	SP-G45P-R	SP-G45P-U
Appearance		F Type	K Type	L Type	R Type	U Type

Outward appearance



Compliance with CE Marking Directive	EMC Directive, ROHS Directive	
Detecting distance	6mm fixed	
Minimum detection object	0.8mm×1.2mm Opaque body	
Hysteresis	0.05mm below	
Repeatability accuracy	0.01mm below	
Supply voltage	5V DC~24V DC±10% Ripple P-P below 10%	
Consumption current	Below 15 mA	
Output	NPN open-circuit collector transistor External voltage: below 30V DC (between output and 0V) PNP open-circuit collector transistor External voltage: below 30V DC (between output and + V)	NPN/PNP Maximum inflow current：50mA Pressure drop：<2V
Output action	Light-on ON/Light-shade ON Two outputs	
Short circuit protection	NPN has, PNP no	
Response time	Light-on:Below 20us Light-shade: Below 80us(The maximum response frequency is 3KHz)	
Working status indicator light	Red LED(Light-on ON)	
Protective structure	IP66	
Use ambient temperature	-25℃~＋55℃(Note that no condensation, freezing) storage：－30℃~＋80℃	
Use ambient humidity	5%RH~85%RH、 Storage：5%RH~95%RH	
Use ambient illumination	Fluorescent lighting: illuminated surface illumination below 1000 lx	
Resistance voltage	AC 1000V 1 minute Between all power connection terminals and the housing	
Insulation resistance	Between all power connect terminals and the housing,above 20M,High Resistance Meter based on DC250V	
Resistance vibration	Frequency 10Hz~2000Hz Double amplitude 1.5mm (maximum acceleration 196m/s) 2 hours in X,Y,Z directions	
Resistance attack	Acceleration 15000m / s² (about 1500G) 3 times in X, Y, Z directions	
Cast light element	Infrared LED(Wavelength of projection peak: 940 nm, non-modulated)	
Material	Housing：PC+PBT、 display cover：ABS	
Cable	0.09mm² 4 core with rubber insulated cable PVC 1m	
Extension cable	Cables over 0.3mm² can be extended to 100m	
Quality	Body weight: about 10g Package weight: about 15g	

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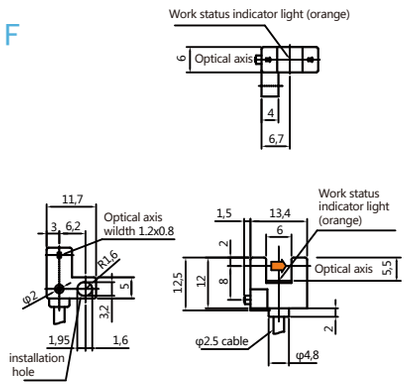
Size specification

F



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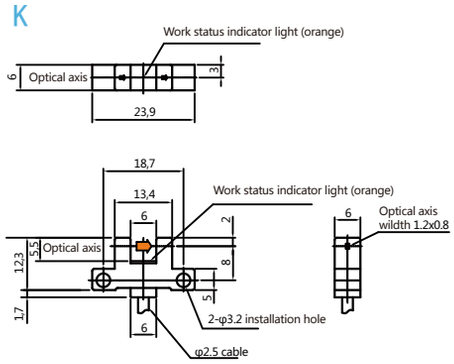

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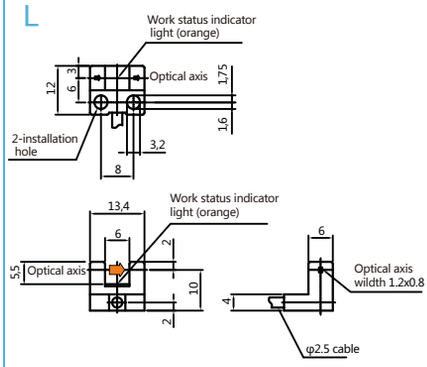

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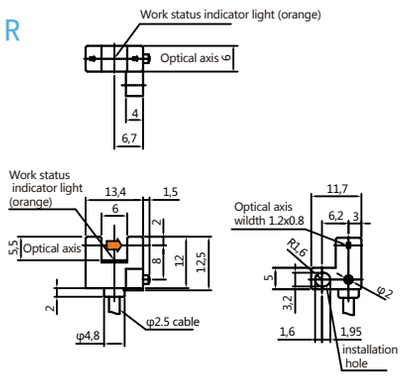

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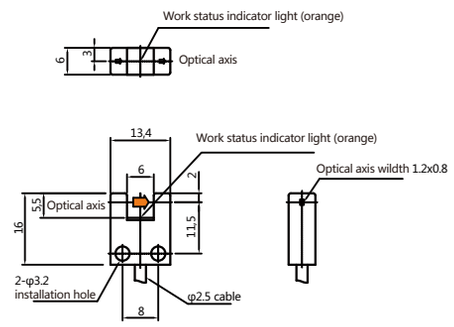
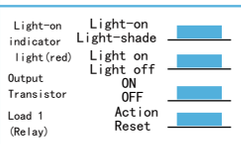
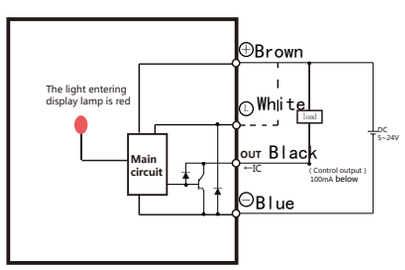
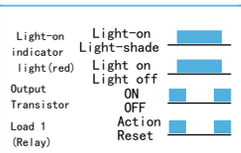
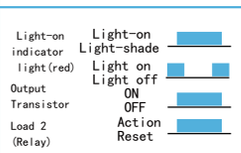
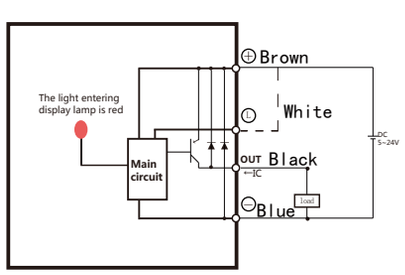
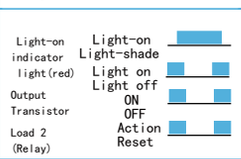


Circuit diagram

Light-on indicator light ON DC4 wire NPN/PNP

Type		Action state	Time chart	Connection terminal	Output circuit
SP-G35N-F SP-G35N-L SP-G35N-K SP-G35N-R SP-G35N-U	SP-G35P-F SP-G35P-L SP-G35P-K SP-G35P-R SP-G35P-U	Light-on ON		L ～ + Interval Short Circuit	NPN 
		Light-shade ON		L ～ + Interval Open *1	

Light-on indicator light OFF DC4 wireNPN/PNP

Type		Action state	Time chart	Connection terminal	Output circuit
SP-G45N-F SP-G45N-L SP-G45N-K SP-G45N-R SP-G45N-U	SP-G45P-F SP-G45P-L SP-G45P-K SP-G45P-R SP-G45P-U	Light-on ON		L ～ + Interval Short Circuit	PNP 
		Light-shade ON		L ～ + Interval Open *1	

Note: If it is light-shade ON , please do not short circuit the L terminal to 0V.

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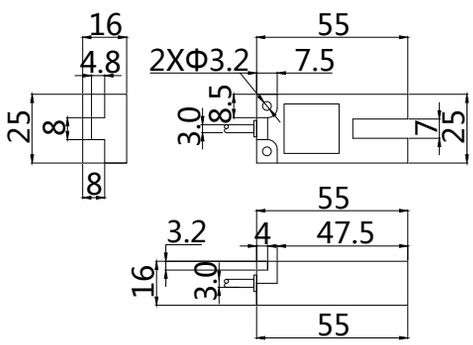
Features:

- Rectangular plastic housing;
- DC 4-wire,switching output;
- Cable version;
- VDE safety class:III;
- Ingress protection:IP67

RoHS CE

Dimensioned drawing

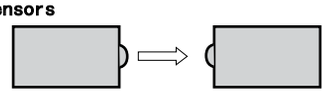


Model No.

Sensing range	Sn: 7 mm
NPN Light/Dark-on	SP-G25G-7N-P31-PV2
PNP Light/Dark-on	SP-G25G-7P-P31-PV2

Type diagram

Through-beam sensors



Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Electrical data	Operating voltage	10-30VDC
	Switching frequency	500Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	100mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Yellow:output/Green:power supply
Electrical connection	Connectors	PVC cable/2m,4*0.15mm²

Wiring

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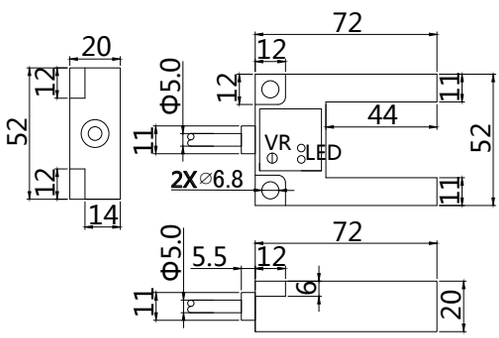
Features:

- Rectangular plastic housing;
- DC 4-wire,switching output;
- Cable version;
- VDE safety class:III;
- Ingress protection:IP67

RoHS CE

Dimensioned drawing

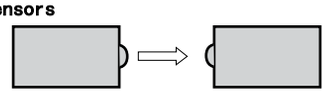


Model No.

Sensing range	Sn: 30 mm
NPN Light/Dark-on	SP-G50G-30N-P31-PV2
PNP Light/Dark-on	SP-G50G-30P-P31-PV2

Type diagram

Through-beam sensors



Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Electrical data	Operating voltage	10-30VDC
	Switching frequency	500Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	100mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Yellow:output/Green:power supply
Electrical connection	Connectors	PVC cable/2m,4*0.25mm²
Accessories	Accessories	NO
	(to be ordered separately)	

Wiring

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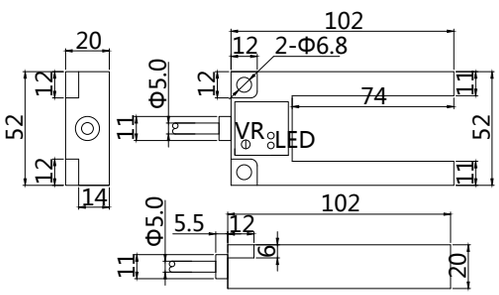
Features:

- Rectangular plastic housing,long type;
- DC 4-wire,switching output;
- Cable version;
- VDE safety class:III;
- Ingress protection:IP67

RoHS CE

Dimensioned drawing

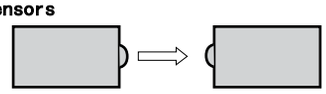


Model No.

Sensing range	Sn: 30 mm
NPN Light/Dark-on	SP-G50G-30N-P31-PV2
PNP Light/Dark-on	SP-G50G-30P-P31-PV2

Type diagram

Through-beam sensors



Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Electrical data	Operating voltage	10-30VDC
	Switching frequency	500Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	100mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Yellow:output/Green:power supply
Electrical connection	Connectors	PVC cable/2m,4*0.25mm²

Wiring

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FG78 Series DC 4-Wire Sn 50mm

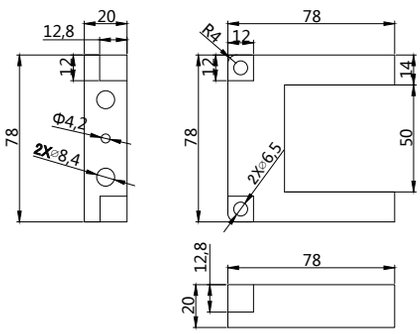
Photoelectric sensors

Features:

- Rectangular plastic housing;
- DC 4-wire,switching output;
- Cable version;
- VDE safety class:III;
- Ingress protection:IP67

RoHS CE

Dimensioned drawing

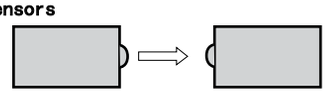


Model No.

Sensing range	Sn: 50 mm
NPN Light/Dark-on	SP-G78G-50N-P31-PV2
PNP Light/Dark-on	SP-G78G-50P-P31-PV2

Type diagram

Through-beam sensors



Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Electrical data	Operating voltage	10-30VDC
	Switching frequency	500Hz
	Light type	Infrared light 880nm/Red light 650nm
	Response time	<2ms
	Load current	100mA
	Power-up delay	<300ms
	Adjustment	Single-turn protentiometer
Environment	Light immunity	<5000Lux.
	Ambient temperature	-25...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	ABS
	Lens material	PMMA
	Operating indicator	Yellow:output/Green:power supply
Electrical connection	Connectors	PVC cable/2m,4*0.25mm²

Wiring

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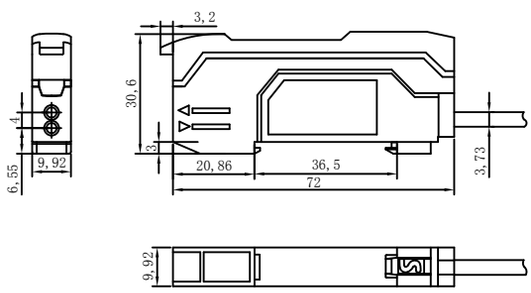
Features:

- Plastic housing;
- DC 3-wire,switching output;
- Cable version;
- VDE safety class:III;
- Ingress protection:IP65

RoHS CE

Dimensioned drawing



Model No.

Light source	Red LED
NPN	SP-Q10F-RN-P31-PV2
PNP	SP-Q10F-RP-P31-PV2

Technical data

Electrical data	Operating voltage	12-24VDC
	Light type	Red LED
	Current consumption	≤40mA
	Switching frequency	1K Hz
	Response time	<250us
Environment	Light immunity	Incandescent Lamp:Max 20000lux;
		Fluorescent:Max 30000lux
	Ambient temperature	-10...55℃
	Ambient humidity	35-85%
Mechanical data	Housing material	PC+ABS
	Operating indicator	Threshold:Green LED
		The current value:Red LED
Electrical connection	Connectors	PVC cable/2m;3*0.25mm^2

Wiring

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Selction Guide

1	-	2	3	4	-	5	-	6	7	8

1 Type

SP	Schlüter Photoelectric

2 Shape

M	Threaded barrel

3 Dimension

3	External diameter 3mm
4	External diameter 4mm
6	External diameter 6mm
…	

4 Sensing mode

T	Diffuse
C	Coaxial diffuse reflection
L	Through Beam
…	

5 Core Diameter

1	1mm
2	2mm
11	1.0 mm*2
14	1.0mm/0.25
22	0.5mm*2
24	0.5mm/0.25,mm
--	

6 Housing Material

P	PNP 3/4 Wire
N	NPN 3/4 Wire
D	DC 2 Wire
A	AC 2 Wire
U	AC/DC 2 Wire

7 Housing material

P	Plastic rectangular housing
F	PTFE

8 Cable length

1	Light On
2	Dark On
3	Dark On/Light On
4	SPDT relay
5	Emitter

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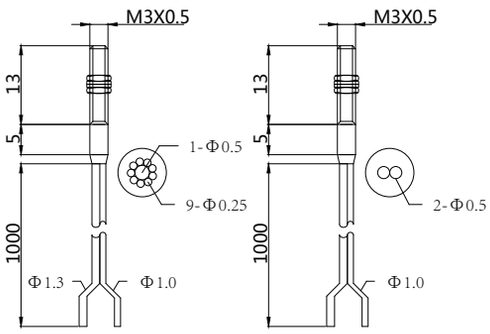
Features:

- Precision、Stabilization;
- Stainless steel housing;
- Performance optimization;
- Compact structure;
- Internal short-circuit protection、Over load protection and polarity protection

RoHS CE

Dimensioned drawing

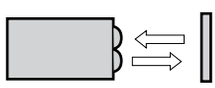


Model No.

Sensing range	Sn: 50 mm	
Housing material	Stainless steel housing	
Type	SP-M3C-24P-P1	SP-M3T-22P-P1

Type diagram

Diffuse type sensors



Diffuse reflection type photoelectric sensor principle and the principle of mirror reflection type photoelectric sensor is the same,but it doesn’ t take reflective lenses,The light emitted by the transmitter is directly reflected by the measured object back to the receiver.The light reflected by the measured object is estimated by the receiver, and the positioning of the object is not very strict.When object under test enterinto effective light rays area,output state changes.The detection distance depends on the size, shape, color and surface characteristics of the measured object.

Technical data

Housing	Stainless steel	Stainless steel
Line body	PVC	PVC
Imports of plastic optical fiber	Φ0.5mm*1/Φ0.25mm*9	Φ0.5mm*2
Plastic cptical fiber diameter	Φ1.0mm*1+Φ1.3mm*1	Φ1.0mm*1
Plastic optical fiber length	1m	1m
Accessories	Nuts (including gasket)	Nuts (including gasket)

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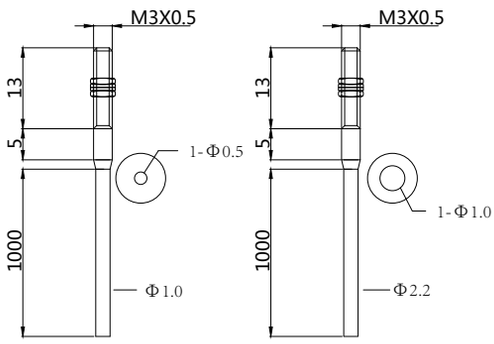
Features:

- Precision、Stabilization;
- Stainless steel housing;
- Performance optimization;
- Compact structure;
- Internal short-circuit protection、Over load protection and polarity protection

RoHS CE

Dimensioned drawing

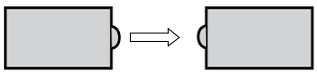


Model No.

Sensing range	Sn: 200 mm	Sn: 400 mm
Housing material	Stainless steel housing	Stainless steel housing
Type	SP-M3L-1P-P1	SP-M3L-2P-P1

Type diagram

Through-beam sensors



Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Housing	Stainless steel	Stainless steel
Line body	PVC	PVC
Imports of plastic optical fiber	Φ0.5mm	Φ1.0mm
Plastic cptical fiber diameter	Φ1.0mm*1	Φ2.2mm*1
Plastic optical fiber length	1m	1m
Accessories	Nuts (including gasket)	Nuts (including gasket)

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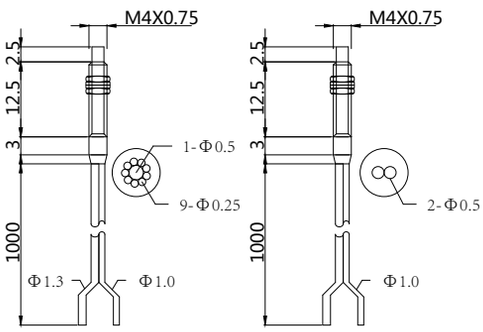
Features:

- Precision、Stabilization;
- Stainless steel housing;
- Performance optimization;
- Compact structure;
- Internal short-circuit protection、Over load protection and polarity protection

RoHS CE

Dimensioned drawing



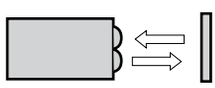
(Coaxial) (Don't coaxial)

Model No.

Sensing range	Sn: 50 mm	
Housing material	Stainless steel housing	
Type	SP-M4C-24P-P1	SP-M4T-22P-P1

Type diagram

Diffuse type sensors



Diffuse reflection type photoelectric sensor principle and the principle of mirror reflection type photoelectric sensor is the same,but it doesn’ t take reflective lenses,The light emitted by the transmitter is directly reflected by the measured object back to the receiver.The light reflected by the measured object is estimated by the receiver, and the positioning of the object is not very strict.When object under test enterinto effective light rays area,output state changes.The detection distance depends on the size, shape, color and surface characteristics of the measured object.

Technical data

Housing	Stainless steel	Stainless steel
Line body	PVC	PVC
Imports of plastic optical fiber	Φ0.5mm*1/Φ0.25mm*9	Φ0.5mm*2
Plastic cptical fiber diameter	Φ1.0mm*1+Φ1.3mm*1	Φ1.0mm*1
Plastic optical fiber length	1m	1m
Accessories	Nuts (including gasket)	Nuts (including gasket)

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FM4 Series Optical Fiber Amplifier Sn 200/400mm

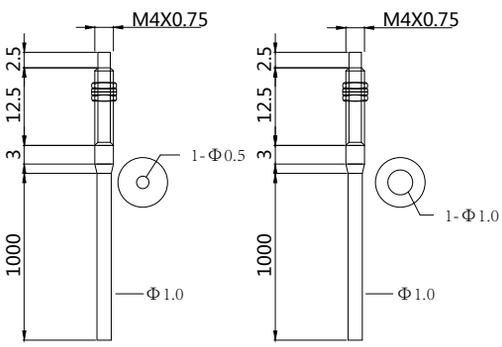
Photoelectric sensors

Features:

- Precision、Stabilization;
- Stainless steel housing;
- Performance optimization;
- Compact structure;
- Internal short-circuit protection、Over load protection and polarity protection

RoHS CE

Dimensioned drawing

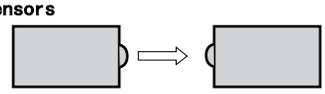


Model No.

Sensing range	Sn: 200 mm	Sn: 400 mm
Housing material	Stainless steel housing	Stainless steel housing
Type	SP-M4L-1P-P1	SP-M4L-2P-P1

Type diagram

Through-beam sensors



Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Housing	Stainless steel	Stainless steel
Line body	PVC	PVC
Imports of plastic optical fiber	Φ0.5mm	Φ1.0mm
Plastic cptical fiber diameter	Φ1.0mm*1	Φ2.2mm*1
Plastic optical fiber length	1m	1m
Accessories	Nuts (including gasket)	Nuts (including gasket)

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Features:

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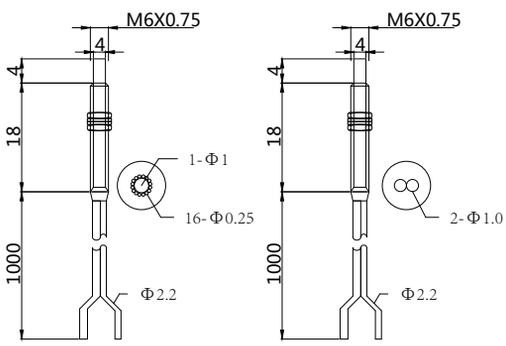
- Stainless steel housing;
- Performance optimization;
- Compact structure;
- Internal short-circuit protection、Over load protection and polarity protection

RoHS CE

Dimensioned drawing

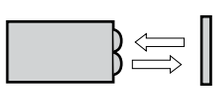


Model No.

Sensing range	Sn: 100 mm	
Housing material	Stainless steel housing	
Type	SP-M6C-14P-P1	SP-M6T-11P-P1

Type diagram

Diffuse type sensors



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Technical data

Housing	Stainless steel	Stainless steel
Line body	PVC	PVC
Imports of plastic optical fiber	Φ1.0mm*1/Φ0.25mm*16	Φ1.0mm*2
Plastic cptical fiber diameter	Φ2.2mm*2	Φ2.2mm*2
Plastic optical fiber length	1m	1m
Accessories	Nuts (including gasket)	Nuts (including gasket)

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- Compact structure;
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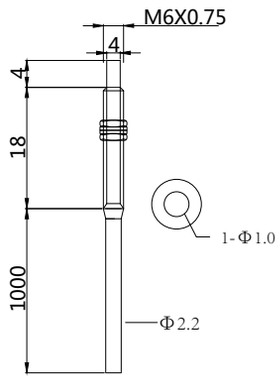
RoHS CE

Dimensioned drawing

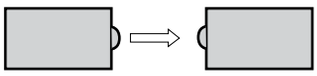


Model No.

Sensing range	Sn: 400 mm
Housing material	Stainless steel housing
Type	SP-M6L-2P-P2

Type diagram

Through-beam sensors



Through-beam photoelectric sensors has independent transmitters and receivers,structure two are separated from each other,the emitter(E)directly transmitted to the receiver(R).At the time of installation,must be bothaligned establish light path. No matter any objectblocking the light,the voltage of the receiver drops,switch changes.

Technical data

Housing	Stainless steel
Line body	PVC
Imports of plastic optical fiber	Φ1.0mm
Plastic cptical fiber diameter	Φ2.2mm
Plastic optical fiber length	1m
Accessories	Nuts (including gasket)

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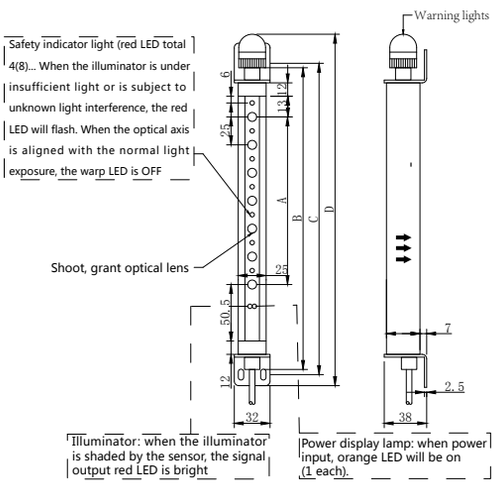
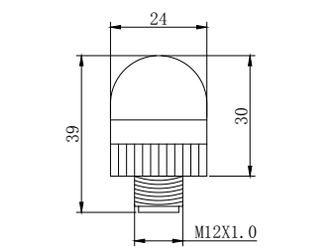
Features:

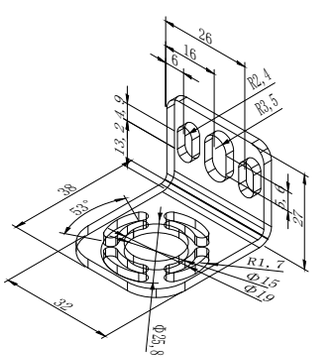
- Through-beam,Emitter/receiver set;
- Aluminum alloys housing;
- DC 4-wire,switching output;
- Pigtail version;Imfrared light

RoHS CE

Dimensioned drawing







Model No.

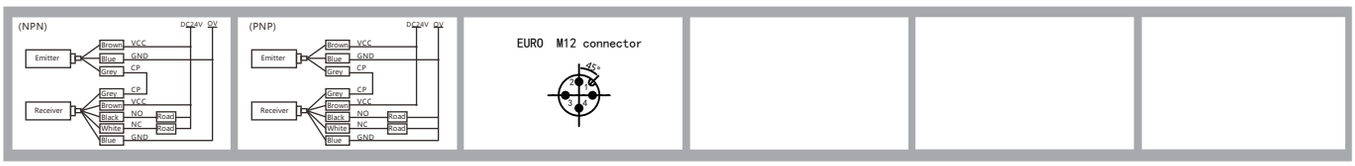
No.of beams	8	12	16
Detection height(A)	175	275	375
Light screen height(B)	262.5	362.5	462.5
Mounting hol center distance(C)	293.1	393.1	493.1
Total height(D)	328.8	428.8	528.8
NPN	SP-H25L-05MN-8	SP-H25L-05MN-12	SP-H25L-05MN-16
PNP	SP-H25L-05MP-8	SP-H25L-05MP-12	SP-H25L-05MP-16

No.of beams	20	24	32
Detection height(A)	475	575	775
Light screen height(B)	562.5	662.5	862.5
Mounting hol center distance(C)	593.1	693.1	893.1
Total height(D)	628.8	728.8	928.8
NPN	SP-H25L-05MN-20	SP-H25L-05MN-24	SP-H25L-05MN-32
PNP	SP-H25L-05MP-20	SP-H25L-05MP-24	SP-H25L-05MP-32

Technical data

Electrical data	Operating voltage	12-24V DC
	Light type	Infrared light 870nm
	Response time	ON-12...50ms;OFF-12ms
	Load current	≤200mA
Environment	Light immunity	Lamplight:<3000Lux/Sunlight:<10000Lux
	Ambient temperature	-10...55°C with no icing
	Ambient humidity	35%...85% with no condensation
	Ingress protection	IP65
Mechanical data	Housing material	Protective cover:PMMA;Housing:Aluminum alloys;
		The upper&lower lid;Zinc die-castings;Bracket;
		(306S12);Sealing ring;silicone
Electrical connection	Operating indicator	Red LED
Accessories	Connectors	M12 connector+PVC-cable/200mm; 4*0.16mm²
	Accessories(to be ordered separately)	NO

Wiring



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Features:

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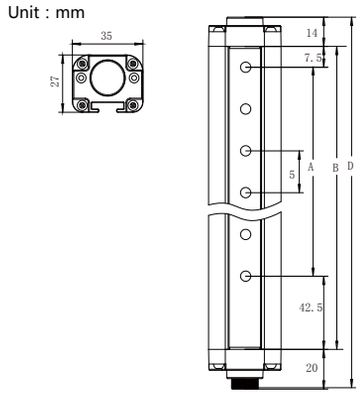
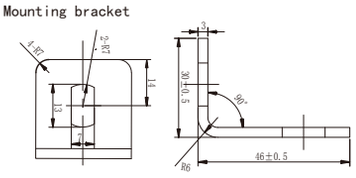
- Photoelectric cycle self-check, improve equipment safety;
- Imported aging equipment can ensure stable performance of products;
- With water discharge function

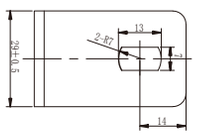
Dimensioned drawing

Unit : mm

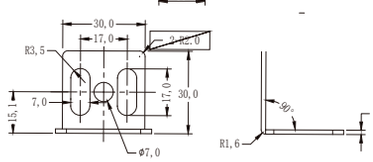


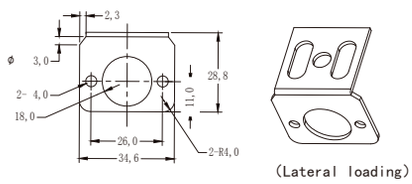
Mounting bracket





(Install the up and down)



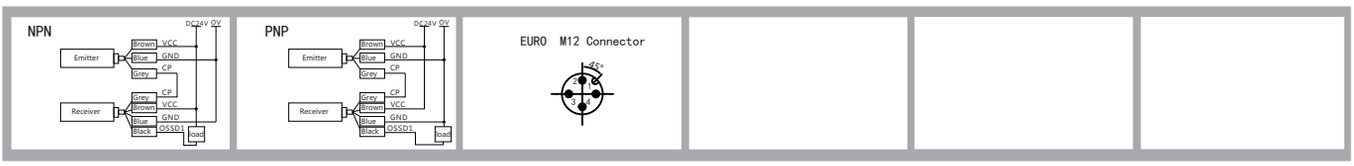


(Lateral loading)

Technical data

Operating voltage	24V DC±20%
Response time	<10ms
Optical axis spacing	5mm
Resolution ratio	10mm
Security level	Ⅱ level
Output way	NPN/PNP(Common)
Ambient humidity	-10℃...55℃
Storage temperature	-25℃...70℃
Working temperature	When the temperature is 20℃, the relative humidity of air is less than 85%
Power	<5W
Output current	≤200mA
Dielectric strength	ACI500V,60S,No breakdown or flicker
Section size	35*27mm
Insulation resistance	≥100MΩ
Light immunity	10000Lux(Angle of incidenceI>5°)
Protect distance	0.1...2m
Ingress protection	IP65
Attachment 1	Side install bracket (The user to specify) ;
	Top and bottom install bracket (The user to specify)
Attachment 2	Outgoing line、standard (emitter2.5m , receiver3.5m)

Wiring



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Model No.

No. of beams	16	24	32	40
Detection height (A)	75	115	155	195
Light screen height (B)	120	165	205	245
Total height (D)	159	199	239	279
NPN	SP-H05L-20MN-16	SP-H05L-20MN-24	SP-H05L-20MN-32	SP-H05L-20MN-40
PNP	SP-H05L-20MP-16	SP-H05L-20MP-24	SP-H05L-20MP-32	SP-H05L-20MP-40

No. of beams	48	56	64	72
Detection height (A)	235	275	315	355
Light screen height (B)	285	325	365	405
Total height (D)	319	359	399	439
NPN	SP-H05L-20MN-48	SP-H05L-20MN-56	SP-H05L-20MN-64	SP-H05L-20MN-72
PNP	SP-H05L-20MP-48	SP-H05L-20MP-56	SP-H05L-20MP-64	SP-H05L-20MP-72

No. of beams	82	88	96	104
Detection height (A)	395	435	475	515
Light screen height (B)	445	485	525	565
Total height (D)	479	519	559	599
NPN	SP-H05L-20MN-80	SP-H05L-20MN-88	SP-H05L-20MN-96	SP-H05L-20MN-104
PNP	SP-H05L-20MP-80	SP-H05L-20MP-88	SP-H05L-20MP-96	SP-H05L-20MP-104

No. of beams	112	120	128
Detection height (A)	555	595	635
Light screen height (B)	605	645	685
Total height (D)	639	679	719
NPN	SP-H05L-02MN-112	SP-H05L-02MN-120	SP-H05L-02MN-128
PNP	SP-H05L-02MP-112	SP-H05L-02MP-120	SP-H05L-02MP-128

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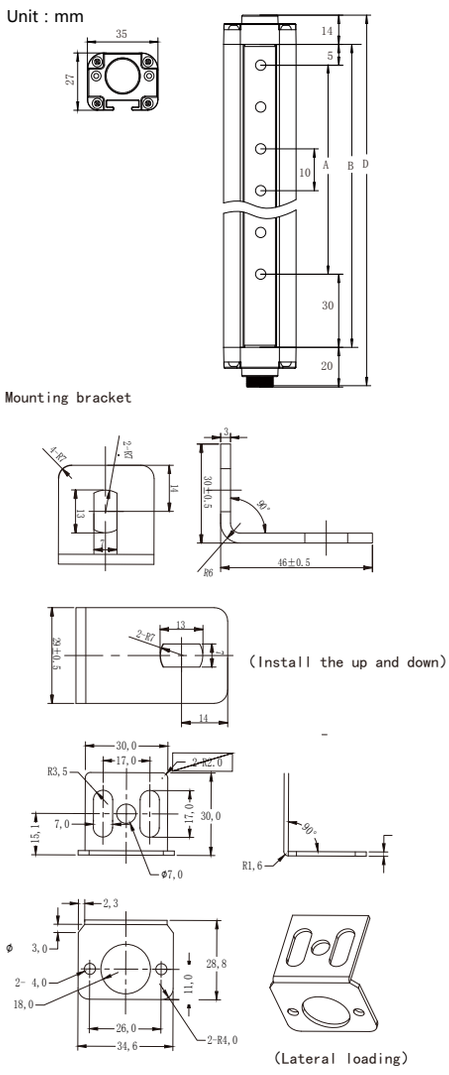
- Imported aging equipment can ensure stable performance of products;
- With water discharge function

Dimensioned drawing

Unit : mm



Technical data

Operating voltage	24V DC±20%
Response time	<10ms
Optical axis spacing	10mm
Resolution ratio	15mm
Security level	Ⅱ level
Output way	NPN/PNP(Common)
Ambient humidity	-10℃...55℃
Storage temperature	-25℃...70℃
Working temperature	When the temperature is 20℃, the relative humidity of air is less than 85%
Power	<5W
Output current	≤200mA
Dielectric strength	ACI500V,60S,No breakdown or flicker
Section size	35*27mm
Insulation resistance	≥100MΩ
Light immunity	10000Lux(Angle of incidenceI>5°)
Protect distance	0.1...2m
Ingress protection	IP65
Attachment 1	Side install bracket (The user to specify) ;
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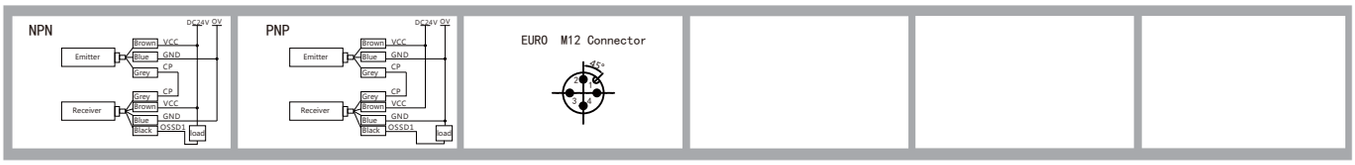
Wiring



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Model No.

No. of beams	8	12	16	20
Detection height (A)	70	110	150	190
Light screen height (B)	105	145	185	225
Total height (D)	139	179	219	259
NPN	SP-H10L-02MN-8	SP-H10L-02MN-12	SP-H10L-02MN-16	SP-H10L-02MN-20
PNP	SP-H10L-02MP-8	SP-H10L-02MP-12	SP-H10L-02MP-16	SP-H10L-02MP-20

No. of beams	24	28	32	36
Detection height (A)	230	270	310	350
Light screen height (B)	265	305	345	385
Total height (D)	299	339	379	419
NPN	SP-H10L-02MN-24	SP-H10L-02MN-28	SP-H10L-02MN-32	SP-H10L-02MN-36
PNP	SP-H10L-02MP-24	SP-H10L-02MP-28	SP-H10L-02MP-32	SP-H10L-02MP-36

No. of beams	40	44	48	52
Detection height (A)	390	430	470	510
Light screen height (B)	425	465	505	545
Total height (D)	459	499	539	579
NPN	SP-H10L-02MN-40	SP-H10L-02MN-44	SP-H10L-02MN-48	SP-H10L-02MN-52
PNP	SP-H10L-02MP-40	SP-H10L-02MP-44	SP-H10L-02MP-48	SP-H10L-02MP-52

No. of beams	56	60	64
Detection height (A)	550	590	630
Light screen height (B)	585	625	665
Total height (D)	619	659	699
NPN	SP-H10L-02MN-56	SP-H10L-02MN-60	SP-H10L-02MN-64
PNP	SP-H10L-02MP-56	SP-H10L-02MP-60	SP-H10L-02MP-64

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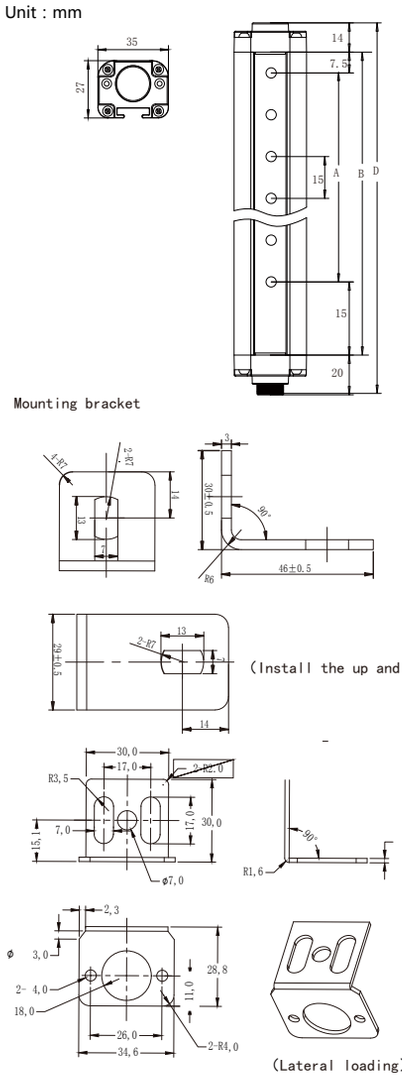
- With water discharge function

Dimensioned drawing

Unit : mm



Technical data

Operating voltage	24V DC±20%
Response time	<10ms
Optical axis spacing	15mm
Resolution ratio	20mm
Security level	Ⅱ level
Output way	NPN/PNP(Common)
Ambient humidity	-10℃...55℃
Storage temperature	-25℃...70℃
Working temperature	When the temperature is 20℃, the relative humidity of air is less than 85%
Power	<5W
Output current	≤200mA
Dielectric strength	ACI500V,60S,No breakdown or flicker
Section size	35*27mm
Insulation resistance	≥100MΩ
Light immunity	10000Lux(Angle of incidenceI>5°)
Protect distance	0.1...2m
Ingress protection	IP65
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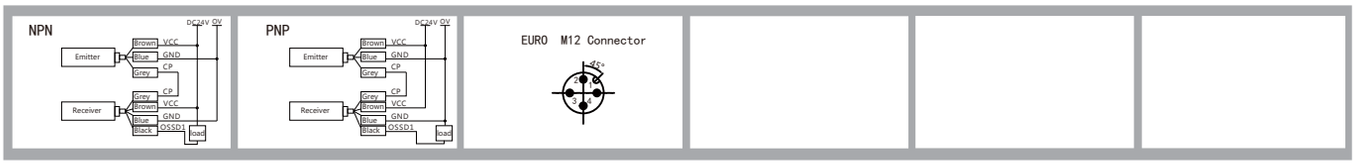
Wiring



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Model No.

No. of beams	8	10	12	14
Detection height (A)	105	135	165	195
Light screen height (B)	127.5	157.5	187.5	217.5
Total height (D)	161.5	191.5	221.5	251.5
NPN	SP-H15L-02MN-8	SP-H15L-02MN-10	SP-H15L-02MN-12	SP-H15L-02MN-14
PNP	SP-H15L-02MP-8	SP-H15L-02MP-10	SP-H15L-02MP-12	SP-H15L-02MP-14

No. of beams	16	18	20	22
Detection height (A)	225	255	285	315
Light screen height (B)	247.5	277.5	307.5	337.5
Total height (D)	281.5	311.5	341.5	371.5
NPN	SP-H15L-02MN-16	SP-H15L-02MN-18	SP-H15L-02MN-20	SP-H15L-02MN-22
PNP	SP-H15L-02MP-16	SP-H15L-02MP-18	SP-H15L-02MP-20	SP-H15L-02MP-22

No. of beams	24	26	28	30
Detection height (A)	345	375	405	435
Light screen height (B)	367.5	397.5	427.5	457.5
Total height (D)	401.5	431.5	461.5	491.5
NPN	SP-H15L-02MN-24	SP-H15L-02MN-26	SP-H15L-02MN-28	SP-H15L-02MN-30
PNP	SP-H15L-02MP-24	SP-H15L-02MP-26	SP-H15L-02MP-28	SP-H15L-02MP-30

No. of beams	32	34	36	38
Detection height (A)	465	495	525	555
Light screen height (B)	487.5	517.5	547.5	577.5
Total height (D)	521.5	551.5	581.5	611.5
NPN	SP-H15L-02MN-32	SP-H15L-02MN-34	SP-H15L-02MN-36	SP-H15L-02MN-38
PNP	SP-H15L-02MP-32	SP-H15L-02MP-34	SP-H15L-02MP-36	SP-H15L-02MP-38

No. of beams	40	42	44	46
Detection height (A)	585	495	645	675
Light screen height (B)	607.5	637.5	667.5	697.5
Total height (D)	641.5	671.5	701.5	731.5
NPN	SP-H15L-02MN-40	SP-H15L-02MN-42	SP-H15L-02MN-44	SP-H15L-02MN-46
PNP	SP-H15L-02MP-40	SP-H15L-02MP-42	SP-H15L-02MP-44	SP-H15L-02MP-46

No. of beams	48	50	52	54
Detection height (A)	705	735	765	795
Light screen height (B)	727.5	757.5	787.5	817.5
Total height (D)	761.5	791.5	821.5	851.5
NPN	SP-H15L-02MN-48	SP-H15L-02MN-50	SP-H15L-02MN-52	SP-H15L-02MN-54
PNP	SP-H15L-02MP-48	SP-H15L-02MP-50	SP-H15L-02MP-52	SP-H15L-02MP-54

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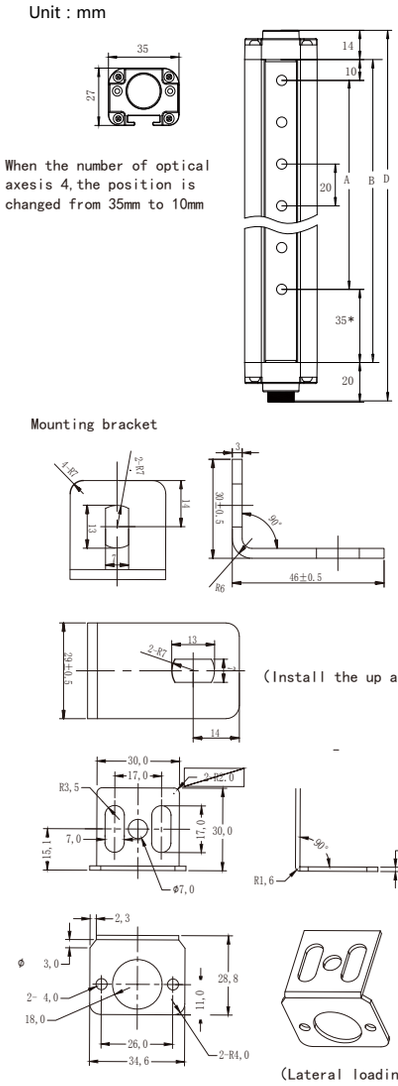
Features:

- Small size, only 35*27mm;
- Convenient and flexible installation, simple;
- Photoelectric cycle self-check, improve equipment safety;
- Imported aging equipment can ensure stable performance of products;
- With water discharge function

Dimensioned drawing

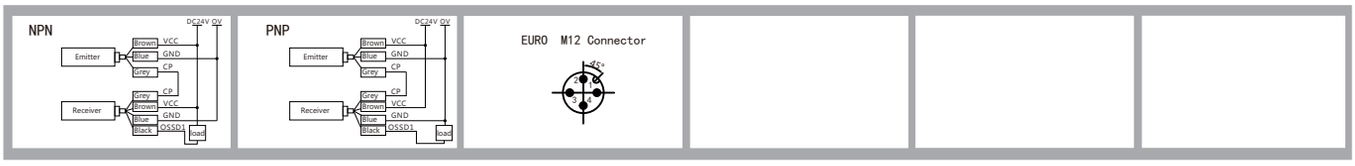
Unit : mm



Technical data

Operating voltage	24V DC±20%
Response time	<10ms
Optical axis spacing	20mm
Resolution ratio	25mm
Security level	Ⅱ level
Output way	NPN/PNP(Common)
Ambient humidity	-10℃...55℃
Storage temperature	-25℃...70℃
Working temperature	When the temperature is 20℃, the relative humidity of air is less than 85%
Power	<5W
Output current	≤200mA
Dielectric strength	ACI500V,60S,No breakdown or flicker
Section size	35*27mm
Insulation resistance	≥100MΩ
Light immunity	10000Lux(Angle of incidenceI>5°)
Protect distance	0.1...2m
Ingress protection	IP65
Attachment 1	Side install bracket (The user to specify) ;
	Top and bottom install bracket (The user to specify)
Attachment 2	Outgoing line、standard (emitter2.5m , receiver3.5m)

Wiring



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Model No.

No. of beams	4	6	8	10
Detection height (A)	60	100	140	180
Light screen height (B)	80	145	185	225
Total height (D)	114	179	219	259
NPN	SP-H20L-02MN-4	SP-H20L-02MN-6	SP-H20L-02MN-8	SP-H20L-02MN-10
PNP	SP-H20L-02MP-4	SP-H20L-02MP-6	SP-H20L-02MP-8	SP-H20L-02MP-10

No. of beams	12	14	16	18
Detection height (A)	220	260	300	340
Light screen height (B)	265	305	345	385
Total height (D)	299	339	379	419
NPN	SP-H20L-02MN-12	SP-H20L-02MN-14	SP-H20L-02MN-16	SP-H20L-02MN-18
PNP	SP-H20L-02MP-12	SP-H20L-02MP-14	SP-H20L-02MP-16	SP-H20L-02MP-18

No. of beams	20	22	24	26
Detection height (A)	380	420	460	500
Light screen height (B)	425	465	505	545
Total height (D)	459	499	539	579
NPN	SP-H20L-02MN-20	SP-H20L-02MN-22	SP-H20L-02MN-24	SP-H20L-02MN-26
PNP	SP-H20L-02MP-20	SP-H20L-02MP-22	SP-H20L-02MP-24	SP-H20L-02MP-26

No. of beams	28	30	32
Detection height (A)	540	580	620
Light screen height (B)	585	625	665
Total height (D)	619	659	699
NPN	SP-H20L-02MN-28	SP-H20L-02MN-30	SP-H20L-02MN-32
PNP	SP-H20L-02MP-28	SP-H20L-02MP-30	SP-H20L-02MP-32

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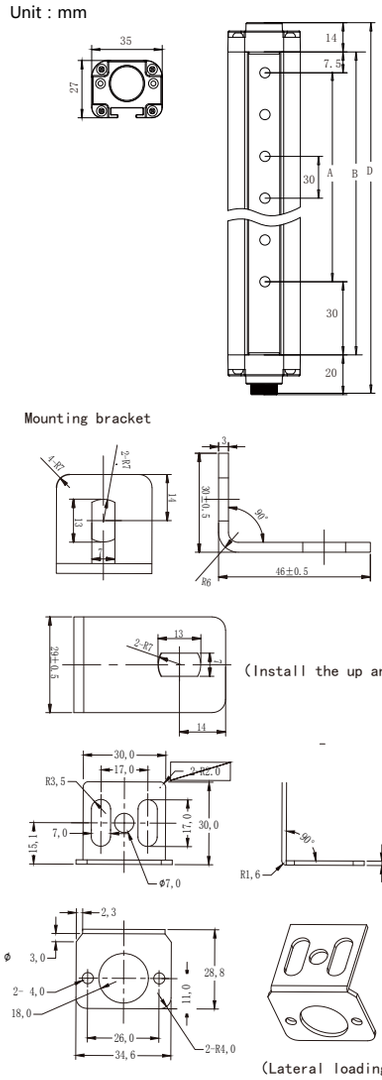
Dimensioned drawing

Unit : mm



Technical data

Operating voltage	24V DC±20%
Response time	<10ms
Optical axis spacing	30mm
Resolution ratio	35mm
Security level	Ⅱ level
Output way	NPN/PNP(Common)
Ambient humidity	-10℃...55℃
Storage temperature	-25℃...70℃
Working temperature	When the temperature is 20℃, the relative humidity of air is less than 85%
Power	<5W
Output current	≤200mA
Dielectric strength	ACI500V,60S,No breakdown or flicker
Section size	35*27mm
Insulation resistance	≥100MΩ
Light immunity	10000Lux(Angle of incidenceI>5°)
Protect distance	0.1...2m
Ingress protection	IP65
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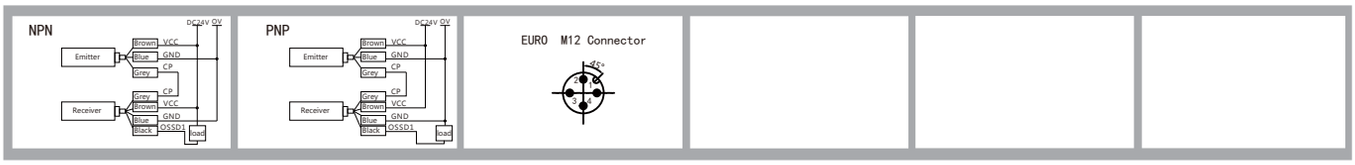
Wiring



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Model No.

No. of beams	4	6	8	10
Detection height (A)	90	150	210	270
Light screen height (B)	127.5	187.5	247.5	307.5
Total height (D)	161.5	221.5	181.5	341.5
NPN	SP-H30L-02MN-4	SP-H30L-02MN-6	SP-H30L-02MN-8	SP-H30L-02MN-10
PNP	SP-H30L-02MP-4	SP-H30L-02MP-6	SP-H30L-02MP-8	SP-H30L-02MP-10

No. of beams	12	14	16	18
Detection height (A)	330	390	450	510
Light screen height (B)	367.5	427.5	487.5	547.5
Total height (D)	401.5	461.5	521.5	581.5
NPN	SP-H30L-02MN-12	SP-H30L-02MN-14	SP-H30L-02MN-16	SP-H30L-02MN-18
PNP	SP-H30L-02MP-12	SP-H30L-02MP-14	SP-H30L-02MP-16	SP-H30L-02MP-18

No. of beams	20	22	24	26
Detection height (A)	570	630	690	750
Light screen height (B)	607.5	667.5	727.5	787.5
Total height (D)	641.5	701.5	761.5	821.5
NPN	SP-H30L-02MN-20	SP-H30L-02MN-22	SP-H30L-02MN-24	SP-H30L-02MN-26
PNP	SP-H30L-02MP-20	SP-H30L-02MP-22	SP-H30L-02MP-24	SP-H30L-02MP-26

No. of beams	28	30	32	34
Detection height (A)	810	870	930	990
Light screen height (B)	847.5	907.5	967.5	1027.5
Total height (D)	881.5	941.5	1001.5	1061.5
NPN	SP-H30L-02MN-28	SP-H30L-02MN-30	SP-H30L-02MN-32	SP-H30L-02MN-34
PNP	SP-H30L-02MP-28	SP-H30L-02MP-30	SP-H30L-02MP-32	SP-H30L-02MP-34

No. of beams	36	38	40	42
Detection height (A)	1050	1110	1170	1230
Light screen height (B)	1087.5	1147.5	1207.5	1267.5
Total height (D)	1121.5	1184.5	1241.5	1301.5
NPN	SP-H30L-02MN-36	SP-H30L-02MN-38	SP-H30L-02MN-40	SP-H30L-02MN-42
PNP	SP-H30L-02MP-36	SP-H30L-02MP-38	SP-H30L-02MP-40	SP-H30L-02MP-42

No. of beams	44	46	48	
Detection height (A)	1290	1350	1410	
Light screen height (B)	1327.5	1387.5	1447.5	
Total height (D)	1361.5	1421.5	1481.5	
NPN	SP-H30L-02MN-44	SP-H30L-02MN-46	SP-H30L-02MN-48	
PNP	SP-H30L-02MP-44	SP-H30L-02MP-46	SP-H30L-02MP-48	

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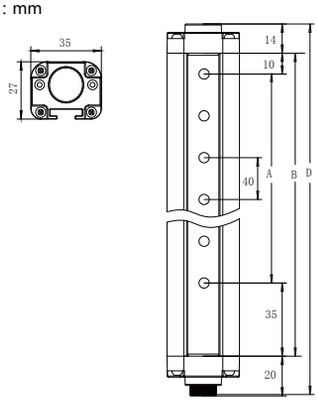
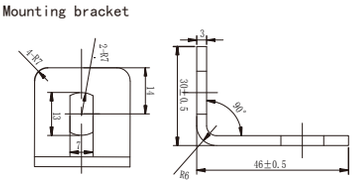
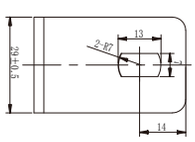
Dimensioned drawing

Unit : mm



Mounting bracket





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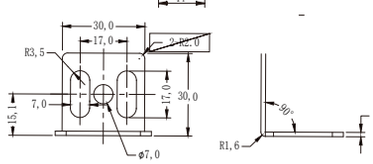

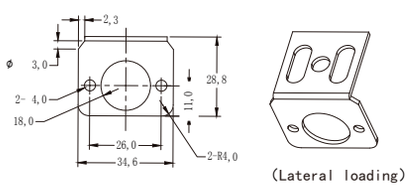

(Lateral loading)

Technical data

Operating voltage	24V DC±20%
Response time	<10ms
Optical axis spacing	40mm
Resolution ratio	45mm
Security level	Ⅱ level
Output way	NPN/PNP(Common)
Ambient humidity	-10℃...55℃
Storage temperature	-25℃...70℃
Working temperature	When the temperature is 20℃, the relative humidity of air is less than 85%
Power	<5W
Output current	≤200mA
Dielectric strength	ACI500V,60S,No breakdown or flicker
Section size	35*27mm
Insulation resistance	≥100MΩ
Light immunity	10000Lux(Angle of incidenceI>5°)
Protect distance	0.1...2m
Ingress protection	IP65
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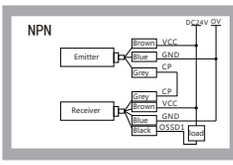

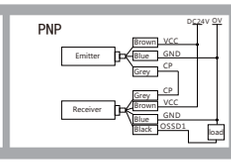

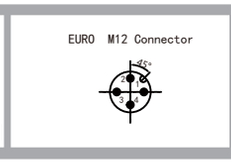

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Model No.

No. of beams	4	6	8	10
Detection height (A)	120	200	280	360
Light screen height (B)	165	245	325	405
Total height (D)	199	279	359	439
NPN	SP-H40L-05MN-4	SP-H40L-05MN-6	SP-H40L-05MN-8	SP-H40L-05MN-10
PNP	SP-H40L-05MP-4	SP-H40L-05MP-6	SP-H40L-05MP-8	SP-H40L-02MP-10

No. of beams	12	14	16	18
Detection height (A)	440	520	600	680
Light screen height (B)	485	565	645	725
Total height (D)	519	599	679	759
NPN	SP-H40L-02MN-12	SP-H40L-02MN-14	SP-H40L-02MN-16	SP-H40L-02MN-18
PNP	SP-H40L-02MP-12	SP-H40L-02MP-14	SP-H40L-02MP-16	SP-H40L-02MP-18

No. of beams	20	22	24	26
Detection height (A)	760	840	920	1000
Light screen height (B)	805	885	965	1045
Total height (D)	839	909	999	1079
NPN	SP-H40L-02MN-20	SP-H40L-02MN-22	SP-H40L-02MN-24	SP-H40L-02MN-26
PNP	SP-H40L-02MP-20	SP-H40L-02MP-22	SP-H40L-02MP-24	SP-H40L-02MP-26

No. of beams	28	30	32
Detection height (A)	1080	1160	1240
Light screen height (B)	1125	1205	1285
Total height (D)	1159	1239	1319
NPN	SP-H40L-02MN-28	SP-H40L-02MN-30	SP-H40L-02MN-32
PNP	SP-H40L-02MP-28	SP-H40L-02MP-30	SP-H40L-02MP-32

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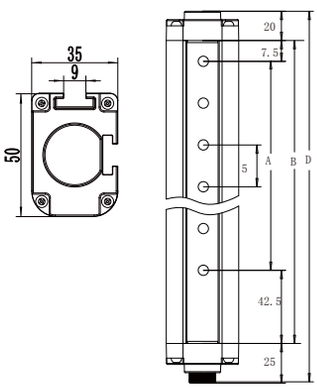
Features:

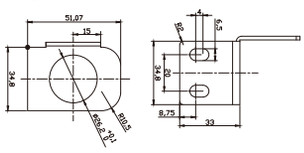
- Self-check function is perfect, when the photoelectric safety protection device failure, to ensure that the control equipment will not send the wrong signal.;
- Adopting line synchronization technology, strong anti-interference ability;
- Photoelectric cycle self-check, improve equipment safety;
- SMD patch design, imported high-end components

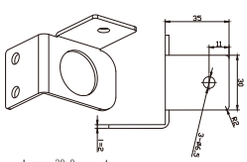
Dimensioned drawing

Unit : mm

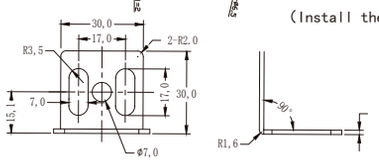


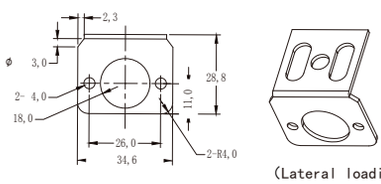
Mounting bracket





(Install the up and down)





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Technical data

Operating voltage	24V DC±20%
Response time	<10ms
Optical axis spacing	5mm
Resolution ratio	10mm
Security level	Ⅱ level
Output way	NPN/PNP (general)/relay normally open/relay normally closed
	(can be selected according to requirements)
Ambient humidity	-10℃...55℃
Storage temperature	-25℃...70℃
Working temperature	When the temperature is 20℃, the relative humidity of air is less than 85%
Power	<5W
Output current	≤200mA
Dielectric strength	ACI500V,60S,No breakdown or flicker
Section size	35*50mm
Insulation resistance	≥100MΩ
Light immunity	10000Lux(Angle of incidenceI>5°)
Protect distance	A:0.1-5m B:0.1-10m; C:0.1-15m; D:0.1-20m
Ingress protection	IP65
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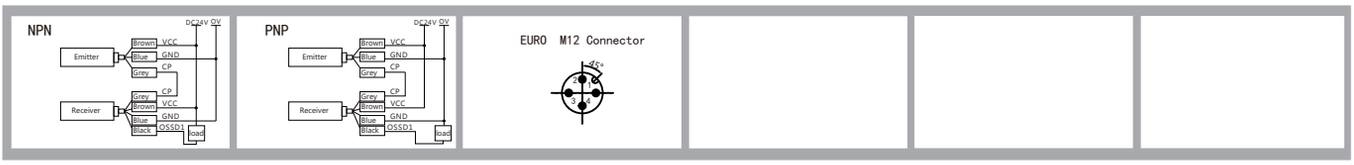

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Model No.

No. of beams	16	24	32	40
Detection height (A)	75	115	155	195
Light screen height (B)	120	160	200	240
Total height (D)	165	205	245	285
NPN	SP-H05L-05MN-16	SP-H05L-05MN-24	SP-H05L-05MN-32	SP-H05L-05MN-40
PNP	SP-H05L-05MP-16	SP-H05L-05MP-24	SP-H05L-05MP-32	SP-H05L-05MP-40

No. of beams	48	56	64	72
Detection height (A)	235	275	315	355
Light screen height (B)	280	320	360	400
Total height (D)	325	365	405	445
NPN	SP-H05L-05MN-48	SP-H05L-05MN-56	SP-H05L-05MN-64	SP-H05L-05MN-72
PNP	SP-H05L-05MP-48	SP-H05L-05MP-56	SP-H05L-05MP-64	SP-H05L-05MP-72

No. of beams	80	88	96	104
Detection height (A)	395	435	475	515
Light screen height (B)	440	480	520	560
Total height (D)	485	525	565	605
NPN	SP-H05L-05MN-80	SP-H05L-05MN-88	SP-H05L-05MN-96	SP-H05L-05MN-104
PNP	SP-H05L-05MP-80	SP-H05L-05MP-88	SP-H05L-05MP-96	SP-H05L-05MP-104

No. of beams	112	120	128
Detection height (A)	555	595	635
Light screen height (B)	600	640	680
Total height (D)	645	685	725
NPN	SP-H05L-05MN-112	SP-H05L-05MN-120	SP-H05L-05MN-128
PNP	SP-H05L-05MP-112	SP-H05L-05MP-120	SP-H05L-05MP-128

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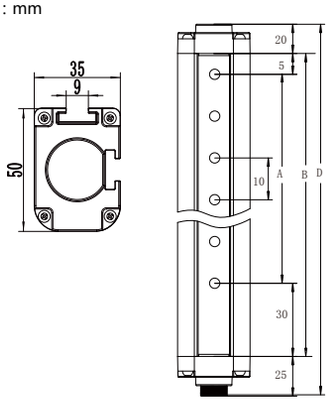
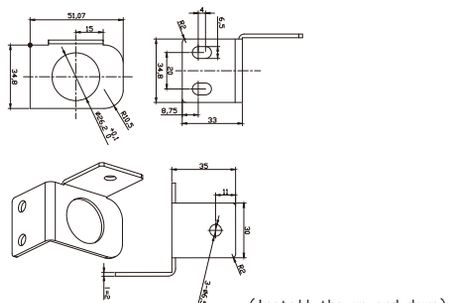
Dimensioned drawing

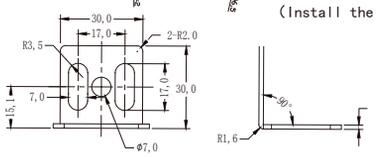
Unit : mm

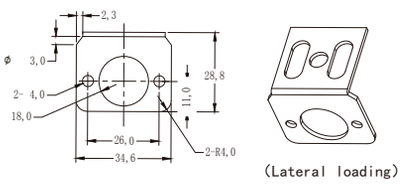


Mounting bracket



(Install the up and down)



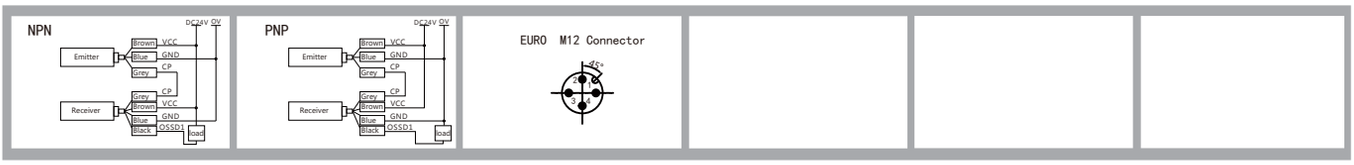


(Lateral loading)

Technical data

Operating voltage	24V DC±20%
Response time	<10ms
Optical axis spacing	10mm
Resolution ratio	15mm
Security level	Ⅱ level
Output way	NPN/PNP (general)/relay normally open/relay normally closed
	(can be selected according to requirements)
Ambient humidity	-10℃...55℃
Storage temperature	-25℃...70℃
Working temperature	When the temperature is 20℃, the relative humidity of air is less than 85%
Power	<5W
Output current	≤200mA
Dielectric strength	ACI500V,60S,No breakdown or flicker
Section size	35*50mm
Insulation resistance	≥100MΩ
Light immunity	10000Lux(Angle of incidenceI>5°)
Protect distance	A:0.1-5m B:0.1-10m; C:0.1-15m; D:0.1-20m
Ingress protection	IP65
Attachment 1	Side install bracket (The user to specify) ;
	Top and bottom install bracket (The user to specify)
Attachment 2	Outgoing line、standard (emitter2.5m , receiver3.5m)

Wiring



Schlüter Automation und Sensorik GmbH
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Model No.

No. of beams	8	12	16	20
Detection height (A)	70	110	150	190
Light screen height (B)	105	145	185	225
Total height (D)	150	190	230	270
NPN	SP-H10L-05MN-8	SP-H10L-05MN-12	SP-H10L-05MN-16	SP-H10L-05MN-20
PNP	SP-H10L-05MP-8	SP-H10L-05MP-12	SP-H10L-05MP-16	SP-H10L-05MP-20

No. of beams	24	28	32	36
Detection height (A)	230	270	310	350
Light screen height (B)	265	305	345	385
Total height (D)	310	350	390	430
NPN	SP-H10L-05MN-24	SP-H10L-05MN-28	SP-H10L-05MN-32	SP-H10L-05MN-36
PNP	SP-H10L-05MP-24	SP-H10L-05MP-28	SP-H10L-05MP-32	SP-H10L-05MP-36

No. of beams	40	44	48	52
Detection height (A)	390	430	470	510
Light screen height (B)	425	465	505	545
Total height (D)	470	510	550	590
NPN	SP-H10L-05MN-40	SP-H10L-05MN-44	SP-H10L-05MN-48	SP-H10L-05MN-52
PNP	SP-H10L-05MP-40	SP-H10L-05MP-44	SP-H10L-05MP-48	SP-H10L-05MP-52

No. of beams	56	60	64
Detection height (A)	550	590	630
Light screen height (B)	585	625	665
Total height (D)	630	670	710
NPN	SP-H10L-05MN-56	SP-H10L-05MN-60	SP-H10L-05MN-64
PNP	SP-H10L-05MP-56	SP-H10L-05MP-60	SP-H10L-05MP-64

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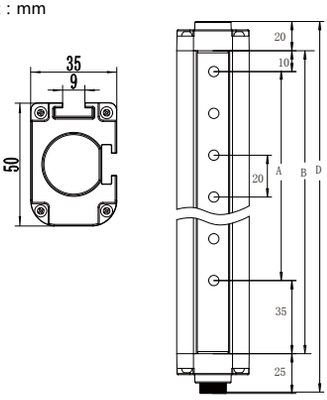
Features:

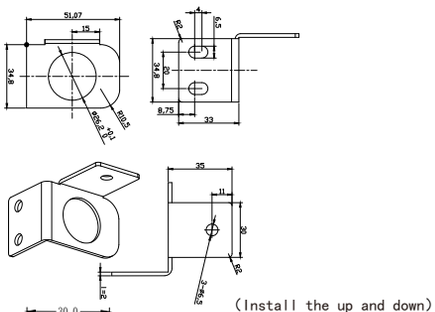
- Self-check function is perfect, when the photoelectric safety protection device failure, to ensure that the control equipment will not send the wrong signal.;
- Adopting line synchronization technology, strong anti-interference ability;
- Photoelectric cycle self-check, improve equipment safety;
- SMD patch design, imported high-end components

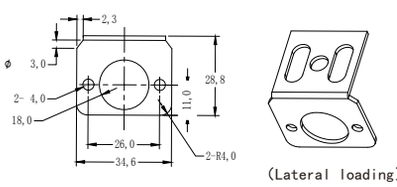
Dimensioned drawing

Unit : mm



Mounting bracket





(Lateral loading)

Technical data

Operating voltage	24V DC±20%
Response time	<10ms
Optical axis spacing	20mm
Resolution ratio	25mm
Security level	Ⅱ level
Output way	NPN/PNP (general)/relay normally open/relay normally closed
	(can be selected according to requirements)
Ambient humidity	-10℃...55℃
Storage temperature	-25℃...70℃
Working temperature	When the temperature is 20℃, the relative humidity of air is less than 85%
Power	<5W
Output current	≤200mA
Dielectric strength	ACI500V,60S,No breakdown or flicker
Section size	35*50mm
Insulation resistance	≥100MΩ
Light immunity	10000Lux(Angle of incidenceI>5°)
Protect distance	A:0.1-5m B:0.1-10m; C:0.1-15m; D:0.1-20m
Ingress protection	IP65
Attachment 1	Side install bracket (The user to specify) ;
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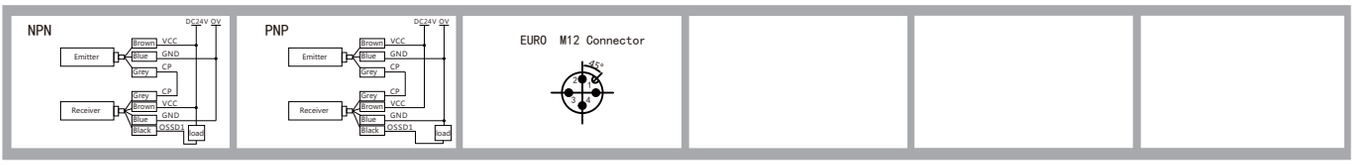

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Model No.

No. of beams	4	6	8	10
Detection height (A)	60	100	140	180
Light screen height (B)	80	145	185	225
Total height (D)	125	190	230	270
NPN	SP-H20L-05MN-4	SP-H20L-05MN-6	SP-H20L-05MN-8	SP-H20L-05MN-10
PNP	SP-H20L-05MP-4	SP-H20L-05MP-6	SP-H20L-05MP-8	SP-H20L-05MP-10

No. of beams	12	14	16	18
Detection height (A)	220	260	300	340
Light screen height (B)	265	305	345	385
Total height (D)	310	350	390	430
NPN	SP-H20L-05MN-12	SP-H20L-05MN-14	SP-H20L-05MN-16	SP-H20L-05MN-18
PNP	SP-H20L-05MP-12	SP-H20L-05MP-14	SP-H20L-05MP-16	SP-H20L-05MP-18

No. of beams	20	22	24	26
Detection height (A)	380	420	480	500
Light screen height (B)	425	465	505	545
Total height (D)	470	510	550	590
NPN	SP-H20L-05MN-20	SP-H20L-05MN-22	SP-H20L-05MN-24	SP-H20L-05MN-26
PNP	SP-H20L-05MP-20	SP-H20L-05MP-22	SP-H20L-05MP-24	SP-H20L-05MP-26

No. of beams	28	30	32
Detection height (A)	540	580	620
Light screen height (B)	585	625	665
Total height (D)	630	670	710
NPN	SP-H20L-05MN-28	SP-H20L-05MN-30	SP-H20L-05MN-32
PNP	SP-H20L-05MP-28	SP-H20L-05MP-30	SP-H20L-05MP-32

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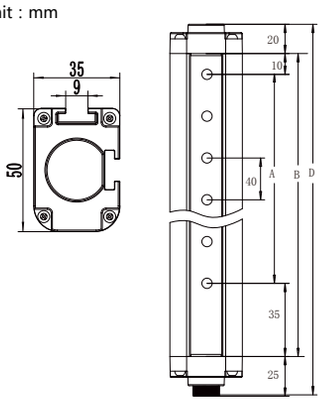
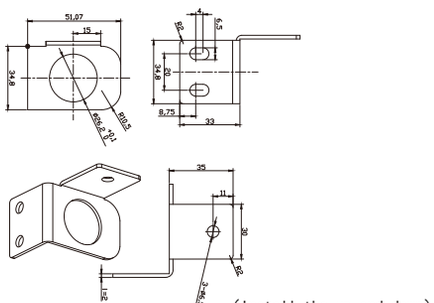
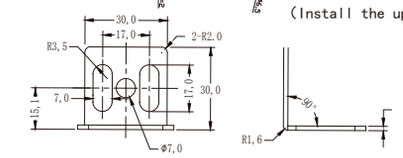
Dimensioned drawing

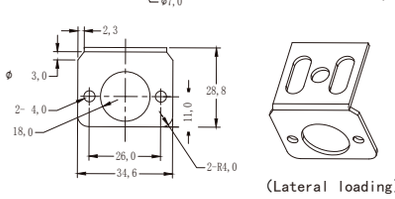
Unit : mm



Mounting bracket







Technical data

Operating voltage	24V DC±20%
Response time	<10ms
Optical axis spacing	40mm
Resolution ratio	45mm
Security level	Ⅱ level
Output way	NPN/PNP (general)/relay normally open/relay normally closed
	(can be selected according to requirements)
Ambient humidity	-10℃...55℃
Storage temperature	-25℃...70℃
Working temperature	When the temperature is 20℃, the relative humidity of air is less than 85%
Power	<5W
Output current	≤200mA
Dielectric strength	ACI500V,60S,No breakdown or flicker
Section size	35*50mm
Insulation resistance	≥100MΩ
Light immunity	10000Lux(Angle of incidenceI>5°)
Protect distance	A:0.1-5m B:0.1-10m; C:0.1-15m; D:0.1-20m
Ingress protection	IP65
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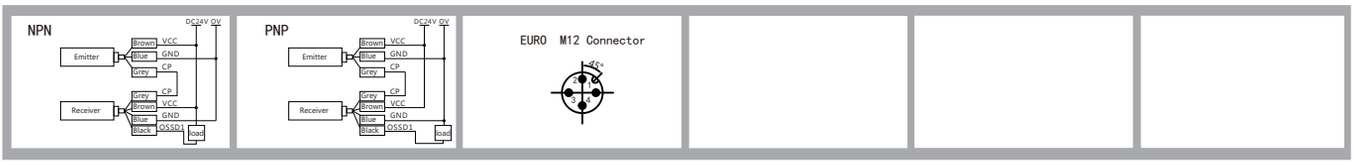
Wiring



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Model No.

No. of beams	4	6	8	10
Detection height (A)	120	200	280	360
Light screen height (B)	165	245	325	405
Total height (D)	210	290	370	450
NPN	SP-H40L-05MN-4	SP-H40L-05MN-6	SP-H40L-05MN-8	SP-H40L-05MN-10
PNP	SP-H40L-05MP-4	SP-H40L-05MP-6	SP-H40L-05MP-8	SP-H40L-05MP-10

No. of beams	12	14	16	18
Detection height (A)	440	520	600	680
Light screen height (B)	485	565	645	725
Total height (D)	530	610	690	770
NPN	SP-H40L-05MN-12	SP-H40L-05MN-14	SP-H40L-05MN-16	SP-H40L-05MN-18
PNP	SP-H40L-05MP-12	SP-H40L-05MP-14	SP-H40L-05MP-16	SP-H40L-05MP-18

No. of beams	20	22	24	26
Detection height (A)	760	840	920	1000
Light screen height (B)	805	885	965	1045
Total height (D)	850	930	1010	1090
NPN	SP-H40L-05MN-20	SP-H40L-05MN-22	SP-H40L-05MN-24	SP-H40L-05MN-26
PNP	SP-H40L-05MP-20	SP-H40L-05MP-22	SP-H40L-05MP-24	SP-H40L-05MP-26

No. of beams	28	30	32
Detection height (A)	1080	1160	1240
Light screen height (B)	1125	1205	1285
Total height (D)	1170	1250	1330
NPN	SP-H40L-05MN-28	SP-H40L-05MN-30	SP-H40L-05MN-32
PNP	SP-H40L-05MP-28	SP-H40L-05MP-30	SP-H40L-05MP-32

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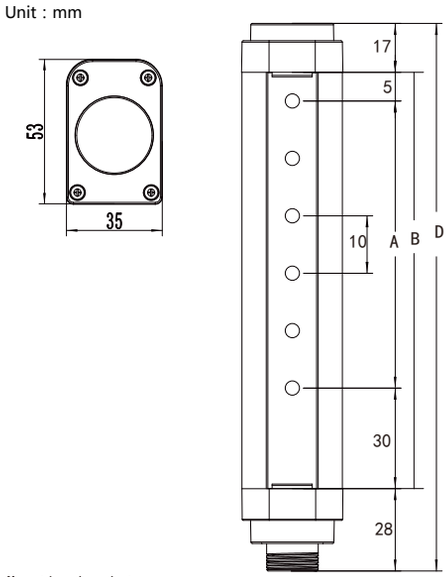
Features:

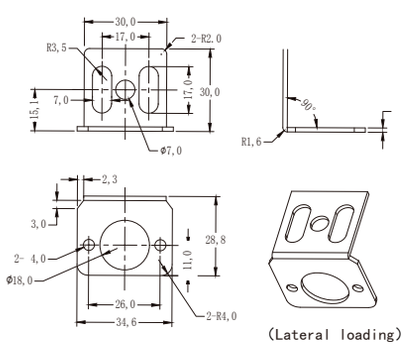
- Easy to install and debug, easy to use accessories. The light bar is connected by aviation plug, which can be loaded and unloaded quickly and accurately;
- Perfect self-check function, using the latest safety technology design, strictly according to the European standard design;
- High resolution, can protect fingers, palms, human body;
- Short response time and high reliability;
- Integrated design, no controller, easy to use;

Dimensioned drawing

Unit : mm



Mounting bracket



(Lateral loading)

Technical data

Operating voltage	24V DC±20%
Response time	<10ms
Optical axis spacing	10mm
Resolution ratio	15mm
Security level	IV level
Output way	NPN/PNP (general)/relay normally open/relay normally closed
	(can be selected according to requirements)
Ambient humidity	-10℃...55℃
Storage temperature	-25℃...70℃
Working temperature	When the temperature is 20℃, the relative humidity of air is less than 85%
Power	<5W
Output current	≤200mA
Dielectric strength	ACI500V,60S,No breakdown or flicker
Section size	35*53mm
Insulation resistance	≥100MΩ
Light immunity	10000Lux(Angle of incidenceI>5°)
Protect distance	A:0.1-5m B:0.1-10m; C:0.1-15m; D:0.1-20m
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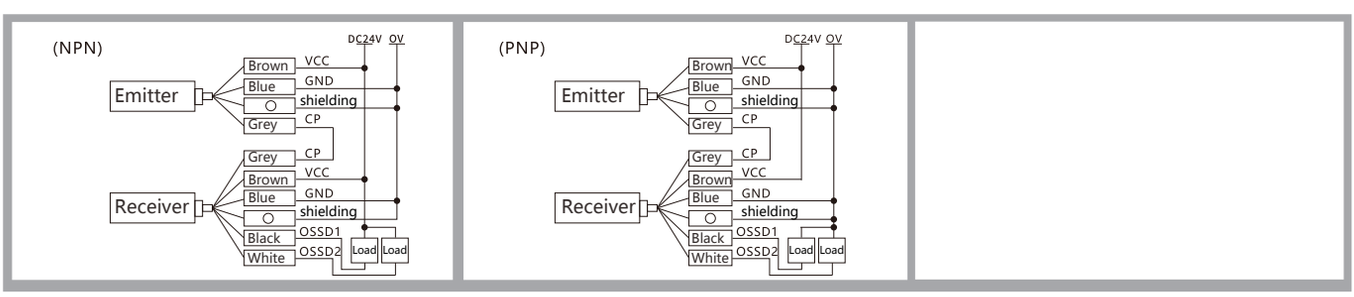
Wiring



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Model No.

No. of beams	12	16	20	24
Detection height (A)	110	150	190	230
Light screen height (B)	145	185	225	265
Total height (D)	190	230	270	310
NPN	SP-H10L-05MN-12-S4	SP-H10L-05MN-16-S4	SP-H10L-05MN-20-S4	SP-H10L-05MN-24-S4
PNP	SP-H10L-05MP-12-S4	SP-H10L-05MP-16-S4	SP-H10L-05MP-20-S4	SP-H10L-05MP-24-S4

No. of beams	28	32	36	40
Detection height (A)	270	310	350	390
Light screen height (B)	305	345	385	425
Total height (D)	350	390	430	470
NPN	SP-H10L-05MN-28-S4	SP-H10L-05MN-32-S4	SP-H10L-05MN-36-S4	SP-H10L-05MN-40-S4
PNP	SP-H10L-05MP-28-S4	SP-H10L-05MP-32-S4	SP-H10L-05MP-36-S4	SP-H10L-05MP-40-S4

No. of beams	44	48	52	56
Detection height (A)	430	470	510	550
Light screen height (B)	465	505	545	585
Total height (D)	510	550	590	630
NPN	SP-H10L-05MN-44-S4	SP-H10L-05MN-48-S4	SP-H10L-05MN-52-S4	SP-H10L-05MN-56-S4
PNP	SP-H10L-05MP-44-S4	SP-H10L-05MP-48-S4	SP-H10L-05MP-52-S4	SP-H10L-05MP-56-S4

No. of beams	60	64	68	72
Detection height (A)	590	630	670	710
Light screen height (B)	625	665	705	754
Total height (D)	670	710	750	790
NPN	SP-H10L-05MN-60-S4	SP-H10L-05MN-64-S4	SP-H10L-05MN-68-S4	SP-H10L-05MN-72-S4
PNP	SP-H10L-05MP-60-S4	SP-H10L-05MP-64-S4	SP-H10L-05MP-68-S4	SP-H10L-05MP-72-S4

No. of beams	76	80	84	88
Detection height (A)	750	790	830	870
Light screen height (B)	785	725	865	905
Total height (D)	830	870	910	950
NPN	SP-H10L-05MN-76-S4	SP-H10L-05MN-80-S4	SP-H10L-05MN-84-S4	SP-H10L-05MN-88-S4
PNP	SP-H10L-05MP-76-S4	SP-H10L-05MP-80-S4	SP-H10L-05MP-84-S4	SP-H10L-05MP-88-S4

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- Perfect self-check function, using the latest safety technology design, strictly according to the European standard design;
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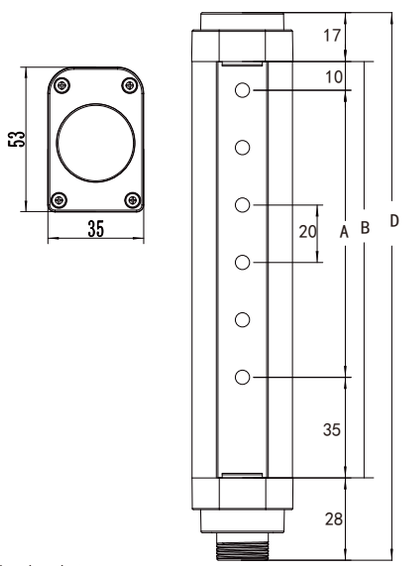
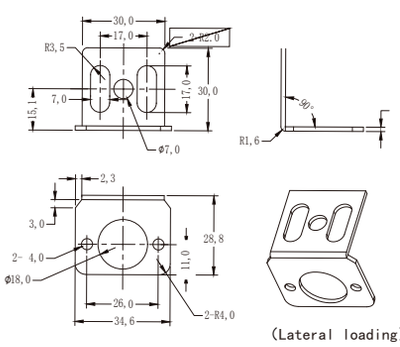
Dimensioned drawing

Unit : mm



Mounting bracket



(Lateral loading)

Technical data

Operating voltage	24V DC±20%
Response time	<10ms
Optical axis spacing	20mm
Resolution ratio	25mm
Security level	IV level
Output way	NPN/PNP (general)/relay normally open/relay normally closed
	(can be selected according to requirements)
Ambient humidity	-10℃...55℃
Storage temperature	-25℃...70℃
Working temperature	When the temperature is 20℃, the relative humidity of air is less than 85%
Power	<5W
Output current	≤200mA
Dielectric strength	ACI500V,60S,No breakdown or flicker
Section size	35*53mm
Insulation resistance	≥100MΩ
Light immunity	10000Lux(Angle of incidenceI>5°)
Protect distance	A:0.1-5m B:0.1-10m; C:0.1-15m; D:0.1-20m
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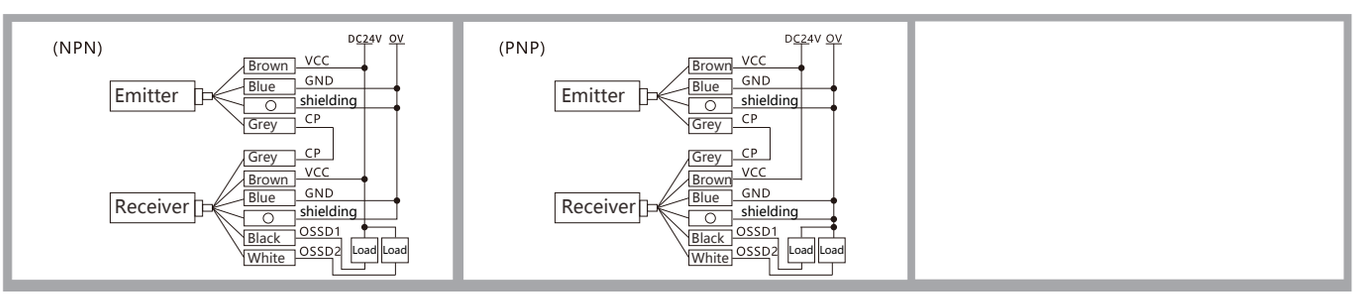

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Model No.

No. of beams	6	8	10	12
Detection height (A)	100	140	180	220
Light screen height (B)	145	185	225	265
Total height (D)	190	230	270	310
NPN	SP-H20L-05MN-6-S4	SP-H20L-05MN-8-S4	SP-H20L-05MN-10-S4	SP-H20L-05MN-12-S4
PNP	SP-H20L-05MP-6-S4	SP-H20L-05MP-8-S4	SP-H20L-05MP-10-S4	SP-H20L-05MP-12-S4

No. of beams	14	16	18	20
Detection height (A)	260	300	340	380
Light screen height (B)	305	345	385	425
Total height (D)	350	390	430	470
NPN	SP-H20L-05MN-14-S4	SP-H20L-05MN-16-S4	SP-H20L-05MN-18-S4	SP-H20L-05MN-20-S4
PNP	SP-H20L-05MP-14-S4	SP-H20L-05MP-16-S4	SP-H20L-05MP-18-S4	SP-H20L-05MP-20-S4

No. of beams	22	24	26	28
Detection height (A)	420	460	500	540
Light screen height (B)	465	505	545	585
Total height (D)	510	550	590	630
NPN	SP-H20L-05MN-22-S4	SP-H20L-05MN-24-S4	SP-H20L-05MN-26-S4	SP-H20L-05MN-28-S4
PNP	SP-H20L-05MP-22-S4	SP-H20L-05MP-24-S4	SP-H20L-05MP-26-S4	SP-H20L-05MP-28-S4

No. of beams	30	32	34
Detection height (A)	580	620	660
Light screen height (B)	625	665	705
Total height (D)	670	710	750
NPN	SP-H20L-05MN-30-S4	SP-H20L-05MN-32-S4	SP-H20L-05MN-34-S4
PNP	SP-H20L-05MP-30-S4	SP-H20L-05MP-32-S4	SP-H20L-05MP-34-S4

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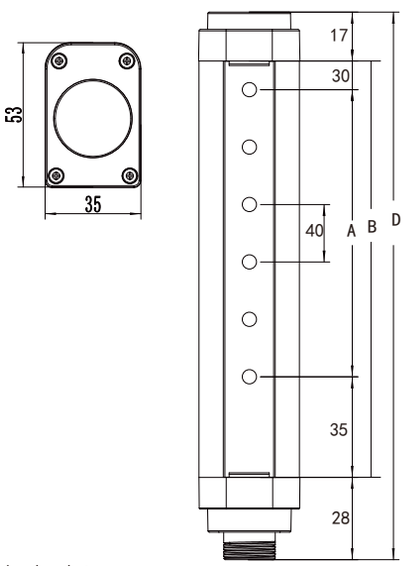
Features:

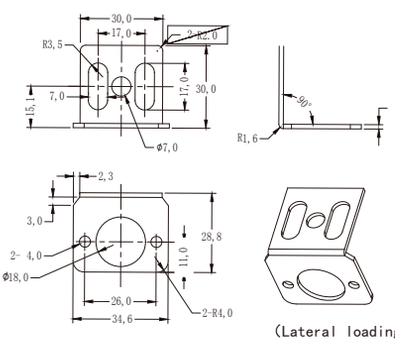
- Easy to install and debug, easy to use accessories. The light bar is connected by aviation plug, which can be loaded and unloaded quickly and accurately;
- Perfect self-check function, using the latest safety technology design, strictly according to the European standard design;
- High resolution, can protect fingers, palms, human body;
- Short response time and high reliability;
- Integrated design, no controller, easy to use;

Dimensioned drawing

Unit : mm



Mounting bracket

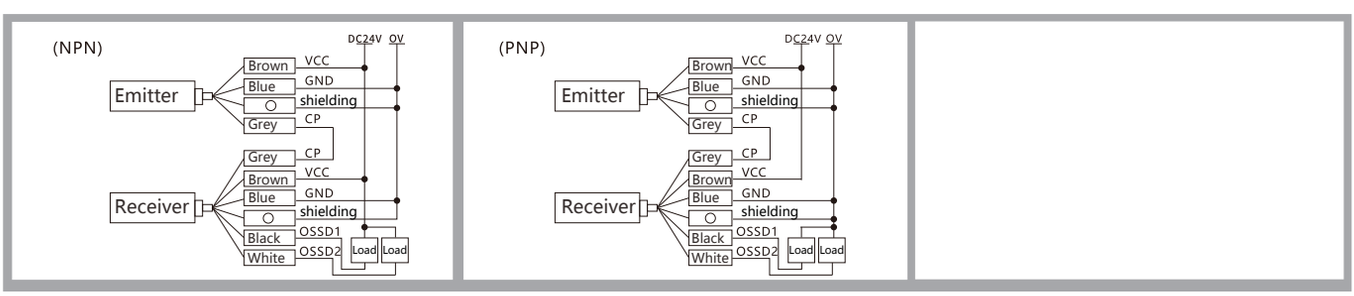


(Lateral loading)

Technical data

Operating voltage	24V DC±20%
Response time	<10ms
Optical axis spacing	40mm
Resolution ratio	45mm
Security level	IV level
Output way	NPN/PNP (general)/relay normally open/relay normally closed
	(can be selected according to requirements)
Ambient humidity	-10℃...55℃
Storage temperature	-25℃...70℃
Working temperature	When the temperature is 20℃, the relative humidity of air is less than 85%
Power	<5W
Output current	≤200mA
Dielectric strength	ACI500V,60S,No breakdown or flicker
Section size	35*53mm
Insulation resistance	≥100MΩ
Light immunity	10000Lux(Angle of incidenceI>5°)
Protect distance	A:0.1-5m B:0.1-10m; C:0.1-15m; D:0.1-20m
Ingress protection	IP65
Attachment 1	Side install bracket (The user to specify) ;
	Top and bottom install bracket (The user to specify)
Attachment 2	Outgoing line、standard (emitter2.5m , receiver3.5m)

Wiring



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Model No.

No. of beams	4	6	8	10
Detection height (A)	120	200	280	360
Light screen height (B)	185	265	345	425
Total height (D)	230	310	390	470
NPN	SP-H40L-05MN-4-S4	SP-H40L-05MN-6-S4	SP-H40L-05MN-8-S4	SP-H40L-05MN-10-S4
PNP	SP-H40L-05MP-4-S4	SP-H40L-05MP-6-S4	SP-H40L-05MP-8-S4	SP-H40L-05MP-10-S4

No. of beams	12	14	16	18
Detection height (A)	440	520	600	680
Light screen height (B)	505	585	665	745
Total height (D)	550	630	710	790
NPN	SP-H40L-05MN-12-S4	SP-H40L-05MN-14-S4	SP-H40L-05MN-16-S4	SP-H40L-05MN-18-S4
PNP	SP-H40L-05MP-12-S4	SP-H40L-05MP-14-S4	SP-H40L-05MP-16-S4	SP-H40L-05MP-18-S4

No. of beams	20	22	24	26
Detection height (A)	760	840	920	1000
Light screen height (B)	825	905	985	1065
Total height (D)	870	950	1030	1110
NPN	SP-H40L-05MN-20-S4	SP-H40L-05MN-22-S4	SP-H40L-05MN-24-S4	SP-H40L-05MN-26-S4
PNP	SP-H40L-05MP-20-S4	SP-H40L-05MP-22-S4	SP-H40L-05MP-24-S4	SP-H40L-05MP-26-S4

No. of beams	28	30	32
Detection height (A)	1080	1160	1240
Light screen height (B)	1145	1225	1305
Total height (D)	1190	1270	1350
NPN	SP-H40L-05MN-28-S4	SP-H40L-05MN-30-S4	SP-H40L-05MN-32-S4
PNP	SP-H40L-05MP-28-S4	SP-H40L-05MP-30-S4	SP-H40L-05MP-32-S4

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