

# SENSOR PRODUCTS SELECTION MANUAL



Wenzhou Gtric Technology Co., Ltd.  
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# Company introduction

Wenzhou Gtric Technology Co., Ltd. is located in Yueqing IoT sensors Park, which covers 5,000 square meters, with over 100 employees. We are focuses on intelligent manufacturing and industrial automation, our main businesses are sensors, encoders, button switch, coupling, expansion set and other industrial automation products, providing standard and individual products and solutions for customers.

Our products cover over 20 series, 1000specification, which have passed CCC, CE, UL, ISO9001 certification as well as EU RoHS Environmental Directives.

Based on our technical advantages, Gtric can provide industrial automation solution according to customers' requirements.

**We support OEM & ODM, if you need  
please feel free to contact us**



Installation conditions

Non shielded proximity switches can achieve maximum operating distance (with the diameter of the relevant); but in order to prevent the switch around the metal impact on the switch, the sensor head must be in a certain gap with the surrounding metal (Figure 1).

Due to the special shielding effect inside the shield, the radial magnetic field of the side is reduced, and the induction distance is about 60% of the non shield type, because it can be flush mounted in the metal (Figure 2).

The magnetic sensor is not affected by the conditions of installation, as long as the material around the material is not magnetized.



Output mode and electrical characteristics

DC 2-wire system NO or NC																			
The load must be connected in series in the sensor to work, there is a polarity and short circuit protection function; in the open circuit state, there is a very small leakage current; in the closed circuit, the switching element has a smaller voltage drop.																			
	<div><div>Detection object</div><div>Load</div><div>Indicator detected</div></div> <div><table><tr><td>Yes</td><td>NO</td><td>NC</td></tr><tr><td>No</td><td></td><td></td></tr><tr><td>Action</td><td></td><td></td></tr><tr><td>Reset</td><td></td><td></td></tr><tr><td>ON</td><td></td><td></td></tr><tr><td>OFF</td><td></td><td></td></tr></table></div>	Yes	NO	NC	No			Action			Reset			ON			OFF		
Yes	NO	NC																	
No																			
Action																			
Reset																			
ON																			
OFF																			
DC 3-wire system(N,P type) NO or NC																			
These switches are connected to the load and power supply separately; the polarity, short circuit and overload protection function, and the residual current can be ignored.																			
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DC 4-wire system (NPN,PNP Type) NO+NC																			
Sensor switches can provide 2 groups of output NO+NC																			
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NO+NC Ac/Dc five wire (relay output) NO + NC																			
These switches can provide to often open, closed two group relay output.																			
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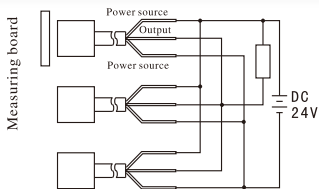


Sensor characteristics

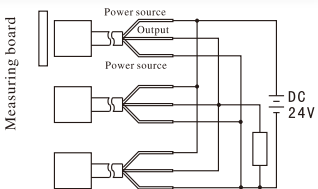
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✧ Series and parallel connection of proximity switch

OR connection ( NPN and PNP types can be used mixed ) series When the proximity switch is OR connected, the action of any proximity switch can drive load. The quantity of the proximity switches depends on the sum of leakage current. More connections are available given that it doesn't affect the loading action.



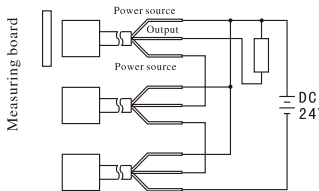
OR connection of NPN output



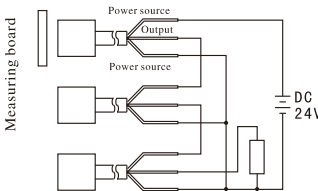
OR connection of PNP output

✧ AND connection (series)

When the proximity switch is AND connected, the action of all proximity switches can drive load. The quantity of the proximity switches depends on the sum of saturation voltage. More connections are available given that it doesn't affect the supply voltage of the proximity switch. The response frequency of the proximity switch is the accumulation of initialized reset of various proximity switch.



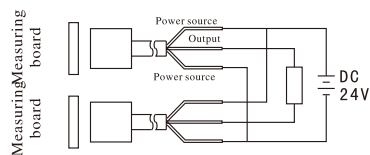
NPN connection of AND output



PNP connection of AND output

✧ Series and parallel connection of proximity switch

AND connection (series) NPN, PNP mixed—use



Promixity switches matters need attention

✧ Cautions when connected or disconnected with the power supply

When connecting the proximity switch with the counter and the programmable controller, there isn't any problem because of the built-in initialized reset circuit. Please avoid the conditions mentioned below

The detection object lies around the detection distance of the proximity switch; For DC voltage type and DC switch type, when power supply is turned on (turned off), time constant rises (drops) greatly; There is self-excitation and noise when the AC switch type proximity switch is power-on (off)

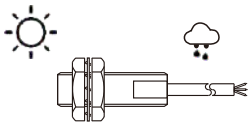
✧ Capacitor, light load

The proximity switch can't have the capacitor or light that has larger jumping current as the load directly connected to be connected through a relay or series connected with a current-limiting resistance. The peak current set by current-limiting resistance R is within the load current of the proximity switch; Make sure to connect through load.

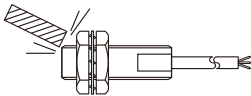
$$\frac{\text{Supply voltage } V}{\text{Peak load current value of proximity switch } \text{mA}} \leq R(\text{K}\Omega)$$
$$\text{Allowable loss of resistance } R(\text{W}) = \frac{\text{Supply voltage } V^2}{\leq R(\text{K}\Omega)} \times 2 \text{ times above}$$

✧ Installation notice of proximity switch

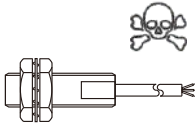
Don't use it in the open air, and use a protective cover, if necessary.



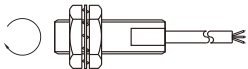
Don't knock the detection surface with hard objects and use a protective cover, if necessary.



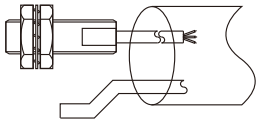
Don't use it in the environment with corrosive objects.



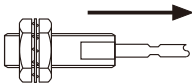
Don't fasten it with a big force, but fasten it with spring washer



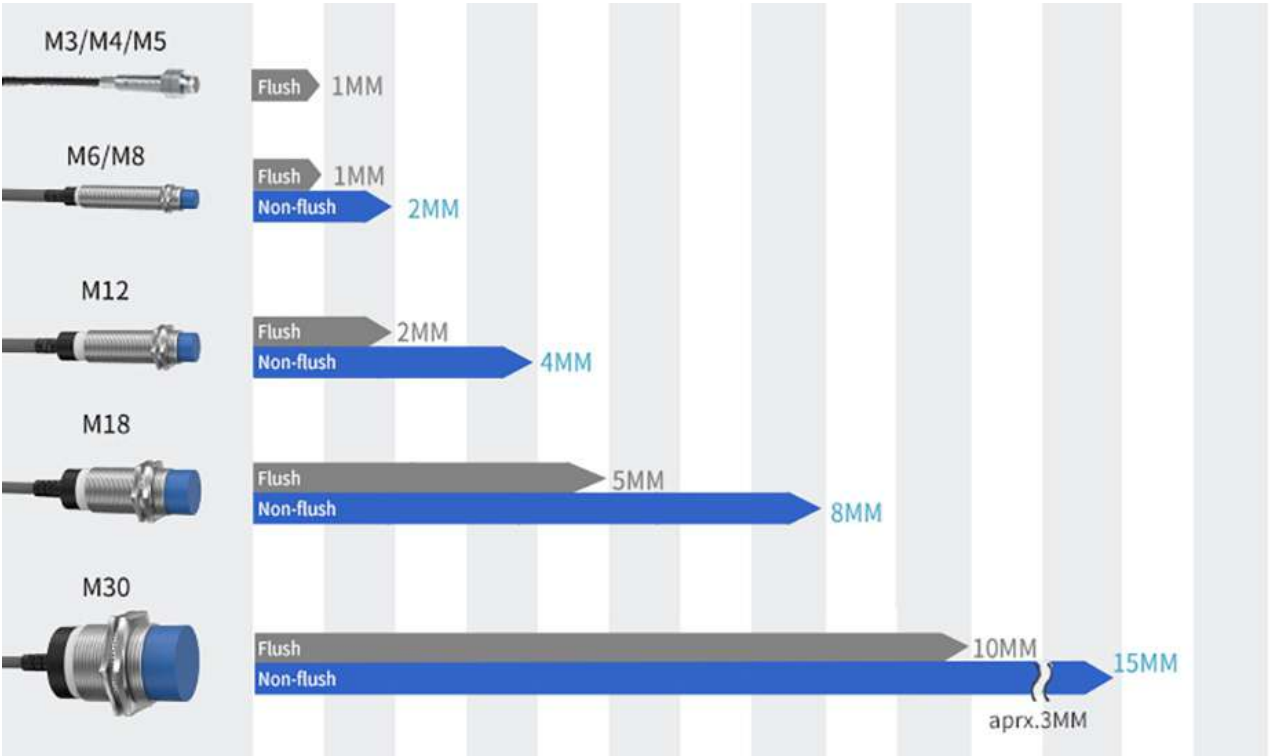
The proximity switch must be equipped individually with metal flexible pipe, and don't make it with the electric line and power line in the same metal flexible pipe



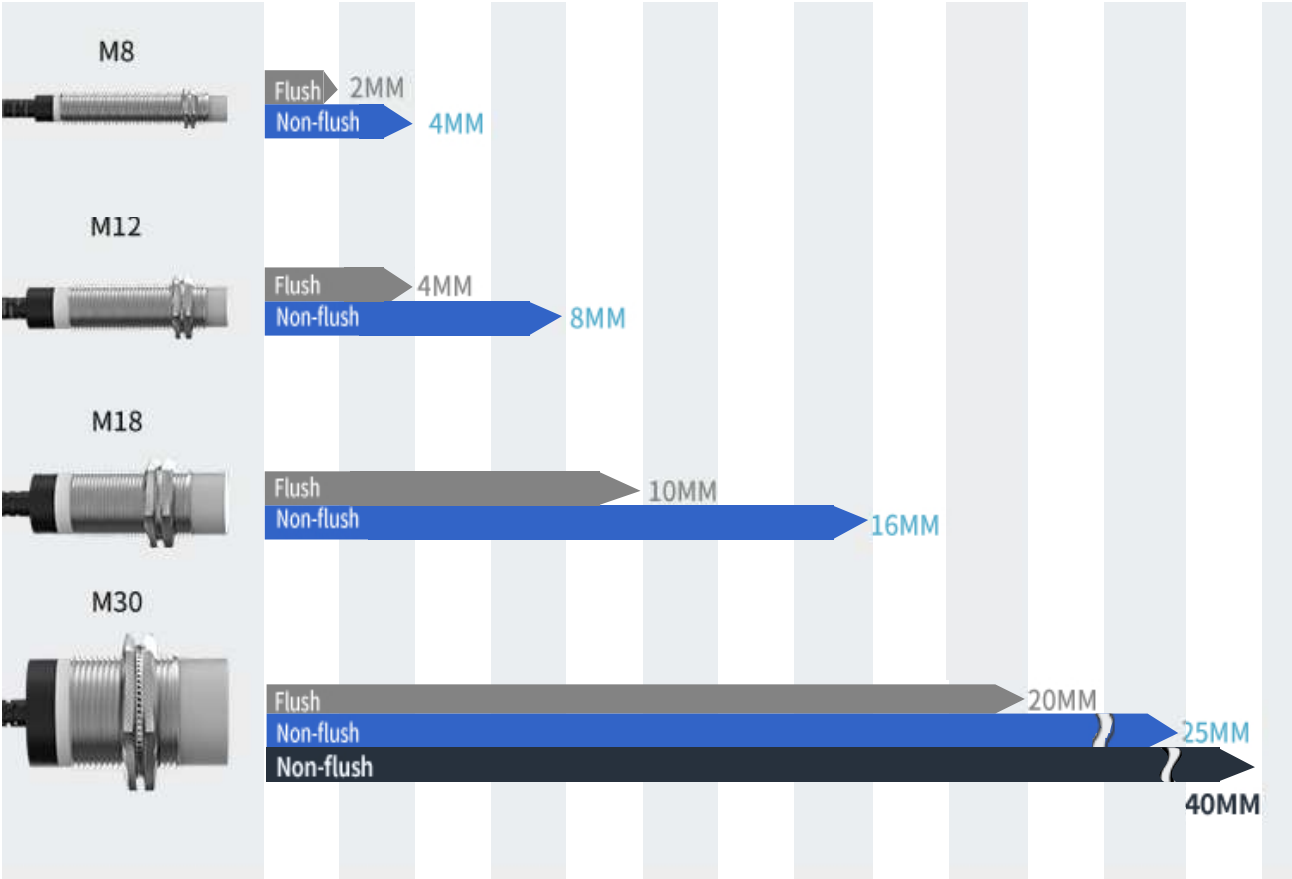
Don't stretch the power line of the proximity switch with a big force.



LR Series Inductive Proximity Sensor Sensing Distance Diagram

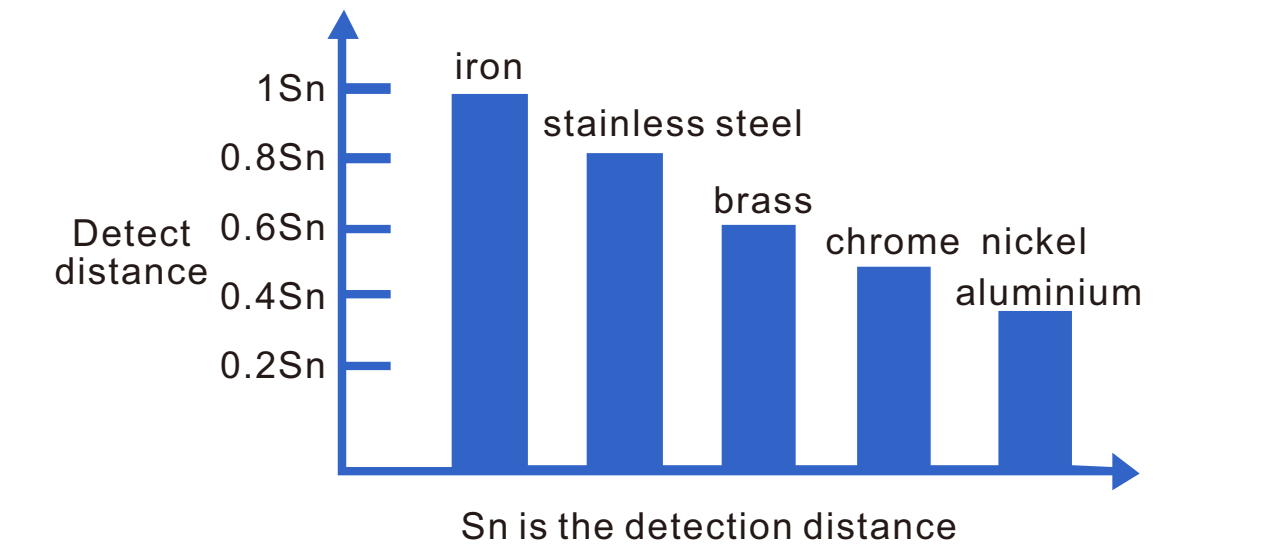


FR Series inductive proximity sensor sensing Distance Diagram



Matters needing attention

When detecting objects of different materials, the actual sensing distance of the proximity switch is different, as shown in the figure below



- ※ Overload short circuit, reverse polarity protection, surge absorption IP67 protection
- ※ It has the advantages of waterproof, oil resistance and high temperature resistance. 360°full surround green LED display
- ※ Working status, more intuitive and obvious



Selection Guide



L	R	12	04	N	1		
①	②	③	④	⑤	⑥	⑦	⑧

①**Model**:L: Inductive、C: Capacitive、M: Reed Magnetic Switch、H: Hall switch、F: long Distance Inductive

②**External structure**:R: Cylindrical、F: Square Type

③**DIA. of sensing side**:Number: DIA. of sensing side (unit:mm)

④**Sensing distance**:Number: Sensing distance (unit:mm)

⑤**Power supply**:N: NPN 10-30VDC 3-wire、P: PNP 10-30VDC 3-wire、D: 10-30VDC 2-wire  
A: 90-250VAC 2-wire

⑥**Control output**:1: Normally open、2: Normally closed

⑦**Connection**:No mark: Cable type、P: Connector type、WP: Cable connector type

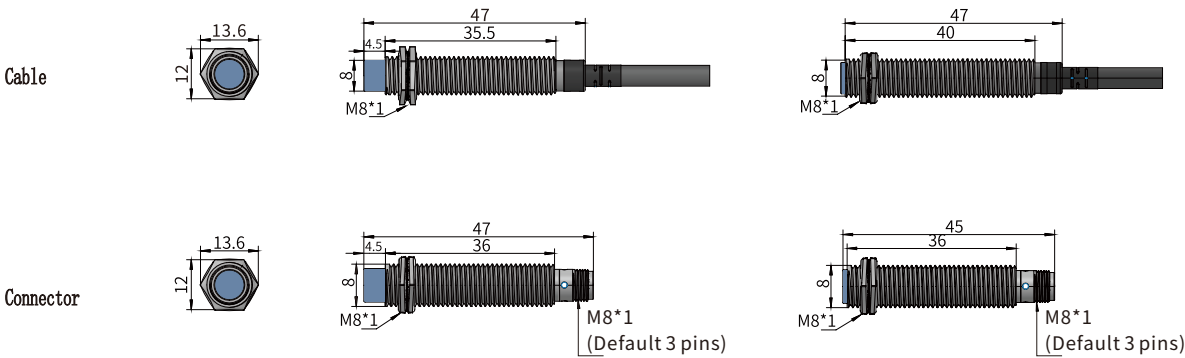
⑧**Tail line length**:No mark:2M Cable number: (unit m)

Specifications



Specifications					
Model	DC 3-wire NPN.NO	LR08-01N1	LR08-02N1	LR08-01N1-P	LR08-02N1-P
	DC 3-wire NPN.NC	LR08-01N2	LR08-02N2	LR08-01N2-P	LR08-02N2-P
	DC 3-wire PNP.NO	LR08-01P1	LR08-02P1	LR08-01P1-P	LR08-02P1-P
	DC 3-wire PNP.NC	LR08-01P2	LR08-02P2	LR08-01P2-P	LR08-02P2-P
	DC 2-wire NO	LR08-01D1	LR08-02D1	LR08-01D1-P	LR08-02D1-P
	DC 2-wire NC	LR08-01D2	LR08-02D2	LR08-01D2-P	LR08-02D2-P
	AC 2-wire NO	LR08-01A1	LR08-02A1	LR08-01A1-P	LR08-02A1-P
	AC 2-wire NC	LR08-01A2	LR08-02A2	LR08-01A2-P	LR08-02A2-P
Mounting		Flush	Non-Flush	Flush	Non-Flush
Sensing distance		1MM±10%	2MM±10%	1MM±10%	2MM±10%
Setting distance(Sa)		0-1MM	0-2MM	0-1MM	0-2MM
Hysteresis		≤10%			
Standard sensing target		12*12*1MM (iron)			
Supply voltage		DC:10-30VDC;AC:90-250V			
Leakage current		≤0.6mA			
Response frequency(F)		500Hz (DC) 25Hz (AC)			
Consunption current		DC3-wireNPNPNP:<10mA;DC2-wire:<3mA;AC2-wire:<2mA			
Load current		200mA			
Voltage drop		≤2.5V			
Circuit protection		Short-circuit,overload,reverse polarity protection			
Output indicator		Green LED			
Ambient temperature		-20~+70℃			
Shock		500m/s(50G) in each X,Y,Z direction for 3 times			
Vibration		1mm amplitudeatfre quenc y10~55Hz(for1min) ineachX.Y Zdirection for 2hours			
Protection degree		IP67(IEC standards)			
Connection		2m PVC cable		M8 connector	
Meterial		Nickel-copper alloy			
Sensing side		PBT			

Dimension



- ※ Overload short circuit, reverse polarity protection, surge absorption IP67 protection
- ※ It has the advantages of waterproof, oil resistance and high temperature resistance. 360°full surround green LED display
- ※ Working status, more intuitive and obvious



Selection Guide

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L	R	12	04	N	1		
①	②	③	④	⑤	⑥	⑦	⑧
① <b>Model</b> :L:Inductive、C:Capacitive、M:Reed Magnetic Switch、H:Hall switch、F:long Distance Inductive							
② <b>External structure</b> :R: Cylindrical、F: Square Type							
③ <b>DIA. of sensing side</b> :Number: DIA. of sensing side (unit:mm)							
④ <b>Sensing distance</b> :Number: Sensing distance (unit:mm)							
⑤ <b>Power supply</b> :N: NPN 10-30VDC 3-wire、P: PNP 10-30VDC 3-wire、D: 10-30VDC 2-wire A: 90-250VAC 2-wire							
⑥ <b>Control output</b> :1: Normally open、2: Normally closed							
⑦ <b>Connection</b> :No mark: Cable type、P: Connector type、WP: Cable connector type							
⑧ <b>Tail line length</b> :No mark:2M Cable number: (unit m)							

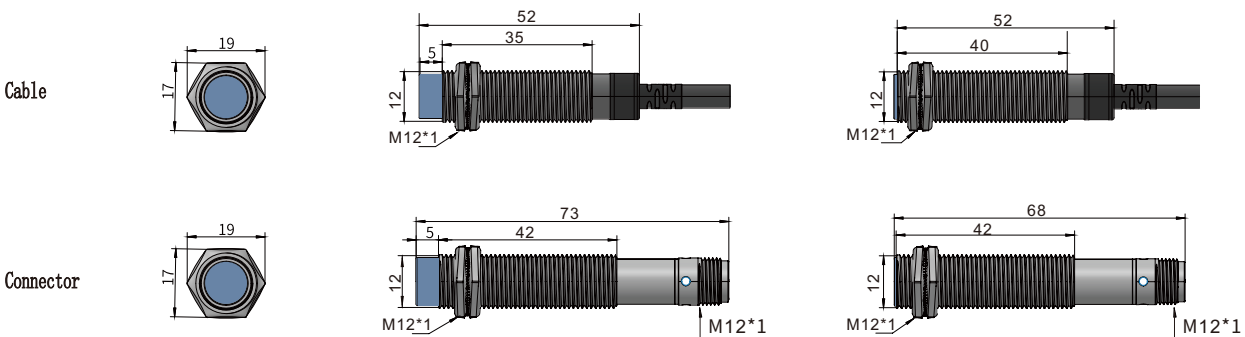
Specifications

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Model	Specifications				
	DC 3-wire NPN.NO	LR12-02N1	LR12-04N1	LR12-02N1-P	LR12-04N1-P
	DC 3-wire NPN.NC	LR12-02N2	LR12-04N2	LR12-02N2-P	LR12-04N2-P
	DC 3-wire PNP.NO	LR12-02P1	LR12-04P1	LR12-02P1-P	LR12-04P1-P
	DC 3-wire PNP.NC	LR12-02P2	LR12-04P2	LR12-02P2-P	LR12-04P2-P
	DC 2-wire NO	LR12-02D1	LR12-04D1	LR12-02D1-P	LR12-04D1-P
	DC 2-wire NC	LR12-02D2	LR12-04D2	LR12-02D2-P	LR12-04D2-P
	AC 2-wire NO	LR12-02A1	LR12-04A1	LR12-02A1-P	LR12-04A1-P
	AC 2-wire NC	LR12-02A2	LR12-04A2	LR12-02A2-P	LR12-04A2-P
Mounting		Flush	Non-Flush	Flush	Non-Flush
Sensing distance		2MM±10%	4MM±10%	2MM±10%	4MM+10%
Setting distance(Sa)		0-1.8MM	0-3.6MM	0-1.8MM	0-3.6MM
Hysteresis		≤10%			
Standard sensing target		12*12*1MM (iron)			
Supply voltage		DC:10-30VDC;AC:90-250V			
Leakage current		≤0.6mA			
Response frequency(F)		500Hz (DC) 25Hz (AC)			
Consumption current		DC 3-wireNPN PNP: ≤10mA; DC 2-wire: ≤3mA; AC 2-wire: ≤2mA			
Load current		200mA			
Voltage drop		≤2.5V			
Circuit protection		Short-circuit,overload,reverse polarity protection			
Output indicator		Green LED			
Ambient temperature		-20~+70°C			
Shock		500m/s(50G) in each X,Y,Z direction for 3 times			
Vibration		1mm amplitudeatfre quency 10~55Hz(for1min) ineachX.Y Zdirection for 2hours			
Protection degree		IP67(IEC standards)			
Connection		2m PVC cable		M12 connector	
Meterial		Nickel-copper alloy			
Sensing side		PBT			

Dimension

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Selection Guide

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L	R	18	05	N	1		
①	②	③	④	⑤	⑥	⑦	⑧

- ①**Model**:L: Inductive、C:Capacitive、M:Reed Magnetic Switch、H:Hall switch、F:long Distance Inductive
- ②**External structure**:R: Cylindrical、F: Square Type
- ③**DIA. of sensing side**:Number: DIA. of sensing side (unit:mm)
- ④**Sensing distance**:Number: Sensing distance (unit:mm)
- ⑤**Power supply**:N: NPN 10-30VDC 3-wire、 P: PNP 10-30VDC 3-wire、 D: 10-30VDC 2-wire  
A: 90-250VAC 2-wire
- ⑥**Control output**:1: Normally open、 2: Normally closed
- ⑦**Connection**:No mark: Cable type、 P: Connector type、 WP: Cable connector type
- ⑧**Tail line length**:No mark:2M Cable number: (unit m)

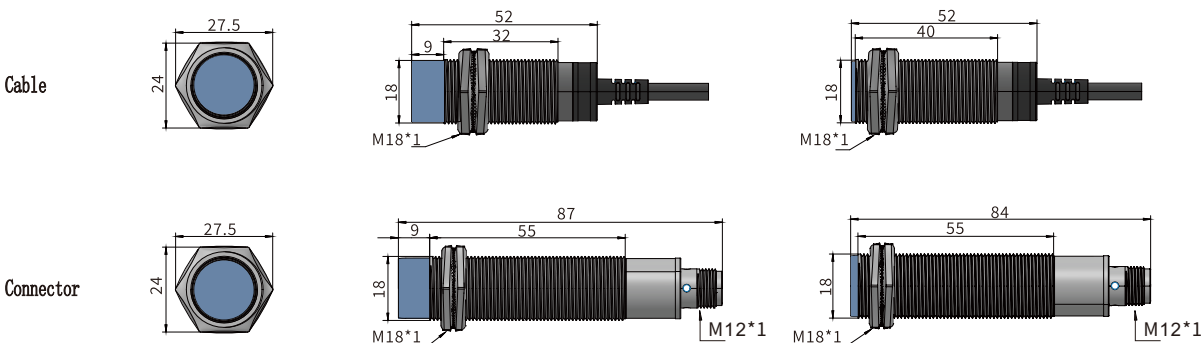
Specifications

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Specifications					
Model	DC 3-wire NPN.NO	LR18-05N1	LR18-08N1	LR18-05N1-P	LR18-08N1-P
	DC 3-wire NPN.NC	LR18-05N2	LR18-08N2	LR18-05N2-P	LR18-08N2-P
	DC 3-wire PNP.NO	LR18-05P1	LR18-08P1	LR18-05P1-P	LR18-08P1-P
	DC 3-wire PNP.NC	LR18-05P2	LR18-08P2	LR18-05P2-P	LR18-08P2-P
	DC 2-wire NO	LR18-05D1	LR18-08D1	LR18-05D1-P	LR18-08D1-P
	DC 2-wire NC	LR18-05D2	LR18-08D2	LR18-05D2-P	LR18-08D2-P
	AC 2-wire NO	LR18-05A1	LR18-08A1	LR18-05A1-P	LR18-08A1-P
	AC 2-wire NC	LR18-05A2	LR18-08A2	LR18-05A2-P	LR18-08A2-P
Mounting		Flush	Non-Flush	Flush	Non-Flush
Sensing distance		5MM±10%	8MM±10%	5MM±10%	8MM±10%
Setting distance(Sa)		0-4.5MM	0-7.2MM	0-4.5MM	0-7.2MM
Hysteresis		≤10%			
Standard sensing target		18*18*1MM (iron)			
Supply voltage		DC:10-30VDC;AC:90-250V			
Leakage current		≤0.6mA			
Response frequency(F)		500Hz (DC) 25Hz (AC)			
Consumption current		DC 3-wireNPN PNP: ≤10mA; DC 2-wire: ≤3mA; AC 2-wire: ≤2mA			
Load current		200mA			
Voltage drop		≤2.5V			
Circuit protection		Short-circuit,overload,reverse polarity protection			
Output indicator		Green LED			
Ambient temperature		-20~+70℃			
Shock		500m/s(50G) in each X,Y,Z direction for 3 times			
Vibration		1mm amplitudeatfre quency 10~55Hz(for1min) ineachX.Y Zdirection for 2hours			
Protection degree		IP67(IEC standards)			
Connection		2m PVC cable		M12 connector	
Meterial		Nickel-copper alloy			
Sensing side		PBT			

Dimension

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- ※ Overload short circuit, reverse polarity protection, surge absorption IP67 protection
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① <b>Model</b> :L:Inductive、C:Capacitive、M:Reed Magnetic Switch、H:Hall switch、F:long Distance Inductive							
② <b>External structure</b> : R: Cylindrical、F: Square Type							
③ <b>DIA. of sensing side</b> :Number: DIA. of sensing side (unit:mm)							
④ <b>Sensing distance</b> :Number: Sensing distance (unit:mm)							
⑤ <b>Power supply</b> :N: NPN 10-30VDC 3-wire、P: PNP 10-30VDC 3-wire、D: 10-30VDC 2-wire A: 90-250VAC 2-wire							
⑥ <b>Control output</b> :1: Normally open、2: Normally closed							
⑦ <b>Connection</b> :No mark: Cable type、P: Connector type、WP: Cable connector type							
⑧ <b>Tail line length</b> :No mark:2M Cable number: (unit m)							

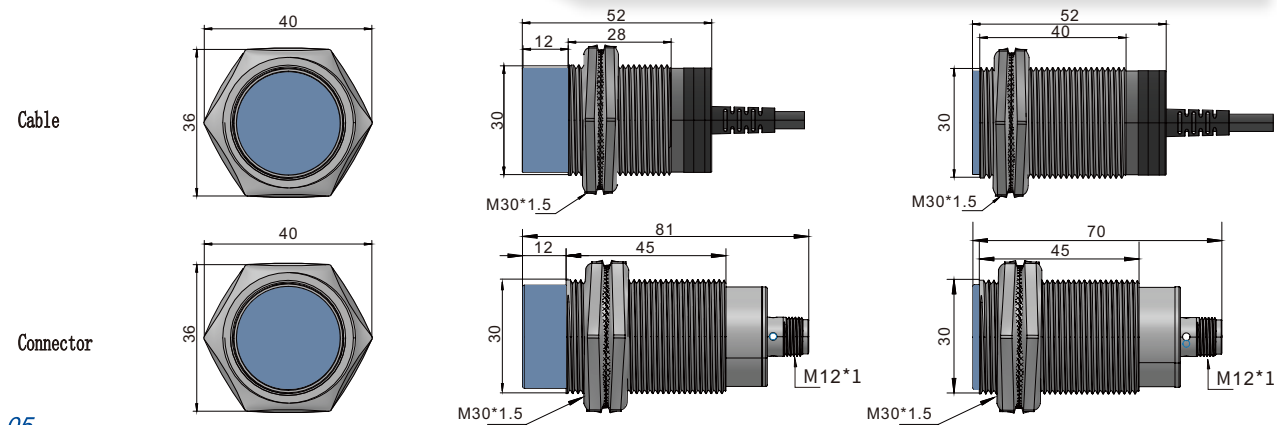
Specifications

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Specifications					
Model	DC 3-wire NPN.NO	LR30-10N1	LR30-15N1	LR30-10N1-P	LR30-15N1-P
	DC 3-wire NPN.NC	LR30-10N2	LR30-15N2	LR30-10N2-P	LR30-15N2-P
	DC 3-wire PNP.NO	LR30-10P1	LR30-15P1	LR30-10P1-P	LR30-15P1-P
	DC 3-wire PNP.NC	LR30-10P2	LR30-15P2	LR30-10P2-P	LR30-15P2-P
	DC 2-wire NO	LR30-10D1	LR30-15D1	LR30-10D1-P	LR30-15D1-P
	DC 2-wire NC	LR30-10D2	LR30-15D2	LR30-10D2-P	LR30-15D2-P
	AC 2-wire NO	LR30-10A1	LR30-15A1	LR30-10A1-P	LR30-15A1-P
	AC 2-wire NC	LR30-10A2	LR30-15A2	LR30-10A2-P	LR30-15A2-P
Mounting		Flush	Non-Flush	Flush	Non-Flush
Sensing distance		10MM±10%	15MM±10%	10MM±10%	15MM±10%
Setting distance(Sa)		0-9MM	0-13.5MM	0-9MM	0-13.5MM
Hysteresis		≤10%			
Standard sensing target		30*30*1MM(iron)			
Supply voltage		DC:10-30VDC;AC:90-250V			
Leakage current		≤0.6mA			
Response frequency(F)		500Hz(DC) 25Hz(AC)			
Consunption current		DC 3-wireNPN PNP: ≤10mA; DC 2-wire: ≤3mA; AC 2-wire: ≤2mA			
Load current		200mA			
Voltage drop		≤2.5V			
Circuit protection		Short-circuit,overload,reverse polarity protection			
Output indicator		Green LED			
Ambient temperature		-20~+70°C			
Shock		500m/s(50G) in each X,Y,Z direction for 3 times			
Vibration		1mm amplitudeatfre quency 10~55Hz(for1min) ineachX.Y Zdirection for 2hours			
Protection degree		IP67(IEC standards)			
Connection		2m PVC cable		M12 connector	
Meterial		Nickel-copper alloy			
Sensing side		PBT			

Dimension

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