Inductive type proximity sensor

UP ☑ Round ☐ Square type

INSTRUCTION MANUAL

Thank you for purchasing HANYOUNG product.
Please check whether the product is the exactly same as you ordered.
Before using the product, please read this instruction manual carefully.
Please keep this manual where you can view at any time

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Safety information

Before using the product, please read the safety information thoroughly and use it properly.
Alerts declared in the manual are classified to Danger, Warning and Caution by their criticality

⚠ DANGER	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury
⚠ WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury
⚠ CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury

⚠ WARNING

- If the user use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
- If there is a possibility of an accident caused by errors or malfunctions of this product, install external protection circuit to prevent the accident.

⚠ CAUTION

- Pay attention that it is possible to damage a proximity sensor by a short circuit when wiring load.
- Wiring to an applicable device shall be certainly connected by using compressing terminals or soldering.
- Do not use PNP type or NPN type indiscriminately.
- Please wire after ensuring whether input conditions are accepted to an applicable device.
- When there is a power or high voltage line close to the cord of the proximity sensor, wire the cord with shielding such as an independent metal conduit to prevent against proximity sensor's damage or malfunction.
- Although the proximity sensor has a surge absorption circuit, if there is any machine that has a large surging one (e.g., a motor, welding machine, etc) near the proximity sensor, connect a varistor, surge absorber, noise filter to a surge generating area.
- Effect of Consumption Current : When AC type of proximity sensor is OFF, the proximity sensor has little consumption current for an operation of the circuit. Because of this fact, the little voltage left in the load may be a cause of load reset defective, so please make sure this voltage is less than the load reset voltage before using.
- In case of a load current is small : When a loaded current of AC type of proximity sensor is less than 5 mA, wire a bleeder resistor with the load in parallel so that make the residual voltage of the proximity sensor be less than the loaded reset voltage.
- Make the ripple content of the rated voltage which supplied into DC (NPN, PNP) type of proximity sensor be less than the maximum ± 10 % of the ripple content.
- In case of using a condenser as a load, wire a current-limiting resistor in series so that set the peak current shall be within the loaded current of the proximity sensor.
- In case of an inductive load (e.g., a motor, relay, magnet, etc), connect the load with surge bsorbing diode in parallel.
- Pay attention at a position of attachment, divergence, slack and distortion of a sensing surface or proximity sensor.
- In the place of possibly occurring metal particles, make sure whether a sensing distance is properly working since it can be affected if metal particles stick to the sensing surface.
- Pay attention on using or storing the proximity sensor outdoors.
- Do not use the proximity sensor in an environment with chemical, solvent or corrosive.
- Please avoid as much as possible to put the proximity sensor in hot water or to use them in a place where generates high pressure steam.
- The contents of this manual may be changed without prior notification.
- The maximum cable extension length shall be within 200 m.

Suffix code

Model	Code						Description
UP	□-	□	□	□	□	□	Inductive type proximity sensor
Sensing area size	8						M8
	12						M12
	18						M18
	30						M30
Structure type		RM					Round type shield
		RD					Round type None shield
		RLM					Long round type shield (M8 and M12 are excluded)
		RLD					Long round type None shield (M8 and M12 are excluded)
Sensing distance			*				Sensing distance(㎜)
Power supply and output				N			NPN type ※ Green body, (NO,NC)
				P			PNP type ※ Purple body, (NO,NC)
				A			A.C 2 wire type(NO : Green, NC : Purple)
				T			D.C 2 wire type(Polarity), (NO : Green, NC : Purple)
				U			D.C 2 wire type(No polarity), (NO : Green, NC : Purple)
Output type					A		Normal open (NO)
					C		Normal close (NC)
Connection structure						*	No indication (Cable type)
						CR	Relay connector type
						C	Connector type

※ M8(Ø8) is only available with the cable type

Specification

■ D.C NPN / PNP type

Model	UP 8RM-1.5 □□ UP 8RD-2 □□	UP 12RM-2 □□ UP 12RD-4 □□	UP 18RM-5 □□ UP 18RD-8 □□ UP 18RLM-5 □□ UP 18RLD-8 □□	UP 30RM-10 □□ UP 30RD-15 □□ UP 30RLM-10 □□ UP 30RLD-15 □□
Snesing distance	1.5㎜, 2㎜	2㎜, 4㎜	5㎜, 8㎜, 5㎜, 8㎜	10㎜, 15㎜, 10㎜, 15㎜
Setting distance	0-1.2㎜, 0-1.6㎜	0-1.6㎜, 0-3.2㎜	0-4㎜, 0-6.4㎜ 0-4㎜, 0-6.4㎜	0-8㎜, 0-12㎜ 0-8㎜, 0-12㎜
Response frequency	800 ㎐	800, 400 ㎐	350, 200, 350, 200 ㎐	250, 100, 250, 100 ㎐
Standard sensing object (㎜)	Iron 8×8×1	Iron 12×12×1	Iron 18×18×1 Iron 25×25×1 Iron 18×18×1 Iron 25×25×1	Iron 30×30×1 Iron 45×45×1 Iron 30×30×1 Iron 45×45×1
Hysteresis	Less than 10 % of sensing distance			
Power supply voltage	12V - 24V d.c (5-35V d.c)			
Control output	Resistive load : 200 ㎃ max			
Residual voltage	1.5 V max			
Current consumption	6 ㎃ max			
Operation indication	Red LED			
Protective circuit	Power reversely connected protective circuit, surge protective circuit and over current protective circuit are built in.			
Ambient temperature	-25 ~ 70 °C (Less than ±10 % of sensing distance at temperature 20 °C)			
Ambient humidity	35 ~ 85 % R.H.			
Degree of protection	IP67 (IEC standard)			
Vibration resistance	10 - 55 ㎐ (cycle 1 min, double amplitude : 1.5 ㎜ 2 hours for each of X, Y and Z directions			
Dielectric strength	For 1 min at 2000 V a.c 50/60 ㎐ (between the recharging part and case)			
Shock resistance	500 ㎨ 3 times to each, X, Y and Z directions			
Insulation resistance	50 ㏁ min (500 V d.c mega standard)			
Material	CASE : Brass (Chrome plating), Sensing surface : PBT 8R CASE : Stainless, Sensing surface : PBT			

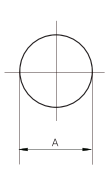
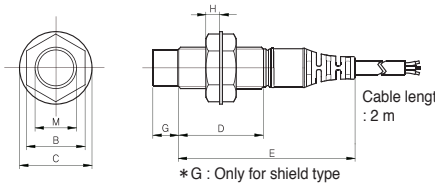
■ D.C 2wire type

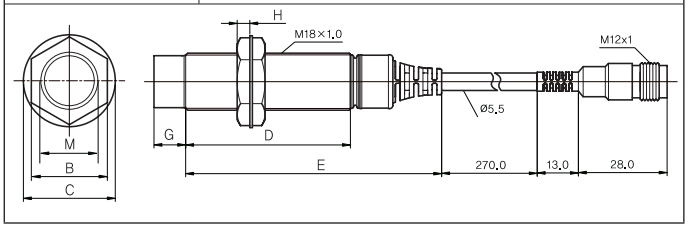
Model	UP 8RM-1.5 □□ UP 8RD-2 □□	UP 12RM-2 □□ UP 12RD-4 □□	UP 18RM-5 □□ UP 18RD-8 □□ UP 18RLM-5 □□ UP 18RLD-8 □□	UP 30RM-10 □□ UP 30RD-15 □□ UP 30RLM-10 □□ UP 30RLD-15 □□
Snesing distance	1.5㎜, 2㎜	2㎜, 4㎜	5㎜, 8㎜	10㎜, 15㎜, 10㎜, 15㎜
Setting distance	0-1.2㎜, 0-1.6㎜	0-1.6㎜, 0-3.2㎜	0-4㎜, 0-6.4㎜	0-8㎜, 0-12㎜ 0-8㎜, 0-12㎜
Response frequency	800 ㎐	800, 400 ㎐	800, 400 ㎐	250, 100, 250, 100 ㎐
Standard sensing object (㎜)	Iron 8×8×1	Iron 12×12×1	Iron 18×18×1 Iron 25×25×1	Iron 30×30×1 Iron 45×45×1 Iron 30×30×1 Iron 45×45×1
Hysteresis	Less than 10 % of sensing distance			
Power supply voltage	12V-24V d.c (10-30V d.c)			
Control output	Resistive load : 100 ㎃ max			
Residual voltage	T(Polarity) : max 3.5 V, U(No polarity) : 5 V max			
Current consumption	1 ㎃ max			
Operation indication	Red LED			
Protective circuit	surge protective circuit and over current protective circuit are built in.			
Ambient temperature	-25 ~ 70 °C (Less than ±10 % of sensing distance at temperature 20 °C)			
Ambient humidity	35 ~ 85 % R.H.			
Degree of protection	IP67 (IEC standard)			
Vibration resistance	10 - 55 ㎐ (cycle 1 min, double amplitude : 1.5 ㎜ 2 hours for each of X, Y and Z directions			
Dielectric strength	For 1 min at 2000 V a.c 50/60 ㎐ (between the recharging part and case)			
Shock resistance	500 ㎨ 3 times to each, X, Y and Z directions			
Insulation resistance	50 ㏁ min (500 V d.c mega standard)			
Material	12R, 18R, 30R CASE : Brass (Chrome Plating), Sensing surface : PBT 8R CASE : Stainless, Sensing surface : PBT			

■ A.C 2wire Type

Model	UP 12RM-2A □ UP 12RD-4A □	UP 18RM-5A □ UP 18RD-8A □ UP 18RLM-5A □ UP 18RLD-8A □	UP 30RM-10A □ UP 30RD-15A □ UP 30RLM-10A □ UP 30RLD-15A □
Snesing distance	2㎜, 4㎜	5㎜, 8㎜, 5㎜, 8㎜	10㎜, 15㎜, 10㎜, 15㎜
Setting distance	0-1.6㎜, 0-3.2㎜	0-4㎜, 0-6.4㎜ 0-4㎜, 0-6.4㎜	0-8㎜, 0-12㎜ 0-8㎜, 0-12㎜
Response frequency	20 ㎐		
Standard sensing object (㎜)	Iron 12×12×1	Iron 18×18×1 Iron 25×25×1 Iron 18×18×1 Iron 25×25×1	Iron 30×30×1 Iron 45×45×1 Iron 30×30×1 Iron 45×45×1
Hysteresis	Less than 10 % of sensing distance		
Power supply voltage	100V - 240V a.c (90V - 250V a.c)		
Control output	Resistive load : 200 ㎃ max		
Residual voltage	10 V a.c max		
Current consumption	2.2 ㎃ max		
Operation indication	Red LED		
Protective circuit	surge protective circuit built in.		
Ambient temperature	-25 ~ 70 °C (Less than ±10 % of sensing distance at temperature 20 °C)		
Ambient humidity	35 ~ 85 % R.H.		
Degree of protection	IP67 (IEC standard)		
Vibration resistance	10 - 55 ㎐ (cycle 1 min, double amplitude : 1.5 ㎜ 2 hours for each of X, Y and Z directions		
Dielectric strength	For 1 min at 2000 V a.c 50/60 ㎐ (between the recharging part and case)		
Shock resistance	500 ㎨ 3 times to each, X, Y and Z directions		
Insulation resistance	50 ㏁ min (500 V d.c mega standard)		
Material	CASE : PBT resin		

Dimension

Installation hole panel cutout	Dimension
	



■ D.C NPN/PNP/2wire Type

[Unit : mm]

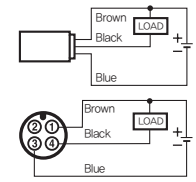
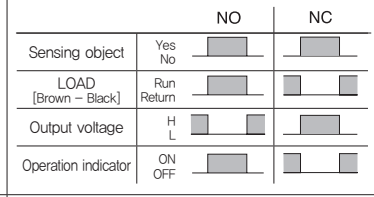
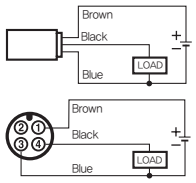
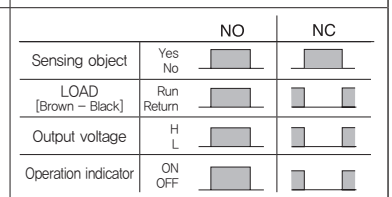
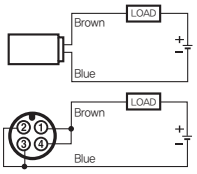
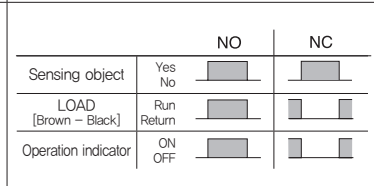
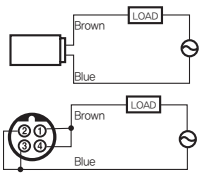
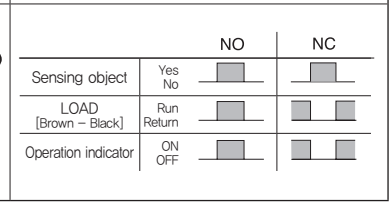
Model	M	A	B	C	D	E	G	H
UP 8RM-1.5 □□	8	9	13	15	33	-	-	3.4
UP 8RD-2 □□	8	9	13	15	29	-	4	3.4
UP 12RM-2 □□	12	13	17	21	32	59	-	3
UP 12RD-4 □□	12	13	17	21	24.5	51.5	7.5	3
UP 18RM-5 □□	18	19	24	29	29	57.8	-	4
UP 18RD-8 □□	18	19	24	29	19	47.8	10	4
UP 18RLM-5 □□	18	19	24	29	62	90.8	-	4
UP 18RLD-8 □□	18	19	24	29	52	80.8	10	4
UP 30RM-10 □□	30	31	35	43	38	66.8	-	5
UP 30RD-15 □□	30	31	35	43	28	56.8	10	5
UP 30RLM-10 □□	30	31	35	43	60	88.8	-	5
UP30RLD-15 □□	30	31	35	43	50	78.8	10	5

■ A.C 2wire Type

[Unit : mm]

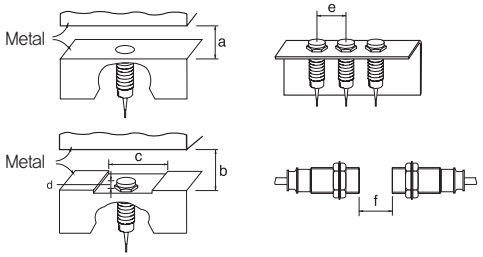
Model	M	A	B	C	D	E	G	H
UP 12RM-2A □	12	13	17	21	49	76	-	3
UP 12RD-4A □	12	13	17	21	42	68.5	7.5	3
UP 18RM-5A □	18	19	24	29	36	64.8	-	4
UP 18RD-8A □	18	19	24	29	26	54.8	10	4
UP 18RLM-5A □	18	19	24	29	62	90.8	-	4
UP 18RLD-8A □	18	19	24	29	52	80.8	10	4
UP 30RM-10A □	30	31	35	43	38	66.8	-	5
UP 30RD-15A □	30	31	35	43	28	56.8	10	5
UP 30RLM-10A □	30	31	35	43	60	88.8	-	5
UP 30RLD-15A □	30	31	35	43	50	78.8	10	5
UP 30RLM-10A □	30	31	35	43	60	88.8	-	5
UP30RLD-15A □	30	31	35	43	50	78.8	10	5

Connection diagram

Type		Connection method	Output state
D.C open / close	N P N		
	P N P		
	2 Wire		
A.C open / close			

Mutual interference and effects of surrounding metals

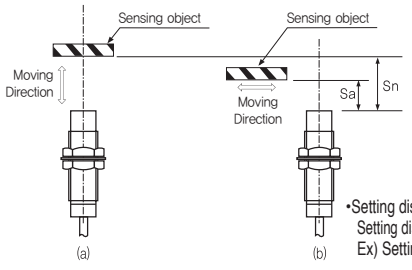
• When attaching more than 1 proximity sensors in parallel direction or facing each other, it can cause the malfunction. When there are metals around the proximity sensor, it can cause malfunctions such as abnormal return due to the existence of metals around the proximity sensor. In order to avoid the malfunction which caused by surrounding metals, please install it with sufficient gap from each other. (Wider than the values written in below chart)



[Unit : mm]

List \ Model	UP8RM-1.5	UP8RD-2	UP12RM-2	UP12RD-4	UP18RM-5	UP18RD-8	UP30RM-10	UP30RD-15
a	4.5	—	6	—	15	—	30	—
b	—	6	—	12	—	24	—	54
c	8	24	12	36	18	54	30	90
d	0	8	0	11	0	14	0	15
e	16	24	24	36	36	54	60	90
f	9	12	12	24	30	48	60	60

How to set distance



Sn : Sensing distance
Sa : Setting distance
(80 % of Sn)

•Setting distance(Sa)Computing Equation :
Setting distance (Sa) = Sensing distance(Sn) x 80 %
Ex) Setting distance(Sa) = 10 ㎜ x 0.8 = 8 ㎜

• When a proximity sensor is operating as a sensing object is approaching, a distance between the sensing surface and the sensing object is the operating distance of the proximity sensor.
• After measuring a maximum value of a perpendicular direction of a sensing object, install it within 80 %.
• When testing a sensing distance of a proximity sensor, a standard sensing object was used so a sensing distance can be varied by its shape, form or material. Please, consider these facts.