Inductive Proximity Sensor
Round Type

INSTRUCTION MANUAL

We appreciate you for purchasing HanYoung NUX Co.,Ltd product. Before using the product you have purchased, check to make sure that it is exactly what you ordered. Then, please use it following the instructions below.

MAIN PRODUCTS
- DIGITAL : Temperature Controller, Counter, Timer,Speedmeter, Tachometer, Panel Meter, Recorder
- SENSOR : Proximity Sensor/Photo Electric Sensor, Rotary Encoder, Optical Fiber Sensor, Pressure Sensor
- ANALOG : Timer, Temperature Controller

HANYOUNG

HEAD OFFICE
1381-3, Juan-Dong, Nam-Gu Incheon, Korea
TEL: (82-32)876-4697 FAX : (82-32)876-4696

■ Safety information

Before you use, read safety precautions carefully, and use this product properly. The precautions described in this manual contains important contents related with safety; therefore, please follow the instructions ,accordingly. The precautions are composed of DANGER, WARNING and CAUTION.

⚠ DANGER
Do not touch or contact the input/output terminals because they may cause electric shock.

⚠ WARNING
Since this product is not designed as a safely used device the user must install double safety equipment when this product is used for equipment with possible fatal accident or large property damage.

⚠ CAUTION
1. Pay attention that it is possible to damage a proximity sensor by a short circuit when wiring load.
2. Wiring to an applicable device shall be certainly connected by using compressing terminals or soldering.
3. Do not use PNP type or NPN type indiscriminately.
4. Please wire after ensuring whether input conditions are accepted to an applicable device.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.
10. 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.
11. In case of an inductive load (e.g., a motor, relay, magnet, etc), connect the load with surge absorbing diode in parallel.
12. Pay attention at a position of attachment, divergence, slack and distortion of a sensing surface or proximity sensor.
13. 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.
14. Pay attention on using or storing the proximity sensor outdoors.
15. Do not use the proximity sensor in an environment with chemical, solvent or corrosive.
16. 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.
17. The contents of this manual may be changed without prior notification.
※ If you do not follow the contents described in the safety information then it is possible to be a cause of the product's malfunction so please follow them.
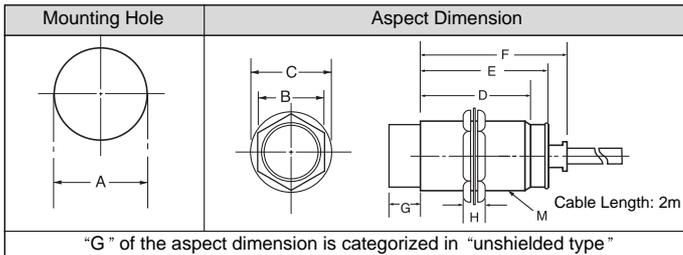
■ Ratings

Type	DC Power Source Type				2-WIRE DC Power Source Type			AC Power Source TYPE		
Model Name	HYP-8R1.5 □□ HYP-8R2 □□	HYP-12R2 □□ HYP-12R4 □□	HYP-18R5 □□ HYP-18R8 □□ HYP-18RL5 □□ HYP-18RL8 □□	HYP-30R10 □□ HYP-30R15 □□ HYP-30RL10 □□ HYP-30RL15 □□	HYP-12R2T □ HYP-12R4T □	HYP-18R5T □ HYP-18R8T □ HYP-18RL5T □ HYP-18RL8T □	HYP-30R10T □ HYP-30R15T □ HYP-30RL10T □ HYP-30RL15T □	HYP-12R2A □ HYP-12R4A □	HYP-18R5A □ HYP-18R8A □ HYP-18RL5A □ HYP-18RL8A □	HYP-30R10A □ HYP-30R15A □ HYP-30RL10A □ HYP-30RL15A □
Sensing Distance	1.5 mm 2 mm	2 mm 4 mm	5 mm 8 mm 5 mm 8 mm	10 mm 15 mm 10 mm 15 mm	2 mm 4 mm	5 mm 8 mm 5 mm 8 mm	10 mm 15 mm 10 mm 15 mm	2 mm 4 mm	5 mm 8 mm 5 mm 8 mm	10 mm 15 mm 10 mm 15 mm
Setting Distance	0 - 1.2 mm 0 - 1.6 mm	0 - 1.6 mm 0 - 3.2 mm	0 - 4.0 mm 0 - 6.4 mm 0 - 4.0 mm 0 - 6.4 mm	0 - 8.0 mm 0 - 12.0 mm 0 - 8.0 mm 0 - 12.0 mm	0 - 1.6 mm 0 - 3.2 mm	0 - 4.0 mm 0 - 6.4 mm 0 - 4.0 mm 0 - 6.4 mm	0 - 8.0 mm 0 - 12.0 mm 0 - 8.0 mm 0 - 12.0 mm	0 - 1.6 mm 0 - 3.2 mm	0 - 4.0 mm 0 - 6.4 mm	0 - 8.0 mm 0 - 12.0 mm 0 - 8.0 mm 0 - 12.0 mm
Response Frequency	800 Hz	800 Hz 400 Hz	350 Hz 200 Hz 350 Hz 200 Hz	250 Hz 100 Hz 250 Hz 100 Hz	800 Hz 400 Hz	350 Hz 200 Hz 350 Hz 200 Hz	250 Hz 100 Hz 250 Hz 100 Hz	20 Hz		
Standard Sensing Target (mm)	Iron 8 $\times$8 $\times$1	Iron 12 $\times$12 $\times$1	Iron 18 $\times$18 $\times$1 Iron 25 $\times$25 $\times$1 Iron 18 $\times$18 $\times$1 Iron 25 $\times$25 $\times$1	Iron 30 $\times$30 $\times$1 Iron 45 $\times$45 $\times$1 Iron 30 $\times$30 $\times$1 Iron 45 $\times$45 $\times$1	Iron 12 $\times$12 $\times$ 1	Iron 18 $\times$18 $\times$1 Iron 25 $\times$25 $\times$1 Iron 18 $\times$18 $\times$1 Iron 25 $\times$25 $\times$1	Iron 30 $\times$30 $\times$1 Iron 45 $\times$45 $\times$1 Iron 30 $\times$30 $\times$1 Iron 45 $\times$45 $\times$1	Iron 12 $\times$12 $\times$1	Iron 18 $\times$18 $\times$1 Iron 25 $\times$25 $\times$1 Iron 18 $\times$18 $\times$1 Iron 25 $\times$25 $\times$1	Iron 30 $\times$30 $\times$1 Iron 45 $\times$45 $\times$1 Iron 30 $\times$30 $\times$1 Iron 45 $\times$45 $\times$1
Hysteresis	Max 10 % of Sensing distance									
Rated Voltage	12 ~ 24 V DC (± 10 %)				24 V DC (± 10 %)			100 ~ 240 V AC (Rated Voltage ± 10 %)		
Control Output	Resistive Loaded Current: below Max. 200 mA, Inductive Loaded Current: below Max. 100 mA				Resistive Loaded Current: below Max. 50 mA, Inductive Loaded Current: below Max. 25 mA			Loaded Current: below Maximum 200 mA		
Residual Voltage	Below 1.5 V	Below 1 V (Using Rated Voltage : 24 V DC, Resistive Load:Max. 200 mA)			Below 7 V (Using Rated Voltage : 24 V DC, Resistive Load : Max. 50 mA)			Below 20 V DC		
Leakage Current in Output	Below 0.5 mA (Using Rated Voltage : 12 V DC)				Below 1 mA (Using Rated Voltage : 12 V DC)			Below 2.2 mA		
Operation Indicator	Red LED									
Protection Circuit	Within Circuit Protection from reversed power supply connection, Surge Protection Circuit, Overcurrent circuit protection (Except HYP-8R)							Within Surge Protection Circuit		
Operating Ambient Temperature	Operating: -25 ~ +70 ℃ (below ± 10 % for sensing distance at 20 ℃)									
Operating Ambient Humidity	35 ~ 85 % R.H (without condensation)									
Case Protection	IP67 (IEC Standard)									
Vibration Resistance	10 ~55 Hz (for 1 minute cycle), double amplitude width: 1.5 mm, in each direction of X·Y·Z for 2 hours									
Dielectric Strength	1000 V AC (at 50/60 Hz for 1 minute between current carry part and case)							2000 V AC (at 50/60 Hz for 2 minute between current carry part and case)		
Shock Resistance	500 m/s^2 (approx. 50 G), in each direction of X · Y · Z for 3 times									
Insulation Resistance	Above 50 MΩ (500 V DC) between current carry part and case									
Material	Case: brass (Cr (Chrome) Chromium plating), Sensing surface: PBT resin									

■ Model Name and Suffix Code Structure

MODEL	Suffix Code						Description
HYP	□	□	□	□	□	□	Inductive Proximity Sensor
Side of Sensing Surface	8						8 mm(Also, Available:12,18, 30 mm)
Sensor Shape		R					Standard Round Case Type
		RL					Long Round Case Type
Sensing Distance			1.5				1.5 mm(Also, available:2, 4, 5, 8, 10, 15 mm)
Output Type				N			NPN Type
				P			PNP Type
				A			AC 2 Wrie Type
				T			DC 2 Wire Type
					A		Normal Open Type
					C		Normal Close Type
Wiring Type						C	Connector
						CR	Relay Connector

■ Aspect Dimension

Unit: mm

Mounting Hole	Aspect Dimension
	Cable Length: 2m

"G" of the aspect dimension is categorized in "unshielded type"

■ DC Switching

Suffix Code	M	A	B	C	D	E	F	G	H
HYP-8R1.5 □□	8	9	13	15	33	-	-	-	3.4
HYP-8R2 □□	8	9	13	15	29	-	-	4	3.4
HYP-12R2 □□	12	13	17	21	32	42.8	-	-	4
HYP-12R4 □□	12	13	17	21	24.5	35.3	-	7.5	4
HYP-18R5 □□	18	19	23	29	29	40.5	47	-	4
HYP-18R8 □□	18	19	23	29	19	30.5	37	10	4
HYP-18RL5 □□	18	19	23	29	62	73.5	80	-	4
HYP-18RL8 □□	18	19	23	29	52	63.5	70	10	4
HYP-30R10 □□	30	31	35	41	38	50	57.8	-	5
HYP-30R15 □□	30	31	35	41	28	40	47.8	10	5
HYP-30RL10 □□	30	31	35	41	60	72	79.8	-	5
HYP-30RL15 □□	30	31	35	41	50	62	69.8	10	5

■ AC Switching

Suffix Code	M	A	B	C	D	E	F	G	H
HYP-12R2 □□	12	13	17	21	49	59.8	-	-	4
HYP-12R4 □□	12	13	17	21	42	52.8	-	7.5	4
HYP-18R5 □□	18	19	23	29	36	47.5	54	-	4
HYP-18R8 □□	18	19	23	29	26	37.5	44	10	4
HYP-18RL5 □□	18	19	23	29	62	73.5	80	-	4
HYP-18RL8 □□	18	19	23	29	52	63.5	70	10	4
HYP-30R10 □□	30	31	35	41	38	50	57.8	-	5
HYP-30R15 □□	30	31	35	41	28	40	47.8	10	5
HYP-30RL10 □□	30	31	35	41	60	72	79.8	-	5
HYP-30RL15 □□	30	31	35	41	50	62	69.8	10	5
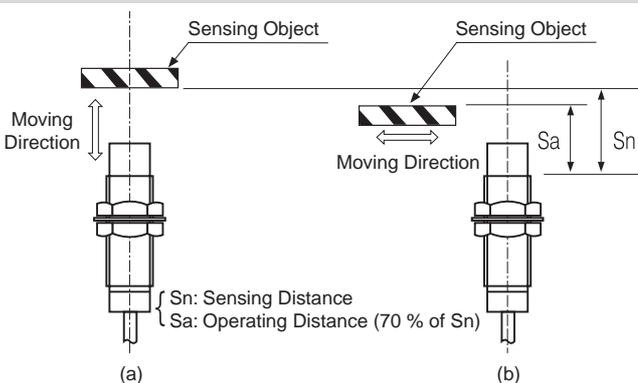
■ Wiring Method

		Wiring Method	Load Operation		
DC Switching	NPN	Brown (Red) / Load / Black (White) / Blue (Black)		NO	NC
			Sensing Object	Presence / Nothing	
			Load [Brown (Red) - Black (White)]	Operation / Reset	
			Output Voltage [Black (White) - Blue (Black)]	H / L	
			Operation Indicator	ON / OFF	
	PNP	Brown (Red) / Black (White) / Load / Blue (Black)		NO	NC
			Sensing Object	Presence / Nothing	
			Load [Black (White) - Blue (Black)]	Operation / Reset	
			Output Voltage [Brown (Red) - Black (White)]	H / L	
			Operation Indicator	ON / OFF	
2 Wire Type		Load / Brown (Red) / Blue (Black)		NO	NC
			Sensing Object	Presence / Nothing	
			Load	Operation / Reset	
			Operation Indicator	ON / OFF	
AC Switching		Load / Brown (White) / Blue (Black)		NO	NC
			Sensing Object	Presence / Nothing	
			Load	Operation / Reset	
			Operation Indicator	ON / OFF	

■ Mutual Interference and Effects of Surrounding Object

· When installing multiple (more than 2) sensors to be face to face which is drawn the below or to be attached in parallel, it can be a cause of malfunction by frequency interference and if there is metal around proximity sensor then it is possible to occur malfunction such as reset defective and others so please ensure the minimum distance is more than the value shown in the table.
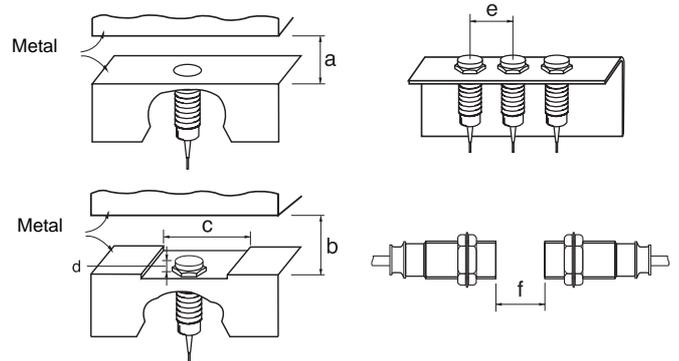
MODEL \ Item	HYP-8R1.5	HYP-8R2	HYP-12R2	HYP-12R4	HYP-18R □5	HYP-18R □8	HYP-30R □10	HYP-30R15
a	4.5	-	6	-	15	-	30	-
b	-	6	-	12	-	24	-	54
c	8	24	12	36	18	54	30	90
d	0	8	0	11	0	14	0	15
e	16	24	24	36	36	54	60	90
f	9	12	12	24	30	48	60	90

■ How to Set Distance

Sn: Sensing Distance
Sa: Operating Distance (70 % of Sn)

(a) (b)

· Operating Distance of Proximity Sensor :
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.
· Deciding Operating Distance
After measuring a maximum value of a perpendicular direction of a sensing object, install it within 70 %.
· Operating Distance of Each Proximity Sensor
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.
· Operating Distance (Sa) Computing Equation:
Operating Distance (Sa) = Sensing Distance (Sn) × 70 %
Ex) Operating Distance = 10 mm × 0.7 = 7 mm