

I N S T R U C T I O N
M A N U A L

- Thank you for using **TAKEX** products.
- Please read this manual carefully prior to sensor use.

FEATURES

This product is a photoelectric sensor with deflective reflector that allow detection of mirror surface objects like a mirror or a lustrous object in addition to opaque objects.

This product is a long distance (10m Max.) type. AC/DC power type or DC power type is available. Relay output can be obtained by connecting 24 to 240V with AC/DC power type, while NPN/PNP open collector output can be obtained by connecting 12 to 24V with DC power type.

SPECIFICATIONS

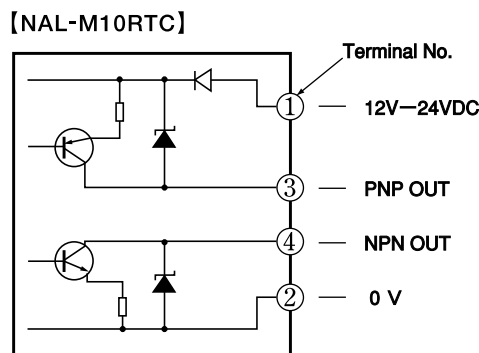
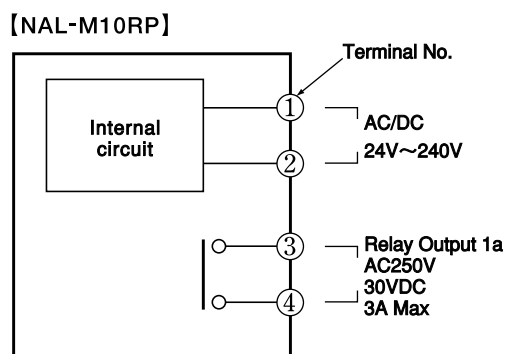
Type	AC/DC power type (Relay output)	DC power type (NPN/PNP open collector, 2 outputs)
Model	NAL-M10RP	NAL-M10RTC
Detection method	Polarized reflection	
Detection range	0.5 to 10m ※ 1	
Detection object	Mirror surface/Opaque objects	
Power supply	24 to 240V AC/DC ± 10%, 50/60Hz	12 to 24VDC ± 10% Ripple 10% or less
Power/current consumption	2W or less	30mA or less
Output mode	Relay output 1a Rating : 3A 250VAC Max. Resistance load 30VDC Max. Resistance load	NPN/PNP open collector, 2 outputs Rating : 100mA(30VDC)Max. NPN : Sink current PNP : Source current
Operation mode	Light on/Dark on changeover	
Response time	15ms or less	0.5ms or less
Operating angle	30° (Reflector side)	

※ 1 When reflector K-77 is used.

Specifications	Light source	Red LED (670nm)
	Indicator	Operation indicator (Orange LED), Stability indicator (Green LED)
	Switch	Light on/Dark on changeover switch
	Short circuit protection	Built-in
	Material	Case Polycarbonate
		Lense Acrylic
		Terminal cover Polycarbonate
		Fittings Stainless (SUS)
	Connection	Terminals (M3.5 screw is used)
	Weight	200g or less (including fittings)

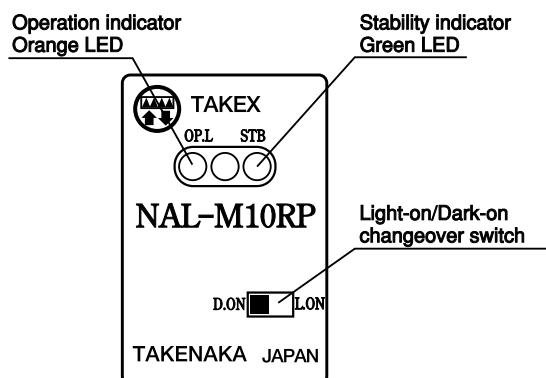
Environmental performance	Ambient illumination	Sun light : Illumination on receiver 10,000 lx or less Incandescent light : Illumination on receiver 3,000 lx or less
	Ambient temperature	-25°C to +55°C (-30°C to +70°C in storage)
	Ambient humidity	35% to 85%RH (without condensation)
	Protective structure	I P 67
	Vibration protection	10 to 55Hz, Double amplitude 1.5mm, 2 hours in each direction (X/Y/Z)
	Shock protection	500m/s ² , 3 times in each direction (X/Y/Z)
	Dielectric strength	2,000VAC for 1 min. 1,000VAC for 1 min.
	Insulation resistance	100MΩ min. at 500VDC 20MΩ min. at 500VDC

OUTPUT CIRCUIT



- ◆ For TC type, an output transistor will turn OFF when output is shorted or over-loaded.

PANEL DESCRIPTION



- ◆ Operation indicator (Orange LED) (O.P.)
An orange LED lights when a sensor is actuated.
- ◆ Stability indicator (Green LED) (STB)
A green LED lights when operation level goes to a stable light-received area (120% or more of threshold) or a stable light-interrupted area (80% or less of threshold)
- ◆ D.ON/L.ON changeover switch
Turn to D.ON for Dark On operation (Actuated when light is interrupted.)
Turn to L.ON for Light On operation (Actuated when light is received.)

DETECTION RANGE DEPENDING ON REFLECTOR TYPE

Detection range differs depending on a used reflector.

Reflector	K-77	K-8	K-7	K-71	S-510G
Detection range	0.5m to 10m	0.5m to 10m	0.5m to 7.5m	0.5m to 4m	0.5m to 6m
Remarks	Accessory	Optional	Optional	Optional	Optional

INDICATOR

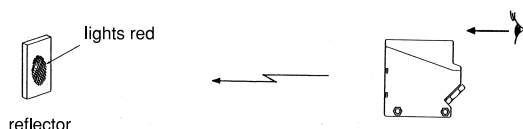
- Operation indicator (orange LED) and stability indicator (green LED) show the following level condition.

	Stability indicator(Green)	Operation indicator (Orange)	
		L.ON	D.ON
Stable light-received area	ON	ON	OFF
Operation×1.2 ----	OFF	ON	OFF
Operation level ----	OFF	OFF	ON
Operation×0.8 ----	ON	OFF	ON
Stable light-interrupted area	ON	OFF	ON

- After adjusting light alignment, interrupt light with an object and let light pass through without it repeatedly to check the stable light-interrupted area or the stable light-received area.
- The sensor reliability is enhanced against environmental change when set at the stable area.

INSTALLATION

- Light On operation
- ① Install a sensor and a reflector linearly. Next move the sensor vertically and horizontally opposite to the reflector and check the incoming light area by each direction with an operation indicator (orange LED). Adjust to position the sensor to be at the center. Then adjust it easily to locate a position that the reflector face lights red as viewed from the rear side of the sensor.

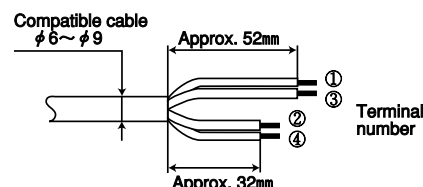


- ② Interrupt light with an object and let light pass through without it repeatedly to make sure a stability indicator (green LED) lights.

NOTES

- Tightening torque should be 0.8N·m or less when a body case is attached.
- Power supply voltage should be within its specifications without exceeding the rated voltage. Do not use TC type sensor connected with AC power source.
- Check correct wiring before power is supplied as wiring miss may cause burns or damage.
- Be sure to sensor line separately from high-voltage line/power line as wiring in the same conduit may cause damage or malfunction due to noise.
- Securely tighten lead wire connected to terminals so as not to contact adjacent terminals. M3.5 is used for terminal screws.

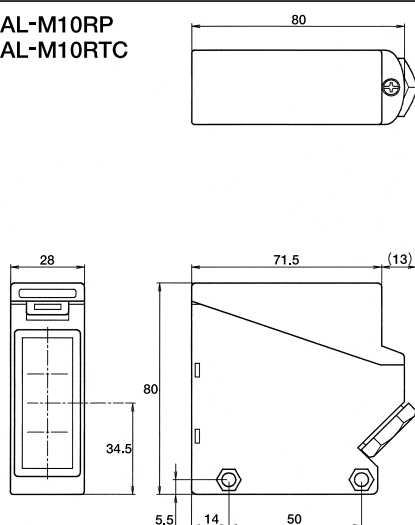
(Example of cable processing dimension)



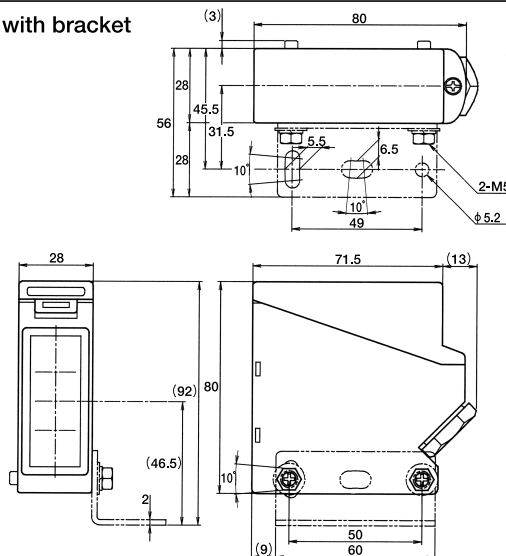
- Do not fail to tighten screws on cover to attach body enclosure in order to prevent water from entering after terminal wiring is completed. Tightening torque should be 0.3N·m.
- Cable extension should be 100m Max. with using 0.3mm² or more cable.
- External dimension of compatible cable is φ6mm to φ9mm. Use a round sectional cable with smooth external sheath.
- Do not fail to ground Frame ground (FG) terminal and Ground (G) terminal when an ordinary switching regulator is used. If grounding is failed, switching noise may cause malfunction.
- Do not use unit under water or where watering is always carried though the unit is designed to be waterproof. Do not use unit where it is subject to corrosive gas, vibration/impact, or direct splash of oil/chemicals, which may cause malfunction.
- Periodically wipe off stains on lens with soft cloth. Stain on lens may cause malfunction.
- P type is a sensor with contact output. Pay your attention on life of relay contact.
 - Mechanical life : 20,000,000 times or more
 - (Frequency of open/closed : 18,000 times/hour)
 - Electrical life : 100,000 times or more
 - (Frequency of open/closed : 1,800 times/hour)
- Use power supply which is limited the current in accordance with the lead wire size of the sensor.

DIMENSIONS (in : mm)

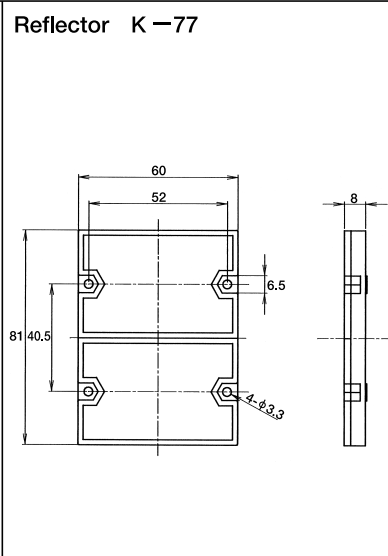
NAL-M10RP
NAL-M10RTC



with bracket



Reflector K-77



- This sensor is designed to detect an object ; it is not a safety device. TAKENAKA is not responsible for damage or losses caused by accident, calamity, acts of God, abuse, misuse abnormal usage, faulty installation or improper maintenance.
- Specifications and external dimensions described herein may be subject to change without notice, if necessary for the purpose of improvements.