

INSTRUCTION MANUAL

DISTANCE ADJUSTMENT · FIXED-FOCUS REFLECTIVE PHOTOELECTRIC SENSOR

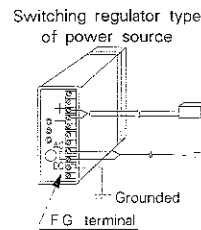
EQ-20 SERIES

Thank you very much for using SUNX sensor. Please read this manual carefully and thoroughly for the optimum use of the sensor, and keep this manual in a convenient place for quick reference.

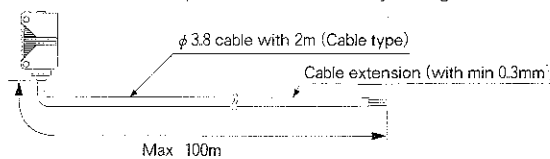
3 CAUTIONS

This products is not safety sensor designed to intend to protect life, to prevent bodily injury or property damage from dangerous parts of machinery, but a normal object detection sensor.

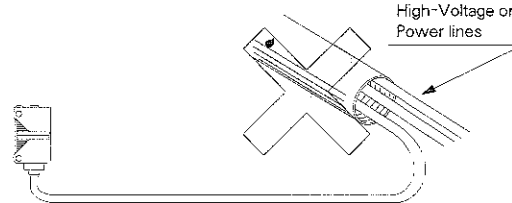
- Wiring must be done after turning off the power
- Verify voltage fluctuation so that it does not exceed the rated value
- When a switching regulator is used for the power supply of the sensor, make sure to ground the frame ground (F.G.) terminal to an actual ground.



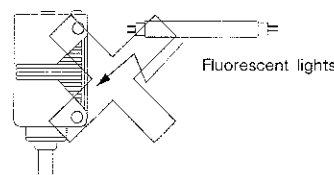
- If any device that may cause noise (switching regulator, inverter, motor, etc.) is used near the sensor, make sure to ground the frame ground (F.G.) to an actual ground.
- Do not use the sensor output signal for 50ms immediately after the power is supplied to the sensor.
- The cable can be extended up to 100m over all by using min. 0.3mm² cable



- Do not run sensor cables near high-voltage lines, or power lines, nor put them together in the same raceway. This warning should be strictly observed to prevent malfunctions caused by inductive interference



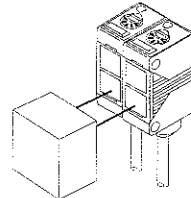
- Avoid places where the sensor will be directly exposed to fluorescent lights with rapid starters or high frequency starters



- Self-diagnostic output circuit is not protected against short circuit. Do not connect the power supply or capacitive load directly to this output

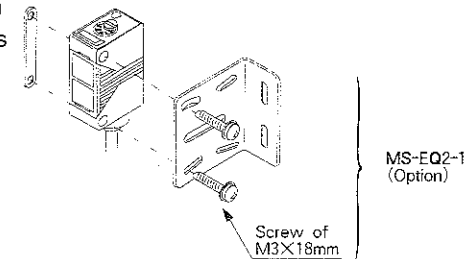
4 AUTOMATIC CROSSTALK PREVENTION

- EQ-20 series is equipped with the automatic crosstalk prevention function so that two sets of it can be installed closely together or facing each other

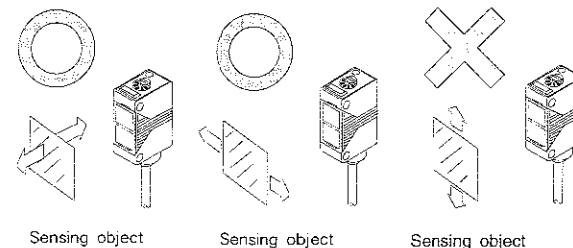


5 MOUNTING

- Tightening torque should be 0.5N · m (5 kgf · cm) or less

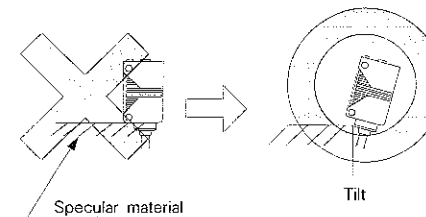


- Notice must be taken of the sensing orientation of the sensor against the moving direction of objects



- Neither specular objects such as aluminum foil, copper foil, and so on, nor shiny materials painted or coated might be detected on condition with some sensing angle error or wrinkles on their surfaces

- Tilt the sensor upwards where a specular material presents under it to prevent an unexpected miss-detection



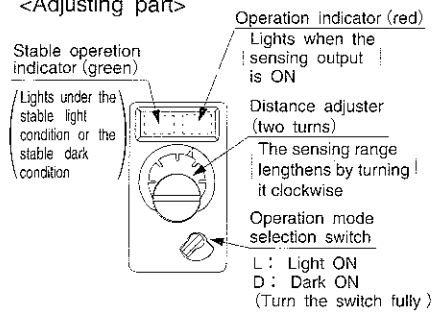
- The sensor should lose the correct detection even if some specular or shiny materials behind objects might slightly change the angle toward it (background influence). In such case, the sensor should be angled against them and fixed again, then tested the operation to eliminate any miss-detection.

- Notice that the sensor compulsory goes into the light condition (ON) when much excessive ambient light is received

- Notice that a dead zone will appear in right front of the sensor when the distance adjuster is set in NEAR side.

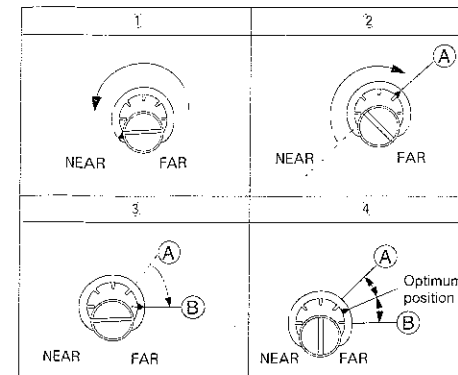
6 DISTANCE ADJUSTMENT

<Adjusting part>



<Trimming with Distance Adjuster>

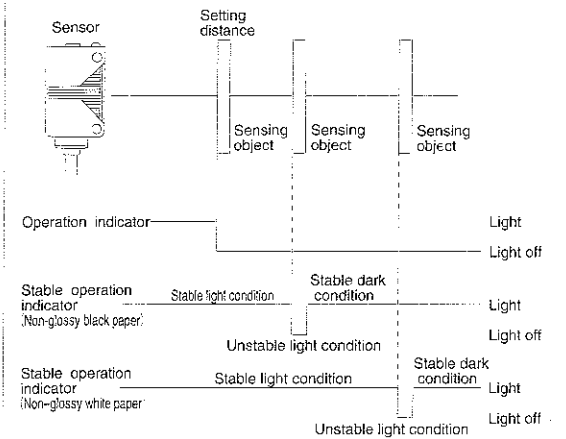
- Turn the distance adjuster fully counterclockwise to take the minimum sensing position (about 30mm or 20mm with EQ-22)
- Place an object at a certain distance from the sensor, turn the distance adjuster gradually clockwise, and find out (A) point where the sensor changes into the light condition
- Remove the object, turn the distance adjuster still clockwise, and find out (B) point where the sensor changes into the light condition again with only a background
- The optimum position to stable detect objects must be the center between (A) and (B) points.



(*1) : Notice that the distance adjuster idles after fully turned to protect itself

7 STABLE INDICATOR

- EQ-20 series avails PSD inside as a light-receiving device and recognizes where the light is received, not how much the beam is received as standard diffuse reflective sensors work. Notice that the positions where the stable operation indicator lights off vary by the dissimilar reflective ratio of objects instead of the same detecting position. Do not have the sensor detect objects where the stable indicator lights off (in the unstable light condition)



8 MOUNTING SLIT (OPTION)

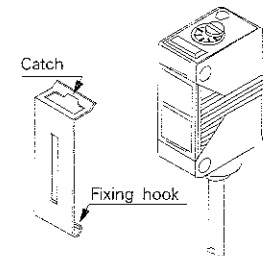
- Use slits to detect small objects or to increase the accuracy for positioning (Do not use for the connector type)

Mounting

- Put the fixing hook into the groove at the bottom
- Press the slit against the sensor and grasp the convex of indicators with the catch

Removing

- Insert a minus driver into the catch of the slit
- Take off the slit against the sensor with pulling the catch upwards



1 SPECIFICATIONS

Type		Distance adjustment · Fixed-focus reflective		
Model No.	NPN output	EQ-22	EQ-23	EQ-24
Data	PNP output	EQ-22-PN	EQ-23-PN	EQ-24-PN
Adjustable range		20 to 40mm	30 to 100mm	30 to 200mm
Sensing range (at non-glossy white paper and MAX. adjuster)		0 to 40mm	0 to 100mm	0 to 200mm
Supply voltage		12 to 24V DC ±10% Ripple P-P : Max. 10%		
Consumption		NPN output type : MAX. 45mA, PNP output type : MAX. 50mA		
Sensing output		<NPN output type> NPN open-collector transistor · Sink current : Max. 100mA · Applied voltage : Max. 30V DC · Residual voltage : Max. 1V (at 100mA sink current) Max. 0.4V (at 16mA sink current)	<PNP output type> PNP open-collector transistor · Source current : Max. 100mA · Applied voltage : Max. 30V DC · Residual voltage : Max. 1V (at 100mA source current) Max. 0.4V (at 16mA source current)	
Output operation		Selection of Sensing-ON/Non-sensing-ON by a switch		
Short-circuit protection		Equipped		
Self-diagnostic output		<NPN output type> NPN open-collector transistor · Sink current : Max. 80mA · Applied voltage : Max. 30V DC · Residual voltage : Max. 1V (at 80mA sink current) Max. 0.4V (at 16mA sink current)	<PNP output type> PNP open-collector transistor · Source current : Max. 80mA · Applied voltage : Max. 30V DC · Residual voltage : Max. 1V (at 80mA source current) Max. 0.4V (at 16mA source current)	
Output operation		ON under the unstable sensing condition		
Short-circuit protection		Equipped		
Response time		Max. 1ms		
Operation indicator		Red LED (lights when the sensing output is ON)		
Stable indicator		Green LED (lights under the stable light condition or stable dark condition)		
Distance adjuster		Having on two turns adjuster with indicator		
Protection		IP67 (IEC)		
Ambient temperature		-20 to +55°C (with no dew nor ice condensation), Storage : -25 to +70°C		
Ambient humidity		35 to 85%RH, Storage : 35 to 85%RH		
Emitting element		Red LED (modulated)		
Material		Enclosure : PBT, Lens · Indicator cover : Polycarbonate		
Cable		0.2mm ² × 4cores with 2m of oil, heat and cold resistant cable		
Cable extension		Extensible up to 100m by using a min. 0.3mm ² cable		
Accessories		Screwdriver for the sensing range adjustment : 1 pc.		

(*1) : The model No. with the suffix -J stands for the connector type (e.g.) EQ-22-J

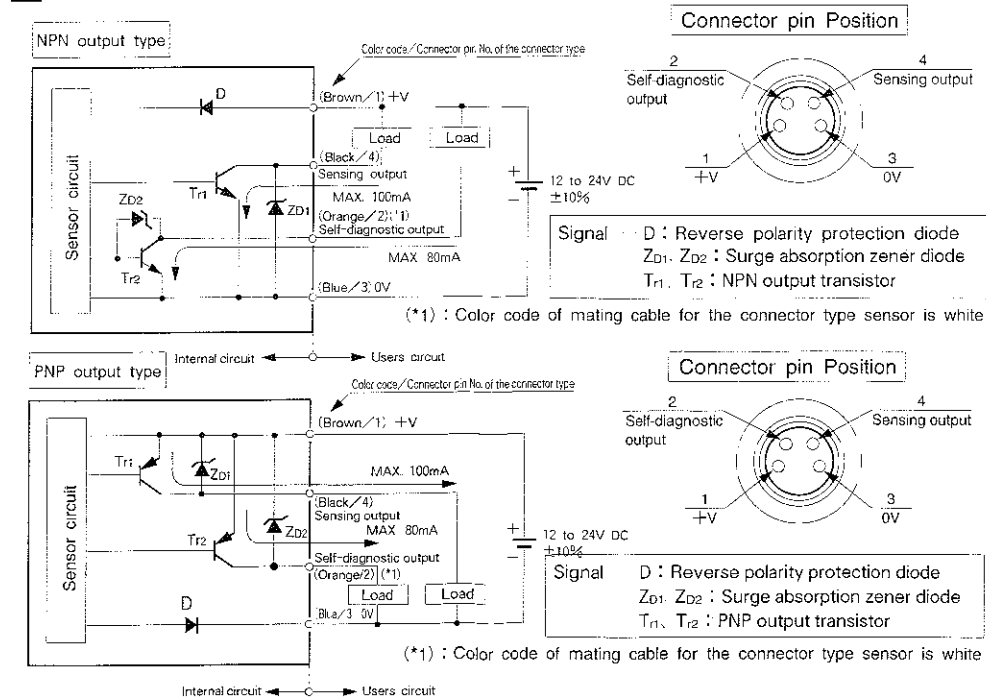
Use the mating cables as shown below

- CN-24E-C2 (Straight type Four-conductor 2m)
- CN-24E-C5 (Straight type Four-conductor 5m)

- CN-24EL-C2 (Elbow type Four-conductor 2m)
- CN-24EL-C5 (Elbow type Four-conductor 5m)



2 TYPICAL WIRING DIAGRAMS



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