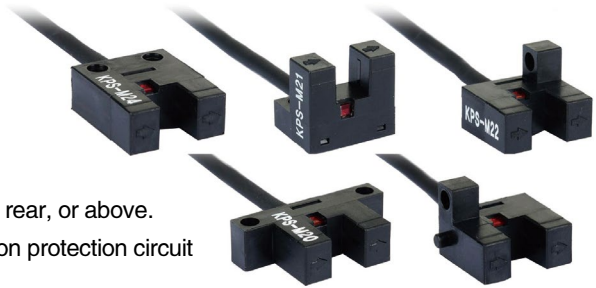


PHOTO SENSORS

KPS-M Series

- Ultra Small Package and Small Package
- 5 types of design configuration
- Built-in overcurrent protection circuit
- Equipped with two independent outputs
- You can check whether indicator is ON at the front, rear, or above.
- Built-in Reverse polarity and Output error connection protection circuit



CLASSIFICATION

KPS - M 2 0 X X
① ② ③ ④

①	Type	M2	
		M6	
②		M2 Series	M6 Series
	0	K Type	K Type
	1	L Type	L Type
	2	F Type	T Type
	3	R Type	F Type
4	U Type	Y Type	
③	None	NPN	
④	None	Wire Type	
	W	Connector Type	

PHOTO SENSORS

Specification

Parameter	KPS-M2 Series	KPS-M6 Series
Sensing range	5mm (fixed)	
Minimum sensing object	0.8mm X 1.8mm opaque object	
Hysteresis	0.05mm less	
Repeatability	0.03mm less	
Supply voltage	5V ~ 24V DC \pm 10 % Ripple P-P 10% or less	
Current consumption	15mA or less	
Output	<NPN output type> NPN open - collector transistor •Maximum sink current : 50mA •Applied voltage : 30 V DC or less (between output and 0 V) •Residual voltage : 0.7 V or less (at 50 mA sink current) 0.4 V or less (at 16 mA sink current)	<PNP output type> PNP open - collector transistor • Maximum source current : 50mA • Applied voltage : 30 V DC or less (between output and +V) • Residual voltage : 0.7 V or less (at 50 mA source current) 0.4 V or less (at 16 mA source current)
Output operation	Incorporated with 2 outputs: Light - ON / Dark - ON	
Response time	Under light received condition : 20us or less Under light interrupted condition : 100us or less (Response frequency : 1 kHz or more) (Note 1)	
Operation indicator	Vermilion LED (lights up under light received condition)	
Environmental resistance	Ambient temperature (Note 2)	- 25 ~ +55 (No dew condensation or icing allowed), Storage : - 3 ~ +80
	Ambient humidity	35 ~ 85%RH , Storage : 35 ~ 85%RH
	Ambient illuminance	Fluorescent light : 1,000lx at the light - receiving face
	Voltage withstandability	1,000V AC for one min. between all supply terminals connected together and enclosure
	Insulation resistance	50M Ω , or more, with 250V DC megger between all supply terminals connected together and enclosure
	Vibration resistance	10 ~ 2,000 Hz frequency, 1.5mm amplitude in X, Y and Z directions for two hours each
	Shock resistance	15,000m/s ² acceleration (1,500G approx.) in X, Y and Z directions for three times each
EMC	EN 50081 - 2, EN 50082 - 2, EN 60947 - 5 - 2	
Emitting element	Infrared LED (non - modulated)	
Material	Enclosure : PBT, Slit cover : Polycarbonate	
Cable	0.09mm ² 4 - core cabtyre cable 1M	
Weight	10g approx.	15g approx.
Reverse polarity protection circuit	NPN, PNP output type	
Output over - current protection circuit	NPN, PNP output type	
Output error connection protection circuit	NPN output type	

Notes : 1) The response frequency is the value when the disc, given in the figure below, is rotated.

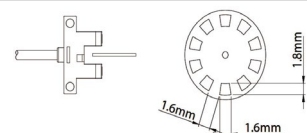


PHOTO SENSORS

Line-up

KPS-M2 Series

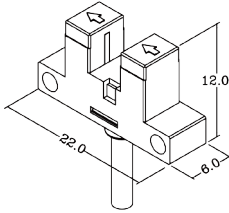
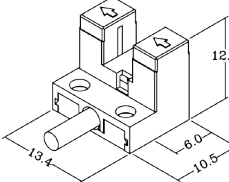
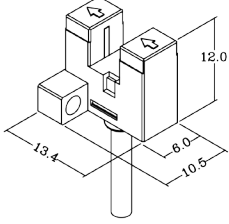
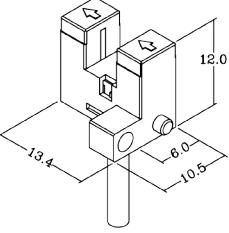
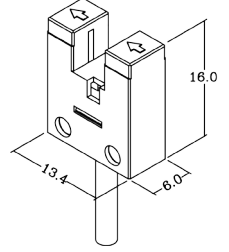
Type	Appearance (mm)	Sensing range	Model No.	Output	Output operation
K Type		5mm (fixed)	KPS - M20	NPN open - collector transistor	Incorporated with 2 outputs : Light - ON / Dark - ON Cable Type
L Type			KPS - M21	NPN open - collector transistor	
F Type			KPS - M22	NPN open - collector transistor	
R Type			KPS - M23	NPN open - collector transistor	
U Type			KPS - M24	NPN open - collector transistor	

PHOTO SENSORS

Line-up

KPS-M6 Series

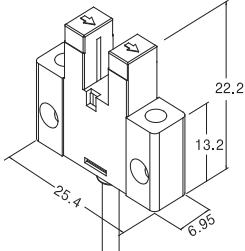
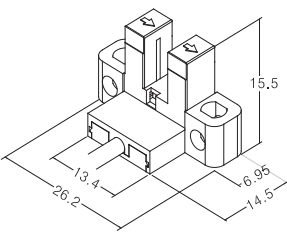
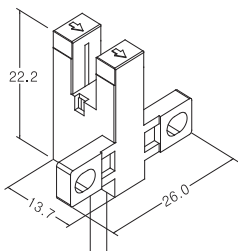
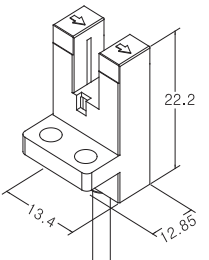
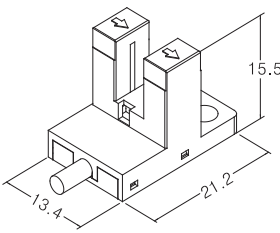
Type	Appearance (mm)	Sensing range	Model No.	Output	Output operation
K Type		5mm (fixed)	KPS - M60	NPN open - collector transistor	Incorporated with 2 outputs : Light - ON / Dark - ON Cable Type
L Type			KPS - M61	NPN open - collector transistor	
T Type			KPS - M62	NPN open - collector transistor	
F Type			KPS - M63	NPN open - collector transistor	
Y Type			KPS - M64	NPN open - collector transistor	

PHOTO SENSOR

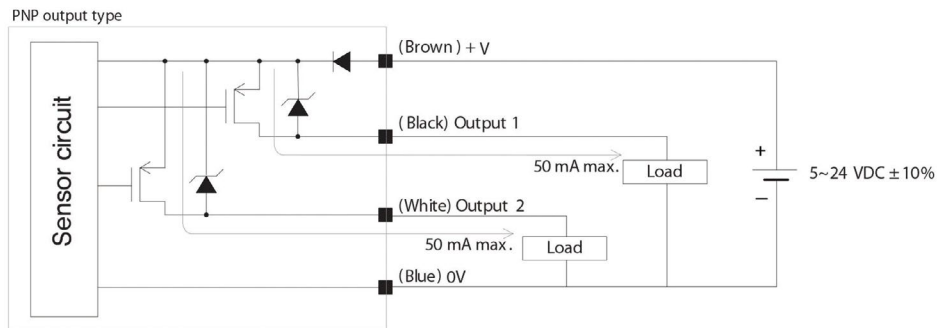
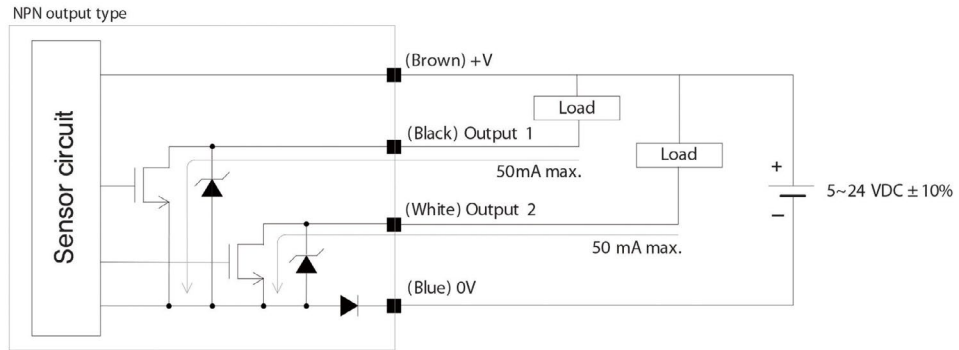
PROXIMITY SENSOR

WATER LEVEL CONTROLLER

PID TEMP. CONTROLLER

PHOTO SENSORS

I/O Circuit and Wiring diagrams



* PNP Type is Make sure to connect terminals correctly as the sensor does not incorporate a Output error polarity protection circuit.

Wiring Table

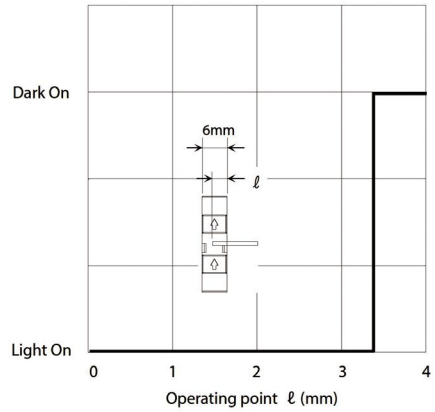
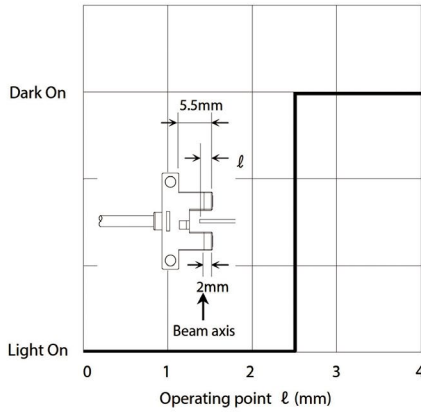
No.	Wire color	Item	Output operation
1	Brown	+V	-
2	Blue	0V	-
3	Black	Output1	Light On
4	White	Output2	Dark On

Wiring Table

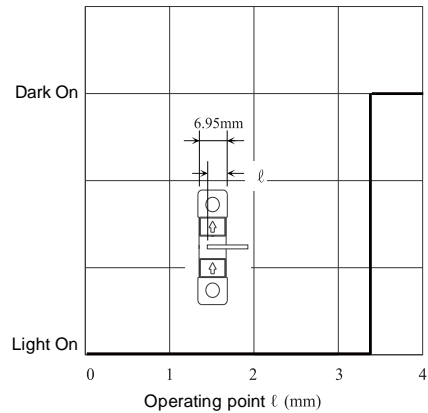
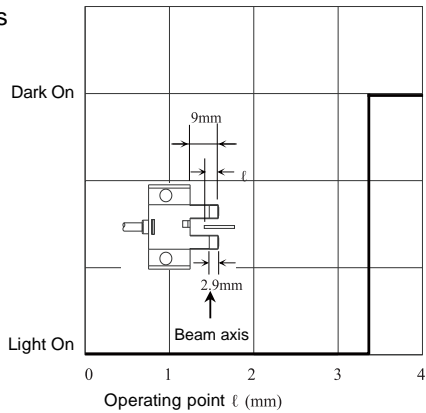
- 1) This product is not a safety sensor. It is not intended or designed to protect life and prevent body injury from dangerous parts of machinery. It is a normal object detection sensor.
- 2) Since the sensor is intended for use inside machines, no special countermeasures have been taken against extraneous light. Take care that extraneous light is not directly incident on the beam receiving section.

Typical

KPS - M2 Series



KPS - M2 Series



installation

When fixing the sensor with screws, use M3 screws(M2 screws in case of KPS - M2 Series) and the tightening torque should not exceed the values given below.

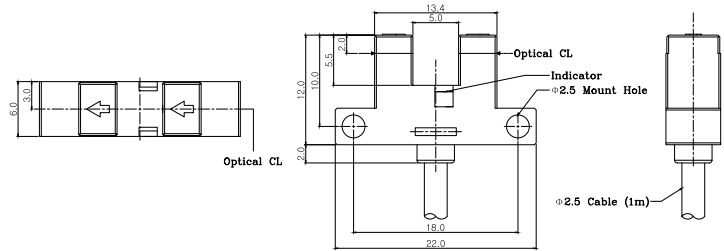
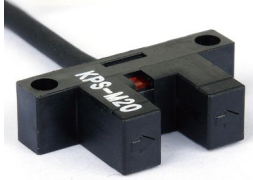
Further, use small, round type plain washers. (M3 : 6 mm, M2 : 4.3mm)

Model No.	Tightening torque
KPS - M2 Series	0.15 N · m
KPS - M6 Series	0.5 N · m

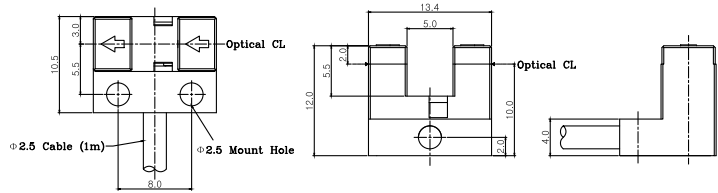
PHOTO SENSORS

Dimensions

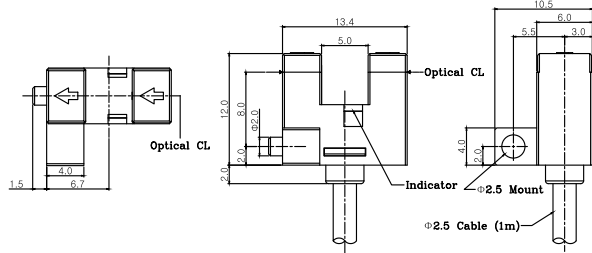
KPS-M20 Type "K"



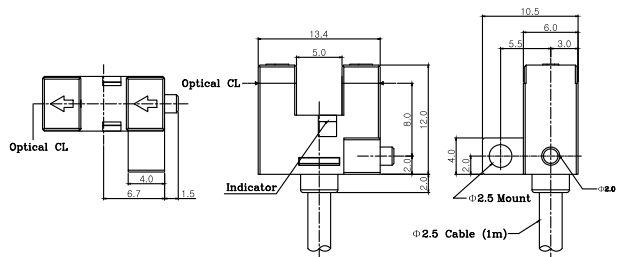
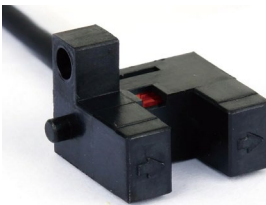
KPS-M21 Type "L"



KPS-M22 Type "F"



KPS-M23 Type "R"



KPS-M24 Type "U"

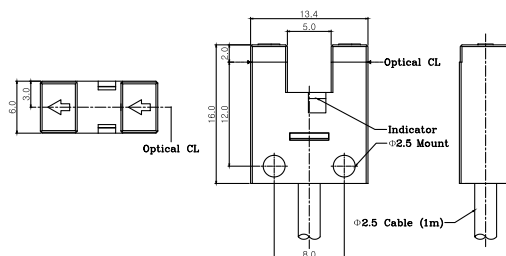
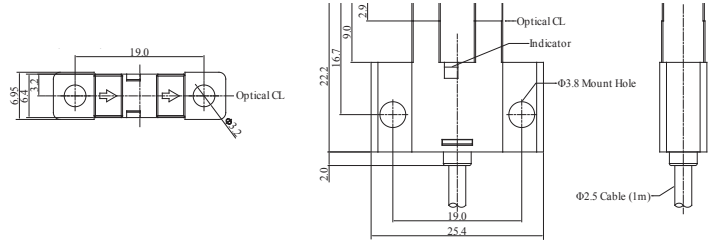


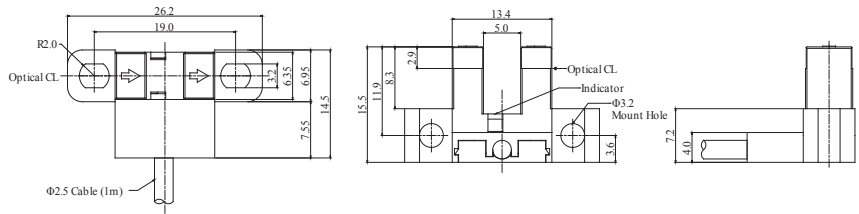
PHOTO SENSORS

Dimensions

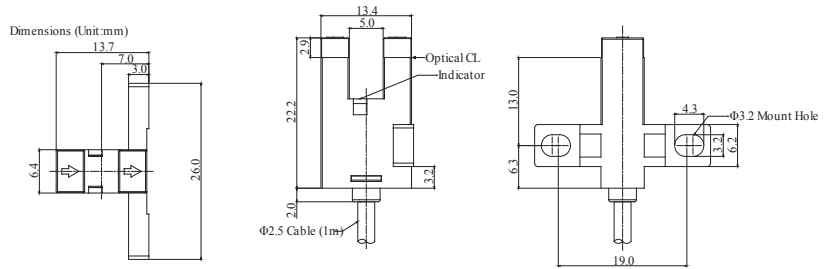
KPS - M60 " K "



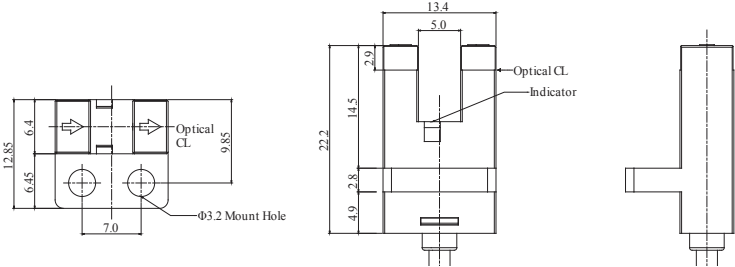
KPS - M61 " L "



KPS - M62 " T "



KPS - M63 " F "



KPS - M64 " Y "

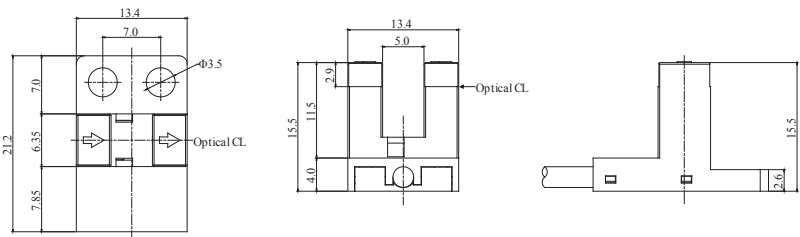


PHOTO SENSOR

PROXIMITY SENSOR

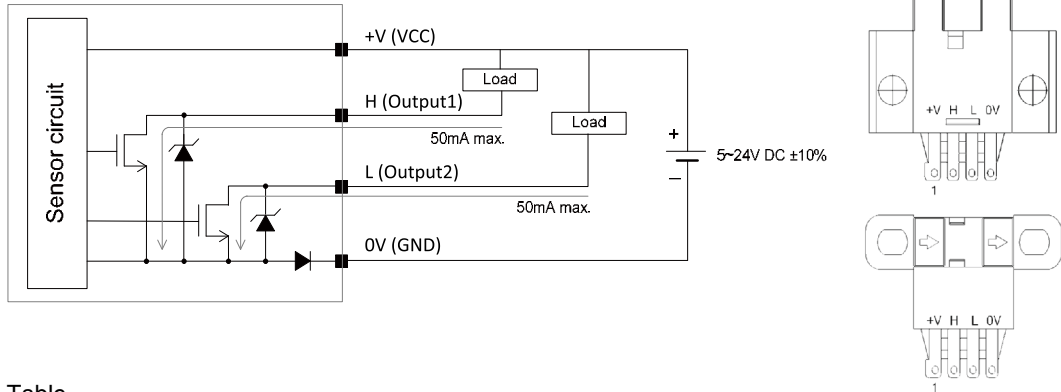
WATER LEVEL CONTROLLER

PID TEMP. CONTROLLER

PHOTO SENSORS

I/O Circuit and Pin diagrams

NPN output type

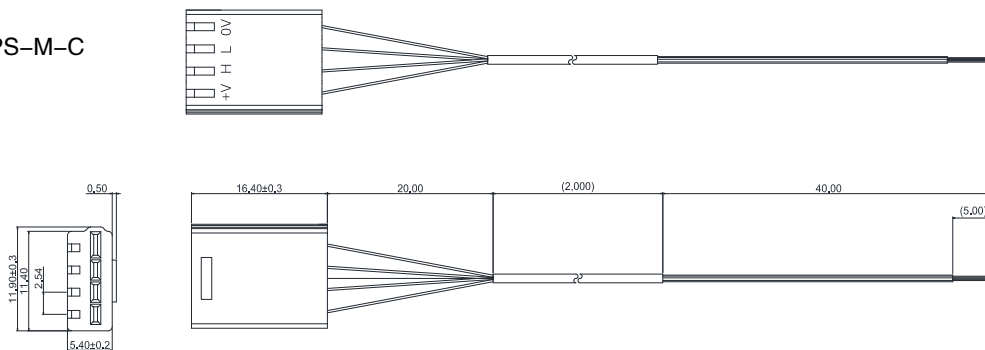


Pin Table

No.	Item	Function	Output operation
1	+V	VCC	-
2	H	Output1	Light On
3	L	Output2	Dark On
4	0V	GND	-

- 1) This product is not a safety sensor. Its use is not intended or designed to protect life and prevent body injury or property damage from dangerous parts of machinery. It is a normal object detection sensor.
- 2) Since the sensor is intended for use inside machines, no special countermeasures have been taken against extraneous light. Take care that extraneous light is not directly incident on the beam receiving section.

KPS-M-C



Terminal Table

No.	Item	Function	Output operation
1	+V	VCC	Brown
2	H	Output1	Pink
3	L	Output2	Black
4	0V	GND	Blue