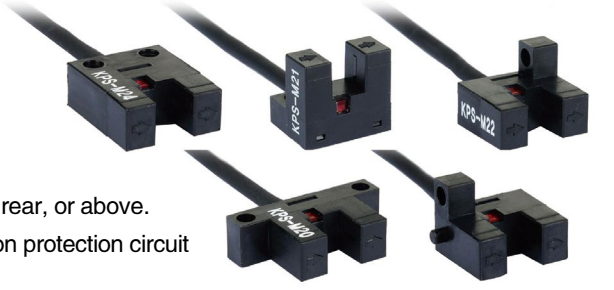
PART 1

PHOTO SENSOR

KPS–M Series
KPS–CT Series
KPS–Z Series
KPS–AL Series
KPS–AR Series
KPS–AP Series
KPS–O Series
CONTROLLER
REFLECTOR
KPS–P300 Series

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

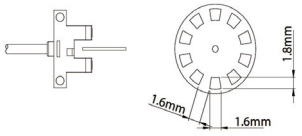
KPS - M 2 0 X X
① ② ③ ④

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	

Specification

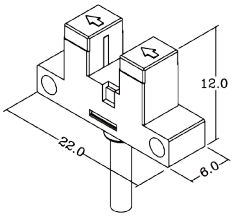
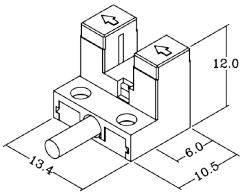
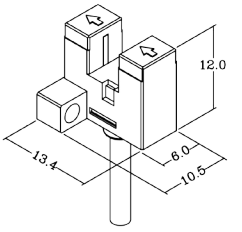
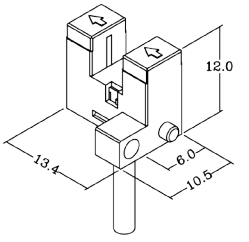
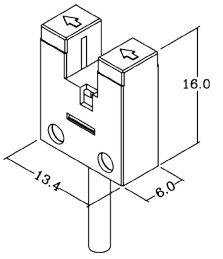
Parameter		KPS–M2 Series	KPS–M6 Series
Sensing range		5mm (fixed)	
Minimum sensing object		0.8mm X 1.8mm opaque object	
Hysteresis		0.05mm less	
Repeatability		0.03mm less	
Supply voltage		5V ~ 24V DC ±10 % Ripple P-P 10% or less	
Current consumption		15mA or less	
Output		<NPN output type> NPN open-collector 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 curernt) 0.4 V or less (at 16 mA sink curernt)	<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°C (No dew condensation or icing allowed), Storage : -3 ~ +80°C	
	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	50MΩ, or more, with 250V DC megger between all supply terminals connected otgether 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/s2 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		0.09mm2 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.



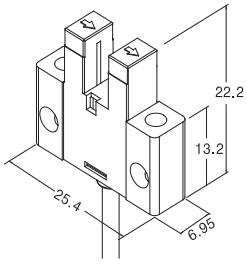
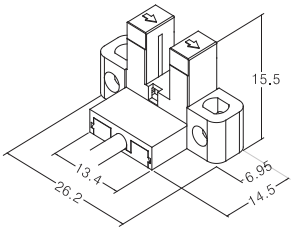
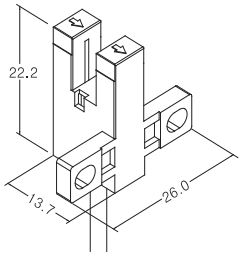
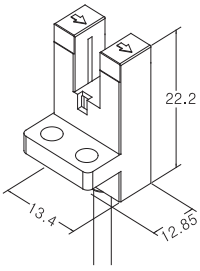
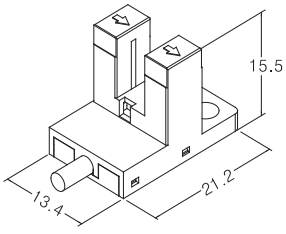
Line-up

● KPS–M2 Series

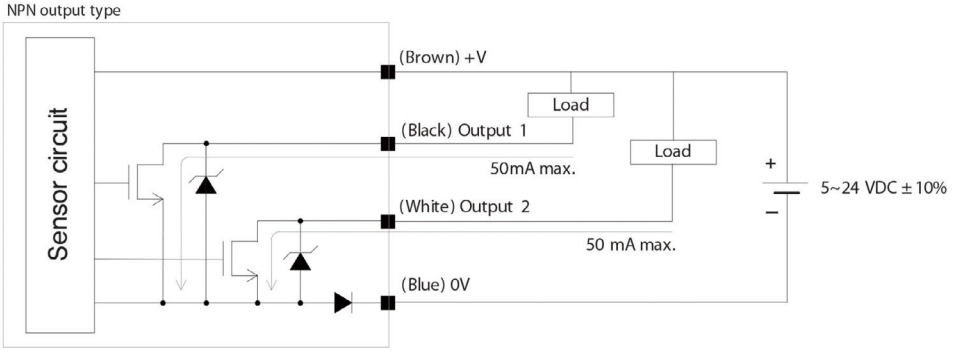
Type	Appearance (mm)	Sensing range	Model No.	Output	Output operation
K Type		5mm (fixed)	KPS - M20	NPN open - collector transistor	Incorporated with 2 outputs : Light - ON / Dark - ON Cable Type
L Type			KPS - M21	NPN open - collector transistor	
F Type			KPS - M22	NPN open - collector transistor	
R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

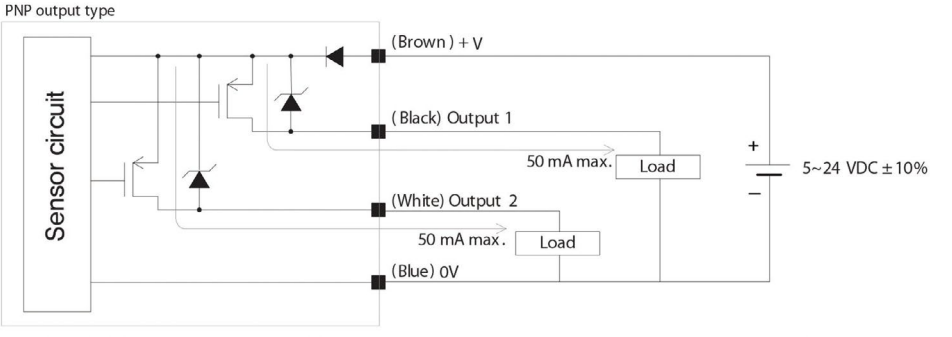
Line-up

● 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	

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

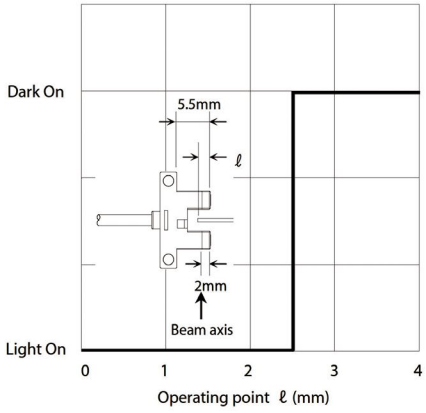
No.	Wire color	Item	Output operation
1	Brown	+V	-
2	Blue	0V	-
3	Black	Output1	Light On
4	White	Output2	Dark On

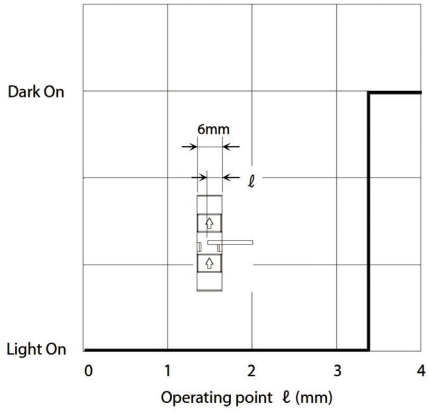
■ Wiring Table

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.

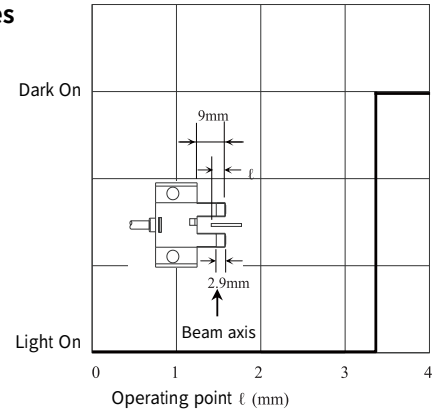
Typical

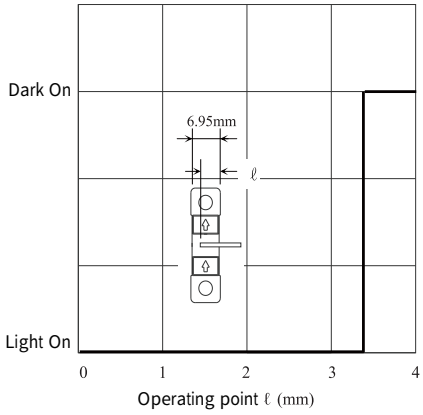
KPS - M2 Series





KPS - M2 Series





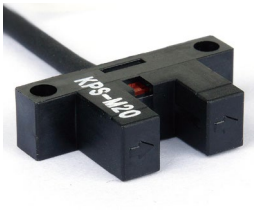
installation

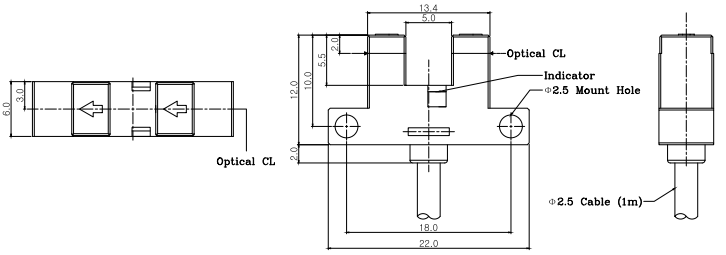
When fixing the sensor with screws, use M3 screws(M2 screws in case of KPS - M2 Series) and the tightening torque should not exceedthe values given below.
Further, use small, round type plain washers. (M3 : Φ6 mm, M2 : Φ4.3mm)

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

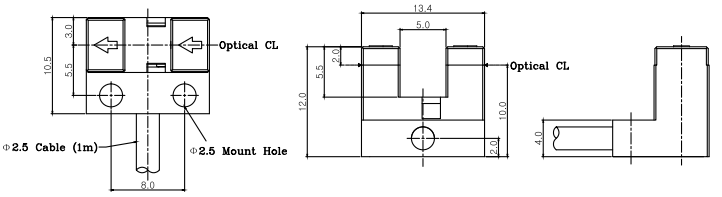
Dimensions

KPS-M20 Type " K "

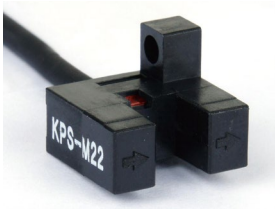


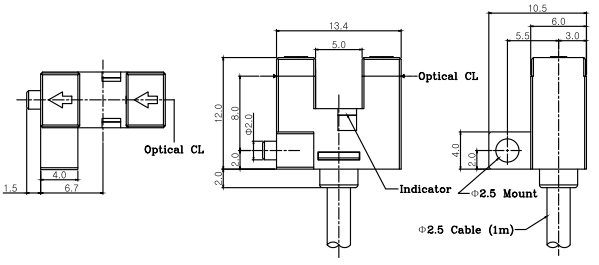


KPS-M21 Type " L "

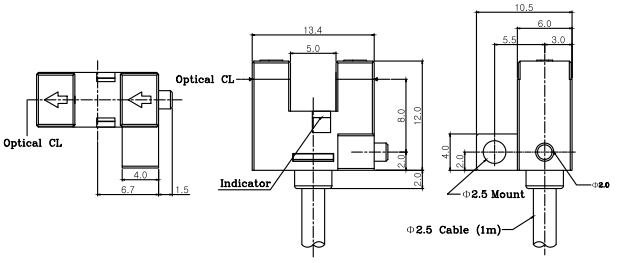


KPS-M22 Type " F "

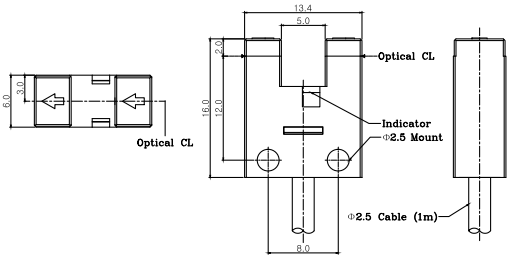




KPS-M23 Type " R "

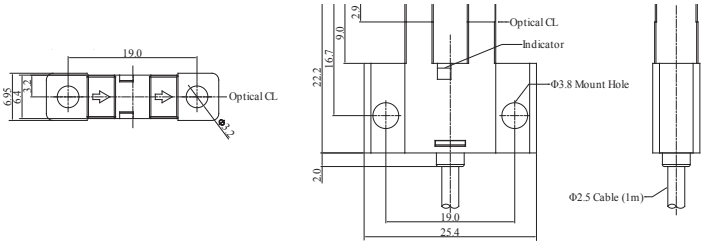


KPS-M24 Type " U "

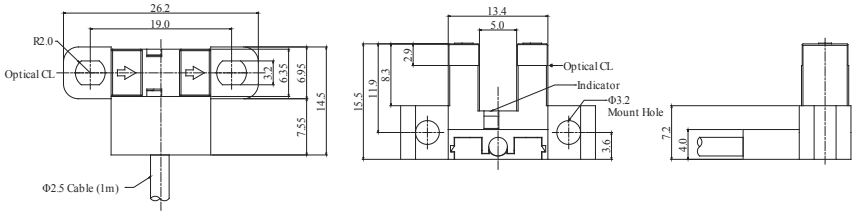


Dimensions

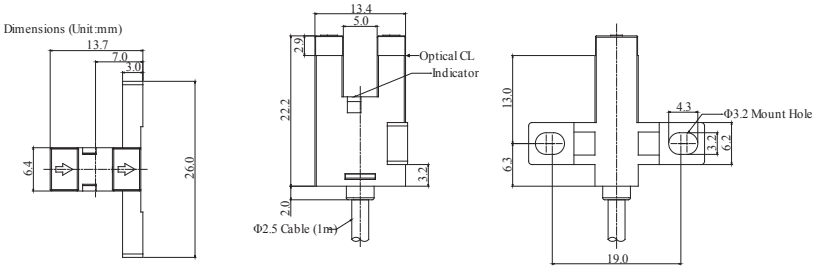
KPS-M60 " K "



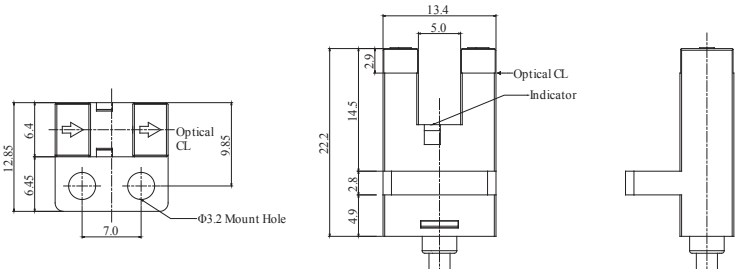
KPS-M61 " L "



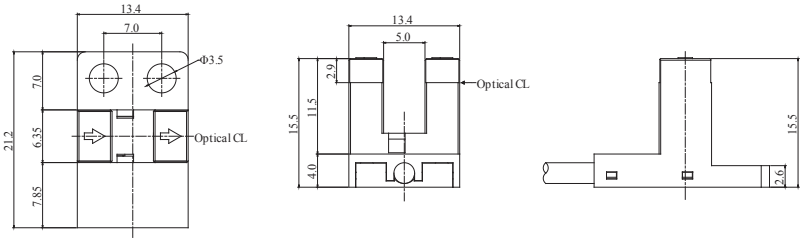
KPS-M62 " T "



KPS-M63 " F "

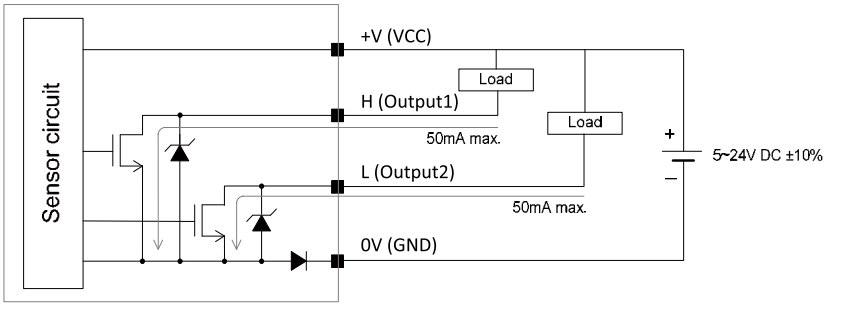


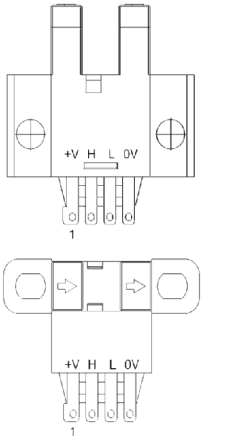
KPS-M64 " Y "



I/O Circuit and Pin diagrams

NPN output type



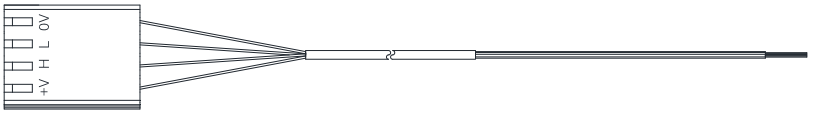


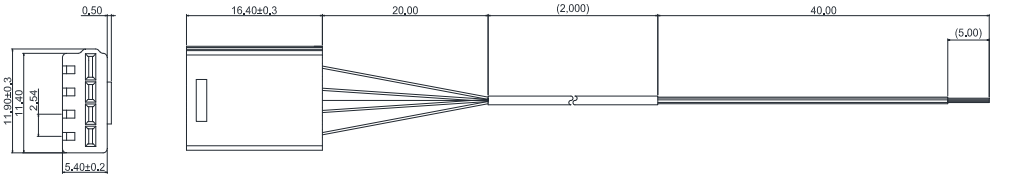
Pin Table

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 portect 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



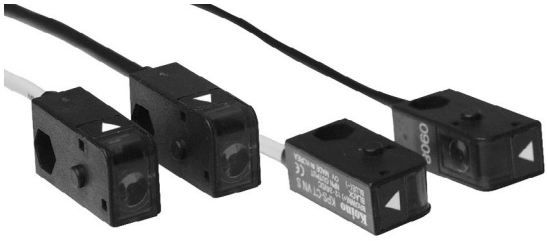


Terminal Table

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

KPS–CT SERIES

- OVERVIEW
- Small size photo sensor
- Through–beam type
- IP–Rating : IP40



CLASSIFICATION

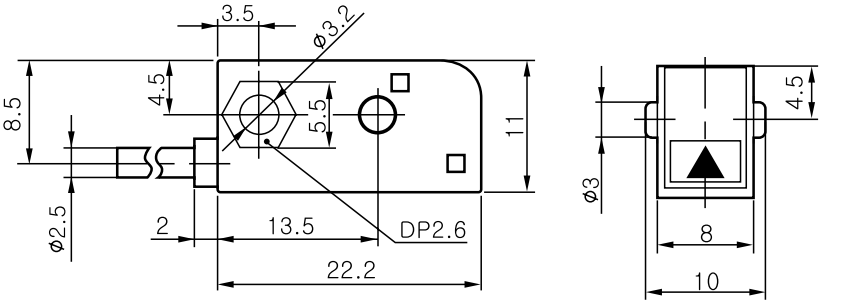
KPS - CT □ □
① ②

① Installation	V	Vertical
	H	Horizontal
② Control output	N	NPN

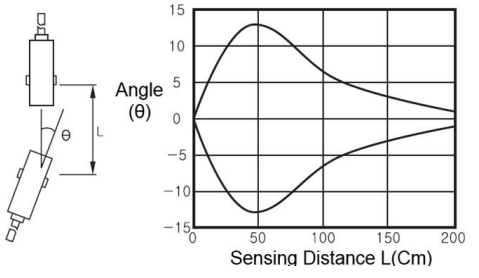
Specification

Model	KPS - CTV	
	Transmitter	Receiver
SENSING DISTANCE	1.5 m	
STANDARD SENSING OBJECT	OPAQUE OBJECT WITH MINIMUM Φ6 DIAMETER	
POWER CONSUMPTION	20mA	20mA
LIGHT SOURCE	Infra Red LED(940nm)	-
VOLTAGE	DC 12~24V	
RESPONSE TIME	Max. 1ms	
Output	-	NPN/PNP output
External light interference	incandescent light 3,000 lx, light of the sun 10,000lx	
Protection	IP40	
Insulation Resistance	min. 20MΩ(DC500V)	
Dielectric Strength	50/60Hz 500VAC for 1 minute	
Ambient Temperature	-20~+60°C	
Vibration resistance	10~55Hz at double amplitude: 1.5mm(X,Y,Z directions) for 1 hour	
Shock resistance	50G	
Material	Case: PBT, Lens: PC	
Cable	Φ2.4, 2m, 2P	Φ2.4, 2m, 3P

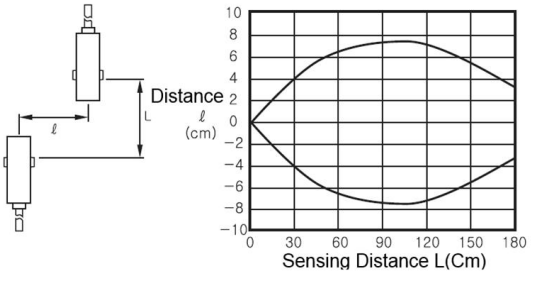
Dimensions



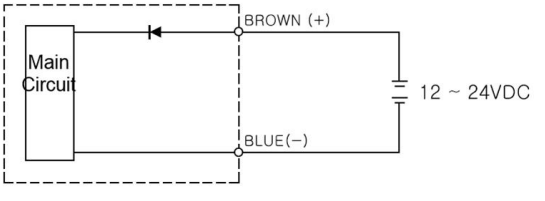
Angle Characteristic

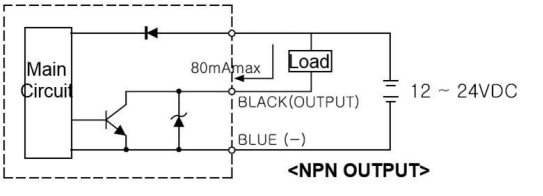


Parallel Operation Range



I/O Circuit Diagram





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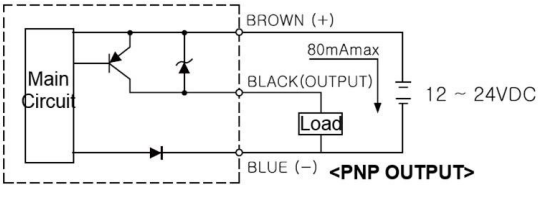


<PNP OUTPUT>

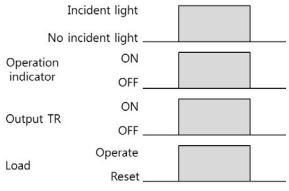
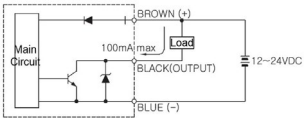
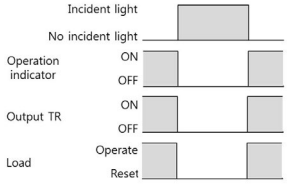
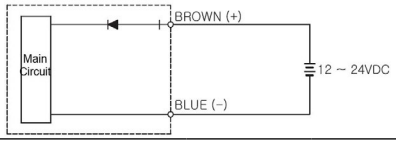
KPS–Z SERIES

CLASSIFICATION

KPS - Z □□□

MODEL	Type		Sensing Distance	Protection
DNS	Diffuse - Reflective		0.5m	-
2DN			1m	IP65
RNS	Retro - Reflective		3m	-
RN				IP65
TS	Through - Beam	Emitter	15m	-
TNS		Receiver		
T		Emitter		IP65
TN		Receiver		

I/O Circuit Diagram

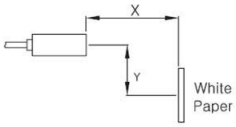
Model	Operation mode	Timing chart	Operation selector	Output Circuit
KPS - ZDNS	LIGHT NO		LIGHT NO	
KPS - Z2DN				
KPS - ZRNS				
KPS - ZRN	DARK NO		DARK NO	
KPS - ZTS				
KPS - ZTNS				
KPS - ZT	Through - beam emitter			
KPZ - ZRN				

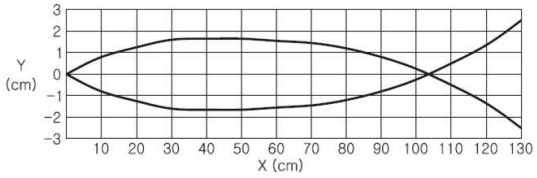
Specification

Type	Diffuse Reflective		Retro-reflective		Through-beam	
Model	KPS-ZDNS	KPS-Z2DN	KPS-ZRNS	KPS-ZRN	KPS-ZTS KPS-ZTNS	KPS-ZT KPS-ZTN
Detecting Distance	0.5m	1m	3m		15m	
Standard detecting object	20(cm)X20(cm) white paper		OPAQUE OBJECT, MINIMUM Φ75 DIAMETER		OPAQUE OBJECT, MINIMUM Φ12 DIAMETER	
Hysterisis	20% of detecting distance		-		-	
Light Source	IR LED(850nm)		IR LED(660nm)		IR LED(850nm)	
Voltage	12~24VDC±10%					
Power consumption	25mA				Emitter: 20mA receiver: 17mA	
Output	NPN open collector					
Operation Mode	Light ON/Dark ON switching					
Response time	1ms					
External light interference	incandescent light 2,000 lx					
Ambient temperature	-20~+60°C					
Ambient humidity	35~85% RH					
Insulation resistance	min. 20MΩ(DC500V)					
Dielectric strength	50/60Hz 500VAC for 1 minute					
Vibration resistance	10~55Hz at double amplitude: 1.5mm(X,Y,Z directions) for 1 hour					
Shock resistance	50G					
Protection	None	IP65	None	IP65	None	IP65
Indicator	Receiver: Operation (Red), Safe (Green) Transmitter: Power (Green)					
Weight	50g					
Material	Case: PBT, Lens: PC					

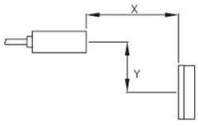
Parallel Operating Range

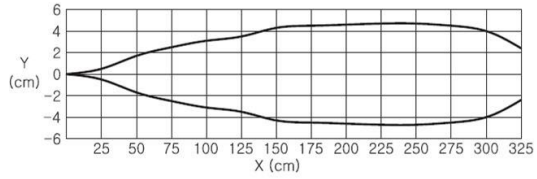
KPS-Z2DN



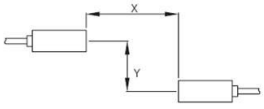


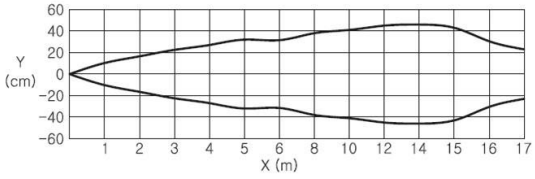
KPS-ZRN





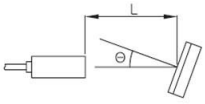
KPS-ZT/ZTN

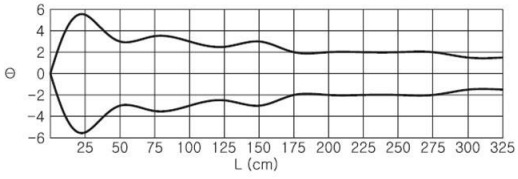




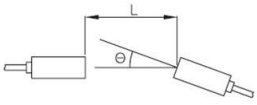
Parallel Operating Range

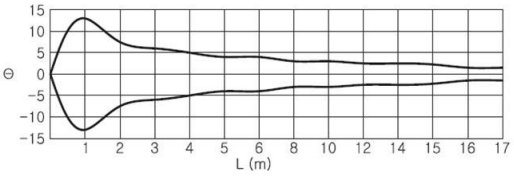
KPS-ZRN





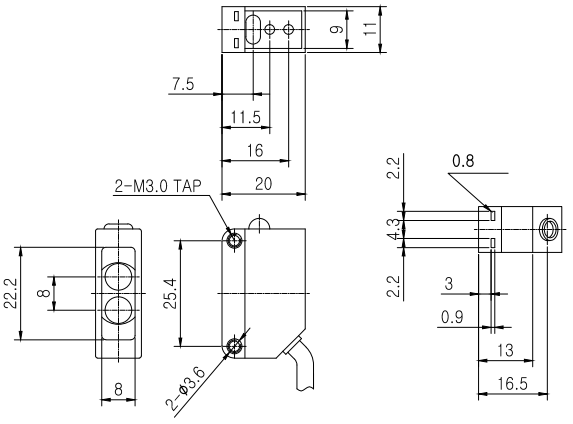
KPS-ZT/ZTN



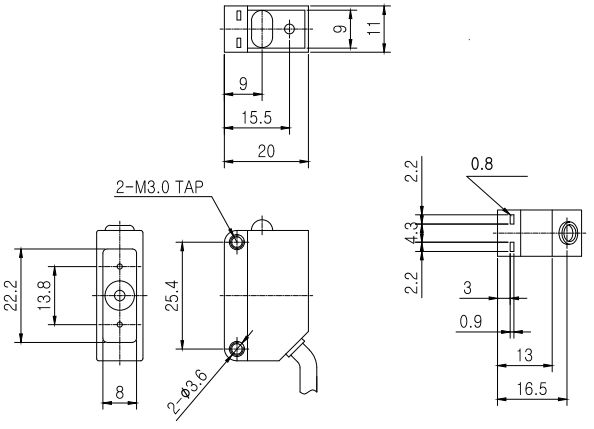


Dimensions

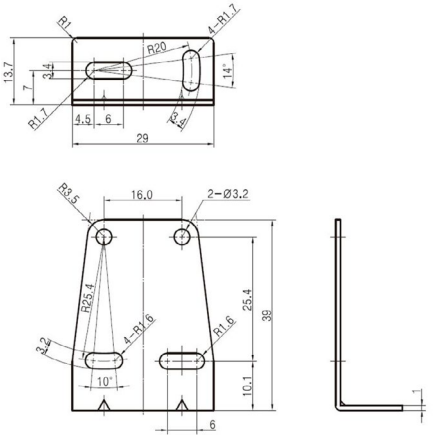
KPS–ZRN, KPS–ZRNS
KPS–Z2DN, KPS–ZDNS



KPS–ZT, KPS–ZTN
KPS–ZTS, KPS–ZTNS



Bracket



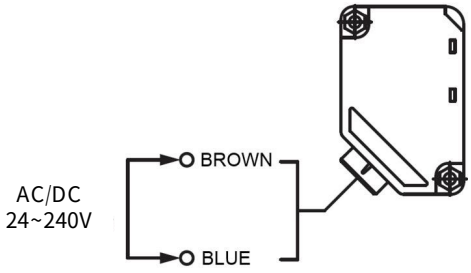
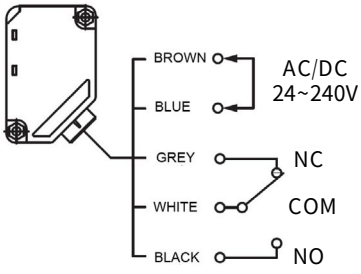
KPS–AL SERIES

CLASSIFICATION

KPS - AL □

MODEL	Type	Type	Sensing Distance	Protection
T	Through - beam	Emitter	10m	IP65
R		Receiver		
TR	Retro - reflective		5m	
TRP	Retro - reflective (polarizing filter)		3m	
D	Diffuse - reflective		1m	

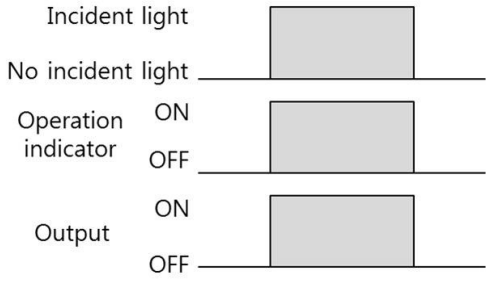
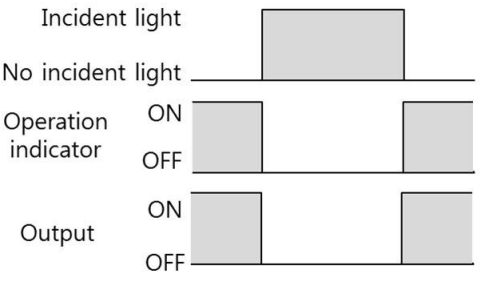
Wiring diagram

KPS–ALT	KPS–ALD, ALTR, ALTRP
	

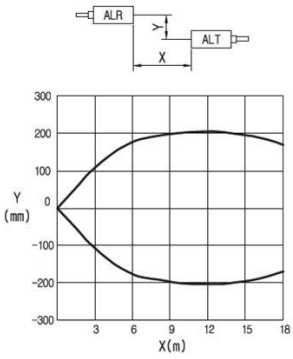
Parallel Operating Range

Type	Diffuse Reflective	Retro-reflective	Retro-reflective (Polarizing-filter)	Through-beam	
				Emitter	Receiver
Model	KPS-ALD	KPS-ALTR	KPS-ALTRP	KPS-ALT	KPS-ALR
Detecting Distance	1m Max.	5m Max.	3m Max.	10m Max.	
Standard detecting object	Opaque object			Opaque object(Ø20)	
Light Source	Infra-Red LED				
Voltage	AC/DC 24~240V				
Power consumption	Max 2W			Max 1.5W	Max 2W
Output	Relay output: 1C				
Contact ratings	30VDC 2A, 125VAC 0.6A				
Response time	20ms Max.				
External light interference	incandescent light 2,000 lx, sun light 10,000 lx Max.				
Ambient temperature	-20~+60°C				
Ambient humidity	35~85%RH				
Insulation resistance	min. 20MΩ				
Dielectric strength	2,000VAC 50/60Hz for 1 minute				
Vibration resistance	10~55Hz at double amplitude: 1.5mm(X,Y,Z directions) for 1 hour				
Shock resistance	10G				
Protection	IP65				
Indicator	Red LED				
Weight	147g			132g	147g
Cable	Ø6.1, 1.5m wire				
Material	PC				

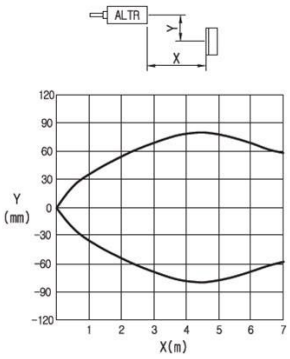
Output mode

Diffuse–reflective	Through–beam/retro–reflective
	

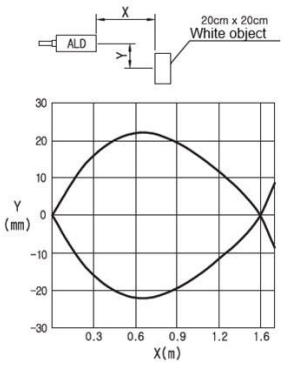
Parallel Operating Range



KPS-ALT/R

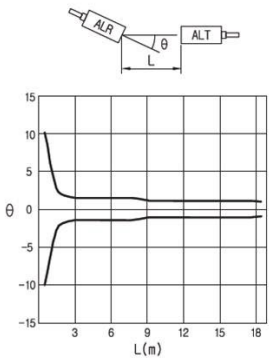


KPS-ALTR

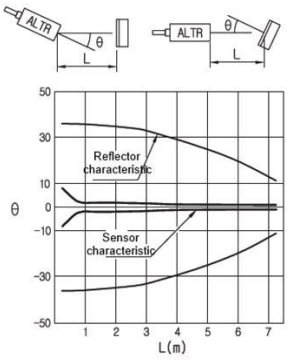


KPS-ALD

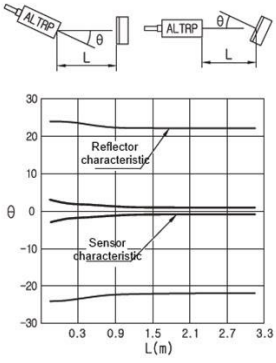
Parallel Operating Range



KPS-ALT/R

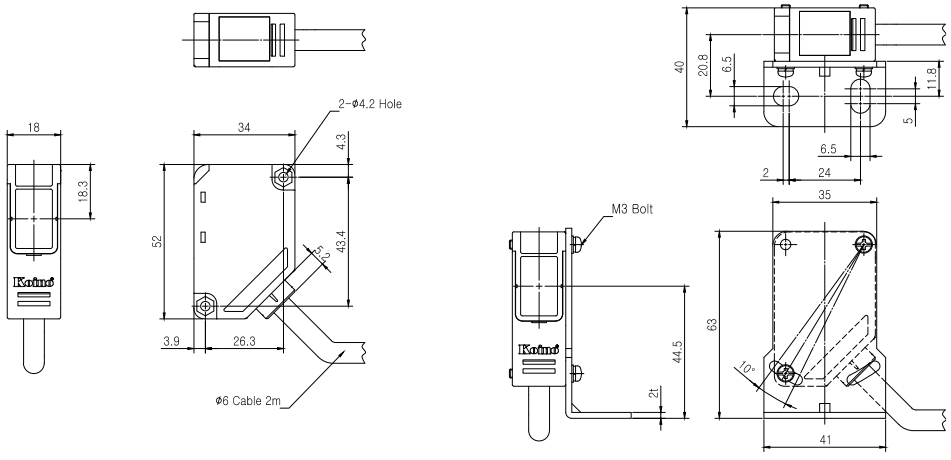


KPS-ALTR

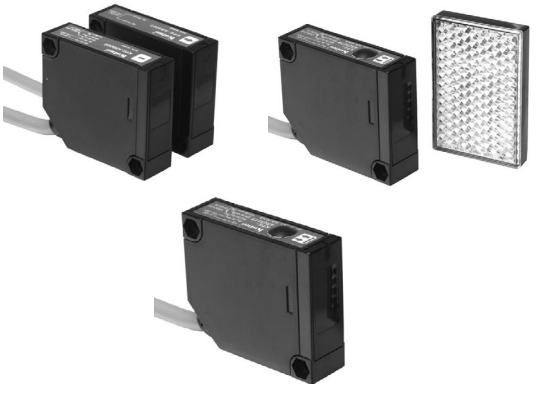


KPS-ALTRP

Dimensions



KPS–AR SERIES

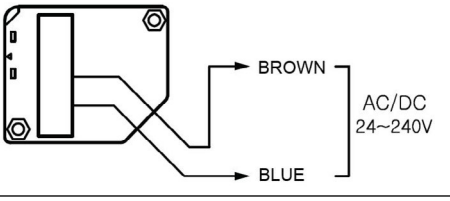
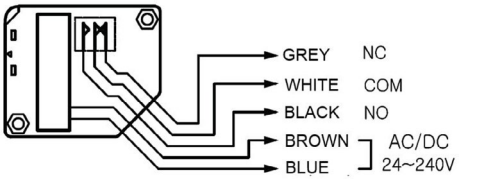


CLASSIFICATION

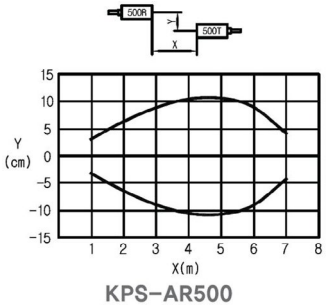
KPS - AR □

MODEL	Type		Sensing Distance	Protection
500T	Through - beam	Emitter	8m	IP64
500R		Receiver		
250TR	Retro - reflective		4m	
40DR	Diffuse - reflective		0.6m	

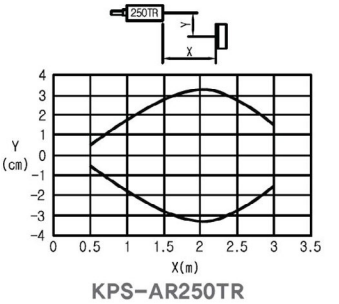
Wiring diagram

KPS–AR500T	KPS–AR500R,AR250TR, AR40DR
	

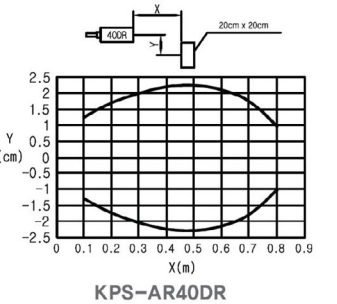
Parallel Operating Range



KPS–AR500



KPS–AR250TR



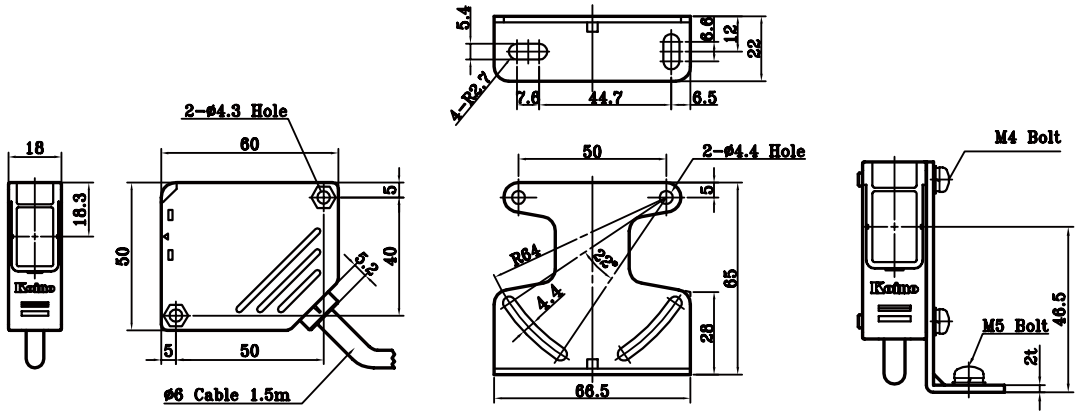
KPS–AR40DR

Parallel Operating Range

Type	Diffuse Reflective	Retro - reflective	Through - beam	
			Emitter	Receiver
Model	KPS - AR40DR	KPS - AR250TR	KPS - AR500T	KPS - AR500R
Detecting Distance	0.6m Max.	2.5m Max.	5m Max.	
Standard detecting object	Opaque object		Opaque object(Ø16)	
Light Source	Infra - Red LED			
Voltage	AC/DC 24~240V			
Power consumption	Max 2W		Max 1.5W	Max 2W
Output	Relay output: 1C			
Contact ratings	30VDC 2A, 125VAC 0.6A			
Response time	20ms Max.			
External light interference	incandescent light 3,000 lx, sun light 10,000 lx Max.			
Ambient temperature	- 20~+60°C			
Ambient humidity	35~85%RH			
Insulation resistance	min. 20MΩ			
Dielectric strength	2,000VAC 50/60Hz for 1 minute			
Vibration resistance	10~55Hz at double amplitude: 1.5mm(X,Y,Z directions) for 1 hour			
Shock resistance	10G			
Protection	IP50			
Indicator	Red LED			
Weight	107 g			
Cable	Ø6.1, 1.5m wire			
Material	ABS			

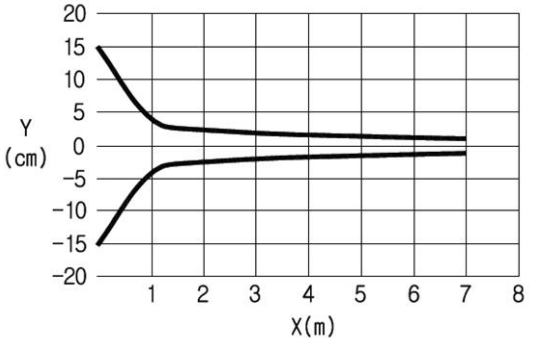
Dimensions

KPS - AR SERIES

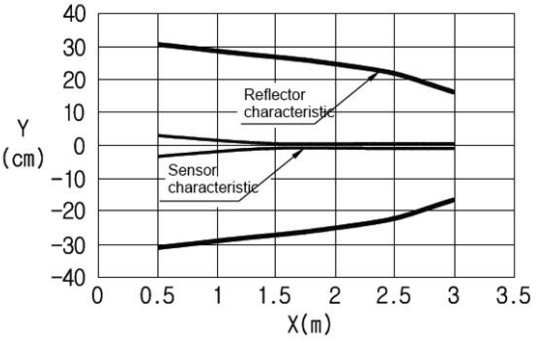


Angle characteristic

KPS-AR500



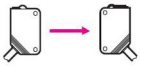
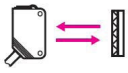
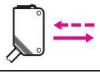
KPS-AR250TR



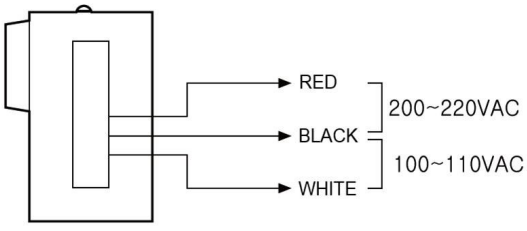
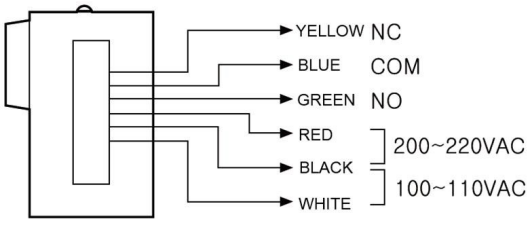
KPS–AP SERIES

CLASSIFICATION

KPS - AP □

MODEL	Type	Sensing Distance
KPS - AP500	Through - beam 	5M
KPS - AP1000		10M
KPS - AP2000		20M
KPS - AP3000		30M
KPS - AP500T/R	Retro - reflective 	5M
KPS - AP1000T/R		10M
KPS - AP50DR	Diffuse - reflective 	0.5M

Wiring diagram

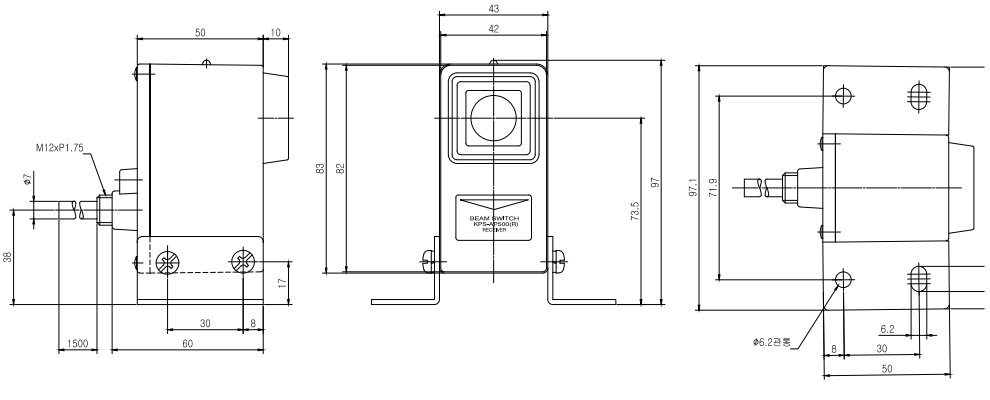
KPS–AP500 Emitter	KPS–AP500TR, AP50DR, AP500 , AP1000， AP2000, AP3000 Receiver
	

Parallel Operating Range

Type	Diffuse Reflective	Retro-reflective	Through-beam	
			Emitter	Receiver
Model	KPS-AP50DR	KPS-AP500TR	KPS-AP500	
Detecting Distance	0.5m Max.	2.5m Max.	5m Max.	
Standard detecting object	Opaque object		Opaque object(Ø20)	
Light Source	Infra-Red LED			
Voltage	110/220 VAC (50/60Hz)			
Power consumption	2.0VA(110VAC)		2.0VA	1.9VA
Output	Relay output: 1C			
Contact ratings	250VDC 2.0A			
Response time	25ms Max.			
External light interference	incandescent light 3,000 lx, sun light 10,000 lx Max.			
Ambient temperature	-20~+60°C			
Ambient humidity	35~85%RH			
Insulation resistance	min. 20MΩ			
Dielectric strength	1,000VAC 50/60Hz for 1 minute			
Vibration resistance	10~55Hz at single amplitude: 0.75mm(X,Y,Z directions) for 4 cycles			
Shock resistance	10G			
Indicator	Red LED			
Weight	380g	380g	350g	367g
Cable	1.5m wire			
Material	Zinc alloy Die-casting			

Dimensions

KPS-AP SERIES



KPS-0 □□ Cylindrical Photo sensor User manual

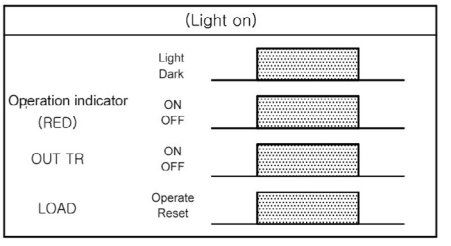
KPS −0 □□ - □□
① ② ③ ④

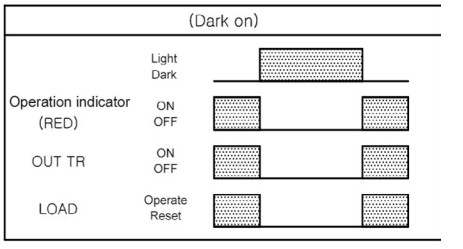
① Sensing type	D	Diffuse-reflective
	R	Retro-reflective
	T	Through beam
② Output	N	Receiver
	E	Emitter
③ Detecting range	None	Normal type
	1	40cm (Diffuse-reflective)
④ Body material	L	Nylon

Specification

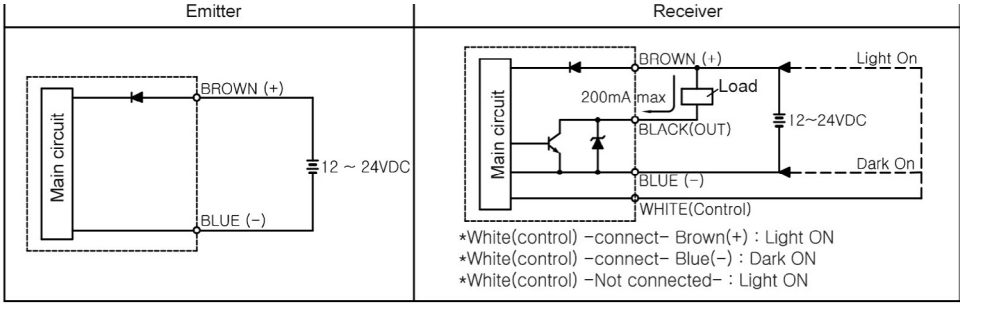
	KPS-OT-L		KPS-ORN-L	KPS-ODN-L	KPS-ODN-1L
	KPS-OTE-L	KPS-OTN-L			
Sensing type	Through-beam		Retro-reflective	Diffuse-reflective	
	Emitter	Receiver			
Detecting range	15m		3m	10cm	40cm
Detecting dbject	minimum Φ15mm opaque object		minimum Φ75mm opaque object	20×20cm Paper(white)	
Light source	IR LED(850nm)		Red LED(640nm)	IR LED(850nm)	
Power supply voltage	12~24VDC ±10%, Ripple(P-P) Maximum 10%				
Power consumption	Maximum 30mA				
Output control	NPN Open collector, Load current; 100 mA max., Load power supply voltage: 30 VDC max.				
Operation modes	Light ON / Dark ON				
Response time	From operation to reset; Maximum 1ms				
Adjusting sensitivity	Fixed		Multi-turn(15 cycles)		
Operaion Indicator	Green(Power)	Green(Power), Red(Operaion)			
Circuit protection	Power supply reverse polarity protection, Output short-circuit protection and Over current protection				
Insulation resistance	Minimum 20MΩ at 500VDC				
Dielectric strength	1000VAC 50/60Hz for 1 miniute				
Vibration resistance	10 to 55 Hz for 1minute, 1mm double amplitude for 2 hours each in X, Y and Z directions				
Shock resistance	500m/s2 3 times each in X, Y and Z directions				
Ambient light interference	Sunlight: 10000lx max., Incandescent lamp: 3000lx				
Ambient temperature	Operating: -10 to 60 ℃/ Storage: -25 to 75 ℃ (with no icing or condensation)				
Ambient humidity	35~85% RH				
Protection degree	IP67				
Connection	Pre-wired				
Wiring	Standard cable(2m/Φ4)				
	2P	4P			
Accessories	Fixing nuts		Reflector(40×60mm), Adjuster, Nuts	Adjuster, Nuts	
Weight	62g				
Material	Body: Nylon, Lens: PC				

Timing Chart

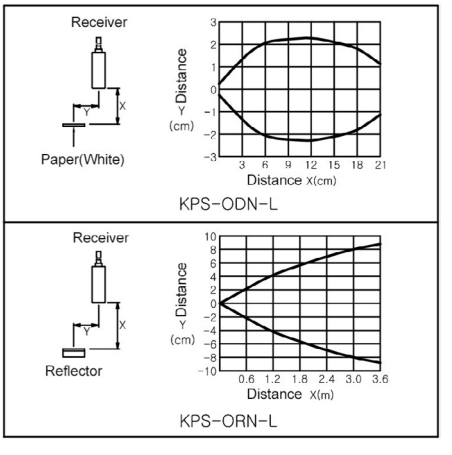


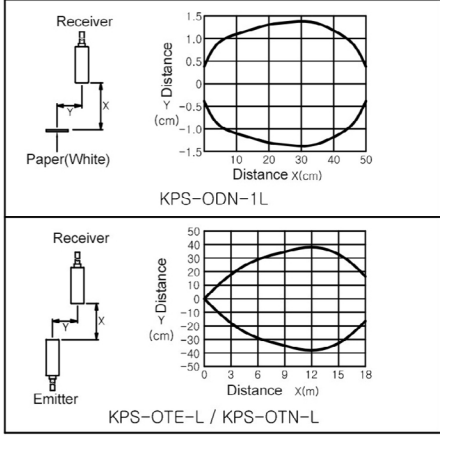


Output Circuit

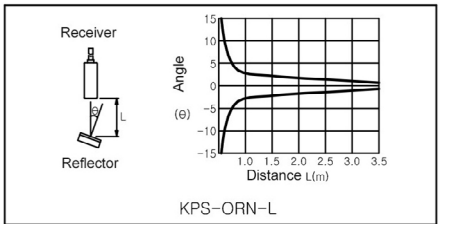


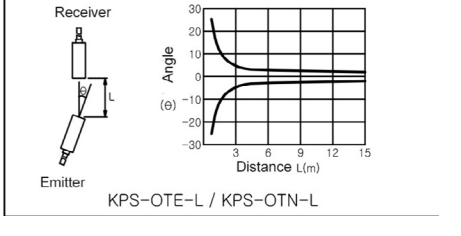
Parallel Operating Range





Angle Characteristic

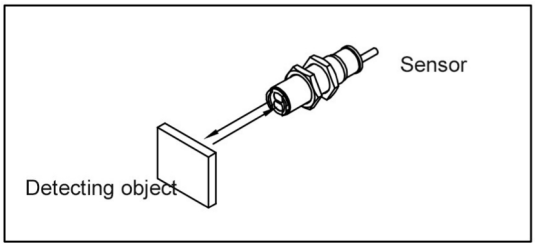


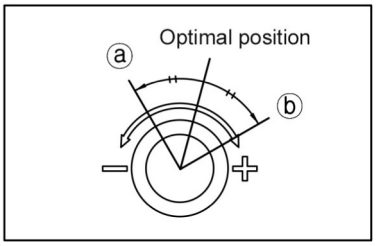


INSTALL

● Diffuse reflective

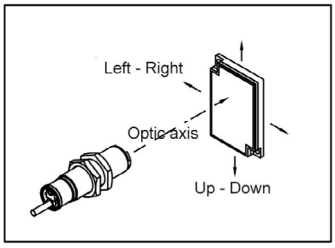
1 Generally set to maximum sensitivity. Adjust sensitivity considering the effects of objects, walls, and columns around objects detected.
2. Locate the object in the detection position and increase its sensitivity slightly to determine its operating position ⓐ
3. Remove the detected object and increase its sensitivity to check the operating position ⓑ
4. The intermediate position of ⓐ and ⓑ is the optimal position. (Volume knob: 15 turns)

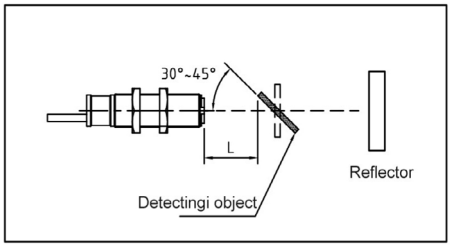




● Retro reflective

1 Place the sensor and the reflector face to face
2. Move the reflector and the sensor left and right to confirm the extent to which the motion indicator lamp illuminates, and install it at its midpoint.
3. The up and down directions shall also be set as follows in section #2
4. After adjustment is completed, place the detecting object on the optical axis, check its stability, and secure it.
*If more than one sensor is used in parallel, the gap between each sensor shall be not less than 30 cm.
*Refer to "Diffuse Reflective" Items for instructions on how to adjust the volume
*If the detecting object has a higher reflectance than white matte paper, the detection face should be leant 30 to 40 degrees to the sensor.
*Light ON: Operate when the detecting object is located between the emitter and the reflector
*Dark ON: Operate when the emitter and the reflector face each other directly.

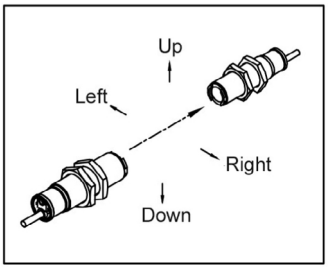




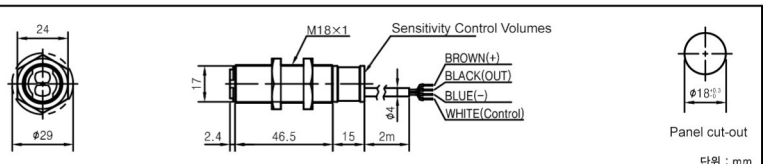
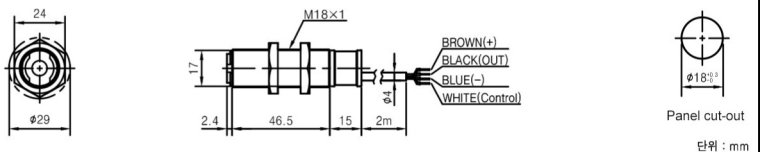
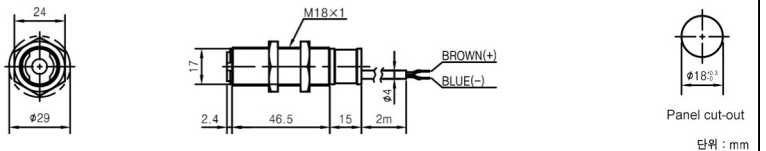
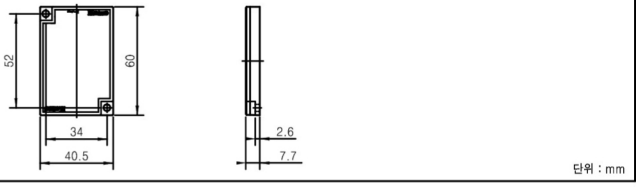
● Through–beam

1. Place the emitter and the receiver face to face on a straight line.
2. Fix one side and move the other up, down, left, and right to determine the extent to which the motion indicator illuminates then install in the central position.

* If the detected object is translucent or very small, it may not be detectable
* If multiple products are used, avoid interference by switching the location of the emitter and the receiver.



Dimensions

Reflective type KPS-ODN-L / KPS-ODN-1L / KPS-ORN-L	
Receiver (Through-beam) KPS-OTN-L	
Emitter (Through-beam) KPS-OTE-L	
Reflector KPS-R3	

* Nut tightening strenth: Maximum 30kgf.cm .

● PRECAUTIONS

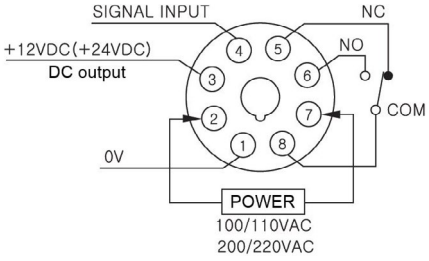
1. Avoid using cleaning agent when removing debris on the lens. However, if cleaning is necessary, wipe lightly with a soft cloth with alcohol. Organic solvents such as thinners and gasoline are prohibited for cleaning
2. Use a sun visor when strong external light (solar or incandescent lighting) comes into the sensor's sensing angle.
3. Do not use the sensor under the environment with corrosive gas or salty-wind.
4. Do not use the sensor under the environment with degeneration and deformation due to load.
5. Avoid flame and direct heat
6. Insulate unused wiring
7. Do not use the sensor in environments in excess of rated environmental specifications.
8. Do not use the sensor in a place where the sensor may receive direct vibration or shock.
9. Using in the range of 80% of maximum operating distance is recommended.
10. Do not connect any power or load higher than the rating.
11 Check the polarity before applying the power.
12. The maximum cable length is 10m

KPS–CP SERIES

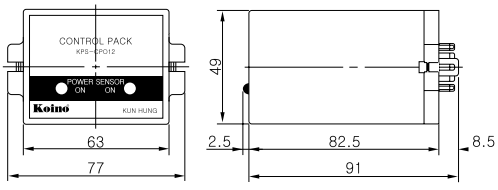
Specification

Model	KPS - CP012	KPS - CP024
Power supply	100~110VAC, 200~220VAC (50/60Hz)	
Power consumption	3.5VA	2.8VA
Output voltage	12VDC±5%(RIPPLE: ±5%)	24VDC±5%(RIPPLE: ±5%)
Output current	Max. 100mA	
Output	Relay output	
Contact ratings	250VAC 2.5A	
Operation switching function	none	
Timer function	none	
Ambient temperature	-20°C ~ +60°C	
Ambient humidity	35~85% RH	
Insulation resistance	minimum 10MΩ (DC500V)	
Dielectric strength	1,000VAC (50/60Hz) for 1 minute	
Vibration resistance	10~55Hz at single amplitude: 0.75mm(X,Y,Z directions)	
Shock resistance	5G	
Material	ABS	
Weight	226g	
Compatible socket	KH - TDR - R8	

Wiring diagram



Dimensions



KPS–R SERIES

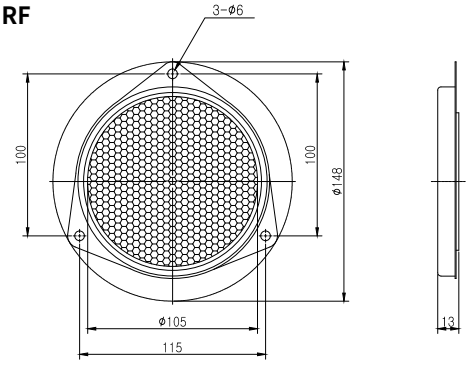
KPS-RF-S3 KPS-R3 KPS-RF

Materials

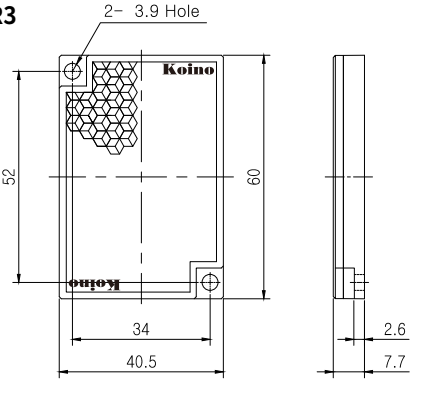
Model	Housing	Reflector	Weight
KPS–RF	Fe	Acryl (transparent)	90g
KPS–R3	ABS (Black)	Acryl (transparent)	24g
KPS–RF–S3	ABS (Black)	Acryl (transparent)	24g

Dimensions

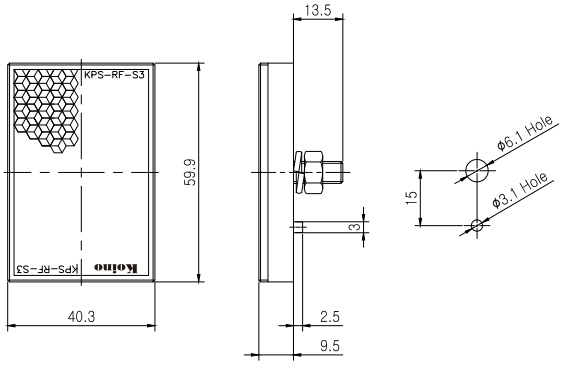
KPS-RF



KPS-R3



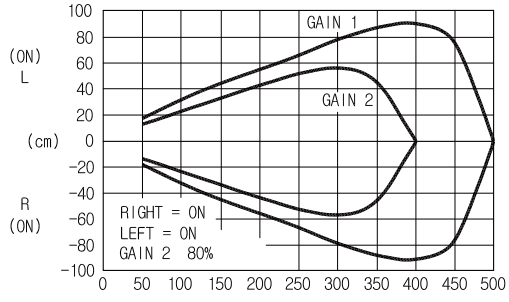
KPS-RF-S3

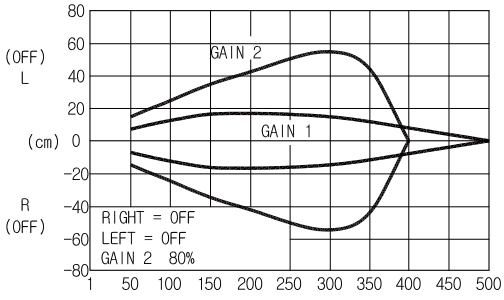


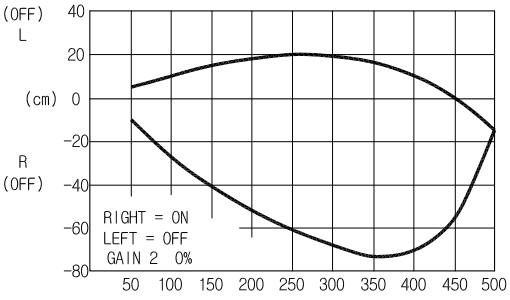
KPS–P300 SERIES

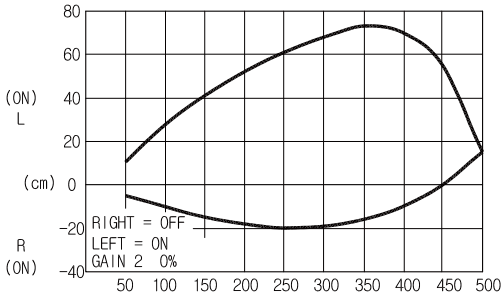
- Suitable for collision prevention
- Can use both relay output and TR output
- Can adjust detection range with gain control knob
- Overload protection circuit

Detection range and DIP switch configuration



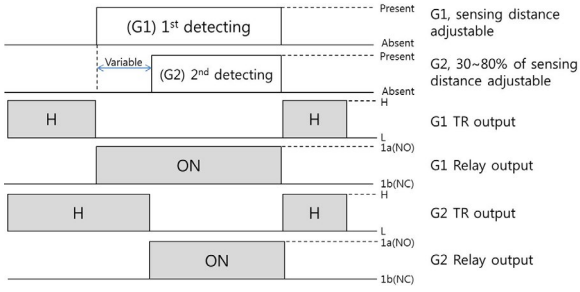




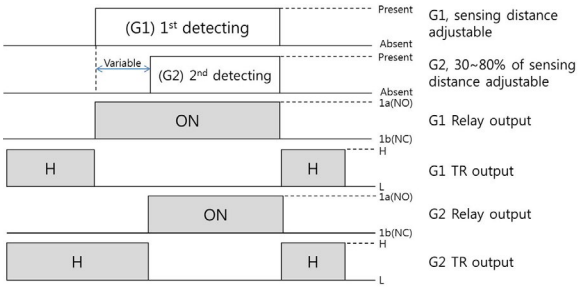


Operation mode

Incident light: ON (DARK OFF)



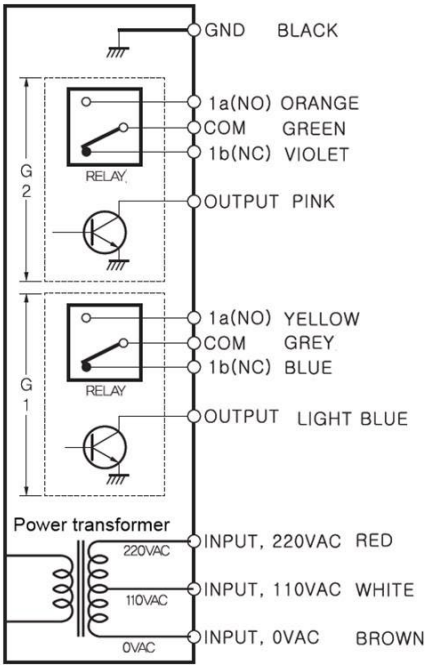
No incident light: ON (DARK ON)



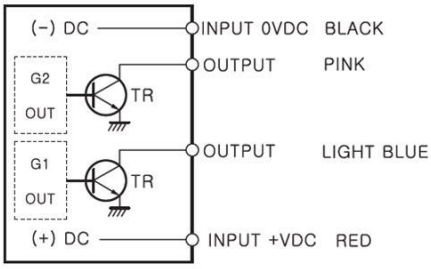
Specification

Model		AC	DC		
		KPS-P300S	KPS-P300DAS	KPS-P300DBS	KPS-P300DS
Sensing distance	G1	0.5m~5m			
Sensing distance	G2	30~80% of G1 sensing distance			
Rated voltage		110~220VAC	12VDC±20%	24VDC±20%	12~24VDC
Operating voltage		99~121VAC/186~242VAC	Ripple P-P: Max. 10%		
Current consumption		2.5VA	Max. 100mA		
Light source		Modulated infrared LED			
Wave length		940 nm			
Response time		Max. 80 ms			
Hysteresis		Max. 20% of sensing distance			
Output	G1	NPN open collector			
		Relay contact 1C			-
	G2	NPN open collector			
		Relay contact 1C			-
Contact ratings		for TR output: 70VDC 80mA			
		for relay output: 30VDC 2A, 125VAC 0.6A			-
Life time of relay		mechanical: 5,000,000 operations / electrical: 200,000 operations			
Operation mode		Incident light: LIGHT ON / No incident light: DARK ON			
External light interference		incandescent light 3,000 lx, sun light 10,000 lx Max.			
Indicator		G1: green LED, G2: red LED			
Protection		IP54(indoor use only)			
Insulation resistance		min. 100MΩ (500VDC)			
Dielectric strength		1,000VAC (50.60Hz) for 1 minute			
Noise resistance		±1,000VAC between AC power inlet terminals			
Ambient temperature		-20℃ ~+60℃			
Ambient humidity		35~85% RH			
Vibration resistance		10~55 Hz single amplitude 0.75mm (X,Y,Z directions) for 4 cycles			
Shock resistance		10G			
Material		ABS			
Weight		470g		400g	
Cable length		2m			

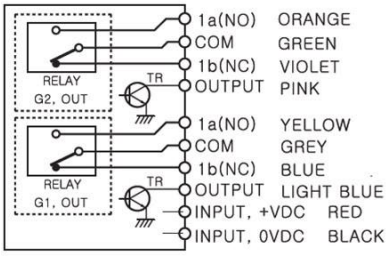
Wiring diagram



KPS-P300DS(DC12V~24V)

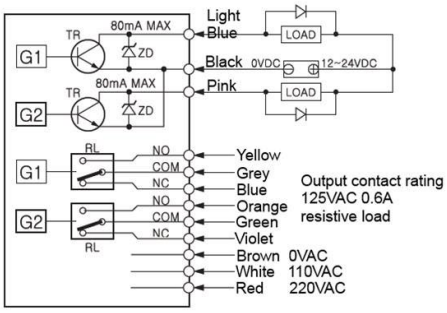


KPS-P300DAS : DC12V
KPS-P300DBS : DC24V

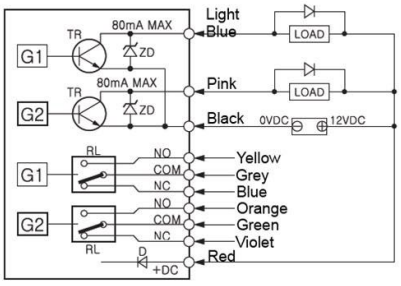


Wiring diagram for load

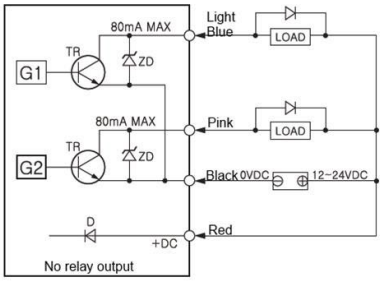
KPS-P300S



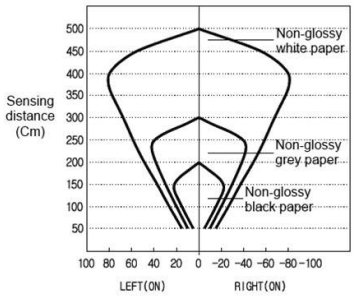
KPS-P300DAS : DC12V
KPS-P300DBS : DC24V



KPS-P300DS(DC12V~24V)

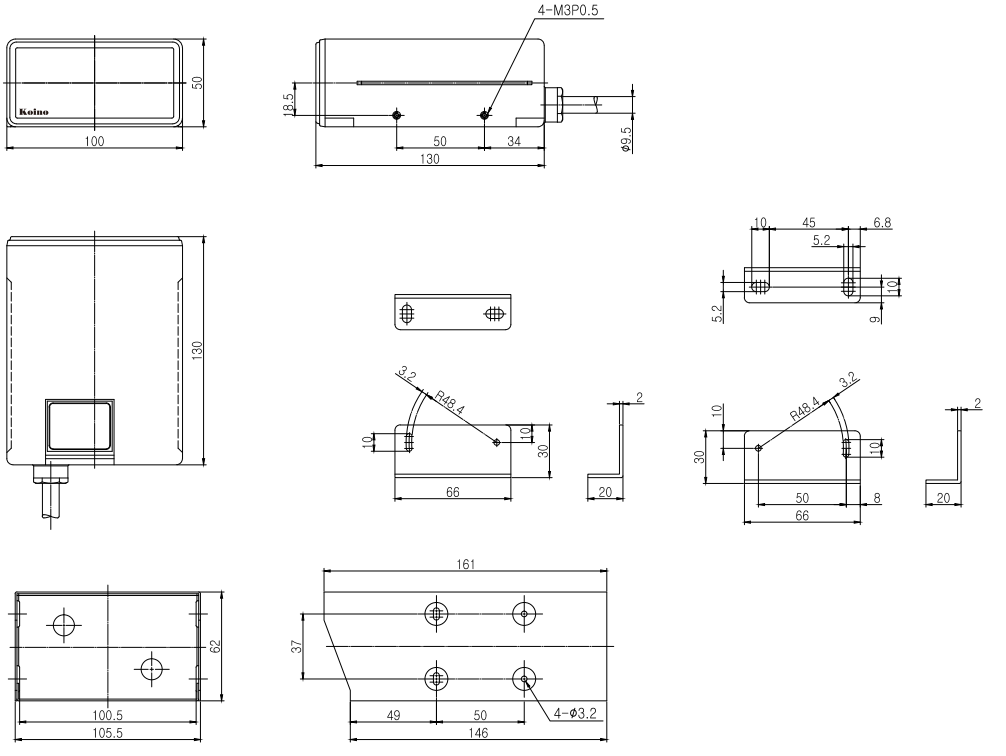


KPS-P300S
: color characteristic



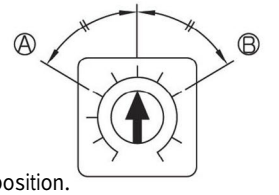
Dimensions

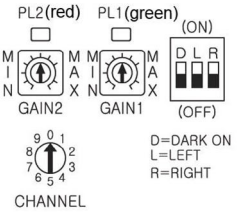
KPS - P300S



How to adjust sensitivity

PIC 1.





1) Turn power OFF.
2) Remove adjustment panel cover.
3) Set sensing area selection switch to desired position.
4) Remove all reflecting object from detection range.
5) Turn power ON.
6) Turn GAIN1 and GAIN2 counter - clockwise to minimum position.
7) Place detecting object in detection range.
8) Turn GAIN1 knob clockwise until green LED for GAIN1 is ON.
9) And then remove detecting object from detection range. Green LED turned off. (position A)
10) Without detecting object, turn GAIN1 knob clockwise until green LED turn ON. (position B)
11) Place GAIN1 knob to the middle position between position A and B.
12) Repeat this process 2~3 times.
13) For GAIN2, follow the same above.

※ Please refer to Pic 1.