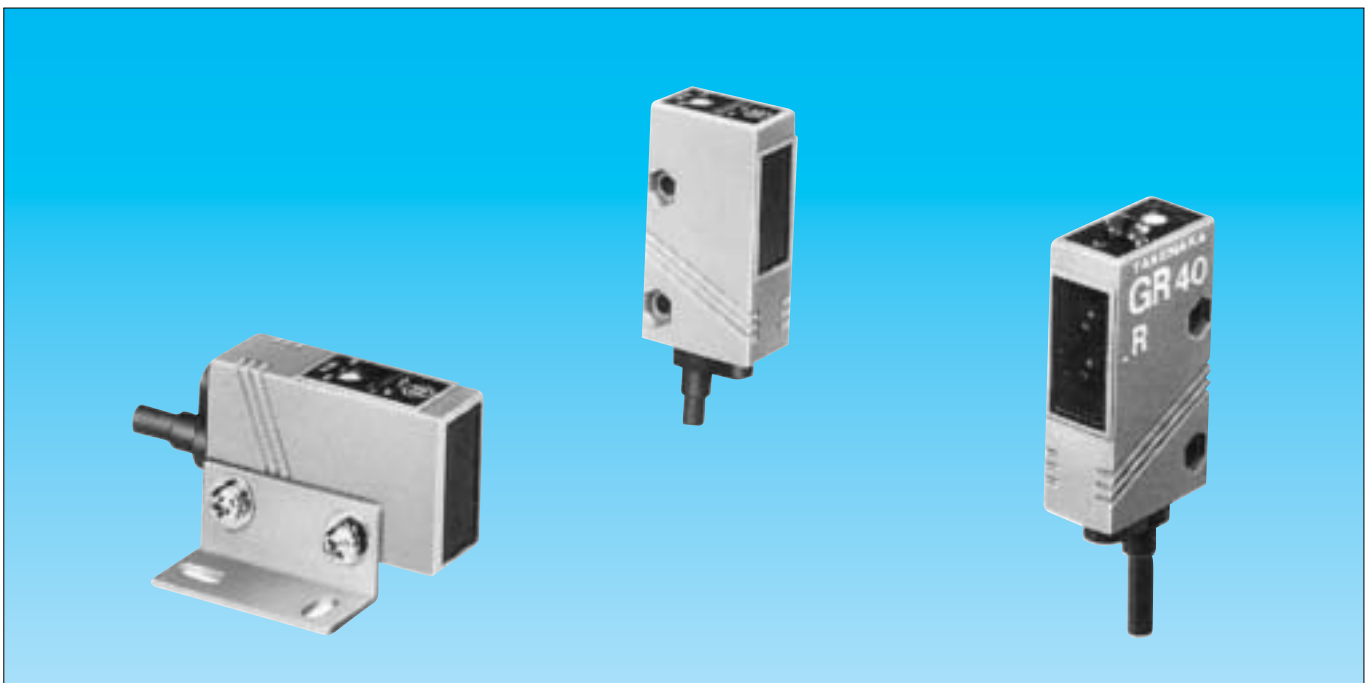


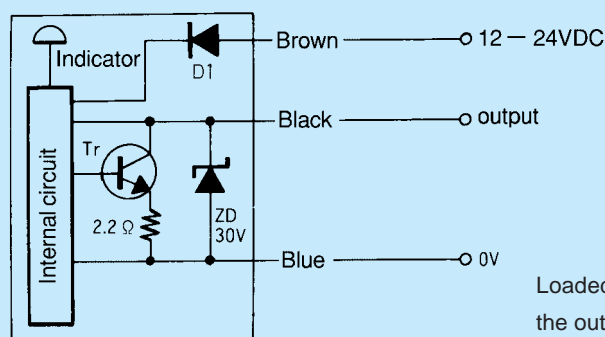
GR series

COLOR SENSORS

- Widely used LED type
- By being encapsulated with resin, the unit has easily passed IP67 (IEC), which enables the unit to be washed in water if required by the machine in which the sensor is built.
- The light IN indicator (red) and the stability indicator (green) are visible from all directions, so the operation can be checked remotely.
- The sensitivity adjustment and light ON / Dark ON changeover switch are built into to the unit. It also has complete short circuit protection and is resistant to noise interference.



OUTPUT CIRCUIT



Loaded short circuit or overload shuts off the output transistor.

Turn the power back on after checking the loaded condition.

SPECIFICATIONS

Models	Basic type	GR12R	GR12G		
	Side-on type	GR12RS	GR12GS	GR40R	GR60R
Detection		Convergent beam			
Range		12mm ± 2mm		2 ~ 7cm	2 ~ 9cm
Object resolution					
Power supply		12 - 24V DC ± 10% , Ripple 10%(Max.)			
Current consumption		25mA(Max.)	30mA(Max.)	25mA(Max.)	
Output mode(max.)		NPN Open collector Rating:Sink current 100mA, (DC30V) 1			
Operating mode		Light-On, Dark-On Selectable			
Response time(max.)		1msec			
Spot diameter		1mm		1.5mm 2	4mm 2
Min.detecting mark width		1mm Black mark on white base	1mm Red mark on white base		
Light source Wave-length		Red LED(680nm)	Green LED(568nm)	Red LED(660nm)	
LED indicator		Light(Red) , Tolerance(Green)			
Sensitivity adjust		Built-in Potentiometer			
Circuit protection		Built in short circuit			

1 PNP output is available (without short circuit protection) 2 Sensing range : 40mm.

ENVIRONMENT

Ambient Light	Withstands 5,000 lx except Convergent beam type
Operating temp.	- 25 ~ + 55
Humidity	35 - 85% RH
Protection	IP67 Waterproof
Vibration	10 ~ 55Hz, 1.5mm Amplitude 2Hr., 3 Directions

Mark Width and Detection Speed

When detecting registration marks, there will be a detection limit determined by the registration mark width and passing speed. This is dependant upon the response delay time (which is a unique feature of the photoelectric sensor) and the minimum detection mark width and can be calculated using the following formula

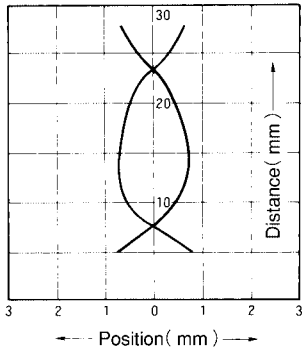
$$T = \frac{60 \cdot (W - 2A)}{V}$$

T: Mark sensor
Response delay time (msec)
W: Mark width (mm)
A: The minimum detection mark width (mm)
V: Line speed (m/min.)

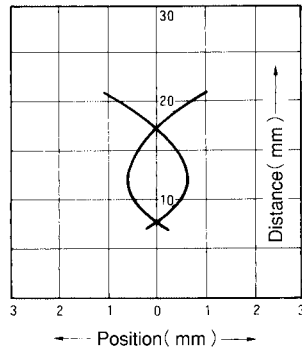
When not satisfying the above formula, any of W, A, V or T variables will have to be changed.

OPERATING AREA CHARACTERISTICS

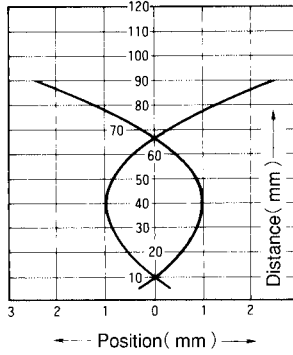
GR12RS · GR12R
(50 × 50mm White paper)



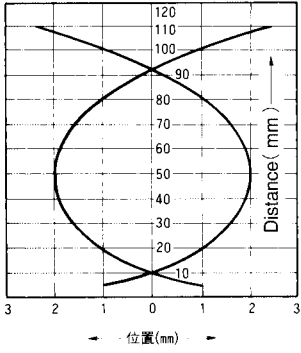
GR12GS · GR12G
(50 × 50mm White paper)



GR40R
(50 × 50mm White paper)

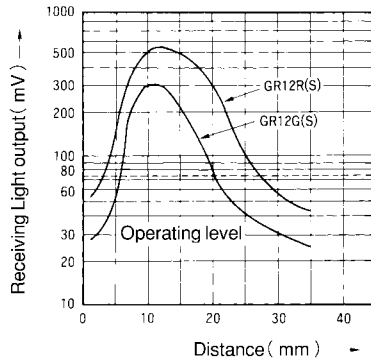


GR60R
(50 × 50mm White paper)

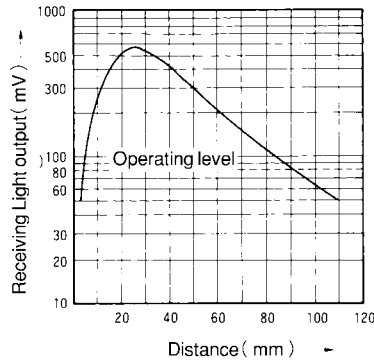


DISTANCE VS RECEIVING LIGHT OUTPUT CHARACTERISTICS

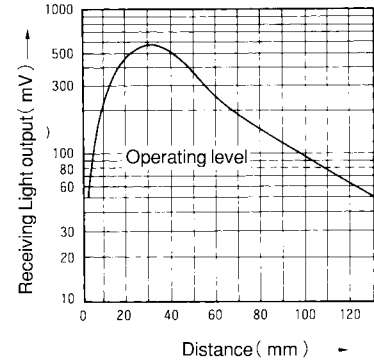
GR12RS · GR12R
GR12GS · GR12G
(50 × 50mm White paper)



GR40R
(50 × 50mm White paper)



GR60R
(50 × 50mm White paper)



DETECTING COLOR

Followings are rough ideas of color detection.

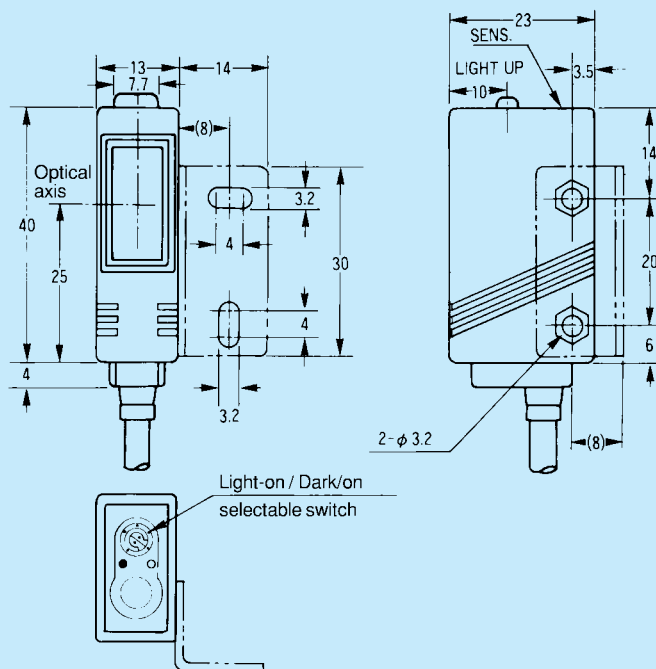
G.....Green LED

R.....Red LED

Base color \ Mark color	Black	Red	Orange	Yellow	Green	Blue	White
White	GR	G	G		GR	GR	
Blue	GR	GR	GR	GR	G		GR
Green	GR	R	GR	GR		G	GR
Yellow	GR	G	G		GR	GR	
Orange	GR	G		G	GR	GR	G
Red	GR		G	G	R	GR	G
Black		GR	GR	GR	GR	GR	GR

DIMENSIONS

GR12RS
GR12GS
GR40R
GR60R



GR12R
GR12G

