FE7W Series

Photoelectric Controls for Collision Prevention Sensing

FEATURES

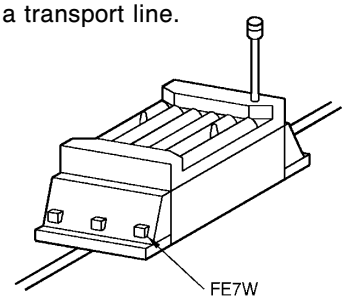
Collision of an Automatic Guided Vehicle (AGV) is Prevented in Advance. Obstavles Can be Sensed not in the Forward Direction of the AGV but also in the Left and Right-hand Directions to Reduce the Speed or Stop the AGV.

- *The obstacle sensing range can be set to two modes (slow, stop)*
- *Obstacles can be sensed not only in the forward direction of the AGV, but also in the left- and right-hand directions.* (**FE7W-D□/5K**)
- *Mutual interference between carts can be prevented since the signal emission frequency can be selected from 4 or 8 arcs.*
- *Wide or narrwo detection width can be selected according to the AGV size* (**FE7W-D□/5K**)
- *Controls are compact and easy to adjust from the front.*
- *Obstacles can be detected from a long 3m range in the direction of travel. These controls are applicable to even high speed AGVs.*

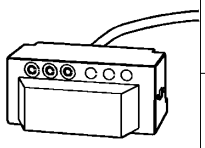
CLICK

APPLICATION EXAMPLES

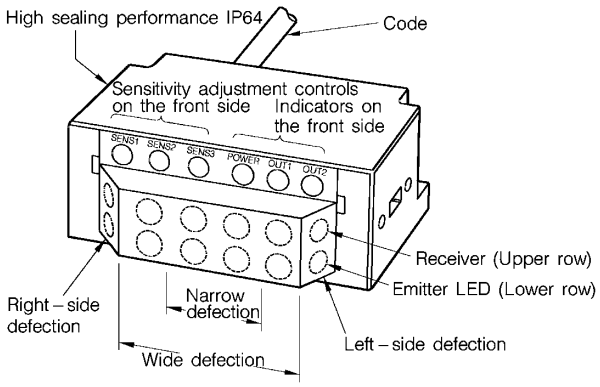
- Preventing the collision of AGVs.
- Sensing long-range position in a transport line.



ORDER GUIDE

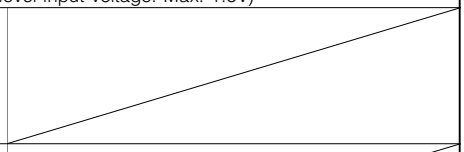
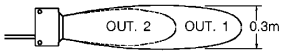
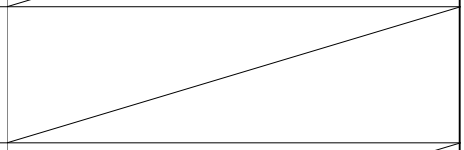
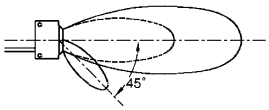
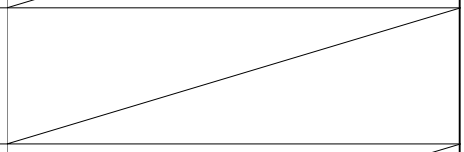
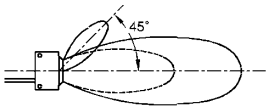
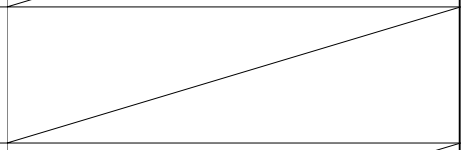
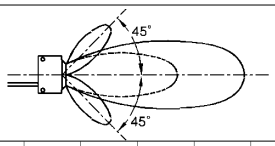
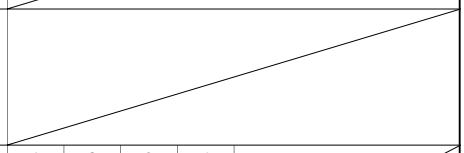
Detection method	Shape	Detection	Forward detection width	Operating mode	Output	Catalog listing
Diffuse scan type		2 rows in forward direction and left & right sides (45 degrees)	1/0.3m selection	N.O. light operated	NPN Open collector	**FE7W-DA5K**
				N.C. dark operated	NPN Open collector	**FE7W-DB5K**
		2 rows in forward direction	0.3m fixed	N.O. light operated	NPN Open collector	**FE7W-DA5**
				N.C. dark operated	NPN Open collector	**FE7W-DB5**

EXTERNAL VIEWS



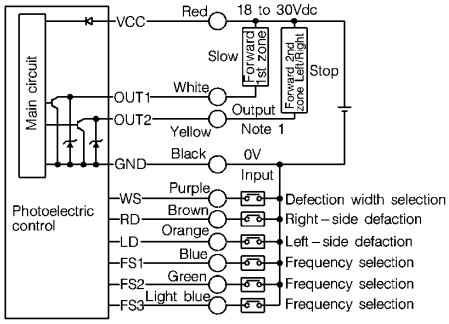
No. CP-PC-2056E

SPECIFICATIONS

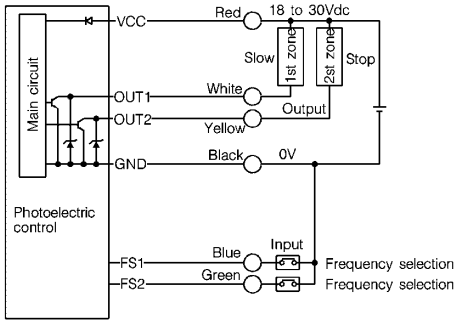
Detection method			Diffuse scan			
Catalog listing			**FE7W-DA5K**	**FE7W-DB5K**	**FE7W-DA5**	**FE7W-DB5**
Detection form			Forward (2 rows) and left & right sides (45 degrees)		Forward (2 rows)	
Scanning distance	Forward: 1st row		3m		3m	
	Forward: 2nd row		2.5m		2.5m	
	Left/right (45 degrees)		1m		—	
	Standard target object		50 × 50 90% reflecting paper			
Sensitivity adjustment	Forward: 1st row		SENS 1 control		SENS 1 control	
	Forward: 2nd row		SENS 2 control		SENS 2 control	
	Left/right (45 degrees)		SENS 3 control		—	
Detection width (1st row)	Horizontal direction		0.3/1.0m selectable by external input		0.3m fixed	
	Vertical direction		0.3m fixed		0.3m fixed	
Response speed			Operation, reset: Max. 80ms			
Differential travel			Max. 20%			
Light emitter			Infrared LED			
Supply voltage			18 to 30Vdc			
Current consumption			Max. 70mA			
Control output	OUT 1 (Slow)		Forward 1st zone output		Forward 1st zone output	
	OUT 2 (Stop)		Forward 2nd zone and left/right 45 degrees or connection output		Forward 2nd zone output	
	Operating mode		Light operated	Dark operated	Light operated	Dark operated
	Output form		Open collector			
	Output switching current		Max. 100mA (resistive load) with output short-circuit protection circuit OUT 1, 2			
	Output saturation voltage		Max. 1V (when load = 100mA)			
Indication	OUT 1		Illuminates (at detection in the 1st zone)		Illuminates (at detection in the 1st zone)	
	OUT 2		Illuminates (at detection in the 2nd or left/right zone)		Illuminates (at detection in the 2nd zone)	
	POWER		Illuminates when power is supplied		Illuminates when power is supplied	
External control input	Input form		Contact or non-contact (low level input voltage: Max. 1.5V)			
	Detection width selection: Wide width	NPN: Open WS-GND				
	Detection width selection: Narrow width	NPN: Close WS-GND				
	Right-side detection (Right LED only)	NPN: Close RD-GND				
	Left-side detection (Left LED only)	NPN: Close LD-GND				
	Right & left detection	NPN: Close RD-GND Close LD-GND				
	Signal emission frequency selection code table	Frequency No.	1 2 3 4 5 6 7 8		1 2 3 4	
		NPN: FS1-GND	○ ○ ○ ○ ● ● ● ●		○ ○ ● ●	
		NPN: FS2-GND	○ ○ ● ● ○ ○ ● ●		○ ● ○ ●	
		NPN: FS3-GND	○ ● ○ ● ○ ● ○ ●		○: Open ●: Short	
Operating ambient light (receiver surface)			Incandescent lamp: Max. 3,000lux, solar light: Max. 10,000lux			
Operating temperature range			−10 to +60°C			
Storage temperature range			−20 to +70°C			
Humidity range			45 to 85% RH			
Insulation resistance, dielectric strength			Min. 20MΩ (measured with 500Vdc megger), 500Vac 1 minute			
Vibration			Double amplitude 1.5mm, 10 to 55Hz, 2 hours along each of X, Y, Z axes			
Shock			490m/s² 3 times along each of X, Y, Z axes			
Protection			IP64			
Housing			Polycarbonate			
Lead			Lead length: 2, 10m 9.0mm dia. in diameter 0.3mm²			
Weight			Approx. 350g			

WIRING DIAGRAM

● **FE7W-DA5K/DB5K**



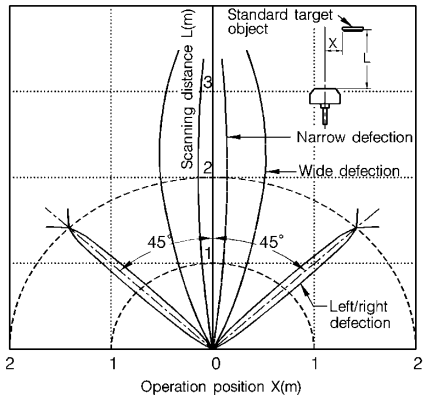
FE7W-DA5/DB5



CHARACTERISTICS

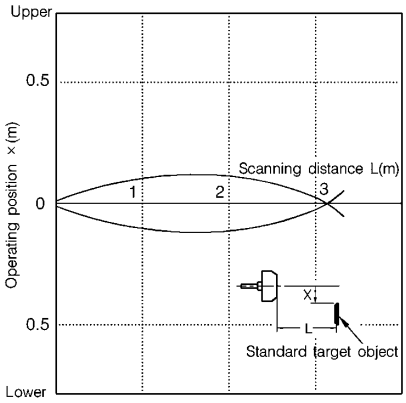
● Detecting area characteristics (Horizontal)

Forward (1st row) detection, left/right detection (Sensitivity adjustment control: Maximum)



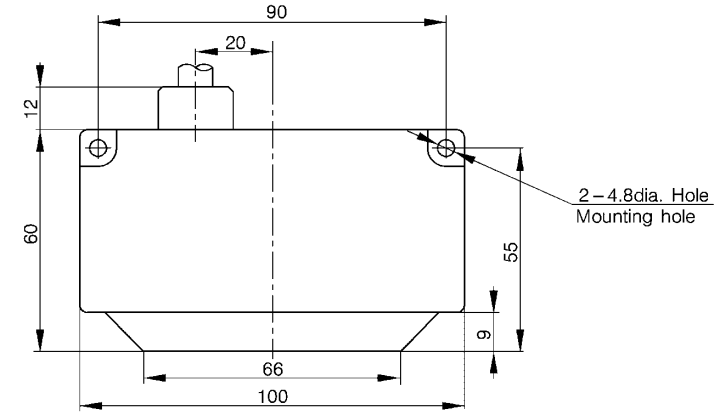
● Detection area characteristics (Vertical)

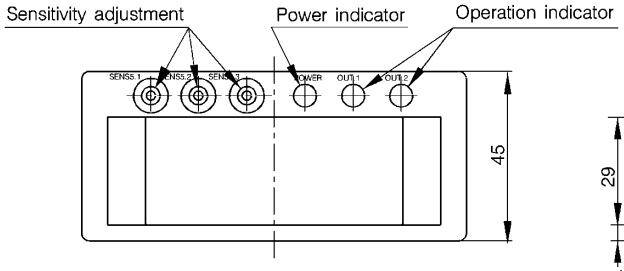
Forward (1st row) detection (Wide/Narrow; Sensitivity adjustment control: Maximum)

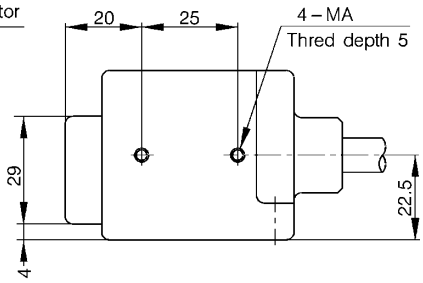


EXTERNAL DIMENSIONS

(unit: mm)



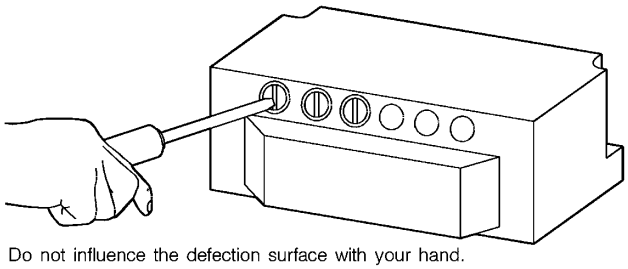




BASIC INSTRUCTIONS

● Basic instructions for sensitivity adjustment

(1) The scanning distance and the scanning distance of a diffuse scan control depend on the size, material, and reflectance of the target object.
(2) To adjust the sensitivity, when a target object is present, raise the sensitivity adjustment gradually from minimum and set it where the operating indicator illuminates or where the output toggles.
(3) After adjusting the sensitivity, remove the target object and make sure that the indicator goes out without being influence from the background or nearby objects. Check this over the entire motion range of the photoelectric control.
(4) If the background or other nearby objects influence the control's sensitivity, reduce the scanning distance or remove the object. Since a white wall exerts a large influence, select dark backgrounds if possible.
(5) Since the controls on the front side adjust sensitivity, make sure your hand is not detected during the above adjustments.



Do not influence the defection surface with your hand.

(6) The sensitivity of the 1st row and the 2nd rows (forward sensing) can be adjusted independently using SENS 1 and SENS 2. You are advised to set the 1st row (which has a long scanning distance) first. After making sure that the background and nearby objects are not exerting any influence, adjust the 2nd row.
(7) Only one control is provided for adjusting the sensitivity of right-side and left-side detection. The two sides cannot to adjusted independently.
(8) If you are not using left-right-side detection, set SENS 3 to the minimum.

● Wiring instructions

(1) Connect photoelectric controls, power units and loads correctly.
(2) Do not put photoelectric control leads in the same conduit tube as high voltage or power cables. Surges and noise can cause destruction or incorrect operation.
(3) Connect the ends of leads securely using a crimp terminal.
(4) Use a cable of at least 0.3mm^2. The lead should not be longer than 100m. Consider the influence of noise due to lead extension.
(5) If a generic controlling regulator is used, ground its frame.

● Mounting instructions

(1) Since this is a long-range diffuse scan photoelectric control, take into consideration the reflectance of the background and nearby objects. Pay special attention to reflection from the reflector of a nearby coaxial diffuse scan photoelectric control.
(2) When a number of photoelectric controls of this series must be used in the same space, set their frequencies by referring to the frequency selection code table, in order to prevent incorrect operation due to mutual interference.
(3) Unstable operation may be caused by the signal of another photoelectric control. Therefore, carefully study the layout of all controls.