TAKEX

Phase differential detection
BGS Photo Sensors

DX-S35F
DX-S33C SERIES Instruction Manual

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OUTLINE

The DX-S35F/DX-S33C model photo sensors are background suppression (BGS) sensors that detect the existence of an object by measuring the distance to that object using the phase differential detection technology.
The DX-S35F has five optical axes and the DX-S33C has three optical axes, with sensor output turning on when any one of them detects an object. Detection distance is adjusted using a distance adjuster. Up to four sensors can be connected for use with the interference prevention function.

⚠
- Do not use the sensor for detection for life saving purposes.
- For safety applications, ensure safe operation of the detection and control system as a whole.

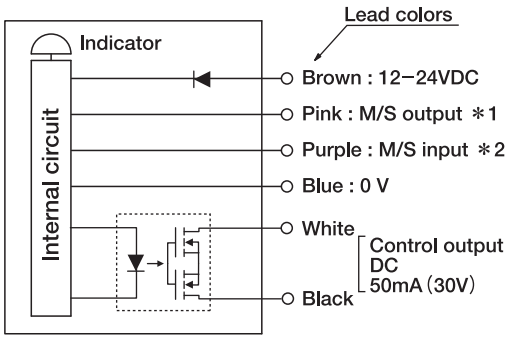
SPECIFICATIONS

Model		DX-S35F	DX-S35F-Y5	DX-S33C	DX-S33C-Y5
Detection method		Reflective / Phase differential detection			
Detecting distance		0.1-3m			
Standard detecting object		300×900㎜ white paper			
No. of optical axes		5 (w/ area setting function)		3 (w/o area setting function)	
Power supply		12-24VDC ±10% Ripple 10% max.			
Power consumption		1.7W or less		1.5W or less	
Output mode		PhotoMOS output (short circuit protection) Load current 50mA (30VDC) max. Residual voltage : 2V or less			
Operation mode		Light-ON			
Anti Interference		Provided (when connected to Master/Slave : up to 4 units)			
Response time		ON : 0.1s OFF : 0.3s max.			
Light source (wavelength)		Infrared LED (850nm)			
Indicator		Operation indicator (orange LED) At Master w/ detection ON : orange LED lit ; detection OFF : blue LED lit At Slave w/ detection ON : orange LED lit ; detection OFF : green LED lit			
Volume (VR)		Distance adjuster (1 to 3m)			
Rotary switch (SW)		Detection area setting switch		———	
Additional functions		Power reverse connection protection, output short-circuit protection			
Material	Case	Heat-resistant ABS			
	Front cover	Polycarbonate			
Connection		Pull out cord (OD : φ4.8㎜)			
		0.2㎟, 6 core, 2m (black)	0.2㎟, 6 core, 5m (black)	0.2㎟, 6 core, 2m (black)	0.2㎟, 6 core, 5m (black)
Weight		Approx. 170g			
Accessory		Operation manual			

ENVIRONMENTAL SPECIFICATION

Ambient light	20,000 lx max.
Ambient temperature	−20-+55℃ (Storage : −40-+70℃) non-freezing
Ambient humidity	35-85%RH (non-condensing)
Protective rating	I P40
Vibration resistance	10-55Hz / 1.5㎜ amplitude / 2 hours each in 3 directions
Dielectric withstanding	1,000VAC for 1 minute
Insulation resistance	500V mega DC, 20MΩ or higher
Shock resistance	500m/s² / 3 times each in 3 directions

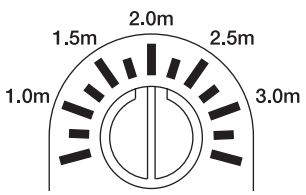
INPUT/OUTPUT CIRCUIT DIAGRAMS



Notes :
1 : Open the M/S (master and slave) output when using the sensor individually. Short-circuit the output to 0V when the sensor is the final slave in a M/S connection.
2 : M/S input of the sensor during individual use or of the first (master) sensor should be open.

DISTANCE ADJUSTMENT

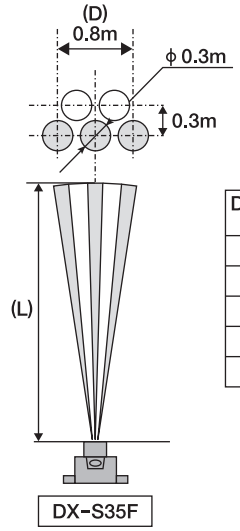
Distance adjustment is illustrated in the diagram below.



Notes : If a background object exists in the sensor's detection area, be sure to adjust the distance to a point at least 0.75m in front of that background. Also, be aware that the distance scale is only a benchmark and does not ensure accuracy.

DETECTION AREA

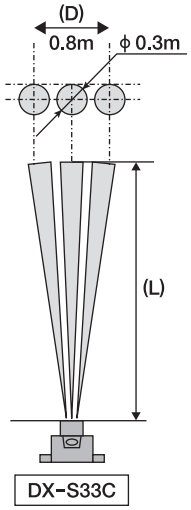
Sensor output turns on when any one of the optical axes detects an object.



DX-S35F

Distance (L)	Detection area (D)
1m	0.25m
1.5m	0.4m
2m	0.55m
2.5m	0.7m
3m	0.8m

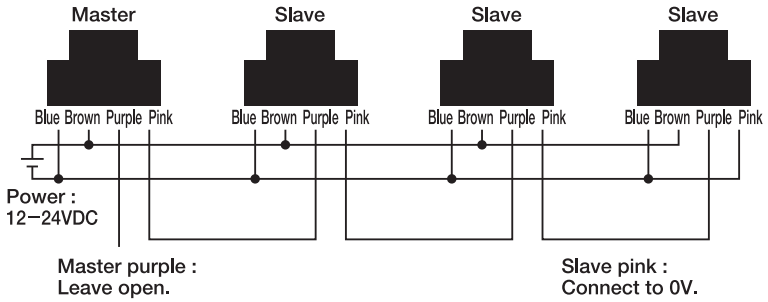
Detection area (with a detection distance of 3m)



DX-S33C

INSTALLATION

- Only the sensor lens surface has a rainproof structure ; other sections are not rainproof. Install the sensor in a rainproof housing in any location that is exposed to rain or snow.
- When a transparent cover is installed on the sensor's front surface, make sure the cover and sensor adhere closely to each other.
- If a background exists in the sensor's detection area, be sure to adjust the distance to a point at least 0.75m in front of the backgound.
- If a metallic or other obstacle with strong specular reflection, like a mirror, exists in the designated non-detection area, it may cause a false deteciton. In such a case, change the angle of the sensor or the obstacle before using the sensor.
- Connect wires as follows for master-slave setups.



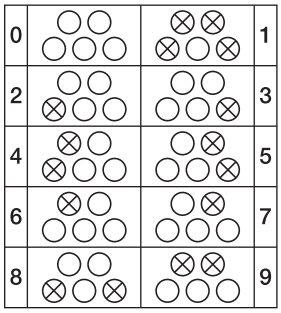
- Install the sensor so that strong light, such as sunlight, a fluorescent light or an incandescence lamp does not enter directly into the sensor lens.
- When using th sensor for vehicle detection, install it so that the optical axis crosses the vehicle body at right angle.
- Make sure the sensor works by checking performance and operation in advance.

CAUTIONS

- Be aware that it takes 0.3 seconds from turning on the power before the sensor operates normally.
- Always use the sensor within the rated voltage.
- Do not use an insulated transformer in the power supply.
- Since faulty wiring can cause fire damage or sensor failure, confirm that wires are correctly connected before turning on the power.
- Using the same conduit for the sensor wiring and a high voltage or power line can cause sensor malfunction or breakdown due to noise ; be sure to use a separate conduit for the sensor wiring.
- Do not repeatedly turn the power on and off.
- Locations with corrosive gas, locations in which vibration or impact can occur, locations where oil and chemicals are dispersed directly can cause sensor malfunction or breakdown.
- Do not use thinner or alcohol to clean the cover ; if it becomes dusty or dirty, etc., wipe gently with a soft cloth, and be sure to clean the cover regularly.

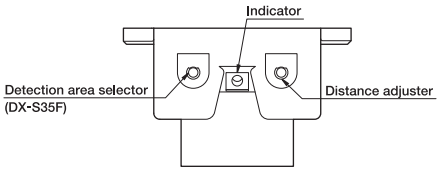
DETECTION AREA SETTINGS (DX-S35F)

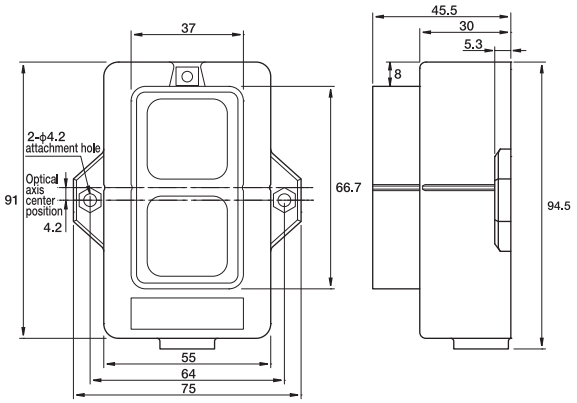
The following 10 detection area settings are possible with the detection area selection.
Note : This function is not available with the DX-S33C.



⊗…Non-detection area

DIMENSIONS (unit : mm)





- This sensor is designed to detect a specific object. It is not provided with control functions for prevention of injuries or accidents in itself.
- Takex will not held responsible for any damage or loss incurred due to accidents, faulty installation, abuse, misuse, improper maintenance or acts of God including lightning surge.
- Specifications and dimensions may be subject to change without notice.