

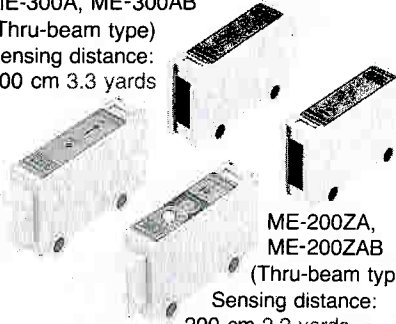


# EASY INSTALLATION AND MAINTENANCE

Components for advanced technology

# ME Photoelectric Sensors

ME-300A, ME-300AB  
(Thru-beam type)  
Sensing distance:  
300 cm 3.3 yards



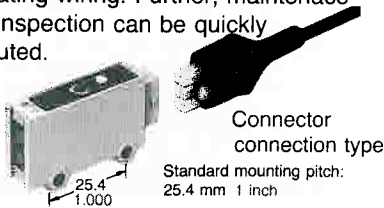
ME-200ZA,  
ME-200ZAB  
(Thru-beam type)  
Sensing distance:  
200 cm 2.2 yards

ME-D30A, ME-D30AB  
(Diffuse reflective type)  
Sensing distance:  
30 cm 12 inches



## 1. Connector connection type with serviceability in mind

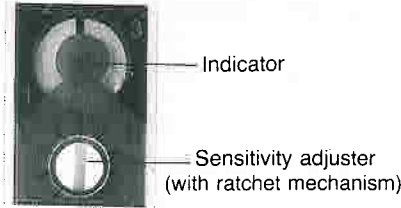
This connection type allows separation of the mounting job and the wiring job, thus facilitating wiring. Further, maintenance and inspection can be quickly executed.



## 2. Three-turn adjuster with ratchet mechanism (Indicator provided)

For detection adjustment, the three-turn adjuster corresponds to the fine detection conditions.

Further, the ratchet mechanism prevents the adjuster from breakage caused by excessive turning during adjustment. The indicators which are visible at a glance facilitate setting when a number of the switches are arranged in line.



## 3. Thru-beam type, ME-200ZA which detects even a translucent object

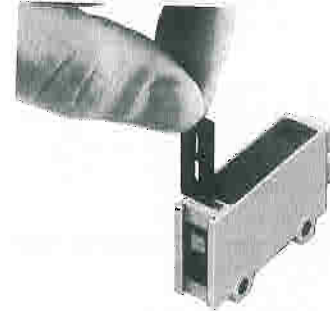
The ME-200ZA and ME-200ZAB are provided with the three-turn adjuster.

Accordingly, a translucent object which has been hard to detect in the existing thru-beam type can be detected.

## 4. Slit filter attachable

To detect a tiny object or to improve the

positioning accuracy, the effective slit filter can be attached. (Separately available)



## 5. High speed detection of 1 msec.

Detection is possible at a rate of 500 times per sec., thus corresponding to high speed machines such as electronic part insertion machines.

## 6. Common use for 12-24V DC operational voltage

The sensor can be used over a wide range from 9.6V to 30V DC.

## APPLICATIONS

Electronic equipment production lines for electric appliances and measuring instruments (under optimum environmental conditions)

## PRODUCT TYPE

### 1. ME Amplifier Selfcontained-DC Photoelectric Sensor

Detection method	Product name	Operation state	Max. sensing distance	Part No.	
				(with connector)	(with cabled connector)
Thru-beam type	ME-300A photoelectric sensor with projector and receiver in a set	Dark-ON	300 cm 3.3 yards	ME-300A1-DC12-24V	ME-300A2-DC12-24V
	ME-300AB photoelectric sensor with projector and receiver in a set	Light-ON	300 cm 3.3 yards	ME-300AB1-DC12-24V	ME-300AB2-DC12-24V
	ME-200ZA photoelectric sensor with projector and receiver in a set	Dark-ON	200 cm 2.2 yards	ME-200ZA1-DC12-24V	ME-200ZA2-DC12-24V
	ME-200ZAB photoelectric sensor with projector and in a set	Light-ON	200 cm 2.2 yards	ME-200ZAB1-DC12-24V	ME-200ZAB2-DC12-24V
Diffuse reflective type	ME-D30A photoelectric sensor	Light-ON	30 cm 12 inches	ME-D30A1-DC12-24V	ME-D30A2-DC12-24V
	ME-D30AB photoelectric sensor	Dark-ON	30 cm 12 inches	ME-D30AB1-DC12-24V	ME-D30AB2-DC12-24V

Note: Mounting hardware are provided.

### 2. Accessories

Product name	Specifications	Application	Part No.
ME slit plate set	Round, vertical and horizontal holed plates are available in a set two per each.	ME photoelectric sensor	ANA1804
MC connector (three-terminal type)	Dust protective cover provided	MQ-F amplifier unit and ME photoelectric sensor	AN53810
MC connector (two-terminal type)	Dust protective cover provided	Projector of ME photoelectric sensor	AN53811
MC cabled connector (two-core type)	2 m 2.2 yards long cable and dust protective cover provided	Projector of ME photoelectric sensor	AN53812
MC cabled connector (three-core type)	2 m 2.2 yards long cable and dust protective cover provided	MQ-F amplifier unit and ME photoelectric sensor	AN53813

36 Note: The connector or cabled connector is attached to the main body of the photoelectric sensor.

# CIRCUIT DIAGRAM

Detection method	Circuit diagram	Type	Output transistor operating state	Light indicator LED (OPE.)	Operation state under load	
Thru-beam type		ME-300A (ON when detected)	ON when light is blocked. (Dark-ON)	Lit when light is received.	Activated when light is blocked.	
		ME-300AB (OFF when detected)	ON when light is received. (Light-ON)		Activated when light is received.	
		ME-200ZA (ON when detected)	ON when light is blocked. (Dark-ON)		Activated when light is blocked.	
		ME-200ZAB (OFF when detected)	ON when light is received. (Light-ON)		Activated when light is received.	
		Diffuse reflective type	ME-D30A (ON when detected)		ON when light is received. (Light-ON)	Activated when light is received.
			ME-D30AB (OFF when detected)		ON when light is blocked. (Dark-ON)	Activated when light is blocked.

## SPECIFICATIONS

### 1. Ratings

Item	Type	Thru-beam type (ME-300A, ME-300AB)	Thru-beam type (ME-200ZA, ME-200ZAB)	Diffuse reflective type (ME-D30A, ME-D30AB)
	Operation side	Rated operating voltage	12 V to 24 V DC	
Rated current consumption		Max. 45 mA Projector, Max. 25 mA Receiver, Max. 20 mA (excluding load)		Max. 25 mA (excluding load)
Load side	Output current capacity	100 mA max.		

### 2. Performance

Item	Type	Thru-beam type		Diffuse reflective type
		ME-300A, ME-300AB	ME-200ZA, ME-200ZAB	ME-D30A, ME-D30AB
Standard target		10 mm .394 inch dia. metallic plate (dull black finish)		White drawing paper, $10 \times 10$ cm, $3.937 \times 3.937$ inches
Operating voltage range		9.6 V to 30 V DC [including ripple (P-P)]		
Max. sensing distance		3 m 3.3 yards	2 m 2.2 yards	30 cm 12 inches
Operation angle		- Min. 5° for both projector and receiver		
Hysteresis		—		Within 20% of rated distance
Detection speed		1 ms (500 times/s)		
Insulation resistance (initial)		Min. 20 MΩ between input/output terminal and external housing (at 500 V DC)		
Dielectric strength (initial)		500 Vrms for one minute between input/output terminal and external housing		
Vibration resistance	Functional	10 to 55 Hz (1 cycle/min), double amplitude 1.5 mm .059 inch (2 h on 3 axes)		
	Destructive	10 to 55 Hz (1 cycle/min), double amplitude 1.5 mm .059 inch (2 h on 3 axes)		
Shock resistance	Functional	100 G (6 times on 3 axes)		
	Destructive	100 G (6 times on 3 axes)		
Protective construction		Plastic case, dust-protected construction (equivalent to IEC IP50)		
Environmental conditions	Ambient light level	Incandescent lamp, 10,000 lux or less, sunlight 30,000 lux or less		
	Detectable target	Opaque material, 5 mm .197 inch dia. or more	Translucent/opaque material, 5 mm .197 inch dia. or more	Transparent/opaque material
	Ambient temperature	-25°C to +55°C -13°F to +131°F		
	Ambient humidity	Max. 85% RH		
Others	Projector	Power supply indication (red)	Power supply indication (red)	Power supply indication (red) Sensitivity adjuster provided.
	Receiver	Lighting indication (red) when received. Detection surplus indication (red) when received.	Lighting indication (red) when received. Sensitivity adjuster provided.	

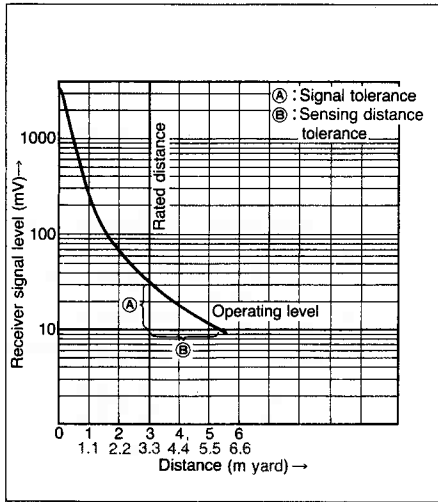
#### Notes:

- Unless otherwise specified, the measurement conditions are: rated operating voltage, battery power supply, 20°C +68°F ambient temperature, standard target and 200 lux or less receiver illuminance.
- Since the rated distance and the response differential distance for the diffuse reflective type are based on the standard target, the detectable distance depends on the material, color and size of the target.

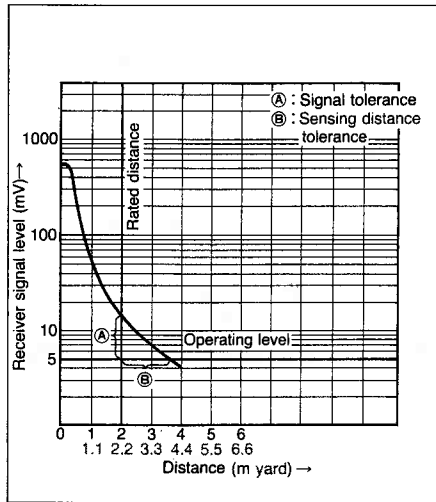
# DATA

## 1. Characteristics of light level received vs distance

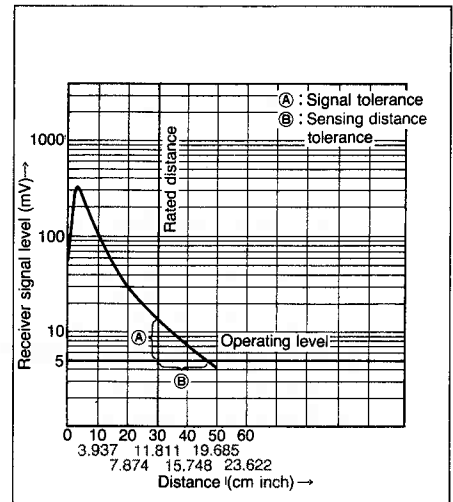
ME-300A(AB) Photoelectric sensor  
(Thru-beam type 300 cm 3.3 yards)



ME-200ZA(AB) Photoelectric sensor  
(Thru-beam type 200 cm 2.2 yards)  
Condition: at max. position (H) of sensitivity adjuster

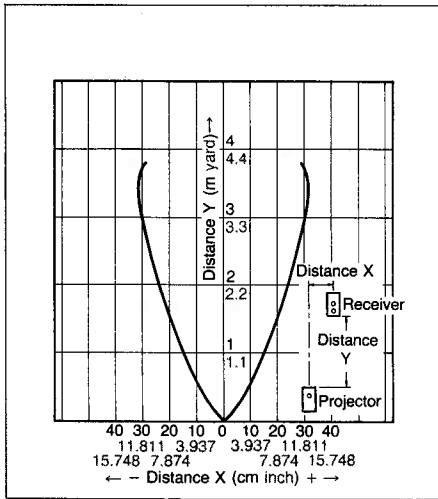


ME-D30A(AB) Photoelectric sensor  
(Diffuse reflective type 30 cm 12 inches)  
Condition: at max. position (H) of sensitivity adjuster  
Target: white drawing paper 10×10 cm  
3.937×3.937 inches

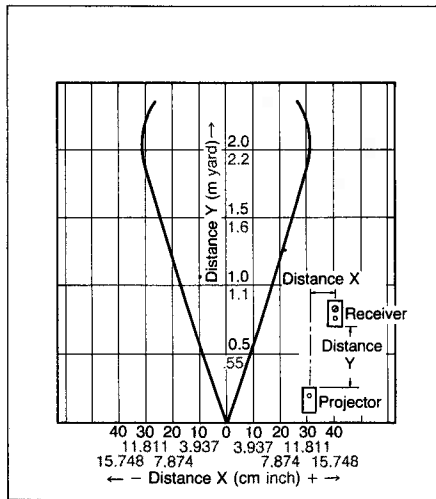


## 2. Operation range characteristics

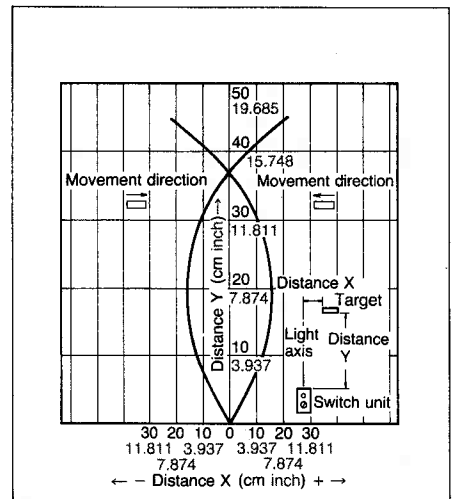
ME-300A(AB) Photoelectric sensor  
(Thru-beam type 300 cm 3.3 yards)



ME-200ZA(AB) Photoelectric sensor  
(Thru-beam type 200 cm 2.2 yards)  
Condition: at max. position (H) of sensitivity adjuster

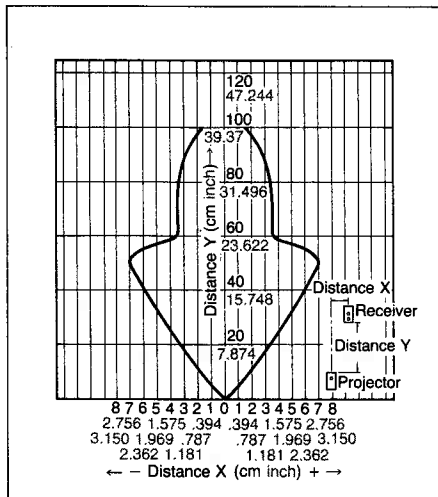


ME-D30A(AB) Photoelectric sensor  
(Diffuse reflective type 30 cm 12 inches)  
Condition: at max. position (H) of sensitivity adjuster  
Target: white drawing paper 10×10 cm  
3.937×3.937 inches

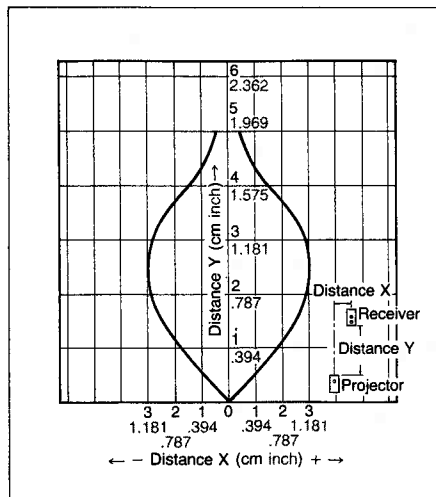


## 3. Operation range characteristics (with slit plate)

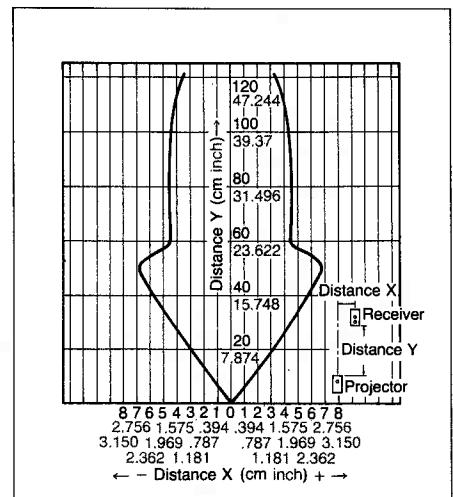
ME-300A(AB) Photoelectric sensor (Thru-beam type)  
Condition: with round slit (2 mm .079 inch dia.) plate



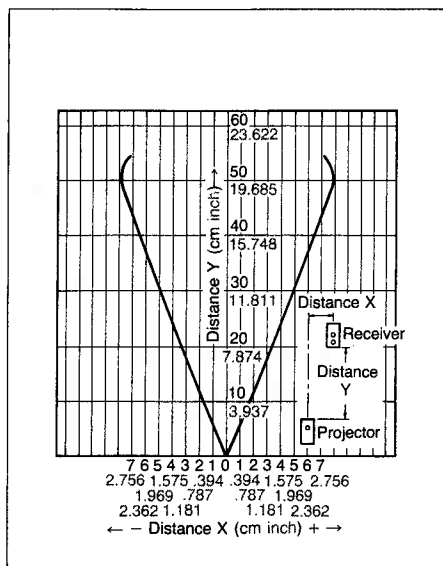
ME-300A(AB) Photoelectric sensor (Thru-beam type)  
Condition: with round slit (0.6 mm .024 inch dia.) plate



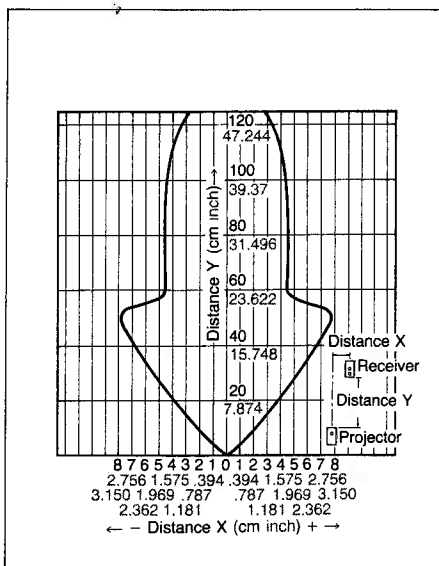
ME-300A(AB) Photoelectric sensor (Thru-beam type)  
Condition: with vertical slit (5×1 mm .197×.039 inch)  
plate



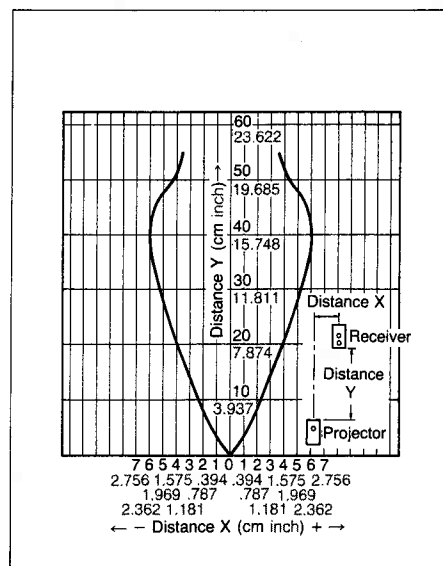
ME-300A(AB) Photoelectric sensor (Thru-beam type)  
Condition: with vertical slit (5×0.5 mm .197×.020  
inch) plate



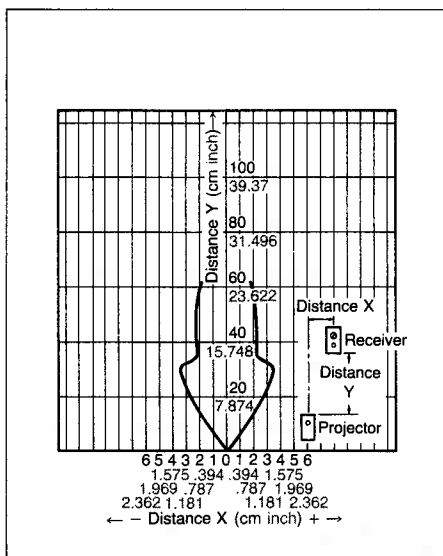
ME-300A(AB) Photoelectric sensor (Thru-beam type)  
Condition: with horizontal slit (1×5 mm .039×.197  
inch) plate



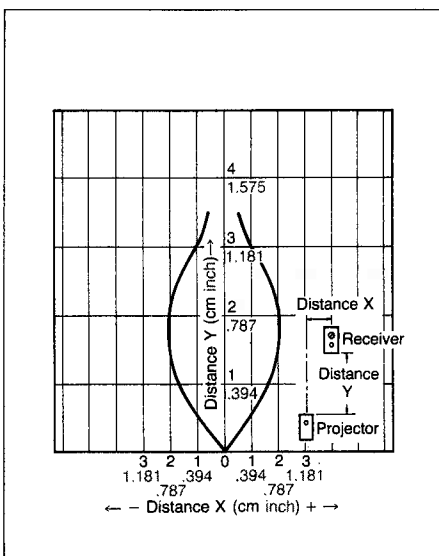
ME-300A(AB) Photoelectric sensor (Thru-beam type)  
Condition: with horizontal slit (0.5×5 mm .020×.197  
inch) plate



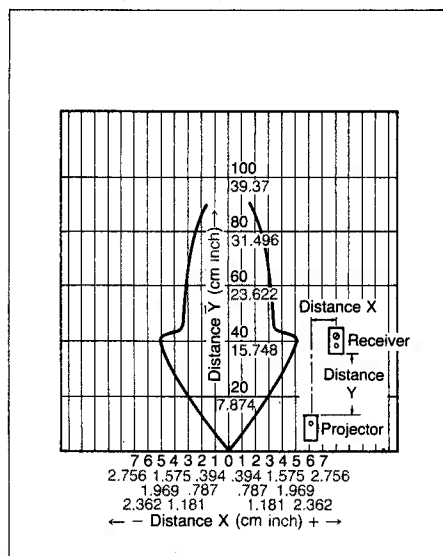
ME-200ZA(AB) Photoelectric sensor (Thru-beam type)  
Condition: with round slit (2 mm .079 inch dia.) plate  
and at max. position (H) of sensitivity  
adjuster



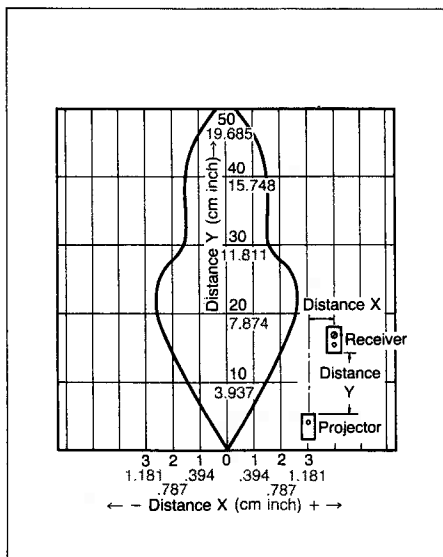
ME-200ZA(AB) Photoelectric sensor (Thru-beam type)  
Condition: with round slit (0.6 mm .024 inch dia.)  
plate and at max. position (H) of sensitivity  
adjuster



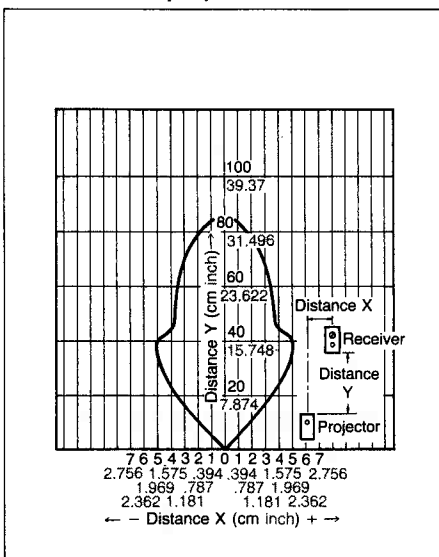
ME-200ZA(AB) Photoelectric sensor (Thru-beam type)  
Condition: with vertical slit (5×1 mm .197×.039 inch)  
and at max. position (H) of sensitivity  
adjuster



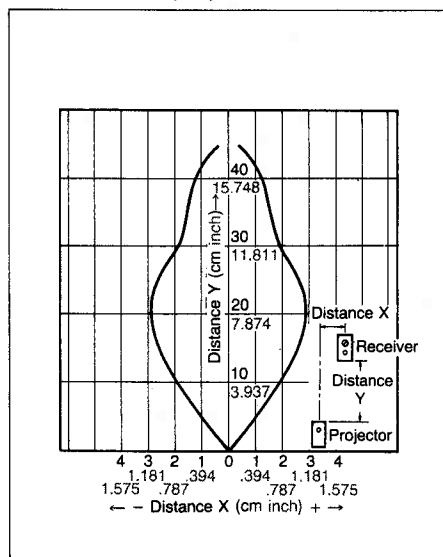
ME-200ZA(AB) Photoelectric sensor (Thru-beam type)  
Condition: with vertical slit (5×0.5 mm .197×.020  
inch) plate and at max. position (H) of  
sensitivity adjuster



ME-200ZA(AB) Photoelectric sensor (Thru-beam type)  
Condition: with horizontal slit (1×5 mm .039×.197  
inch) plate and at max. position (H) of  
sensitivity adjuster



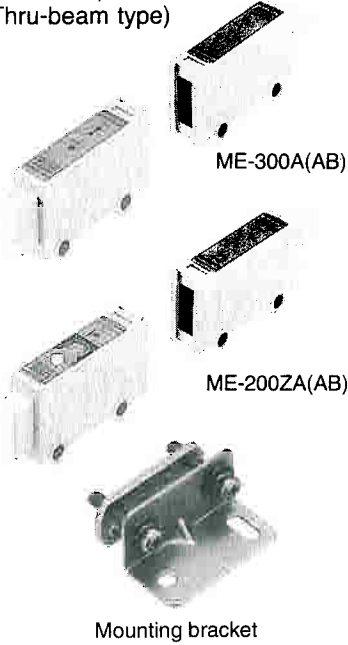
ME-200ZA(AB) Photoelectric sensor (Thru-beam type)  
Condition: with horizontal slit (0.5×5 mm .020×.197  
inch) plate and at max. position (H) of  
sensitivity adjuster



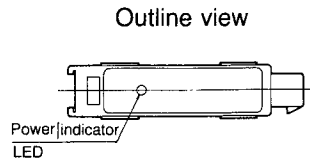
# DIMENSIONS (excluding the connector)

mm inch

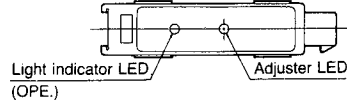
- ME-300A, ME-300AB,  
ME-200ZA, ME-200ZAB  
(Thru-beam type)



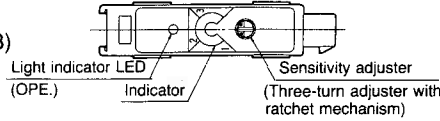
Projector  
ME-300A (AB)  
ME-200ZA (AB)



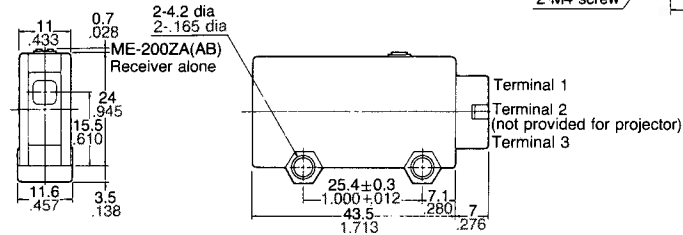
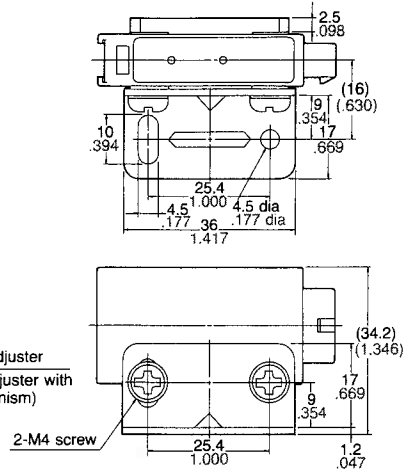
Receiver  
ME-300A (AB)



Receiver  
ME-200ZA (AB)



## Mounting bracket attachment view

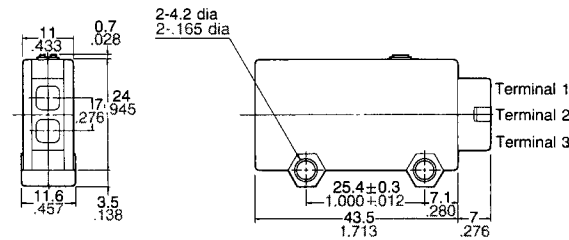
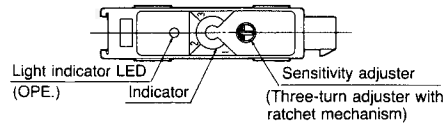


Tolerance: ±1.0 ±.039

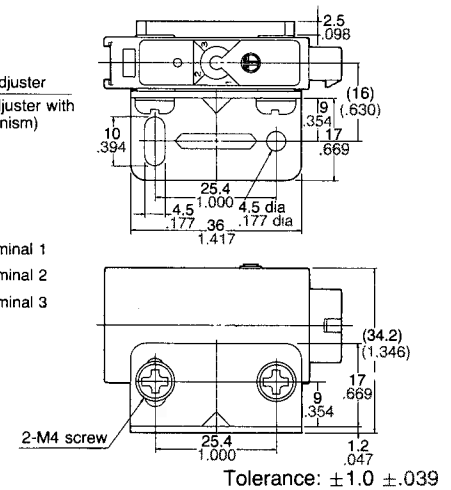
- ME-D30A, ME-D30AB  
(Diffuse reflective type)



## Outline view

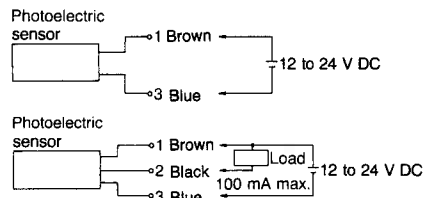


## Mounting bracket attachment view

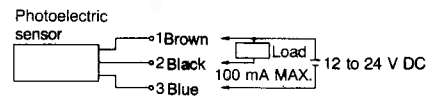


# CONNECTIONS

- Thru-beam type



- Diffuse reflective type

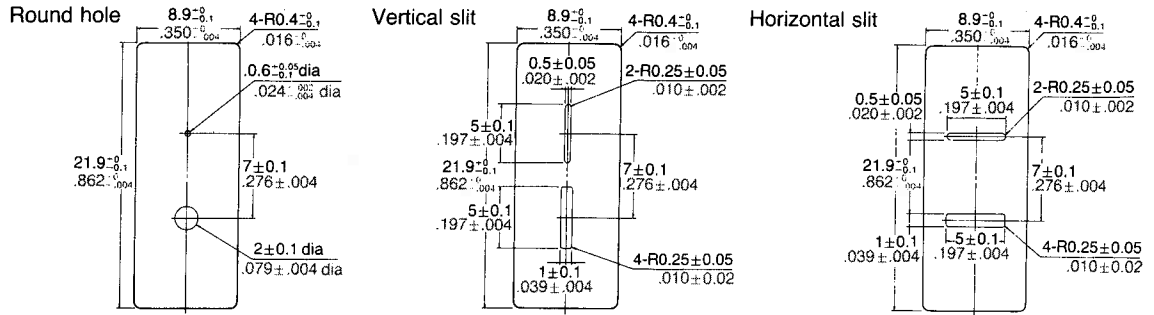


Note: The colors are applicable for a set with cabled connector.

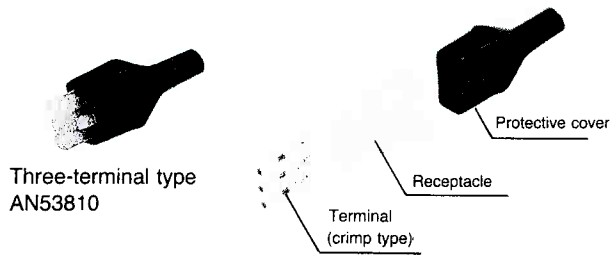
# ACCESSORIES

mm inch

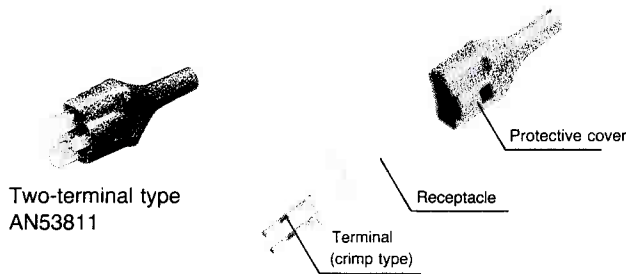
## 1. ME slit plate



## 2. MC connector

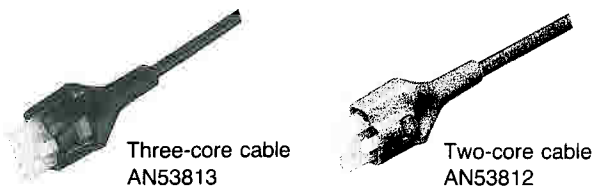


Terminal No. (code)	Content
1 (—)	⊕ terminal
2 (≡)	● terminal
3 (≡)	⊖ terminal



Terminal No. (code)	Content
1 (—)	⊕ terminal
3 (≡)	terminal

## 3. MC cabled connector (2 m 2.2 yard long cable)



Terminal No. (code)	Content
1 (Brown)	⊕ terminal
2 (Black)	● terminal
3 (Blue)	⊖ terminal

Note: The connector or the cabled connector is attached to the main body of the photoelectric sensor.

# CAUTIONS

## 1. Operational conditions

- 1) The ambient temperature should be kept within a range from  $-25^{\circ}\text{C}$  to  $+55^{\circ}\text{C}$   $-13^{\circ}\text{F}$  to  $+131^{\circ}\text{F}$ .
- 2) The operating voltage should be kept within a range from 9.6 V DC to 30 V DC (including ripple P-P).
- 3) The ambient illuminance should be 10,000 lux or less at the receiver under an incandescent lamp, and 30,000 lux or less at the receiver under sunlight.
- 4) Since the internal circuit may be broken when the external surge voltage exceeds 500 V [single polarity full wave voltage of  $\pm(1.2 \times 50) \mu\text{s}$ ], the surge absorbing element should be used.
- 5) Avoid using the sensor at the site where much steam, dust or corrosive gas is suspended, water or oil splashes directly over the unit, or organic solvent adheres to the unit.

## 2. Wiring

- 1) Since improper wiring results in breakage of the internal circuit, check the wiring before turning on the power supply.
- 2) The load relays rated at 12 V DC or 24 V DC should be used. Since the voltage applied to the load relay is determined by subtracting the internal voltage drop (max. 1.2 V) from the photoelectric sensor operating voltage, care should be taken for the voltage fluctuation.
- 3) Keep in mind that the output area is broken if a load of 100 mA or more is connected.
- 4) Keep in mind that the inductive noises cause malfunction and breakage if the wiring to the photoelectric sensor runs with the high voltage cables and the power cable.
- 5) When extending the cable, use a cable of  $0.3 \text{ mm}^2$  or more and limit its length within 100 m.
- 6) When using an attached mounting hardware, the tightening torque for the mounting screws should be 15 kg-cm or less. When the attached mounting hardware is not used, the unit should be mounted on the flat surface. Use M4 screws with plain washers and apply a torque of 10 kg-cm or less.
- 7) When the photoelectric sensor is mounted with the lock mechanism side of the connector closely contacted on the flat surface, use the attached mounting plate as a spacer or put a 2.5 mm .098 inch or more thick spacer between the photoelectric sensor main body and the flat surface.
- 8) When crimping the terminals, it is recommended to use the following tool made by Molex.

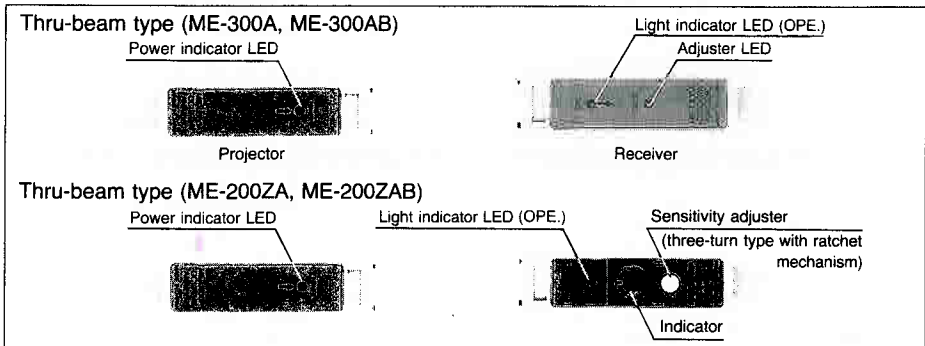
Crimping	Insertion	Pulling-out
JHTR1719C	J5800-001	J5800-002

Here, the terminal is 5005TL made by Molex and the receptacle is 5025-03R1.

## 3. Optic axis adjustment for the thru-beam type

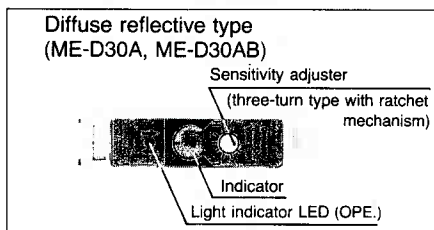
- 1) Temporarily fasten the projector and the receiver, and roughly position them to face each other. If positioned in the operational state, the light indicator LED (OPE.) will come on.
- 2) Finely reposition the projector by swinging it to left and right, and up and down so as to turn on its adjuster LED (ADJUST) at the center in the lighting range. Then, secure the projector.
- 3) Next, reposition the receiver by swinging it to left and right, and up and down so as to

- turn on its adjuster LED at the center in the lighting range. Then, secure the receiver.
- 4) Securely fasten the units to prevent displacement of the optic axes when vibration or shock is applied.
- 5) Since the sensitivity adjuster is provided on the ME-200ZA(AB), adjust the sensitivity particularly for detection of translucent target such as acrylic resins.



## 4. Sensitivity adjustment for diffuse reflective type

- 1) Facing the detector in the detection direction, temporarily fasten the photoelectric sensor.
- 2) Under the condition that no detectable target exists, gradually turn the sensitivity adjuster counterclockwise from the maximum (H side) to find the position where the Light indicator LED (OPE.) goes out. When the LED goes out even if the adjuster is in the max. position, select the H position.
- 3) Place a detectable target in the detection position, and gradually turn the sensitivity adjuster clockwise from the minimum position (L side) to find the position where the light indicator LED (OPE.) comes on. When the LED comes on even if the adjuster in the min. position, select the L position.
- 4) Set the adjuster at the middle point between the positions selected in step 2) and step 3).
- 5) Securely fasten the photoelectric sensor to prevent displacement of the sensor when vibration of shock is applied.



## Notes:

1. When the positions in step 2) and step 3) indicate the 5th graduation or less, reposition the detector and repeat the procedure from step 1) to step 4), or check external factors such as the fluctuation of the temperature and the deviation of the target position.
2. Since the detectable distance depends on the material, color, size, shape and direction of a target and the environmental conditions, check the distance by using an actual target.
3. Use the sensitivity adjuster within a range between H and L on the nameplate. If used outside the range, the L state is selected.

## 5. Sensing area

- 1) If dust or dirt excessively adheres to the sensing area, the detectable distance will be reduced. Therefore, the sensing area should be kept clean at all times.
- 2) The front surface of the lens and the casing are made of polycarbonate. This material is resistant against water, dilute acids, and alkalis, aliphatic hydrocarbons, oils, etc., but not resistant against ketones, esters, halogenated hydrocarbons, or aromatic hydrocarbons.