Sensing	Supply voltage	Output	
3 to 25 mm, adjustable	90 to 250 VAC, 50/60 Hz 10 to 40 VDC	200 mA	200 mA, NPN or PNP

Capacitive Proximity Sensor

E2K-C

Cylindrical Sensor Offers Adjustable Detecting Distance

- Permits non-contact detection of metallic and non-metallic objects such as glass, wood, water, oil and plastic
- Allows indirect detection of materials inside non-metallic containers
- Adjustable detecting distance from 3 to 25 mm
- Built-in amplifier accepts wide range of supply voltages and switches up to 200 mA
- Mounting bracket included

Ordering Information

■ SENSORS

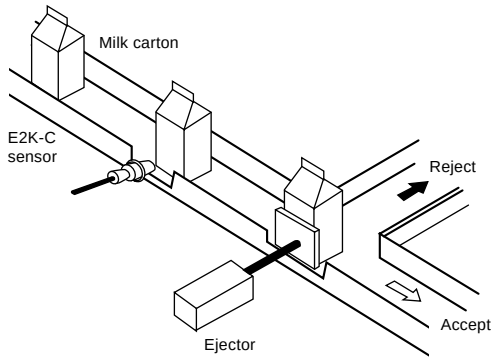
Type			Unshielded	
Nominal detecting distance			3 to 25 mm (0.12 to 0.98 in), adjustable	
Output type			NO	NC
Part number	AC switching type (SCR)		**E2K-C25MY1**	**E2K-C25MY2**
	DC switching type	NPN	**E2K-C25ME1**	**E2K-C25ME2**
		PNP	**E2K-C25MF1**	**E2K-C25MF2**

■ REPLACEMENT PARTS

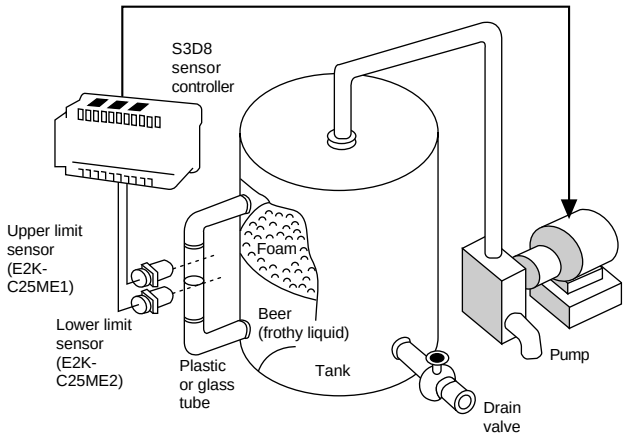
Description	Part number
Mounting bracket for E2K-C (supplied with sensor)	**Y92E-A34**

■ TYPICAL APPLICATIONS

Detecting fill level in non-metallic containers



Detecting and maintaining level of liquid in storage tanks



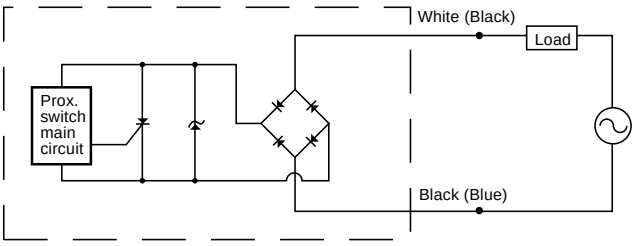
Specifications

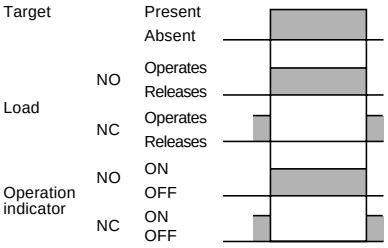
Part number			E2K-C25M❑❑	E2K-C25MY❑
Sensor type			Capacitive	
Body		Size	34 mm (1.34 in) diameter	
		Type	Unshielded	
Supply voltage			10 to 40 VDC, 10% max. permissible ripple peak to peak	90 to 250 VAC, 50/60 Hz
Current consumption			10 mA max. at 12 VDC 15 mA max. at 24 VDC	1 mA max. at 100 VAC 2 mA max. at 200 VAC
Detectable object type			Metallic and non-metallic objects	
Sensitivity			Adjustable	
Effective maximum detecting distance (with standard target)			3 to 25 mm (0.12 to 0.98 in)	
Standard target size (grounded mild steel, L x W x H)			50 x 50 x 1 mm (2.0 x 2.0 x 0.04 in)	
Differential travel			15% max. of detecting distance	
Control output	AC solid-state	Type	—	SCR-NO (E2K-C25MY1) SCR-NC (E2K-C25MY2)
		Max. load	—	200 mA
		Min. load	—	5 mA
		Max. off-state leakage current	—	See “Leakage Current Characteristics” graph in Engineering Data
		Max. on-state voltage drop	—	2V max.
	DC solid-state	Type	NPN-NO open collector with pull-up NPN-NC open collector with pull-up PNP-NO open collector with pull-down PNP-NC open collector with pull-down	—
		Max. load	200 mA	—
		Max. on-state voltage drop	See “Residual Load Voltage” graph in Engineering Data	—
Response frequency			70 Hz	10Hz
Circuit protection		Output short-circuit	Not provided	
		DC power supply reverse polarity	Provided	Not provided
		Weld field immunity	Not provided	
		RFI immunity	Not provided	
Indicators			Target Present (red LED)	Output Operation (red LED)
Materials		Housing	Plastic	
		Sensing face	Plastic	
		Cable sheath	Plastic	
Mounting			Bracket Y92E-A34 included	
Connections		Prewired	Three-conductor cable, 2 m (6.56 ft) length	Two-conductor cable, 2 m (6.56 ft) length
Weight with cable			Approx. 200 g (7.0 oz.)	
Enclosure ratings		UL	1	
		NEMA	1, 4, 12, 13	
		IEC 144	IP67	
Approvals		UL	—	Listed, File Number E76675
		CSA	—	Certified, File Number LR45951
Ambient operating temperature			–25° to 70°C (–13° to 158°F)	
Vibration			10 to 55 Hz, 1.5 mm (0.06 in) double amplitude	
Shock			Approx. 50 G's	

■ OUTPUT CIRCUIT DIAGRAMS AND TIMING CHARTS

AC Switching Types

E2K-C25MY❑



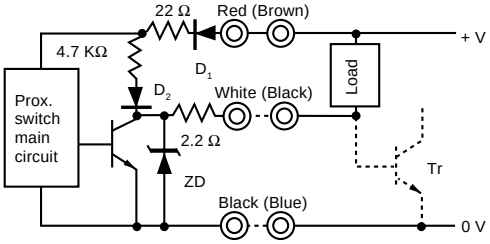


Note: IEC colors are shown in parentheses.

DC Switching Types

E2K-C25ME❑

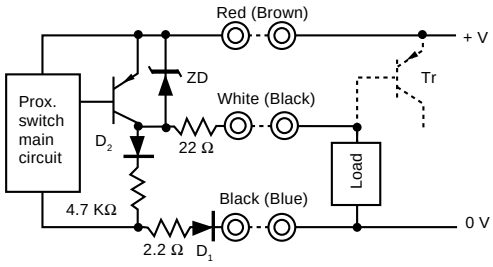
The dotted line shows a transistor circuit load.

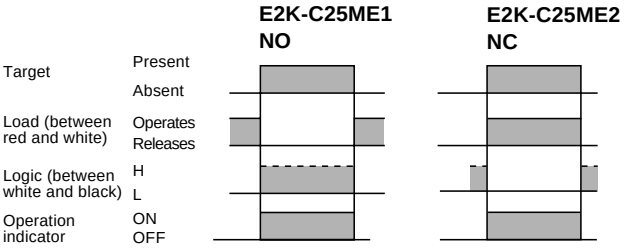


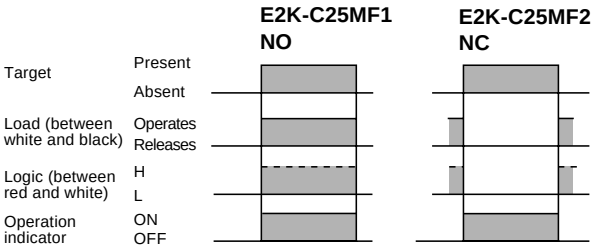
Note: IEC colors are shown in parentheses.

E2K-C25MF❑

The dotted line shows a transistor circuit load.



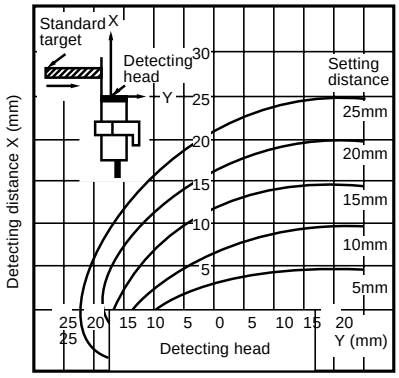




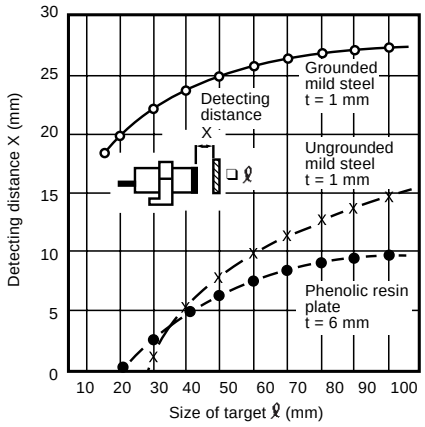
Engineering Data

Operating Range

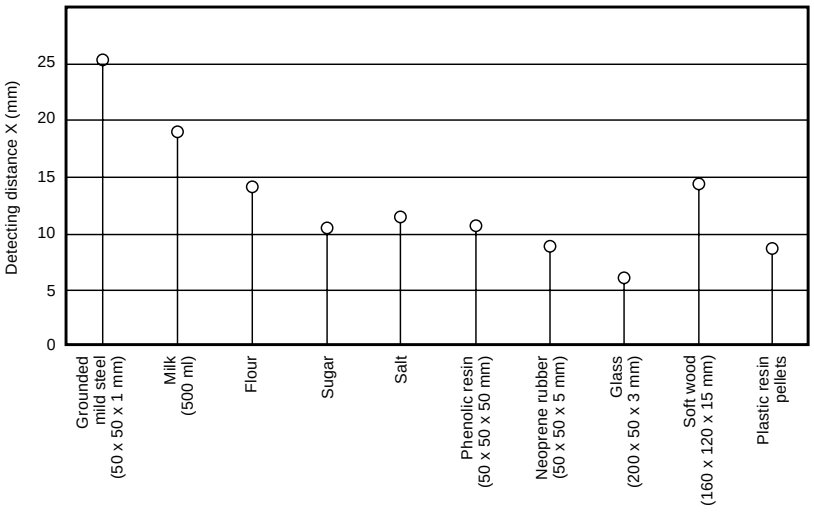
E2K-C25MY1



Detecting Distance vs. Size and Material of Target



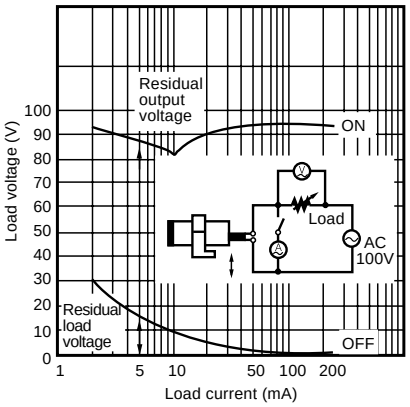
Detecting Distances of Common Materials



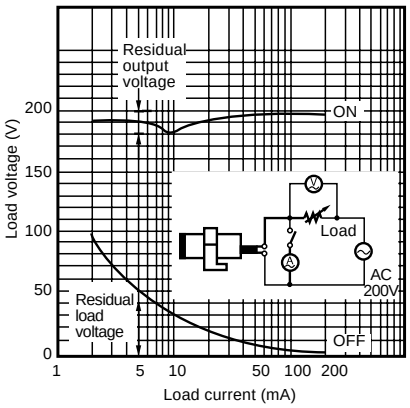
Residual Load Voltage Characteristics

AC switching types
E2K-C25MY❑

100 VAC

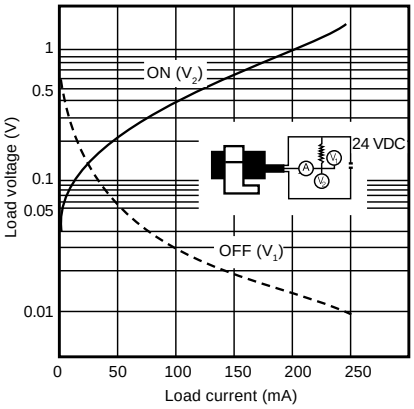


200 VAC



DC switching types
E2K-C25M❑❑

24VDC



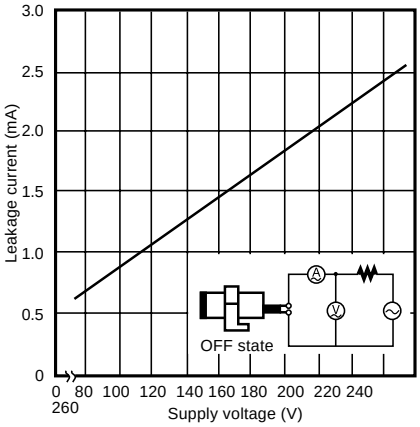
Note: When the current rating of the load is less than 10 mA, false operation may occur. This is normal, and the problem can be cured by installing a bleeder resistor in parallel with the load. Use the formulas given here to calculate the power rating and value of
the resistor.

$$R \leqq \frac{V_S}{10 - i}\ (k\Omega) \qquad P > \frac{V_S^2}{R}\ (mW)$$

P : Power rating of bleeder resistor
i : Load current (mA)
V_S : Supply voltage (V)

Leakage Current Characteristics

AC switching types
E2K-C25MY❑

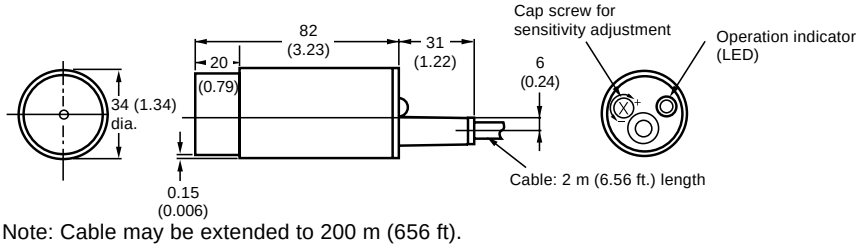


Dimensions

Unit: mm (inch)

■ SENSORS

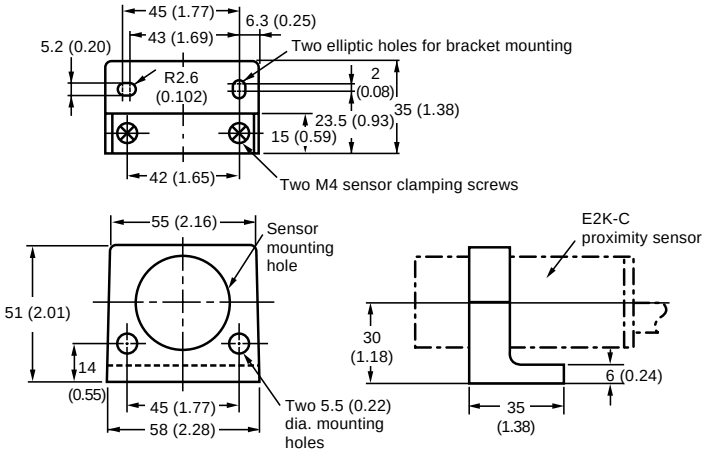
E2K-C25M❑❑



Note: Cable may be extended to 200 m (656 ft).

■ MOUNTING BRACKET

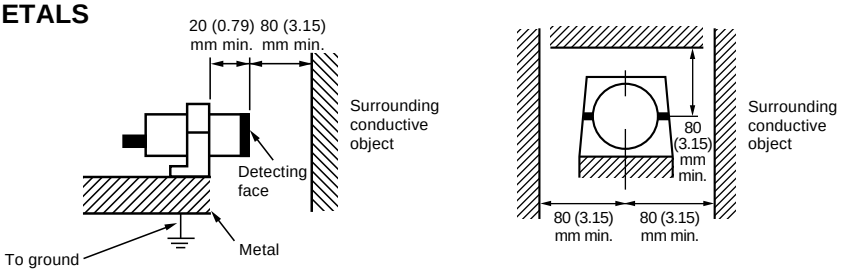
Y92E-A34 (supplied with sensor)



Mounting

■ EFFECTS OF SURROUNDING METALS

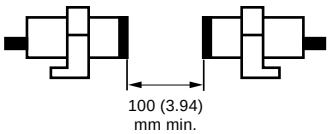
When mounting the sensor, be sure to provide the minimum distance shown in the diagram. This prevents the sensor from being affected by metallic objects other than the target. Also, when using the supplied mounting bracket, be sure to allow a distance of 20 mm or more between the detecting face and the mounting bracket.



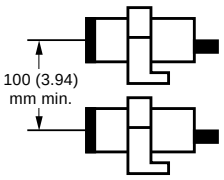
■ MUTUAL INTERFERENCE

To prevent mutual interference, be sure to space the two sensors at a distance greater than that shown in the diagrams.

Opposed mounting



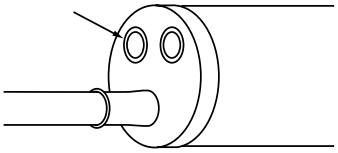
Parallel mounting



■ SENSITIVITY ADJUSTMENT

NO type (E2K-C25M❑1)

Remove protective rubber plug to gain access to sensitivity adjustment screw. Use the screwdriver provided with each sensor to turn the sensitivity adjustment screw.



1) Remove any targets from in front of the sensor. Turn the sensitivity adjustment screw CLOCKWISE until the sensor turns ON and the indicator illuminates.

Sensitivity adjustment

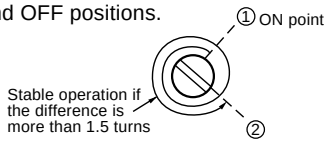
Stop when the sensor turns ON

2) Place a target in front of the sensor. Turn the sensitivity adjustment screw COUNTERCLOCKWISE until the sensor turns OFF and the indicator goes out. Note the number of revolutions between OFF and ON positions.

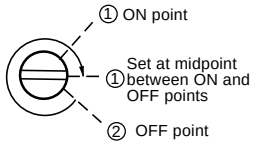
Sensitivity adjustment

Stop when the sensor turns OFF

3) If the number of revolutions is greater than one and a half, the sensor will provide stable output. If the number of revolutions is less than one and a half, increase or decrease the distance between the target and the sensing face as necessary to allow at least one and a half revolutions between the ON and OFF positions.



4) Now turn the sensitivity adjustment screw CLOCKWISE to the midpoint between the ON and OFF points.



5) If the distance between the target and the sensor is not constant, perform the first adjustment operation (#1) when the target is at the closest position to the sensor. Then perform the second adjustment operation (#2) when the target is at the farthest position from the sensor.

NC type (E2K-C25M❑2)

The sensitivity adjustment procedure for NC type proximity sensors is the same as for NO type sensors, with the exception that ON and OFF operations of the proximity sensor and ON and OFF points in the adjustment procedure are exactly reversed.

■ USING METAL CONDUIT

If a high voltage of power line runs near the proximity sensor cable, be sure to wire the sensor cable through a metal conduit to protect the sensor from malfunctioning or damage.

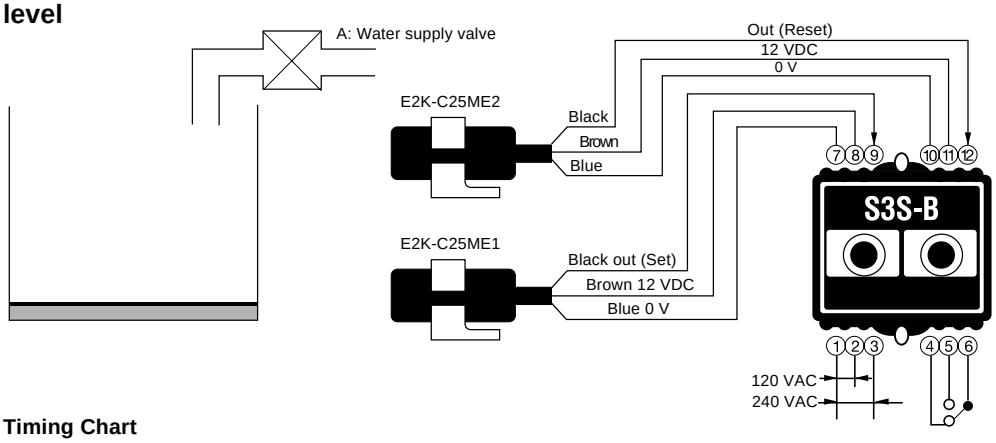
■ SURGE PROTECTION

The proximity sensor is provided with a surge suppressor circuit. However, if any large surge generating source (i.e., motor, welding machine, etc.) exists in the vicinity of the proximity sensor, insert a surge suppressor (such as a varistor) into the surge generating source.

Application Examples

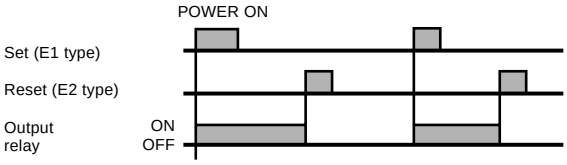
For two-unit control to directly detect a water level, use type E2K-C25ME1 and E2K-C25ME2 proximity sensors together as a pair, connected as shown in the examples below.

For water supply control by directly detecting the water level

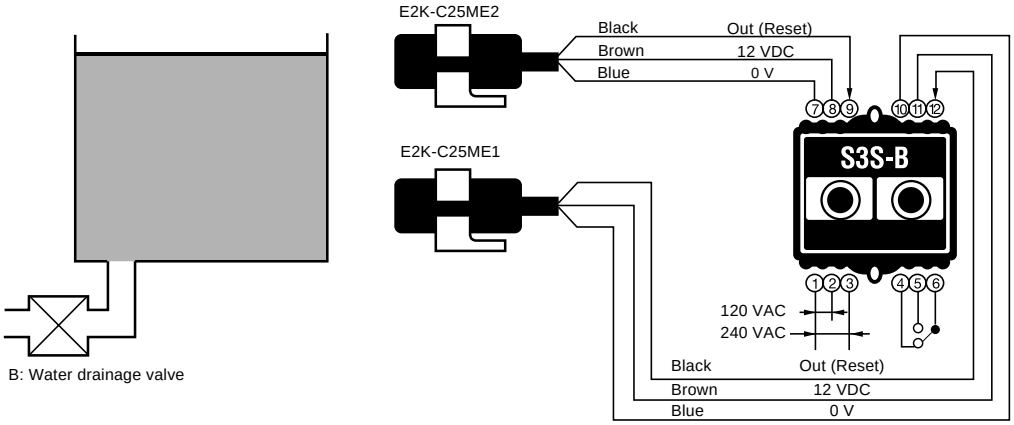


Timing Chart

Connect water supply valve "A" to the NO contact of sensor controller S3S-B10-US.

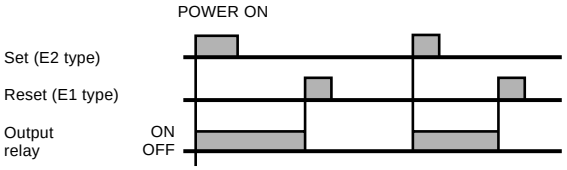


For water drainage control by directly detecting the water level



Timing Chart

Connect the drain valve "B" to the NO contact of sensor controller S3S-B10-US.



NOTE: ALL DIMENSIONS ARE IN MILLIMETERS. To convert millimeters into inches divide by 25.4.