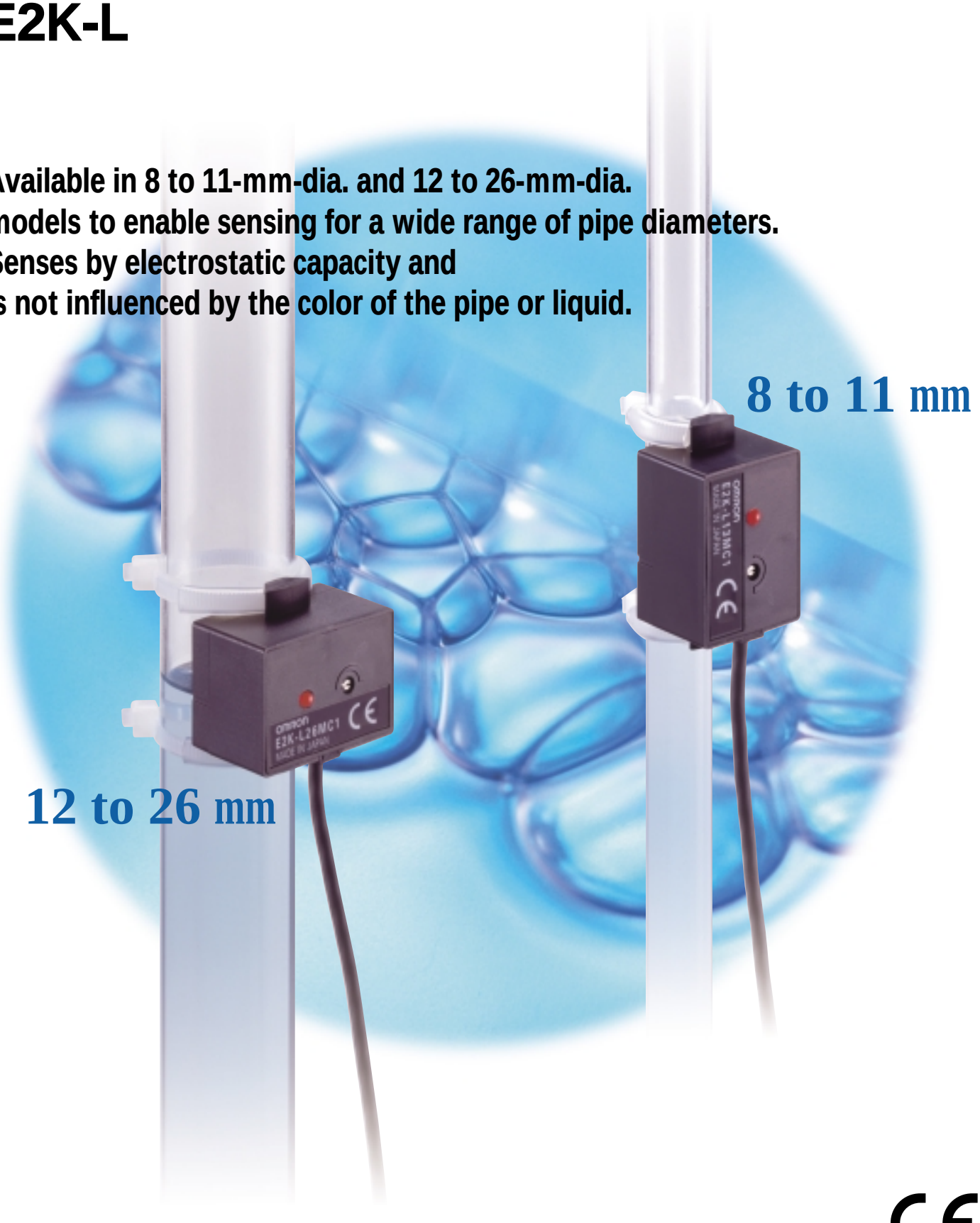
OMRON

Liquid Level Sensor

E2K-L

Available in 8 to 11-mm-dia. and 12 to 26-mm-dia. models to enable sensing for a wide range of pipe diameters. Senses by electrostatic capacity and is not influenced by the color of the pipe or liquid.

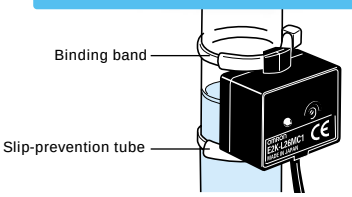


CE

Optimum for Liquid Level Detection

Space saved with built-in amplifier

Easy installation using binding bands

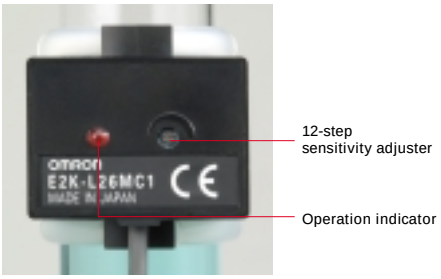


Unlike conventional cylindrical or flat types, the E2K-L is attached to the pipe using binding bands. Slip-prevention tubes are also included to stop the Sensor from moving due to vibrations.

Conforms to CE standards

Conforms to CE standards, an indispensable requirement for semiconductor manufacturing installations.

Little influence from bubbles



Not influenced by the color of the pipe or liquid

Use for pipes with diameters in the range 8 to 11 mm or 12 to 26 mm

The E2K-L is not subject to the same restrictions on pipe diameter as optical sensors. It can be used for a wide range of diameters, allowing reductions in stock requirements.

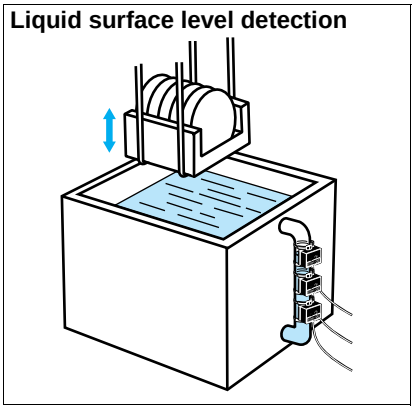
E2K-L
Liquid Level Sensor

Sense Different, Make Difference !

- Mounts to pipes.
- Senses by electrostatic capacity and is not influenced by the color of the pipe or liquid.
- Available in 8 to 11-mm-dia. and 12 to 26-mm-dia. models to enable sensing for a wide range of pipe diameters.
- Space saved with built-in amplifier.

Applications

Liquid surface level detection



Available Models

Sensing method	Applicable pipe diameters	Appearance	Output format		Model number
Electrostatic capacity method	8 to 11 mm-dia.		NPN open-collector output	NO	**E2K-L13MC1**
	12 to 26 mm-dia.				**E2K-L26MC1**

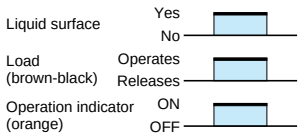
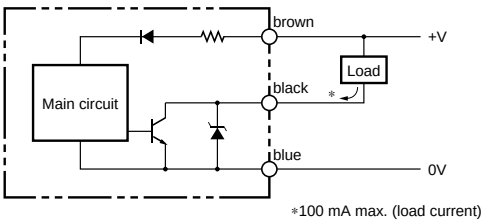
■ Characteristics

Item	Model number		E2K-L13MC1	E2K-L26MC1
Applicable pipes	Material		Non-metal	
	Size	External diameter	8 to 11 mm-dia.	12 to 26 mm-dia.
		Wall thickness	1 mm max.	1.5 mm max.
Sensing object			Liquid *	
Repeat accuracy			±0.2 mm max.	
Hysteresis (reference value only; varies with pipe size and solution)			0.6 to 5 mm	0.3 to 3 mm
Supply voltage (operating voltage range)			12 to 24 VDC, 10% max. ripple (10.8 to 30 VDC)	
Current consumption			12 mA max.	
Control output	Switching capacity		100 mA max.	
	Residual voltage		1 V max. (for load current of 100 mA cable length of 2 m)	
Detection position of liquid surface			Notch position (For details, refer to Sensitivity Adjustment on **page 6.**)	
Indicator			Operation indicator (orange)	
Ambient temperature			Operating: 0 to 55°C; Storage: –10 to 65°C (with no icing or condensation)	
Ambient humidity			Operating/storage: 25% to 85% (with no condensation)	
Temperature influence			In the range 0 to 55°C: Detection level at 23°C ±4 mm (with distilled water or 20% concentration salt water) (±6 mm with E2K-L13MC1 for distilled water in pipe of diameter 8 mm)	
Voltage influence			At the rated power supply voltage ±10%: Detection level at rated power supply voltage ±0.5 mm	
Insulation resistance			50 MΩ min. (at 500 VDC) between charged parts and case	
Dielectric strength			500 VAC, 50/60 Hz for 1 minute between charged parts and case	
Vibration resistance (destruction)			10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions	
Shock resistance (destruction)			500 m/s² for 3 times each in X, Y, and Z directions	
Enclosure rating			IEC60529 IP66	
Connection method			Pre-wired (standard cable length: 2 m)	
Weight (packed state)			Approx. 70 g	
Material	Case, cover		Heat-resistant ABS resin	
	Cable clamp		NBR	
Accessories			2 binding bands, 4 slip-prevention tubes, instruction manual	

* In the following cases, stable detection may not be possible and so be sure to confirm correct operation in the actual installation before use.

1. If the dielectric constant or conductivity of the liquid is low.
2. If the capacity of the liquid is small, or if the pipe diameter is so small or the walls of the pipe are so thick that the amount by which the capacity changes in proportion to the level of the liquid is small.
3. If there are a lot of bubbles or a highly viscous liquid film residue on the inside walls of the pipe, or if there is a build up of dirt on the inner or outer walls of the pipe.

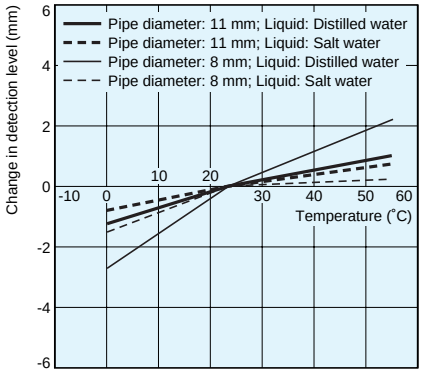
■ Output Circuit Diagrams

Output format	Model number	Timing chart	Output circuit
NO	E2K-L13MC1 E2K-L26MC1		 *100 mA max. (load current)

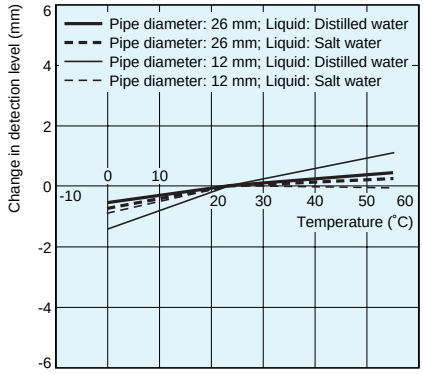
■ Engineering Data (Typical Examples)

● **Influence of Temperature on Detection Level**

E2K-L13MC1



E2K-L26MC1



■ Precautions

General Precautions

To ensure safety, be sure to observe the following precautions.

◆ Wiring

● **Power Supply Voltage**

• Do not use voltages above the allowable range. Applying a voltage above the allowable range or applying an AC voltage (100 VAC) to a DC-type Sensor may result in burning or damage.

● **Load Short-circuits**

• Do not short-circuit the load. Doing so may result in burning or damage.

● **Incorrect Wiring**

• Be sure to perform wiring correctly. Incorrect wiring may result in burning or damage.

● **No-load Connection**

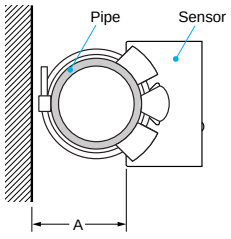
• Connecting the power supply directly to the Sensor without a load may result in burning or damage to internal elements. Be sure to connect a load when wiring.

Correct Use

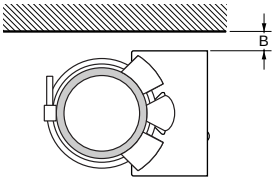
◆ Installation

● **Influence of Surrounding Objects**

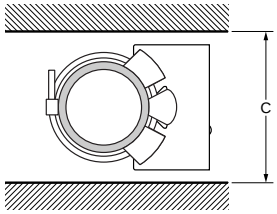
• Performance may be adversely affected by conductive objects (e.g., metals) in the vicinity of the Sensor. Ensure that any conductive objects are separated from the Sensor by at least the distances shown below.



Object on Opposite Side



Object on One Side



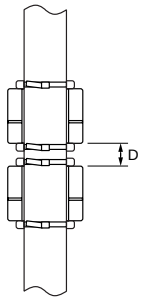
Objects on Both Sides

Influence of Surrounding Objects (Units: mm)

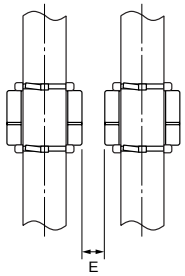
Model / Dimension	A	B	C
E2K-L13MC1	25	5	45
E2K-L26MC1		0	40

● **Mutual Interference**

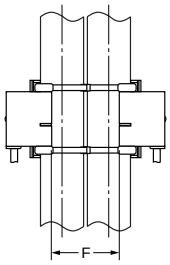
• When installing 2 or more Sensors in series, in parallel, or facing each other, be sure that they are separated by at least the distances shown below.



Installed in Series Sides



Installed in Parallel



Installed Facing Each Other

Mutual Interference (Units: mm)

Model / Dimension	D *	E	F
E2K-L13MC1	10	10	25
E2K-L26MC1			30

* The detection level for the top Sensor may change when the detection level for the bottom Sensor is set. Be sure to set the detection level for the bottom Sensor first.

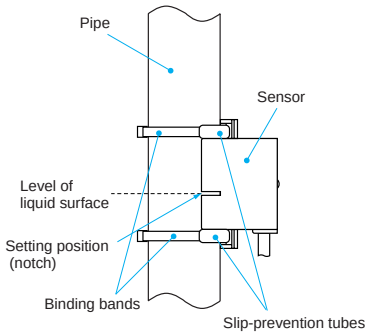
■ Precautions

Correct Use

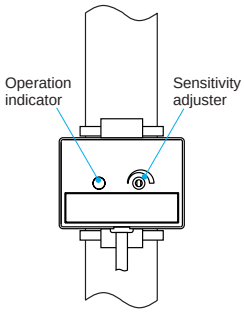
◆ Mounting

● Mounting Procedure

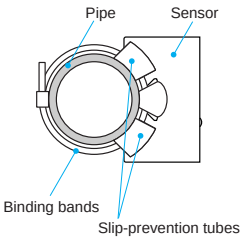
- Mount the Sensor securely to the pipe using the 2 binding bands and the 4 slip-prevention tubes provided (2 tubes per band) in the way shown below. Mount the Sensor so that the pipe is in contact with the entire sensing face of the Sensor with the pipe and Sensor in parallel.



Side View



Front View



Top View

◆ Wiring

● Power Supply

- If separate power supplies are used for the Sensor and the load, be sure to turn on the power supply to the Sensor first.
- If a commercially available switching regulator is used, the Sensor may malfunction because of switching noise. Connect the frame ground and ground terminals to ground.
- Separate the Sensor wires from other power lines or lines carrying high voltages. Wiring together (e.g., in the same cable or duct) may produce inductance in the Sensor wires resulting in malfunction or damage.

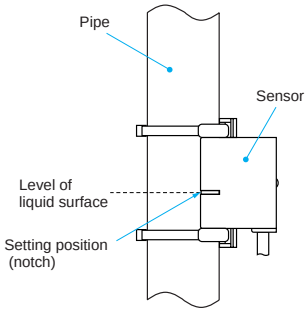
● Cable Tensile Strength

- Do not use the Sensor with an excessive force exerted on the cable. Do not exert a pulling force of more than 30 N on the cable.

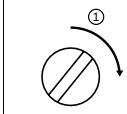
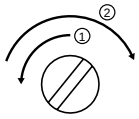
◆ Adjustment

● Sensitivity Adjustment

- Mount the Sensor with the setting position (notch) in line with the liquid level to be detected.

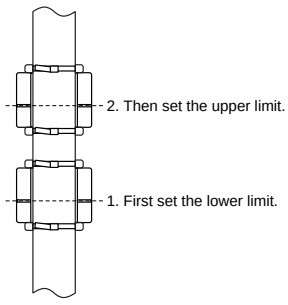


- After the Sensor is mounted, adjust the detecting sensitivity using the (12-step) sensitivity adjuster in the way shown below.

Status of the indicator when the liquid level is aligned with the setting position	Sensitivity adjuster	Adjustment procedure
Not lit		Turn the sensitivity adjuster clockwise using a screwdriver until the indicator lights.
Lit		Turn the sensitivity adjuster anti-clockwise using a screwdriver until the indicator turns OFF. Then, turn the sensitivity adjuster clockwise until the indicator lights again.

Note 1: While adjusting the sensitivity, do not put your hand on the Sensor and make sure that the cable is properly secured. Failure to observe these points may affect the detection level.

Note 2: When using more than one Sensor (e.g., to detect for upper and lower limits), adjust the sensitivity of the Sensors in order starting from the bottom. Adjusting the sensitivity of a Sensor may affect the detection level of the Sensor above it.



■ Precautions

Correct Use

◆ Operating Environment

● Surrounding Atmosphere

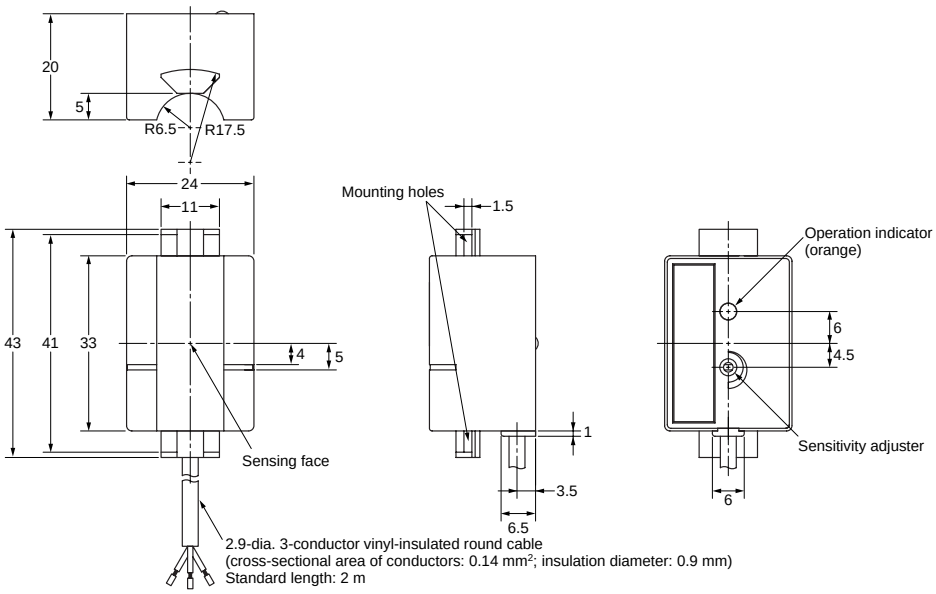
- In order to maintain operating reliability, do not use or keep the Sensor in locations outside the specified temperature range, or in outdoor locations.
- Although this product has waterproof specifications, do not use it in locations where it will come into direct contact with liquids (e.g., water or cutting oil). Such locations can interfere with the electrostatic capacity method used by the Sensor.
- Do not use the Sensor in locations where chemicals (in particular, solvents or strong acids) are present in the atmosphere.
- Even if the Sensor is used within the specified temperature range, do not subject it to sudden changes in temperature because this will shorten the service life.

◆ Miscellaneous

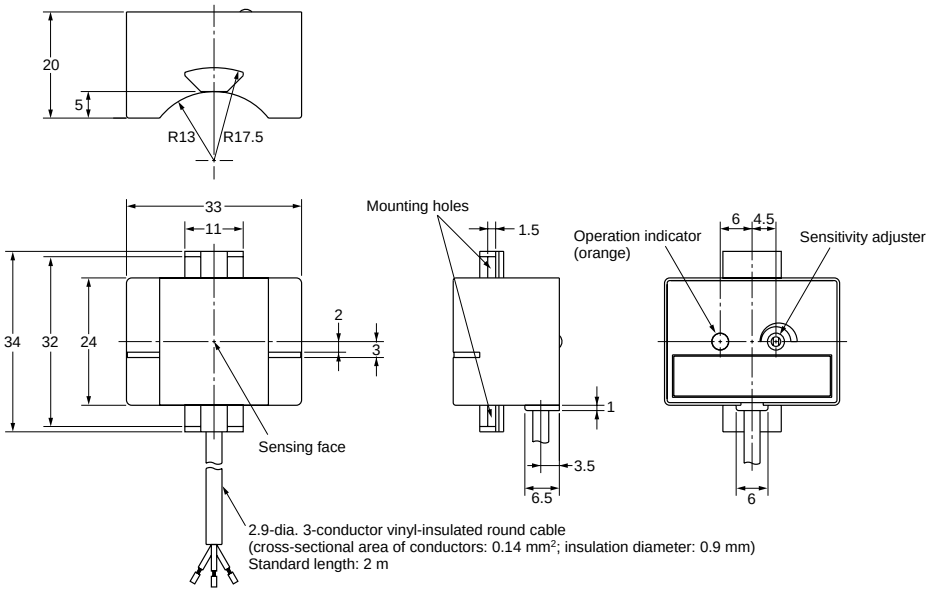
- Drift may occur when the power supply is turned ON. If the dielectric constant of the liquid is low, the detection level of the liquid may be 2 to 3 mm higher than the set level for approximately 20 minutes after power is turned ON.

■ Dimensions (Units: mm)

E2K-L13MC1



E2K-L26MC1



OMRON Corporation
Industrial Automation Company

Industrial Sensors Division
Sensing Devices and Components Division H.Q.
Shiokoji Horikawa, Shimogyo-ku,
Kyoto, 600-8530 Japan
Tel : (81)75-344-7068 / Fax : (81)75-344-7107

Regional Headquarters

OMRON EUROPE B.V.
Sensor Business Unit
Carl-Benz-Str. 4, D-71154 Nufringen,
Germany
Tel : (49)7032-811-0 / Fax : (49)7032-811-199

OMRON ELECTRONICS LLC
1 East Commerce Drive, Schaumburg, IL 60173
U.S.A.
Tel : (1)847-843-7900 / Fax : (1)847-843-8568

OMRON ASIA PACIFIC PTE. LTD.
83 Clemenceau Avenue,
#11-01, UE Square,
239920 Singapore
Tel : (65)835-3011 / Fax : (65)835-2711

OMRON CHINA CO., LTD.
BEIJING OFFICE
Room 1028, Office Building,
Beijing Capital Times Square,
No.88 West Chang'an Road,
Beijing, 100031 China
Tel : (86)10-8391-3005 / Fax : (86)10-8391-3688

Authorized Distributor:

Cat. No. D094-E1-1

Note:Specifications subject to change without notice.

0601-1M(0501)(G)