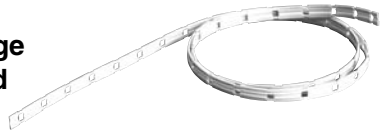


Sensing Band/Point Sensor

F03-16PE Liquid Leakage Sensing Band



- SUS316 used for core and polyethylene used for sheath to ensure high resistance to both acidic and alkaline liquids.
- Sensing Band Stickers that use the same material as the Sensing Band's insulating resin are available in 2 types: adhesive-tape type and screw type.

Ordering Information

Name	Model number
Liquid Leakage Sensing Band	F03-16PE
Sensing Band Stickers	F03-26PES
	F03-26PEN

Specifications

Sheath	Polyethylene
Core	SUS316 stainless steel
Ambient operating temperature	-15 to 55°C
Weight	Approx. 16 g (1 m)

Dimensions Sensing Band

F03-16PE (Unit: mm)

Appearance	
Structure	

Sensing Band Stickers F03-26PEN (screws)

(Unit: mm)

Appearance	
Structure	

F03-26PES (adhesive tape)

(Unit: mm)

Appearance	
Structure	

* The shape of the adhesive tape shown above is for securing the F03-16PE.

Chemical Resistivity

	Polyethylene	SUS316	Fluoroplastic
Water	A	A	A
Acetone	C	A	A
Ammonia	A	A	A
Ethanol	B	A	A
Hydrochloric acid	A	C	A
Hydrogen peroxide solution	A	A	A
Xylene	B	A	A
Cyclohexane	C	---	A
Trichloroethylene	C	A	A

A: Not affected at all or only very slightly affected.
C: Affected but may still be used. (Replace the Sensing Band immediately after detection.)

	Polyethylene	SUS316	Fluoroplastic
Toluene	C	B	B
Phenol	B	A	B
Butanol	B	---	A
Fluorine	A	C	A
Hexane	C	---	A
Benzene	C	A	A
Methanol	B	A	A
Sulfuric acid	C	B	A
Phosphoric acid	A	B	B

B: Slightly affected but, depending on the conditions, sufficient for use.

F03-16PT Fluoroplastic Sensing Band



- Compared to the F03-16PE (polyethylene), the F03-16PT has higher resistance to both high temperatures and chemicals.
- Detection precision remains constant even with a loopback, thanks to a two-sided detection design.

Ordering Information

Name	Model number
Fluoroplastic Sensing Band	F03-16PT
Fluoroplastic Sensing Band Stickers	F03-26PTN

Specifications

Sheath	PTFE fluoroplastic
Core	SUS316 stainless steel
Ambient operating temperature	-50 to 200°C
Weight	Approx. 16 g (1 m)

Dimensions Fluoroplastic Sensing Band F03-16PT

(Unit: mm)

Appearance	
Structure	

Fluoroplastic Sensing Band Stickers F03-26PTN (screws)

(Unit: mm)

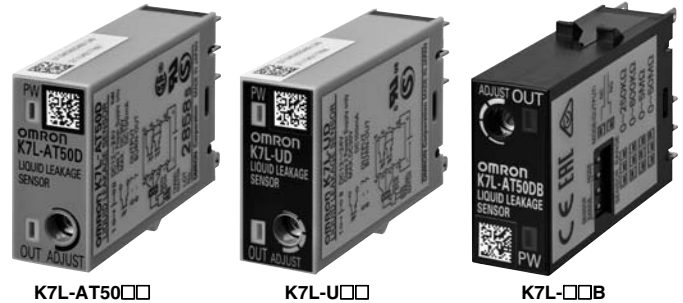
Appearance	
Structure	

- Note: 1.** The F03-16PE Sensing Band is made from the following materials.
Core: SUS316
Insulated sheath: Polyethylene
- 2.** In order to prevent secondary fire damage, consider the effect of the atmosphere of the environment and the solution to be detected on the Sensing Band.
- 3.** If the Sensing Band changes shape or color when a liquid is detected, replace the Sensing Band.

Liquid Leakage Sensor Amplifiers K7L Series

Reliable Sensitive Liquid Sensors for Stable Detection of Liquid Chemicals with Low Conductivity and Water Leakage

- A lineup of new models compatible with Push-In Plus Terminal Block Sockets is available.
- UL listed when used with Push-In Plus Terminal Block Sockets.
- Sensor disconnection detection (K7L-AT50D□□/-UD□□).
- Models for long-distance wiring to 400 m.
- Ribbon Electrode Bands and Point Sensors available.



For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Model Number Legend

K7L-□□□□ □ □
(1) (2) (3)

(1)		(2)				(3)	
Symbol	Meaning	Symbol	Meaning	Output		Symbol	Meaning
				NPN connection	PNP connection (Equivalent)		
AT50	Standard wiring distance	Blank	No sensor disconnection detection	OK	OK	Blank	For Screw Terminal Block Socket
U	Long wiring distance	D	Sensor disconnection detection	OK	NG	B	For Push-In Plus Terminal Block Socket
		DP	Sensor disconnection detection Supports plus common connection	NG	OK		

Wiring distance	Disconnection detection	Socket terminals (*1)	Standards	Model
Standard usage Wiring cable: 50 m max. Sensing Bands: 10 m max.	Not supported.	Screw Terminal Block P2RF-08/-08-E	CE SF RU S	K7L-AT50
		Push-In Plus Terminal Block P2RF-08-PU	CE C RU US UL CERTIFIED S	K7L-AT50B
	Supported.	Screw Terminal Block P2RF-08/-08-E	CE SF RU S	K7L-AT50D
			CE SF RU S	K7L-AT50DP
		Push-In Plus Terminal Block P2RF-08-PU	CE C RU US UL CERTIFIED S	K7L-AT50DB
			CE C RU US S UL CERTIFIED	K7L-AT50DPB
Long distance use Total Length of Wiring Cable and Sensing Bands: 400 m max.	Not supported.	Screw Terminal Block P2RF-08/-08-E	CE C RU US S	K7L-U
		Push-In Plus Terminal Block P2RF-08-PU	CE C RU US UL CERTIFIED S	K7L-UB
	Supported.	Screw Terminal Block P2RF-08/-08-E	CE C RU US S	K7L-UD
			CE C RU US S	K7L-UDP
		Push-In Plus Terminal Block P2RF-08-PU	CE C RU US UL CERTIFIED S	K7L-UDB
			CE C RU US S UL CERTIFIED	K7L-UDPB

*1. The applicable models of the K7L depend on the model of the Socket. If the correct Socket is not used, the K7L nameplate will be upside down.
*2. The UL listing applies only when the Sensor is used in combination with a Push-In Socket (P2RF-08-PU). By itself, the K7L is UL recognized.

Model Number Legend

K7L-U □ □
(1) (2)

(1)

Symbol	Meaning	Output	
		NPN connection	PNP connection (Equivalent)
Blank	No sensor disconnection detection	OK	OK
D	Sensor disconnection detection	OK	NG
DP	Sensor disconnection detection Supports plus common connection	NG	OK

(2)

Symbol	Meaning
Blank	Ivory, Screw Terminal Block Socket
B	Black, Push-In Plus Terminal Block Socket

Note: If you want a Push-In Plus Terminal Block Socket, use the K7L-U□□B. (The terminal arrangement of a Push-In Plus Terminal Block Socket is upside down in comparison with a Screw Terminal Block Socket.)

Ordering Information

Product name		Model
Amplifier	Liquid Leakage Sensor Amplifier #1	K7L-U
		K7L-UB
	Liquid Leakage Sensor Amplifier with Disconnection Detection Function #1	K7L-UD
		K7L-UDP
		K7L-UDB
		K7L-UDPB
Sensors	Sensing Band	F03-15
		F03-16PE
		F03-16PT
		F03-16SF F03-16SFC
	Point Sensor (for K7L-U/UB)	F03-16PS F03-16PS-F
Mounting Brackets and Stickers	Sensing Band Stickers	F03-25
		F03-26PES
		F03-26PEN
		F03-26PTN
Track-mounted Socket #2 (for K7L-U/UD)	Round terminals can be used.	P2RF-08
	Round terminals cannot be used.	P2RF-08-E
Track-mounted Socket #2 (for K7L-UB/UDB)	Push-In Plus Terminal	P2RF-08-PU
Terminal Blocks		F03-20
Terminator		F03-20T

*1. Accessories are available. Check the ratings for details.

*2. The applicable models of the K7L depend on the model of the Socket. If the correct Socket is not used, the K7L nameplate will be upside down.

Characteristics

Ambient temperature	Operating: -10 to 55°C
Ambient humidity	Operating: 45% to 85%
Insulation resistance	10 MΩ at 100 VDC between case and current-carrying parts
Dielectric strength	1,000 VAC at 50/60 Hz for 1 min between case and current-carrying parts
Power consumption	1 W max.
Response time	Operate: 800 ms max. Release: 800 ms max. Startup time after power ON: 2 s max.
Weight	Approx. 14 g

Ratings

Rated power supply voltage	12 to 24 VDC (Allowable voltage fluctuation range: 10 to 30 VDC)																
Operate resistance	0 to 1 MΩ variable Note: The adjuster (ADJUST) on the top of the Sensor Amplifier sets the resistance for detection within the setting range. It is factory-set to the upper limit. (Normally, the K7L can be used with the adjuster at this setting.)																
Disconnection detection function #	Detection signal: 10 VDC max., 200 ms Detection time: 10 s max. Recovery: Operation is recovered by resetting the power supply.																
Release resistance	105% min. of operate resistance																
Output configuration	Open-collector transistor output with 100 mA at 30 VDC max. for both liquid leakage detection and disconnection detection. Note: If the rightmost pin of the DIP switch on the side of the Sensor Amplifier is set to the down position, the output turns ON when liquid is detected; if it is set to the up position, the output turns OFF when liquid is detected.																
Vibration resistance	10 to 150 Hz, 0.1-mm single amplitude with 15-m/s ² acceleration for 8 minutes 10 times each in X, Y, and Z directions																
Shock resistance	150 m/s ² 3 times each in six directions on 3 axes																
Wiring distance	Wiring cable } Total: 400 m max. Sensing Band } Note: These values are possible on the condition that a completely insulated 3-conductor VCT cable with a thickness of 0.75 mm ² and a dielectric strength of 600 V is used together with the Liquid Sensing Band specified by OMRON. (A 0.2-mm ² cable can also be used.)																
Accessories	<table border="1"> <thead> <tr> <th>Product Name</th> <th>Terminal Block</th> <th>Screwdriver for ADJUST</th> <th>Terminator</th> </tr> </thead> <tbody> <tr> <td>Model</td> <td>F03-20</td> <td>---</td> <td>F03-20T</td> </tr> <tr> <td>K7L-U/UB</td> <td>1</td> <td>1</td> <td>---</td> </tr> <tr> <td>K7L-UD/UDB/UDP/UDPB</td> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table>	Product Name	Terminal Block	Screwdriver for ADJUST	Terminator	Model	F03-20	---	F03-20T	K7L-U/UB	1	1	---	K7L-UD/UDB/UDP/UDPB	1	1	1
	Product Name	Terminal Block	Screwdriver for ADJUST	Terminator													
	Model	F03-20	---	F03-20T													
	K7L-U/UB	1	1	---													
K7L-UD/UDB/UDP/UDPB	1	1	1														

* For the K7L-UD□□.

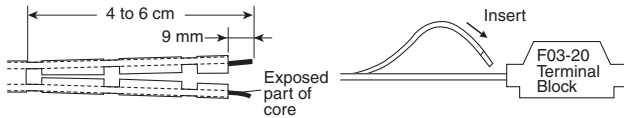
Connecting the Sensing Band

Connecting F03-20 Terminal Blocks and Sensing Cables

The F03-20 Terminal Block is provided to connect the connecting cable from the K7L Liquid Leakage Sensor Amplifier to a Sensing Band in a liquid detection application.

Stripping and Connecting Terminals

1. Cut into the Sensing Band approximately 4 to 6 cm in from the end as shown in the diagram below.
2. Strip away approximately the last 9 mm of the sheath to expose the core (SUS line).
3. To connect to the Terminal Block, insert the screwdriver * from the top of the Terminal Block and insert the stripped end of the core from the side. (Refer to *Dimensions* on page 17.)



Note: Check that the wiring is secure before using the K7L in applications.

* You can use a commercially available screwdriver, but we recommend either 1) a 210-350/01 Screwdriver or 2) a 209-132 Operating Tool from Wago. Information: [//www.wago.com](http://www.wago.com)

The F03-20 Terminal Block was designed to maintain continuity between the connecting cable and Sensing Band. The tensile strength after connection to the Sensing Band was not considered. If the Sensing Band may be pulled, use F03-26PES Sensing Band Stickers to secure it. If it is located where people may step on it, attach a commercially available cover to take other measures to ensure that the Sensing Band connected to a Terminal Block is not subjected to external force.

Application Examples in Which an F03-16PE Sensing Band Is More Difficult to Pull Free from an F03-20 Terminal Block

- Fold the electrode section of the Sensing Band to double the electrode plate thickness and insert it into the Terminal Block.
- Attach round crimp terminals on the electrode section of the Sensing Band and connect them to a commercially available terminal block.

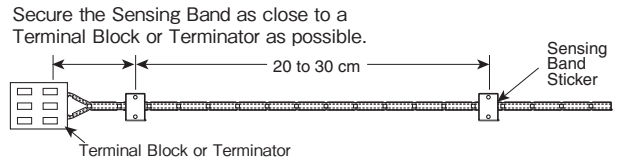
If required by your application, another method can be used (e.g., installation with suitable connectors).

After installation, confirm that a reliable electrical connection has been achieved.

Also, when you remove a Sensing Band from an F03-20 Terminal Block, do not pull it with excessive force. Remove it while inserting a screwdriver from the top of the Terminal Block.

Interval Between Stickers

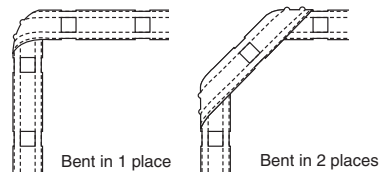
When securing the Sensing Band with Stickers, attach the Stickers at intervals of 20 to 30 cm in places where the core is not exposed.



- Secure the Sensing Band as close to a Terminal Block or Terminator as possible.
1. When using the F03-26PES (adhesive-tape model), be sure to wipe all moisture, oil, and dust from the surface to which the Sticker is to be attached. Failure to do so may result in insufficient adhesion, and the Sticker may peel away from the surface.
 2. When using the F03-26PEN (screw model), before installing the Sensing Band, it is necessary to perform stud welding. For details on the pitch of the studs, refer to the information on the dimensions of Sensing Band Stickers.
 3. If you connect a Sensor Band with an F03-20 Terminal Block and F03-20T Terminator, secure the Sensing Band with Sensing Stickers near the Terminal Block and Terminator to help adsorb stress, e.g., from something pulling on the Sensing Band.

Bending the Sensing Band

To change the direction of the Sensing Band, bend the Sensing Band in one or two places where the core is not exposed.



Note: Bend the Sensing Band approximately 4 cm (i.e., twice the distance between places where the core is exposed) away from places where a Sticker is attached. If the Sensing Band is bent at places further away than this, the Sensing Band may come away from the surface.