LIQUID LEAK SENSOR

OPERATION MANUAL

(Web Site Download only)

For RS-3000 and RS-3500 Series
Detection Unit with Buzzer Alarm

RS-3000FAP-BZ RS-3500FAP-BZ

For another detection type of RS-3000/3500 series Liquid Leak Sensor,
please consult to separate brochures of RS-3000/3500 Sensors.
It would help to understand the basic information of RS-3000/3500 series

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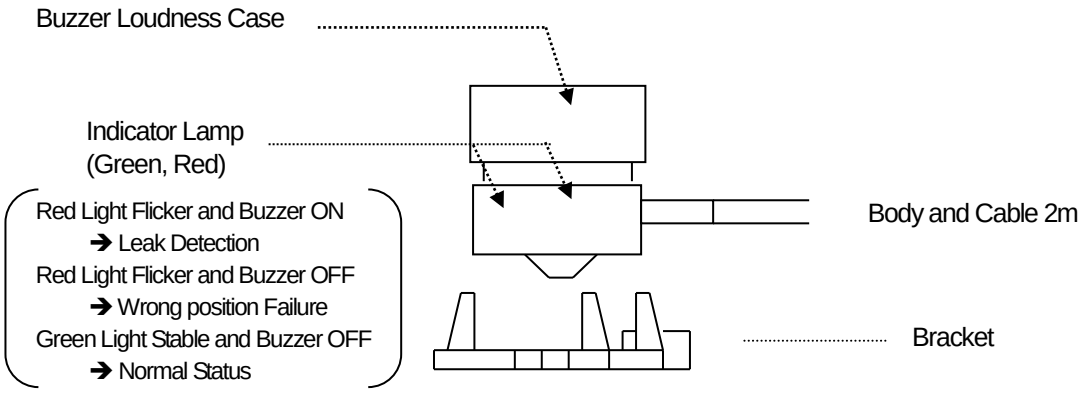
Introduction

We appreciate that you have chosen our Liquid Leakage Sensor.
Before you install or operate it, please read this operation manual thoroughly, and follow the instruction in order to avoid any accidents, malfunction, defects and hazards.
Please keep this manual with good care as long as the sensor is being operated.

Table of Contents

1.Designation of Sensor

Detection Unit: RS-3000FAP-BZ / RS-3500FAP-BZ



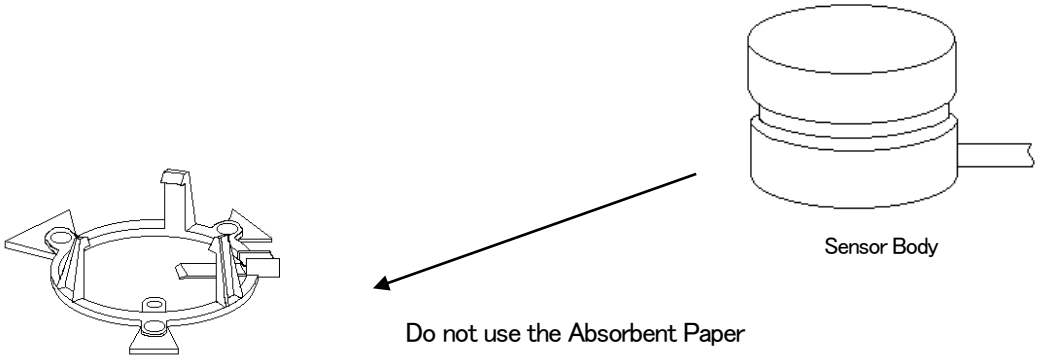
2. Installation

Detection Unit: RS-3000FAP-BZ/RS-3500FAP-BZ

(1) Place the Bracket of the Detection Unit on the surface where you want to detect the leakage, and fix it firmly.
* Use the correct Bracket for the detection Unit.

(2) To mount the Sensor Body, push it into the Bracket completely.

NOTE: Verify that the Body has fixed entirely and it does not hook up at intermediate height in the Bracket.



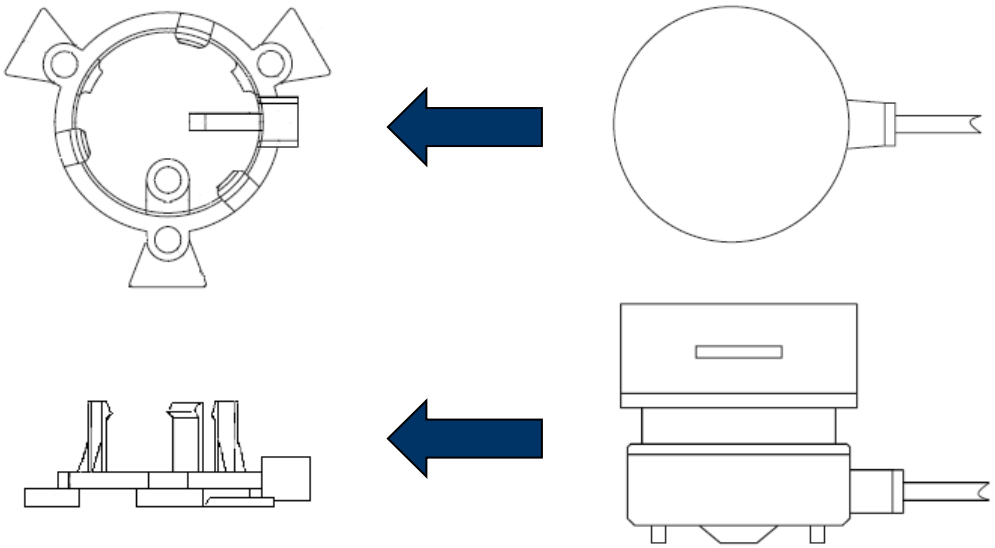
Bracket for Paperless RS-3000:
P/N-6720B
*This Bracket can be used with Buzzer Alarm Type only.

When the Control Unit RS-3000C/3500C is used to be combined with the Detection Unit, please refer to the Operation manual of RS-3000/3500 series for details of installation.

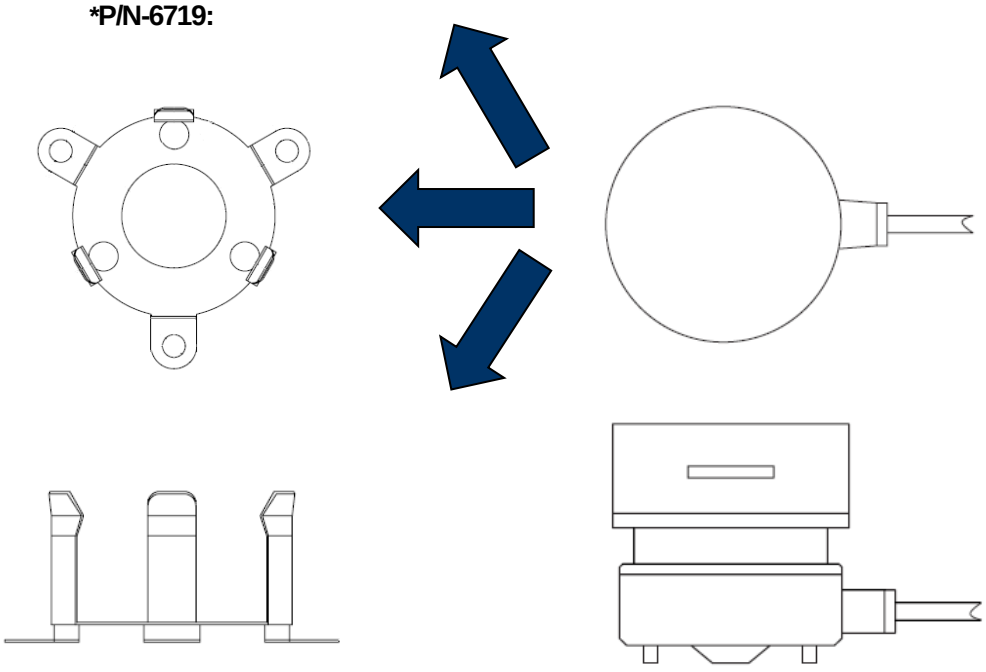
NOTE: When the sensor is located at the position, align the direction of the detection unit against the Bracket as described below.
And make sure that the location of the sensor will not have any difficulties for maintenance job、or the direction of the cable heads for no obstructions where the cable may not be damaged by excessive bent or pressure.

Bracket
P/N-6720B

Detection Unit
RS-3000FAP-BZ / RS-3500FAP-BZ



Bracket
***P/N-6719:**



Remarks: *This stainless steel material Bracket does not have structural restriction by cord plug orientation of RS-3000 Detection Unit, but needs to fit the position of three (3) foots of the Detection Unit, which has been located at every corner of equilateral triangle.*

3. Wiring Instruction

3-1. Detection Unit Stand-alone application without Control Unit

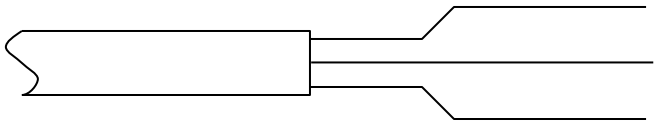
Both of RS-3000 and RS-3500 Detection Unit have the same wire allocation as below:

RS-3000FAP-BZ → Refer to NPN circuit configuration wiring;

RS-3500FAP-BZ → Refer to PNP circuit configuration wiring:

(1) The Detection Unit has a 3-wire sheath cable by 2 meters long (as a standard length)

When you extend the cable length for your electric system, do not exceed 30 meters long to comply with its technical conditions of EN61326, which is our certified test conditions, too.
Each wire will be connected as below.



Red: Power DC +12V～24V

White: Output (Normal: ON)

Black: Power 0V

(2) Connect the red wire (Positive pole) and the black wire (Negative pole) to the power source correctly. White wire is for an open collector output.

NOTE: Do not miswire with DC power source each other.

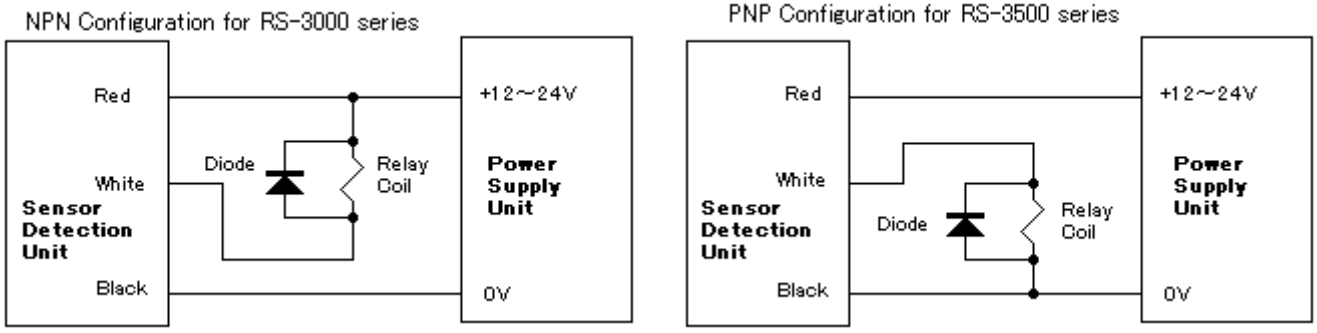
NOTE; Use the sensor unit between the power voltages of DC12V to DC24V.

(3) The output current for the load is limited up to 50mA maximum rating. Excessive rating may damage the output circuit.

NOTE: When an inductive load is applied, the protective treatment for the back electromotive is recommended. The following sample chart shows a hint to add a protective diode (F14C equivalent) to a relay coil load

Wiring Instruction: (Sample charts)

Please be careful to recognize the difference between both NPN and PNP wiring.



NOTE: Avoid short circuit between each wire after the power is supplied, otherwise the damage may be happened.

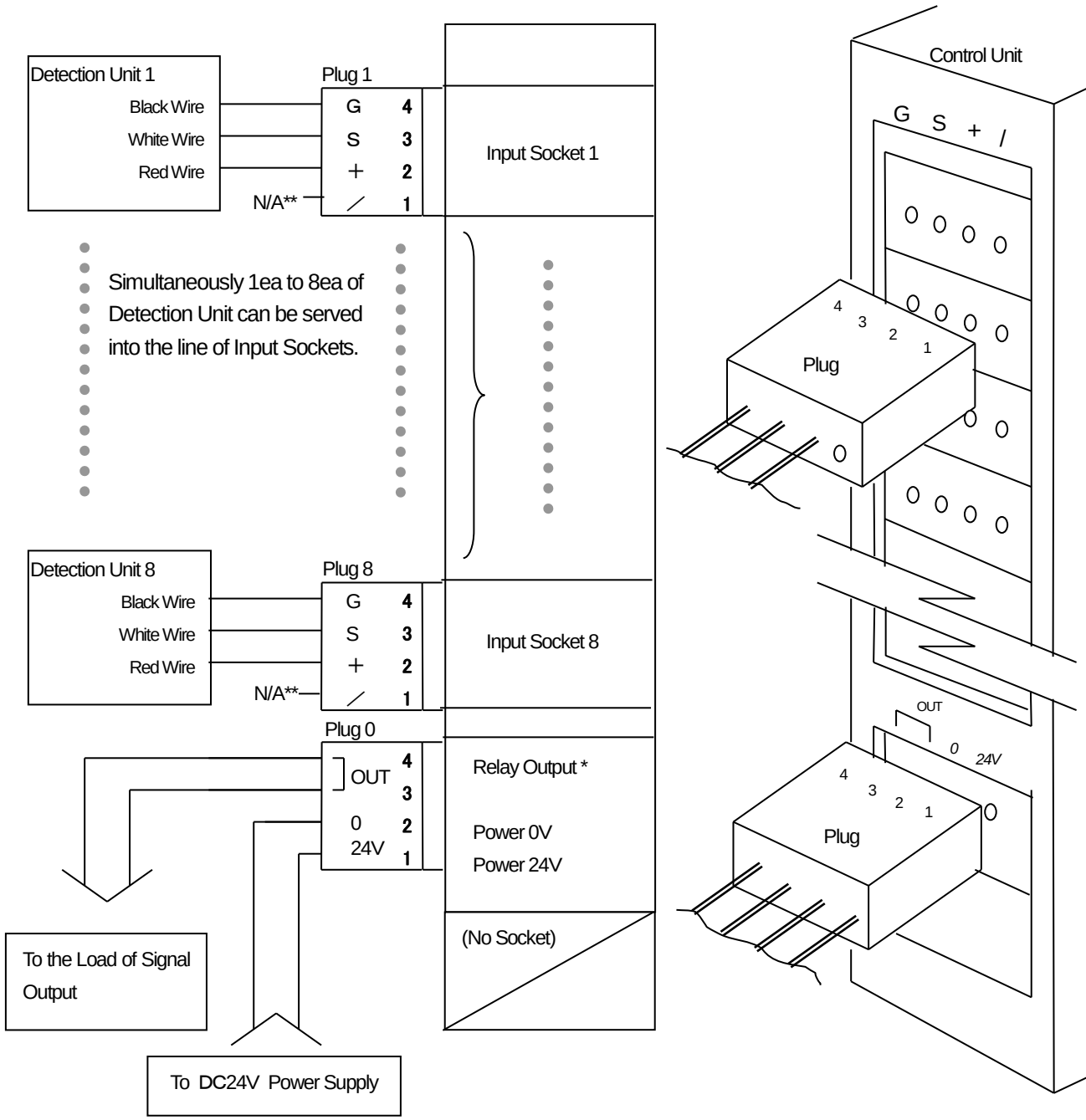
3-2. Detection Unit: Combination application with Control Unit

RS-3000FAP-BZ will be connected to the Control Unit RS-3000C.
RS-3500FAP-BZ will be connected to the Control Unit RS-3500C.

Use **the Plug connectors** for wiring with the Control Unit. The Connector can be obtained in the market by the keyword of "e-con" specification associated by Japanese connector suppliers. We recommend using OMRON, XN-2 Type connector for the connection as below:

For further information about XN-2 connectors, please visit web site of OMRON: URL www.fa.omron.co.jp/product/family/1728/index_p.html

(1) Refer to the wiring information in the illustration below.



***** The specification of the "Relay Output" of the Control Unit is one pole of SPST relay contact.

** N/A = not applied

4. Operation

WARNING : The following procedure must be implemented after the wiring work has done and prior to the operation. Each specific name of the Product will be referred in the previous section of "1. Designation of Sensor"

4-1. Detection Unit: Stand-alone application without Control Unit

After installation and wiring works are completed, you may turn on the power for initial verification process. At this moment, Green LED on the Detection Unit will light while the other Red LED is off. Now the Sensor works as the output is ON status.
Next, you may proceed the following step for alarm function testing:

To check the alarm function, just pour a drip of water to the Detection Unit. Upon the water is absorbed into almost whole area of the absorbent paper, the LED of the Detection Unit will be switched from Green to Red. The output will become OFF status simultaneously. This is the correct alarm status.
After the check, wipe off the water remaining completely, and set again the Detection Unit in the Bracket.

(1) After required installation and the wiring have been completed, turn on the power. .At this moment, Green LED on the Sensor will light while the other LED is off. (The output comes to ON status.)

(2) Then, pour a drip of water into the close area of the Sensor for the test. Upon the water penetrates into the detection area of the Sensor, the Red LED of the Sensor will start to flick hence Green LED comes out. At the same time, the buzzer starts to sound. The output of the Sensor will become 'OFF' status simultaneously.
(The sound level of the buzzer is around 80-90dB, so please take care for other people near around the testing site. It is recommended to spread a precaution to other people as this is a test.)

(3) Next, you may put out the Sensor body from the Bracket to stop the buzzer sound. At this moment, even the buzzer sound has stopped, the output signal is 'alarm' status. *Namely you can distinguish the two typed of alarm whether it is generated by liquid leak detection with the buzzer sound, or Sensor body is put at wrong position from the Bracket with electric alarming output but no buzzer sound.*

(4) After these functions are verified, wipe off the water from the Sensor and Bracket completely, and place the Sensor Body in the Bracket again.

4-2. Detection Unit: Combination application with Control Unit

(1) After installation and wiring works are completed, you may turn on the power, then, set the position of each Dip Switch of the Control Unit. The detailed function is described in the chart on next page.

[Adjusting of Dip Switches]

(2) Put the adequate number of the Dip Switch ON position same as the selected number of the input port of the Control Unit. For example, 5 of the Detection Unit are connected to the input port of 1 through 5, the Dip Switch of 1 through 5 must be turn ON position and other rest of 6 to 8 must be OFF position.
In case that the selected number of the Dip Switch may be OFF in spite the Detection Unit is connected at the same input number, the output signal from the Detection Unit will not be recognized, then both of the Green and Red LED Display on the Control Unit remain unlit.

(3) Verify the status of all the Detection Unit connected in the Control Unit as the same way described in the above 4.1 section.

(4) When the Detection Unit shows Red LED on, and its output is OFF, the LED Display of the Control Unit shows Red (Alarm) on for the selected number of Input Socket, and Relay contact of the output is OFF, as the Close status of relay contact.
When all the Detection Unit shows Green LED, the Relay contact of the Control Unit is ON, as the Open status.

Connection and Status Reference Chart

	Input No	LED Indicator of Detection Unit	Dip Switch	LED Display	Relay Out
1	n	Green ON	n=ON	n = Green ON	OFF = Close
2	n	Red ON 1) Leakage 2) Wrong position***		n = Red ON	ON = Open
3	n	Not Connected		n = Red ON	ON = Open
4	n	Not Connected	n=OFF	n = blank	OFF=Close

* "n" represents selected input socket numbers from 1 to 8 of the Control Unit.

** If the correspondent number of the Dip Switch may not be set correctly, the Relay output will not function accurately.

***This function is not applied to the "-S" suffix models. This model only outputs the alarm when the liquid is detected.

NOTE: For further information about the Control Unit of RS-3000/3500C, please consult to the separate Operation Manual of RS-3000/3500 series.

Distinction of the abnormal status

(1) If both of Green and Red LED of the Sensor will not put on, wrong wiring or the damage of the unit by the short circuit of the output that causes the overload may be possible. Stop to use the unit, and check with the wiring and the load status.

(2) If Green LED may light though the test water penetrates into the detecting area, the Sensor may be supposed it has been damaged. Stop using the unit immediately, and consult the supplying vendor or the factory.

(3) If the incorrect output may be observed though the LED functions correctly, the unit may be damaged by wrong wiring or overloaded output at the output transistor inside. Check the wiring and the load.

(4) When the Detecting Unit is not placed far into the Bracket as its position, the Red LED will flicker and output turns OFF status. Check the location of the Detecting unit with its Bracket again, and adjust it if placement is wrong. At this placement error, the Buzzer will not sound.

NOTE: The RS-3000 series sensors utilize the optical devices, and the highly intensive light from outwards (over 1,000 luxes) may disable the function of the Sensor. The normal intensity like the room light may not affects critically, however for safety, you are recommended to avoid any devices which emit the intensive light from the Detection Unit neighborhood, or to shade the light by means of anything applicable.

5. Reset Procedure after Alarm Clearance

WARNING : The liquid may contain hazardous acids, alkalis, or chemical substances. The following procedure has to be dome by a well-trained person who is knowledgeable for that liquid.

NOTE : The protection gloves must be worn.

NOTE : In case of handling any chemicals that are obliged to wear the protection goggles, masks, etc. by regulation, must follow the regulation.

(1) Turn off the power..

(2) Remove the Detection Unit from the Bracket, and wipe the liquid off.

(3) Remove the wet Absorbent Paper and wipe the Bracket and surroundings. Replace with a new paper then reset to follow the process of Installation of the Detection Unit.

(4) If the absorbent paper is not applied, wipe the unit, the Bracket and the surroundings. Then reset to follow the process of installation section in this manual.

(5) Turn on the power again then the reset is completed..

(6) Check the function of the sensors with the steps of the Section 4.1 to 4.2. Operation

(7) Achieve periodical maintenance check of the sensor.

NOTE : The periodical check is recommended at least annually, in accordance with your factory direction.

WARNING : This sensor is not explosion proof. Do not use in the area where explosion proof is specified.

6. Specification

6-1. Control Unit:

Model	RS-3000C	RS-3500C
Input Voltage	24V DC +/- 10%	
Power Consumption	200mA below	
Input	Simultaneously 1 to 8 ea of independent Input available	
LED Display	Independent LED Display for corresponding Input Socket Number Red LED for Alarm x 8 points, Green LED for normal status x 8 points If both LED are blank, its corresponding Input Socket is empty.	
Output	SPST Relay Output × 1, Normal Status: Close, Leakage or Alarm: Open, Power Failure: Open	
Ambient Temp.	－10 to 60 deg C (environment)	
Case Material	ABS Polymer	
Cable connection	8 ea of Socket for the Plug with Detecting Unit (Lock fix feature) Power supply & Output:: 1ea of Socket for both wirings (Lock fix feature)	
Installation	On the DIN Rail, or Screw fix up (by 2ea of M4 thread)	
Wiring Error	RS-3000 will outputs the alarm status by followings; Cut circuit conditions (no power or no signal) Wrong-wiring conditions **Warning: The shortage between Red cord and black cord may destroy the transistor device for output signal instantly.**	
Applicable Detection Unit	RS-3000FA, RS-3000FAP, RS-3000FAP-S; *RS-3000*-BZ Buzzer Alarm Leak Sensor is available, too.*	RS-3500FA, RS-3500FAP, RS-3500FAP-S; *RS-3500*-BZ Buzzer Alarm Leak Sensor is available, too.*

*The recommended Plug for connection of Control Unit and Detection Unit is OMRON XN2A-1430 Type.

6-2. Detection Unit

Model		RS-3000FAP-BZ	RS-3500FAP-BZ
Supply Voltage		DC 24V ±10%	
Current		30mA below	
Indication of LED Buzzer Alarm		Leakage : Red Flicker, Buzzer ON Floating position: Red Flicker, Buzzer OFF, Normal : Green Stable, Buzzer OFF	
Output		NPN open collector, 50mA max 1 Output, Normal Status: ON,	PNP open collector, 50mA max 1 Output, Normal Status: ON,
Ambient Temp.		－10～60℃	
Material	Case	PFA	
	Cable	FEP, 3-wire sheath	
	Lamp	Epoxy (embedded)	
Water Protect		Sealed, IP 67 equivalent (IEC)	
Weight		Approx 55g	
Absorbent Paper		Not Required	
Bracket		P/N-6720B (PVC) P/N-6716 (S.S.)	

*Out Diameter of the cable is as below, but the slight difference may remain as the tolerance because of the manufacturing process.
Diameter = 2.29mm +/- 0.25mm

6-3. Bracket:

Models	P/N-6716	P/N-6720-B*
Sensors	RS-3000FAP-BZ RS-3500FAP-BZ	
Materials	SUS301	PVC
Bracket Installation	3-M3 screw holes	3-M3 screw holes

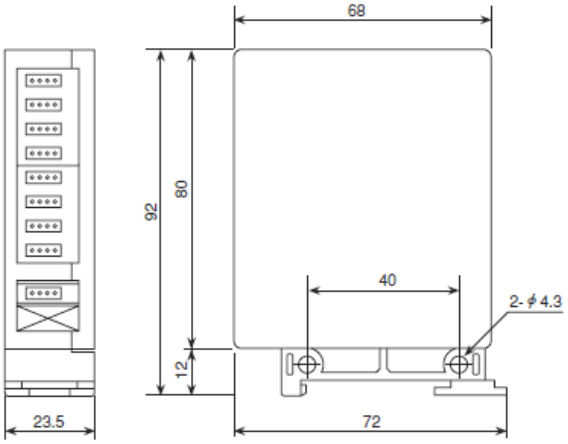
*P/N-6720-B is designed to be applied for the Detector Unit of the Leak Sensor with Buzzer Alarm.

**M3is the nominal code for screw specification designated by Japanese Industrial Standard, JIS B 1101.

7. Appearances and Dimensions:

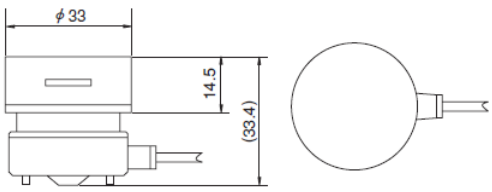
Control Unit:

RS-3000C / RS-3500C



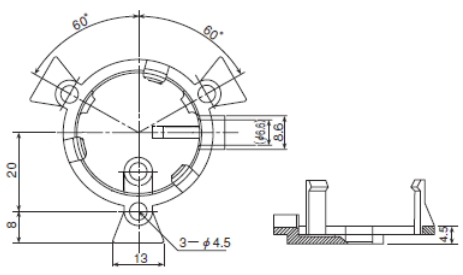
Detection Unit:

RS-3000FAP-B / RS-3500FAP-BZ



Bracket:

P/N-6720B (Material: PVC)



P/N-6716 (Material: SUS301)