Conductive Level Controller
61F-GP-N2

CSM_61F-GP-N2_DS_E_1_5

Automatic Water Supply and Drainage Control

- Ideal for level control of any conductive liquid.
- Compact plug-in controller for single- or two-point control of conductive liquid level.
- 24/110/120/220/230/240 VAC operation possible.
- Easy installation on DIN rail.
- Low voltage (AC) electrodes.
- Full surge protection.



Ordering Information

Compact plug-in conductive level controller	61F-GP-N2

When placing your order, be sure to specify the desired operating voltage.

Example: 61F-GP-N2 120 VAC

Rated supply voltage

■ Accessories (Order Separately)

Selection Guide for Electrode Holders and Separators

Electrode Holders

Applications		For city water and other general-use electrodes. Easy-to-replace separate versions facilitate maintenance of electrodes.	When mounting space is limited. Special 3-pole holder of small size and light weight. Ideal for soft drink vendors, etc., where only limited space is available.	For low specific liquids. Used for sewage, sea water, etc., having a low specific resistance. In sewage use, electrode holders must be installed 10 to 20 cm apart from one another. For acids, alkalis and sea water, electrode holders may be as much as 1 meter apart to operate properly.	When resistance to high pressure is required. Ideal for use in tanks where temperature or pressure inside the tank is high, e.g. 250°C
Mounting style		Flange	Screw	Flange	Screw
Insulator material		Phenol resin	Phenol resin	Ceramics	Fluorine Resin
Max. temperature			70°C (without water drips or vapour on the surface of the electrode holder)	150°C (without water drips or vapour on the surface of the electrode holder)	250°C (without water drips or vapour on the surface of the electrode holder)
No. of electrodes	**1**	---	---	BF-1	BS-1
	3	PS-3S	PS-31	---	---

Electrode Separators

No. of electrodes	Model
1	F03-14-1P
3	F03-14-3P

Selection Guide for Electrodes, Connecting and Lock Nuts

Applicable liquids	Material	Models for individual electrode assembly components					
		Electrode (1m long)		Connecting nut		Lock nut	
		Model	Indication mark	Model	Inscription	Model	Inscription
Purified city water, industrial water, sewage	SUS-304 (AISI-304)	F03-01-SUS304	1 line	F03-02-SUS304	---	F03-03-SUS304	---
Purified city water, industrial water, sewage, dilute alkaline solution	SUS316 (AISI-316)	F03-01-SUS316	2 lines	F03-02-SUS316	6	F03-03-SUS316	6

Application Example

- Level control in tanks, reservoirs, sewage plants, underground wells, mixing plants etc.
- Level control for element protection in pipes, channels, and irrigation systems.
- Flow detection in pipes, channels, and irrigation systems.
- Ice bank control in cold drink dispensers, ice makers, water chillers, bulk milk tanks, etc.
- Dispensing of liquids by volume.
- Indication of liquid buildup due to filter blockages.
- Pollution/foul water detection for rivers, drains, etc.
- Alarm control warning of abnormal or dangerously high or low levels.

Specifications

Supply voltage	24, 110, 120, 220, 230, 240 VAC; 50/60 Hz
Operating voltage range	85% to 110% of rated voltage
Interelectrode voltage*	8 VAC
Power consumption	Approx. 3.2 VA
Operate resistance	Approx. 4 KΩ min. Between electrode E1 and E3
Release resistance	Approx. 15 KΩ max. Between electrode E2 and E3
Response time	Operate: 80 ms max., Release: 160 ms max.
Control output	10 A, 250 VAC (at 40°C) 3 A, 250 VAC (at 55°C)
Insulation resistance	100 MΩ max. (at 500 VDC) between power terminals and electrode terminals, and between electrode terminals and contact terminals
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min., between power terminals and electrode terminals, and between electrode terminals and contact terminals
Ambient temperature	Operating: –10°C to 55°C
Ambient humidity	Operating: 45% to 85%
Life expectancy	Mechanical: 10,000,000 operations min.
Weight	Approx. 190 g
Approved standards	UL508, CSA C22.2 No.14, EN61010-1, EN61326-1 Industrial electromagnetic environment

*Secondary voltage of transformer

Connections

Automatic Water Supply and Drainage Control

1. Water supply

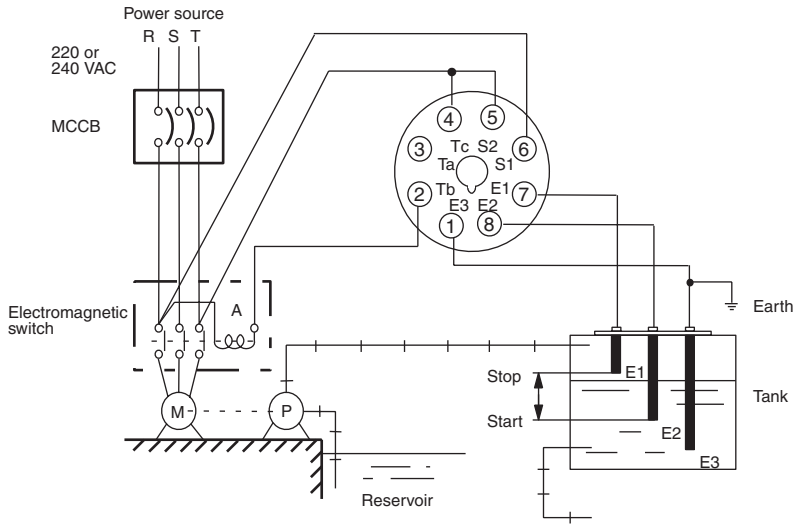
- Connect electromagnetic switch coil terminal A to Tb.
- The pump stops when the water level reaches E1 and starts when the water level drops below E2.

2. Drainage

- Connect the electromagnetic switch coil terminal A to Ta.
- The pump starts when the water level reaches E1 and stops when the water level drops below E2.

Note: 1. The diagram shows the connections for water supply. When draining, change the connection Tb to Ta.

2. The earth terminal must be grounded.



Operation

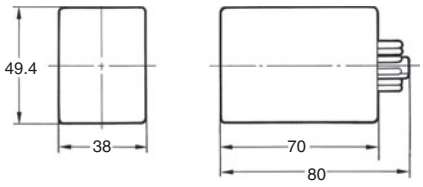
The conductive type level controller consists of a plug-in controller connected to a set of stainless steel probes. These are cut to length and inserted vertically into the liquid. A low voltage is applied between these probes and the earth probe (or tank, if it is electrically conductive). The water provides a current between the earth probe and the high-level probe. The output relay in the controller is energized when the water level reaches the high-level probe and de-energized when the water level falls below it.

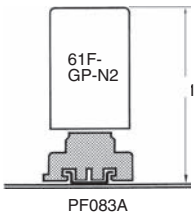
For two-point control a low-level probe is used as well. In this case the relay does not de-energize until the water level falls below the low-level probe. Using the low-level probe allows a wide differential between switching a pump on and off, and can avoid excessive pump operation during tank emptying or filling. If this differential is not required, the low-level probe need not be connected.

Dimensions

Note: All units are in millimeters unless otherwise indicated.



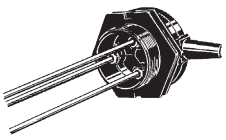


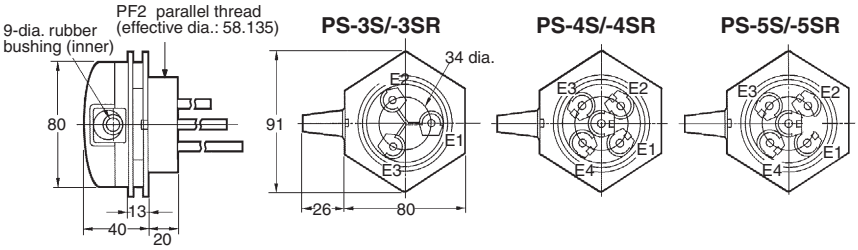


PF083A

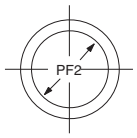
■ Electrode Holders

PS-3S





Mounting Holes



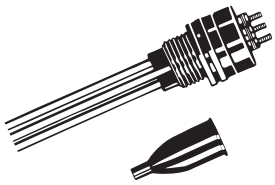
Used with coupling

Screw Holes

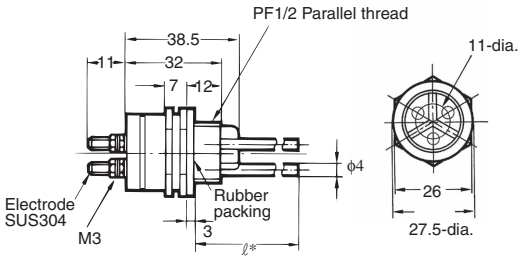


Used with mounting bracket

PS-31



Dust preventive rubber cap (optional)

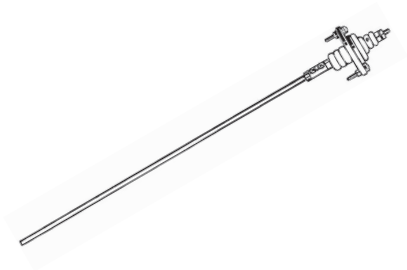


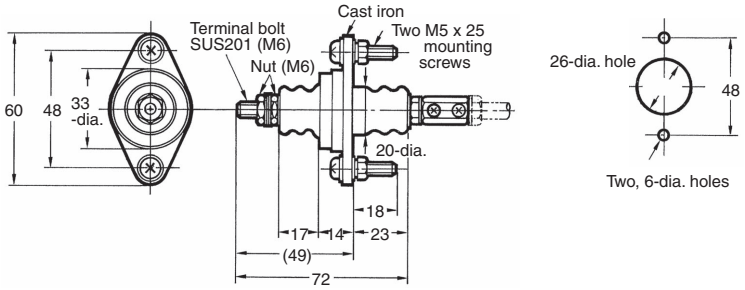
Mounting Holes



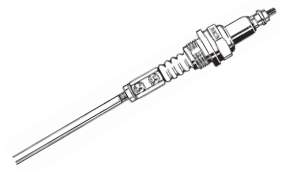
* Standard holder construction includes three integral 300 mm length electrodes. However, a type having 1,000 mm length electrodes is available on request.

BF-1

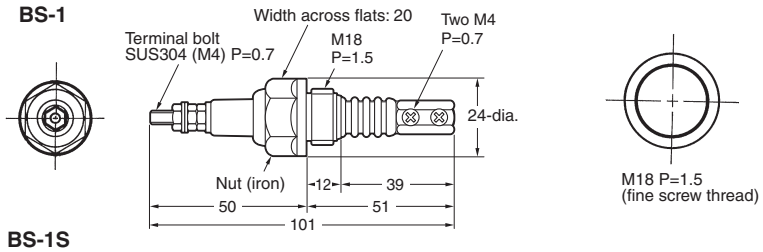




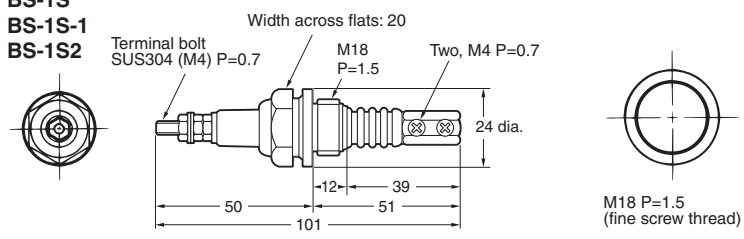
BS-1(S)



BS-1

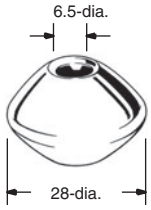


BS-1S
BS-1S-1
BS-1S2

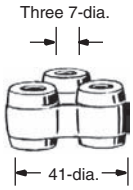


■ Electrode Separators

F03-14 1P (for Single Pole)



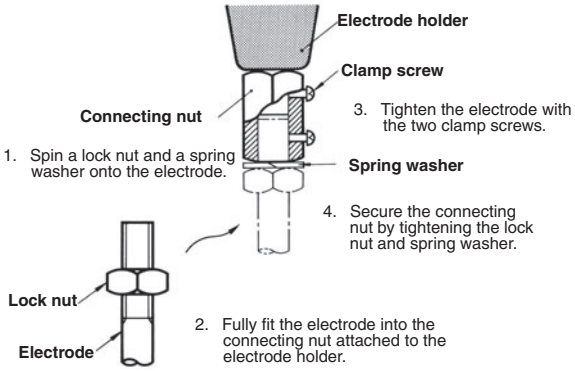
F03-14 3P (for Three Poles)



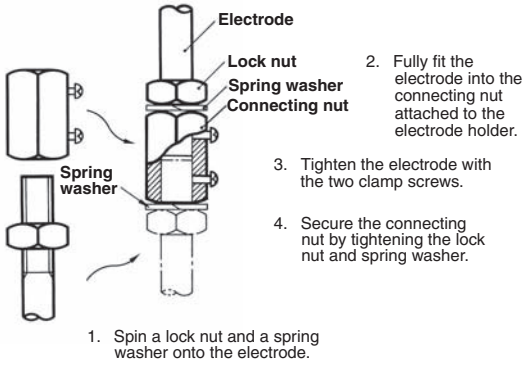
Precautions

■ How to Mount Electrodes

Connecting Electrodes to Electrode Holders



Connecting One Electrode to Another



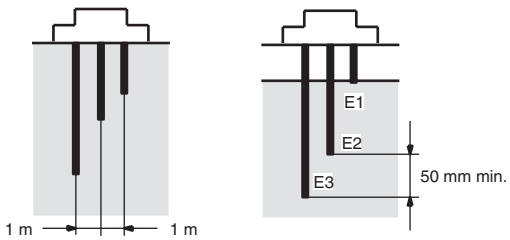
■ Application

When using electrodes in sea water or sewage, provide a sufficient interval (normally 1 m) between the electrodes. If the sufficient interval cannot be provided, employ a low-sensitivity type Floatless Level Controller.

When taping one of the electrodes to prevent it from contacting the other electrodes in water, do not tape the electrode entirely but leave at least 100 mm of its end uncovered.

When the required length of the electrode is more than 1 m, use a separator at each joint of two electrodes so as to prevent the electrodes from contacting one another. (NOTE: Avoid use of the separators in dust-containing liquids.)

Usually, electrodes are used in a set of three: long, medium, and short. Connect the short electrode to E1, the medium electrode to E2, and the long electrode to E3. Make E3 at least 50 mm longer than E2.



Electrodes are in actual contact with the liquid. Standard electrodes are made of stainless steel and usable in purified water, sea water, sewage, acid (except acetic acid, sulfuric acid, etc.) and alkaline liquids, although they may corrode depending upon the temperature and working conditions.

Note that the Conductive Level Controller 61F-GP-N2 is capable of controlling liquids with specific resistances of up to 30 kΩ-cm when the controller employs a type PS-3S electrode holder with the electrode(s) submerged to a depth of 30 mm max.

Kind of water	Specific resistance	Applicable type
City water	5 to 10 kΩ-cm	General-purpose type
Well water	2 to 5 kΩ-cm	General-purpose type
Industrial water	5 to 15 kΩ-cm	General-purpose type
Rainwater	15 to 25 kΩ-cm	General-purpose type
Sea water	0.03 kΩ-cm	Low-sensitivity type
Sewage	0.5 to 2 kΩ-cm	Low-sensitivity type
Distilled water	100 kΩ-cm or less	High-sensitivity type
	Over 100 kΩ-cm	Consult OMRON

■ Safety Precautions

⚠ WARNING

Do not touch the terminals while power is being supplied. Doing so may possibly result in electric shock. Make sure that the terminal cover is installed before using the product.



⚠ CAUTION

Do not attempt to disassemble, repair, or modify the product. Doing so may occasionally result in minor or moderate injury due to electric shock.



Precautions for Safe Use

1. Precautions for the environment

- Use and preserve within the proper temperature and humidity described in the specifications.
- Temperature of surroundings for preservation (including during transportation) and use: −10 to 55°C, humidity: 45 to 85%.
- Do not install, among others, near heat devices such as coils or other devices having coils, etc.
- Avoid preserving (including during transportation) and using in a humid place, in a corrosive gas environment, outdoors and in a place which receives direct sunlight.
- Preserve and use without exposing to danger of explosion, flammable dust, gas and vapor, excessive dust, and saline spray or droplets.
- Avoid preserving (including during transportation) and using in a place which is vulnerable to flooding or oil spillage.
- Avoid preserving (including during transportation) and using in a place where vibrations and impacts are strong. Similarly, avoid using next to a high-capacity contactor which may impacts at operation. Doing so causes malfunctions such as chattering, etc.
- Do not install the product near devices generating strong high-frequency waves or surges. When using a noise filter, check the voltage and current and install it as close to the product as possible.

2. Cautions for Use

- Read the instruction manual and catalog before operating and maintaining the product.
- Fit socket(s) and DIN rail(s) so that the screws are tight. If the screws are not tight, DIN rail(s), socket(s), the product and cable(s) may lead to come off.
- Be sure to fit socket(s) to DIN rail(s) without fail.
- Use metal strengthener(s) to maintain a firm connection between the product and socket(s).
- Read the instructions manual and catalog before the operation and maintenance of the product.
- When fitting crimping terminal(s) to terminal screw(s), use a tightening torque of between 0.45 and 0.6 N·m
- Use power supply of appropriate specifications to provide control source(s), inputs, etc., and to wire cables. [Recommended cable to wire between the model 61F and electrode(s) when using three-core cabtire cable(s) of completely insulated 600 V 0.75 mm VCT: 50 m max.]
- Do not put power line(s), high-voltage cable(s) and wire(s) of electrode circuit(s) in the same duct nor wire closely. Doing so causes malfunctions by getting vulnerable to induction noise.
- Shorten the distance for wiring between the model 61F and electrode holders as much as possible. Long distance for wiring may causes malfunctions because stray capacitance may influence operation, or abnormal surges or noise may run through electrode circuit(s).
- Be sure to ground common electrode terminal(s). Doing so can reduce some effects of noise.
- Use the product within the noted supply voltage and rated load.
- Before using, recheck the application, wiring, power supply, etc.
- Check the application and power supply. Power supply (AC 220 V, AC 230 V) consists of other specifications. If the power voltage is not AC 200 V or AC 100 V, follow the instructions described on the device.
- Firmly ground the earth terminal No.4.
- Make sure that electrode probes in the liquid do not come in contact one another as it may cause malfunction. Use separator when connecting.
- Tighten nuts for electrode probe(s) firmly.
- Prevent flotage from attaching to electrode.
- This device is not available when the resistance is too high and is not conductive such as oil.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

In the interest of product improvement, specifications are subject to change without notice.

Terms and Conditions Agreement

Read and understand this catalog.
Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranties.
(a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.
(b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE
PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.
Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.
See http://www.omron.com/global/ or contact your Omron representative for published information.

Limitation on Liability; Etc.
OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.
Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

Suitability of Use.
Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.
NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.
Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

Performance Data.
Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

Change in Specifications.
Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.
Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

2019.9

In the interest of product improvement, specifications are subject to change without notice.

OMRON Corporation
Industrial Automation Company

http://www.ia.omron.com/

(c)Copyright OMRON Corporation 2019 All Right Reserved.