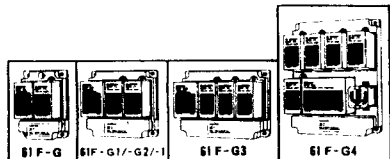


形 61F

フロートなしスイッチ ベースタイプ

取扱説明書

オムロン製品をお買いあげいただきありがとうございます。
この製品を安全に正しく使用していただくために、お使いになる前にこの取扱説明書をお読みになり、十分にご理解してください。
お読みになったあとは、いつも手元においてご使用ください。



オムロン株式会社

2406546-9C

安全上のご注意

●警告表示の意味

警告 誤った取り扱いをすると、死亡または重傷を負う可能性が想定される場合を示します。

●警告表示

警告
端子には触らないでください。
感電の恐れがあります。

電源を入れた状態で分解したり、内部に触らないでください。
感電の恐れがあります。

お願い

爆発性、可燃性の粉塵、可燃性のガス、引火性物の蒸気、腐食性のガス、過度の粉塵、塩水の飛沫及び、水滴にさらさない状態で使用して下さい。

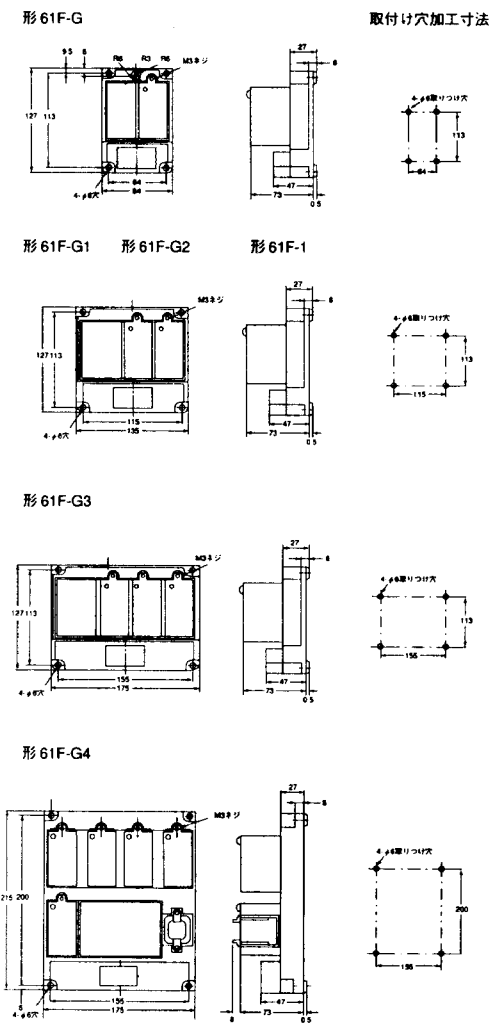
正しい使い方

- 用途、使用電源をご確認ください。
AC200VとAC100Vとは、接続端子が異なります。
なお、電源電圧がAC200V、AC100V以外の場合には、本体表示に従って下さい。
- 電極回路の配線を間違えないようにして下さい。
総合回路図をもう一度たしかめて下さい。
- 接地端子は、確実に接地して下さい。
- 電極と電極とが液中で接触する時は、別売品のセパレータを使って防いで下さい。
- 電極と電極の接続部は、雨水などがたまる恐れのないところにして下さい。
- 電極棒のナットは、十分締め付けて下さい。
- 電極に浮遊物がつかないようにして下さい。
- 液体の固有抵抗が高すぎ、ほとんど電気が通じない油等には使用できません。

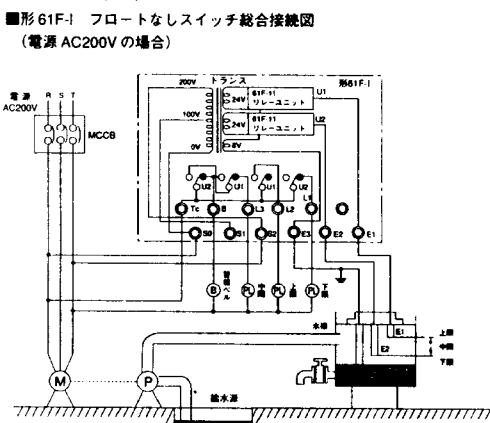
種類 本体/基本形

用途	Gタイプ	G1タイプ	G2タイプ	G3タイプ	G4タイプ	Iタイプ
給水、排水の自動運転		(用途1) 空転防止を兼ねた給水の自動運転	(用途2) 異常増水警報を兼ねた給水の自動運転	異常増水警報を兼ねた給水、排水の自動運転	満水、湯水警報を兼ねた給水、排水の自動運転	給水源の水位表示、空転防止、高架水槽の水位表示、給水の自動運転
項目						
基本形	61F-G	61F-G1	61F-G2	61F-G3	61F-G4	61F-I
シリーズ品	61F-GT	61F-G1T	61F-G2T	61F-G3T	61F-G4T	61F-IT
	61F-GL	61F-G1L	61F-G2L	61F-G3L	61F-G4L	61F-IL
	61F-GH	61F-G1H	61F-G2H	61F-G3H	61F-G4H	61F-IH
	61F-GD	61F-G1D	61F-G2D	61F-G3D	61F-G4D	61F-ID
	61F-GR	61F-G1R	61F-G2R	61F-G3R	61F-G4R	
取付け方法	●ネジ取付け					
	●高温用 61F-GT 使用温度範囲 -10 ~ +70℃					
	●遠距離用 61F-GL 2km用、4km用					
	●高感度用 61F-GH 蒸留水など 10 ¹⁰ Ω・cm 以下の固有抵抗制御					
	●低感度用 61F-GD 固有抵抗が低い液体の制御					
	●2線式 61F-GR 簡単な液面制御に適した2線式					

外形寸法



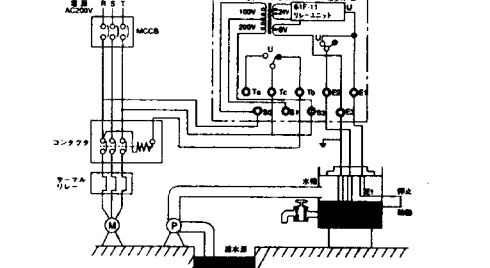
外部接続例



- 電源電圧が100VのときはSo-Si端子に配線して下さい。200VのときはSs-Si端子です。
- E5端子は必ず接地して下さい。

- (動作確認)
- ① 水槽内の液がE1(短)より増えると上限ランプがつき、液面表示ベルがなります。
 - ② 水槽内の液がE1(短)とE2(中)の間では中間ランプがつきます。
 - ③ 水槽内の液がE2(中)より減ると下限ランプがつき、液面表示ベルがなります。
 - ④ ただし液の種類と電圧の変化で、電極の先端に液面が達しても動作する高さには多少の相違があります。

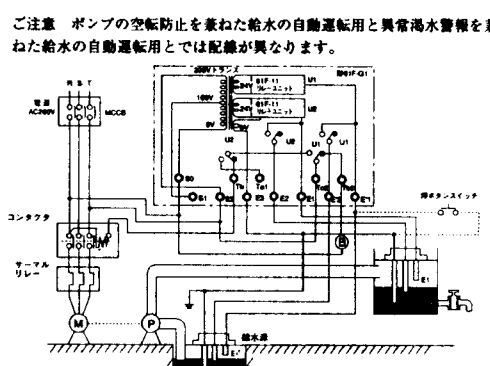
■形 61F-G フロートなしスイッチ総合接続図 (電源 AC200V で給水の場合)



- 排水用を使用されるときはTb端子配線をTa端子につなぎかえて下さい。
- 電源電圧が100VのときはSo-Si端子に配線して下さい。200VのときはSs-Si端子です。
- E5端子は必ず接地して下さい。

- (動作確認)
- 給水するとき
水面がE1電極に達するとポンプは止まり、E2電極以下になると始動します。
- 排水するとき
水面がE1電極に達するとポンプは始動し、E2電極以下になると止まります。

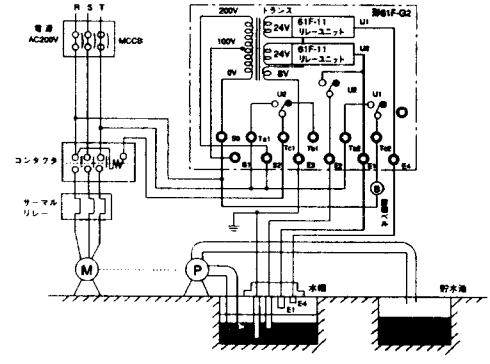
■形 61F-G1 フロートなしスイッチ総合接続図 (電源 AC200V の場合)



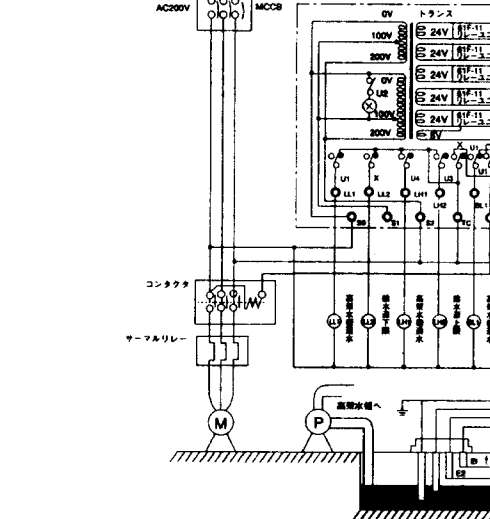
- 電源電圧が100VのときはSo-Si端子に配線して下さい。200VのときはSs-Si端子です。
- E5端子は必ず接地して下さい。

- (動作確認)
- ① 空転防止の場合・水槽の液がE1(短)まで増えると、ポンプのモータが止まり、E2(中)より減るとモータが回り、異常増水警報ベルがなります。
 - ② 空転防止の場合・給水源の液がE1(中)以下に満水したとき、自動的にポンプのモータが回り、警報ベルがなります。
 - ③ 異常増水警報の場合・ポンプが運転中、何らかの事故で液面が水槽のE1(長)以下になると、自動的にポンプのモータが止まり、警報ベルがなります。
 - ④ 液面制御の範囲は水槽内のE1(短)とE2(中)の先端間の距離です。したがって電極棒の長さを変えたり範囲を自由に調整できます。
 - ⑤ ただし、液の種類と電圧の変化で、電極の先端に液面が達しても、動作する高さには多少の相違があります。
 - ⑥ 破線のようE1'とE2'間に押ボタンスイッチ(a接点)を入れてください。始動のとき、および停電復帰時、給水源の水面がE1'に達していない場合は押ボタンスイッチを押して瞬間短絡させ(U1動作"ON")、ポンプを始動させます。通常運転時に低水位警報がでてポンプが停止した場合は(U1動作"OFF") (水位がE1'に達していない)、押ボタンスイッチは押さないでください。

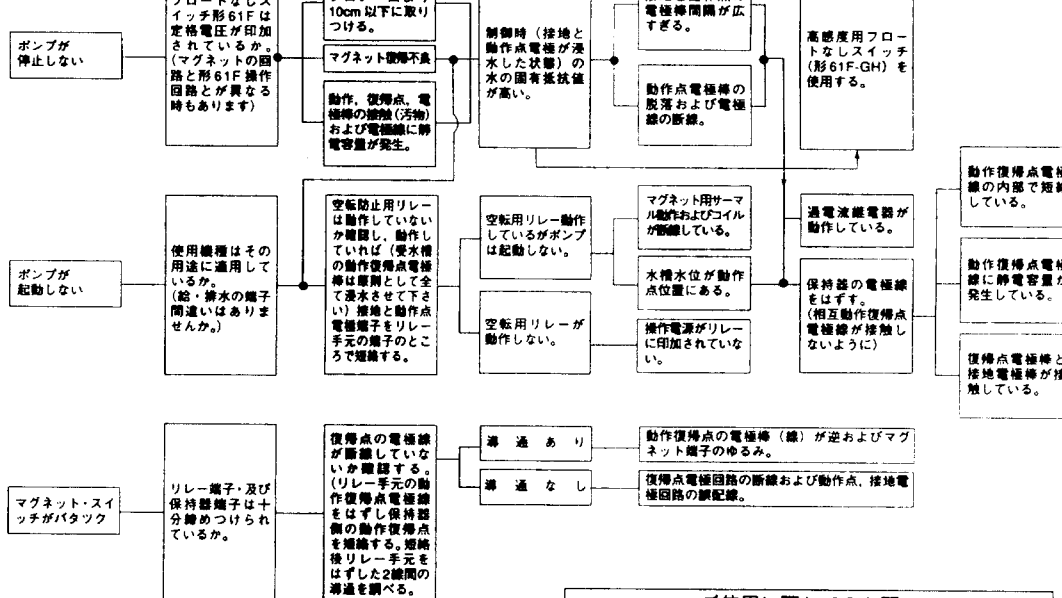
■形 61F-G2 フロートなしスイッチ総合接続図 (電源電圧 200V の場合)



- (動作確認)
- ① 給水の場合・水槽内の液がE2(短)まで増えると、ポンプのモータが回り、E3(中)より減るとモータが回り、異常増水警報ベルがなります。
 - ② 排水の場合・水槽内の液がE2(短)まで増えると、ポンプのモータが回り、E3(中)より減るとモータが止ります。
 - ③ 異常増水警報の場合・水槽内の液がE1(最短)まで増えると、上限ランプがつき、異常増水警報ベルがなります。
 - ④ 異常増水警報の場合・水槽内の液がE1(長)以下になると、下限ランプがつき、異常増水警報ベルがなります。



■保守・点検



ご使用に際してのお願い

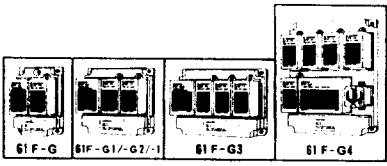
次に示すような条件や環境で使用される場合は、定格、電圧に対して余裕を持った使い方やフェールセーフなどの安全対策への配慮をいただくとともに、当社営業担当者までご相談くださるようお願いいたします。

1. 取扱説明書に記載のない条件や環境での使用
2. 摩り劣り、腐蝕、航空・車両・燃焼装置、医療機器、精密機械、安全機器などへの使用
3. 人命や財産に大きな影響が予測され、特に安全性が要求される用途への使用

MODEL 61F
FLOATLESS LEVEL SWITCH

INSTRUCTION MANUAL

Thank you for purchasing the Model 61F Floatless Level Switch. Before using it, thoroughly familiarize yourself with the instructions in this manual. It is recommended that you save this sheet for future reference.



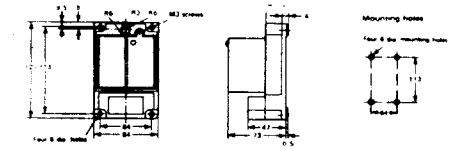
OMRON Corporation

AVAILABLE TYPES

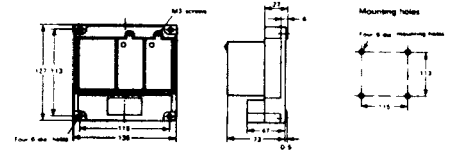
	Model G	Model G1	Model G2	Model G3	Model G4	Model I
Classification by application	Automatic Water Supply and Drainage Control	Application 1 Automatic Water Supply Control with Prevention of Pump Idling	Application 2 Automatic Water Supply Control with Alarm for Abnormally Low Level	Automatic Water Supply and Drainage Control with Alarm for Abnormally Low Level	Automatic Water Supply and Drainage Control with Alarm for Abnormally High and Low Levels	Automatic Water Supply Control with Level Display of Water Source and Tank
General purpose type	61F-G	61F-G1	61F-G2	61F-G3	61F-G4	61F-I
Classification by control purpose	61F-GT 61F-GL 61F-GH 61F-GD 61F-GR	61F-G1T 61F-G1L 61F-G1H 61F-G1D 61F-G1R	61F-G2T 61F-G2L 61F-G2H 61F-G2D 61F-G2R	61F-G3T 61F-G3L 61F-G3H 61F-G3D 61F-G3R	61F-G4T 61F-G4L 61F-G4H 61F-G4D 61F-G4R	61F-IT 61F-IL 61F-IH 61F-ID
	<ul style="list-style-type: none"> High temperature 61F-GT -10°C to +70°C Type Long distance 61F-GL 2km or 4km Type High sensitivity 61F-GH Control of liquids, such as distilled water, that as low a specific resistance as 10¹⁰Ω·cm Low sensitivity 61F-GD For low specific resistance liquids Two-wire 61F-GR Suitable for simple liquid level control 					
Mounting	Screw fastening					

DIMENSIONS

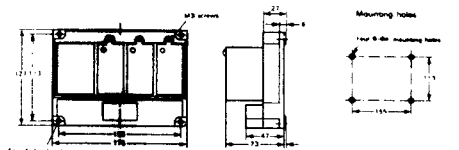
61F-G



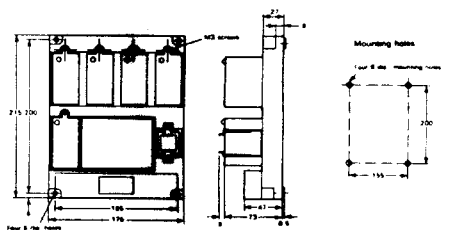
61F-G1 61F-G2
61F-1



61F-G3

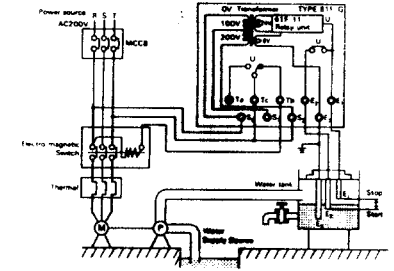


61-G4



EXTERNAL CONNECTION EXAMPLE

G type (200, 220, or 240VAC)
Automatic Water Supply and Drainage Control



- With the power supply voltage 100V, (110, 120V) the wiring is made between S₀-S₁ and with 200V (220, 240) S₀-S₁.
- Be sure to ground terminal E3.

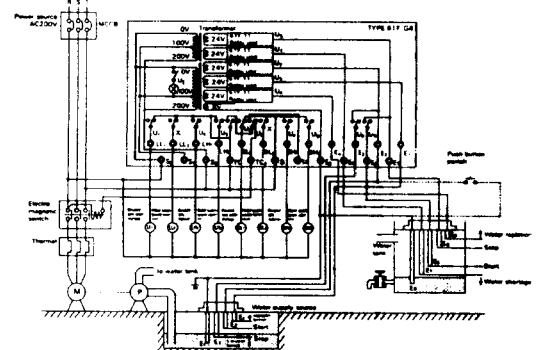
OPERATION

Water supply
Connect electromagnetic switch coil terminal A to T_b. The pump stops (U operates) when water level reaches E1 and starts (U stops the operation) when water level drops below E2.

Drainage
Connect the electromagnetic switch coil terminal A to T_a. Pump starts (U operates) when water level reaches E1 and stops (U stops the operation) when water level drops below E2.

G4 type (200, 220, or 240 VAC): Water Supply Water Source Level Indication, Prevention of Pump Idling Due to Water Shortage, Automatic Water Supply Control and Indication of Water Level in Tank.

- With the power supply voltage 100V, the wiring is made between S₀-S₁ and with 200V S₀-S₁.
- Be sure to ground terminal E8.



OPERATIONS

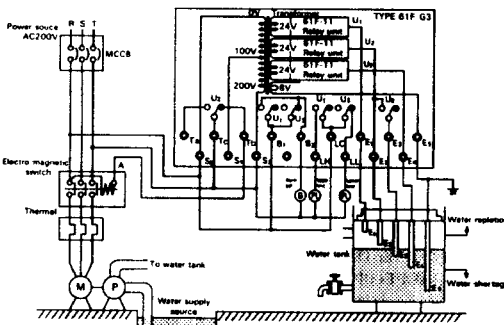
- The lower-limit indicator lamp for the water supply source remains lit while water level is below E₁.
- When water level rises to E₁, the lower-limit indicator lamp goes out and the pump becomes ready for operation.
- When water level reaches E₂, the upper-limit indicator lamp lights.
- When the water level is not as high as E₂ at the start of the pumping operation, E₂ and E₁ are short-circuited before commencing the operation.
- The water-shortage indicator lamp for the elevated tank remains lit while water level in the elevated tank is below E₂. The indicator lamp goes out when water level rises to E₂.
- The pump stops when water level reaches E₃ and starts when water level drops below E₃.
- If water level reaches E₃ for any reason, the tank repletion indicator lamp for the elevated tank lights.
- Insert a pushbutton switch (NO contact) between E2 and E8 as shown by the dotted line on the right. In starting pump and after recovery from power failure, if water source level has not yet reached E2 (U2 LED goes off), depress the push button switch to start the pump by momentarily short-circuiting E2 and E8. When the pump stops during normal operation subsequent to an alarm issued for low water level (water level has not reached E3), do not depress the pushbutton switch.

HINTS ON CORRECT USE

- Prior to power application, check the following.
- Be sure to use the floatless level switch for the correct applications at the correct supply voltage. The terminal connection of the switch at 100 VAC is different from that at 200 VAC. When using supply voltage other than 100 or 200 VAC, refer to the indication on the switch.
- Check the wiring of the power circuit. Check the wiring against the circuit diagram provided in this instruction manual.
- Be sure to ground the ground terminal.
- Check whether the electrodes contact each other in the liquid. If they do, separate them using a separator optionally available.
- Avoid placing the connection of the electrodes where liquids other than that to be sensed, such as rainwater, exist.
- Adequately tighten the nuts of the electrodes.
- Prevent any foreign objects from collecting on the electrodes.
- The level switch cannot be used to sense substances with high specific resistance such as oil.

G3 type (200, 220, or 240VAC)

Automatic Water Supply and Drainage Control with Issuance of Alarm for Abnormal Water Shortage and Repletion in Tank.

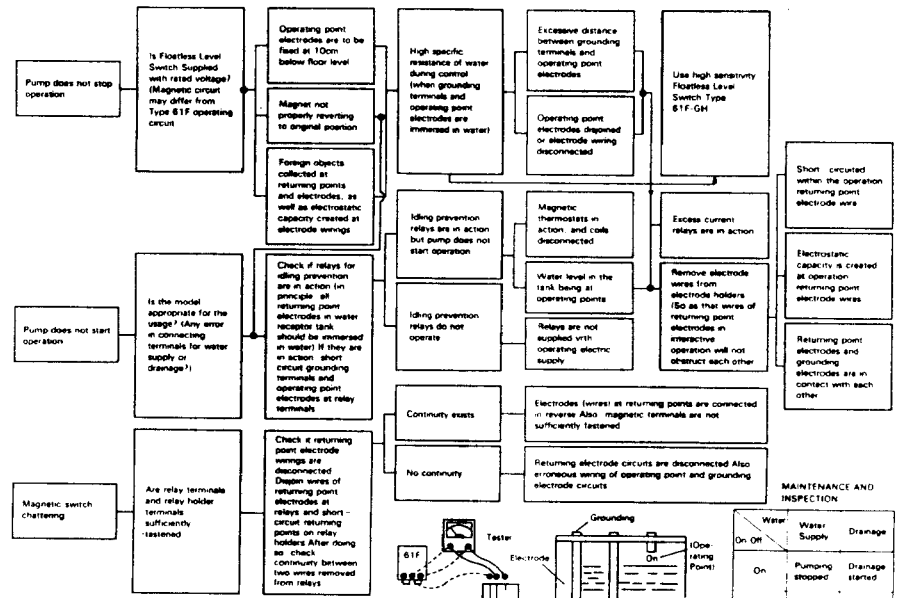


- With the power supply voltage 100V, the wiring is made between S₀-S₁ and with 200V S₀-S₁.
- Water supply - Connect electromagnetic switch coil terminal A with T_b.
- Drainage - Connect electromagnetic switch coil terminal A with T_a.
- Be sure to ground terminal E5.

OPERATIONS

- Water Supply:** The pump stops when the liquid level in the water tank reaches E₂ (high) and resumes operation when the level drops below E₂ (medium).
- Drainage:** The pump starts operating when the liquid level within the water tank reaches E₂ (high) and stops when the level drops below E₂ (medium).
- Issuance of Alarm for Abnormally High Level:** When the liquid level within the water tank reaches E₁ (high), the upper limit indicator lamp lights and an alarm is sounded indicating an abnormally high level of liquid.
- Issuance of Alarm for Abnormal Water Shortage:** When the liquid level within the water tank drops below E₁ (low), the lower limit indicator lamp lights, and an alarm is sounded in dicating an abnormal water shortage.

MAINTENANCE AND INSPECTION

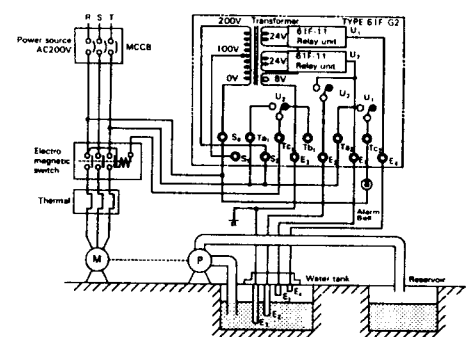


Electrode, accessories

Product name	Type
SUS201 electrode (1m)	F03-01 (SUS201)
SUS201 connecting nut	F03-02 (SUS201)
SUS201 lock nut	F03-03 (SUS201)
SUS201 spring washer	F03-04 (SUS201)
SUS201 electrode set	F03-60 (SUS201)
SUS316 electrode (1m)	F03-01 (SUS316)
SUS316 connecting nut	F03-02 (SUS316)
SUS316 lock nut	F03-03 (SUS316)
SUS316 spring washer	F03-04 (SUS316)
SUS316 electrode set	F03-60 (SUS316)
Hastelloy B electrode (1m)	F03-01 (HAS B)
Hastelloy B connecting nut	F03-02 (HAS B)
Hastelloy B lock nut	F03-03 (HAS B)
Hastelloy B electrode set	F03-60 (HAS B)
Hastelloy C electrode (1m)	F03-01 (HAS C)
Hastelloy C connecting nut	F03-02 (HAS C)
Hastelloy C lock nut	F03-03 (HAS C)
Hastelloy C electrode set	F03-60 (HAS C)
Titanium electrode (1m)	F03-01 (Titanium)
Titanium connecting nut	F03-02 (Titanium)
Titanium lock nut	F03-03 (Titanium)
Titanium electrode set	F03-60 (Titanium)
Electrode band 3P (1m)	F03-05 3P
Electrode band 4P (1m)	F03-05 4P
Electrode band 5P (1m)	F03-05 5P
Electrode band connecting nut	F03-06
Electrode band split weight	F03-07
Electrode band and cap	F03-08
Electrode band insulation cap	F03-09
Electrode band adhesive agent	F03-10
Protective cover (for BF)	F03-11
Spring clamp	F03-12
Frame for installing in concrete	F03-13
Separator (for one pole)	F03-14 1P
Separator (for three poles)	F03-14 3P
Separator (for five poles)	F03-14 5P

G2 (200, 220, or 240 VAC)

Automatic Drainage Control with Issuance of Alarm for Abnormal Water Increase



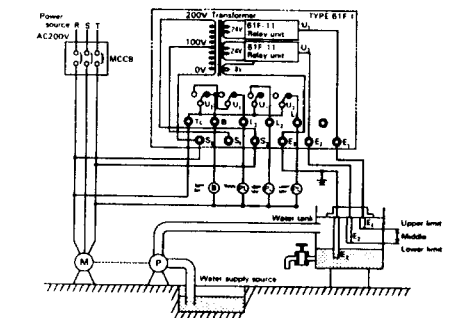
- With the power supply voltage 100V, the wiring is made between S₀-S₁ and with 200V S₀-S₁.
- Be sure to ground E3.

OPERATION

- When the liquid level in the drainage tank exceeds E₁ (high), the motor is turned on and when the level drops to E₂ (medium) it is turned off. When the liquid surface rises to E₁ (highest), an alarm is sounded warning the abnormally high level of water.
- Thus, the liquid level control is conducted within the range between the tips of E₁ (high) and E₂ (medium) in the water tank. Therefore, the range of control can be freely adjusted by changing the length of.
- However, depending on the type of liquid and voltage variation, a slight difference is noted of the level where the pump resumes operation after the liquid level has reached the tip of the electrode.

I type (200, 220, or 240VAC)

Liquid Level Indication and Alarm.



- With the power supply voltage 100V, the wiring is made between S₀-S₁ and with 200V S₀-S₁.
- Be sure to ground terminal E₁.

OPERATION

- When liquid within the water tank exceeds the level of E₁ (high), the upper limit indicator lamp lights and the alarm bell is sounded.
- When liquid within the water tank remains at a level between E₁ (high) and E₂ (medium), the medium level indicator lamp lights.
- When liquid within the water tank is reduced to the level below E₂ (medium), the lower limit indicator lamp lights and the alarm bell is sounded.
- However, depending on the type of liquid and voltage variation, a slight difference is noted of the level where the pump resumes operation after the liquid level has reached the tip of the electrode.

OPTION

Electrode holder

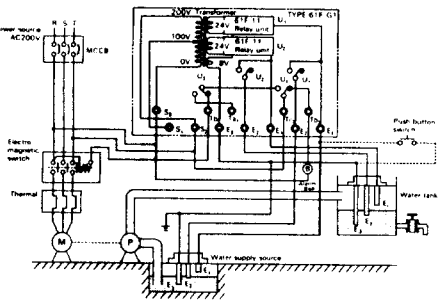
Type
PS-3S
PS-4S
PS-5S
PS-3SR
PS-4SR
PS-5SR
PS-31 (SUS304 300mm)
BF-1
BF-3
BF-4
BF-5
BF-3R
BF-4R
BF-5R
BS-1
BS-1X
BS-1T
PH-1 (1m vinyl code)
PH-1 (1m chloroprene cord)
PH-2 (1m vinyl cord)
PH-2 (1m hypalon cord)

NOTE: Select the lengths of the Type PH-1 and Type PH-2 cords from the following.
1m, 2m, 3m, 4m, 5m, 6m, 7m, 8m, 9m, 10m, 15m, 20m, 30m, 40m, 50m, 60m, 70m, 80m, 90m, 100m.

G1 type (200, 220, or 240VAC)

Automatic Water Supply Control with Prevention of Pump Idling.

Warning: Note the difference in the wiring between the automatic water supply control with prevention of pump idling and that with issuance of alarm for abnormal water shortage.



- With the power supply voltage 100V (110, 120V), the wiring is made between S₀-S₁ and with 200V (220, 240V) S₀-S₁.
- Be sure to ground terminal E3.

OPERATION

- Prevention of Pump Idling:** When the liquid level in the water tank reaches E₁ (high) the motor is turned off, and when the level drops below E₂ (medium) it is turned on.
- Prevention of Pump Idling:** The motor is automatically turned off, when the liquid at the water supply source is in shortage and drops below the level of E₂ (medium). An alarm is then sounded.
- Issuance of Alarm for Abnormal Water Shortage:** The motor is automatically turned off when for any reason the liquid level in the water tank drops below E₂ (low). An alarm is then sounded.
- Liquid level control** is conducted within the range between the tips of E₁ (high) and E₂ (medium) in the water tank. Therefore, by changing the length of electrodes the range of control can be freely adjusted.
- However, depending on the type of liquid and voltage variation, a slight difference is noted of the level where the pump resumes operation after the liquid level has reached the tip of the electrode.
- Insert a pushbutton switch (NO contact) between E1' and E3 as shown by the dotted line on the light. In starting pump or after recovery from power failure, if water supply source level has not yet reached E1', depress the pushbutton switch to start the pump by momentarily short-circuiting E1' and E3. When the pump stops during normal operation subsequent to an alarm issued for low water level (water level does not reach E2'), do not depress the pushbutton switch.