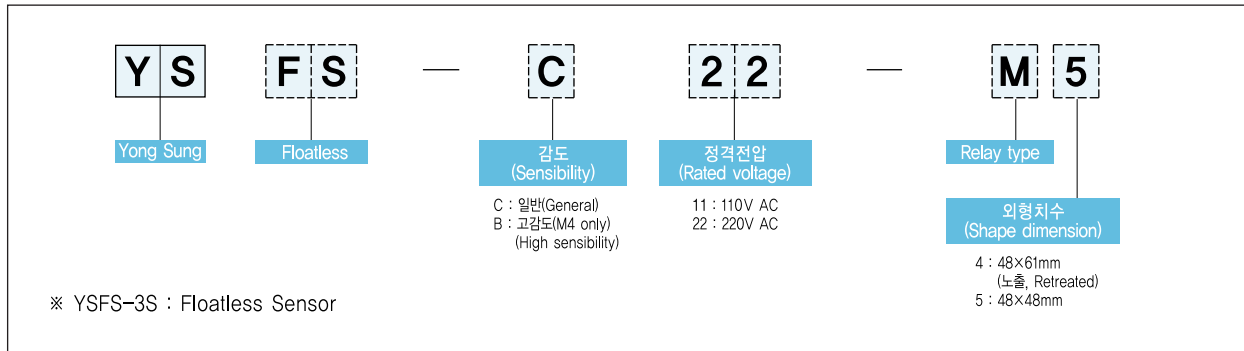


## 14-1

후로드레스  
Floatless

## 형식 구분도 | Type Classification Diagram |



## 특징 | Features |

- 소형이며 8PIN 소켓방식으로 공사보수점검이 용이합니다.
- 반도체 방식으로 수명이 반영구적입니다.
- 수위를 완전 자동조절하므로 관련된 기계의 고장을 방지합니다.
- With small and 8 Pin socket method, maintenance is easy.
- With semiconductor process, lifetime is semi-permanent.
- Completely automatic control of water level prevents breakdown of related machines.

## 성능 개요 | Performance Summary |

| 형식 (Type)                                             | 일반 (M4, M5)                                                                                           | 고감도 (M4)               |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------|------------------------|
| 정격전압 (Rated voltage)                                  | AC 110V, AC220V 50/60Hz                                                                               |                        |
| 허용전압변동범위 (Allowabl voltage variation range)           | 정격전압의 $\pm 10\%$ ( $\pm 10\%$ of rated voltage)                                                       |                        |
| 전극간전압(2차전압) (Voltage between electrodes(2nd voltage)) | AC 10V                                                                                                | AC 24V                 |
| 소비전력 (Power consumption)                              | 기술자료 20-2 참조 (Refer to Technical Data 20-2)                                                           |                        |
| 동작저항 (Operating resistance)                           | About 10K $\Omega$                                                                                    | About 25K $\Omega$     |
| 복귀저항 (Return resistance)                              | Less than 13K $\Omega$                                                                                | Less than 30K $\Omega$ |
| 사용주위온도 (Ambient temperature)                          | $-10^{\circ}\text{C} \sim +50^{\circ}\text{C}$                                                        |                        |
| 절연저항 (Insulation resistance)                          | 100M $\Omega$ 이하 (Below 100M $\Omega$ ) (DC 500V. Meg))                                               |                        |
| Relay 출력접점정격 (Relay output contact rated)             | AC 250V, 5A (저항부하 Resistive load)                                                                     |                        |
| Relay 수명 (Relay lifetime)                             | 전기적 (Electrical) : 50만 이상 (Above 500,000 times)<br>기계적 (Mechanical) : 300만 이상 (Above 3,000,000 times) |                        |
| 상대습도 (Relative humidity)                              | 45 ~ 85%                                                                                              |                        |

※ 전극봉 표면에 절연성 피막이 형성되면 동작불량의 원인이 됩니다. (Insulating film on surface of electrode bar causes malfunction.)

※ 전극고정 연결기(YS FS-3S)를 사용하여야 감지거리가 정확합니다.

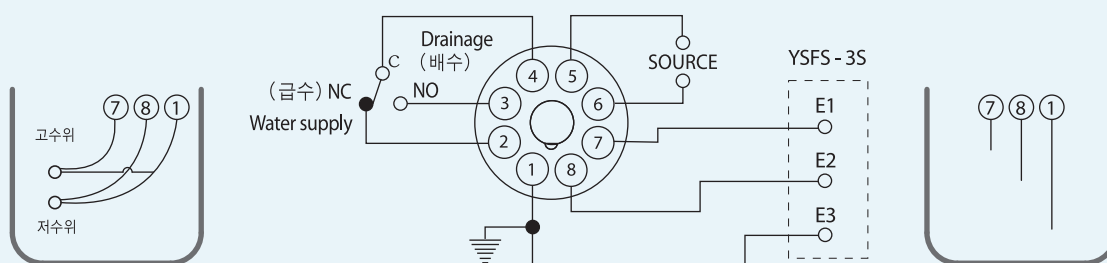
(Electrode fixing coupler(YS FS-3S) should be used in order to get the exact perceived distance.)

## 사용 방법 | How to Use |

- Relay Unit와 전극봉(Holder) 25KΩ 이상일시는 고감도를 채택하십시오.
- 물탱크에 전극봉을 설치하고 후로드레스 S/W(Relay Unit)는 Panel에 설치하여 Magnet S/W와 연결합니다.
- Magnet S/W는 Pump Motor용량에 맞추어 선정하면 됩니다.
- 전극봉은 스테인레스봉이나 황동봉을 사용하며 4~5Ø가 적합합니다.
- 전극봉의 길이는 상한, 하한위치를 선정하여 설정하십시오.
- When Relay Unit and electrode holder is above 25KΩ, select high sensitivity.
- Install electrode holder to water tank and Floatless Switch (Relay Unit) to panel respectively, and then connect to magnet switch.
- Select Magnet Switch according to pump motor capacity.
- Use stainless or brass rod and 4~5Ø is suitable.
- As to the length of electrode bar, select max. and min. limits and set it.

## 접속 회로도 | Connection Diagram |

YS FS-C22-M5/M4



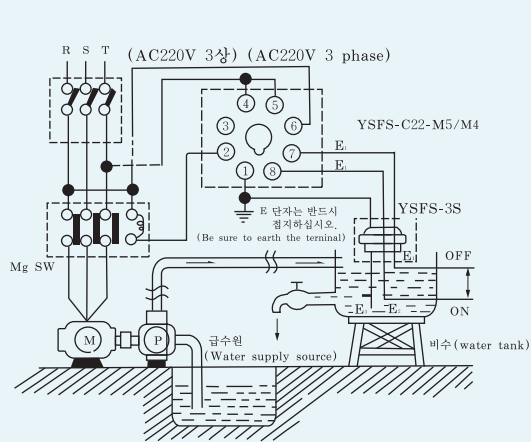
※ 오투기와 전극봉의 결선시 좌,우 같이 사용할 수 있습니다.

(During wiring tumbler to electrode pole, be able to use both the right and the left.)

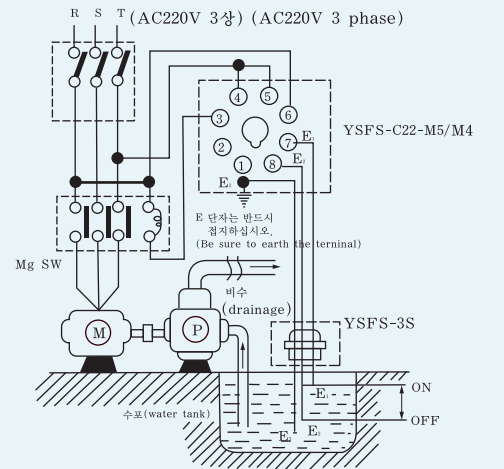
14

후로  
드레스

## 접속도 | Connection Diagram |



급수인 경우 사용예 (Using example in water supply)



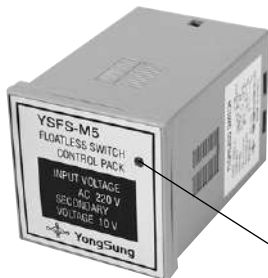
배수인 경우 사용예 (Using example in water drainage)

## 외형 / 치수도 | Shape / Dimension Drawing |

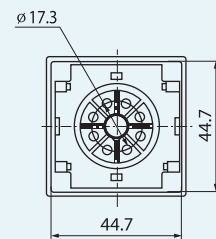
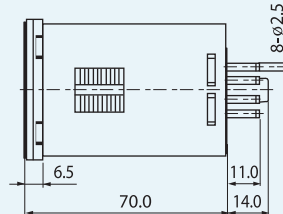
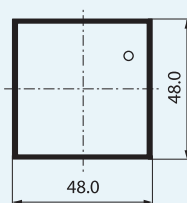
(unit : mm)

## M5 Type

※ 적용 소켓 (Applied socket) : YS SK08-F



배수 (급수) (Water supply (Drainage))

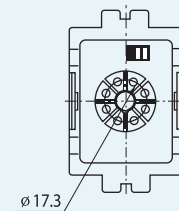
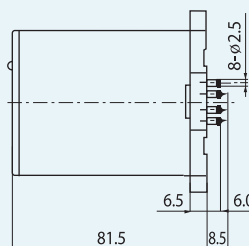
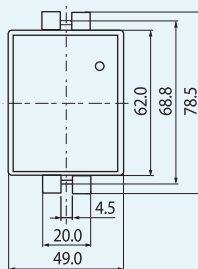


## M4 Type

※ 적용 소켓 (Applied socket) : YS SK08-M

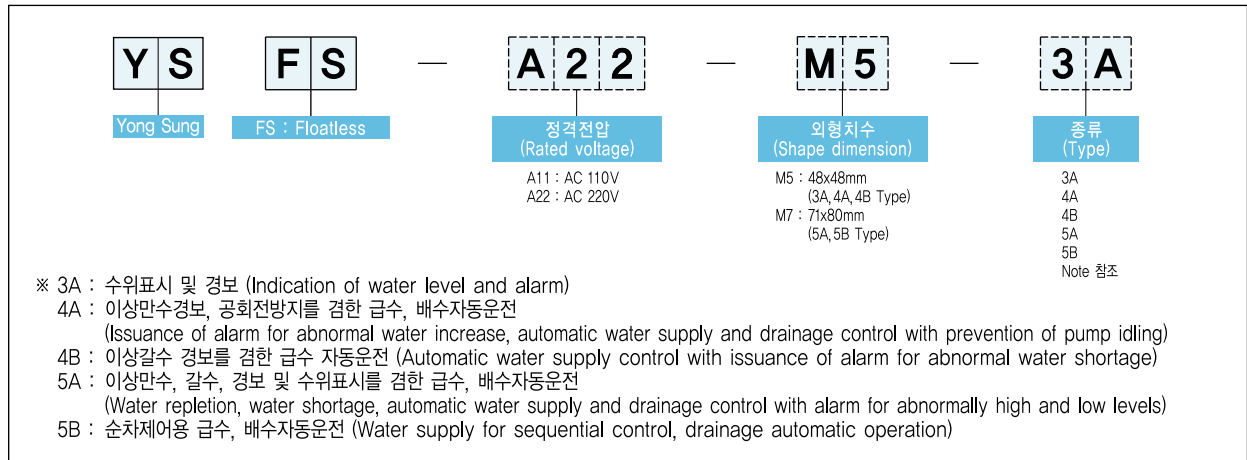


배수 (급수) (Water supply (Drainage))





## 형식 구분도 | Type Classification Diagram |



## 특징 | Features |

- 11P 소켓방식(3A,4A,4B), 14P 소켓방식(5A,5B) 사용으로 보수점검 용이
- 소형으로 제작하여 설치 용이
- 공회전 방지 및 배수 및 급수 자동 운전
- 배수/급수/경보 램프 표시
- Using 11Pin socket type (3A,4A,4B), and 14 Pin socket type (5A,5B), therefore, easy to repair and maintain.
- Manufactured in small size therefore, easy to install.
- Prevention of idling and Automatic operation for water supply and drainage.
- Indicating lamps for water drainage/water supply/alarm.

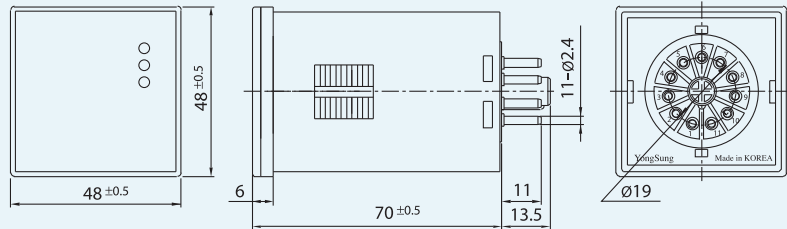
## 성능 개요 | Performance Summary |

| 형 식 (Type)                                  |                                 | FS-3A                                 | FS-4A | FS-4B | FS-5A                  | FS-5B |
|---------------------------------------------|---------------------------------|---------------------------------------|-------|-------|------------------------|-------|
| 정격전압 (Rated voltage)                        |                                 | AC110V, AC220V 50/60Hz                |       |       |                        |       |
| 허용전압변동범위 (Allowable voltage variable range) |                                 | 정격전압의 ±10% (Rated voltage ±10%)       |       |       |                        |       |
| 전극간전압(2차전압) (Voltage between electrodes)    |                                 | AC10V                                 |       |       |                        |       |
| 동작저항 (Operating resistance)                 |                                 | 10kΩ                                  |       |       |                        |       |
| 복귀저항 (Returning resistance)                 |                                 | 15kΩ                                  |       |       |                        |       |
| 최대감지거리 (Max sense distance)                 |                                 | Below 400m                            |       |       |                        |       |
| 소비전력 (Power consumption)                    |                                 | 2.2VA 이하 (Below 2.2VA)                |       |       | 5.5VA 이하 (Below 5.5VA) |       |
| 릴레이 출력접점정격 (Relay output contact rated)     |                                 | AC250V 5A (저항부하 Resistive load)       |       |       |                        |       |
| 내전압<br>(Withstand voltage)                  | 전기회로대지 (Electric circuit earth) | AC2,000V/min                          |       |       |                        |       |
|                                             | 독립회로상호간 (Between each circuits) | AC1,500V/min                          |       |       |                        |       |
| 절연저항 (Insulation resistance)                |                                 | 100MΩ 이상 (Above 100MΩ) (DC 500V. Meg) |       |       |                        |       |
| 사용주위온도 (Ambient temperature)                |                                 | -10℃ ~ 55℃                            |       |       |                        |       |
| 허용주위습도 (Ambient humidity)                   |                                 | 45 ~ 80%                              |       |       |                        |       |
| 취부형태 (Mounting)                             |                                 | Socket YS SK11                        |       |       | Socket YS SK14-K       |       |

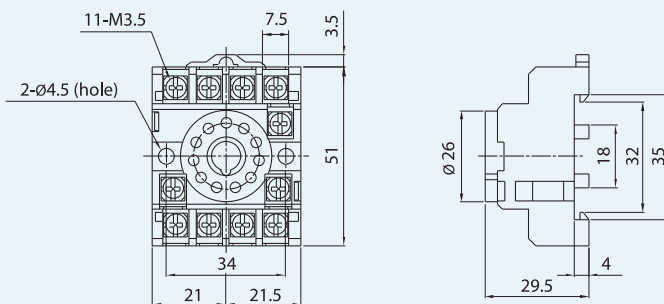
## 외형 / 치수도 | Shape / Dimension Drawing |

(unit : mm)

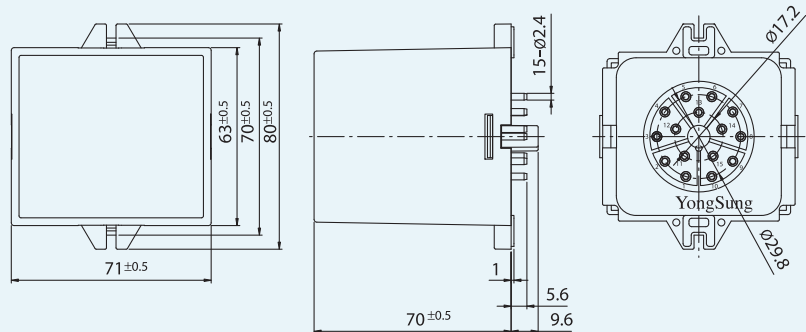
FS - 3A / 4A / 4B



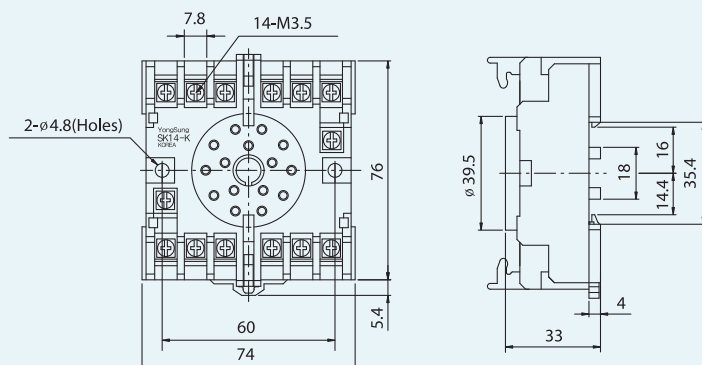
적용소켓(Applied Socket) : YS SK11



FS - 5A / 5B



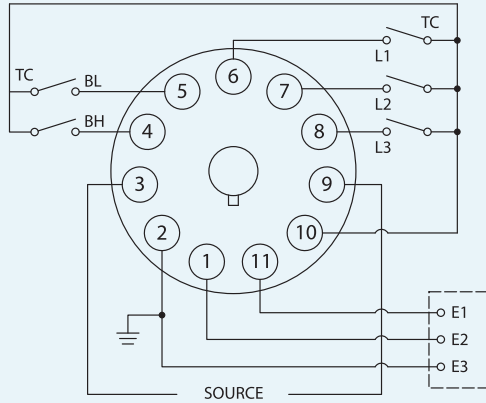
적용소켓(Applied Socket) : YS SK14-K



접속도 / 동작상태 | Connection Diagram / Operating state |

· YS FS-3A : 수위표시 및 경보 (Indication of water level and alarm)

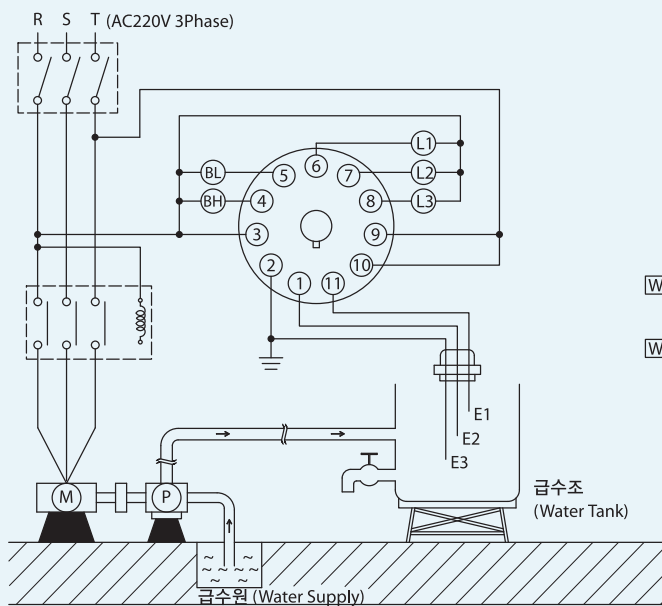
▶ 접속도 (Connection diagram)



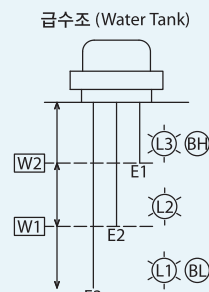
▶ 단자용어 (Terminal terms)

- 1 : E2
- 2 : E3
- 3 : 0V
- 4 : BH(고수위경보) (High-water level alarm)
- 5 : BL(저수위경보) (Low-water level alarm)
- 6 : L1(하한램프) (Lower limit indicator lamp)
- 7 : L2(중간램프) (Middle lamp)
- 8 : L3(상한램프) (Upper limit indicator lamp)
- 9 : AC220V
- 10 : Tc(COM) (Common)
- 11 : E1

▶ 결선도 (Connection wiring diagram) – 급수 시 (When water is supplied)



[ LED indicator ]



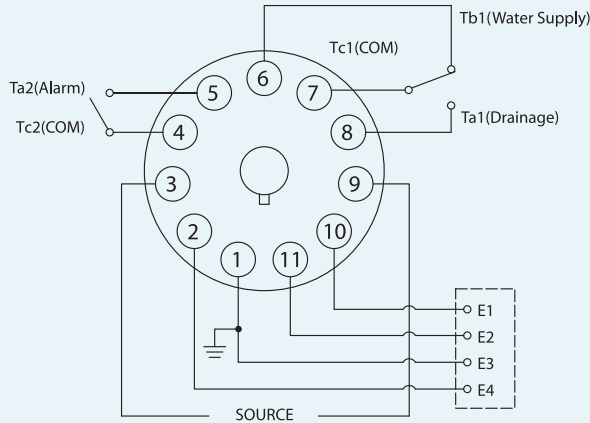
|   |   |   |   | P        | H  | L  |
|---|---|---|---|----------|----|----|
|   |   |   |   | POWER ON | W1 | W2 |
| P | O | O | O | O        | O  | O  |
| H | X | X | O | X        | X  | O  |
| L | X | O | O | X        | O  | O  |

▶ 동작 (Operating) – 급수 시 (When water is supplied)

- 수면이 E2 이하이면 하한램프 지시 및 저수위 경보가 발신을 합니다.  
(When the water level drops below E2, the lower limit indicator lamp lights and an alarm is sounded.)
- 수면이 E2에 도달하면 저수위 경보는 꺼지고 중간 램프가 켜집니다.  
(When the level reaches E2, the alarm stops and the middle lamp lights.)
- 수면이 E1에 도달하면 상한램프 지시 및 고수위 경보가 발신을 합니다.  
(When the water level reaches E1, the upper limit indicator lamp lights and an alarm is sounded.)

- **YS FS-4A** : 이상만수 경보, 공회전 방지를 겸한 급수, 배수자동운전  
(Alarm for water overflow, automatic water supply and drainage control with prevention of pump idling)

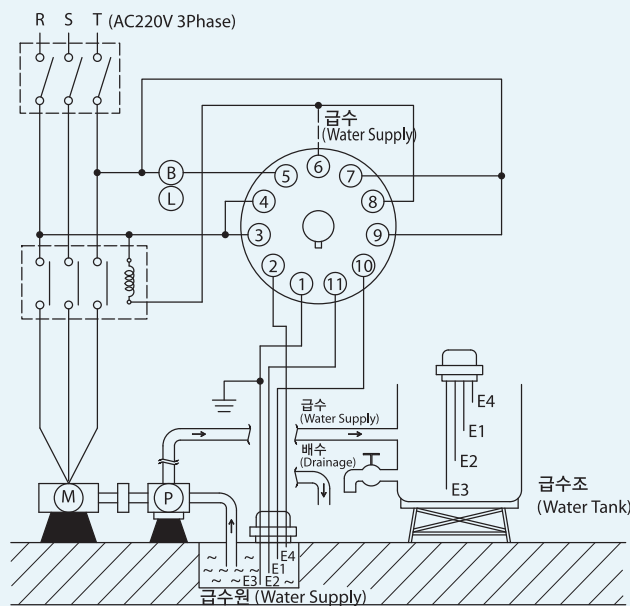
▶ 접속도 (Connection diagram)



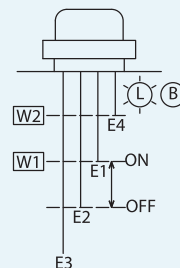
▶ 단자용어 (Terminal terms)

- 1 : E3
- 2 : E4
- 3 : 0V
- 4 : Tc2(만수램프/경보 COM)
- 5 : Ta2(만수램프/경보)
- 6 : Tb1(급수) (Water supply)
- 7 : Tc1(급수/배수 COM)  
(Water supply/Drainage common)
- 8 : Ta1(배수) (Drainage)
- 9 : AC220V
- 10 : E1
- 11 : E2

▶ 결선도 (Connection wiring diagram) - 배수 시 (Drainage)



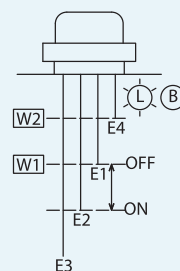
배수시 (Drainage)



[ LED indicator ]

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

급수시 (Water Tank)



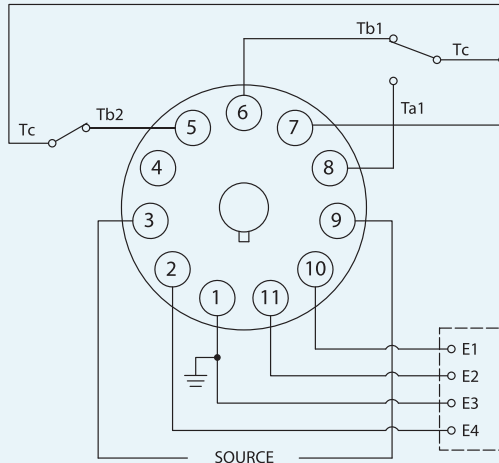
|   | POWER ON | W1 | W2 |
|---|----------|----|----|
| P | O        | O  | O  |
| W | X        | X  | O  |
| E | X        | O  | O  |

▶ 동작 (Operating) - 배수 시 (Drainage)

- 수면이 E1에 도달하면 펌프가 시동합니다. (급수 시 : 펌프정지)  
(The pump operates when water level reaches E1. (When water supplied : Pump stops))
- 수면이 E2 이하가 되면 펌프는 정지합니다. (급수 시 : 펌프시동)  
(The pump stops when water level is under E2. (When water supplied : Pump operates))
- 수면이 E4에 도달하면 경보음(표시램프)이 발생합니다.  
(Alarming(indicating lamp)when water level reaches E4.)
- 급수인 경우 Ta1단자를 Tb1단자로 전환시켜 주세요.  
(When the water is supplied from the water supply source, change the terminal Ta1 into Tb1.)
- E3 단자는 반드시 접지시켜 주세요.  
(Be sure to ground terminal E3.)

- **YS FS-4B** : 이상갈수 경보를 겸한 급수 자동운전  
(Automatic water supply control with alarm for abnormal water shortage)

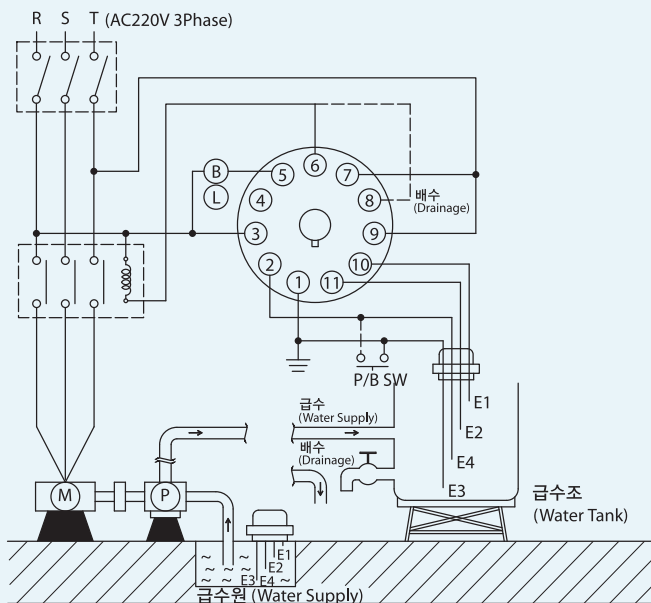
▶ 접속도 (Connection diagram)



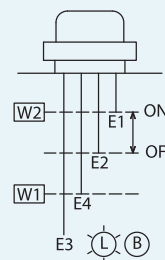
▶ 단자용어 (Terminal terms)

- 1 : E3
- 2 : E4
- 3 : 0V
- 4 : -
- 5 : Tb2(갈수경보)  
(Alarm for abnormal water shortage)
- 6 : Tb1(급수) (Water supply)
- 7 : Tc(급수/배수 COM)  
(Water supply/Drainage common)
- 8 : Ta1(배수) (Drainage)
- 9 : AC220V
- 10 : E1
- 11 : E2

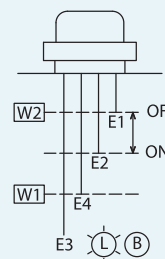
▶ 결선도 (Connection wiring diagram) – 급수 시 (When water is supplied)



배수시 (Drainage)



급수시 (Water Tank)



[ LED indicator ]

|  |     |
|--|-----|
|  | ○ P |
|  | ○ W |
|  | ○ E |

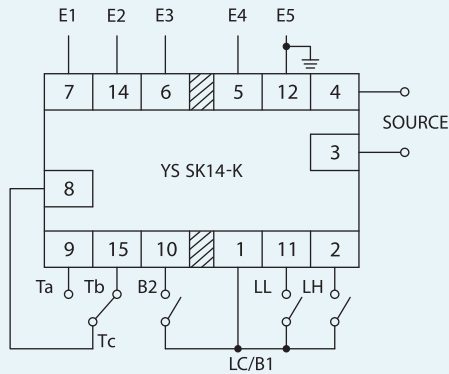
|   | POWER ON | W1 | W2 |
|---|----------|----|----|
| P | O        | O  | O  |
| W | X        | O  | O  |
| E | X        | X  | O  |

▶ 동작 (Operating) – 급수 시 (When water is supplied)

- 수면이 E1에 도달하면 펌프는 정지합니다. (배수시 : 펌프시동)  
(The pump stops when water level reaches E1. (When water drained : pump operates))
- 수면이 E2 이하가 되면 펌프는 시동합니다. (배수시 : 펌프정지)  
(The pump operates when water level is under E2. (When water drained : pump stops))
- 수면이 E4 이하가 되면 경보음(표시램프)이 발생합니다. (Alarming(indicating lamp) when water level is under E4.)
- 시동 및 정전복귀 시 수면이 E4에 도달하지 않는 경우 누름 S/W 를 눌러 E4에 도달할 때까지 눌러주세요.  
(If water level has not yet reached E4, When turning on or after recovery from power failure, keep depressing the pushbutton switch until it reaches E4.)
- 배수인 경우 Tb1단자를 Ta1단자로 전환시켜 주세요. (For the water drainage, change terminal Tb1 into Ta1.)
- E3 단자는 반드시 접지시켜 주세요. (Be sure to ground terminal E3.)

- **YS FS-5A** : 이상만수 경보, 갈수, 경보 및 수위표시를 겸한 급수, 배수자동운전  
(Water supply and drainage automatic control with Alarm for water overflow & water shortage and water levels indicator)

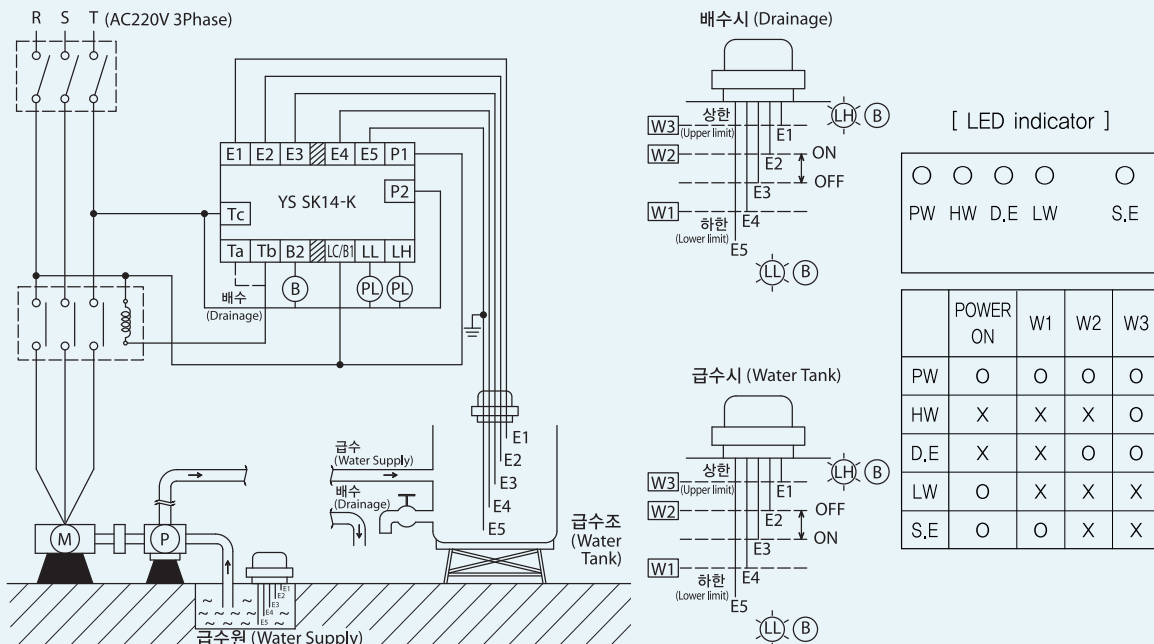
▶ 접속도 (Connection diagram)



▶ 단자용어 (Terminal terms)

- 1 : LC/B1(램프/경보COM) (Lamp/Alarm common)
- 2 : LH(상한램프) (Upper limit lamp)
- 3 : 0V
- 4 : AC220V
- 5 : E4
- 6 : E3
- 7 : E1
- 8 : Tc(급수,배수 COM) (Water supply/Drainage common)
- 9 : Ta(배수) (Drainage)
- 10 : B2(경보) (Alarm)
- 11 : LL(하한램프) (Lower limit lamp)
- 12 : E5
- 14 : E2
- 15 : Tb(급수) (Water supply)

▶ 결선도 (Connection wiring diagram) – 급수 시 (When water is supplied)

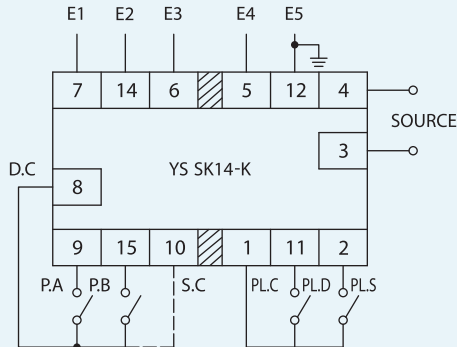


▶ 동작 (Operating) – 급수 시 (When water is supplied)

1. 수면이 E2에 도달하면 펌프는 정지합니다. (배수시 : 펌프시동)  
(The pump stops when water level reaches E2. (When water drained : pump operates))
2. 수면이 E3 이하가 되면 펌프는 시동합니다. (배수시 : 펌프정지)  
(The pump operates when water level is under E3. (When water drained : pump stops))
3. 사고로 수면이 E1 까지 도달하면 상한램프가 켜지고 E4 이하가 되면 하한램프가 켜져 각각 경보를 울립니다.  
(Alarm for abnormally hight and low levels : When the liquid level reaches E1, the upper limit indicator lamp lights and an alarm is sounded. When the liquid level drops under E4, the lower limit indicator lamp lights and an alarm is sounded.)
4. 배수인 경우 Tb 단자를 Ta 단자로 전환시켜 주세요. (For water drainage, change terminal Tb into Ta.)
5. E5 단자는 반드시 접지시켜 주세요. (Be sure to ground terminal E5.)

· YS FS-5B : 순차제어용 (Sequential control)

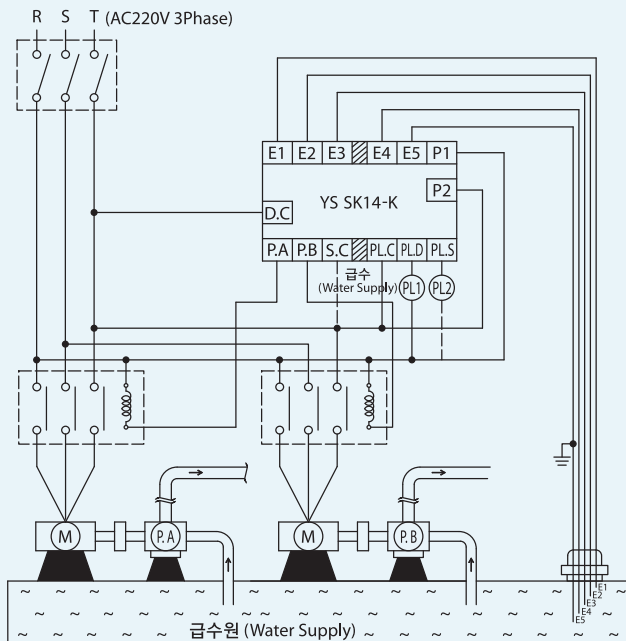
▶ 접속도 (Connection diagram)



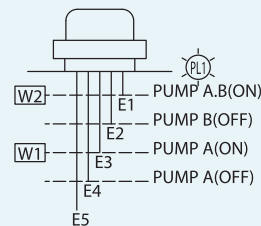
▶ 단자용어 (Terminal terms)

- 1 : P.L.C(램프 COM) (Lamp common)
- 2 : P.L.S(급수램프) (Water supply lamp)
- 3 : 0V
- 4 : AC220V
- 5 : E4
- 6 : E3
- 7 : E1
- 8 : D.C(배수 COM) (Drainage common)
- 9 : P.A(펌프 A) (Pump A)
- 10 : S.C(급수 COM) (Water supply common)
- 11 : P.L.D(배수램프) (Drainage lamp)
- 12 : E5
- 14 : E2
- 15 : P.B(펌프 B) (Pump B)

▶ 결선도 (Connection wiring diagram) – 배수 시 (Drainage)



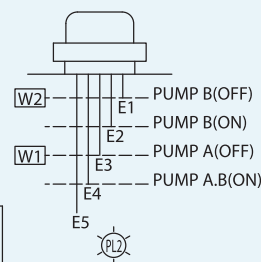
배수시 (Drainage)



[ LED indicator ]

|    |     |     |     |     |
|----|-----|-----|-----|-----|
| ○  | ○   | ○   | ○   | ○   |
| PW | D,A | D,B | S,A | S,B |

급수시 (Water Tank)



|     | POWER ON | W1 | W2 |
|-----|----------|----|----|
| PW  | O        | O  | O  |
| D,A | X        | O  | O  |
| D,B | X        | X  | O  |
| S,A | O        | X  | X  |
| S,B | O        | O  | X  |

▶ 동작 (Operating) – 배수 시 (Drainage)

- 수면이 E3에 도달하면 펌프 A가 시동합니다. (급수시 : 펌프 A 정지)  
(The pump A operates when water level reaches E3. (When water supplied : Pump A stops))
- 수면이 E1에 도달하면 펌프 A,B가 시동하고 PL1 램프가 켜집니다.(급수시 : 펌프 A , B 정지)  
(The pump A and B operate and PL1 lamp turns on when the water level reaches E1. (When water supplied : pump A and B stops))
- 수면이 E2 이하가 되면 펌프 B가 정지, 펌프 A 만 동작하고 PL1 램프는 꺼집니다.  
(When the water lever is under E2, pump B stops and only pump A operates and PL1 lamp turns off.)
- 수면이 E4 이하로 내려가면 펌프 A도 정지하고 PL2 램프가 켜집니다. (급수시 : 펌프 A , B 시동, PL2 램프 켜짐)  
(When the water level is under E4, pump A also stops and PL2 lamp turns on.  
(When water supplied : Pump A and B operate and PL2 lamp turns on))
- 급수인 경우 D.C단자를 S.C단자로 전환시켜 주세요. (For water supply, change terminal D.C into S.C)
- E5 단자는 반드시 접지시켜 주세요. (Be sure to ground terminal E5.)

## 사용시 주의사항 | Remarks in Use |

1. 동작전원은 정격사양에 맞도록 사용하여 주십시오.  
정격사양 이상 또는 이하 시에는 고장 및 오동작 원인이 될 수 있으므로 사용을 피하여 주십시오.
  2. 단자결선은 접속도에 따라 바르게 연결하여 주십시오.
  3. 전원스위치를 OFF 한 후 후로드레스 전원단자 간에 유도전압, 잔류전압이 인가되지 않도록 주의하여 주십시오.
  4. 전원전압은 허용범동범위 내에서 사용하여 주십시오.
  5. 전원전압은 스위치, 릴레이 등의 접점을 사용하여 단번에 인가하도록 하여 주십시오.  
서서히 전원을 인가하면 오동작 할 수 있습니다.
  6. 릴레이접점 부하는 정격 부하용량 이하로 사용하여 주십시오.
  7. 다음과 같은 장소에서는 사용을 피하여 주십시오.
    - 온도 또는 습도의 정격을 벗어나는 장소
    - 온도변화에 의하여 결로현상이 발생하는 장소
    - 먼지나 기름이 많은 장소
    - 강 알칼리, 강 산성 물질을 사용하는 장소
    - 직사광선이 쬐이는 장소
    - 강한 자기력이나 전기적인 노이즈가 발생하는 기기의 근접 장소
1. Please use the operating power according to the rating specification.  
When the power is below or over the rating specification, please don't use the device in order to avoid any possible malfunction or error.
  2. Please wire contacts according to the Wiring Connection Drawing.
  3. After turning off the power, please prevent induced voltage and residual voltage from getting into the power terminals.
  4. Power supply voltage should be used within the allowable range.
  5. Please connect the power supply voltage at once by using switches, relays etc.  
When the power is connected gradually, it can cause malfunction.
  6. The contact load should be less than the rating load capacity.
  7. Please avoid using the Floatless in the following places.
    - Places where the temperature and the humidity are out of the permissible range.
    - Places where there is dew condensation from changing temperature.
    - Places that contain much dust or oil.
    - Places where strong alkalinity and acidity are used.
    - Places exposed to direct sunlight.
    - Places where equipments are making strong magnetism and electric noise.