

Watertight Door Indication Panel User Manual

KOMECO

KOMECO는 항상 고객 만족을 위해 최선을 다하고 있습니다.

KOMECO is always doing its best to realize customer satisfaction.

Zip code 46059, 1554, Bansong-ro, Gijang-eup, Gihang-gun, Busan, Korea

TEL: (051)724-5070

FAX: (051) 724-5175

Home page: www.komeco.net

Content

Introduction	-----	1
Specification	-----	2
Production Composition	-----	3
Type	-----	5
Basic Function Test	-----	6
Flow Diagram	-----	7
Function Test Flow Chart	-----	8
Power Source Test Flow Chart	-----	9
Proximity Switch	-----	10
Sensor, SSR Structure & Connection Diagram	-----	11
Watertight Door Indication Panel Connection to Yard	-----	12
Troubleshooting	-----	14

Introduction

This product is a system that indicates the state of Watertight Door(open, close) visually (LED) and auditorily(Buzzer) during vessel voyage or porting. The system informs the state of Watertight Door in accordance with the setting of Sensor by putting out contacts on Local Indication BOX and VDR(Voyage Data Record).

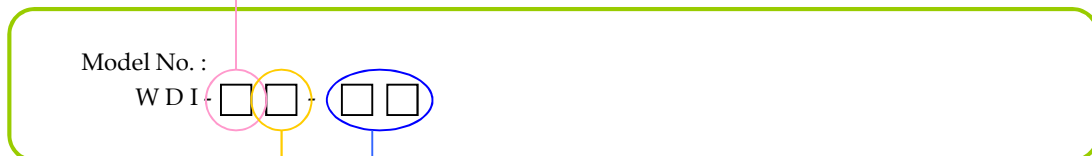
Where to Attach Panel : Control Console in Wheel House(W/H) Room(Bridge Room)



Specification

ITEM		MODEL NAME	WDI - DI - 23 WDI - DS -23
POWER SUPPLY		AC220V(AC110V)	
DISPLAY METHOD		WATERTIGHT DOOR CLOSE - GREEN LED	
		WATERTIGHT DOOR OPEN - RED LED	
ALARM		BUZZER(VOYAGE : DOOR OPEN)	
POWER CONSUMPTION		37.4W(170mA, AC220V)	
INPUT	PROXIMITY SWITCH	SSR(AC220V SIGNAL)	
OUTPUT	VDR	DRY CONTACT	
	LOCAL INDICATION PANEL	WATERTIGHT DOOR OPEN-AC220V	
OPERATING TEMPERATURE		-10℃ ~ +60℃	
STORAGE TEMPERATURE		-20℃ ~ +70℃	
DIMENSION	INTEGRATED TYPE	340(W) x 485(H) x 150(D) (unit:mm)	
	SEPERATED TYPE	200(W) x 300(H) x 100(D) (unit:mm)	
WEIGHT	INTEGRATED TYPE		14.55kg
	SEPARATED TYPE	FRONT CASE	3.55kg
		MIDDLE PLATE	6.15 kg

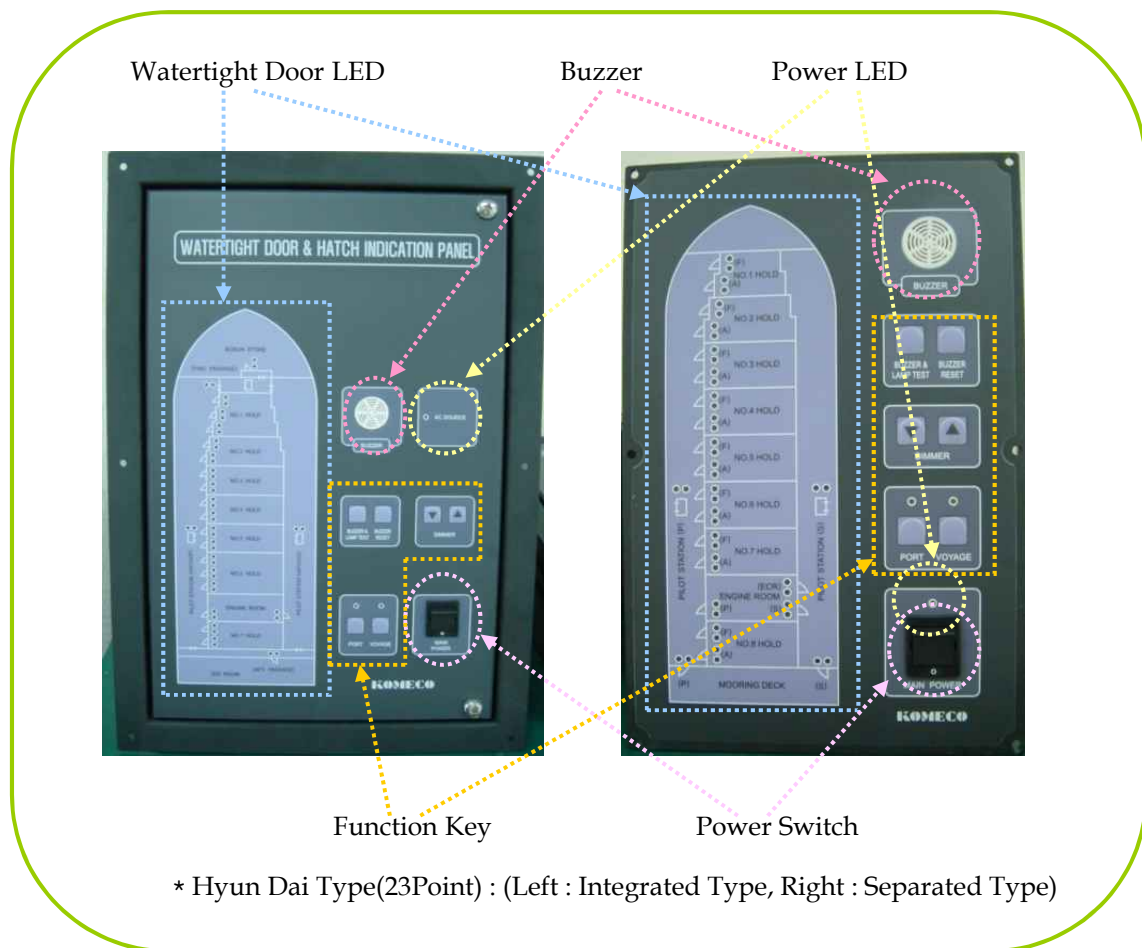
D : Hyun Dai, J : Han Jin



Sensor Input Channel No.

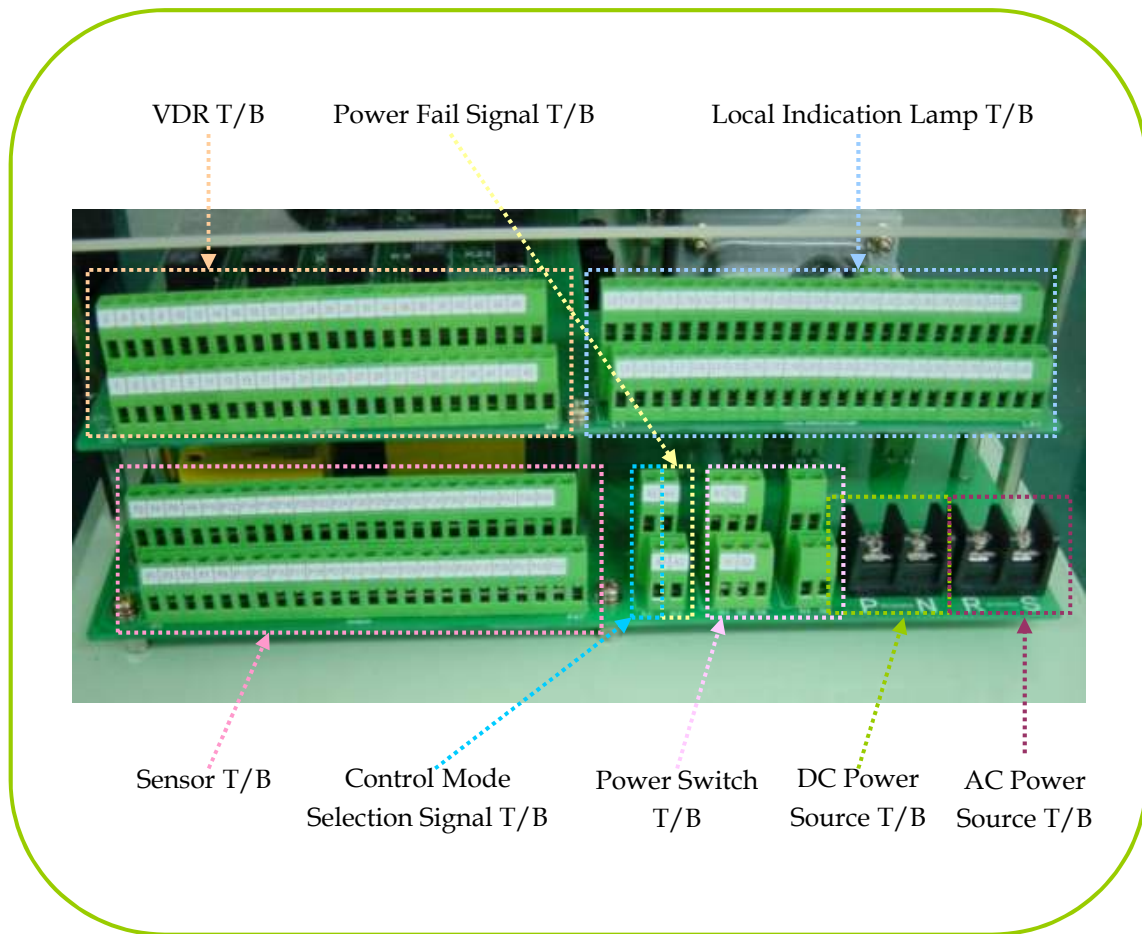
I : Integrated Type, S : Separated Type

Production Composition 1



- ① Watertight Door LED : LED that indicates the state of Watertight Door
 [Close : Green LED, Open : Red LED
 → Changeable at each PJT. (Contact System Development Team or Research Development Team)]
- ② Buzzer : Generate an alarm when Watertight Door opens (during vessel voyage)
- ③ Power LED : Indicate the state of Power Supply
- ④ Power Switch : Switch ON or OFF Power
- ⑤ Function Key :
 - * Dimmer - Adjust the brightness of LED
 - * Buzzer & Lamp Test - Check whether Buzzer and Lamp operate normally
 - * Port - Indicates the state of Port by way of LED
 - * Voyage - Indicates the state of Voyage by way of LED
 - * Buzzer Reset - Voyage : Sound off Buzzer , LED keeps lighting after flickering when Watertight Door opens.

Production Composition 2



- ① VDR T/B : Output contacts in accordance with the state of Watertight Door
(When Watertight Door closes : NC Contact)
- ② Local Indication Lamp T/B : Output signals on Local Indication Panel in accordance with the state of Watertight Door
(When Watertight Door opens : AC220V)
- ③ Sensor T/B : Input Sensor signals (When Watertight Door closes : AC220V)
- ④ Power Fail Signal T/B : Output NC Contact when Power is switched ON
- ⑤ Control Mode Selection Signal T/B : Output NC Contact at the time of porting
- ⑥ Power Switch T/B : Connect Power Source with Power Switch - Power ON/OFF
- ⑦ DC Power Source T/B : Supply DC Power Source
- ⑧ AC Power Source T/B : Supply AC Power Source

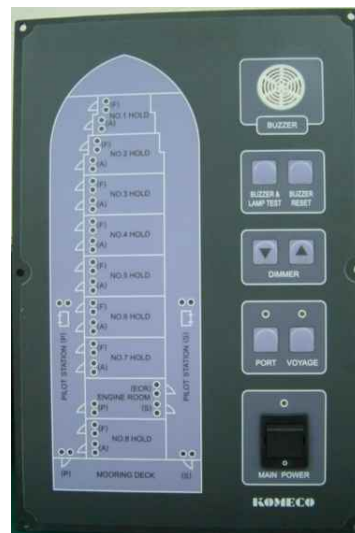
※ NC - Normal Close

1. Integrated Type : (Hyun Dai Type:23Point)



2. Separated Type : [Hyun Dai Type(23Point)

- Top : Front Case, Bottom : Middle Plate]



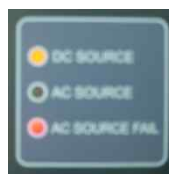
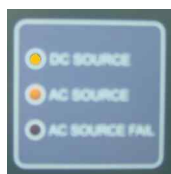
Basic Function Test

1. Power ON : AC Source LED ON (Hyun Dai Type - Left)

AC Source LED ON, DC Source LED ON (Han Jin Type - Middle)

Han Jin Type : AC Source OFF

→AC Source Fail LED ON (Flickering), Buzzer ON - Right



2. Pressing Buzzer & Lamp Test Key : All LED ON, Buzzer ON

(Left : Integrated Type, Right : Separated Type)



3. Pressing Port Key : Port LED ON (Left)

Pressing Voyage Key : Voyage LED ON (Right)

(This state maintains even if power is shut off again)



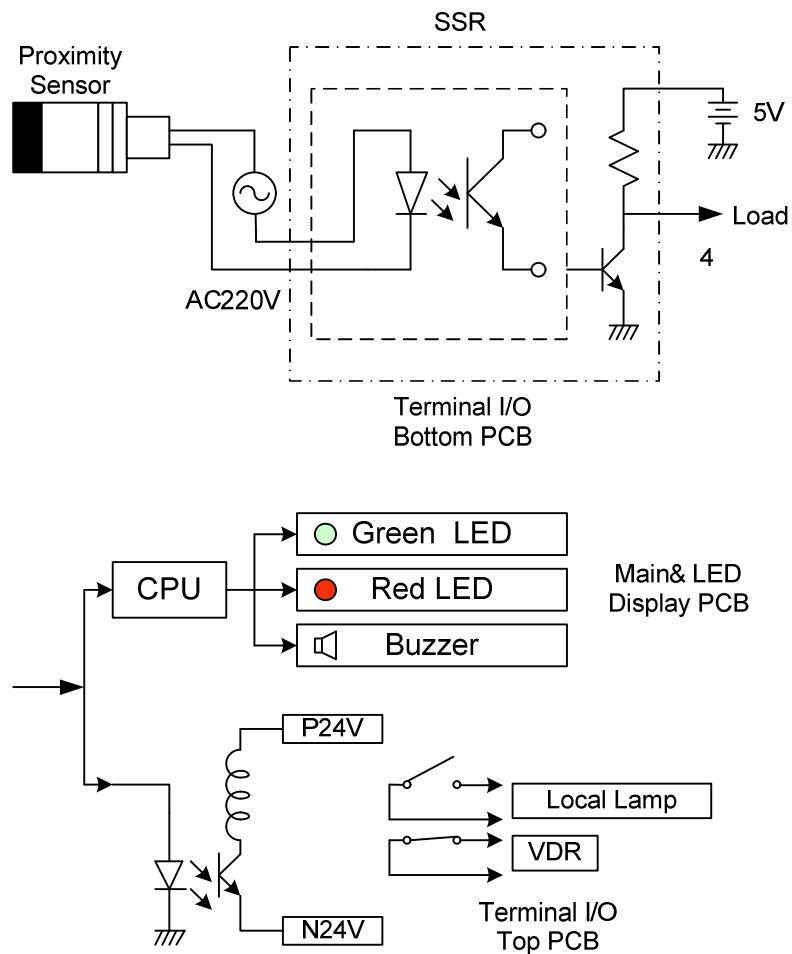
4. ▲ Pressing Dimmer Key : The brightness of LED improves

▼ Pressing Dimmer Key : The brightness of LED reduces

(In case that Red LED is lit on during vessel voyage, Dimmer does not work)

Flow Diagram

The Flow Diagram of Watertight Door Indication Panel



(1) In case that Sensor ON (When Watertight Door closes) :

- "0(0V)" is output on Terminal 4 in the part of load
 - "1(+5V)" is input CPU : Green LED ON
 - "0(0V)" is input Terminal I/O Top Board (Relay OFF)
- Relay Contact State : VDR-Close, Local Indication Panel - Open

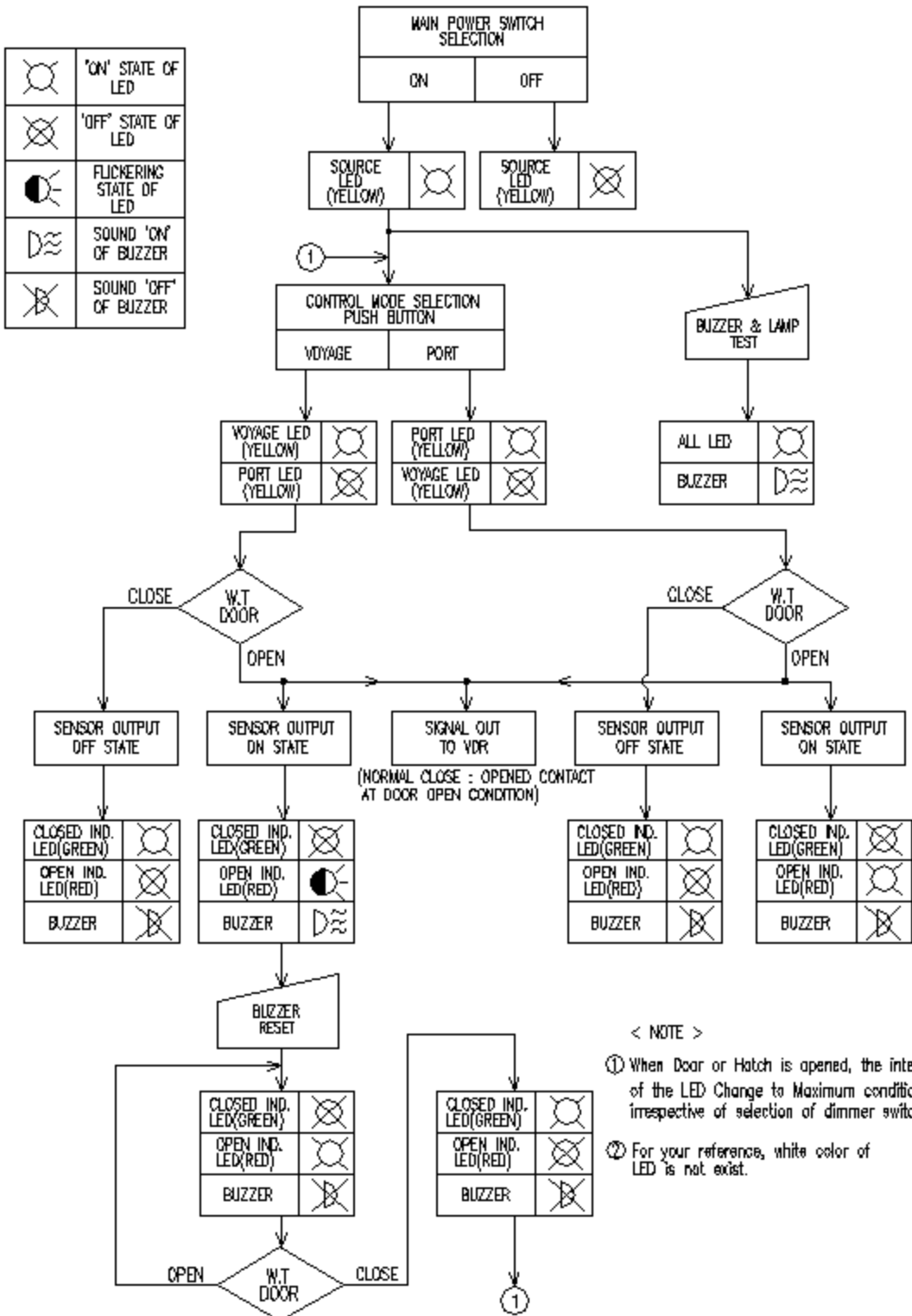
(2) Sensor OFF (Watertight Door opens) :

- "1(+5V)" is output on Terminal 4 in the part of load
 - "0(0V)" is input CPU : Both Red LED and Buzzer ON
 - "1(+5V)" is input Terminal I/O Top Board(Relay ON)
- Relay Contact State : VDR-Open, Local Indication Panel - Close

※ For details about operation tests, see the next chapter

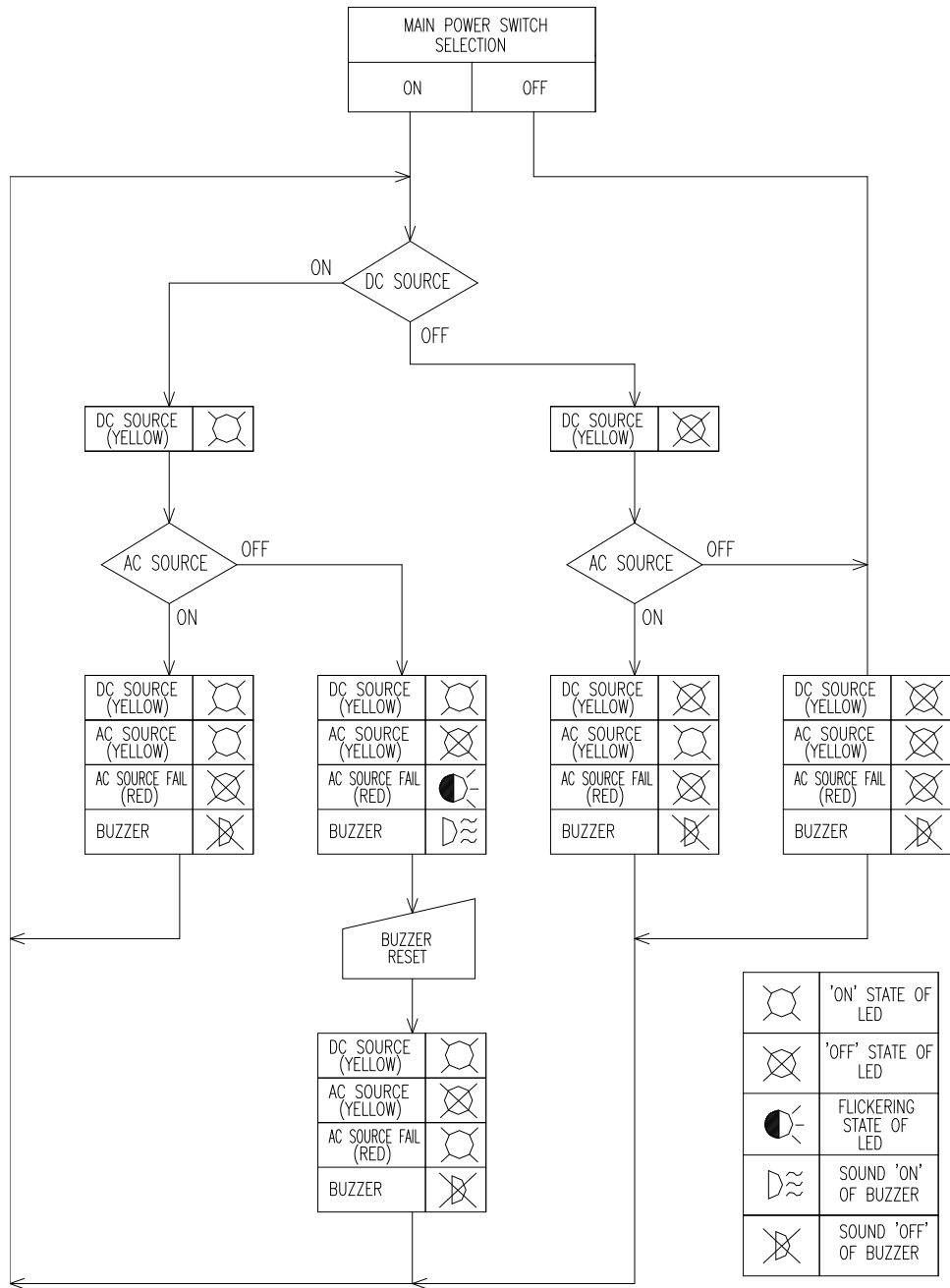
Function Test Flow Chart

Watertight Door Indication Panel Function Test Flow Chart :
 Test on step-by-step basis in accordance with Flow Chart



Power Source Test Flow Chart

Watertight Door Indication Panel Power Source Test Flow Chart :
 – In case of Han Jin Type, test on step-by-step basis in accordance with Flow Chart



Proximity Switch

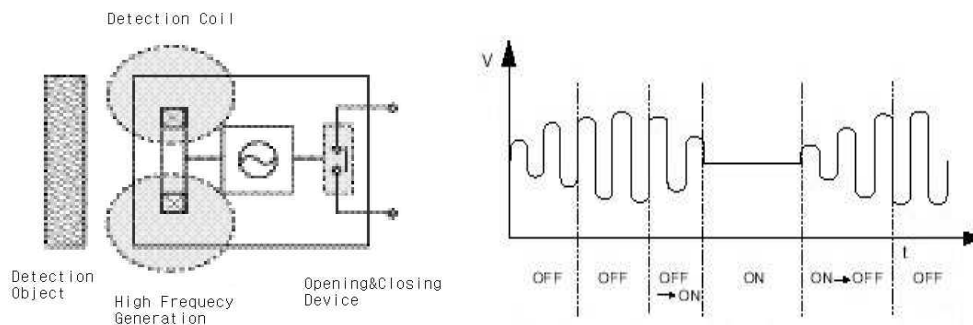
Proximity Switch :

This is a no-touch detector (detection switch) that can determine whether an object to be detected is near or not. It is different from Micro Switch or Limit Switch that relies on mechanical touch.

- Detection Type : High-Frequency Generation, Magnetic Field, Capacitance
- Model Name of Proximity Switch : PR12-4AO
- Detection Range : $4\text{mm} \pm 10\%$
- Peripheral Environment : High in humidity, Low in temperature
- IP67 : IEC Standard of Dust Prevention and Waterproof
- IP (International Protection) 6X : Protected against dust (totally)
- IPX7 : There's no water penetration even when the switch is put into water in a given pressure for a given time. Make the switch stay 1 meter below the water level for 30 minutes.

Principles of High-Frequency Generation Proximity Switch :

A high-frequency field is generated from detection coils of Proximity Switch. When the field is approached by an object to be detected, the phenomenon of electromagnetic induction makes an induction field float through the metal part of the switch. This may reduce or stop high-frequency generation from the switch. The switch detects such reduction or stoppage by using its detection circuit and thereon works its output circuit.



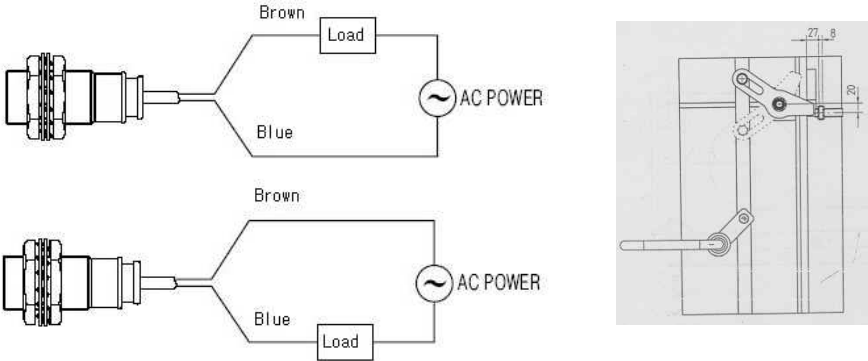
Characteristics :

- 1) No-Touch Detection : There's no risk of damage to an object to be detected or Proximity Switch.
- 2) High in Resistance to Environment : Clearly detectable even under bad environments, for example, the existence of grinding oil
- 3) Rapid in Response Time : With its high response frequency, the switch has a stable performance of detecting an object that moves at a high speed.
- 4) The switch has a long life : No-contact output → The switch has a long life

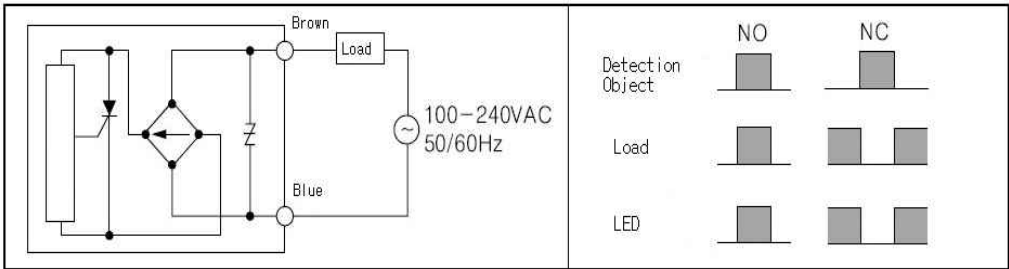
Sensor, SSR Structure & Connection Diagram

Proximity Switch Connection Diagram & Watertight Door Drawing :

The switch is AC 2-lines. The switch may be damaged if power is supplied without load connection. Therefore, the switch must be used under load connection

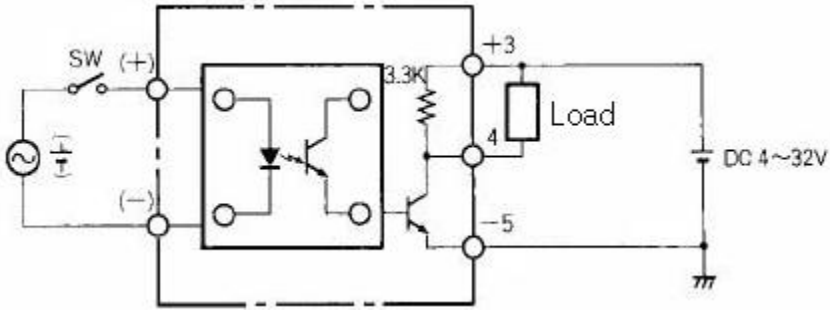


Internal Structure of Proximity Switch & Connection Diagram (PR12-4A0 : No Type)



Internal Structure of SSR & Connection Diagram : Isolated internally

- SW : Proximity Switch (Sensor)
- Terminal 4 in the part of load : Signals to CPU and Terminal I/O Top Board



Watertight Door Indication Panel Connection to Yard 1

Watertight Door Indication Panel Attached to Control Consol in Bridge Room



Proximity Switch(Sensor) Connected to Yard



Watertight Door Attached to Yard



Watertight Door Indication Panel Connection to Yard 2

Local Indication Box and Junction Box Connected to Yard



Proximity Switch, Local Indication Box and Junction Box Connected to Yard



Troubleshooting

Troubleshooting of Watertight Door Indication Panel :

Check whether all flat cables are properly connected to Socket

1. In case that AC Source LED does not work

- Check the state of the terminal of AC Power Source outside (CN2 on Terminal I/O Bottom Board)
- Check whether Power Switch operates normally. Check the state of F1 and F2 fuses
- Check whether there are any defects of CR1(LED) and R9
- Check whether there is any defect of Relay(K1)

2. In case that Red LED ON when Watertight Door closes

- Check whether 220V Signal is put into Sensor properly
- Check whether Sensor is defective or disconnected

3. In case that Buzzer does not work

- Check whether Buzzer lines are properly connected to Buzzer Connector(CN4)

4. In case that Function Key does not work

- Check whether U4(CPU) is properly connected to IC Socket
- Check whether U3(2803) normally operates when the key is pressed

5. In case that VDR and Local Indication Lamp do not work normally

- Check whether Terminal I/O Top Board is properly connected to Socket and whether Relay is defective

6. In case that Control Mode Selection Signal does not work normally

- Check whether K2(Relay) normally operates when Port Key is pressed (NC Contact operate at the time of porting.)

7. In case that Power Fail Signal does not operate normally.

- Check whether K1(Relay) operates normally (NC Contact operates when Power is switched on)

8. In case that LEDs do not normally operate when Watertight Door opens

- Check whether the part of No. 8255 is actually provided in Material Specifications(NEC).

※ Production Team : Shooting troubles related to production and assembly
Q. A Team : Making the feedback of A/S and troubleshooting results to Research Development - Those results will be analyzed and attached here