

TOUCH SCREEN TYPE WATER INGRESS DETECTION SYSTEM MARISAFE

TYPE WD-2003T



TOTAL CONTROL CO.

Marine Automation Control System & Electric System Repairs

General Description

Solas regulation XII/12 requires to install water level detection system for each cargo hold, fore peak tank and bosun store from 1st July 2004. In order to comply with Solas regulation, we have developed most suitable detectors and alarm control system. MARISAFE is a unique water ingress detection system for bulk carriers type approved in accordance with Solas chapter XII/12, IACS UR S24, IMO MSC, Res.145(77) and IACS UI SC 180. Marisafe comprises of main alarm panel and alarm control panel interfacing with intrinsically safe water level detectors installed in each compartment. The water level detectors are installed at a height of 0.5m above inner bottom and another at a height not less than 15% of the depth of the cargo hold but not more than 2.0m. In any ballast tank forward of the collision bulk head, the detector is installed at a height not exceeding 10% of the tank capacity. In any other dry or void space other than chain locker, any part of which extends forward of the foremost cargo hold and the volume of which exceeds 0.1% of the ship's maximum displacement volume, the detector is installed at a height of 0.1m above deck.

Features

- User friendly touch screen type TFT display unit with multi-window.
- Using programmable controller for alarm and monitoring
- Easy installation & maintenance
- Intrinsically safe
- Low cost
- Simplest system on market
- Available for any number of detecting point
- No damage by cargo

Major Functions

- Pre and main alarm
- Fault alarm for line monitoring
- Override/repose function
- Function Test for lamp/buzzer/external output
- Alarm time delay
- Automatic power changeover
- Power failure alarm
- Automatic cancellation of override condition
- Override indication
- Valve remote control and indication system for pumping system

Main Alarm Panel



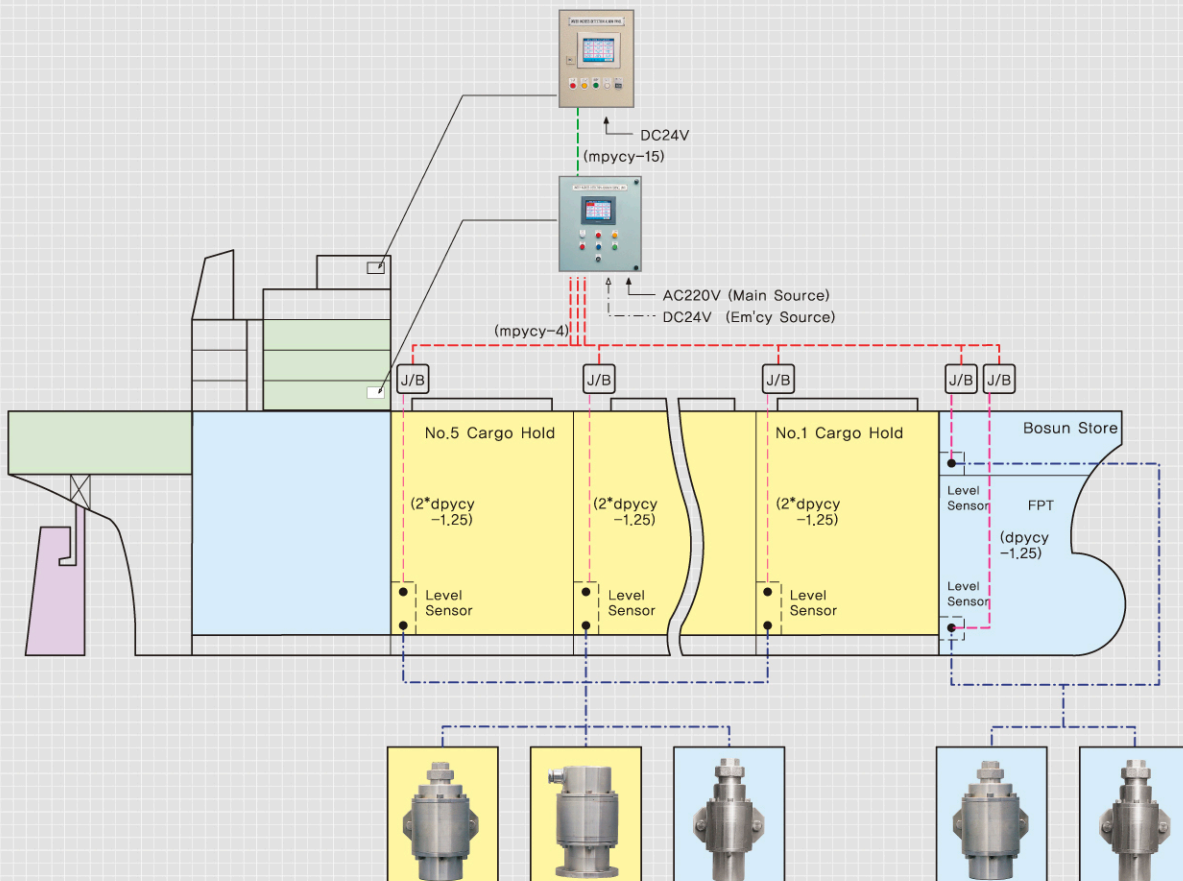
- Dimensions : 300 × 400 × 210mm
- Weight : 10kg
- Power Supply : DC24V
- Function
 - 3 Distinct Audible & Visual Alarm
 - Function Test (Lamp & Buzzer Test)
 - Alarm Reset
 - Override Device
 - Buzzer Stop
 - Flicker Stop

Marisafe Interface Unit



- Dimensions : 520 × 580 × 240 mm
- Weight : 35kg
- Ingress Detection : IP55
- Main Source : Selectable 110/220V 50/60Hz
- Emergency Source : 24VAC with auto changeover
- Power Consumption : 10W, 24VDC
- Options : Touch screen monitor
- Override Reinstatement : Automatic on de-ballasting cargo hold
- Audible Alarm : 3-Distinct tone for pre alarm, main alarm and fault alarm
- Alarm Time Delay : 3sec validity to switch outputs
- System Alarm Test : By function test button to test all visual & audible alarms and relay output

System Layout



Principle of Operation

1. Electrode Type Sensor

Two electrodes are installed inside of level sensor and when the depth of water at the sensor reaches the electrodes, low value A.C loop circuit between the two electrodes is built up. This low value A.C current is transmitted to the signal converter in sensor housing and signal converter amplifies A.C current and send converted signals to the I.S barrier in alarm panel. Finally I.S barrier generates isolated contact outputs and alarm annunciator adopt this isolated contact outputs.

2. Float Type Level Sensor

Reed switch type float level switch have a magnet built in the float and a reed switch set inside guide pipe. The contact of reed switch is changed according to the up and down of water levels. The changes of contact is transmitted to the alarm annunciator through the I.S. barrier.

3. Operation

When the depth of water at the sensor reaches the pre level sensor, audible and visual alarms on the main alarm panel & repeater alarm panel are activated. At this time, the indication identify the space. When the depth of water at the sensor reaches the main level sensor, audible and visual alarms are activated and indication identify the space but audible & visual alarms are not the same as that for pre level alarm. Acknowledgement on the unit causes the alarm lamp to remain lighted and will return to normal white when depth of water return to below the preset level.



4. Specification of Level Sensor

- Housing Material : SUS 316
- IP Rating : IP68 in accordance with IEC60529
- Cargo : All Bulk Cargoes
- Ambient Temp : $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$
- Press : 0 ~ 5 bar
- Weight : 7.5kg(TMS2000A) / 5kg(TMS2000B) / 3kg(TMS2000C)

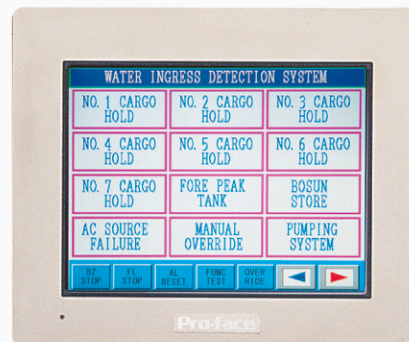


Operation

Touch Screen Alarm Monitor

The touch screen monitor consists of multi-window pages and each pages will show following informations.

- Status of individual cargo hold
- Buttons for buzzer stop, flicker stop, alarm reset, function test, override and buttons for next & previous page.



(fig.1)



(fig.2)

Main Page

Upon turning on the panel, the touch screen will show the main page(see fig.1).

When the pre level alarm, main level alarm, and fault alarm for each cargo hold are activated, red lamps for cargo holds on the main pages will flicker, common buzzer and external alarm relay will be activated. When the buzzer stop button is depressed, buzzer will be deactivated but alarm lamps are still flickering.

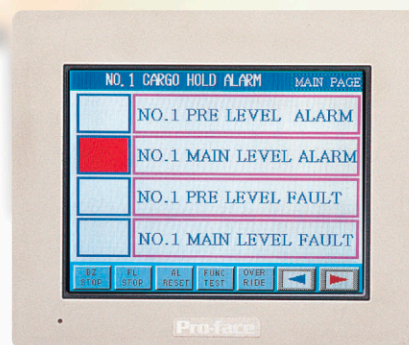
Individual alarm page for cargo hold

At this time, when alarm red lamps on the main page are depressed, the touch screen monitor will show the individual alarm pages for cargo holds(see fig.3) and this individual alarm pages show the location and status of level sensors.

On the individual alarm pages, alarm lamp is still flickering until the flicker stop button is depressed(see fig.3). When the flicker stop buttons on the individual alarm pages are depressed, alarm lamps will be remained lighted.

After the depth of water at the sensor has been returned to a level below the preset alarm level, when the alarm reset buttons on the each pages are depressed, alarm lamps will return to normal white(see fig.1).

When the buttons for previous and next page on the individual cargo hold alarm pages and main page are depressed, the touch screen will show the previous and next page.



(fig.3)



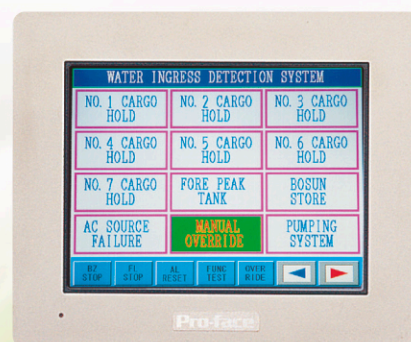
(fig.4)

Override Page

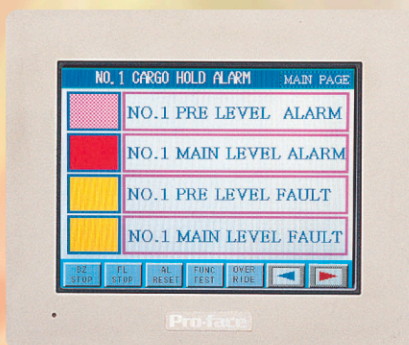
When the override buttons on the main page and individual cargo hold alarm pages(see fig.1,2) are depressed, the touch screen will show the override page(see fig.4). When the set buttons on the override page are depressed, selected override indication lamp will be changed from white to green and override indication lamp on the main page is also changed from white to green and the systems give a warning that level sensors are under override conditions (see fig 4,5).

When the reset buttons on the override pages are depressed manually, override indication lamps on the override page and main page will return to normal white from green.

Meanwhile, cancellation of override condition and reactivation of alarms are automatically carried out after hold or tank has been de-ballasted to a level below the lowest alarm indicator level.



(fig.5)



(fig.6)

Distinction of Visual Alarm Indicator

When pre level alarms, main level alarms and fault alarms are activated, individual cargo hold alarm pages will show alarm lamp of distinct color(see fig.6) as followings.

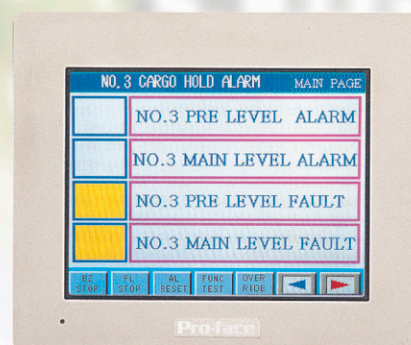
- Pre Level Alarm : Pink Color
- Main Level Alarm : Red Color
- Fault Alarm : Yellow Color

Fault Monitoring

A facility for monitoring of the fault detecting (open or short circuit) is also provided in the water ingress detection system.

When the system detects the fault, visual and audible alarms are activated.

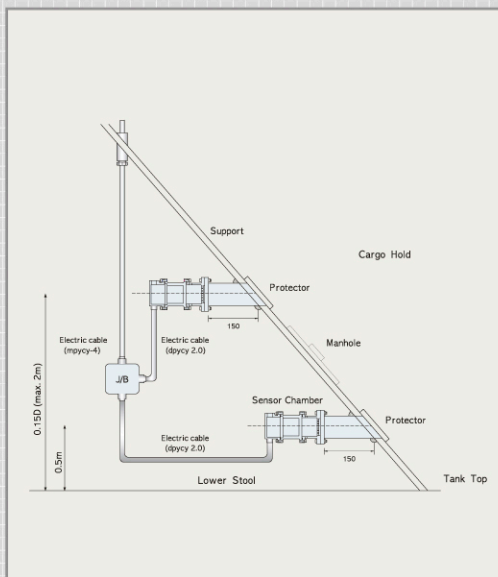
The audible alarm is capable of being muted but visual indication is remained lighted until the malfunction is cleared and audible alarm & visual alarm is not the same that for the pre level alarm & main level alarm.(see fig.7)



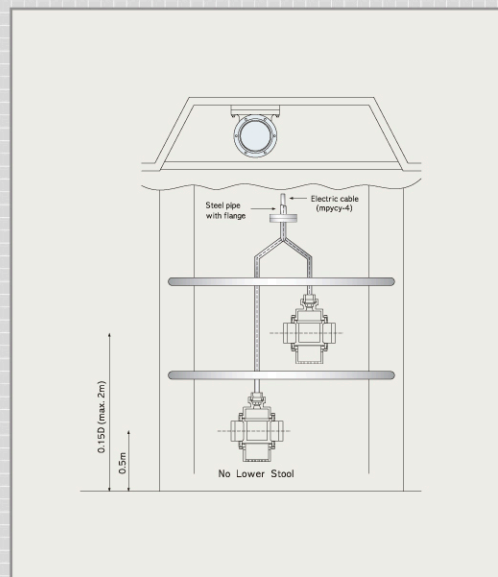
(fig.7)

Installation

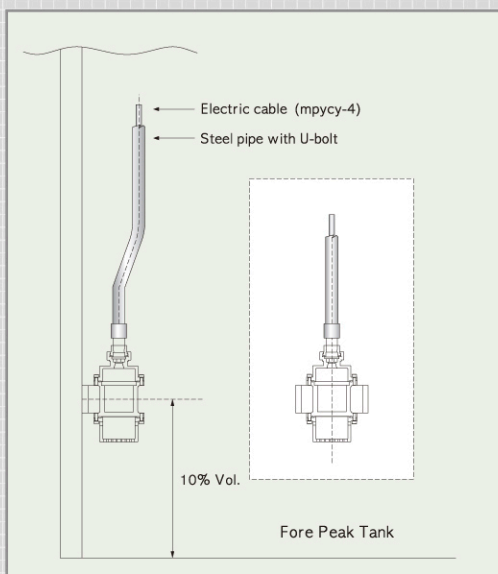
Installation jobs including hot works to be carried out by owner or shipyard and refer to additional installation manuals for details of installation. Hereunder describe brief diagrams for installation.



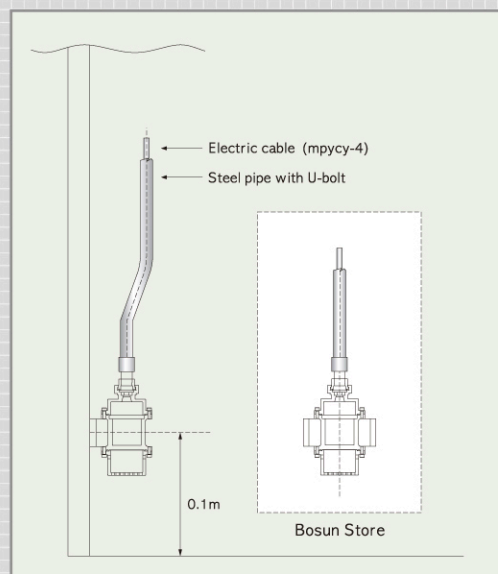
For Lower Stool



For No Lower Stool

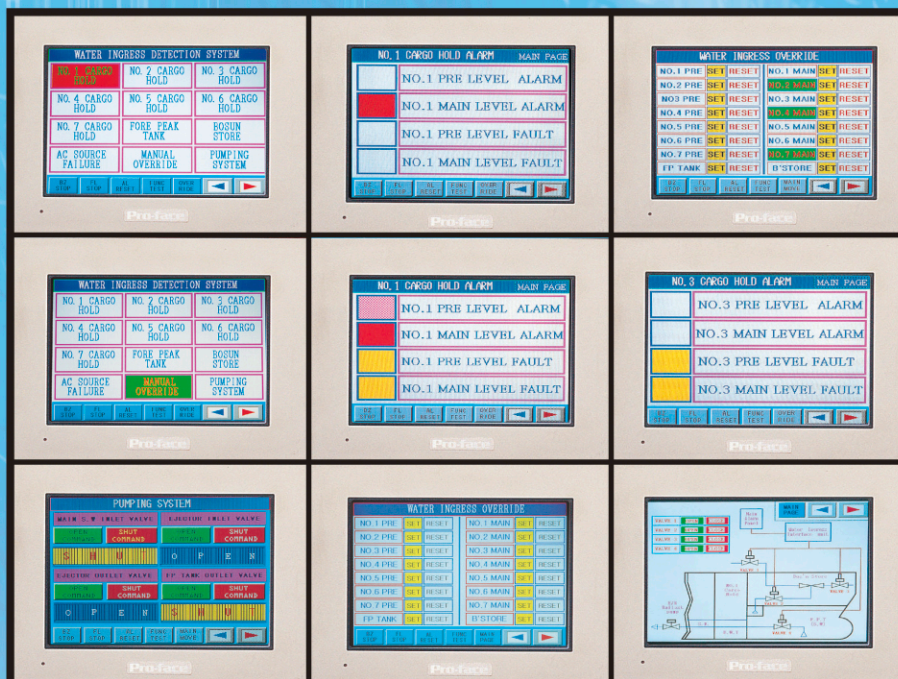


For Fore Peak Tank



For Bos'n Store

TOUCH SCREEN TYPE WATER INGRESS DETECTION SYSTEM MARISAFE



⚠ Warning

- High voltage runs through the GP. Except for replacing backlight, never disassemble the GP, otherwise an electric shock can occur.
- Do not modify GP unit. Doing so may cause a fire or an electric shock.
- Do not use power beyond the GP's specified voltage range. Doing so may cause a fire or an electric shock.



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