

# Cargo Tank Measuring System

## GENERAL & APPLICATION

This system has been specially designed, manufactured for detecting the presence of water in the **cargo holds** and **closed dry or void space** where the volume exceeds 0.1% of the ship's displacement volume on summer load water line, located partially or totally forward of the foremost card hold, and **ballast tanks** located forward of the foremost cargo hold, collision bulkhead of Bulk carrier in conformity with SOLAS regulation XII/ 12 rule requirements.

## THE POSITION OF DETECTION

- A reliable indication of water reaching a present level will be supplied on our water ingress detection system according to following installation position required by SOLAS regulation XII/ 12.
- These level switches should be installed either in the aft part of each cargo hold or in the lowest part of the spaces other than cargo holds to which these requirements apply.
- **For Cargo Hold :**
  - 1) An alarm, both visual and audible for which the space is identified on the main alarm panel will be activated when the depth of water at the level sensor reaches the pre-alarm in the space being monitored.
  - 2) An alarm, both visual and audible on the main alarm panel will be activated when the level of water at the sensor reaches the main alarm level, indicating increasing water level in a cargo hold. In addition, the both alarms will identify the space and the audible alarm should not be the same as that for the pre-alarm level.
- **For compartments other than cargo holds:**
  - 1) An alarm, both visual and audible, indicating the presence of water in a compartment other than a cargo hold on the main alarm panel will be activated when the level of water in the space being monitored reaches the sensor. The visual and audible characteristics of the alarm indication will be the same as those for the main alarm level in a hold space.

## FEATURES

- Intrinsically safe detection can be applicable to all of inflammable area, if required.
- Available for any number of detecting points
- Available for applying various type level switch according to configuration of the tank
- Available for the overriding device for which the alarm can be deactivated or reactivated

## SYSTEM SELECTION FOR ORDER CONFORMATION

HWID - □ - □

Number of detection point

- P16 : 1 to 16
- P32 : 17 to 32
- POV : Over 32

Enclosure of sensor

- E: Ex-type
- W: Weather proof

## PRINCIPLE OF OPERATION

This system consists of the Main alarm panel / Repeat alarm panel on which the audible and visual alarms are activated and Electrode Type Level Switch operated by detecting the conductivity in the liquid and Intrinsically Safety barrier according to purpose or the position of the installation.

When the presence of water has reached the detecting point of level switch installed on the preset detection level in the cargo holder or other space, the electric signals which is activated on the level switches are transmitted to the main alarm panel provided with alarm unit, power supply unit and alarm buzzer, malfunction alarm as well as overriding device. At the same time, the audible and visual alarms are activated on the main alarm panel installed on the Navigation bridge and the repeat alarm panel installed on the bridge.

**The overriding device** for which the alarm can be deactivated or reactivated for the detector installed in the tank and holds used for carriage of water ballast will be provided on the alarm panel according to the SOLAS regulation XII/ 12.1.

An override visual indication should be continuously provided throughout deactivation of the water level detector for the hold or tanks used for carriage of water ballast. Where such an override function is provided, the override condition should be automatically reactivated after the hold or tank has been deballasted to a level below lowest level alarm indicator level.

When the fault is detected on water level detector, **the malfunction alarm** having visual and audible alarm the same as detection alarm on the main alarm panel should be activated to monitor continuously the system. The audible alarm should be capable of being muted but the visual indication should remain active until the malfunction is cleared.

**The main power and standby power** should be prepared on this system and if the main power is failed, the standby power should be supplied to the main alarm panel so as to monitor continuously.

When the main power is failed, the power failure alarm having audible and visual alarm should be operated. The water ingress detection system should be continuously operated while the ship is at sea.

**The Electrode Type Level Switch** installed in appointed space should be satisfied with the intrinsically safe type with the I.S barrier.

## TECHNICAL SPECIFICATION

### 1. Main alarm panel

- Power supply : AC 110/220V 60Hz
- Stand-by power supply : DC 24V
- Number of detection point : No limits
- Accuracy of detecting : ±3mm
- Function :
  - visual alarm LED lamp for individual detection
  - audible main & pre-level alarm for individual detection
  - output signal for repeat alarm panel
  - overriding device, -common alarm buzzer
  - AC/DC power fail alarm & alarm reset
  - lamp test, -malfunction alarm
  - main power and standby power
  - navigation function, -time delay:0-99 seconds
  - dimming function, -flicker stop
- Mounting : wall or console mounting type

## TECHNICAL SPECIFICATION

### 2. Repeat alarm panel

- Power supply : DC 24V
- Function :
  - visual alarm & LED lamp for individual detection
  - audible main & pre-level alarm for individual detection
  - common alarm buzzer
  - lamp test
  - dimming function
- Mounting : wall or console mounting type

### 3. Conductive electrode type Level switch

- Function :
  - When the electrodes is touched by an electrically conductive liquid, the low value A.C circuit detected on the electrodes is transmitted to the signal conditioning instrument on which the relay output contact signal is offered. This appropriate contact signal is transmitted to main alarm panel on which the audible and visual alarm is provided.
- Signal conditioning instrument(alarm unit) : I.S type, EEx ia IIC
- Operating voltage : 20~250VAC, 50/60 Hz,
- Input of response resistor : 1~200K Ω
- Relay output : 2A AC or 1A DC
- Enclose protection : IP 66/68
- Working pressure : 0~5 kg/cm<sup>2</sup>
- Working temperature : -20 °C~80 °C
- Model number code system

## 16 CHANNELS ALARM UNIT



### MODEL : AU-160D(W)

- No. of Channels : 16 channels
- Housing :
  - standard DIN cabinet for built-in mounting.
  - made of fiber glass reinforced Noryl.
  - front : 144 × 144mm, depth : 86mm
- Power supply
  - voltage : 24VDC(18~32VDC) or 85~264VAC
  - power consumption : 4.5W(24VDC)
- Input signals : Contact. NC or NO
- Time delays : 00~99 seconds (interval 1 sec.)
- Horn output
  - relay contact output : potential free SPDT.
- Accept horn
  - by means of push button on the front, or externally
- Accept flash
  - by means of push button on the front, or externally
- Test function : by pushing both accept push buttons
- Special function
  - override device, - malfunction alarm
  - main power and standby power
  - navigation function, - dimming function

