

Water Ingress Detection System C20/MOS for Bulk Carriers as required under SOLAS chapter XII regulation 12.

General description

The Water Ingress Detection System for Bulk Carriers C20/MOS is designed to meet the requirements under SOLAS Chapter XII Reg.12. The system is based on state of the art Kongsberg Maritime technology. The system includes operator panel, water detection sensors GL-10 and Zener-barriers. Audible and visual alarms will be provided on the bridge in the event of water levels being detected in cargo holds and other spaces forward of the collision bulkhead. The system can be interfaced to an Integrated Automation System or it can operate as a stand-alone system. All system components are designed and manufactured to work in rugged marine environment. The system is type approved by all major classification Societies.



MOS Alarm display



Sensor GL-10

Standard features

The Water Ingress Detection System C20/MOS is based upon experiences gained through more than 30 years working with liquid level gauging. User-friendly operator panel; based on colour graphic TFT display. The system offers the following key features:

- Unique and patent pending liquid detection sensor GL-10, designed for the harsh environment in ships cargo holds.
- Discriminating between pre-alarm and alarm conditions, with outputs for separate acoustic alarms.
- Visible and audible alarm for each sensor location.
- Internal alarm buzzer and output for other alarm devices.
- Alarm for fault and power failure.
- Well suitable for refit installations by ship's crew.

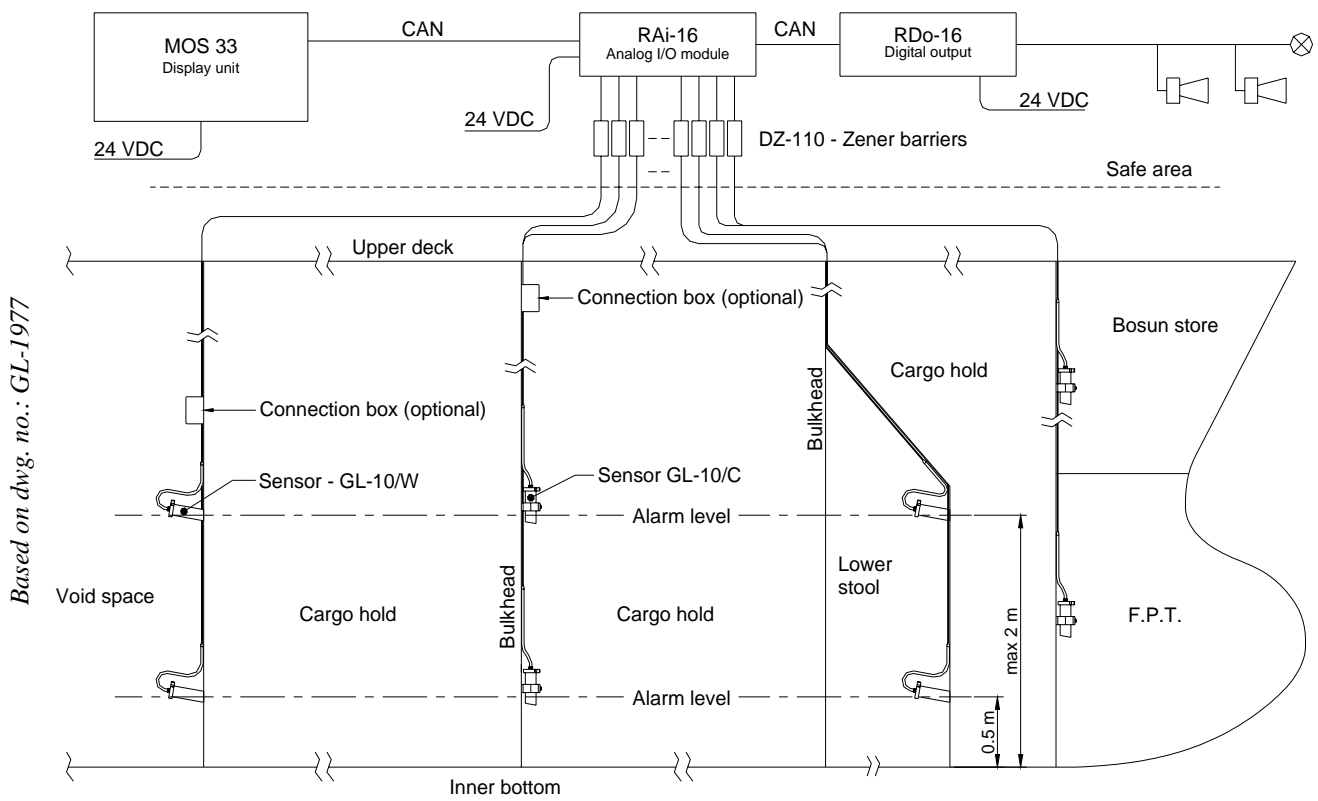
- Alarm override possibility is standard.
- Independent or integrated.

Optional features

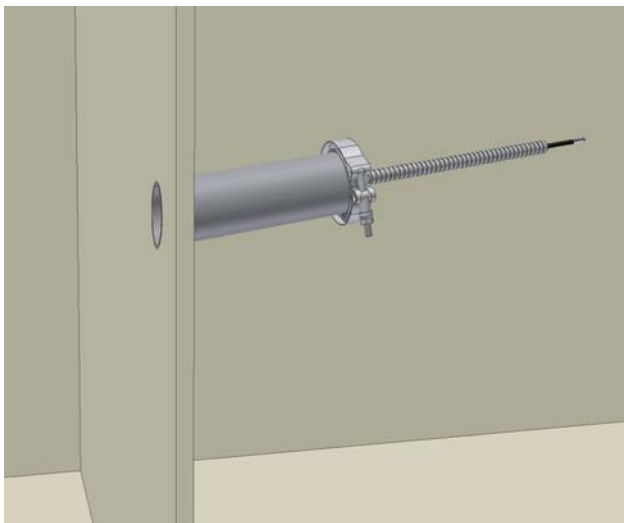
The Water Ingress Detection System C20/MOS has a flexible design and can be offered with the following optional features:

- Cabinet (600 x 600 x 360) mm for wall mounting arranged with power supply, Zener-barriers, termination, etc.
- Possible for connection of other sensors as bilge wells, gas detectors, level alarms, etc.

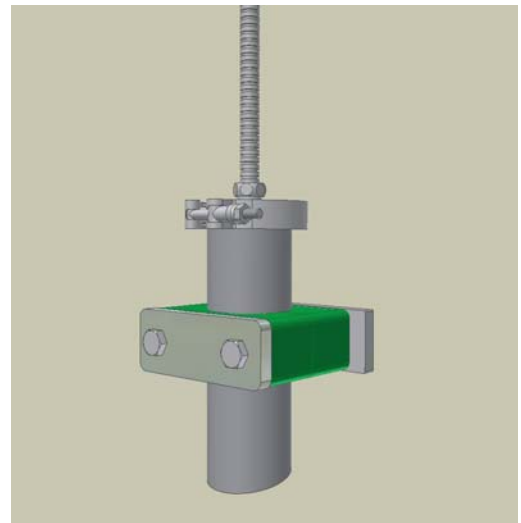
Typical system configuration



Sensor installation



The GL-10/W Sensor welded to bulkhead



The GL-10/C Sensor clamped to bulkhead

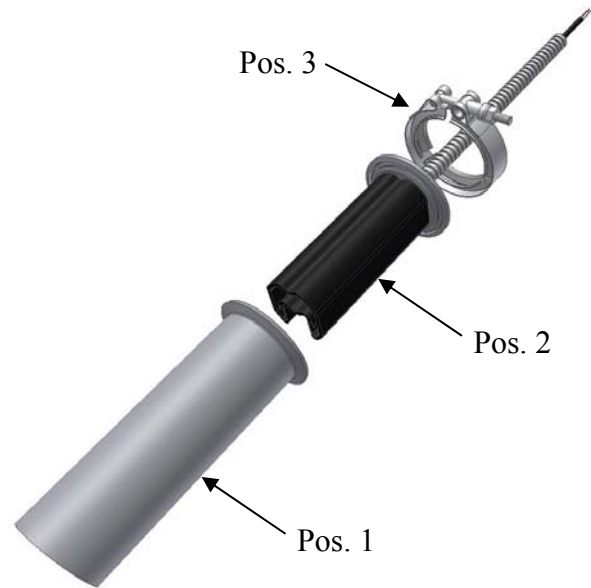
Notes to typical system configuration

The most typical cargo hold installations are indicated in the above system configuration drawing.

The water ingress sensors GL-10 are delivered with a fixed cable of PUR (polyurethane) type. The length of this cable must be specified upon ordering. The sensor is a rugged construction specially made to detect water in various types of bulk cargo holds. The sensor must in some cases, be equipped with extra protection against mechanical damage.

The cabinet UEN024/9 is an optional feature. Cable entrance (from top or bottom) must be specified when ordering. The standard cabinet has a size of 600 x 600 x 360 mm (wall mounting type).

The drawing above shows an assembly drawing of the Water Ingress GL-10 level switch. The sensor consists of 3 major parts; the protective steel pipe (Pos. 1), the sensor element with cable (Pos. 2), and the assembly clamp (Pos. 3).



The protective sensor pipe is made of AISI 304. This pipe can be clamped to the cargo hold bulkhead inside the tank (GL-10/C), or welded inside a hole in the bulkhead between a cargo hold and a void space (GL-10/W).

Extract from SOLAS regulation 12:

1 Bulk carriers shall be fitted with water level detectors

.1 in each cargo hold, giving audible and visual alarms, one when the water level above the inner bottom in any hold reaches a height of 0.5 m and another at a height not less than 15 % of the depth of the cargo hold but not more than 2.0 m. The water level detectors shall be fitted in the aft end of the cargo holds.

.2 in any ballast tank forward of the collision bulkhead required by the regulation II-1/11, giving an audible and visual alarm when the liquid in the tank reaches a level not exceeding 10 % of the tank capacity.

.3 in any dry or void space other than chain cable locker, any part of which extends forward of the foremost cargo hold, giving an audible and visual alarm at a water level 0.1 m above the deck. Such alarms need not be provided in enclosed spaces the volume of which does not exceed 0.1 % of the ship's maximum displacement volume.

2 The audible and visual alarms specified in paragraph 1 shall be located on the navigation bridge.

Specifications

Water Ingress Sensor GL-10 (patent pending)

| | |
|------------------------------|--|
| Water Ingress Sensor | GL-10 |
| Power supply: | 24 VDC nom. |
| Output signal: | 4 to 20 mA/Digital |
| Load: | 0 to 600 Ohm (24 V) |
| Type of protection | IP68 |
| Operating temperature | -40 to +85 °C |
| Sensor housing | Steel pipe AISI 304, Ø = 60 mm, L = 190 mm |

Operator Panel MOS 33

| | |
|-------------------------------|---|
| Supply voltage: | 18 to 32 VDC, ±5 % ripple |
| Power consumption: | 10 W |
| Operating temperature: | -15 °C to + 70 °C |
| Storage temperature: | -25 °C to + 70 °C |
| Maximum humidity: | 96 % no condensation |
| Display: | TFT colour, power backlight: 5.7" 320 x 240 pixels |
| Weight of unit | 1.5 kg |
| Dimensions: | Outline: 252 x 144 x 70 mm Cut-out: 242 x 134 mm |
| Mounting | Bracket for table, ceiling and wall. Flush mount with removable corners |
| Shock and vibration | DnV Class B IACS E10 |
| EMC properties | According to IACS E10, IEC 60945 |

I/O Modules

| | |
|---------------------------------|--|
| Supply voltage: | 18 to 32 VDC |
| Power consumption: | 7.5 to 10 W |
| Operating temperature: | -15 °C to + 70 °C |
| Storage temperature: | -25 °C to + 70 °C |
| Maximum humidity: | 96 % no condensation |
| Amount of I/O each unit: | Analogue input unit: RAI 16: 16 AI channels Digital output unit RDO 16: 16 DO channels (relay) |
| Weight of unit: | 1.5 to 2.0 kg each unit |
| Dimensions: | Outline: 341 x ≈150 x 90 mm |
| Mounting | Screws, 4 pcs M5. To be mounted in cabinet |
| Shock and vibration | DnV Class B IACS E10 - Direct mount on engines, compressors etc. |
| EMC properties | According to IACS E10, IEC 60945 |
| Serial interfaces: | 2 CAN ports for communication with MOS 33 or ROS (PC) 1 serial interface RS 422 (dPSC) (option) |

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