

Water Ingress Detection System for Bulk Carriers as required under SOLAS chapter XII regulation 12 and II-1 regulation 25.

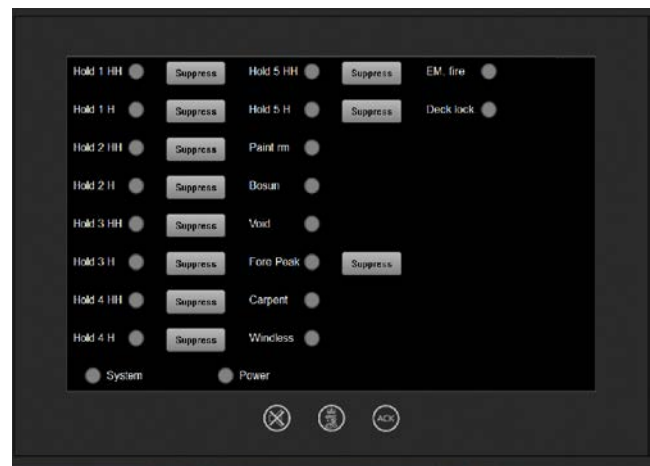
General description

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. The GL-10 level switch is wheelmarked according to Maritime Equipment Directive, MED.

Standard features

The Kongsberg Water Ingress Detection System is based upon experiences gained through more than 30 years working with liquid level gauging. User-friendly operator panel with touch offers the following key features:

- Unique and patented 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 alarm and light.
- Visible and audible alarm for each sensor location.
- Internal alarm buzzer and output for external alarm devices.
- Alarm for fault and power failure.
- Well suitable for refit installations by ship's crew.



8" AIPC Alarm panel



Sensor GL-10

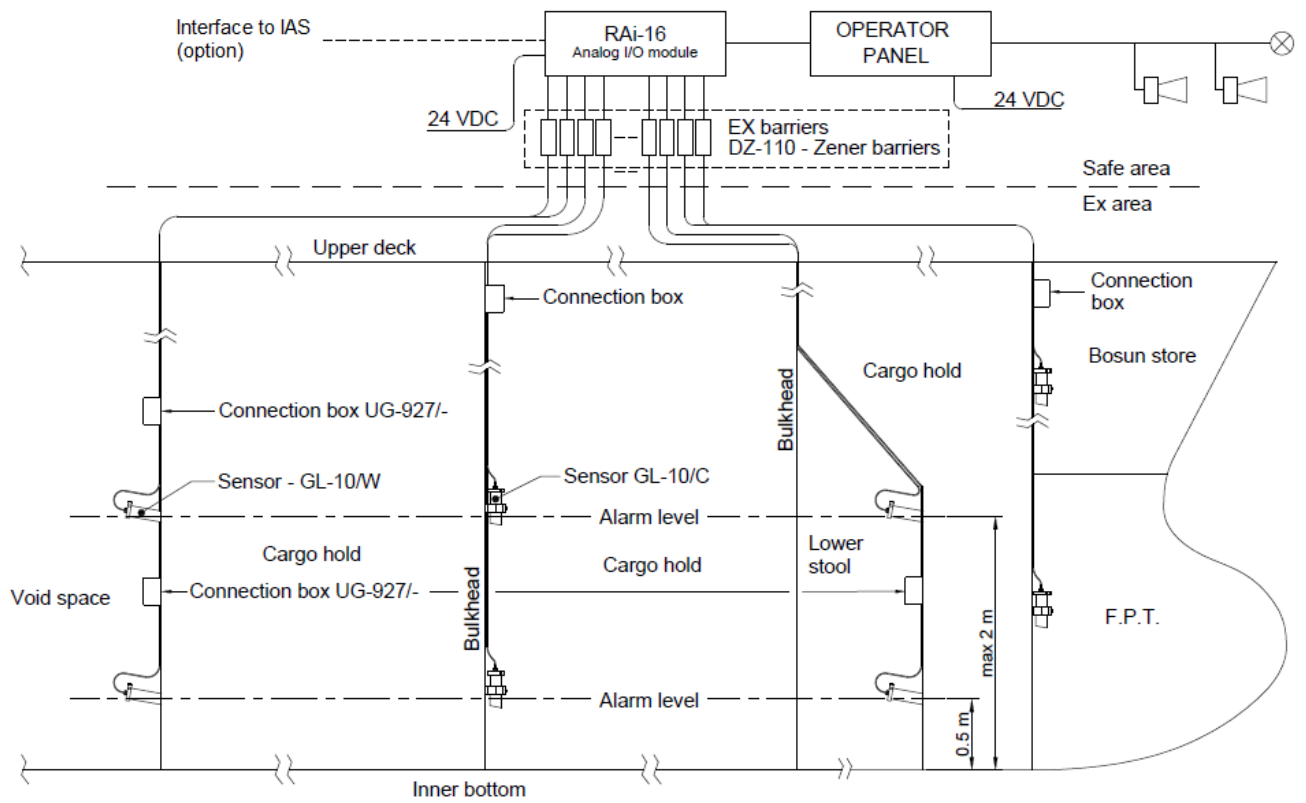
- Alarm override possibility in cargo holds which also can be used as ballast tanks and in fore peak tank.
- Automatically removal of override after deballasting.
- Independent or integrated solution.

Optional features

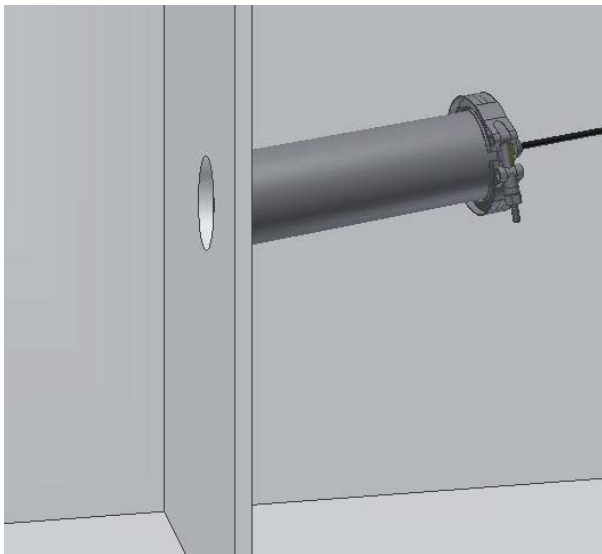
The Kongsberg Water Ingress Detection System has a flexible design and can be offered with the following optional features:

- Cabinet for wall mounting arranged with power supply, Zener-barriers and termination.

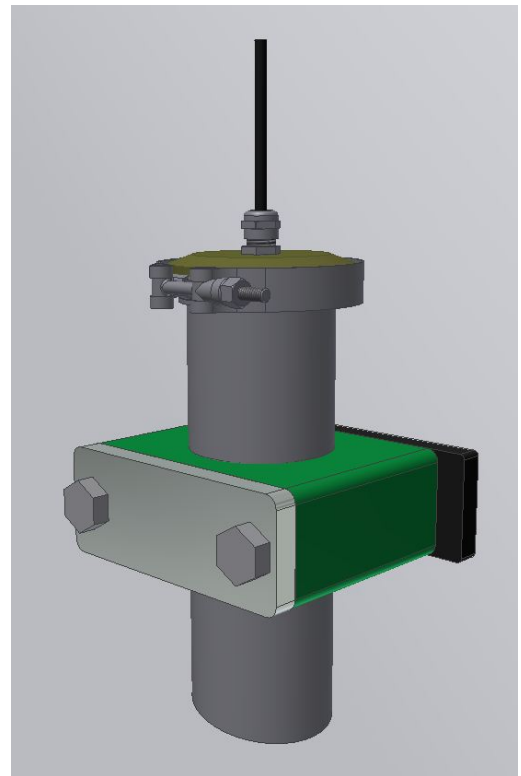
Typical system configuration



Sensor installation



The GL-10/W Sensor welded to bulkhead



The GL-10/C Sensor clamped to bulkhead

Notes to typical system configuration

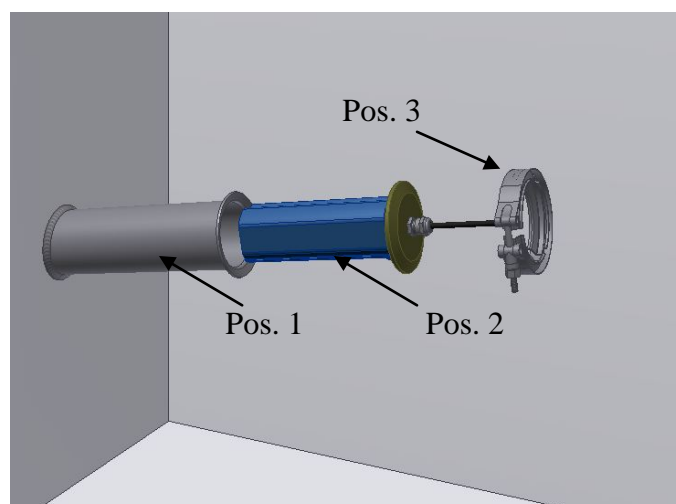
The most typical cargo hold installations are indicated in the above system configuration drawing.

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.

A wall mount cabinet is an optional feature, cable entrance from bottom.

The standard cabinet has a size of 800 x 800 x 300 mm.

The drawing above shows an assembly drawing of the Water Ingress GL-10 level sensor. 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 AISI304 or AISI316. This pipe can be clamped to the bulkhead inside the cargo hold (GL-10/C), or (if the holds have void spaces between them) welded inside a hole in the bulkhead between the cargo hold and the void space (GL-10/W).

The sensor can be delivered with titanium flange if the sensor is submerged in seawater when the cargo hold is used as ballast tank.

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 m. On bulk carriers to which regulation 9.2 applies, detectors with only the latter alarm need be installed. The water level detectors shall be fitted in the aft end of the cargo holds. For cargo holds which are used for water ballast, an alarm overriding device may be installed. The visual alarms shall clearly discriminate between the two different water levels detected in each hold;

.2 in any ballast tank forward of the collision bulkhead required by regulation II-1/12, giving an audible and visual alarm when the liquid in the tank reaches a level not exceeding 10% of the tank capacity. An alarm overriding device may be installed to be activated when the tank is in use; and

.3 in any dry or void space other than a chain cable locker, any part of which extends forward of the foremost cargo hold, giving an audible and visual alarm at a water level of 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 (patented)

Water Ingress Sensor	GL-10
Power supply:	24 VDC nom.
Output signal:	4 to 20 mA
Load:	0 to 600 Ohm (24 V)
Type of protection	IP68
Operating temperature	-40 to +85 °C
Sensor housing	Steel pipe AISI 304 or 316, Ø = 60 mm, L = 190 mm Flange in titanium or AISI304

Operator Panel 8" AIPC

Supply voltage:	18 to 32 VDC
Power consumption:	Max- 25 W
Operating temperature:	-15 °C to + 70 °C
Storage temperature:	-15 °C to + 70 °C
Maximum humidity:	96 % non condensation
Weight of unit	1.8 kg
Dimensions:	Outline: 251 x 168 x 51 mm Cut-out: 231 x 152 mm
Mounting	Flush mount
Shock and vibration	DnV Class C 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: RAI16xe: 16 AI channels
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 MPP or ROS (PC)

Kongsberg Maritime AS

NO-7005 Trondheim
Norway

Telephone: +47 73 58 10 00
Telefax: +47 73 58 10 01
www.kongsberg.com
E-mail: km.sales@kongsberg.com



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