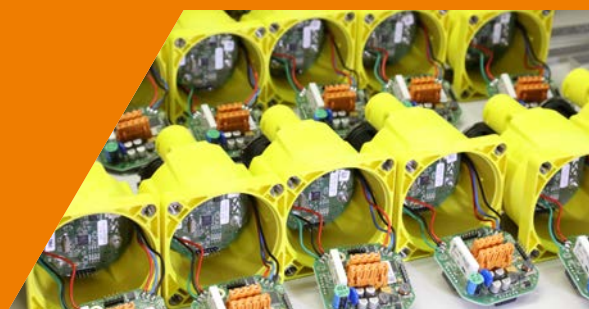


Smart-VS-Level Flood Detection System



The flood detection system is designed for the total, reliable and safe flood monitoring and measurement of void spaces/dry compartments on board ships using the Wärtsilä Smart-VS-Level sensors to comply with the Safe Return to Port (SRtP) rules.

The Wärtsilä Smart-VS-Level sensor is a complete stand-alone Level Measuring Unit specifically designed for the continuous monitoring of flooding in dry compartments, bilges and void spaces. The hydrostatic pressure of a liquid is directly measured by sensors that are in direct contact with the liquid, while the presence of liquid is independently detected by a float switch. The digital signals corresponding to the pressure

measured and to the detection of liquid, each by an independent sensor, are either used locally or transmitted to a centralized system.

Each unit is fully independent so that no malfunctions occurring in one unit can affect the other units in the same loop. The system is totally integrated and all relevant data are available for connection with other systems (ship automation, loading calculator, safety system).

Purpose

- Continuous monitoring of void spaces and dry compartments on board ships.

Benefits

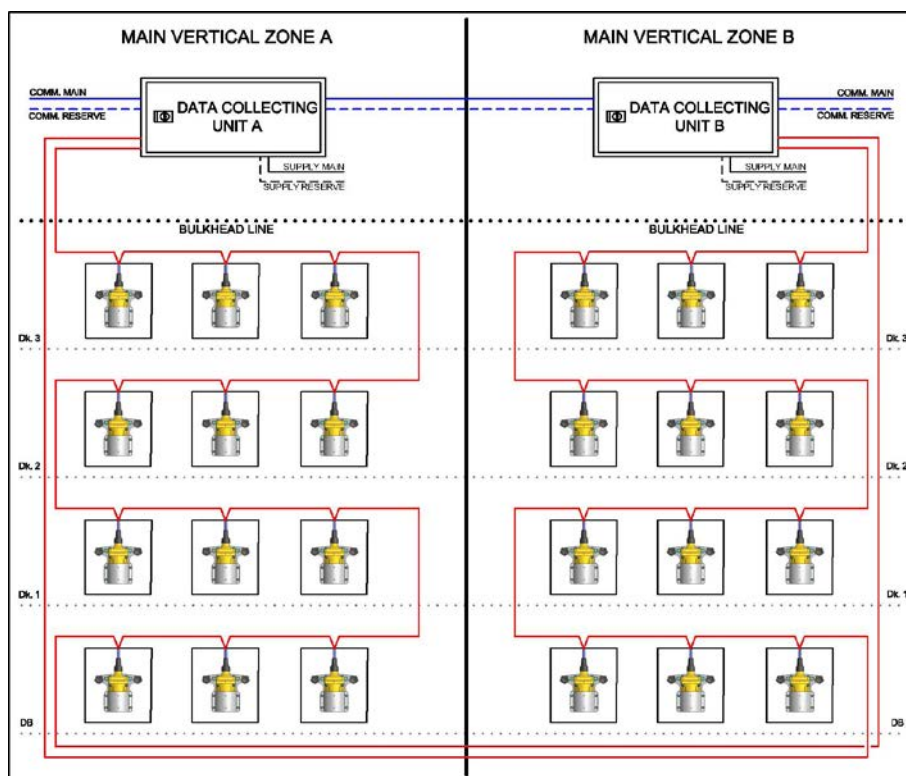
- Reliability of the measure
- Not affected by ambient pressurization/depressurization
- Self diagnostic
- IP68 enclosure
- Cost effective
- Maintenance free.

Applications

- Continuous monitoring of void spaces
- Continuous monitoring of dry compartments
- Continuous monitoring of bilges
- Detection and measurement of any liquid media.

Main Features

- Fully redundant pressure measuring unit: three pressure sensors per unit and therefore per each measured point
- Filtered power supply
- Serial interface (RS485 HD) using standard Modbus protocol
- Standard 4-20 mA output
- No calibration required
- Operating temperature -25 to 70 °C
- Level range 0-15 m H₂O
- Level accuracy 15 mm H₂O
- Power consumption 2.5 W.



Flood monitoring system layout

Safety and Redundancy Criteria

The system allows complete disconnection of a faulty part of the device from the chain without affecting the entire system of communication and power lines. Alarms concerning the faulty part of the device are made available on a dedicated Modbus register. Should the entire device be affected by a fault, the problem is not propagated along the lines and the integrity of the power and communications is ensured.

The branch connection for the power supply lines enters into and exits from the device, connecting all modules directly without a star scheme. The main and reserve power supplies can be connected on both sides of the ring, allowing both redundancy and wire saving. The internal hardware takes care of power supply merging and propagation.

Data available

On 4-20 mA signal:

- Level, range 0-15 mt H₂O.

On the bus:

- Level
- Temperature
- Absolute pressure AVG
- Absolute pressure sensor 1
- Absolute pressure sensor 2
- Absolute pressure sensor 3
- Level status
- Temperature status
- Pressure sensor 1 status
- Pressure sensor 2 status
- Pressure sensor 3 status
- Level switch status.



Sensor with bracket

Sensor Types

The Smart-VS-Level is available in two types:



Standard for "clean" environment applications



Bilge for critical applications, including bilges