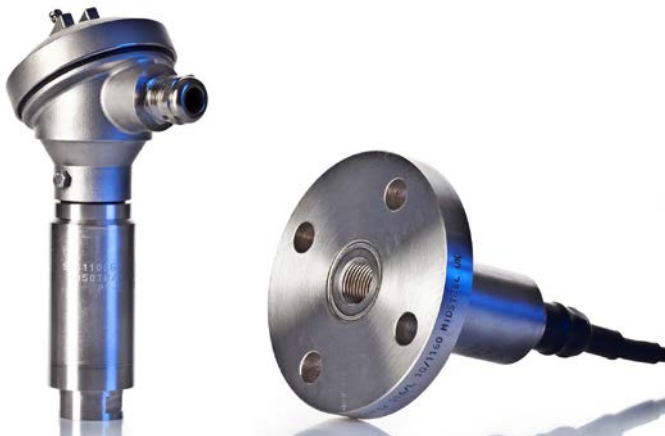
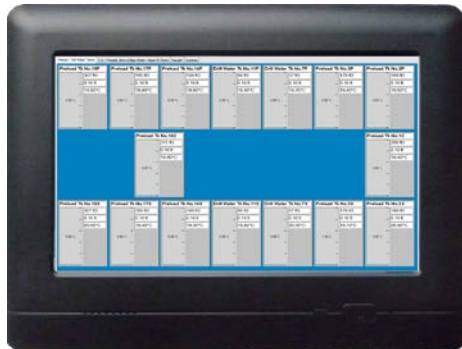




## VentSafe: Cargo Tank Pressure Monitoring and Alarm System



### KEY FEATURES

- Detects over or under (vacuum) pressure conditions in a cargo tank and triggers an alarm to prevent deformation in case of primary pressure release valve failure
- Complies with SOLAS II-2/59.1 regulations by providing an alternative to the secondary venting of cargo tanks
- Also complies with subsequent SOLAS II-2/4.5.3.2.2, II-2/11.6.3.2 and IACS UI SC 140 amendments
- Meets the ExxonMobil MESQAC guide for affiliate vessel vetting as well as OCIMF and SIRE best practices
- Cost effective to install in new builds or as a retrofit to existing ships
- Simple to operate and reliable based on marine approved components

Part of the **ComplianceSystems** product group



## Cargo Tank Pressure Monitoring and Alarm System

**SOLAS II-2/59.1** regulation effective July 1998, and subsequent **SOLAS II-2/4.5.3.2.2**, **II-2/11.6.3.2** and **IACS UI SC 140** regulations effective July 2013, requires that a secondary means of allowing full flow of vapour, air or inert gas is provided in the event that the primary pressure relief valve arrangement fails. This ensures that the cargo tank is operated within its design limits and is not mechanically damaged by over or under (vacuum) pressure.

Alternatively, and more cost effectively (especially where retrofit is required), the regulation allows that cargo tank pressure sensors may be fitted to each tank and their outputs routed to a monitoring system in the cargo control room which will provide an alarm in the event of a cargo over or under pressure condition.

The regulations are applicable to all vessels that transport flammable cargoes, or additionally fitted with an inert gas blanket system as part of the fire prevention system, these are typically crude oil, fuel and chemical cargo tankers.

## A Cost Effective and Simple System for Cargo Tankers

PSM has produced a cost effective complete package based on proven and approved equipment which contains all that is needed to fully meet the above requirements.

The PSM ict 1000 pressure transmitter is fully protected against positive or negative overloads and submersion. It is available with a choice of flanged or threaded fittings for installation directly to the tank top or piping into the venting system.

They are type approved by many marine classification societies. They may also be used in hazardous areas when installed with appropriate PSM RFM safety barriers.

The PSM MTU display unit located in the Cargo Control Room provides a monitoring station which shows an indication of normal or alarm status for each tank, as well as the actual pressure.

Up to four alarm setpoints can be assigned for each tank over the compound range of typically  $-500$  to  $+500$  mbar. The unit's standard configuration will suit most applications, but specific changes to setpoints, acceptance delays and hysteresis settings can be made during factory configuration.

A local audible and visual alarm is provided to alert the crew in the event of a pressure hazard.

Optional relay outputs are provided for remote repeater audible and visual alarms.

Transmitters are connected to the MTU using the integral Modbus communication of the ict 1000. This allows up to 127 transmitters to be connected onto one data bus, simplifying installation and reducing cable costs.

## Functionality

When a pressure excursion is detected an alarm condition is triggered and the MTU unit provides a visual and audible alarm.

The alarm condition may be observed and acknowledged on the MTU unit.

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## **MTU Central Monitor, Control and Alarm Panel**

**The MTU is a powerful yet simple to use central monitoring, control and alarm unit.**

Comprising a 7" IP65 HMI unit panel mounted into an optional epoxy coated steel enclosure it is suitable for marine applications and installations.

The MTU is supplied pre-configured according to each installation with the tank details and descriptions, as well as the four alarm setpoints required by the regulations.

Input is a Modbus loop is used for connection to the pressure transmitters.

The MTU will display normal operation, alarm conditions as well as trigger an inbuilt audible alarm to alert staff in the cargo control room.

Alarm conditions can be acknowledged or reset within the MTU.

An optional relay output module (SPCO rated 240V AC at 5A) is provided for comprehensive remote alarm control.

## **ict 1000 Pressure Transmitter**

**Designed, constructed and approved for marine applications such as inert gas tank blanket pressure measurement**

PSM has drawn upon thirty years of global marine application experience, to develop a smart dual mode Modbus and analogue pressure transmitter that offers you the highest possible standards in terms of performance, versatility, functionality and reliability.

The ict 1000 pressure transmitter's advanced capacitive measurement cell is manufactured in robust and durable ceramic, and our careful design of the sensor means the diaphragm is fully supported and protected against overload and shock pressure conditions.

The ict 1000 transmitter body is manufactured from 316 stainless steel and employs a carefully engineered Kalrez seal assembly to provide a fully submersible (IP68) construction capable of withstanding the toughest operating conditions for many years.

Advanced features are not confined to mechanical design. The ict 1000 has a powerful on-board micro-controller to precisely monitor the pressure related output of the capacitive cell. Ambient temperature is also monitored to provide a fully compensated measurement output.

The transmitter is certified according to ATEX regulations for installation in a hazardous area and approved by many major classification societies as suitable for use in marine applications.

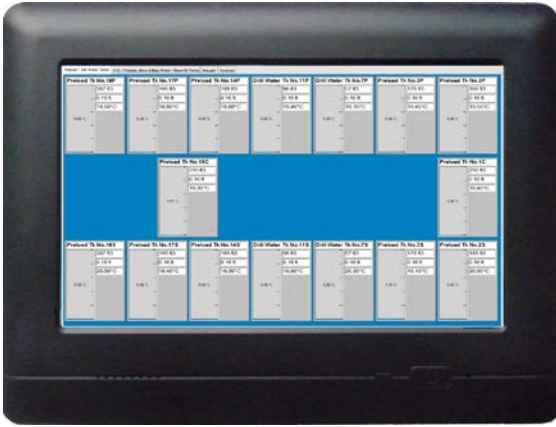
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## Typical system components



**MTU**  
Central Monitor, Control and Alarm Panel mounted in cargo control room

Optional relay outputs for remote mounted audible and visual alarms



**RFM-ISR zener barrier module**  
Required for hazardous area installation



**Ict 1000 pressure transmitters**  
Mounted on top of tank or vent pipe

Ship's tanks or gas vent pipes

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