



MARINE INDUSTRY

TANKERS | BULKARIANS

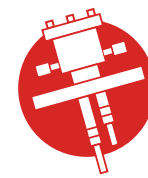
CARGO | RO-RO | SUPPLY

CRUISE | DOCKS





SERIES **80-IM**
YEAR **1992**



Valcom[®]

SINCE 1974

MARINE INDUSTRY

TANKERS | BULKARIANS

CARGO | RO-RO | SUPPLY

CRUISE | DOCKS



Founded in Milan in 1974, **Valcom®** started with the designing, developing and manufacturing of measurement and control instruments with specific know-how in the Pulp & Paper Industry where the patented ET connection became soon an indisputable trademark, internationally recognized. In the 80s the development towards a Smart Electronic was enforced and as a result Valcom® introduced the SENIC version as a historical milestone in the remote field measuring of Pressure, relying on modular composition between transmitter head and various type of sensors, suitable for all Process Industries purposes.

The continuous efforts in researching together with a favorable economical situation made Valcom® significantly enter the Marine business in the Early 90s, with perfect selection of the

suitable materials for sea-going and offshore application, expanding clients portfolio from domestic to all across Europe in the time of a few years.

Today **Valcom®** engineers and manufactures instrumentation for various industrial markets: Pulp & Paper, Marine, Water, Food & Beverages, Chemical & Pharmaceutical. ISO, ATEX, PED & SIL certifications, together with latest compliance to Marine Standards and Type Approvals, guarantee the products to be compliant with the up-to-date technical standards.

TERRANOVA® INSTRUMENTS gathers the oldest and most historical Italian Brands of Process Instrumentation: Spriano® (1923), Valcom® (1974) and Mec-Rela® (1976).

TERRANOVA®

WE DO PROCESS INSTRUMENTATION PRECISELY



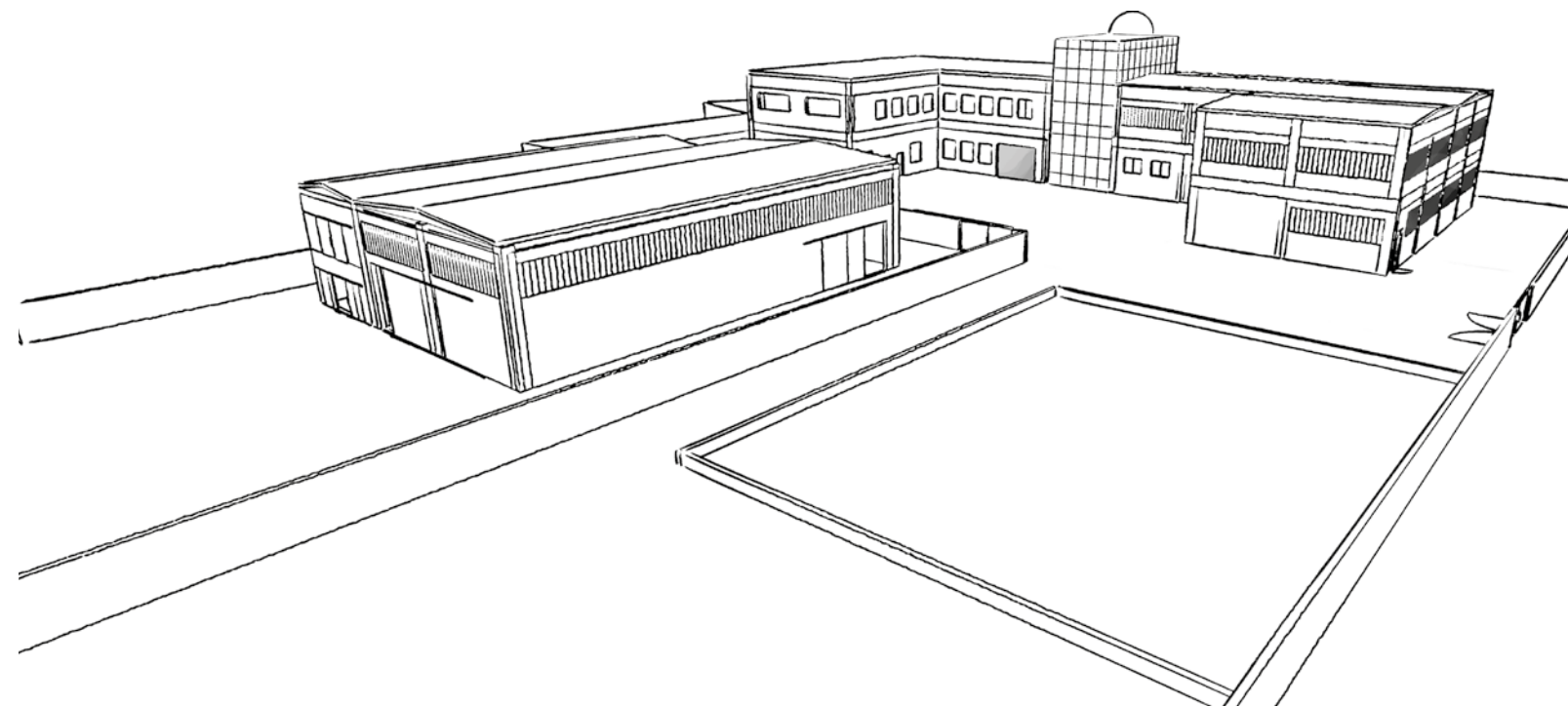
SPRIANO



Valcom



MEC-RELA



MISSION: TERRANOVA is committed to bring forth the great Italian manufacturing tradition through a broad portfolio of solutions for the process industries.

The experience of many years in various sectors has pushed us towards a wide qualitative and creative offer which aims to satisfy our customers'

needs in a precise and diligent way.

VISION: TERRANOVA intends to face evolution by relying on people and data. The strength of our offer is the result of an approach based on both the contribution of human creativity and the precision of manufacturing and instruments measurement.



SINCE 1974 INNOVATION, QUALITY & SERVICE ON DEMAND

Decades of experience escorted by continuous efforts in researching and developing innovative solutions, make Valcom® the ideal partner as supplier of measurement and control equipment for water treatment process, wells, chests, lakes as well as various areas such as food and beverage, chemical, pharmaceutical, cement and steel industry.

Our products have obtained approval certificates from the main international

audit institutes and are sold directly or through distributors located in several countries all over the world. Our product range includes instruments with screwed, flanged, sanitary and special connections, featured by integral or remote versions. Capillary and seals manufactured, assembled and tested in our factory are also available, in materials such as Stainless Steel, Duplex, HC, HB, Ti, Monel, Inconel, Ta.

MARINE INDUSTRY

A comprehensive range of sensors and systems manufactured by Valcom® offers the possibility to choose high quality products, even supported by leading digital technologies, suitable for installations on all ships including tankers, bulkarians, navy, floating docks, passengers ships and off-shore applications.

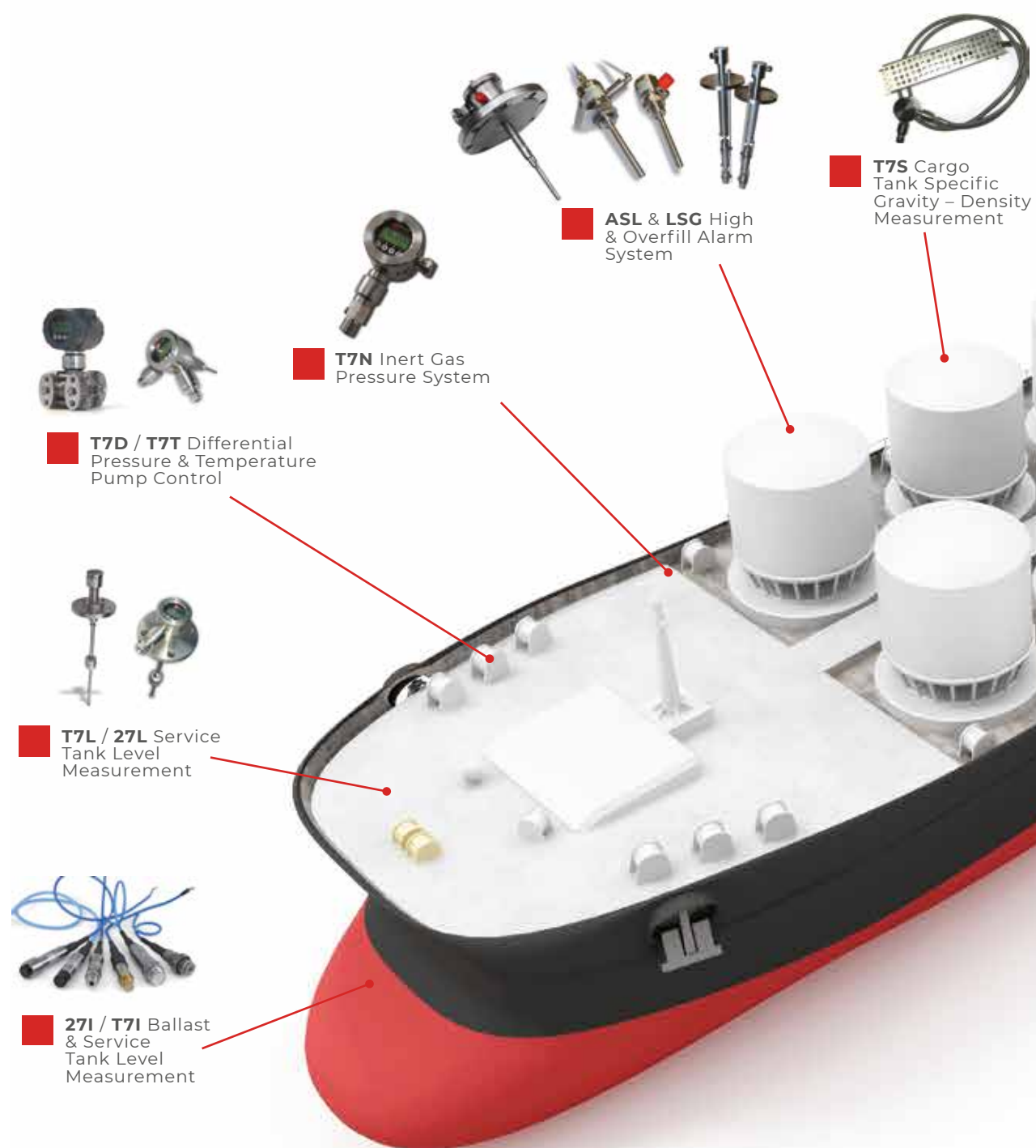
For ballast and service tanks, a wide selection of sensors is available, also for submersible installations as well as bubbling type systems, composed by a row of sensors mounted on a DIN rail complete with pressure regulators for constant bubbling flow (PR3).

Level sensors used in Water Ingress Alarm System named "WISE" and in high and overfill alarm systems named "STHOP" are realized utilizing the principle of ultrasonic waves distributed into a metal rod. A pure static sensor, with no vibrating parts and

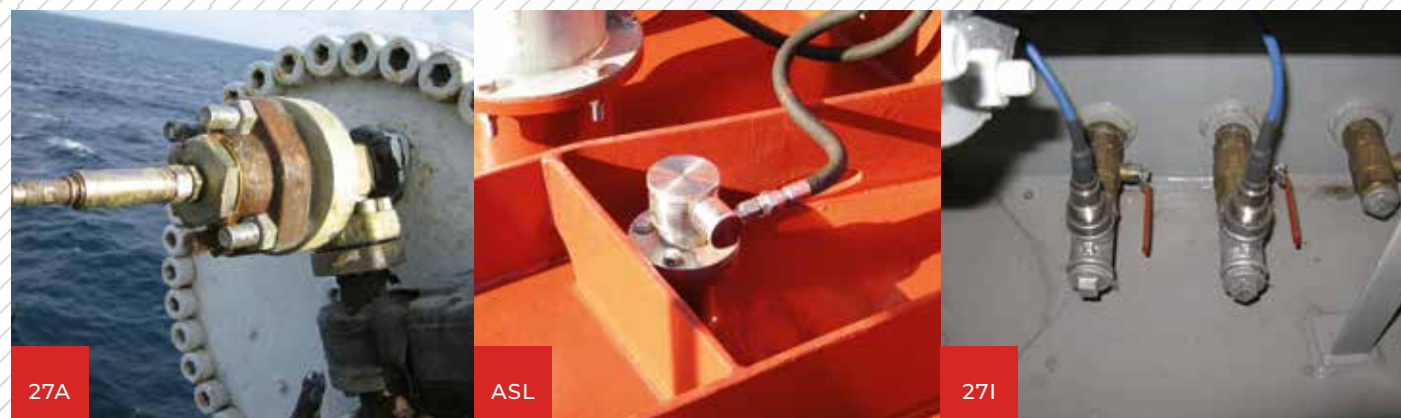
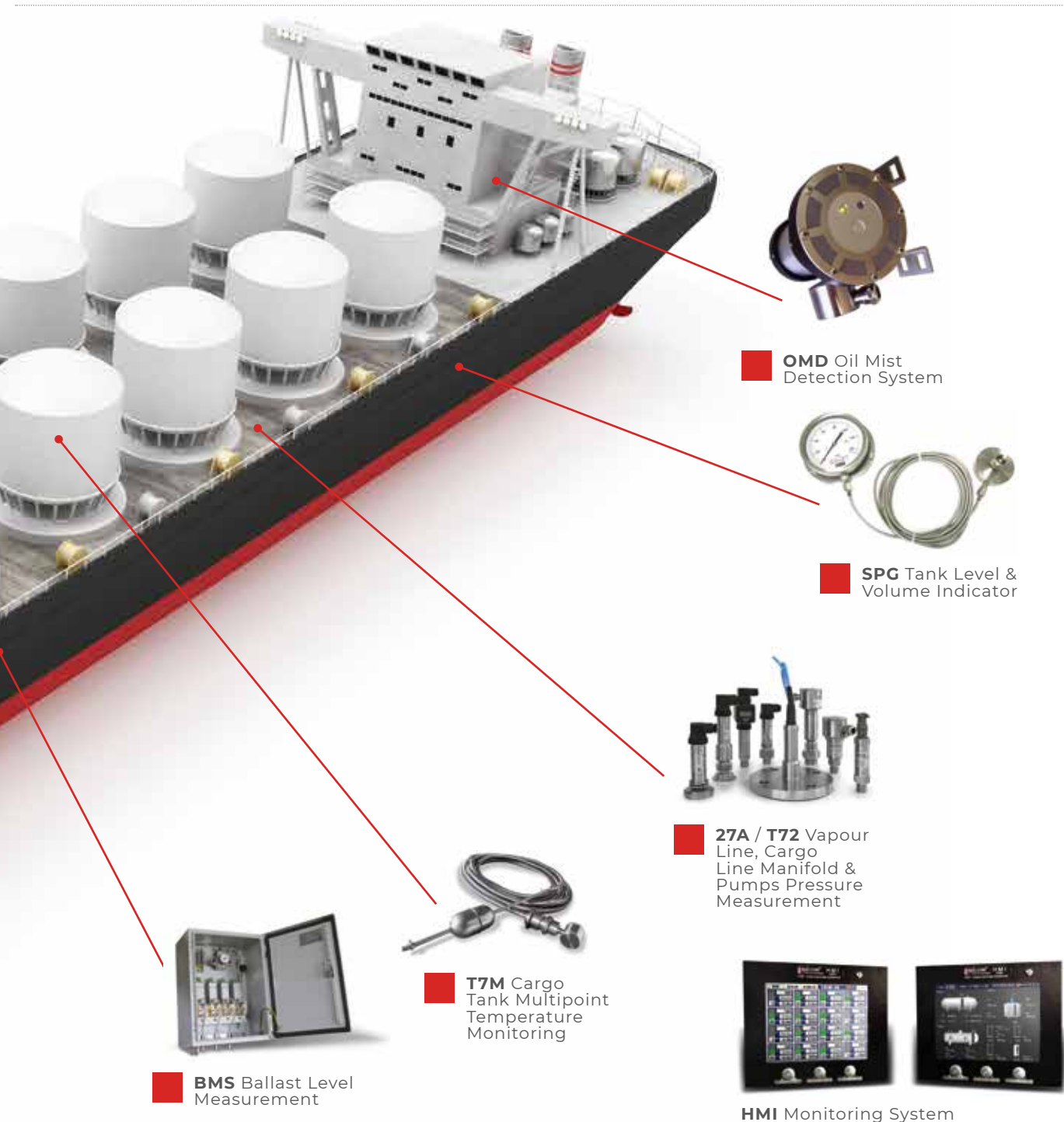
no optical or capacitive components, withstand a temperature ranging from -200°C up to +450°C and pressures from -1 bar up to 400 bar. These sensors have proved to be extremely robust complying and even exceeding all tests requested by IACS, IMO and SOLAS regulations for installation on bulkarians. Easiness of installation is a peculiarity of these instruments, as well as the self-cleaning construction, the possibility to have local or remote surveying test and the fact that no filter is needed.

A wide range of pressure sensors has been produced by Valcom® since many years; cargo-tanks inert-gas pressure, vapours line pressure, cargo line manifold pressure, ballast pump, line pressure, draft measurements and Oil Mist Detectors are some applications examples of our instruments.

SENSORS & SYSTEMS



FOR SHIPS & VESSELS



OUR SECRET
ARE THE DETAILS.

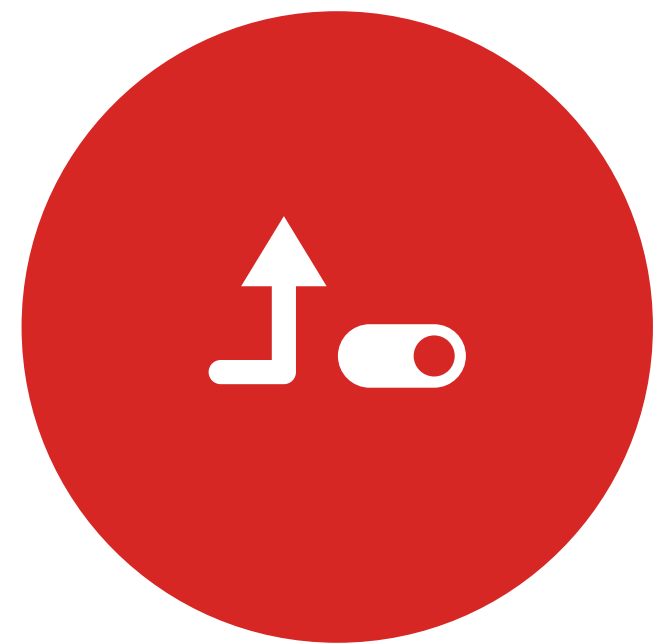
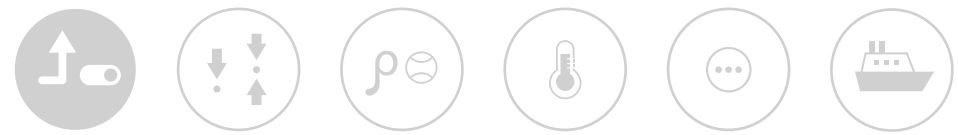


PRESSURE, LEVEL, TEMPERATURE, FLOW, DENSITY

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**LEVEL CONTINUOUS
& ON/OFF**



T72 Smart Submersible Level Transmitter



T72 series includes submersible electronic level transmitters with 4 ÷ 20 mA output and HART® digital communication protocol for hydrostatic pressure sensing. Sensors are always calibrated individually together with their own seal. Configurations and adjustments can be made remotely using HART® protocol compatible communicators.

- Level measurement;
- Installation on water, chemical, food, pharmaceutical plants, marine, navy;
- Installation in areas with persistence of potentially explosive mixtures.



Supply:	12.5 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA + HART®
Measuring range:	From 0 ÷ 0,2 bar to 0 ÷ 100 bar
Max load:	550 Ohm @ 24 Vdc
Total accuracy:	< 0.30 % FS (-25 ÷ 0°C) / < 0.1 % FS (0 ÷ 80°C)
Measured value update frequency:	4 ÷ 20 mA + HART®: ≈ 1 s / HART®: ≈ 500 ms (on request)
Polling time:	4 ÷ 20 mA + HART®: ≈ 800 ms / HART®: ≈ 500 ms (on request)
Response time (63% FS):	< 256 ms (Standard HART®)
Allowable de-range:	Down to 30 times the Nominal Range
Damping:	0 ÷ 60 s (adjustable through HART®)
Long term stability:	< 0.1 % FS/year
Ambient / Process / Storage temperature:	-40 ÷ +85°C / -10 ÷ +80°C / -40 ÷ +90°C
Ingress protection degree:	IP68
Zero Offset:	± 1 % FS

271 Analog Submersible Level Transmitter

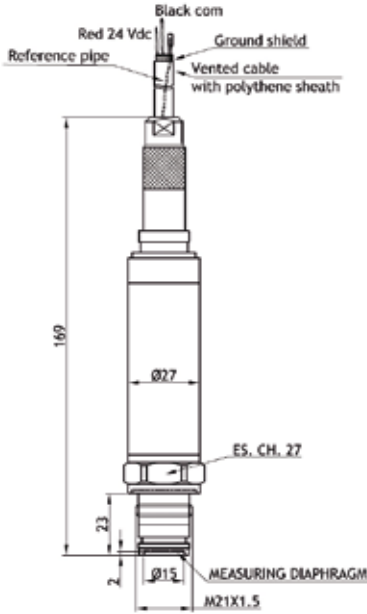
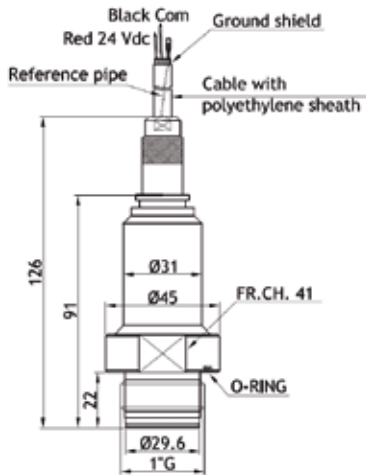
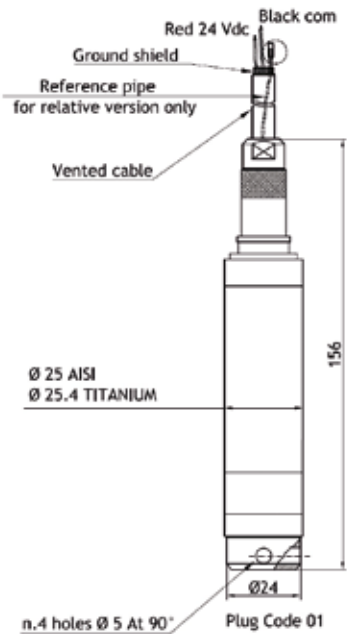


271 series includes submersible electronic level transmitters for hydrostatic pressure sensing. All 27 series versions are featured with analog electronic and have small sizes (typical housing Ø 27 mm) and fixed ranges. 271 series transmitters are used in industrial and marine applications to measure level of liquids in wells, chests, lakes, water treatment plants, tanks, pore water pressure, level, etc.



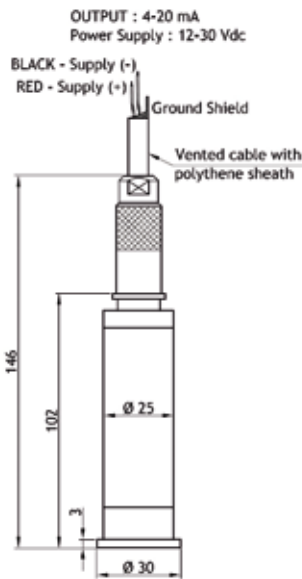
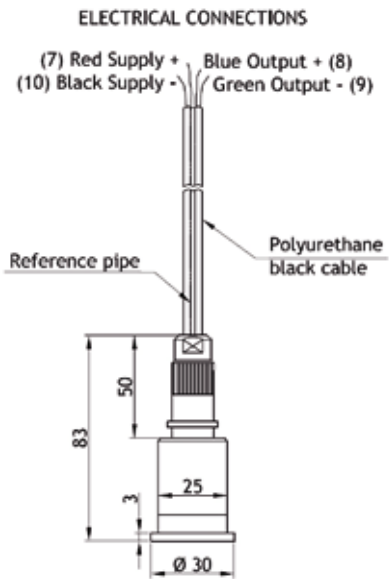
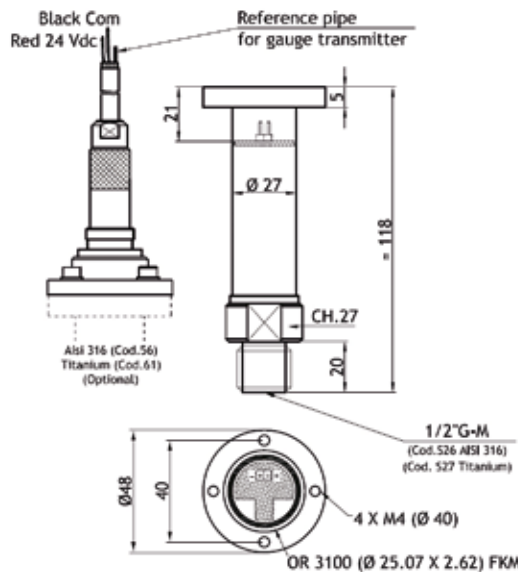
Supply:	2 wires: 11 ÷ 30 Vdc / 3 wires: 16 ÷ 26 Vdc
Output signal:	2 wires: 4 ÷ 20 mA / 3 wires: 0 ÷ 5 Vdc or 0 ÷ 10 Vdc (min 30 mVdc)
Measuring range:	From -1 ÷ 0 bar to 0 ÷ 100 bar (minimum span 100 mbar)
Max load:	650 Ohm @ 24 Vdc
Total accuracy:	< ± 0.25 % FS (+0.1 % for ranges < 0.5 bar)
Zero offset:	< ± 1 % FS
Temperature zero drift:	< ± 0.025 % FS/°C (0 ÷ 60°C)
Span thermal drift:	Piezo: < ± 0.02 % FS/°C / Ceramic: < ± 0.01 % FS/°C
Long term stability:	Piezo: < ± 0.15 % FS/year / Ceramic: < ± 0.12 % FS/year
Response time (63% FS):	Piezo: 10 ms / Ceramic: 5 ms
Allowable de-range:	Piezo down to 4 times / Ceramic down to 2.5 times the Nominal Range
Ambient / Process / Storage temperature:	-40 ÷ +85°C / -10 ÷ +80°C / -40 ÷ +90°C
Ingress protection degree:	IP68

T72/271 Submersible Special Constructions



Titanium and/or SS AISI 316 transmitters for Ballast Water, Fuel Oil, Draft and service tanks.

CODE	MEASURING RANGE	OVERPRESSURE W/O OFFSET (bar)
P21	30 ÷ 100 mbar	4
P22	70 ÷ 350 mbar	10
P23	200 ÷ 1000 mbar	20
P24	500 ÷ 2500 mbar	40
P25	1 ÷ 5 bar	50
P26	2 ÷ 10 bar	60
P27	6 ÷ 30 bar	150
P28	20 ÷ 100 bar	200
P29	40 ÷ 200 bar	600
P30	80 ÷ 400 bar	800



T7I Smart Remote Level Transmitter

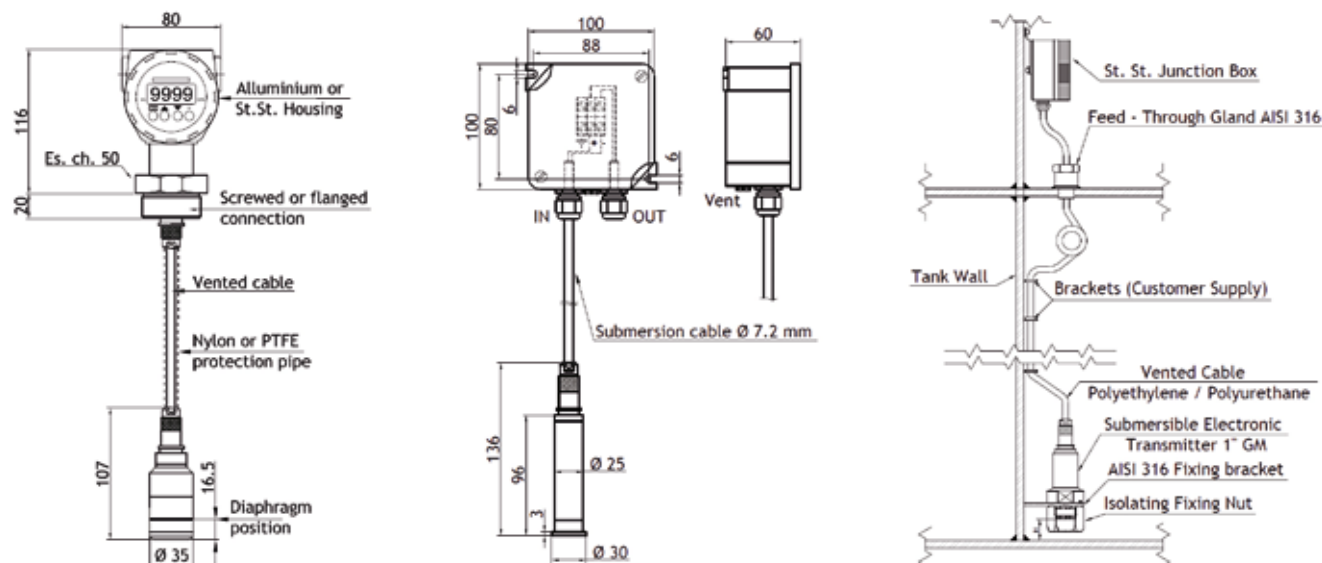


T7I series includes SMART electronic transmitters with 4 ÷ 20 mA output and HART® digital communication protocol. Sensors are calibrated individually together with their own seal. Configurations and adjustments can be made locally, by means of push buttons and display, or remotely using HART® communication protocol.



Supply:	12.5 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA + HART®
Measuring range:	From 0 ÷ 0,2 bar to 0 ÷ 100 bar
Max load:	550 Ohm @ 24 Vdc
Total accuracy:	< 0.30 % FS (-25 ÷ 0°C) / < 0.1 % FS (0 ÷ 80°C) + 0.1 % FS (for ranges < 0.5 bar)
Measured value update frequency:	4 ÷ 20 mA + HART®: ≈ 1 s / HART®: ≈ 500 ms (on request)
Polling time:	4 ÷ 20 mA + HART®: ≈ 800 ms / HART®: ≈ 500 ms (on request)
Response time (63% FS):	< 256 ms (Standard HART®)
Allowable de-range:	Down to 30 times the Nominal Range
Damping:	0 ÷ 60 s
Long term stability:	< 0.1 % FS / year
Ambient / Process / Storage temperature:	-40 ÷ +85°C / Up to -40 ÷ +130°C / -40 ÷ +90°C
Ingress protection degree:	IP66 / IP67
Zero Offset:	± 1 % FS

T7I Constructions



T7L Smart Float Level Transmitter



T7L series includes Float Reed level transmitters. Inside the float is placed a toroidal magnet which drives, without contact, reed contacts located inside the guide pipe. Moving along the guide pipe the float changes the reed contact status. These variations are then acquired by the electronic board and converted into a 4 ÷ 20 mA + HART® current signal.



Supply:	12.5 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA + HART®
Measuring range:	0.6 ÷ 10 m
Max load:	550 Ohm @ 24 Vdc
Total accuracy:	< ± 5 mm
Measured value update frequency:	4 ÷ 20 mA + HART®: ≈ 1 s / HART®: ≈ 500 ms (on request)
Polling time:	4 ÷ 20 mA + HART®: ≈ 800 ms / HART®: ≈ 500 ms (on request)
Response time (63% FS):	< 256 ms (Standard HART®)
Minimum fluid specific gravity:	0.5 kg / dm ³
Damping:	0 ÷ 60 s
Long term stability:	< 0.1 % FS / year
Ambient / Process / Storage temperature:	-40 ÷ +85°C / Up to -40 ÷ +130°C / -40 ÷ +90°C
Ingress protection degree:	IP66 / IP67
Relative Humidity:	< 98% RH not condensing

27L Analog Float Level Transmitter



27L series includes Float Reed level transmitters. Inside the float is placed a toroidal magnet which drives, without contact, reed contacts located inside the guide pipe. Moving along the guide pipe the float changes the reed contact status. These variations are then acquired by the electronic board and converted into a 4 ÷ 20 mA current signal.



Supply:	2 wires: 12 ÷ 30 Vdc / 3 wires: 16 ÷ 26 Vdc
Output signal:	2 wires: 4 ÷ 20 mA / 3 wires: 0 ÷ 10 Vdc or 0 ÷ 5 Vdc
Measuring range:	0.6 ÷ 10 m
Max load:	650 Ohm @ 24 Vdc
Total accuracy:	< ± 5 mm
Minimum fluid specific gravity:	0.5 kg / dm ³
Long term stability:	< ± 0.1 % FS / year
Ambient / Process / Storage temperature:	-40 ÷ +85°C / Up to -40 ÷ +130°C / -40 ÷ +90°C
Ingress protection degree:	IP65 / IP67
Relative Humidity:	< 98% RH not condensing

SPG Self Powered Gauge

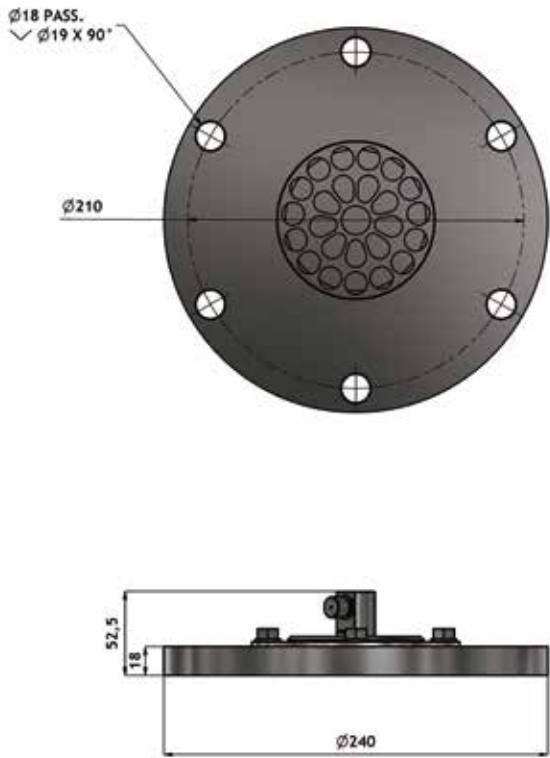
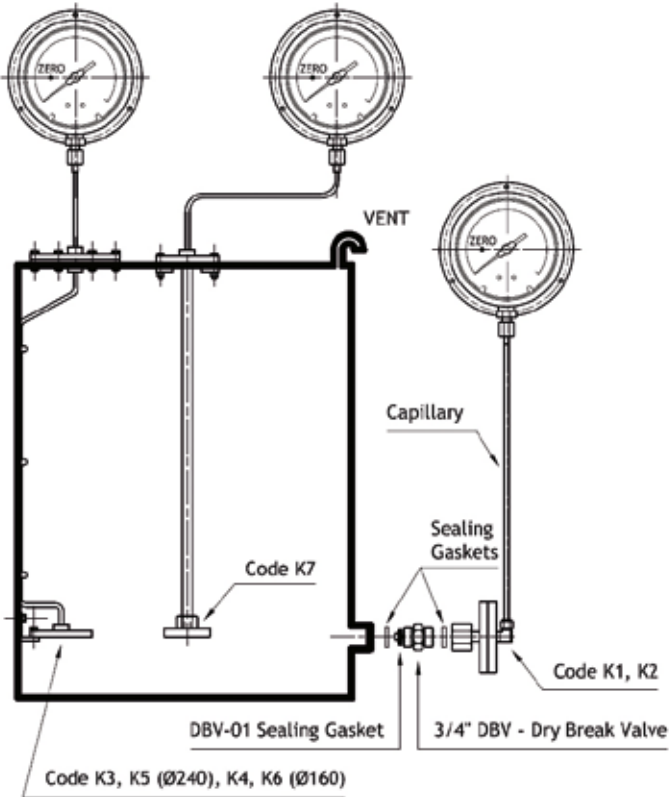


Tank gauges SPG series are available with stainless steel wetted parts for all liquid applications compatible with AISI 316 stainless steel. Mounting of the sensor, internally or externally of the tank, meet practically all installation requirements. The SPG Self Powered Gauges have been designed for Marine and Industrial applications. They are completely autonomous and provide remote continuous indication of tank contents. Indicators are of stainless steel construction. Calibration in unit of volume or depth of liquid, each scale is individually calibrated and painted.



Indicator Nominal Diameter:	DN 100 & DN 150
Capillary Length:	Standard: 10 m – up to 30 m after technical evaluation
Calibration:	According to customer specified head or volume units and tank reference
Accuracy:	Class 1 at Standard conditions between 10% and 90% of FS
Error introduced by diaphragm seal and capillary:	±1,5 % FS
Total temperature error (0 ÷ 55°C):	• Range < 1.5 mH2O : < ± 2 % FS • Range > 3 mH2O : < ± 0,5 % FS
Overload:	150 % of Range
Temperature limits:	Process: -20 ÷ 130°C Ambient: -10 ÷ 60°C
Ingress protection degree:	Sensor: IP67 / IP68 Indicator: IP65

SPG Constructions



Flanged seal diaphragm with protection shield

BMS Bubbling Measurement System

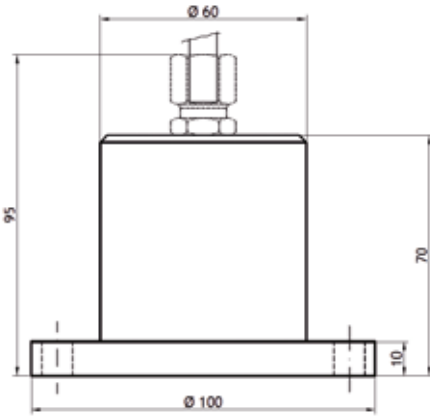


BMS is a bubbling system for level detection based on the measurement of hydrostatic pressure caused by the liquid contained in the tank. The working principle is founded on the measure of the pressure value needed to maintain a constant and regular air flow through a pipe probe open in the bottom and submerged into the liquid. At any level variation of the liquid in the tank corresponds a variation of the hydrostatic pressure of the air inside the probe pipe; these pressure variations are precisely detected by the T72 / 27M P/I transmitter and converted into a standard 4 ÷ 20 mA electric signal or HART® protocol. PR3 regulator keeps constant bubbling air flow at any level value, assuring a highly accurate measurement.

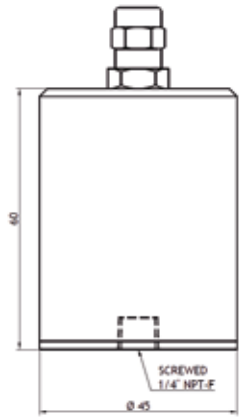


Supply:	12.5 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA / 4 ÷ 20 mA + HART® optional with T72
Measuring range:	From 0 ÷ 1 m to 0 ÷ 60 m
Max load:	550/650 Ohm @ 24 Vdc
Overpressure:	< 3 x FS
Total accuracy:	± 0.25 % FS / 0,1 % FS optional with T72
Temperature zero drift:	< ± 0.025 % FS /°C (-10 ÷ 60°C)
Span thermal drift:	Piezo: < ± 0.02 % FS/°C / Ceramic: < ± 0.01 % FS/°C
Long term stability:	Piezo: < ± 0.15 % FS/year / Ceramic: < ± 0.12 % FS/year
Response time (63% FS):	Piezo: 10 ms / Ceramic: 5 ms
Allowable de-range:	Piezo down to 4 times / Ceramic down to 2.5 times /Smart down to 10 times the Nominal Range
Ambient / Process / Storage temperature:	-40 ÷ +85°C / -10 ÷ +80°C / -40 ÷ +90°C
Relative Humidity:	< 98% RH not condensing

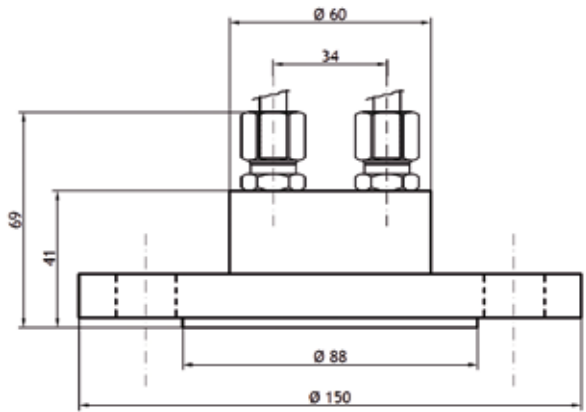
VNR Non return valve models



VNR non-return valve
Spring Type



VNR non-return valve
Spring Type



TDR Series Pneumatic
1:1 level repeater

KRG Smart Radar Level Transmitter



KRG series includes radar level transmitters. Using 26GHz microwaves, the liquid reflects them back to the instrument. The travel time, proportional to the distance between the surface and the gauge, is processed by the transmitter, in order to generate an output signal.



Supply:	10,5 ÷ 36 Vdc
Output signal:	4 ÷ 20 mA + HART®
Measuring range:	1 ÷ 30 m
Frequency:	26 GHz
Total accuracy:	Up to ± 2 mm
Tracking Rate:	2 m/s
Beam Angle (α):	8°<α<25° depending on the Antenna type
Response time (63% FS):	< 256 ms (Standard HART®)
Fluid typologies:	Crude oil, Alcohol, acids, water based fluids
Ambient / Process / Storage temperature:	-40 ÷ +85°C / Up to -40 ÷ +200°C / -40 ÷ +90°C
Ingress protection degree:	IP66
Relative Humidity:	< 98% RH not condensing

GMG Smart Guided Wave Radar Level Transmitter



GMG uses TDR (Time Domain Reflectometry) technology: low-energy, high-frequency electromagnetic impulses are propagated along the probe which is immersed in the liquid to be measured. GMG is equipped with single rod, wire rope or coaxial probe for continuous level measurement and point level detection in liquids and light solid, with analog and switching output.



Supply:	12 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA (4 wires)
Rope lenght:	1000 ÷ 20000 mm
Max load:	500 Ohm @24 Vdc
Current consumption:	<70 mA @24 Vdc
Total accuracy:	0.03 % FS
Repeatability:	<2 mm
Resolution:	<1 mm
Temperature drift:	< ± 0.2 mm/°C
Response time (63% FS):	<100 ms
Ambient / Process / Storage temperature:	-25 ÷ +80°C / -40 ÷ +150°C / -40 ÷ +85°C
Ingress protection degree:	IP68
Relative Humidity:	< 98% RH not condensing

ASL Ultrasonic Level Switch

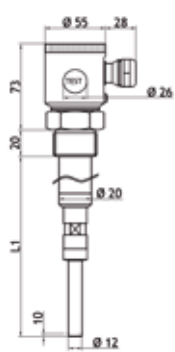


ASL instrument is designed for marine and on-land applications for liquid detection, pump control, water ingress alarm systems, overfilling protection on liquids with or without foam. ASL works on Valcom® proprietary principle of distributed acoustic waves in a metal rod. If the rod is not covered by the liquid the acoustic waves are dispersed freely without any interference. If liquid covers the rod the emission of acoustic waves is muffled and this interference is picked up by the piezoelectric sensor and converted into an on-off signal. These instruments have no moving parts, no vibration, no optical or capacitive detectors, they are pure static instruments offering the maximum reliability.

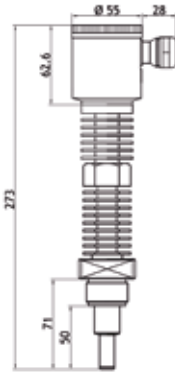


Supply:	12 ÷ 30 Vdc
Current Output signal:	ON-OFF 5 mA \ 13 mA
Frequency Output signal:	ON-OFF 1.2 kHz \ 3.8 kHz (± 30 %)
Relay Output signal:	1 A @ 30 Vdc – Max Switching Power 30 W \ 2.5 VA (non ATEX version)
Length of probe:	Rigid up to 6 m / Flexible up to 20 m
Switching point:	10 mm from bottom of probe.
Repeatability:	Vertical Mounting: <3 mm / Horizontal Mounting: <1 mm
Ambient / Process / Storage temperature:	-40 ÷ +85°C / -200 ÷ +450°C / -40 ÷ +90°C
Ingress protection degree:	IP66 / IP68
Relative Humidity:	< 98% RH not condensing

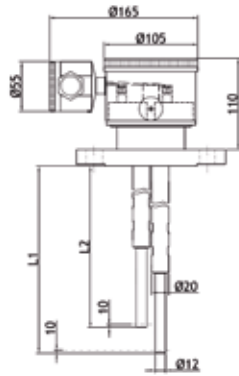
ASL Constructions



Single probe ASL

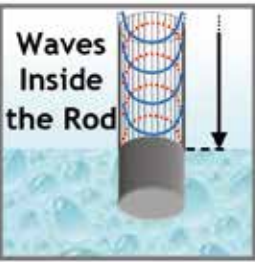


ASL for High Temperature Application

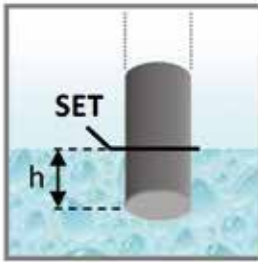


Double probe ASL with high and overflow alarm

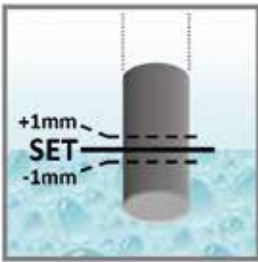
ASL level switches are supplied with a sensor able to transmit and receive ultrasonic waves. The pulse train generated is guided in a cylindrical St St rod; an ultrasonic wave is driven into the rod up to the end of the antenna, where is partially dispersed and partially reflected back. The entity of the amplitude of this reflection is great when the final part of the antenna is submerged in a fluid, much more than the case in which the antenna is “in the air”.



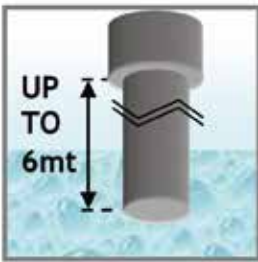
NO VIBRATING OR MOVING PARTS



SWITCHING POINT BACKED UP



EXTRAORDINARY REPEATABILITY



RIGID ANTENNA UP TO 6mt



FLEXIBLE ANTENNA UP TO 20mt

LSG Float Level Switch

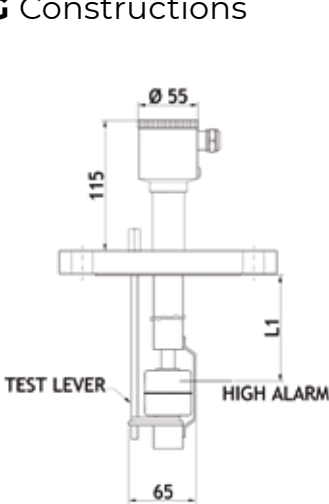


LSG is a float level switch designed for liquid level control. Typical applications are high and overfilling protection, water presence detection, high and low alarm level of liquids with or without foam. Inside the float is placed a toroidal magnet which drives, without contact, a switch located inside the guide pipe; instrument have to be supplied with a constant voltage of 24 Vdc (for example by means of VALCOM® TSU barrier) in order to provide two constant current output values related to alarm thresholds (On=6mA / Off=14mA). Switch replacement can be done without dismantling instrument from the process and doesn't need any recalibration. LSG can be used also in ON/OFF mode (simple connection).

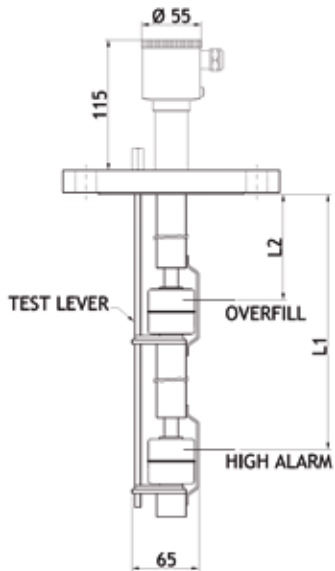


Supply:	24 Vdc stabilized
Output signal:	Current output: 6mA (ON) – 14mA (OFF) @24 Vdc or Simple contact
Measuring Range:	Minimum 48 mm
Repeatability:	<1 cm
Working Pressure:	Standard 10 bar – Maximum 25 bar
Ambient / Process / Storage temperature:	-35 ÷ +85°C / -40 ÷ +130°C / -35 ÷ +85°C
Ingress protection degree:	IP67
Relative Humidity:	< 98% RH not condensing

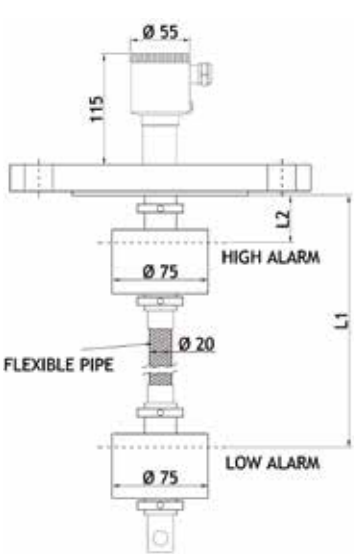
LSG Constructions



Single Float LSG

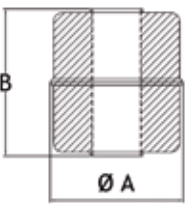


Double float LSG with high and overfill alarm



Double float LSG with flexible pipe

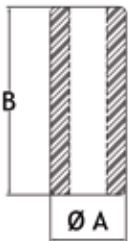
TYPES OF FLOATS



A=Ø30, B=36, Density 0.67 Kg/dm³
A=Ø44.4, B=51 Density 0.5 Kg/dm³
A=Ø55, B=62.5 Density 0.5 Kg/dm³
Float Material SS AISI 316



A=Ø75, B= 50, Density 0.3 Kg/dm³
Float Material NEOPRENE



A=Ø40, B=100, Density 0.35 Kg/dm³
Float Material SPANSIL

LSG-02 Bilge Level Switch



LSG-02 is a float level switch designed for detecting bilge liquid level and for controllling the level of oily and salty waters in marine and industrial fields. Typical applications are high and overfilling protection, water presence detection, high and low alarm level of liquids with or without foam. Inside the float is placed a toroidal magnet which drives, without contact, a switch located inside the guide pipe. The switch is equipped with integral test lever that conforms to class rules without complicating installation. Switch replacement can be done with no need of recalibration.



Type of contact:	ON/OFF contacts: SPST standard; SPDT on request
Repeatability:	<1 cm
Liquid specific gravity:	> 0,63 kg/l
Max pressure:	20 bar
Process temperature:	-20 ÷ +85°C / -40 ÷ +130°C
Protection degree:	IP68

TYPES OF CABLES:

PICTURE	TYPE & DESCRIPTION	TECHNICAL FEATURES	APPLICATION FEATURES
	POLYETHYLENE (PE) 6 wires in tinned copper Wire section: 6xAWG24 Shielding: Cu Sn twisted >90% Reference at atmosphere: YES	Test Voltage: 500 V AC x 60 sec Resistance: <100 ohm/Km Inductance: 0,4 mH/Km Capacitance: <65 pF/m Temperature limits: -30/+60 °C	- Lowest water absorption - Approved for drinking water - Suitable for ballast, oil, fresh water and service tanks - Avoid exposure to sunlight Not recommended for Diesel Oil unless protected (*)
	POLYETHYLENE (PE) 7 wires in tinned copper isolated per couple Wire section: 7xAWG24 Shielding: Cu Sn twisted >90% Reference at atmosphere: YES	Test Voltage: 500 V AC x 60 sec Resistance: <100 ohm/Km Inductance: 0,4 mH/Km Capacitance: <65 pF/m Temperature limits: -30/+60 °C	- Lowest water absorption - Approved for drinking water - Suitable for ballast, oil, fresh water and service tanks - Avoid exposure to sunlight Not recommended for Diesel Oil unless protected (*)
	POLYETHYLENE (PE) 3 wires in tinned copper Wire section: 3xAWG24 Shielding: Cu Sn twisted >90% Reference at atmosphere: NO	Test Voltage: 500 V AC x 60 sec Resistance: <100 ohm/Km Inductance: 0,4 mH/Km Capacitance: <65 pF/m Temperature limits: -30/+60 °C	- Lowest water absorption - Approved for drinking water - Suitable for ballast, oil, fresh water and service tanks - Avoid exposure to sunlight Not recommended for Diesel Oil unless protected (*)
	POLYURETHANE (PUR) 3 wires in tinned copper Wire section: 3xAWG24 Shielding: Cu Sn twisted >90% Reference at atmosphere: YES	Test Voltage: 500 V AC x 60 sec Resistance: <100 ohm/Km Inductance: 0,4 mH/Km Capacitance: <65 pF/m Temperature limits: -30/+80 °C	- Widely used in ballast, oil and service tanks. - Limited resistance to Diesel Oils unless protected (*)
	POLYURETHANE (PUR) 3 wires in tinned copper Wire section: 3xAWG24 Shielding: Cu Sn twisted >90% Reference at atmosphere: YES	Test Voltage: 500 V AC x 60 sec Resistance: <100 ohm/Km Inductance: 0,4 mH/Km Capacitance: <65 pF/m Temperature limits: -30/+80 °C	- Suggested for hot water and Oil - Overlaied protection for other hot liquids is recommended in particular PTFE/SS AISI 316 (*)

(*) Under request, all types of cables can be overlaid with protection in RILSAN, PTFE or SS AISI 316 sleeve for submersion into Diesel Oil or other aggressive chemical liquids.

ACCESSORIES FOR LEVEL MEASUREMENT



ABS/PVC/PVDF submersible sensors



HMI Data acquisition
and control panel



Test Magnet for ASL Series



VCM ATEX Electrical plug connectors



Process connection with sliding
nipple for ASL Series



Finned body for temperature range
from -200°C to +450°C
for ASL Series



JBX in AISI 316 or Aluminum
Junction Box



1" Mounting Bracket with
Delrin/Moplen protection Cap
and isolating ring



Housing with thermo-shrinkable
sleeve protection



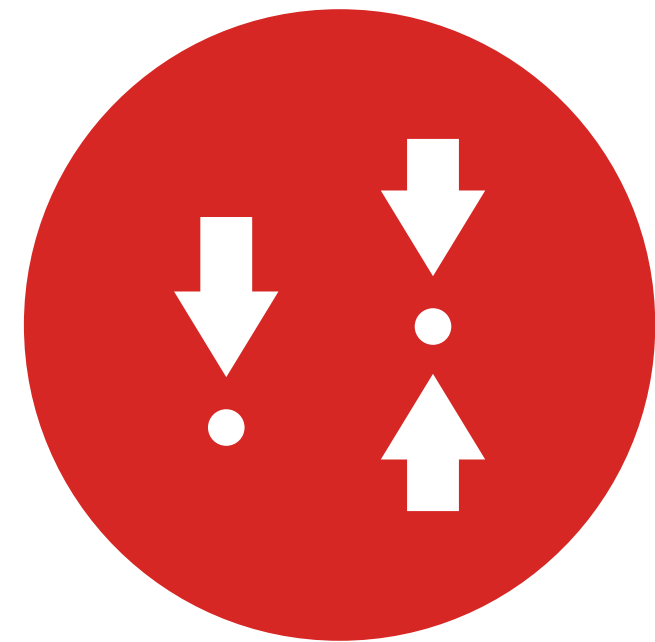
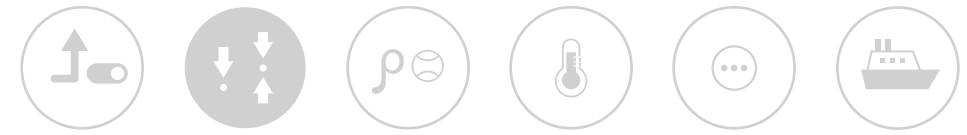
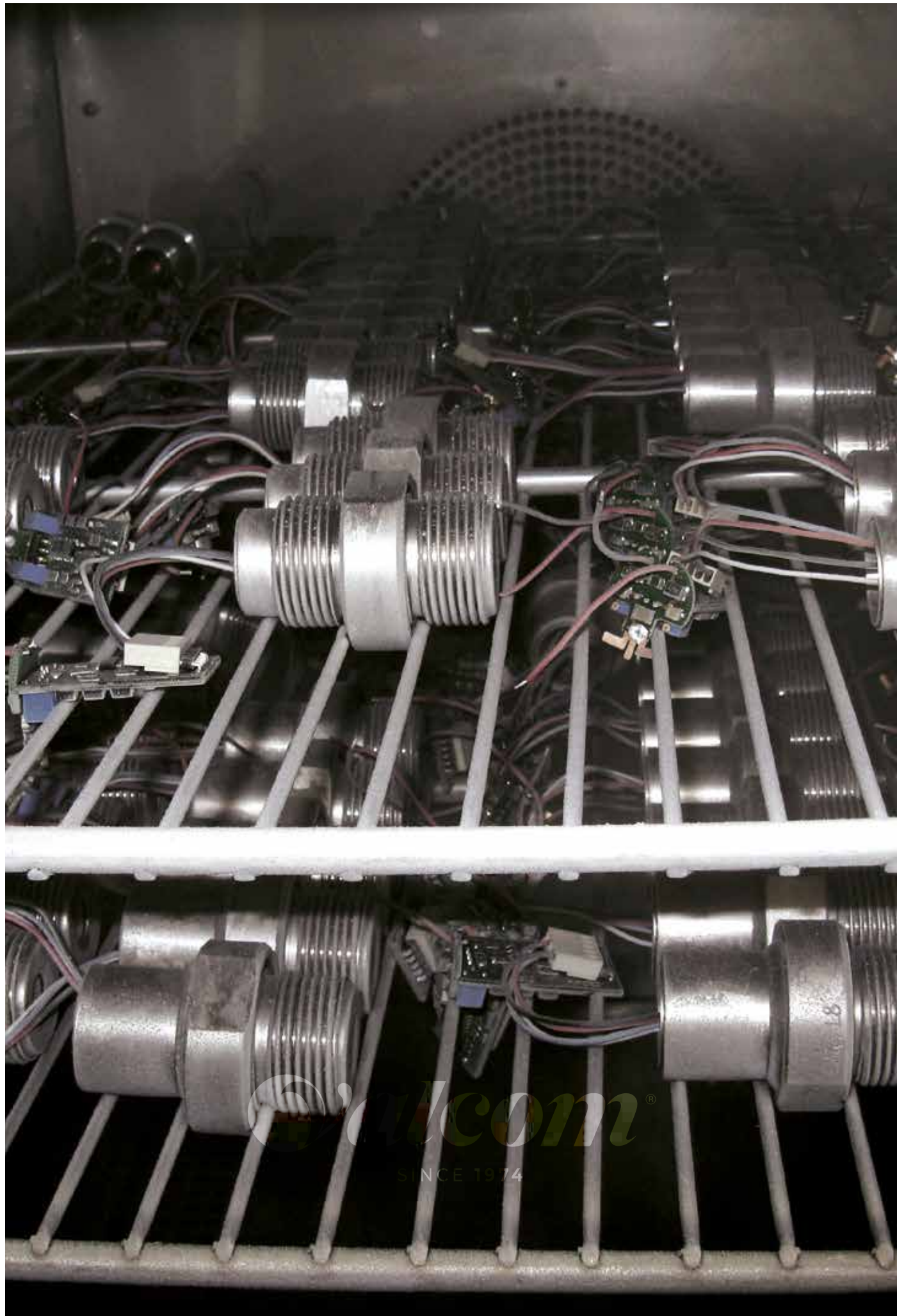
PAI Pump control
and monitoring Panel



Sliding bracket on submersible cable



Intrinsic safety Barrier Single
or Double channel



PRESSURE & DIFFERENTIAL PRESSURE



T7N Smart Pressure Transmitter



T7N series are Smart electronic transmitters with 4 ÷ 20 mA + HART® output. Sensors are always calibrated individually together with their own seal. These transmitters allow the measurement of pressure, vacuum and level in industrial, marine and off-shore. Configurations and adjustments can be made locally by means of push buttons and display or remotely using HART® protocol compatible communicators. The transmitters are intended for direct mounting on pipe or tank. For remote sensor version and when remote seal and capillary are supplied, a bracket for wall or for 2" stand pipe mounting is also supplied.



Supply:	12.5 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA + HART®
Measuring range:	From 0 ÷ 0,1 bar to 0 ÷ 1000 bar
Max load:	550 Ohm @ 24 Vdc
Total accuracy:	< 0.20 % FS (-25 ÷ 0°C) / < 0.1 % FS (0 ÷ 80°C)
Measured value update frequency:	4 ÷ 20 mA + HART®: ≈ 1 s / HART®: ≈ 500 ms (on request)
Polling time:	4 ÷ 20 mA + HART®: ≈ 800 ms / HART®: ≈ 500 ms (on request)
Response time (63% FS):	< 256 ms (Standard HART®)
Allowable de-range:	Down to 30 times the Nominal Range
Damping:	0 ÷ 60 s
Long term stability:	< 0.1 % FS / year
Ambient / Process / Storage temperature:	-40 ÷ +85°C / -40 ÷ +280°C / -40 ÷ +90°C
Ingress protection degree:	IP66 / IP67
Relative Humidity:	< 98% RH not condensing

T79 Smart Pressure Transmitter



T79 series are Smart electronic transmitters with 4 ÷ 20 mA + HART® output. The design of the housing in SS AISI 316 is specially developed with only one cover, for easy wall installation or back process connection. Configurations and adjustments can be made locally by means of push buttons and display or remotely using HART® protocol compatible communicators.



Supply:	12.5 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA + HART®
Measuring range:	From 0 ÷ 0,1 bar to 0 ÷ 1000 bar
Max load:	550 Ohm @ 24 Vdc
Total accuracy:	< 0.20 % FS (-25 ÷ 0°C) / < 0.1 % FS (0 ÷ 80°C)
Measured value update frequency:	4 ÷ 20 mA + HART®: ≈ 1 s / HART®: ≈ 500 ms (on request)
Polling time:	4 ÷ 20 mA + HART®: ≈ 800 ms / HART®: ≈ 500 ms (on request)
Response time (63% FS):	< 256 ms (Standard HART®)
Allowable de-range:	Down to 30 times the Nominal Range
Damping:	0 ÷ 60 s
Long term stability:	< 0.1 % FS / year
Ambient / Process / Storage temperature:	-40 ÷ +85°C / -40 ÷ +280°C / -40 ÷ +90°C
Ingress protection degree:	IP67
Relative Humidity:	< 98% RH not condensing

T7D Smart Differential Pressure Transmitter



T7D series are Smart electronic differential pressure transmitters with 4 ÷ 20 mA output and HART® digital communication protocol. These transmitters allow the measurement of differential pressure, level and volumetric flow. Configurations and adjustments can be made locally by means of push buttons and display or remotely using HART® protocol compatible communicators. When remote seal and capillary are supplied, a bracket for wall or for 2" stand pipe mounting is also supplied. It's available with aluminum or AISI 316 housing.



Supply:	12.5 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA + HART®
Measuring range:	From -0 ÷ 0,1 bar to 0 ÷ 10 bar
Max load:	550 Ohm @ 24 Vdc
Total accuracy:	< 0.20 % FS (-25 ÷ 0°C) / < 0,1 % FS (0 ÷ 80°C)
Measured value update frequency:	4 ÷ 20 mA + HART®: ≈ 1 s / HART®: ≈ 500 ms (on request)
Polling time:	4 ÷ 20 mA + HART®: ≈ 800 ms / HART®: ≈ 500 ms (on request)
Response time (63% FS):	< 256 ms (Standard HART®)
Allowable de-range:	Down to 30 times the Nominal Range
Damping:	0 ÷ 60 s
Long term stability:	< 0.1 % FS/year
Ambient / Process / Storage temperature:	-40 ÷ +85°C / -40 ÷ +280°C / -40 ÷ +90°C
Ingress protection degree:	IP66 / IP67

T72-D Smart Differential Pressure Transmitter



T72 series are Smart electronic transmitters with 4 ÷ 20 mA output and HART® digital communication protocol. These transmitters allow the measurement of differential pressure level and volumetric flow. Configurations and adjustments can be made remotely using HART® protocol compatible communicators. For remote sensor version and when remote seal and capillary are supplied, a stainless steel bracket for wall mounting is also available.



Supply:	12.5 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA + HART®
Measuring range:	From 0 ÷ 0,1 bar to 0 ÷ 20 bar
Max load:	550 Ohm @ 24 Vdc
Total accuracy:	< 0.20 % FS (-25 ÷ 0°C) / < 0.1 % FS (0 ÷ 80°C)
Measured value update frequency:	4 ÷ 20 mA + HART®: ≈ 1 s / HART®: ≈ 500 ms (on request)
Polling time:	4 ÷ 20 mA + HART®: ≈ 800 ms / HART®: ≈ 500 ms (on request)
Response time (63% FS):	< 256 ms (Standard HART®)
Allowable de-range:	Down to 30 times the Nominal Range
Damping:	0 ÷ 60 s
Long term stability:	< 0.1 % FS/year
Ambient / Process / Storage temperature:	-40 ÷ +85°C / -40 ÷ +280°C / -40 ÷ +90°C
Ingress protection degree:	IP66 / IP67

T72 Smart Pressure Transmitter



T72 series are Smart electronic transmitters with 4 ÷ 20 mA output and HART® digital communication protocol. Sensors are always calibrated individually together with their own seal. These transmitters allow the measurement of pressure (absolute, relative or differential), vacuum and level in industrial, marine and off-shore. Configurations and adjustments can be made remotely using HART® protocol compatible communicators.



Supply:	12.5 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA + HART®
Measuring range:	From 0 ÷ 0,1 bar to 0 ÷ 1000 bar
Max load:	550 Ohm @ 24 Vdc
Total accuracy:	< 0.20 % FS (-25 ÷ 0°C) / < 0.1 % FS (0 ÷ 80°C)
Measured value update frequency:	4 ÷ 20 mA + HART®: ≈ 1 s / HART®: ≈ 500 ms (on request)
Polling time:	4 ÷ 20 mA + HART®: ≈ 800 ms / HART®: ≈ 500 ms (on request)
Response time (63% FS):	< 256 ms (standard HART®)
Allowable de-range:	Down to 30 times the Nominal Range
Damping:	0 ÷ 60 s
Long term stability:	< 0.1 % FS/year
Ambient / Process / Storage temperature:	-40 ÷ +85°C / -40 ÷ +280°C / -40 ÷ +90°C
Ingress protection degree:	IP65 / IP67
Relative Humidity:	< 98% RH not condensing

VHS Valcom HART® Server



Valcom® HART® Server is an application software that allows the user to access the process and diagnostic data available on HART® field transmitters. It has been developed with the HART® (FieldComm Group™) protocol. Valcom® HART® Server can be used with any HART® instruments of any manufacturers and the read data from the field are easily accessible by the operator. With the Valcom® HART® Server is supplied an interface that allows the management of the whole instrumentation parameters as well as the recording of the measure with the integrated Data Logger feature.



Supported Systems:	Microsoft Windows (from XP up to version 10)
RAM Memory:	Minimum Version 4.0
USB Interface:	HART® USB or HART® RS232
Supported HART® Instruments:	15 Sensors for each Bus
Functions:	Set Zero, Set 4 ÷ 20 mA Span, Damping Value, PV measure Unit, Set Alarm Mode, Loop Test, DAC Trim
Main Features:	Transmitter TAG, Polling Address and ID direct configuration feature, Quality of transmission diagnostics, Parallel displayed in real-time all the data from the transmitters connected to each loop, Data Logger feature to record the data
Other Features:	Dedicated Valcom® transmitter windows, with specific command implemented for every series of instruments, Universal windows to be used with any HART® transmitters, from any manufacturers, Display the table of the process variables (PV, SV, TV, QV) with relative measure units, TAG and description, Ability to send HART® specific commands
Relative Humidity:	< 98% RH not condensing

86A Analog Pressure Transmitter



86A series are electronic transmitters with 4 ÷ 20 mA output. All versions allow zero and span adjustments by suitable trimmers and dip-switches located inside the housing. The transmitters are intended for direct mounting on pipe or tank. For remote sensor version and when remote seal and capillary are supplied, a bracket for wall or for 2" stand pipe mounting is also supplied.



Supply:	12 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA
Measuring range:	From -1 ÷ 0 bar to 0 ÷ 1000 bar (minimum span 100 mbar)
Max load:	600 Ohm @ 24 Vdc
Total accuracy:	< ± 0.25 % FS
Zero offset:	< ± 1 % FS
Temperature zero drift:	< ± 0.025 % FS /°C (-10 ÷ 60°C)
Span thermal drift:	Piezo: < ± 0.02 % FS/°C / Ceramic: < ± 0.01 % FS/°C
Long term stability:	Piezo: < ± 0.15 % FS/year / Ceramic: < ± 0.12 % FS/year
Response time (63% FS):	Piezo: 5 ms / Ceramic: 10 ms
Allowable de-range:	75 % FS, 50 % FS, 25 % FS
Ambient / Process / Storage temperature:	-40 ÷ +85°C / -40 ÷ +280°C / -40 ÷ +90°C
Ingress protection degree:	IP66 / IP67

27A Analog Pressure Transmitter



27A series includes electronic level, pressure and vacuum transmitters. All versions have analogue electronics, small sizes (typical housing Ø 27 mm) and fixed ranges (when possible to adjust zero and span, this can be done within ± 10 %). The transmitters are, as standard, installed on process, or supported by the process pipe or flanged on mating flange. For remote sensor version and when remote seal and capillary are supplied, a stainless steel bracket for wall mounting is also available.



Supply:	2 wires: 11 ÷ 30 Vdc / 3 wires: 16 ÷ 26 Vdc
Output signal:	2 wires: 4 ÷ 20 mA / 3 wires: 0 ÷ 5 Vdc or 0 ÷ 10 Vdc (min 30 mVdc)
Measuring range:	From -1 ÷ 0 bar to 0 ÷ 1000 bar (minimum span 100 mbar)
Max load:	650 Ohm @ 24 Vdc
Total accuracy:	< ± 0.3 % FS
Zero offset:	< ± 1 % FS
Temperature zero drift:	< ± 0.025 % FS /°C (-10 ÷ 60°C)
Span thermal drift:	Piezo: < ± 0.02 % FS/°C / Ceramic: < ± 0.01 % FS/°C
Long term stability:	Piezo: < ± 0.15 % FS/year / Ceramic: < ± 0.12 % FS/year
Response time (63% FS):	Piezo: 10 ms / Ceramic: 5 ms
Allowable de-range:	Piezo down to 4 times / Ceramic down to 2.5 times the Nominal Range
Ambient / Process / Storage temperature:	-40 ÷ +85°C / -40 ÷ +280°C / -40 ÷ +90°C
Ingress protection degree:	IP65 / IP67
Relative Humidity:	< 98% RH not condensing

27D Differential Electronic Pressure Transmitter



27D series includes transmitters for differential pressures and level measurement. All 27D series versions have analogue electronics, small sizes (typical housing Ø 27 mm) and fixed ranges (when possible to adjust zero and span, this can be done within ± 10 %). The transmitters are, as standard, installed on and supported by the process pipe or flanged on mating flange. For remote sensor version and when remote seal and capillary are supplied, a stainless-steel bracket for wall mounting or for stand pipe 2" is also supplied.



Supply:	2 wires: 12 ÷ 30 Vdc / 3 wires: 16 ÷ 26 Vdc
Output signal:	2 wires: 4 ÷ 20 mA / 3 wires: 0 ÷ 5 Vdc or 0 ÷ 10 Vdc (min 30 mVdc)
Measuring range:	From 0 ÷ 0,1 bar to 0 ÷ 20 bar
Max load:	650 Ohm @ 24 Vdc
Total accuracy:	< ± 0.25 % FS
Zero offset:	< ± 1 % FS
Temperature zero drift:	< ± 0.025 % FS /°C (-10 ÷ 60°C)
Span thermal drift:	< ± 0.02 % FS/°C
Long term stability:	< ± 0.3 % FS/year
Response time (63% FS):	5 ms
Ambient / Process / Storage temperature:	-40 ÷ +85°C / -40 ÷ +280°C / -40 ÷ +90°C
Ingress protection degree:	IP65 / IP67
Relative Humidity:	< 98% RH not condensing

MAN Pressure Gauge



Entirely manufactured in stainless steel (case in 304 and pressure connection in 316), they are particularly resistant to work in harsh conditions and environment. They are used in ships, chemical, petrochemical, canning food and pharmaceutical industry. Thanks to the filling (optional) it is possible to make the gauge work with water hammers, pulsating pressures and vibrations. Available also for ATEX installations.



Measuring element:	Stainless steel seamless pipe
Measuring range:	From -1 ÷ 0 bar to 0 ÷ 250 bar
Accuracy Class:	Standard:1.6 / Up to Class 1
Temperature drift:	± 0.3 %FS/10°C
Filling liquid:	Optional with Glycerin or Siliconic Oil
Temperatures with dry execution:	Ambient: -30°C ÷ +65°C / Process: -40°C ÷ +180°C
Temperatures with filling:	Ambient: -5°C ÷ +60°C / Process: -5°C ÷ +70°C
Ingress protection degree:	IP55 / IP65 (With filling fluid)

TDR Pressure & Level Transducers Ratio 1:1



TDR series transducers are working on a force balance principle and have been realized to measure level of liquids in open vessels or pressure in closed systems. The pneumatic output signal ratio is 1:1 with the measured variable. They are used in connection with the pneumatic receivers and/or pressure switches installed locally or on control panels for indication alarm, or in connection with pneumatic controllers for analog pneumatic control of level and pressure.



Supply:	1.2 times max measured pressure
Output signal:	1 to 1 ratio
Measuring range:	from 0...1mH2O up to 0...10bar
Total accuracy:	better than 1%
Repeatability:	0.15%
Max static pressure:	10 bar
Max medium temperature:	150°C
Diaphragm material:	PTFE; Titanium; FL ; AISI 316 st.st.; Hastelloy B or C ; etc..
Air consumption:	0.08 Nm3/h max
Connection:	1/8" G- F
O-Rings on process material:	FKM
Body and welding nipple material:	AISI 316 st.st.; Hastelloy B or C; Titanium

TLP Pneumatic Level Transmitter



TLP series are specifically designed for level measurement, and transmission, in open tanks or chests containing dense or viscous liquids. These transmitters are available in two versions: with flush mounting diaphragm (TLP1) and with extended diaphragm (TLP2). The measurement diaphragm, facing the process liquid, doesn't have any death zones so the TLP can be used with dense and viscous liquids even if they contain suspended solids.



Supply:	~1.4 bar (19 ÷ 24 psi)
Output:	0.2 ÷ 1 bar (3 ÷ 15 psi)
Air consumption:	250 NI/h
Total accuracy:	± 1% FS
Linearity:	± 0,25%
Histeresys:	≤ 0,1%
Repeatability:	≤ 0,1%
Overpressure:	2x full span
Supply pressure influence:	0.1% FS/1psi
Temperature error at zero:	0.4% FS/10°C
Ambient temperature:	-20 ÷ +80°C
Process temperature:	-20 ÷ +100°C
Measuring ranges:	Ø62 diaphragm 0÷5000 mmH2O; Ø28 diaphragm 0÷25000 mmH2O
Pneumatic connections:	1/8" NPT-F
Process connections:	DN80 PN10 flange; DN 3" ANSI 150 RF flange

PRESSURE SPECIAL CONSTRUCTIONS

CAP-SEP Series for Relative TX



Pressure / Level transmitters with PTFE wetted parts and Tantalum / Hastelloy C / Titanium diaphragm for service on highly aggressive fluids.

Transmitter for installation in hot and aggressive environment complete with capillary and remote seal.



Level / Pressure transmitters with plastic wetted parts, plastic rotating flange and PTFE covered Hastelloy C diaphragm.

Different versions of seals, wafer type manufactured in various materials as Norsok and NACE MR 0175 compliant.



DIFFERENTIAL PRESSURE SPECIAL CONSTRUCTIONS

CAP-SEP Series for Differential TX



Compact DP transmitter body with SS capillary armour and wafer seals.

Flanged level transmitter up to 8" / 200mm flange. Extensions length to 250 mm and Ø 73, 74, 76, 80, 96 mm available.



Differential pressure transmitter with special SS AISI 316 housing with back connection, wafer remote seals and plastic protection on capillaries.

Full SS AISI 316 differential pressure transmitter for the measuring of level, with welding ring connection and flush diaphragm.



ACCESSORIES FOR PRESSURE MEASUREMENT



SYP Cooling Syphon



PDA Pulsation dampener



OVP Overpressure protector



Welding nipple



MAN2 two ways manifold



R4 Finned extension with 4 or 11 fins

ACCESSORIES FOR DIFFERENTIAL PRESSURE MEASUREMENT



MAN3 / MAN5 Three / Five ways and
Three / Five valves manifold



ORI Calibrated flanges



SEP Process seals



SUN Sunshade protection



T7V Digital field indicator



27 Transmitter with Shut-Off valve
and test nipple



Exalcom[®]
SINCE 1974



DENSITY & FLOW



T7S Smart Density Transmitter



T7S series are smart electronic transmitters with 4 ÷ 20 mA + HART®. These transmitters allow the measurement of specific gravity of fluids as liquids or cement slurry. The instrument gives the specific gravity value of the product by measuring the static differential pressure between the two seals (Δp) and applying the formula $p = \Delta p / d$ where “p” is the specific gravity, “ Δp ” is the differential pressure and “d” is the distance between the two seals. Configurations and adjustments can be made locally by means of push buttons and display or remotely using HART® protocol compatible communicators. A bracket for wall or for 2” stand pipe mounting is also supplied.



Supply:	12.5 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA + HART®
Measuring range:	From -0 ÷ 250 g/l to 0 ÷ 3000 g/l
Max load:	550 Ohm @ 24 Vdc
Total accuracy:	± 2 g/l for span of 1000 g/l
Sensitivity:	0.1 g/l
Fluid specific gravity:	0.5 kg / dm ³ ÷ 5 kg / dm ³
Measured value update frequency:	4 ÷ 20 mA + HART®: ~ 1 s / HART®: ~ 500 ms (on request)
Polling time:	4 ÷ 20 mA + HART®: ~ 800 ms / HART®: ~ 500 ms (on request)
Response time (63% FS):	< 256 ms (Standard HART®)
Allowable de-range:	Down to 30 times the Nominal Range
Damping:	0 ÷ 60 s
Long term stability:	< 0.1 % FS/year
Ambient / Process / Storage temperature:	-40 ÷ +85°C / -10 ÷ +130°C / -40 ÷ +90°C
Ingress protection degree:	IP66 / IP67

T7B Smart Displacer Density Transmitter



T7B series transmitters are used in all industry branches for continuous measurement of specific gravity, level and interface of liquids in open or closed tanks. Because of the adopted construction solutions, T7B allows to realize a reliable measuring system easy to install since no additional components are required.



Supply:	12.5 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA + HART®
Measuring range:	500 ÷ 3000 g/l
Max load:	550 Ohm @ 24 Vdc
Density total accuracy:	± 3 g/l
Measured value update frequency:	4 ÷ 20 mA + HART®: ~ 1 s / HART®: ~ 500 ms (on request)
Polling time:	4 ÷ 20 mA + HART®: ~ 800 ms / HART®: ~ 500 ms (on request)
Response time (63% FS):	< 256 ms (Standard HART®)
Damping:	0 ÷ 60 s
Ambient / Process / Storage temperature:	-40 ÷ +85°C / -100 ÷ +350°C / -40 ÷ +90°C
Ingress protection degree:	IP66 / IP67
Relative Humidity:	< 98% RH not condensing

Differential Pressure Transmitters combined with measuring elements



ORI Series
Orifice flange assembly
in SS AISI 304/316



MUL Series
Multistage and Multihole
meter run



WGE Series
Fully SS AISI 316 wedge unit with
integral manifold



PIT Series
Pitot tube with remote or integrally
mounted DP transmitter



VCO Series
V-Cone flow element with
flanged connections

UPF Ultrasonic Portable Flowmeter

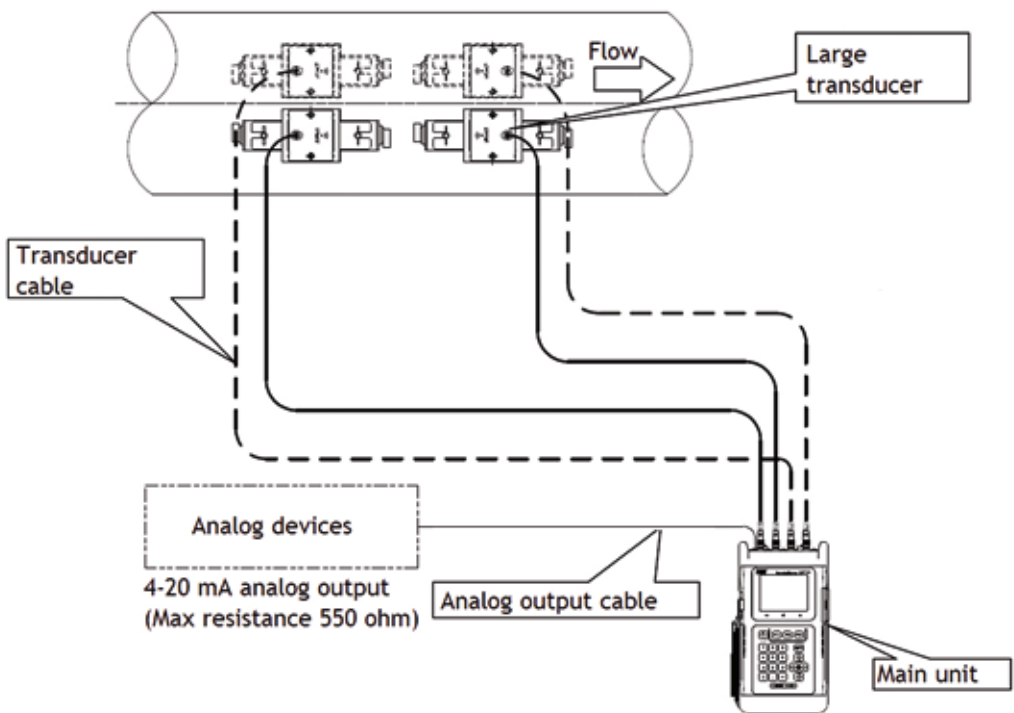


Ultrasonic flowmeter UPF is a next-generation instrument that meets technically advanced ergonomic standard requirements. This system is particularly advised to carry out measurements in severe operating environments and in places difficult to be reached. Ultrasonic flowmeter UPF is suitable for use in flow measuring tasks that require advanced performance, a simple installation method and a high portability for flow measurement of clean fluid in the absence of bubbles and solid parts suspended.

- Portable Clamp-on version
- Kit for energy application
- Double channel
- USB port for datas downloading



Supply:	90 ÷ 264 Vac 47 ÷ 63 Hz (47 ÷ 63Hz/AC adapter included)
Measuring range:	-30 ÷ +30 m/s
Process Connections:	Clamp on: DN 13 ÷ 50 mm / DN 20 ÷ 500 mm / DN 300 ÷ 5000 mm
Accuracy DN 13÷50mm:	V > 1 m/s ± 2%; V < 1m/s ± 0,02m/s
Accuracy DN 50÷300mm:	V > 1 m/s ± 1,5%; V < 1m/s ±0,015m/s
Accuracy DN 300÷5000mm:	V > 1 m/s ± 1%; V < 1m/s ±0,01m/s
Operating temperature range:	-20 ÷ 120° C
Volumetric flow:	m<3, L, ft3, bbl, gal / (s, min, h, day)
Thermal power:	W, kW, MW, BTU/h, kBTU/h, MBTU/h
Mass flow:	kg, ton, kton / (s, min, h, day)
Ingress protection degree:	IP65
Special function:	Echo viewer
Special function:	Multiple inputs for multiple measures



WGE Wedge Flowmeter



The wedge flowmeter WGE series is a fluid metering device for inline installation able to manage an accurate and repeatable fluid measurement. It is based on the proven technology of differential pressure principle; it can work as bi-directional unit so that reversing the mounting it is possible to double the working life. The instrument WGE can be supplied from machined barstock and it's suitable for Oil & Gas in upstream, midstream and downstream applications. Its housing is dust and sand tight, protected against sea wave effects as defined by IEC IP67, and suitable for tropical climate operation as defined by DIN 50015. WGE is not sensitive to vibrations and entrained gas. It shows a high resistance to wear and the installation is easy and fast.



Manufacturing size:	3/4" ÷ 8"
Operating pressure:	up to 3000 psi (for higher pressure, please contact us)
Process temperature:	WGE body: -40°C ÷ 280°C With integral manifold: -40°C ÷ 180°C
Storage temperature:	-40°C ÷ 120°C
Straight pipe length:	Inlet: 4 ÷ 10 x ØIN, Outlet: 2 ÷ 3 x ØOUT
Accuracy:	< ± 1 % FS / < ± 0,5 % FS on request
Rangeability:	5:1 or 10:1 (when equipped with Flow Computer Unit)
Construction material:	Standard: AISI 316L; Options: AISI 4130, DUPLEX
Wetted parts:	AISI 316L NACE MR0175 / ISO 15156 compliance
Body:	AISI 316L, AISI 4130, duplex, brass (for sizes up to 2")
Nameplate:	Stainless steel
Output signal:	Double 4 ÷ 20 mA + HART®

ASG Magnetic Flowmeter



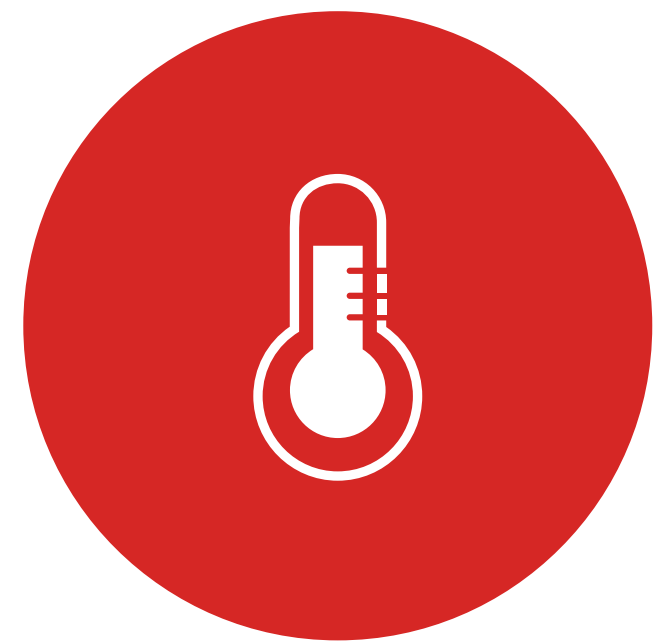
The ASG series flanged sensor is suitable for the measure of flow of fluids whose minimum conductivity is 5 mS / cm. Flow range is available with the widest diameters range. The ASG sensor is supplied with a graphic display converter to view the electromagnetic flow measurement. The used converter has high performances, communication buses, flexibility on the number of inputs/outputs, batch applications, data storing are required. Flow measurement for water, wastewater and conductive fluids.



Supply:	85 ÷ 230 Vac / 48÷60 Hz
Output signal:	4 ÷ 20 mA / Optional RS-485 / Optional HART®
Measuring range:	0 ÷ 12 m/s (forward and reverse) / Optional 0 ÷ 15 m/s
Nominal diameter:	DN 25 ÷ 2000 (JIS, ANSI, etc..)
Flanges material:	Carbon steel-/ SS AISI 316
Accuracy:	±0,5% reading value (0.1 ÷ 10 m/s) / Optional ±0,2%
Liquid temperature range:	-20 ÷ 160°C
Housing material:	Aluminum Alloy
Gasket material:	PTFE, PFA, Hard rubber
Display:	Graphic LCD (back light)
Ingress protection degree:	IP68 (Flanged sensor) / IP67 (Converter)



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TEMPERATURE



T7T Smart Single Temperature Transmitter



T7T series includes SMART temperature electronic transmitters with 4 ÷ 20 mA output and HART® digital communication protocol able to accept 3 wires resistance thermometers. Total accuracy is depending on class of the sensors utilized such as class A, class B, 1/3 DIN, 1/5 DIN, etc. Digital electronics, combined with a linearization formula, makes the use of the transmitter more simple than the other classical analog ones. Temperature transmitter is designed for mounting on pipes, tanks and both for marine and land industrial plants.



Supply:	12.5 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA + HART®
Measuring range:	-50 ÷ 450°C
Max load:	550 Ohm @ 24 Vdc
Accuracy Class:	Following IEC751 – Standard Class A PT100
Measured value update frequency:	4 ÷ 20 mA + HART®: ≈ 1 s / HART®: ≈ 500 ms (on request)
Polling time:	4 ÷ 20 mA + HART®: ≈ 800 ms / HART®: ≈ 500 ms (on request)
Response time (63% FS):	< 256 ms (Standard HART®)
Allowable de-range:	Down to 30 times the Nominal Range
Damping:	0 ÷ 60 s
Long term stability:	< 0.1 % FS/year
Ambient / Process / Storage temperature:	-40 ÷ +85°C / Up to 500°C / -40 ÷ +90°C
Ingress protection degree:	IP66 / IP67

T7M Smart Multipoint Temperature Transmitter



T7M is an electronic multipoint temperature transmitter with a SMART-HART® electronic and a built-in multiplexer that can accept up to 15 resistance thermometers PT100 (3-wires) or 14 resistance thermometers plus 1 interface or level sensor. The multipoint solution offers great advantages for his mounting simplicity and for connection cables saving. Output is analog 4 ÷ 20 mA + HART. In T7M series with display version the average and intermediate single temperature points can be displayed locally. Accuracy is depending on class of the sensors utilized such as DIN A, DIN B, 1/3 DIN, 1/5 DIN and 1/10 DIN.



Supply:	12.5 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA (as average of measured values) + HART®
Measuring type:	15 PT100 or 14 PT100 sensors plus 1 float interface sensor
Max load:	550 Ohm @ 24 Vdc
Accuracy Class:	Following IEC751 – Standard Class A PT100
Measured value update frequency:	4 ÷ 20 mA + HART®: ≈ 1 s / HART®: ≈ 500 ms (on request)
Polling time:	4 ÷ 20 mA + HART®: ≈ 800 ms / HART®: ≈ 500 ms (on request)
Response time (63% FS):	< 256 ms (Standard HART®)
Allowable de-range:	Down to 30 times the Nominal Range
Damping:	0 ÷ 60 s
Long term stability:	< 0.1 % FS/year
Ambient / Process / Storage temperature:	-40 ÷ +85°C / -40 ÷ +85°C / -40 ÷ +90°C
Ingress protection degree:	IP66 / IP67

TRT Temperature Transmitter



The temperature transmitter mod. TRT is equipped with a PT100 probe and provides a current signal output within the 4 ÷ 20 mA range (2 wires system).

It can be used in different applications such as, for example, for mounting on tank ships and in all the processes which requires an accurate temperature measurement. The instrument is also available with ATEX intrinsically safe certified electronics for installation in hazardous areas. Great advantages are given by its easy and simple installation.

Total accuracy depends on sensor class (DIN A, DIN B, 1/3 DIN, 1/5 DIN, 1/10 DIN).



Supply:	12.5 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA
Measuring range:	-50 ÷ 600°C
Accuracy Class:	Following IEC751 – Standard Class A PT100
Minimum span:	50°C
Linearity:	± 0.1%
Allowable de-range:	Down to 30 times the Nominal Range
Damping:	0 ÷ 60 s
Long term stability:	< 0.1 % FS/year
Ambient / Process / Storage temperature:	-40 ÷ +85°C / Up to 600°C / -40 ÷ +90°C
Ingress protection degree:	IP66

TWE Thermowell



A thermowell is a thermally conductive socket recommended to protect delicate instrument sensing elements against corrosive effects and permit instrument interchange or calibration check without disturbing or closing down the process. Thermowells are available for high pressures, high temperatures and high velocity applications.

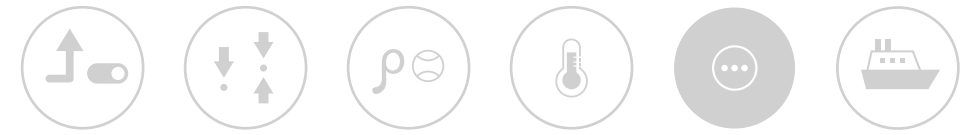
Selected on the basis of pressure, temperature, flow, vibration and corrosion service parameters, basic thermowell types include: barstock execution or built-up execution, Threaded, Socket Welded and Flanged executions.



Standard material:	SS AISI 316 / 316L
Special materials:	Duplex, Superduplex, Hastelloy alloys, Inconel alloys, Incoloy alloys.
Optional conformity:	NACE MR 0175
Tests:	Hydrostatic Test Pressure, Dye Penetrant Test, Wake Frequencies Test
Treatments:	Pickling and Passivation, Heat Treatment, Stellite coating on wetted parts.
Options:	Plug and chain



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**OTHER
EQUIPMENT**



27M Pressure to Current Converter



27M series converters/transmitters measure and converts relative (for example 3÷15 psi or 0.2÷1 bar) and differential pressures into an electrical signal within a range between 0,003 and 16 bar. The direct conversion of the pressure into an electrical signal is achieved by a minute deflection of sensor diaphragm which changes the resistance of the bridge with the applied stress; changes in pressure cause a corresponding change in the transmitter output proportionally to the bridge unbalance. A single circuit supplies power to sensor and receives its signal providing conversion into a standard 4 ÷ 20 mA 2 wires system or 3 wires for voltage output.



Supply:	2 wires: 12 ÷ 30 Vdc / 3 wires: 16 ÷ 26 Vdc
Output signal:	2 wires: 4 ÷ 20 mA / 3 wires: 0 ÷ 5 Vdc or 0 ÷ 10 Vdc (min 30 mVdc)
Measuring range:	From -1 ÷ 0 bar to 0 ÷ 35 bar
Max load:	650 Ohm @ 24 Vdc
Total accuracy:	< ± 0.25 % FS
Zero offset:	< ± 1 % FS
Temperature zero drift:	< ± 0.025 % FS /°C (-10 ÷ 60°C)
Span thermal drift:	Piezo: < ± 0.02 % FS/°C / Ceramic: < ± 0.01 % FS/°C
Long term stability:	Piezo: < ± 0.15 % FS/year / Ceramic: < ± 0.12 % FS/year
Response time (63% FS):	Piezo: 10 ms / Ceramic: 5 ms
Allowable de-range:	Piezo down to 4 times / Ceramic down to 2.5 times the Nominal Range
Ambient / Process / Storage temperature:	-40 ÷ +85°C / -40 ÷ +85°C / -40 ÷ +90°C

PC3-5-8 Current to Pressure Converter



These instruments are meant for the conversion of a standard direct current signal into a standard pneumatic signal, for the change-over from electrical controllers to pneumatic control valves, or from electrical measuring system to pneumatic controllers. They are featured by particularly compact design, good dinamic response, insensitivity to mechanic vibrations, low maintenance & low consumption, high reliability and an adjustable output measuring span.



Input:	4 ÷ 20 mA; 0 ÷ 20 mA; 1 ÷ 5 V; 1 ÷ 10V; 0 ÷ 10 V
Output:	3 ÷ 15 psi (0.2 ÷ 1 bar); 2 ÷ 20 psi (0.14 ÷ 14 bar); 4 ÷ 30 psi (0.3 ÷ 2 bar); 15 ÷ 3 psi (1 ÷ 0.2 bar); 0.5 ÷ 8 bar
Linearity error:	< ± 1 % FS
Hysteresis error:	< ± 0.5 % FS
Repeatability error:	< ± 0.2 % FS
Air consumption:	0,15 Nm³/h
Air delivery:	2,6 Nm³/h
Housing material:	ABS Tecnopolimer, 10% fiber glass stiffened
Mounting:	On 35 mm wide rail
Pneumatic connections:	Pipe fitting for tube 4x1 (outer Ø 6mm)
Electrical connections:	Terminal for 2 wires connection. Ø 0,5 ÷ 1,5 mm
Ambient / Process / Storage temperature:	-20 ÷ +70°C / -20 ÷ +70°C / -30 ÷ +80°C

A2X Multifunction Process Indicator



The process indicators A2X series are configurable microprocessor devices, with analog input selectable via terminal block connection for measurements in mA or Vdc. Maximum display scale ±99999 with programmable reading scale and decimal point by means of four keys keypad and seven-segment display (character height 12.5mm). Start and end of scale calibration in self-learning mode through two external digital inputs and Loop interruption monitoring with visual indicator and output override (for 4 ÷ 20 mA signals) are only some of the features.



Supply:	24, 110, 220 Vac, 24 Vdc
Output:	24 Vdc + Loop 4 ÷ 20 mA or 0 ÷ 10 VDC + Optional Relays
Alarm:	Eight types of alarm function (minimum, maximum, window, hysteresis)
Size dimensions for panel mounting:	DIN 96x48 mm
Operating temperature range:	-10 ÷ 50°C
Display:	5 digits + sign
Programming:	Simple programming via keypad with four keys
Maximum range:	± 99999
Average conversion time:	250 ms
Resolution:	± 20000 points
Optional volume indication:	Up to 320 segments
Linearization option:	Provision for entering 20 linearization segments

VEM Visible Emission Monitor



Visible Emission Monitors are designed to measure dust and smoke discharged from furnaces, incinerators, boilers and industrial plant. Satisfying legal requirements to monitor smoke and particulate emissions into the atmosphere. The equipment comprises a digital indicator control unit suitable for panel mounting, transmitter and receiver units, complete with extension tubes for mounting to the flue or stack.



Supply:	115 V or 230 V; 50/60 Hz
Power consumption:	6 VA
Display mode:	Optical density / Particle density / Opacity
Stability:	± 1 % opacity or equivalent
Ambient temperature:	0 ÷ 50°C
Throw limits:	0.3 ÷ 6 m
Storage temperature:	-10 ÷ 60°C
Emissions temperature:	850°C maximum
Maximum cable length:	100 m (from panel unit)
Cable:	6 core screened
Operating voltage:	5 V maximum
Length:	150 mm; 300 mm; 450 mm

T7V Digital Field Indicator



T7V series includes 4 ÷ 20 mA loop powered field digital indicators for ATEX Ex ia or Ex n applications and non ATEX applications. Configuration and calibration are performed locally through the use of the buttons and the display.
All of the standard industrial and marine field measuring units are available (level, ullage, volume, pressure, flow, temperature, density, consistency etc. and user-defined units inserted by display).



Supply:	24 Vdc loop powered
Input signal:	4 ÷ 20 mA
Total accuracy:	< ± 0.1 % reading value
Zero offset:	< ± 1 % FS
Long term stability:	< ± 0.02 % FS/year
Ambient / Storage temperature:	-40 ÷ +85°C / -40 ÷ +90°C
Ingress protection degree:	IP66 / IP67
Relative Humidity:	< 98% RH not condensing

OMD Oil Mist Detector



OMD is an atmospheric oil mist detection instrument for industrial applications, developed for installation in machinery and pump rooms. The OMD detector is an independent measuring and transmitting system with 4 ÷ 20 mA + HART® and photorelays output, proportional to the density of oil mist in the sampled air.
OMD oil mist measuring is based on the physical principle of optical scattering. Infrared light emitted from a LED is received from two photodiodes for measure and reference purpose; by the comparison between the photodiodes output, the presence of oil mist can be detected. The typical flammability level of the oil mist is 50mg/l; the alarm level is set to 2.5% of lower flammability level and is calibrated to 1.2mg/l. The detector must be calibrated by the manufacturer with a certified oil mist generator, as stated by IMO recommendations. OMD is based on a digital electronics for signal analysis, including fault detection and photodiodes degrading monitoring system.

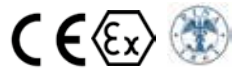


Supply:	24 Vdc ± 20%
Output signal:	4 ÷ 20 mA + HART®
Total accuracy:	< ± 0.2 mg/l
Detectable particle diameter:	0.4 ÷ 10 µm
Oil mist density measuring field:	0 ÷ 2 mg/l
Process / Storage temperature:	-20 ÷ +70 °C / -40 ÷ 75 °C
Relative Humidity:	< 98% RH not condensing

TSU Intrinsic Safety Barrier



TSU series galvanically isolated safety barriers are designed for connection to ON/OFF sensors (two wires) with current (5 mA / 13 mA ± 1 mA) or frequency (1,2 kHz / 3,8 kHz ± 0,2 kHz) output as VALCOM® ASL Series. Inputs are constantly monitored to reveal any possible wiring anomalies (such as short circuit, open circuit or dispersion to ground). The ON/OFF signals from the sensors are retransmitted to the output with the control signals separated for each channel. The presence of bicolour LED's in input and output circuits allows to locally monitor the status of barrier and sensors. The small size of the housing and the presence of two channels per unit offer the possibility of a high density wiring on DIN rail 35mm.



Supply:	24 Vdc/Vac
Current Input:	2 inputs from two wires ON-OFF transmitters, current (5/13 ± 1 mA)
Frequency Input:	2 inputs from two wires ON-OFF transmitters frequency (1,2/3,8 ± 0,2 kHz)
Output:	4 Open Collector NPN or TTL outputs for ON/OFF and FAULT MONITOR signals
Max voltage per channel:	U0 = 28,4 V
Max current per channel:	I0 = 96 mA
Max power per channel:	P0 = 682 mW
Max capacitance per channel:	C0 = 79 nF
Max inductance per channel:	L0 = 4 mH
Ambient Temperature:	-20 ÷ +55°C

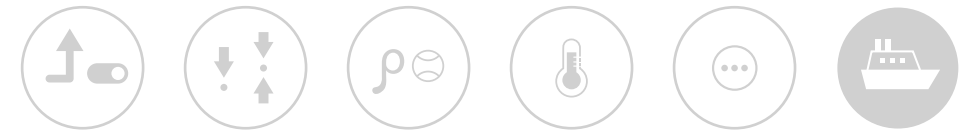
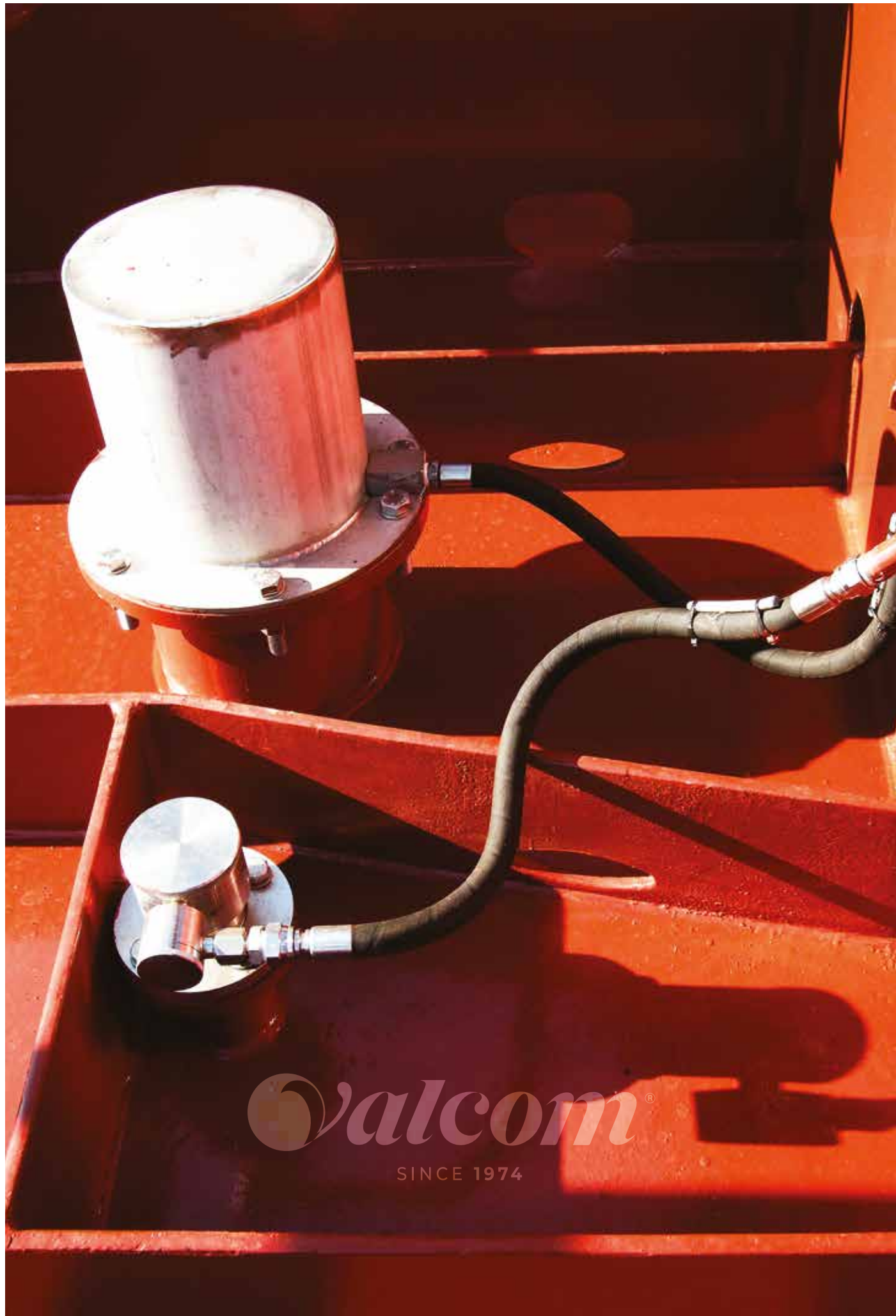
HMI Smart Interface Panel



The touch panel HMI device is used to monitor the variables detected by HART® transmitters. The most typical application is the level monitoring of tanks for marine or industrial applications that requires a dislocated control for their variables. The HMI devices are used for monitoring and alarms management using the HART® communication protocol. It is possible to connect to the system up to 30 HART® compatible transmitters on two buses in multi-drop mode, while in mixed mode 30 HART® transmitters and 12 on/off switches (16 in the only On/Off version).



Supply:	16 ÷ 32 Vdc / I=0.7 ÷ 1.5 A
Processor:	AMD Geode LX, 500MHz (LX800)
Total accuracy:	< ± 0.1 % reading value
RAM Memory:	256 MB SDRAM
Memory:	4 GB SSD Disk Compact flash
GPIO:	12 Input - (16 Input in the only On/Off version)
HART:	2 buses, maximum 30 sensors
RS232 / RS485:	Optional Output
MODBUS:	RS485, TCP/IP, UDP/IP
Ingress protection degree:	IP45 front
Operating System:	Microsoft® Windows® XP
Pre-Installed:	Valcom® HART® Server, HMI Software 2.0 Rev8.2
Ambient / Process / Storage temperature:	+5 ÷ +60°C / -20 ÷ +75°C



SYSTEMS & SPECIFIC APPLICATIONS



STH SERIES - HIGH & OVERFILL ALARM LEVEL SYSTEM

OIL & CARGO TANKERS



STH is a high (95%) and overfill (98%) alarm system for installation on tank ships, designed in accordance to classification societies requirements. The system is composed by the following main components:

- Static level switch ASL series with a complete SS AISI 316 construction, including cable gland. These sensors have a switching accuracy less than 3 mm and are not influenced by the presence of foam. LSG detectors have no vibrating, optical or capacitive parts. LSG is based on a float Reed level switch: a toroidal magnet is placed inside the float and its vertical movement activates a Reed contact located in the guiding pipe.
- 2-channels galvanically isolated safety barrier TSU series with intrinsic supply voltage regulation; widely used on board of ships, they perform visual local indications other than separated outputs to signal the alarm and fault conditions.
- HMI complete with colour graphic indications and buzzers for visual and acoustic signals (ISA sequence) of the high and overfill, fault (short circuit, cable interruption) and power failure conditions (main and auxiliary). The signals can be retransmitted via relay output to a remote location from the control panel, for instance to a panel placed in the bridge console, or to an external power unit consisting of flashing lights and sirens.

WIS SERIES - WATER INGRESS SYSTEM

BULKARIANS



WISE is a system for water ingress detection designed in accordance to requirements and resolutions for applications on bulk carriers. The system is composed by the following main components:

- Static level switch ASL series that can be installed in any position with all SS AISI 316 construction or Hydrostatic level transmitters T72 series;
- 2-channels galvanically isolated safety barrier TSU series with intrinsic voltage regulation of the supply; widely used on board of ships, they perform visual indications other than Open Collector outputs (or alternatively TTL) separated to signal the alarm and fault conditions;
- Control panel based on HMI complete with touch screen panel for the visual and acoustic signals (ISA sequence) of the pre-alarm, alarm, fault and ballast override conditions with the indication of event type and the localization.

BMS SERIES - BUBBLING LEVEL MEASUREMENT SYSTEM

CRUISE SHIPS

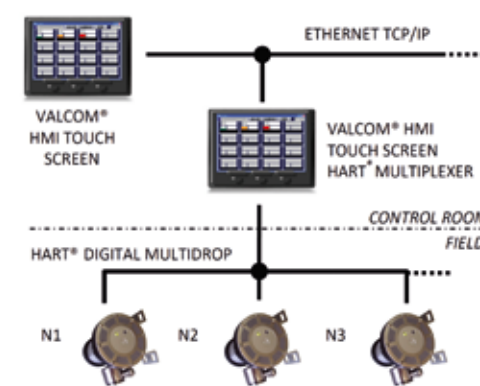


BMS is a bubbling system for level detection through the measurement of hydrostatic counter pressure caused by the liquid contained in the tank. The working principle is based on the measure of the pressure value needed to maintain a constant and regular air flow through a pipe probe open in the bottom and submerged into the liquid. At any level variation of the liquid in the tank corresponds a variation of the hydrostatic pressure applied on the air outgoing from the probe pipe; these pressure variations are precisely detected by the 27M / T72 P/I converter and converted into a standard 4 ÷ 20 mA electric signal or HART® protocol. PR3 regulator keeps constant bubbling air flow at any level value, assuring great reliability and accuracy.

Non return valve VNR series is manufactured with stainless steel AISI 316 housing, flange (optional) and connections. According to the application, the functional principle is based on a sealing diaphragm counterbalanced by a spring system, or based on float principle. The non return valve is placed between the bubbling pipe and the regulator-converter unit in order to guarantee in both cases a quick and safe protection of the instrumentation from possible liquids return. A side connection can be optionally supplied for bubbling pipe clearing (only for spring version).

OMD SERIES - OIL MIST DETECTION SYSTEM

RO-RO & CARGO SHIPS



The digital HART® acquisition system enables several OMD to be connected on the same pair of wires in a multidrop network configuration. Communications in multidrop mode are entirely digital. Standard HART® commands are used to communicate with field instruments to determine process variables or device parameter and diagnostic information. It is also possible to make instruments setup and calibration remotely. The built-in ethernet network card allows the join of an existent network or the creation of a new point to point network to send data or working from a remote position. The main HMI interface allows to monitor up to 16 OMD sensors per page altogether, showing the measure, the percentage of measure (in number along with coloured bar), a user defined tag to identify the sensor location and textual indication of the diagnostic and status of each sensor (fault, pre-alarm and alarm). It is possible to browse the existing pages using the arrows on the upper right of the screen. The last not acknowledged event is displayed in the status window. Buttons DATA LOG and ALARM LOG allow for configuration and visualization of registered data and alarm status during the time. The SETUP button brings to the software configuration interface. The TEST, RESET and ACKNOWLEDGE buttons complete the certified ISA sequence.

T72 / 27I SERIES - HIGH OVERPRESSURE SUBMERSIBLE LEVEL TRANSMITTERS SUPPLY VESSELS



Submersible Level transmitters 27I / T72 manufactured by VALCOM® are well known for the extraordinary flexibility of constructions and the great reliability in several Marine applications. Featured by standard 4 ÷ 20 mA analog and HART® digital output, they perform an accuracy of $\pm 0,25\%$ or $\pm 0,1\%$ and can work within temperature range $-40 \div 85^\circ\text{C}$, they are fully made in SS AISI 316 or titanium. Over 15 different output connections, over 10 different submersible cables, over 50 process connections available give the idea of the many possibilities we can offer to perform and satisfy your applications.

Main installations are: Ballast tank Level measurement, Cargo Tank Level measurement, Oil & Fuel Oil Level Measurement, Service Tanks Level monitoring, Black, Grey & White water Level monitoring, draft etc...

T72 / ASL SERIES - HEAVY DUTY PRESSURE, LEVEL TRANSMITTERS & SWITCHES NAVY VESSELS



Developed to operate on naval ships and submarines, the pure static level switches of the ASL series offer the highest reliability when operating on board of Frigates, Patrol vessels, Aircraft carriers, LPD, Mine hunters, Destroyers, Coastal vessels, Hydrographic ships, etc. Classic applications can be satisfied by the bilge level switches series LSG-02.

Transmitters Series 27 / T72 for level, pressure and temperature measurement can withstand shock levels that may exceed the ones required by MIL Standards. Both ASL and 27 / T72 are available with digital electronic or analogue for fast response needs.

Oil mist detection Series OMD provide a solution especially designed for the monitoring of Engine and Pump room of Patrol vessels with a software calculation able to distribute the installation in function of the volumes to be monitored.

T72 / ASL SERIES - NON MAGNETIC PRESSURE, LEVEL TRANSMITTERS & SWITCHES SUBMARINES



ASL series NON MAGNETIC level switches employ paramagnetic, low magnetically permeable, materials for construction of metal parts. Beside this characteristic, ASL series consists in purely static sensors, insensitive to vibrations, liquid dielectric constant and free of any optical parts. Also pressure and differential pressure transmitters have been produced in paramagnetic material.

Main applications features:

- Liquid density: $> 0.4 \text{ kg/dm}^3$;
- Temperature limits: down to -200°C and up to $+450^\circ\text{C}$;
- Pressure limit: up to 400bar;
- Shock test: 200, 500, 1000g according to MIL-STD-202 F method 213B / IEC 68-2-28;
- Construction materials: paramagnetic, $\mu\text{R} \sim 1.000015$;
- Output signal: 5 ÷ 15mA on/off 2-wires (recommended);
- Optional relay output.

HMI SERIES - MONITORING CONTROL PANEL YACHTS & MEGA-YACHTS



HMI promotes integrated solutions for the monitoring of all the variables in small boats, small ships, yachts, mega-yachts, ferries and floating docks. Layout can be customized according to vessel's shape and customer's requests considering the below features:

- Measure of level for fresh water, sea water, grey & black water tanks;
- Measure of level for Fuel Oil, Oil & Diesel tanks;
- Presence of fluid for bilge, sludge and scupper;
- Measure of Temperature;
- Measure of Pressure;
- Digital Indicators.



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