

MILLTRONICS

Mercap 2-Wire Smart Level Measurement

Setting a New World Standard



A Welcome Breakthrough in Level Measurement Technology for the Process Industries

The Milltronics Mercap features a special, patented Active-Shield technology to provide reliable, accurate performance for continuous level monitoring and point level detection, even in extreme conditions.

The Mercap probe is unaffected by vapors, product deposits, dust or condensation. It performs in liquids, solids, interfaces and foam. It is effective even in the most extreme process conditions, including temperatures from -200°C to 450°C (-328°F to 842°F) and pressures from full vacuum to 525 bar (7665 psi). Mercap is approved for hazardous environments, and its performance and accuracy will outmatch any traditional capacitance transmitter.

The unique probe design has a high integrity seal, and is coupled with a high performance transmitter to give superior results with a low cost of ownership. The universal transmitter and modular construction facilitate use in many applications. This simplifies your training, installation and stocking requirements.

The 2-wire (loop powered) 4-20/20-4 mA transmitter is quick to install, and features simple, push-button calibration for easy set-up. It's also a smart transmitter with built-in HART® protocol for on-site or remote commissioning and inspection.

Best of all, it's a **proven technology** that has been successfully applied in the oil and gas, petrochemical, offshore, chemical processing, food and beverage, pharmaceutical, cement, shipping and other major industries.

Milltronics Reliability

Mercap is another high quality performer in the Milltronics family of high performance level detection and monitoring instruments. Milltronics is a leading brand of sophisticated process control instruments, offering the process industries a broad range of technology choices and product flexibility.



Reliability and Accuracy

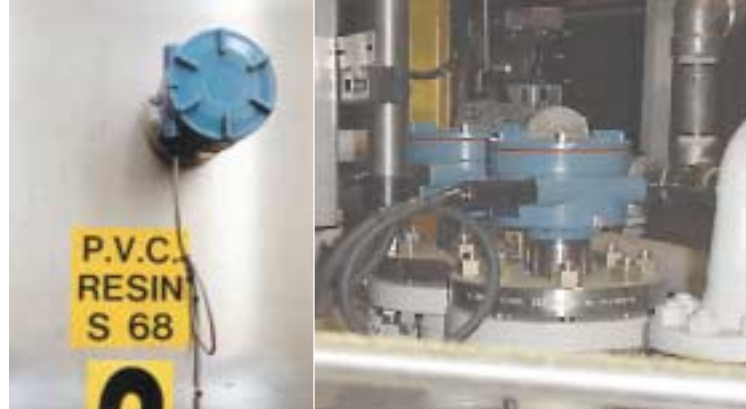
in a Wide Range of Applications

Mercap provides reliable, accurate measurement even under extreme process conditions, including temperatures from -200°C to 450°C (-328°F to 842°F) and pressures from full vacuum to 525 bar (7665 psi). With its strong capabilities and numerous configurations, it is proven effective in an extensive list of applications.

- **LIQUIDS:**
oil, water, chemicals, acids, caustics, beverages
- **SLURRIES:**
adhesives, paper pulp, glucose, drilling mud
- **SOLIDS:**
granulate, sugar, coal dust, plastics
- **INTERFACES:**
high pressure coalescers, glycol regenerators, heater treaters, desalters, separators, storage tanks, gas and oil tankers, F.P.S.O. ships

Mercap is reliable in toxic chemicals under high pressure. It's effective in storage silos with solids or liquids. It performs in very small vessels where accuracy is essential because even minute changes in level are significant. The compact Mercap unit is ideal for applications where space is limited such as on oil platforms. It takes up far less room and requires less set-up time than a traditional pressure transmitter and box with mounting hardware.

The standard Mercap S-series is suitable for most applications, but many options are available for special requirements. For added safety on extremely toxic chemicals, Mercap DD-series has a redundant process seal and all wetted parts made of Teflon®. Mercap HP-series is designed for extreme high pressure applications. A flow-through electrode model provides important quality measurement such as the percentage of water in oil. Sanitary versions are available for food and beverage or pharmaceutical applications.



Performance and Value: the Mercap Advantage

Mercap combines the advantages of a high performance measurement instrument with a low cost of ownership.

Reliable, Accurate Level Measurement

Mercap is unaffected by vapors, product deposits, dust and condensation. The PFA probe-insulating sleeve gives very high chemical resistance. Its microprocessor technology offers high accuracy, stability, repeatability and linearity.

Extensive Application Range

Mercap can be used in conductive and non-conductive materials. It is suitable for high pressure and high temperature applications, and for aggressive chemical environments. It's effective in liquids, solids, slurries and interfaces.

Safety Approvals

Mercap is suitable for use in extreme conditions and approved for use in hazardous areas.

Low Cost of Ownership

With its universal probe, Mercap is easy to specify. The universal transmitter reduces the need to stock spare parts. Its wide list of applications lets you limit the number of technologies in your plant, simplifying your training and installation requirements and reducing stocking requirements. It has built-in, full-function diagnostics and complies with NAMUR NE 43 for easy maintenance and ease of use.

Rapid, Cost-Effective Commissioning

This 2-wire (loop powered) 4-20/20-4 mA measurement instrument is quick and easy to install. The Mercap unit offers simple push-button calibration for easy set-up.

Smart Transmitter Connectivity

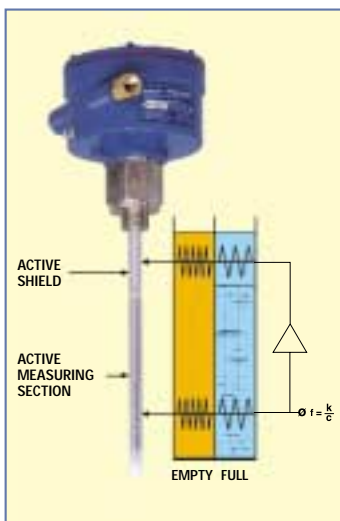
Mercap has a single, modular configuration which means that the probe together with the 2-wire transmitter forms a single instrument unit. It can immediately be connected to any DCS system without using special interface equipment for all applications. It's a smart transmitter, with built-in HART protocol, to facilitate on-site or remote commissioning and inspection.

Proven Technology

Mercap has proven its effectiveness in challenging applications, including interface measurement in high pressure coalescers and glycol regenerators. It's proven effective in oil and gas, tankers, cement, and other industries that have critical storage and level measurement challenges.

Technical Support

Milltronics instruments are high quality devices, supported by prompt delivery, competitive pricing, expert applications assistance and strong technical support.



The Technology Behind the Proven Performance

Mercap takes you beyond the limitations of traditional technologies that are sensitive to moisture, product build-up and temperature and pressure variations in the mounting gland area. Mercap uses an innovative concept of capacitance measurement technology, incorporating a patented Active Shield, to provide accurate measurement you can depend on.

The Mercap electrode has a unique Active Shield and an active measuring section which are electrically isolated from each other and fully covered with an insulating sleeve. Changes in vapor concentration, dust and condensation that occur above the active measurement section are virtually eliminated from the measurement, giving you unsurpassed reliability and accuracy. The electronic transmitter, which converts the variable capacitance from the probe into a standard 4-20mA and HART processing signal, is housed in an explosion-proof enclosure.

Modular Design for Maximum Application Flexibility

Many probe configurations and materials are available, including rigid rod and flow-through electrode models. Choose the combination that is right for your application.



Mercap features HART protocol built in for communications, diagnostics, and local or remote setup of the transmitter. It can be easily programmed with a hand-held communicator.

External measurement current available without breaking the current loop wiring to eliminate false alarms.

Fully potted integral transmitter is impervious to condensation, dust and vibration.

Patented spring package and cone construction in the process gland resist pressure and temperature changes for a high degree of safety.

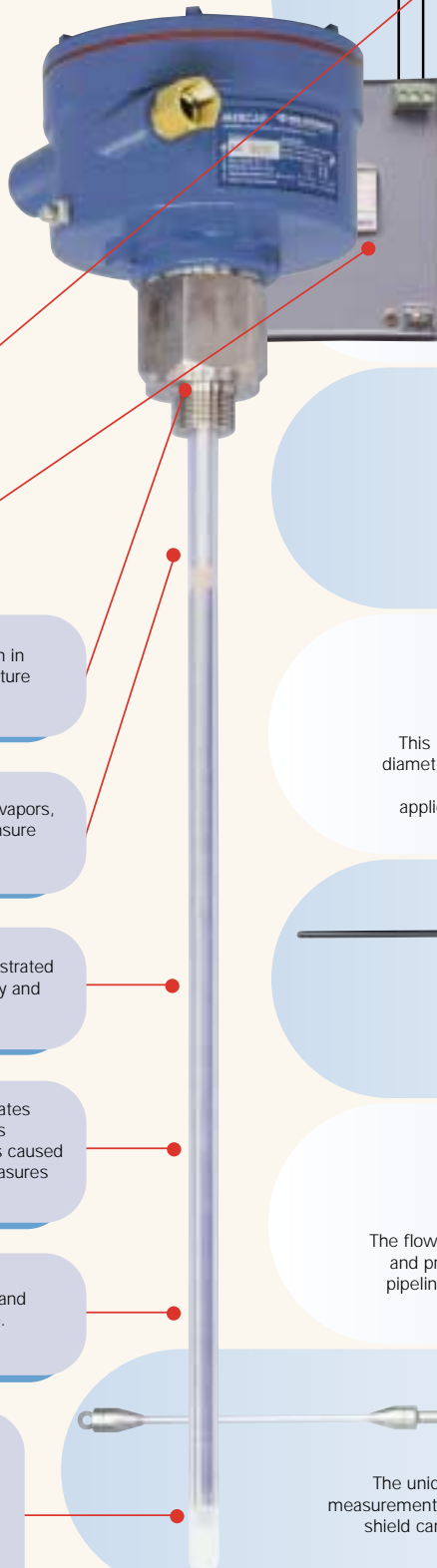
Active-Shield technology eliminates effects of vapors, product deposits, dust and condensation to ensure accurate, reliable measurement.

PFA-sleeve has a low permeability and demonstrated high voltage spark test of 55KV/mm for stability and longevity.

Super-tight insulating-sleeve technology eliminates spaces between the sleeve and the probe. This reduces the effects of cold flow characteristics caused by changes in pressure, so the instrument measures accurately even in high pressure conditions.

High quality PFA sleeve eliminates adherence and chemical attack, producing stable performance.

The plug or seal on the probe end is attached mechanically to the probe rod for improved reliability (proven up to 525 bar/7665 psi). The probe sleeve and seal make the Mercap probe immune to typical cold flow effects so the instrument measures accurately even in high temperature conditions.



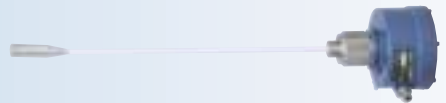
The S-series 16 mm probe with threaded connection and single process seal is suitable for most general level, interface or detection applications.



The S-series probe is available with a machined or welded flange, suitable for applications involving high pressure.



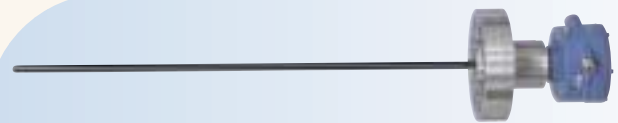
This S-series style probe has a threaded connection and features a larger 24 mm rod for added strength in applications involving long-distance measurement or where agitation or other side forces are present.



This S-series style probe features a flexible rod of bare stainless steel and is suitable for long-range measurements. This probe is also available with a Teflon jacket.



This DD-series probe with machined flange has a 16 or 24 mm diameter rod and a redundant process seal for utmost safety. All wetted parts are made of PFA/PTFE Teflon. It's ideal for applications that combine high temperature, high pressure and very toxic chemicals such as phenol or phosgene.



The HP-series probe features a redundant process seal and is specially designed for extreme temperatures and pressures.



The flow-through electrode is ideal for measuring quality, interface, and product presence (e.g. percentage of water in oil) in a liquid pipeline system. It allows process measurement without placing a probe or obstacle in the pipeline.



The unique probe design of the Mercap 2 offers superior interface measurement for long-range applications (e.g. storage tanks). The active shield can be extremely long lengths in storage vessels with only a short measurement probe for interface.

Note: Other process seal designs are available (S, SD, D, DD, and HP).

Technical Specifications





Transmitter

Measurement Range	0 to 3300 pF
Span	min. 3.3 pF
Supply Voltage	max. 33 Vdc min. 12 Vdc @ 3.6 mA min. 9.5 Vdc @ 22 mA
Measurement Current	3.6 to 22 mA / 22 to 3.6 mA (2-wire loop powered)
Smart Communication	Conforming to the HART Communication Foundation (HCF)
Temperature Range	-40 to 85°C (-40 to 185°F)
Temperature Stability	0.15 pF (0 pF) or 0.25% (typical < 0.1%) of actual measurement value, whichever is greater over the full measurement range
Non Linearity and Reproduceability	<0.1% of full scale and actual measurement respectively
Accuracy	<0.1% of actual measurement value
Features	Polarity protection input circuit E.S.D. protected Galvanically isolated measurement circuit Fully potted with epoxy resin
Diagnostics	Includes fault alarm when: primary variable (PV) out of limits, system failure in measurement circuit, deviation between A/D and D/A converter, check sum, watch dog and measurement current out of range
Measurement Current Signalling	NAMUR NE 43
Function Rotary Switch	Position 1: 4 mA measurement value Position 2: 20 mA measurement value Position 3: 3.8 up to 20.5 mA range by means of a field service simulator Position 4: functionality test

Probe

Process Connection	Screw mounting: NPT, BSPT, JIS Flange mounting: ANSI, DIN, API
Process Material	AISI 316 LSS (standard), and Monel 400, C 22.8, Hastelloy C22, Duplex Steel (options)
Probe Diameter	Rod: 16 mm (0.63") or 24 mm (0.95") Cable: 9 mm (0.35")
Probe Length	Rod version: 5500 mm (216") Rope version: 35000 mm (1378")
Probe Lining	PFA Teflon (standard), Enamel, PTFE (options)
Pressure Rating	FV - 200 bar/2920 psi (standard), up to 525 bar / 7665 psi as option
Temperature Rating	-200 to 200°C (-328 to 392°F) as standard, up to 450°C (842°F) as option

Approvals

CE	Complies with the requirements of E.C.C. as per EN 55011 and EN 50082-2		
Cenelec	EEx ia IIC T6...T4, EEx ia IIB T6-T4 (Intrinsically Safe), EExd [ia] IIC T6-T4 (Explosion Proof), Ex nC IIC T4 (Non Sparking Proof)		
FM/CSA	Class I, II & III, Div. 1 Groups A, B, C and D (Intrinsically Safe), Class I, Div. 2, Class II, Div. 2, Class III, Div. 1&2 (Hazardous Locations)		
FM	Class I, II & III, Div. 1 Groups A, B, C and D (Explosion Proof)		
ATEX	II1GD EEx ia IIC6...T4		

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