

Measurement Solutions

Product Portfolio

Analytical
Blocked Chute
Blanket Gas Regulation
Condition Monitoring
Density
Displays & Panel Meters
Direction Control Valves
Flame Arrestors
Flow
Level & Interface
Moisture & Water Content
Pressure
Pressure & Vacuum Relief
Rupture Discs
Speed
Temperature
Vibration

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About us

Measurement Solutions specialises in the application and supply of process measurement sensors, switches, transducers, direction control valves, condition monitoring, analytical and over pressure protection equipment. Measurement Solutions have a commitment to the application of sound engineering principles and to supply quality assured products in our endeavour to provide the most appropriate solution to your process measurement or over pressure application.

Equipment Summary

Analysers	<ul style="list-style-type: none">- Trace Moisture- Water Cut (% water in Hydrocarbons)
Condition Monitoring	<ul style="list-style-type: none">- Vibration- Speed & Phase- Proximity sensors
Control Valves, Manifolds & Regulators	<ul style="list-style-type: none">- Gas & Hydraulic Control Valves- Actuated Assemblies- Instrument Valves & Manifolds
Flame Arresters, Pressure Vacuum Relief Valves & Tank Breathing	<ul style="list-style-type: none">- IIA & IIB Service Flame Arresters- Certified Combination Arrester & Valve Set- Blanket Gas Regularors- Low Pressure Relief Valves for Pressure Vacuum or both- Emergency Relief Valves
Process Instrumentation	<ul style="list-style-type: none">- Blocked Chute- Density- Flow Meters & Primary Elements- Interface- Level- Pressure- Speed- Temperature- Vibration- Water in Hydrocarbons
Rupture Discs	<ul style="list-style-type: none">- Rupture and Bursting Discs- Vent Panels / Explosion Panels- Burst disc indicators- Quick release systems- Vacuum protection- Sanitary assemblies

Drexelbrook – Level & Analytical

Known throughout the world as a leader in Level measurement. Ametek Drexelbrook pioneered and continues to advance RF Admittance and RF Capacitance level instrumentation. Drexelbrook also offer superior Ultrasonic, Time Domain Reflectometry (TDR), Hydrostatic pressure, Radar and Magnetostrictive instrumentation. This comprehensive product offering provides customers with the best level or open flow measurement solutions for any application; from the most basic to the most complex.

RF Admittance Level Transmitter

Patent coating rejection technology

Features:

- Patent Cote-Shield™ technology ignores coatings
- IECEx approved
- Handles extreme temperature, pressure & vibration
- No dead zones.
- 25mm to 250 metre spans
- Unaffected by condensate and foam

Applications:

- Liquids, slurry and granular
- Interface
- Corrosives



RF Admittance Level Switch

Patent coating rejection technology

Features

- Truly universal level switch
- Patent Cote-Shield™ technology ignores coatings
- IECEx approved
- Handles extreme temperature, pressure & vibration
- Relay or 2-wire output

Applications:

- Liquids, slurry and granular
- Interface
- Corrosives



Water Cut (Water in Hydrocarbon)

Now with density and temperature compensation!

High accuracy, inline, monitor for % water in oil. Ideal for custody transfer and LACT where accuracy and reliability are critical. Drexelbrook's cut monitor offers unmatched cost of ownership and ease of use.

Features

- 0.03% accuracy
- Patent Cote-Shield™ to ignore paraffin build-up
- IECEx approval for Ex d and Ex ia
- 350 msec response time
- Unaffected by changes in salinity



Drexelbrook – Level & Analytical

TLS - Magnetostrictive

Total level, interface and temperature

The TLS Magnetostrictive devices can provide level, interface, & temperature measurements in one device. No calibration required, easy installation with superior accuracy to 0.01%. An ultra-reliable design ideal for process and custody transfer applications.

Features

- IECEx approval for Ex d and Ex ia
- Sanitary 3A approval
- Insertion lengths in excess of 15 metres
- Rigid 316SS or flexible PVDF sensor
- Measures:
 - o Total level
 - o Product level
 - o Interface level
 - o Average temperature
 - o Product temperature
 - o Interface temperature

Applications

- Beverage production
- Custody transfer and terminal storage
- Pharmaceuticals and Biotech
- Separators



Ultrasonic level Transmitter

Drexelbrook's USonic transmitter uses patent SMARTgain™ software to automatically profile vessels for obstructions. Coupling SMARTgain with the fastest response time on the market and Drexelbrook's renowned durability you'll find USonic to be head and shoulders above the rest.

Features:

- Patent SMARTgain™ software to auto ignore obstructions and agitator blades.
- IECEx approval for Ex ia IIC
- Quickest response time
- Superior $\pm 0.15\%$ accuracy

Applications:

- Water treatment
- Mud pits
- Sumps & diesel Tanks
- Open channel flow



Drexelbrook – Level & Analytical

Blocked Chute Switch

Flush mounted with no moving parts

Drexelbrook's blocked chute switch builds on the proved RF admittance technology by mounting flush with the chute wall to reliably detect blockages in the presence of fines build-up. The heavy-duty construction has no moving parts to wear out or hand up.

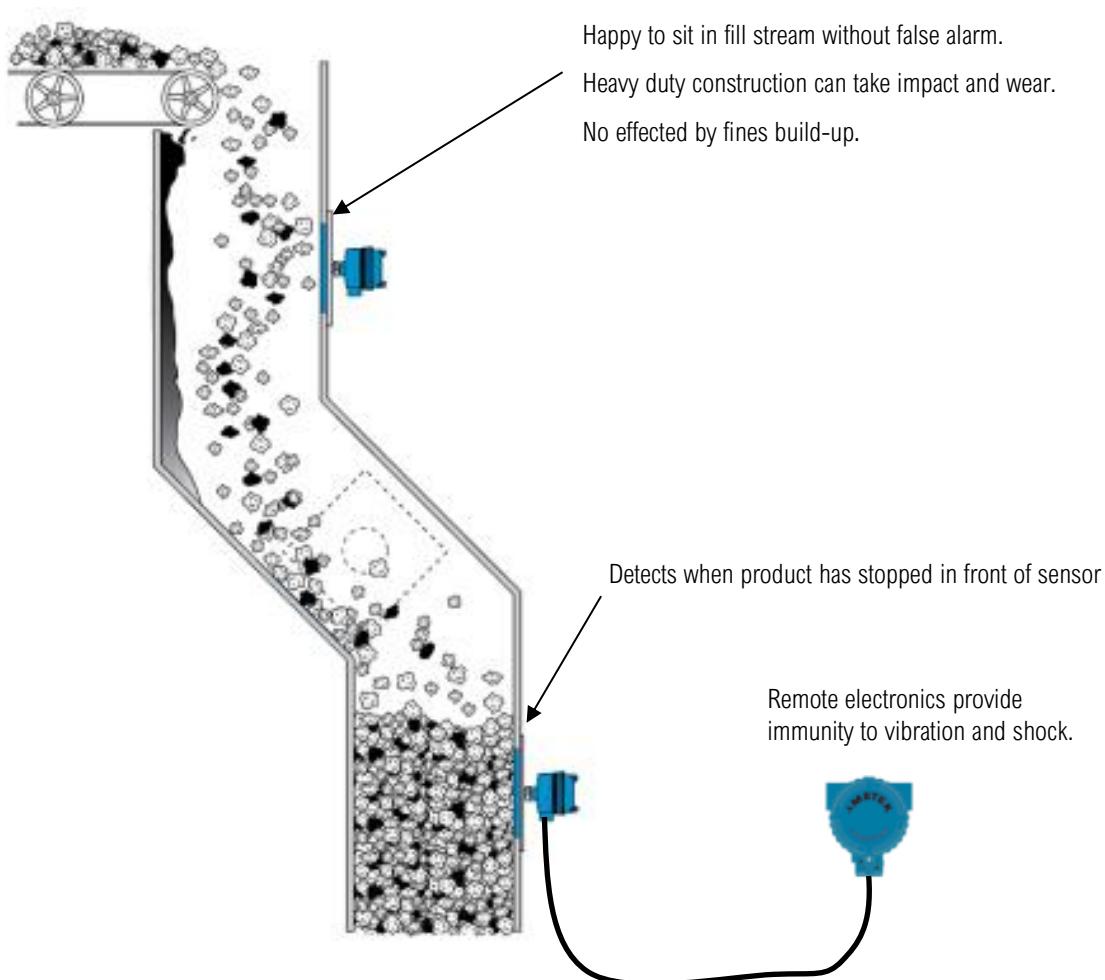
Features:

- Cote-Shield™ technology to ignore fines build-up
- Flush mounted sensor
- No receiver required
- Superior impact, wear & vibration resistance.
- No periodic maintenance required.
- AUSEx / IECEx Ex d & Ex ia



Applications:

- Mining
- Paper mills
- Large rocks, wood chips & ore
- Powders
- Coal pulverisation
- Other granular applications



Drexelbrook – Level & Analytical

Clear Line

Flush, inline level switch. Ideal for run dry or viscous level detection.



ClearLine level switch employs a unique sensor that mounts directly into the process piping. The sensor does not interfere with the material flow and does not contribute to plugging the way insertion type sensors do. The ClearLine is ideal for pump protection, levels of viscous fluid and prevention of run dry damage as well as empty vessel indication.

Features:

- Patent Cote-Shield™ ignores coatings
- No periodic maintenance required.
- Flow through design does not impede flow
- IECEx approval

Applications:

- Liquids, slurry
- Run dry
- Presence/absence of fluid in pipe

Retractable Level Assemblies

Hot tap extraction of level switches & transmitters when the process is under pressure



Heavy duty level controls that can be extracted from the process without dumping product or pressure to do so.

Features:

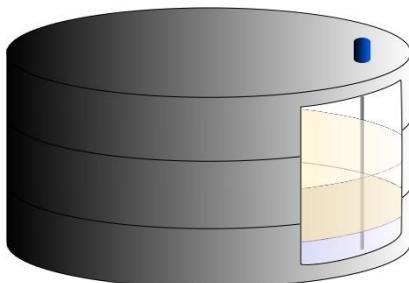
- Patent Cote-Shield™ ignore coatings
- Cote-Shield™ technology to ignore coatings
- No periodic maintenance required.
- IECEx approval

Applications:

- Liquids, slurry, foam and powders
- Interface detection
- Water bottoms of hydrocarbon tanks

Water Bottoms Transmitter

Simple and reliable detection of water accumulation in hydrocarbon storage tanks



Features:

- Immune shifts in temperature, density and composition.
- No periodic maintenance required.
- IECEx approval

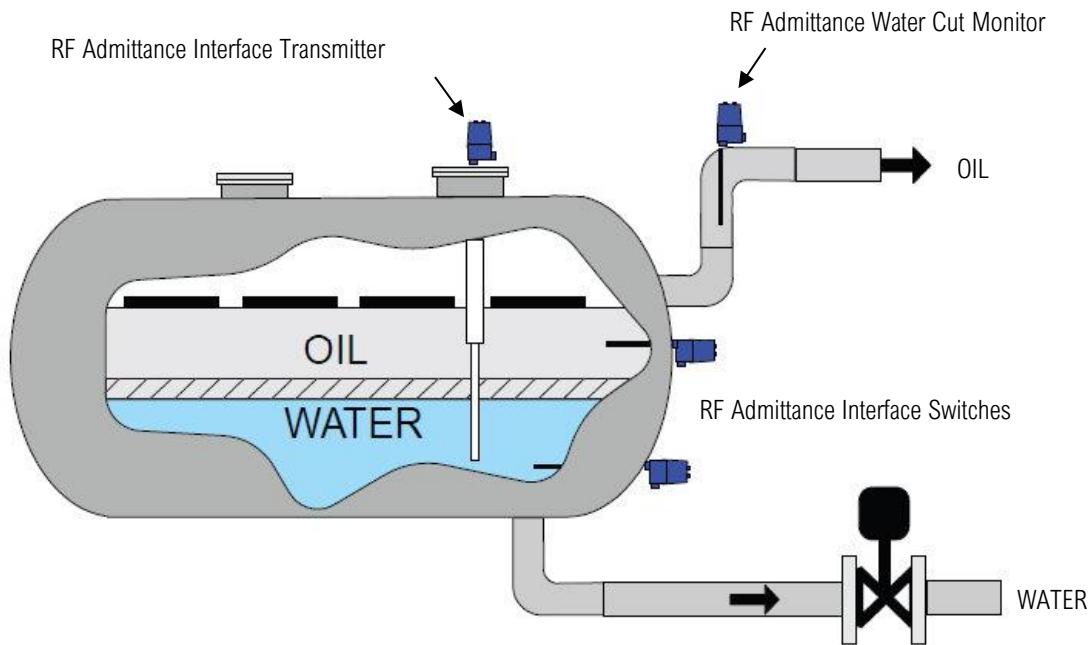
Applications:

- Liquid Interface detection
- Water bottoms of hydrocarbon tanks

Drexelbrook – Level & Analytical

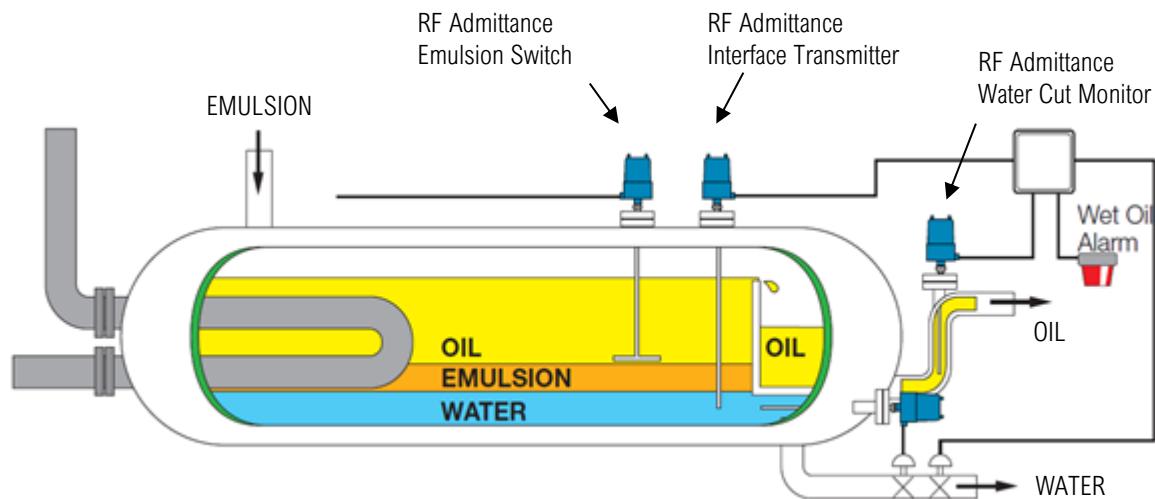
Drexelbrook Separator Solutions

Electrostatic Separation



RF Admittance successfully tracks the electrical interface between water and oil to ensure you are as close but never too close to the grid for maximum efficiency. A UNI IV CM Water cut monitors is fitted to oil outlet to ensure quality of the finished product.

Thermo-mechanical Separation



Primary interface feedback is provided by the RF Admittance transmitter. A UNI IV cut monitor checks the outlet quality, while interface level switch prevents oil being discharged with the water. A backup emulsion switch can also be utilised to monitor the quality of the final product.

Drexelbrook – Level & Analytical

**Guided Wave Radar
(TDR)**



The Guided Wave Radar employs field proven TDR (Time Domain Reflectometry) technology to provide accurate measurement of Total Level, Distance or Volumetric outputs. TDR Technology has been widely used for its inherent ability to remain unaffected by variations in the process materials electrical characteristics

Airborne Radar



FMCW 80 GHz radar and state of the art design. Drexelbrook's latest generation of radars are able to operate over a 80 GHz bandwidth: this ensures sharper resolution and higher accuracy. These 2-wire devices with easy navigation display and touch screen interface allows for easy configuration and set up.

**Submersible
Level transmitter**



Hydrostatic pressure, level transmitters that generate an analogue signal proportional to the head pressure above the installed unit. Drexelbrook's 316SS or Hastelloy C sensors are durable, reliable and easy to install. Simply lower the unit into a well, tank dam or vessel and start measuring.

**Desalter
Separator interface**



The Desalter Interface Transmitter provides an excellent solution for separator vessels with or without electrostatic grids. Drexelbrook's Desalter level transmitter is unaffected by changes in salinity and density and with no moving parts to hang up. You'll be able to do away with scheduled maintenance of the traditional methods.

Floating Roof Tanks



Spill Prevention switch specifically designed for Floating Roof Tanks (Internal and External roofs) with Flexible Sensing Element. Field adjustable insertion lengths and special non-sparking materials combined with the proven RF technology. SIL 1 and SIL 2 options available. Will detect contact with roof or fluid.

**Across Screen
Blocked chute for screens**



Across screen, blocked chute detector is specially designed with Drexelbrook's patented Cote-Shield technology. This unique Across Screen system reliably detects blockages across the entire span while ignoring any fines build up associated with the process.

**Conductivity
Level Switches**



Simple conductivity holder and electrode that can be configured for multiple measurement points. This is a simple level switch that can be used on liquids and light slurries. Conductivity switches utilize the conductive properties common to aqueous liquids to provide point level control and alarm functionality.

**Ultrasonic
Level switch**



VeriGAP ultrasonic gap switch provides reliable high or low level measurement in a wide variety of liquids. The VeriGAP requires no calibration and is not affected by changes in electrical properties of the material being measured. VeriGAP also features Auto Verify and Certify test.

Continental – Rupture Discs

Why use Rupture discs?

Rupture Discs function as a pre-designed "weak point" in a pressurized system, and should be the strongest part of your pressure protection system. Continental Rupture Discs utilise innovative, patented designs, the highest quality materials from traceable sources, and ISO 9001 manufacturing procedures performed by skilled craftsmen.

HPX Rupture Discs – True 95% operating to burst ratio

Built on years of research and development, the HPX and SANITRX® HPX rupture discs are high precision pressure relieving devices that protect personnel, equipment and the environment. The versatility of the HPX product family offers pressure protection for a wide range of applications in many processing industries, including: chemical, oil and gas, food, beverage, pharmaceutical, biotech, pulp and paper, power and more. The HPX product family is the most advanced line of rupture discs available, incorporating proven performance in excess of a quarter million cycles, operating up to 95% of burst pressure, and offered in a wide range of burst pressures, materials and sizes. These features support reduced down time and lower maintenance costs, increasing the productivity of your facility!

Features:

- 90 or 95% operating to burst ratio (95 or 100% per ISO definitions)
- Manufacturing range of Zero, -5% and -10%
- SAFETY RATIO of 1 to 1 or less. If the rupture disc becomes damaged, it will relieve at or below the burst pressure.
- **Design tested for 5 Million+ cycles from full vacuum to 95% of burst rating**
- Non-fragmenting, reverse acting, bubble-tight seal



Continental – Rupture Discs

Sanitary HPX

3A Sanitary Rupture Discs. Tested in excess of 5 million cycles!

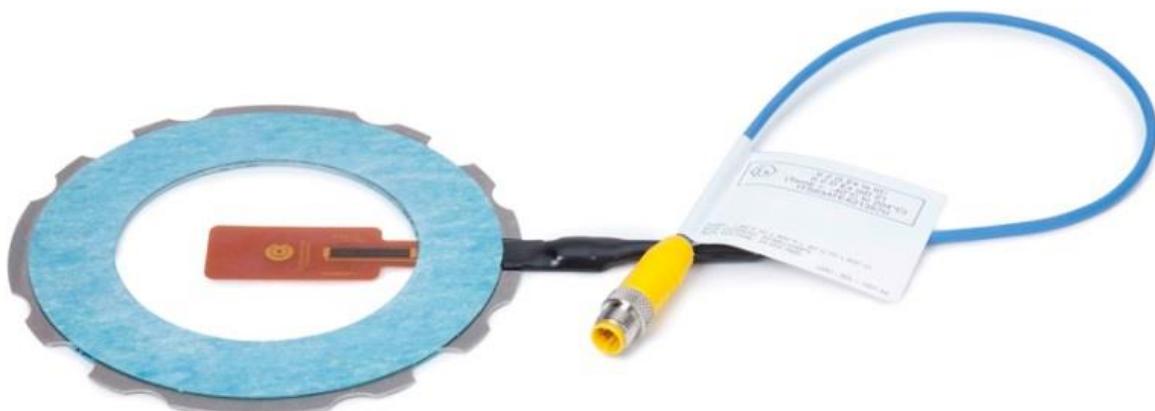
The SANITRX HPX rupture disc is a semicircular scored reverse acting rupture disc designed specifically for the pharmaceutical, biotech, food, and beverage industries. This rupture disc is available to fit between industry standard sanitary ferrules, NACONNECT® flanges or SANITRX fittings.

SANITRX HPX rupture discs are shipped in sanitary, environmentally friendly, non-toxic packaging



Burst Disc Indicator – BDI

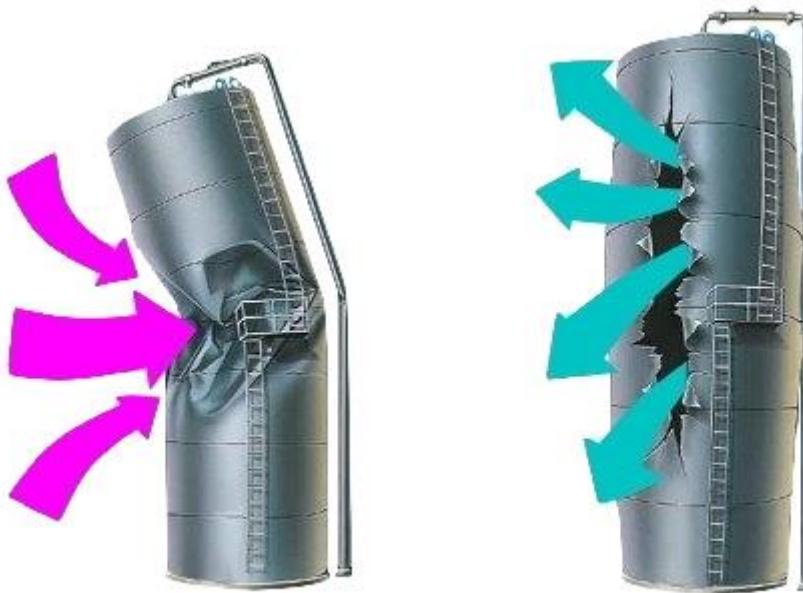
Universal or Integral B.D.I.® (Burst Disc Indicator) Alarm System The B.D.I. (Burst Disc Indicator) Alarm System is designed for use with Continental rupture discs. The B.D.I. Alarm System signals the system operator when a rupture disc has burst to relieve an overpressure or vacuum condition.



Continental – Rupture Discs

Bi-Directional Rupture Discs

Thin wall tank protection of positive and negative pressures



The CAL-VAC / POS-A-SET Rupture Disc Assembly is a highly accurate, double acting pressure relief device designed to protect processing and storage tanks against implosion or overpressure conditions that can occur:

- When too much vacuum is pulled during liquid product withdrawal
- During hot water or steam cleaning of tanks
- From development of an abnormal process condition

Both designs relieve pressure settings starting as low as 1" water column differential. The difference in performance of the CAL-VAC Rupture Disc and the POS-A-SET Rupture Disc is how each one is installed (oriented) in the system.

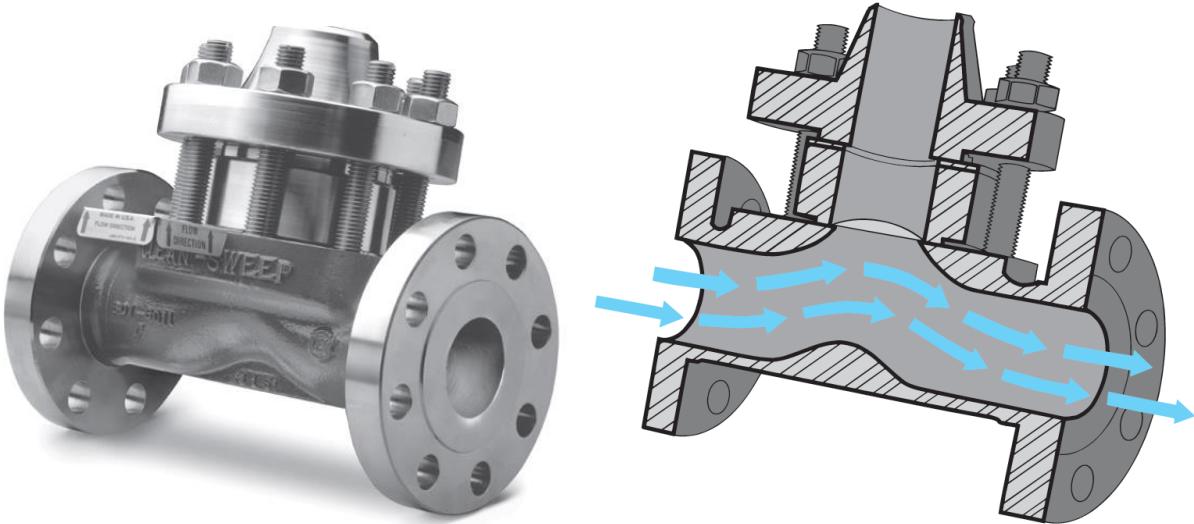
The CAL-VAC Rupture Disc relieves ultra-low pressure in the vacuum (negative) pressure direction, while the POS-A-SET Rupture Disc relieves ultra-low pressure in the positive pressure direction.



Continental – Rupture Discs

Clean-Sweep® Assembly

Flow through rupture disc holder for viscous medium



The CLEAN-SWEEP® Holder is designed for systems handling viscous media processes, particularly where product build-up in a piping system may cause excessive overpressure conditions.

This holder is an ideal replacement for rupture discs installed off the leg of a pipe tee where product build-up could affect the proper operation of the rupture disc.

The CLEAN-SWEEP® Holder body is specifically designed for a rupture disc. The rupture disc is mounted directly on the holder body adjacent to the process flow. Compared to other designs, the CLEAN-SWEEP® greatly reduces the possibility of product build-up under the rupture disc and it is available for pressures up to 1440 psig (99,3 barg).

Double Disc Holders

A Double Disc Holder Assembly consists of three holder components: an inlet, a mid-flange and an outlet piece, along with two rupture discs. The first of the two rupture discs is located between the inlet and the mid-flange, and the second rupture disc is between the mid-flange and outlet.

This assembly arrangement provides the solution to multiple applications without the need of a more complicated piping arrangement.

Applications:

- Leak Detection
- Environmental isolation
- Elimination of back pressure/vacuum influence
- Rupture on demand
- Rupture Disc Redundancy



Continental – Rupture Discs

HPX®-PT Pre-Torqued Holders

HPX-PT pre-torqued holders incorporate high strength steel socket head cap screws to ensure accurate loading and sealing of the HPX® rupture disc. The HPX-PT holder allows the disc to be correctly fitted in the workshop using precise recommended torque levels, prior to installation of the complete assembly between the flanges in the process system relief stream.



Special Assemblies

Custom designed assemblies and solutions

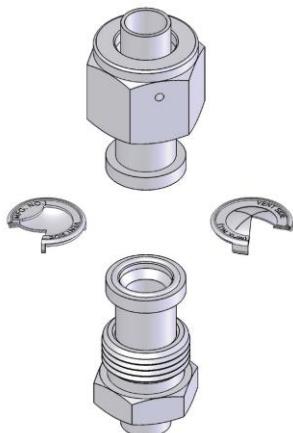


Whether it's from the standard product line, or a custom-manufactured rupture disc for a one-of-a-kind application, Continental Disc Corporation has built a reputation for solving the toughest pressure relief problems.

For OEM's. Defence Industries. Space exploration program. Aircraft and aerospace manufacturers. Chemical and petrochemical industries. Food processing. Electronics industry. Countless more.

Face Seal Assemblies

Designed for critical leak rate applications



These special Welded Rupture Disc Assemblies (rupture discs & holders) are suitable for applications which must meet leak rate specifications as low as **4 x 10⁻⁹ atm. cc/sec. helium**.

- Ultra-Pure Gas (including corrosive, toxic & reactive gases)
- Gas Panels // Gauges // Instrumentation
- Micro Processing (Semi-Conductor)
- Pumps & Compressors
- Valve Connections
- Manifolds
- Purge & Vent Lines
- Sampling Lines

Continental – Rupture Discs



MICRO X®, Forward Acting Rupture Disc are scored on the outlet (vent) side of the rupture disc, a smooth disc surface is provided on the inlet (process side) of the rupture disc. The result is an undisturbed inlet surface resistant to corrosion and the accumulation of process media.



Grafsert® impervious **Graphite rupture discs** are simple, reliable overpressure relief devices designed to protect processing systems, truck tanks, storage tanks, and closed processing vessels from overpressure conditions.



Tite-Seal & Screw Type assemblies are complete rupture disc and holder units designed for use on various "mini systems" such as air-con, refrigeration units, hydraulics, gas cylinders, portable compressed air systems, and laboratory equipment.



Vent Panels are designed to provide instantaneous overpressure protection for pressurized equipment like dust collectors, driers, silos, spreaders, elevators, air scrubbers, sieves, and other various types of dry, bulk handling and storage equipment.



Continental Disc Corp's **Union Holder** is designed to provide flexibility of use in tight piping configurations. These precisely built holders combine remarkable ease of installation with high pressure ratings.



Full Bolted Holders do not need companion flanges. The proper seat configuration is machined directly into the flange. Full bolted holders are available in 30° light or heavy lip seat configurations, dependent upon size.

Groth Corporation

Groth Corporation was founded by Edward Groth on August 1, 1960. Groth began as a manufacturers' representative, distributor, and remanufacturer of pressure relief valves sold to the refining and petrochemical industries. In 1999, Groth Corporation joined Continental Disc Corporation and moved to its current Stafford, Texas manufacturing site in 2002. These two events strengthened Groth's position as a global leader in low pressure safety solutions.



Today, Groth is a global leader in low pressure safety equipment with representatives around the world, providing engineered solutions with uncompromising commitment to customer satisfaction. Groth industrial products are comprised of independent product lines, classified as: pressure/vacuum relief valves, blanket gas regulators and flame arresters.

Additionally, that's why we maintain the prestigious ISO 9001 Quality Management Systems certification, conferred by TÜV SÜD America Inc, in the design and manufacture of pressure/vacuum relief valves, deflagration and detonation flame arresters, emergency relief valves, waste gas burners, blanket gas regulators, sediment traps, flame traps, check valves and drip traps.



Groth Corporation

Deflagration Flame Arresters



Detonation Flame Arrester



Horizontal Flame Arresters



Vent Stack Flame Arresters



Threaded Flame Arresters



Combination Valve & Flame Arresters



Ethanol / Distilling Flame Arresters



Union Flame Arresters



Welded Inline Flame Arresters



Groth Corporation

Pressure/Vacuum
Relief Valve



Pilot Operated
Relief Valves



Side Mount Vacuum
Relief Valve



Emergency
Relief Valves



Pilot Operated Emergency
Relief Valves



Fibreglass
Relief Valves



Steam Jacketed
Valves



Roof Manhole Covers



Gauge Hatches



Groth Corporation

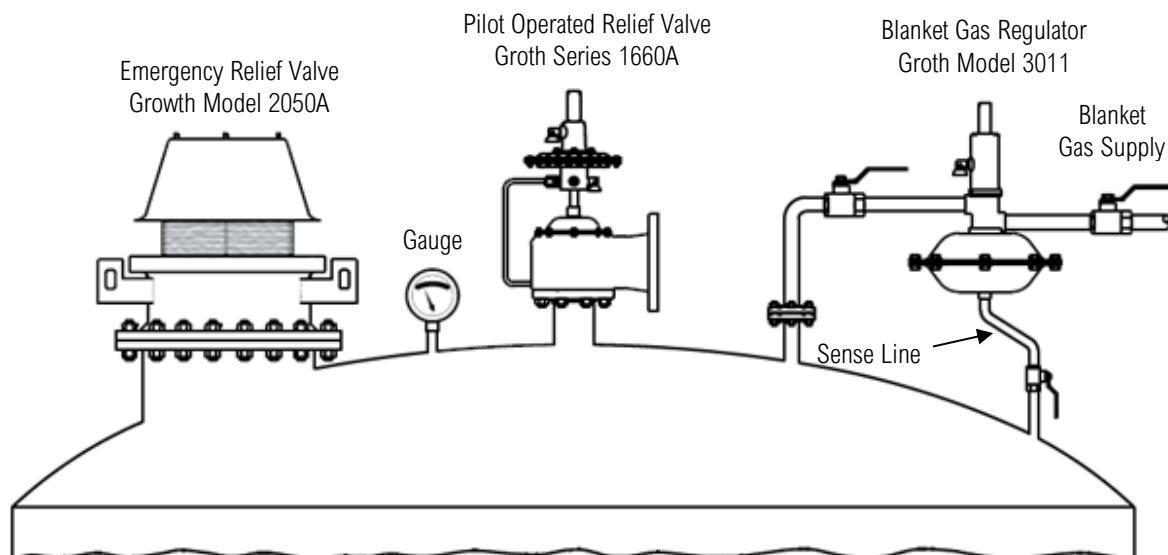
Blanket Gas Regulators

Blanket Gas Regulators from Groth Corporation ensure that a constant gas pressure is maintained in the vapor space of a storage tank. A blanket gas regulator supplies an inert gas to prevent a vacuum from developing when liquid is removed from a tank, to maintain the desired blanket pressure when the temperature drops, and to prevent outside air from contaminating the tank or creating a flammable or explosive environment. A blanket gas pressure as low as 0.5 InWC prevents outside air and moisture from entering the storage vessel and reduces evaporation of the stored product to a negligible amount. The end result: product conservation and significant reduction in tank emissions.



Features:

- Simple operation, spring-loaded "push-push" balanced piston design
- Bubble-tight shut-off
- Variable orifice, field-adjustable flow capacity
- Single stage regulator
- Setting ranges from 0.5 InWC to 15 psig
- Modulating opening
- Minimal lockup and droop



Aplisens – Pressure, Level, Temp & Flow

Aplisens is one of the leading manufacturers of high-quality process instrumentation. The company was founded in 1992 with a main factory and headquarters located in Warsaw concentrating on electronic pressure and differential pressure measurement technology. The basic philosophy has always been: high quality, high flexibility and competent support to customers.



Today Aplisens offers a wide range of products:

- Differential pressure transmitters
- Hydrostatic level probes
- Level transmitters
- Temperature instruments
- Diaphragm seals
- Instrument, manifold & needle valves
- Digital indicators and panel meters
- Power supplies, isolators & separators
- Gauges

The constant development, high-tech production and ISO 9001 management system are the best warranty of quality.

Pressure Transmitters

- 4-20 mA, HART, Modbus or Profibus PA
- Aluminium or 316SS Housing
- 0.075% accuracy
- IECEx Approval
- SIL 1 & 2 certificates
- MID Certificate
- Marine/Shipbuilding approval
- Ranges from 0.02 mbar to 1000 bar
- 5-year warranty



Differential Pressure Transmitters

- 4-20 mA, HART, Modbus or Profibus PA
- Aluminium or 316SS Housing
- 0.075% accuracy
- IECEx Approval
- SIL 1 & 2 certificates
- MID Certificate
- Marine/Shipbuilding approval
- 5-year warranty



Aplisens – Pressure, Level, Temp & Flow

Hydrostatic Level – Submersible

- IECEx Approval
- 4-20mA, VDC, MODBUS, HART and other outputs
- 316SS, Titanium or Hastelloy C wetted
- Teflon shielded cabling for corrosives
- Ranges from 0.5 to 500 mH₂O
- SIL 1 Certificate
- Marine/Shipbuilding approvals



Hydrostatic Level – Slim Line

- 16 MM diameter
- 4-20mA, VDC outputs
- 316LSS wetted parts
- Teflon shielded cabling for corrosives
- Ranges from 10 to 100 mH₂O
- RTD Temperature Sensor option
- Marine/Shipbuilding approvals



Hydrostatic Level – Rigid sensor

- IECEx Approval
- 4-20mA HART or 4-20 mA
- 316SS
- Ranges from 0.2 to 3 mH₂O
- Marine/Shipbuilding approvals



Hydrostatic Level – Flexible sensor

- 4-20mA HART
- Wetted: 316SS, Titanium, Hast C, PTFE, PU
- Ranges from 0.5 to 20 mH₂O
- Flexible for easy handling
- IECEx approval
- Multiple mounting options



DP Flow meter

- 4-20 mA HART
- Profibus PA
- IECEx Approval
- Diaphragm and high temp seal options
- SIL 1 & 2 certificates
- MID Certificate
- Marine/Shipbuilding approval
- 5-year Warranty



Aplisens – Pressure, Level, Temp & Flow

Magnetic Flow Meter

- Flow of liquids with conductivity down to 5 $\mu\text{S}/\text{cm}$
- Programmable
- DN10 to DN1000
- Easy to read LED display
- Alarm outputs
- Remote configurations
- Corrosive resistant materials



Temperature Transmitters

- 4-20 mA HART
- IECEx Ex d & Ex ia
- 0.075% Accuracy
- MID Certificate
- Single or dual probes configurations
- RTD or Thermocouple element



RTD & Thermocouple Assemblies

- RTD and Thermocouple types
- Metal and ceramic shields
- Precision and OEM solutions.
- Customisable designs



Head and Rail mount Transmitters

- Programmable
- Head mounted or DIN Rail configuration
- RTD, Thermocouple or potentiometer input
- 4-20 mA HART



Magnetic Level Switches

- Heavy duty design
- Up to 250 deg C
- Horizontal and vertical mounting
- High current capacity contacts



Aplisens – Pressure, Level, Temp & Flow

Diaphragm Seals

S-CompCH	S-Comp	S-Nord	S-Mazut
			
Large diaphragm with teflon or tantalum wetted parts for corrosives	Seal with seperable lower section and high linearity	High-temperature applications with low ambient temperature	Compact seal for integral and remote mountng.
SP	ST	S-Comp 10M	Sanitary
			
Flush faced seal for thick or coating mediums	Extended face to accommodate nozzles	High pressure	DIN, Tri-Clover, Universal
S-TK	S-Homogenizer	S-RC	S-RCF50
			
Seal cleaning	Homogeniser	High temperature compact with flush face	High temperature, high linearity with flush face

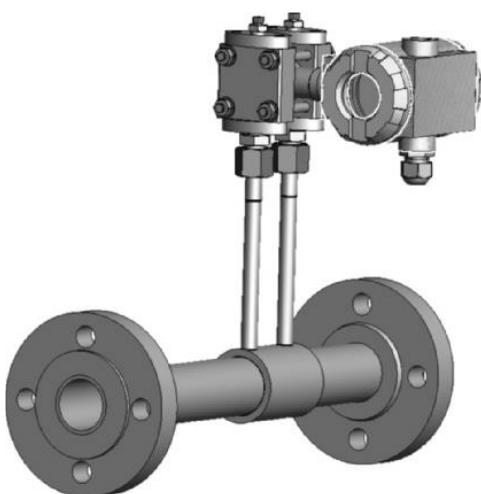
Aplisens – Pressure, Level, Temp & Flow

Aplisens DP Flow elements

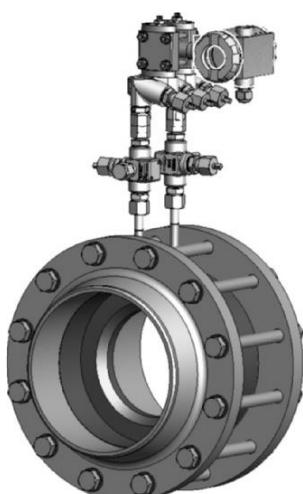
- High accuracy in wide measuring
 - o Ranges. 0.5 to 1.5%
- Applicable to measure flow of neutral
 - o and aggressive mediums
- Easy calibration

Information needed for orifice calculation:

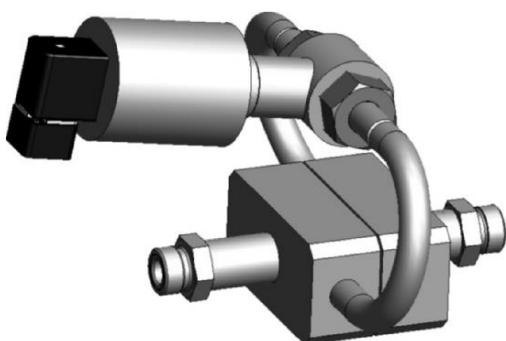
- Require correction from pressure and temperature?
- Line diameter DN?
- Material of pipe?
- Outside diameter of pipe or wall thickness?
- Nominal pressure?
- Nominal temperature?
- Maximum and minimum flow rate?



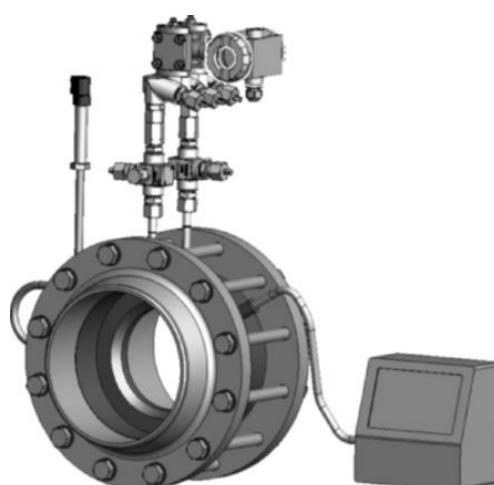
Flanged with straight sections



Flanged and weld neck



*Micro Orifice for small diameters
& flow rates*



*With correction from
pressure & temperature*

Aplisens – Pressure, Level, Temp & Flow

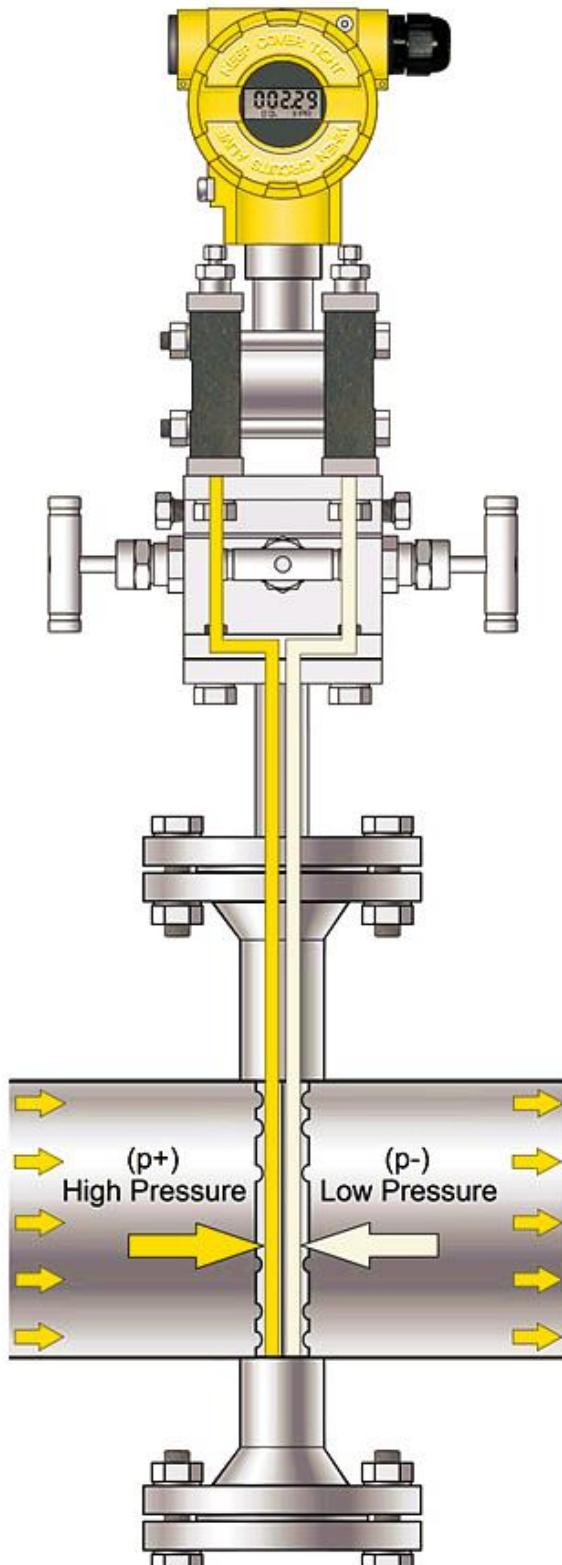
Pitot Tubes

- Gases, liquids and steam
- Pipe diameters: 40 to 2500 mm
- Operating temperature: -50° C to +450°C
- Short straight pipe run requirements.
- Low permanent pressure loss
- Cost effective
- Maintenance free
- Bi-directional flow measurement
- Handles irregular flow with averaging ports

The Pitot tube based flow Sensor measures the flow in pipes and ducts by using the differential pressure principle based on the basics of Bernoulli.

A rectangular design of the PRP sensor profile is divided diagonally into two symmetrically constructed chambers with sensing holes (dp-tappings). The chamber facing to the upstream generate a higher pressure (p_+) and the chamber in the downstream a lower pressure (p_-).

Several dp-tappings along the sensor profile provide a steady averaging of the flow velocity. This facilitates exact metering even with irregular flow profiles. Each chamber is connected to the corresponding side of a differential pressure transmitter. The value of the differential pressure is proportional to flow. With increasing flow, the dp increases. A differential transmitter converts the dp into an electrical signal (i.e. 4-20mA) that is transmitted to the process control system.



APAR – HVAC , Control & Display

APAR is a manufacturing company operating since 1985 in the market of automation, electronics and measurements in Poland. Our offer is focused on two main areas: Industrial Automation, and Housings and Connectors.



In the area of **Industrial Automation** we specialize in the production of sensors, transducers, meters, recorders and controllers constituting the elements of temperature, humidity and pressure measurement and control systems. These solutions also include devices for wireless measuring and recording of the above-mentioned values. Our projects are characterized by modern technical solutions, high accuracy, resistance to EMC interference and good functional properties, while maintaining a moderate price level. With over 25 years of experience and highly qualified engineers we are able to develop from scratch devices according to customer demand. We offer expert advice, analysis of possible design options, timely execution, and training in the operation of the device.

Air Quality

Carbon Dioxide, Humidity, & Temperature	Dust, Pressure, Humidity & Temperature	TVOC, Humidity & Temperature
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Humidity & Temperature

Humidity Sensor	Temperature Sensor	Combined Humidity & Temperature Sensors
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APAR – HVAC , Control & Display

Panel Meters

Universal Input

Oversize

Flow / Counters



Data Logging

Battery Powered

Panel Mount

Multi-Channel



Signal Conditioners & Converters

Galvanic Seperator

Signal Converter

Universal Transmitters



Barksdale - Instruments & Valves

Barksdale is subsidiary of Crane Co, Stamford CT, and was founded in 1949. Primary manufacturing is based in Los Angeles, CA, with another manufacturing facility in Reichelsheim, Germany. Barksdale are a ISO 9001 registered manufacturer of controls for industrial applications, specialising in the control and measurement of fluids and gases.

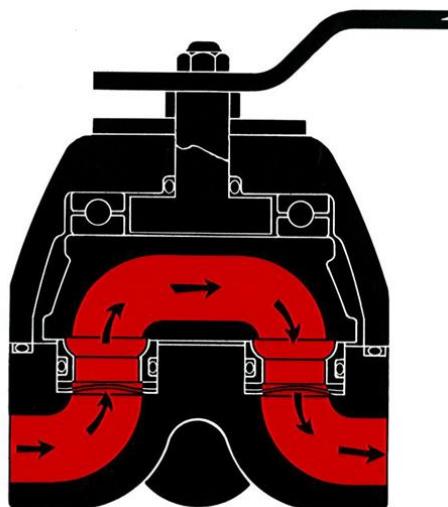
Barksdale specialise in control valves, pressure, temperature, level and flow products for the mining, oil/gas, marine,

Shear-Seal Control Valves

What makes **Shear-Seal®** so special? This special design controls the media through internal galleries in the sealing components rather than across the critical sealing faces. This means that metallic particles and other contaminants commonly found in fluid power systems have little opportunity to damage the valve. The continual sliding motion between the **Shear-Seal®** faces and the rotor along with the combination of spring and pressure loading, allows automatic adjustment of the seals as they wear in. The lapping action between the valves sealing elements mend minor sealing surface defects with each movement of the handle. The result is a valve that doesn't wear out – but wears in.

Shear-Seal® Valve Advantages

- Metal to Metal Seal
- Handles Contaminants Better Than Other Valves
- Fluid Flows Through the pressure seal and not across the Sealing Surface
- Self-Lapping
- High flow rate & velocity
- Minimal pressure drop
- Available with Interflow



Manual Valves



Actuated Valves



Hydraulic Regulators



Barksdale - Instruments & Valves

Generation 3000 – Switch, Transmitter and Gauge

Compact and modern design

The new 3000 series of solid-state instruments are characterised with a panel height of 99 mm and diameter of 40 mm which enables compact installation of many switches.

Rotatable 320° display & electrical connection

It is as simple as that: due to rotatable 320° display and electrical connection, the mounting and installation will be a walk in the park.

Perfect readability

The 4-digit 14-segment LED display ensures a perfect readability independent of the positioning: even in case of mounting upside down the indication can be inverted.



High protection with IP65/IP67 & EMI protection

Harsh environmental circumstances, with dust or water being present are not a problem for the generation 3000. Continued functionality will be achieved by a sophisticated housing seal and a keypad integrated within the plastic housing.

IO-Link Compatible

IO-Link is a bi-directional, digital, point-to-point serial communication protocol used to connect digital sensors and actuators to optimize industrial automated processes.



Pressure



Temperature



Level



Differential Pressure



Barksdale - Instruments & Valves

Pressure Switches



Compact

Versatile and flexible options suited to most applications

Diaphragm

High accuracy and capable of measuring down to .013 kPag or 0.06" Hg

Bourdon Tube

High pressure applications and zero leakage. Perfect for gas.

Piston

Suited to hydraulic and lubricating media, Excellent for high repetitions.

Electronic Pressure



Switches

A compact, lightweight, long-lasting and reliable alternative to mechanical devices.

Indicating Switch

Accuracy and versatility through onboard display, programmable functions.

Transmitters

Options to suit just about any application. mA and voltage outputs combined with field proven reliability. IECEx approval.

Temperature



Mechanical Switches

Compact, industrial & OEM options with ambient compensation for remote devices. IECEx approval.

Electronic Switches

Greater accuracy and control with programmable features and a built in display/keypad.

Transmitters

PT100 temperature transmitters with 4-20 mA or voltage outputs.

Barksdale - Instruments & Valves

Pressure Switches



Economical

Low cost with high reliability and dependable performance

Calibrated dial

Graduated adjustment dials for reference.

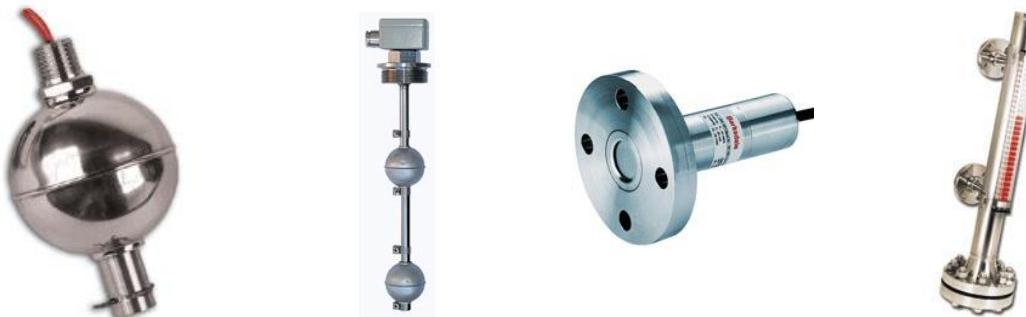
Terminal strip

An internal terminal strip to land field wiring

Electronic

Greater accuracy and control for

Level



Single Point

Horizontal and vertical mount options

Multipoint

Up to 6 set points in a single unit.

Transmitters

High accuracy with shipbuilding approval

Level Site

Visual indication of level with mechanical operation.

Flow



Flow Switch

Simple SPST or SPDT contact for detection of flow. Viscosity compensated up to 600 cSt

Indicating Flow Switch

Simple SPST or SPDT contact for detection of flow. Viscosity compensated up to 600 cSt.

Electronic

Solid-state measurement with transistor and analogue output.

Dynalco – Speed & Condition Monitoring

Dynalco was started in 1968, with three products and a goal of producing engineered solutions for the oil and gas industries. In the 47 years since, Dynalco has become a worldwide industry leader, recognized for its high-quality instruments and controls used in the oil & gas, chemical, power generation, marine and construction industries.

DYNALCO



Magnetic Pick ups

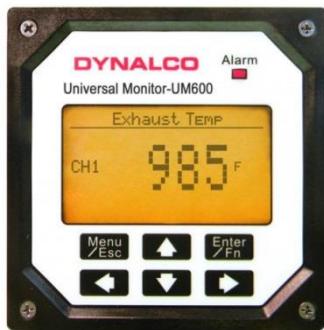
- Ultra reliable
- Largest range of pickups
- Sensitivity choices to suit all ranges of speed
- Explosion proof and intrinsically safe options

Hall Effect Pickups

- Provide a digital output down to zero-speed
- Allows wider airgap
- Detects ferrous or magnetic targets
- Compatible with most PLC Input cards

Speed Switches/Transmitters

- Over and under speed alarms
- Digital and analogue processing options
- DIN rail or panel mount
- Local display
- Analogue outputs
- msec response times



Universal Monitors

- Up to 6 channels
- Accepts many different signals types
- Capable of custom calculations and differential measurements.
- Alarms and analogue outputs

Scanner/Monitor

- Monitor up to 24 channels or speed, pressure, temperature and other parameters
- Microprocessor controller
- Large display of parameters and alarm state.

Tachometers/Hour meters

- Speed indication and control
- Reliably and accurately Keep tabs on machine hours with non-volatile memory.
- Can be pick up powered for remote areas or application convenience.

Dynalco – Speed & Condition Monitoring

IECEx Magnetic Pickups

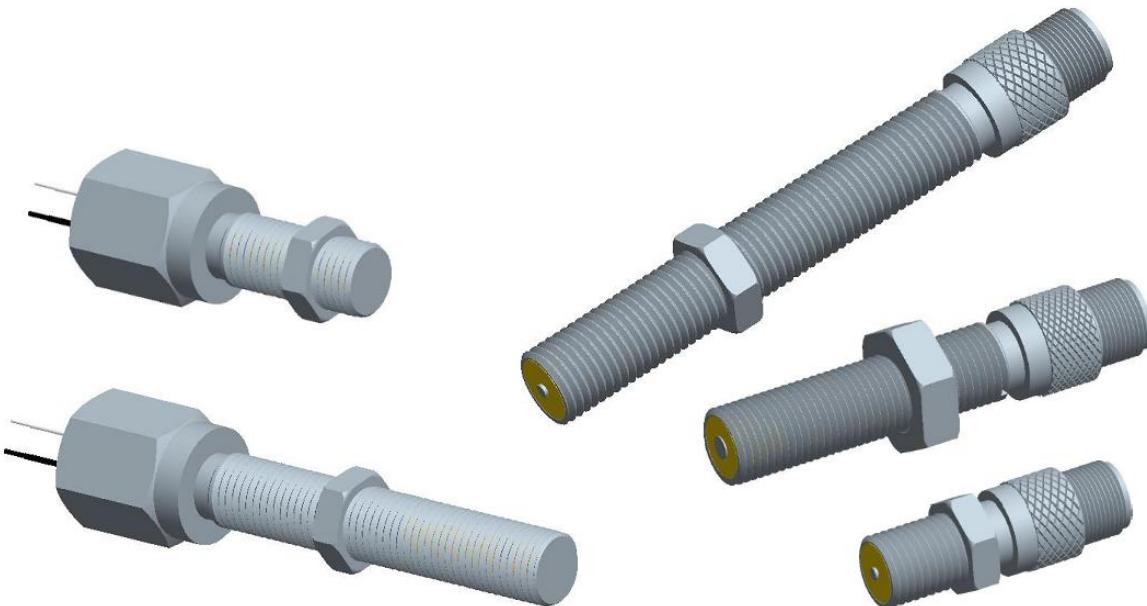
Dynalco's IECEx approved passive and powered pickups are suitable for detection of speed, position and as a phase reference for condition monitoring racks and analysers. Easy equipped to sense gear teeth, keyways and notches.



- Over and under speed protection systems
- Phase reference for condition monitoring
- Position detection of rotary and linear objects
- IECEx Ex ia and Ex mb IIC approval

Available with Imperial and Metric threads, variable case lengths and diameters, output types, electrical connections and more.

Conduit connections for local termination via Ex e junction boxes and 2-Pin MIL plugs for reliable cable termination of Ex ia applications.



M321

Passive variable reluctance magnetic pickup with IECEx approval. Self-powered and ultra-robust. These detect the presence of ferrous material and are an ideal option for remote, and low power installations.

M920

Hall effect magnetic pickup with IECEx approval. Fixed output for any speed from zero to 20,000 Hz. These are an excellent choice for monitoring speed and phase of critical rotating machinery.

The M920's fixed amplitude DC output is directly compatible with PLC's, condition monitoring racks and common control systems.

Metrix Vibration

Metrix is the preferred supplier of industrial condition monitoring systems to many of the world's leading manufacturers and users of cooling towers, gas turbines, reciprocating compressors, and other rotating and reciprocating machinery. With headquarters in Houston, Texas, we operate in more than 40 countries via factory-direct sales and service professionals, along with a strategic network of instrumentation partners.



DPS – Digital Proximity System.

The world's first digital proximity probe system. Fully programmable. Fully digital. Fully API 670-compliant. Now, a single programmable device can be configured to work with nearly any probe/cable/target-material combination, and supports probes from a variety of manufacturers including Metrix and Bently Nevada.

Features:

- Field Calibration
- One driver for all applications
- Interchangeable with other manufactures
- Vibration, thrust and speed measurements
- IECEx approved



Proximity Probes

5mm, 8mm and 11 mm tips designed to offer full API 670-compliance.



Extension Cables

0.5 to 12 meter lengths with coax and triax options



Cable Trimming Kit

Shorten or repair extention cables in the field with Metrix cable trimming kit.



Shaft Calibrators

Calibrate your drivers directly on the shaft



Probe Mounting Hardware

Holders and brackets for fixing probes to machinery



Static Calibrator

Used to calibrate or verify your probes and cable sets

Metrix Vibration

Vibration Transmitters



Highly accurate vibration transmitter with wide frequency response for seismic applications. IECEx approval.

Vibration Switches



Available in electronic and mechanical with relay, analogue and solid state output. IECEx approvals for hazardous areas

Vibration Sensors



Acceleration or velocity sensors for high temp and hazardous areas with IECEx approval.



5580 Signal Conditioner

The 5580 is a new generation DIN rail mounted Smart Vibration Signal Conditioner from Metrix. It has been designed to accept signals from machine casing mounted velocity sensors, accelerometers or shaft observing proximity probe systems and produce a 4-20 mA output proportional to the measured variable.

Features:

- Field programmable via USB
- 1 or 2 channels
- 4-20 mA and local BNC for raw data
- Local display
- Reconfigurable High, Low and Band Pass

ST5484E-SW

Compact & Configurable Vibration Switch

The ST5484E-SW is a loop powered seismic velocity transmitter and configurable switch. The compact vibration switch incorporates a piezoelectric accelerometer, signal integrator, RMS or peak detector, 4-20 mA signal conditioner and a digital microcontroller into a single package. It is mounted directly on a machine case or bearing housing without disturbing the signal conditioning equipment.



Features:

- Field programmable
- Compact footprint
- IECEx approval
- Submersible ingress protection

MCM – Trace Moisture in Gases

MCM supply a comprehensive range of Hygrometers and associated Dew point services for moisture measurement in gas.



Moisture Control & Measurement Ltd (MCM) are the globally recognised leaders in gas moisture analysis. We are proud to manufacture and supply trace moisture analysers that are the preferred choice of industry experts for a wide variety of applications around the world.

MCM's unique temperature controlled silicon sensor and "Push Purge" function enables users a no fuss solutions to reliable moisture measurement.

The Temperature Controlled Silicon Sensor

Temperature Control – a Prerequisite of Good Hygrometry

The necessity for Temperature Control in hygrometry is determined by the Laws of Physics, which dictate that all hygroscopic materials will lose or gain moisture in relation to their temperature. This is clearly observed, for example, when condensation collects on a cold surface, and is then subsequently removed when the temperature of the same surface is raised above the temperature at which the dew forms.

Stable Operating Temperature = Stable Readings

This principle applies to any moisture Sensor. Changes in temperature will give rise to a variation in the amount of water the Sensor can hold in a state of equilibrium. This will, in turn, give rise to larger uncertainties associated with any measurement if Temperature Control is not applied.

Therefore, if a Sensor is to give a reproducible response to a fixed water concentration, it must operate at a constant temperature. Accordingly, all MCM moisture analysers feature Temperature Control.



Laboratory Performance & Traceability – In the Field

By applying Temperature Control to a thermally stable Silicon Sensor MCM offers a unique advantage over its competitors who do not use Temperature Control, namely stability and traceability of data. This is particularly relevant when operating at temperatures significantly different from the temperature at the point of calibration.

Traceability

Calibrations, traceable to National Standards, are performed in our laboratory with direct moisture injections – no extrapolations or calibration gases are used. The most demanding applications can be satisfied with ISO17025 calibrations, certified with mass traceability to 20 ppb[V]. Mass traceable calibrations are critical to ppm[V] or ppb[V] determinations - NIST does not offer this service.

We offer ongoing service contracts to provide clients with regular recalibrations, thus ensuring traceability of data and compliance with ISO directives.

MCM – Trace Moisture in Gases

The Push Purge® Feature

An Effective Means Of Verification

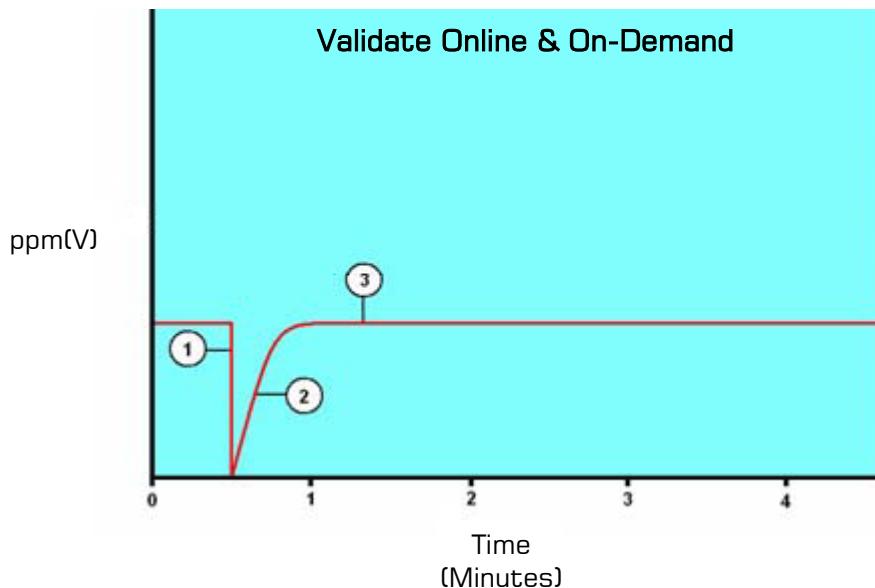
When sampling a gas for the first time, or if anomalies occur that cause concern, the ability to verify results is invaluable. MCM makes this possible with the Push Purge® feature. When activated the surface of the Sensor is heated rapidly, burning off superficial moisture any hydrocarbon contamination that may be present. As the temperature of the Sensor increases moisture is displaced and the displayed reading drops accordingly^①. As the Sensor cools, and equilibrium is re-established^②, the moisture reading will return to its previous value if surface contamination is negligible, confirming the value of the water vapour present in the sample gas^③. In addition, Push Purge® provides valuable information on the risk of contamination of the Sensor, the gas condition and the electronic functionality of the hygrometer.

Rapid, Repeatable Measurements by Eliminating Hysteresis

The effects of hysteresis are minimised when using Push Purge® because each measurement is started with the Sensor in a repeatable, dry condition. Equally, the time required for each measurement to stabilise can be vastly reduced by using the Push Purge® Sensor drying function to speed up the equilibrium process. The time it takes for the water vapour equilibrium to be re-established from this dry state will confirm the analyser's sensitivity to moisture and establish its response time under field conditions.

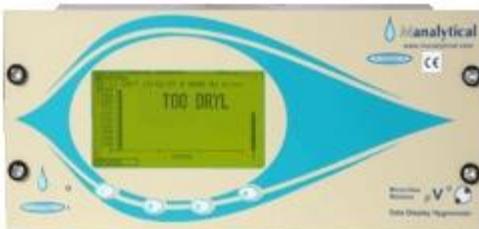
Invaluable Diagnostics

Any hygrometer that has the ability to confirm its sensitivity or speed of response to changes in moisture levels, without disturbing the sample condition itself, is a valuable tool for any operator in terms of the confidence it provides in the data that is collected. Push Purge® is, therefore, an invaluable diagnostic tool which aids productivity and Quality Control.



MCM – Trace Moisture in Gases

On-Line Analysers



MicroView

The **MicroView** and On-Line Hygrometer can sample inert and non-reactive gases. It is ideal for applications where fast speed of response and reliable data collection are important, and the ability to provide audit records is of benefit.

Portable Analysers



MicroView Portable

MicroView Mini Portable Hygrometer, cutting-edge capabilities presented in a portable device that elevates spot-check measurements to a new level of simplicity and performance, with a broad range of measurement from 0.1 – 1000 ppmV



MicroView Mini

The brand new **MicroView Mini** Hygrometer combines MCM's key performance advantages in an unbeatable entry-level transmitter.

The MicroView Mini is ideal as a stand-alone transmitter, or as the keystone of a more complex system solution.



MicroView Mini Trace 3

Parts Per Billion Analysis

Based on Manalytical's well-established Si-Chip moisture sensor, the MicroView Mini Trace-3 Hygrometer brings a new clarity of vision and unique insight for applications requiring precise control in the parts per billion [ppbV] moisture range. Quite simply, it represents the most significant evolutionary step in precision moisture analysis in the last 25 years and provides a new level of performance for demanding industrial processes.



Hazardous area Analysers

MCM's hazardous on-line hygrometer redefines hazardous area applications with Ex ia IIC T4 Ta = -20°C to +60°C. Suitable for use with inert and hazardous gases including Natural Gas, methane, LNG / LPG, H₂, and volatile hydrocarbons (up to C5)

MCM – Trace Moisture in Gases

Self-Validating Systems

The **MCM Auto-Zero System** provides high precision, on-line moisture analysis in applications where levels of contamination are greater than normal and routine servicing is impractical.

- Mitigate the effects of contamination.
- Reduces the necessity for operator interface and maintenance - 24 hour uninterrupted operation.
- Extends the mean service interval of the System and reduces maintenance costs.
- Ideal for Natural Gas and Petrochemical applications. For example: Offshore Platforms, FPSOs, Post-Glycol 'Contactor' Monitoring, LNG, Pipeline Drying, Natural Gas Storage & Distribution, Receiving Terminals (Custody Transfer) and LPG Container Transfer.
- Customised Auto-Zero & Span Systems are also available.



Self-Calibrating System

Developed for catalytic reforming applications in the refinery industry, our most comprehensive analyser system comprises dual sensors and an internal, prime-standard moisture generator.

The MCM Continuous Moisture Measuring System (CMMS) provides catalytic reforming applications with the most accurate and reliable means available for on-line monitoring of moisture in recycle gas. Utilising our unique Temperature Controlled Silicon Sensor, the CMMS detects changes as low as 1 ppm[V] and stands up to corrosives, such as chloride, ensuring representative sampling of the recycle gas stream.



Desiccant Dryers

Continuous drying with seamless regeneration

MCM's range of Continuously Operating Desiccant Dryers (CODD) are intended to provide a constant flow of 'dry' Air or N₂, certified by NPL to be drier than -75°C Dewpoint.

Incorporating either 2 or 4 columns, dependent on the required flow, these on-line dryers (dehumidifiers) switch between duty and regeneration columns, thus ensuring that the desiccant is always in its best possible condition





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