



# PRODUCT CATALOG

PRESSURE | TEMPERATURE | FLOW | VALVES | DIAGNOSTIC | ENVIRONMENT & ENGINE CONTROL | TEST & CALIBRATION EQUIPMENTS | GAS DETECTION







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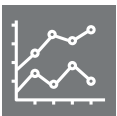
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## **GMS INSTRUMENTS**

MEASURE REGULATE AND CONTROL EQUIPMENT

In the shipping, offshore, and industrial sector, everything revolves around accuracy and speed. We know that agility in these markets is essential. And as a specialist in measuring, regulating and control instruments, we're ready to act swiftly and according to various wishes; of mechanics, engineers, purchasers, ship owners and many other end users.

**“ It's the people of GMS Instruments who give meaning to our service, day in and day out.**

Obviously, given every minute counts. Therefore, you have to be able to rely on a supplier who can immediately draw on almost 50 years of deep-rooted knowledge. And from an extensive product inventory, so when it comes down to it, speed is guaranteed.

In this demanding world, it's the people of GMS Instruments who give meaning to our service, day in and day out.

By producing and servicing highly specific and precise instruments. By assembling, repairing and calibrating technical equipment. And by the prompt handling of urgent requests. But especially by understanding the value when the provided good, or service works. This can only be done by operating as a single team; working together, each contributing their own expertise, heart and soul. All with the knowledge that you can rely on colleagues, manufacturers and suppliers. That collaboration means that we are in control, now and for decades to come.

With our services, our loyal and also new generations of customers can continue to thrive. Not only because we deliver products and services quickly, but because we know what it takes to finish the job.



Managing Director  
**Andres van Eijnatten**



Purchaser  
**Tamara Wolders**



Marketing Manager  
**Milan Boer**



Purchaser  
**Monique Meulenberg**



Junior Account Manager  
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Sales Representative  
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Delivery Driver  
**Arie Frerichs**



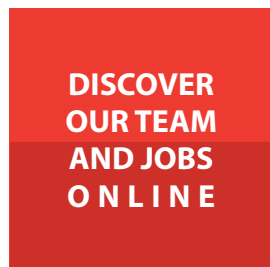
Sales Representative  
**Linda van den Herik**



Purchaser  
**Leonie van Zundert**



Service Technician  
**Tharwat Younan**



This is our promise. This way, we create lasting relationships; small enough to be personal and agile, yet big enough to stay professional and specialists in our field. That is how we stay ahead.

## **“ Because we know what it takes to finish the job**

With new distribution Hubs in Algeciras (Spain), Houston (United States of America) and Singapore (Singapore) we have managed to decrease delivery time of high-quality goods even further towards our end users.

With the introduction of these distribution points, you can expect the premier brands you have been accustomed to by GMS Instruments kept in stock across the following product categories:

- Pressure
- Temperature
- Instrument Valves and Manifolds
- Thermal Imaging
- Test and Calibration
- Gas Detection
- Level
- Diaphragm Seals
- Environmental and Engine control
- Diagnostic
- Valves
- Flow

At GMS Instruments, we know what it takes to finish the job. This is our promise. This is how we stay ahead.

**GMS Instruments B.V.**



# GMS SERVICE CENTER

DOWNTIME IS SOMETHING OF THE PAST

For almost half a decade, GMS Instruments has offered services to our customers in several industries. For years we have been extending our services by investing in high-quality workshops/laboratories. With the growth of our services and the capacity of it, we have launched the GMS Instruments Service Center. A unique location for all your instrument related services.

**“ In case of an emergency, we could even supply several instruments in order to prevent downtime.**

With the GMS Instruments Service Center, it is easier to access all services offered by GMS Instruments by having one contact, the Service Center itself. Directly to the source and heart of all services. We provide a comprehensive maintenance and repair service for most instruments in our assortment. Our service technicians are highly qualified and will supply you with relevant information concerning your instrument. In case of an emergency, we could even supply several instruments in order to prevent downtime. We strive to offer the best solution available within our scope.

### 360° Product Care

Over the years, we have been and stayed in close contact with our users of the Service Center, which brought us by they development of an overall and complete service package, the 360° Product Care\* service. Unique to the market in the way of complete service, administration and transportation. For decades GMS Instruments has offered services to our customers in several industries. For years we have been extending our services by investing in high-quality workshops/laboratories.





#### Advantages:

- Minimum downtime
- Condition-based maintenance
- Calibration and certification according to international regulations
- Original spare parts nothing else
- Increased productivity due to reduced administrative operations
- Cost transparency

#### Services

Besides our unique 360° Product Care, we are specialised and trained in exercising diaphragm seal services, repairs, calibration & certification and the pick-up and redelivery of your precious instrumentation.

To make sure your instrument is able for service right away we keep a large stock of original manufactured spare parts. By working with original spare parts, we can re-guarantee the quality of the instrument as intended by the manufacturer. For more information about our service center, feel free to contact us at any time.



\*Discover our Service Center on YouTube





## PRESSURE

CONTROLLERS | GAUGES | REGULATORS | SWITCHES | TRANSMITTERS

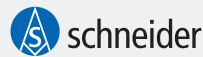
### BRANDS





Many industries are faced with pressure issues. When pressure needs to be measured, checked, calibrated or controlled GMS Instruments is your partner. Representing leading pressure measuring instruments manufacturers like WIKA, AMOT Controls, SIKA and AS-Schneider Armaturen. GMS Instruments carries a broad range of pressure gauges and transmitters, pressure regulating valves and controllers and pressure calibrators. We also carry accessories for pressure measuring instruments like pressure gauge valves, over pressure protectors and 2-, 3- and 5-fold manifolds. All kinds of mounting equipment and adaptors are within our scope of supply.

# Pressure Gauges & Accessoires



Our pressure gauges (mechanical pressure measuring instruments) for gauge, absolute and differential pressure have been proven millions of times over. For the optimal solution for the broadest range of applications, there is a choice of measuring systems in Bourdon tube, diaphragm element and capsule element technologies. The pressure gauges cover scale ranges from 0 ... 0.5 mbar to 0 ... 6,000 bar and indication accuracies of up to 0.1 %. For the various requirements in industrial and process instrumentation, there are pressure elements from copper alloys, stainless steel or special materials. Sizes of the pressure gauge case are available in 40, 50, 63, 100, 160, 250mm. Placement of the pressure gauge is possible through bottom-, back-, back flange bottom-, U-Clamp back-, front flange back connection. Furthermore, are there diverse materials of connection possible such as BSP, NPT or metric steal.

<b>Ranges:</b>	0 ... 0.5 mbar / 0 ... 6000 bar
<b>Size:</b>	40mm, 50mm, 63mm, 100mm, 160mm, 250mm
<b>Filling:</b>	Glycerine, Other filling liquids depending on use, none
<b>Mounting:</b>	Bottom (with or without backflange) or Back (with or without front flange or panel mount clamb)
<b>Connection:</b>	Thread, flange, diaphragm seal, sterile connections
<b>Outputs:</b>	4-20 mA or electrical switch (1-, 2-, or 3 switch points) optional ATEX
<b>Certificates:</b>	2.2 test report, 3.1 inspection certificate
<b>Approvals:</b>	CE, ATEX, Ghost, GL

## MOST POPULAR



WIKAI 213.53 / 0 ... 10 Bar / 63 mm



WIKAI 233.30 / -1 ... 10 Bar / 100 mm



WIKAI 732.14 / 0 ... 0.6 Bar / 160 mm

# Pressure Switches



A pressure switch is a device designed to monitor a process pressure and provide an output when a set pressure (setpoint) is reached. This is done by applying the process pressure to a diaphragm- or a piston-sensing element to generate a force which is compared to that of a pre-compressed range spring. This sensing element is used to actuate one or more switch contacts to indicate an alarm and/ or initiate a control action. Depending on the maker, there are pressure switches with 2 pressure setpoints or even a combination of a pressure and a temperature setpoint.

<b>Ranges:</b>	-1 ... +600 bar (divided over several ranges)
<b>Connection:</b>	Threaded or Flanged
<b>Output:</b>	1 or 2 contacts
<b>Certificates:</b>	ISO9001, GL, ATEX, GL, Loyds, Ghost
<b>Options:</b>	Digital display, Setpoint(s) pre set, Overpressure protector, Damping elements, Gold plated contacts, Vibration resistant contacts



**MOST POPULAR**



# Pressure Transmitter



A pressure sensor is measuring a pressure which then is converted into a signal (electrical or pneumatic). The majority of all pressure sensors work the same way. They measure the deflection or displacement of a diaphragm or membrane that is acted on by force and convert the amount of deflection into this signal. They differ in the materials used to construct the diaphragm and how the detection is measured. The two most common principles are resistive pressure measurement and captive pressure measurement. Absolute, relative or differential pressure can be measured.

<b>Ranges:</b>	-1 ... +2500 bar (divided over several ranges)
<b>Connection:</b>	Thread, flange, diaphragm seal
<b>Output:</b>	mA, mV, Pneumatic
<b>Certificates:</b>	ISO9001, GL, ATEX, GL, Loyds, Ghost
<b>Options:</b>	Digital display, Overpressure protector, Damping elements, Special types for level measurement

**MOST POPULAR**



# Digital Pressure Gauges



Digital pressure gauges are particularly suitable for both stationary and mobile measurement and display of pressure. They can be used as reference pressure gauges to simplify the checking, adjustment and calibration of other pressure measurement devices directly on site. High accuracy in the signal acquisition is achieved by using high-performance measuring cells with electronic linearisation of the characteristic curve. Suitable instruments are available for a wide variety of measurement tasks. Ease of use is assured by innovative design and advanced technology. All essential functions for everyday use can be selected conveniently at the press of a button. Excellent protection against dust and moisture is provided by a membrane keypad or rubber buttons. Integrated supplementary functions make digital pressure gauges true all-rounders.

<b>Range:</b>	-1 ... 2000 bar (divided over several ranges)
<b>Resolution:</b>	0.001 / 1 / 10 / 50 / 100
<b>Accuracy:</b>	0.05% ... 0.5%
<b>Medium temperature:</b>	-20 ... 80 °C
<b>Connection:</b>	G $\frac{1}{4}$ , G $\frac{1}{2}$ , H16 UNF
<b>Certificates:</b>	DNV GL, Ex II 1G EEx ia II C T5 / T6, Ex II 2G Ex ia II C T6

## MOST POPULAR



TUVO  
INSTRUMENTS



SIKA



SIKA



SIKA



SIKA



WIKAL

# Pressure Relieve Valve



Pressure relieve valves are proven all-round valves with proportional operating characteristics and an extremely compact design. In addition to basic pressure relieve valves version, these valves are also available for the most varied customer requirements as a gastight version or with lifting lever. The various sealing materials available mean that this valve is suitable for a wide range of media and temperatures.

As a closed, gastight version without lifting mechanism, it is suitable for all media. This makes the pressure relieve valve an economically interesting alternative for plants which do not require any approval or which do not fall under the PED. Besides, due to its relatively large setting range per spring, it is ideally suited in cases where either a stock valve for various applications and set pressures is required or if the you are looking for an adjustable pressure relief valve.

<b>Sizes:</b>	3/8" - 2"
<b>Material:</b>	Gun metal
<b>Temperature:</b>	-60 °C ... + 225 °C
<b>Pressure:</b>	0,2 ... 20 bar
<b>Approvals:</b>	TR ZU 032/2013, TR ZU 010/2011, PED 2014/68/EU



# Pressure Reducing Valves



Pressure Reducing Valves are designed to reduce incoming water or steam pressure to a safer constant predetermined downstream level. Depending on the type of valve, the downstream pressure is established by a pressure adjustment setting on the valve or by an external sensor. Pressure Reducing Valves are utilized in residential, commercial, institutional, and industrial applications.

Installed directly after the water meter, a water pressure reducing valve automatically reduces the pressure from the water supply main to a lower, more sensible pressure.



## Pressure Reducing Valve Series 681

This pressure reducing valve is also suitable for hot water applications.

### Features:

- Gun metal
- 1/2" ... 2"
- -20 °C ... +120 °C
- Inlet pressure: 0 ... 40 bar
- Outlet pressure: 0.5 ... 15 bar

## Pressure Reducing Valve Series 682

this type is now not only available in sizes DN65 and DN100, but also in sizes DN20 to DN50, as well as in a high- and low-pressure version.

### Features:

- Gun metal
- DN 15 ... DN 100
- -20 °C ... +120 °C
- Inlet pressure: 0 ... 40 bar
- Outlet pressure: 0.5 ... 15 bar



## Pressure Reducing Valve Series 683

With an outlet pressure of max. 50 bar the pressure reducing valve is used, for example, to control the starter air on ships

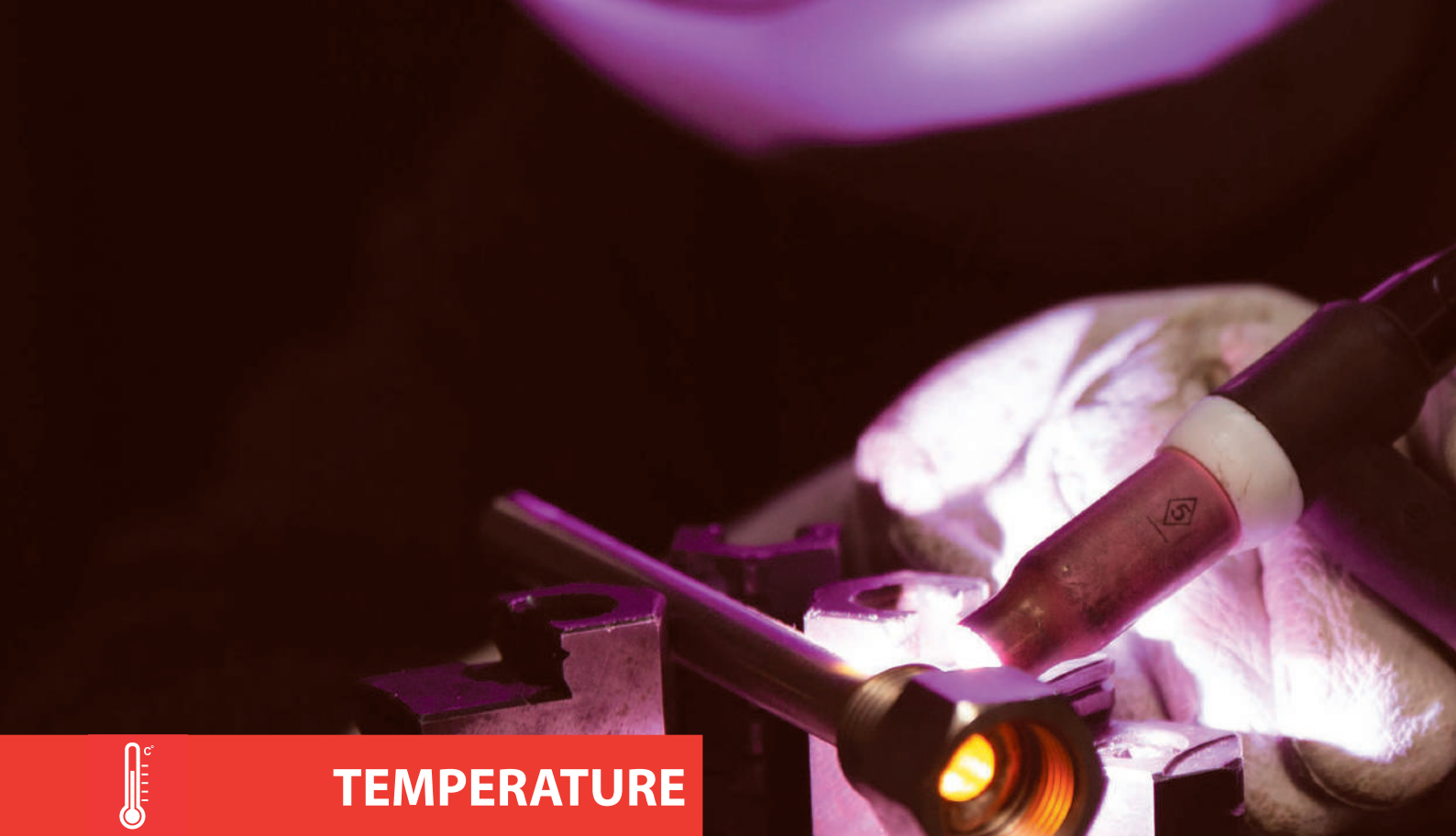
### Features:

- Gun metal
- 3/8" ... 1 1/4"
- -10 °C ... +95 °C
- Inlet pressure: 0 ... 50 bar
- Outlet pressure: 1.5 ... 10 bar

## Pressure Reducing Valve Type G1PR

Clorius G1PR/H1PR is a self-acting unit consisting of a valve, springs, an actuator and one capillary tube connected on the upper side of the actuator. The valve body is made of nodular cast iron or cast steel. The seat and cone are made of stainless steel. The diaphragm is made of EPDM or NBR rubber, depending on the medium to be controlled. For steam applications and media temp. above 100°C a compensation chamber is needed.





## TEMPERATURE

Controllers | Sensors | Switches | Thermometers | Thermowells | Transmitters

### BRANDS





Temperature is a key aspect of many industries. Temperature needs to be measured, checked, calibrated or controlled by high-quality products that are reliable. Therefore GMS Instruments represents leading companies like WIKA, SIKA, AMOT Controls, Brannan, Rexotherm, Danfoss and FLIR. The quality of products and processes depend on correct measurement and control of temperature. With an extensive stock of temperature measuring instruments like thermometers, thermocouples, temperature controllers, valves and other equipment we can support you at short notice with high-quality materials.

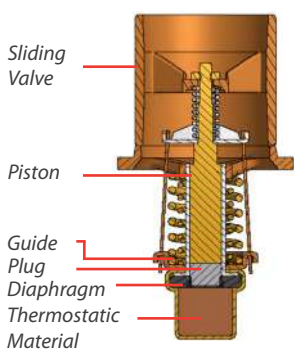
# Thermostatic Control Valves



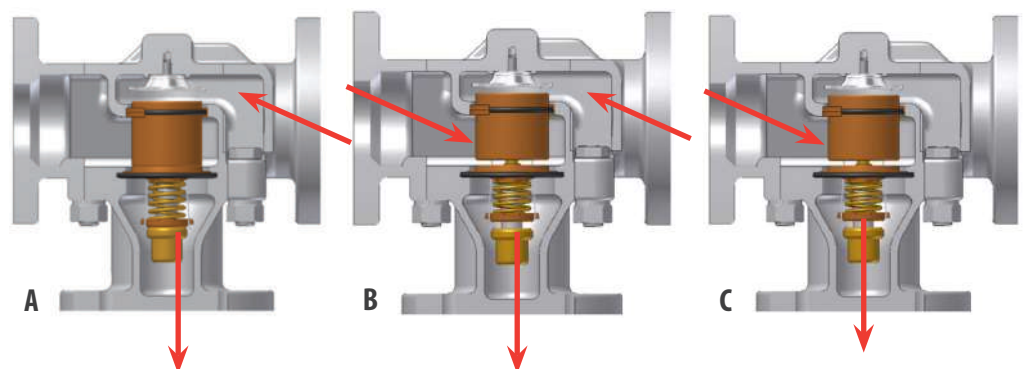
Controlling the temperature of engine fluids is essential to ensuring equipment efficiency and performance. Depending on the application, failure to maintain temperature accuracy can lead to poor fuel consumption, high emission output, and smoking. AMOT is the leading manufacturer of actuated and thermostatic temperature control valves and regulators.

Internal-sensing, 3-Way thermostatic control valves, or temperature regulators, are suitable for process control and industrial applications where fluids must be mixed or diverted depending on their temperatures. Simple to install, operate and maintain, they provide years of trouble-free, reliable temperature control without the need for external power sources. AMOT 3-Way thermostatic control valves are the perfect “fit and forget” solution in cooling, lubricating oil, heat recovery, and jacket water systems as well as water-saving and tempered water applications.

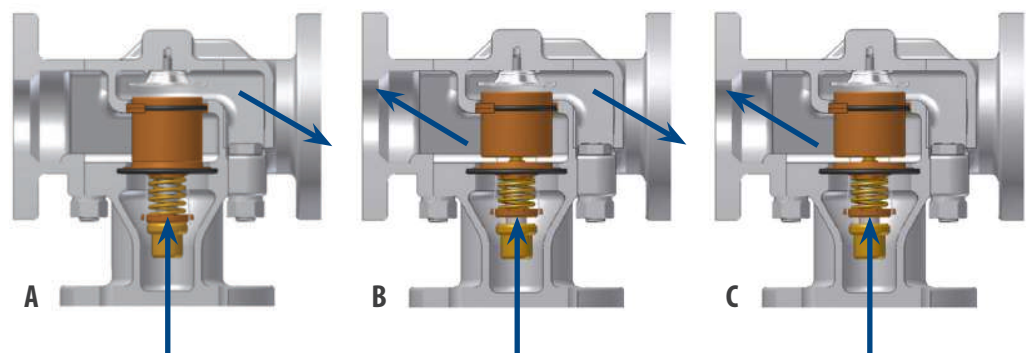
<b>Body Material:</b>	Carbon Steel, Cast Iron, Ductile Iron, Stainless Steel, Bronze
<b>Connection:</b>	AMSE/ ANSI, BS10, BSP, NPT, PNxx, SAE Jx, Socket weld
<b>Manual Override:</b>	With or Without
<b>Size (in):</b>	From 1/2" to up to 8"
<b>Max. Pressure:</b>	Depending on material
<b>Control Temp:</b>	From 13 °C to up to 116 °C
<b>Certification:</b>	ATEX, CSA, IECEx, LT, DNV GL, ABS, BV, CCS, CRS, IRS, KR, NK, PRS, RINA, RS



## Mixing



## Diverting



- A: Crank Open (Cold Piston)
- B: Control Temperature (50% Open Position)
- C: Full Open (Hot Position)

# Thermostatic Control Valves

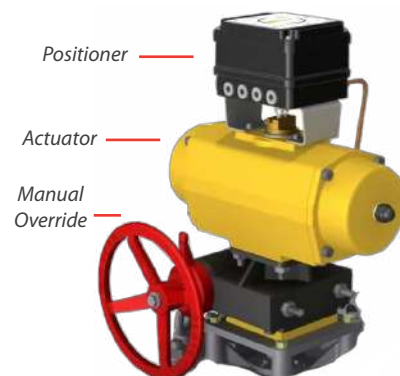
The external-sensing, rotary-style Model G 3-Way temperature control valve is an integral part of your electric, pneumatic or electro-pneumatic system. The electric G Valve system is simple to install with standard multi-core cable. The pneumatic G Valve system is ideal when there is a lack of electricity or when a fail-safe system is needed. The electro-pneumatic system combines the features and functionality of the AMOT electronic control system with the fail-safe action benefits of a pneumatically-actuated valve. The positioner on both electric and electro-pneumatic versions allows direct connection for control by an engine management system.

AMOT's model G 3-way rotary control valves provide a high degree of accuracy for precise temperature control in both mixing and diverting applications. If you experience long warm-up times, excessive white smoke coming from the exhaust, or difficulty regulating fluid temperatures at idle, replace your thermostatic valve with an externally-actuated AMOT model G without the need for piping modifications. The heavy-duty, compact design fits in cramped spaces and withstands high vibration applications to minimize stem leaks and actuator board failures. The external temperature sensing probe enables more precise, more responsive temperature control. With the model G, you can maintain a temperature setting to within  $\pm 1^{\circ}\text{F}$ . The AMOT model G valve has over 25 years of proven performance in Marine, Power Generation, and Oil & Gas applications.

<b>Size:</b>	2" (DIN50) ... 16" (DIN400)
<b>Body Materials:</b>	Bronze, Carbon Steel, Ductile Cast iron, Stainless Steel
<b>Actuation Types:</b>	24 VDC, 110/120 VAC, 200/240 VAC, Standard & High Vibration actuator
<b>Connection:</b>	ANSI, PN xx, JIS xK
<b>Actuators:</b>	24 VDC, 110/120 VAC, 200/240 VAC, Pneumatic
<b>Actuator Positioning:</b>	Relays/Live Switching (Electric), 4-20mA, 3-15psi (Pneumatic)
<b>Certification:</b>	ATEX, CSA, IECEx, LT, DNV GL, ABS, BV, CCS, CRS, IRS, KR, NK, PRS, RINA, RS



*Rotor with Electric Actuator*



*Pneumatic*

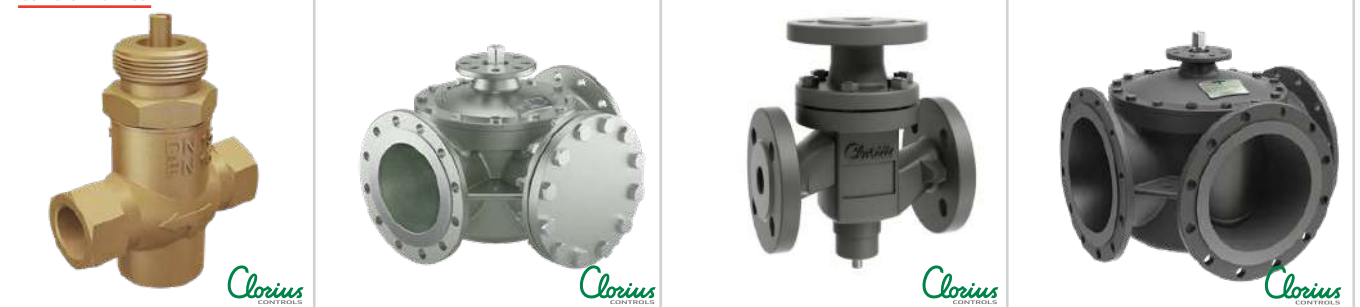
# Thermostatic Control Valves



Linear and rotary valves are designed for use in conjunction with industrial processes, district heating and marine installations with large water or lubricating oil volumes. The flexibility in materials, sizes and connection options ensures that there is always a product that suits the process at hand. Rotary valves are used for larger dimensions and for higher flow rates, while linear valves are simpler in their operation. This makes them more suitable for lower flow rates in simpler processes than the rotary valves.

Valves can be accompanied by temperature regulators in order to control temperature in any industrial process where temperature needs to be regulated meticulously. Actuators can be used to remotely control the valve from a control center. There are electric and pneumatic options available.

## Control Valves



## Thermostats



## Electric Actuators



## Pneumatic Actuators



# Thermometers



At GMS Instruments, two types of thermometers are available; Glass thermometers or dial thermometers. Dial thermometers work on the bimetal, expansion or gas actuation principle. This enables scalar ranges of -200 to +700 °C in different accuracy classes, response times and resilience to environmental influences. Diverse connection designs, stem diameters and individual stem lengths enable a flexible measuring point design. Dial thermometers with capillaries are particularly versatile. All thermometers are suited for operation in a thermowell if necessary.

The advantages of a glass thermometer over other thermometers such as dial thermometers or electronic versions are apparent: no mechanically moving parts, no material fatigue, no electrical energy requirement, but a high level of accuracy and exceptionally long service life. In other words, as long as a glass thermometer is not mechanically destroyed, it remains accurate for the duration of its service life.

	Glass thermometer	Bimetal	Gas Expansion
<b>Operating Range:</b>	Up to 600 °C	-70 °C .. 600 °C	-200 °C .. 750 °C
<b>Available Versions:</b>	Straight, 90° and 135°	Every angle	Straight, 90°, remote
<b>Available Sizes:</b>	110, 150 and 200 mm	40 mm .. 200 mm	100, 160 mm
<b>Insert Lengths:</b>	40 mm .. 250 mm	40 mm .. 250 mm	40 mm .. 400 mm
<b>Material options (all types):</b>	Copper Alloy, Aluminium, Steel, Stainless Steel or Copper-nickel alloy		
<b>Electrical output (optional):</b>	4 .. 20 mA	x	4 .. 20 mA or 0 .. 10 V



# Resistance Thermometers & Thermocouples



Resistance thermometers are equipped with platinum sensor elements which change their electrical resistance as a function of temperature. In our range of products, you will find resistance thermometers with connected cable as well as versions with connection head. A temperature transmitter can be installed directly in the connection head. Resistance thermometers are suitable for applications between -200 ... +600 °C (dependent on instrument model, sensor element, accuracy class and materials coming into contact with the medium). Accuracy classes AA, A and B apply to all resistance thermometers. They are available with a tolerance value to IEC 60751.

Thermocouples generate a voltage directly dependent on temperature. They are particularly suited for high temperatures up to 1,700 °C. Instrument designs from the mineral-insulated sheathed cable are very resistant against extremely high vibration loads (depending on instrument model, sensor element and wetted materials). For thermocouples, the accuracy classes 1 and 2 apply (standard and special). They are available with a tolerance value in accordance with IEC 60581 / ASTM E230.

<b>Wiring options</b>	3-wire, 4-wire, 2x 3-wire, 2x 4-wire
<b>Range Resistance Thermometers:</b>	-200°C ... +600°C
<b>Range Thermocouples:</b>	-200°C ... +800°C
<b>Insert Diameter Options:</b>	From 6 up to 16 mm
<b>Connection Options:</b>	(Sliding) Threaded connection, Flange connection, Weld-in socket
<b>Insert Lengths:</b>	≥ 40 mm up to 400 mm



# Temperature Switches & Transmitters



Temperature transmitters convert the input signal from a wide range of sensors, such as resistance sensors and thermocouples, but in some cases also from potentiometers, into a standardised output signal (e.g. 0 ... 10 V or 4 ... 20 mA). With digital temperature transmitters, the sensor type and the measuring span can be freely configured, along with many further options such as the error signalisation or a measuring point identification.

Temperature switches are used in a variety of industrial and technical processes. If a preset temperature is reached, then the temperature switch opens or closes a corresponding switch contact. Depending on the requirements, mechanical or electronic switches can be used.

## Transmitters

### MOST POPULAR



### Input options:

Pt100, Pt1000, Thermocouples, Potentiometers, specifically integrated sensors.

### Output options:

4-20 mA, 0,5V-4,5 V, 0-10 V. HART, PROFIBUS & FOUNDATION protocols.

## Switches



### Mechanical switches

### Electrical switches

### Operating range:

Up to 600°C

Up to 250°C

### Electrical connections:

No power needed

Fit to customer reqs.

### Materials available:

Brass, stainless steel, specials

Brass, stainless steel, specials

### Operation:

Normally closed or normally open versions for both types.

# Thermowells



Thermowells are used with demanding operating conditions both in solid-machined versions from solid-body material and in fabricated versions with a tubular design. The variants offered differ mainly in their designs; with flanges, with threads for screwing in or for welding. Furthermore, all connections for sanitary applications and also thermowells in solid-machined designs are available without weld seams.

The selection of materials and the manufacturing of the thermowells in accordance with global standards or to customer specifications ensure optimal protection for the sensor. Thermowells in special lengths are made by welding several solid-drilled individual components.

<b>Material options:</b>	Brass, Steel, Stainless steel, special materials on request
<b>Outside Diameter options:</b>	From 6 up to 20 mm
<b>Inside Diameter options:</b>	From 4 up to 16 mm
<b>Wall Thickness options:</b>	1, 1,5 or 2 mm
<b>Insert Length:</b>	From 40 mm up to any reasonable length
<b>Connection options:</b>	(Sliding) Threaded connection, Flange connection, Weld-in socket
<b>Versions:</b>	Solid machined, welded



## USDA Probes

USDA Probes are used for insertion in cold or frozen provisions to monitor and control the temperature during transportation from producer to consumer. Every USDA Probe comes in a different length. At GMS Instruments we have different lengths directly available from stock, varying from 1 (one) till 15 (fifteen) meters.

USDA Probe with Pt-100 features	
Cable	Max. length 15 meters
Conductors	4 pcs.
Element	1x Pt-100
Tolerance	0.05 °C at 0 °C
Temperature range	-40 °C ... +60 °C

### Reference:

- 00920 - USDA Sensor 5 meter
- 00925 - USDA Sensor 15 meter

### Type:

- USDA Sensor 5 meter
- USDA Sensor 15 meter



## Air Temperature Sensors

Air Temperature Sensors and Connection Boxes for mounting on walls, for measurement of temperature in rooms, e.g. in refrigerated holds, cargo and freeze compartments come in three different types;

### Reference:

- 00900 - Air Temp. Sensor Simplex 4-L
- 00901 - Air Temp. Sensor Duplex 3-L
- 00902 - Connection Box

### Air Temp. Sensor & Connection Box

#### Features:

- Grey-enamelled light-alloy metal
- Protective sheat of 6/8 mm stainless steel
- Response time measures at velocities in air at 3.0 m/s
- Recommended measuring current: max. 2 mA



## FLOW & LEVEL

Indicators | Switches | Transmitters | Ultrasonic

### BRANDS



SIEMENS

AQUAMETRO  
OIL & MARINE

TOKICO





To monitor your processes, flow and level measurements are essential. Let's say you want to gain insight into the efficiency of a system. It is necessary to know what the input and the output is. But flow measurements are also required to monitor waste substances. Furthermore, there is a need to record the delivery and procurement of raw materials to the entire business.

GMS Instruments has a wide range of products in the area of flow measurement. Tell us what your flow challenge is and we will provide you with the best solution.

# Oil Flow Meters

AQUAMETRO  
OIL & MARINE

SIEMENS

TOKICO

Flow measurement are used in a wide variety of applications including measuring of boiler fuel oil and diesel oil, as well as for transactions for kerosene, light oil and heavy oil. There are totalizing or current flow options available in a wide range of flow volumes, with different connections available to suit the process. Totalizing flowmeters show the total volume of the liquid that has passed through the flowmeter since the start of operations. Current flowmeters indicate the flow through the instrument in the current moment. Current flow meters are also commonly referred to as flow sensors.

Both versions come with temperature sensing options to also measure the temperature of the liquid flowing through the flowmeter.

**MOST POPULAR**



AQUAMETRO  
OIL & MARINE

## Aqua Metro CONTROIL® VZF(A) II 15-50

The Aqua Metro Contoil VZF features a mass flow signal and an integrated temperature probe. With an accuracy up to 0.1% the CONTOIL® VZF II fulfills high requirements. It can be incorporated in Aquametro's Fuel Monitoring and Ship Performance Systems.

### Features:

- Integrated temperature sensor
- Mass & Massflow calculation
- Optional linearization
- Volume compensation
- "auto" detection of medium change

## Aqua Metro CONTROIL® VZO/A 15-50

A versatile flow meter for oil, heavy oil and many other oil-like liquids. It is used for efficient consumption measurement of heat burners and various combustion engines. A reliable solution for any application where oil is consumed.

### Features:

- Robust design
- Designed for long-term measuring
- Protection class IP66



AQUAMETRO  
OIL & MARINE



AQUAMETRO  
OIL & MARINE

## Aqua Metro DFM 8 + 12 ECO

### Features:

Range:	4 ... 180 L/hour
IP:	66
Power Supply:	12 VDC ... 24 VDC
Other:	No changes in the fuel pipeline needed

## Aqua Metro DFM Boardcomputer

The CONTOIL® DFM-BC is a suitable computer and display, which covers all direct and differential applications in fuel metering. It can be used for all available flowmeter sizes.



AQUAMETRO  
OIL & MARINE

# Oil Flow Meters

## Tokico FGB / FRO / FRP Oil Flow Meter

TOKICO has a long history of producing high-quality flow meters since 1950 in the fuel measurement field. Its flowmeters are used in a wide variety of applications including measuring of boiler fuel oil and diesel oil, as well as for transactions for kerosene, light oil, and heavy oil. At GMS Instruments we have the following Tokico flow meters in stock:



	FGB	FRO	FRP
<b>Size (mm):</b>	15 ... 25	40 ... 50	80 ... 100
<b>Flow rate:</b>	40 ... 3000 L/h	0.8 ... 15 m <sup>3</sup> /h	0.6 ... 130 m <sup>3</sup> /h
<b>Material:</b>	Resin	Auminium alloy	Cast iron
<b>Pressure loss:</b>		None	None
<b>Other:</b>		Roots rotors rotate without physical contact	
<b>Other:</b>		Accuracy remains unchanged over long time periode	



SIEMENS

## SIEMENS SITRANS F/C Coriolis

Every SITRANS F C Coriolis flow meter provides precise information about liquids or gases flowing through a pipe. Typically, Coriolis flow measurement capabilities are used for measuring, mixing products, accounting, as well as many other applications.

<b>Size:</b>	DN15 (1/2"), DN25 (1"), DN50 (2")
<b>Accuracy:</b>	± 0.10%
<b>Flow Range:</b>	3700 kg/h, 1150 kg/h, 52000 kg/h
<b>Power Supply:</b>	24 ... 90 V DC, 100 ... 240 V AC
<b>IP:</b>	67

## SERVICE

GMS Instruments is a specialised and authorised maintenance partner of a.a. Aqua Metro. This means that all our service technicians are properly trained and educated by the manufacturer before handling your instrumentation. Because we are an authorised maintenance partner of leading manufacturers, we can keep a large stock of original spare parts. By continuing a large inventory of original spare parts, we can react correct and swift at your service requests.

All our service technicians are well trained to perform repairs on site, to minimize downtime for your process.



# Water Flow Meters

AQUAMETRC  
OIL & MARINI



Water flow meters are used to measure the volume of water used. Water meters may also be used at water sources or throughout the water system to calculate the flow rate of a part of the system. Water flow meters may also measure the flow rate of slurries or fluids in closed pipes. The flow rate of water is measured in cubic metres (m<sup>3</sup>) or litres on an electronic or mechanical register.

## MOST POPULAR



### Elster M100

Available in the dimensions 15 mm. up to and including 50 mm, with nominal flow rates Q<sub>3</sub> of 2.5 m<sup>3</sup> / h up to and including 25 m<sup>3</sup> / h. Also available as a riser model. DN dimensions 20, 25 and 40. The M100 is available with a KIWA certificate on request.

**Size:** 15 ... 50 mm

**Flow rate:** 2.5 m<sup>3</sup> ... 25 m<sup>3</sup>

**Max medium temp:** 40 °C

### Aqua Metro aquabasic PMK-basic

- Innovative technology from a single source
- Design safety can be updated at any time
- Simple and user-friendly technology
- Lower shelf-life costs

**Nominal pressure:** 16 bar

**Max medium temp:** 40 °C

**IP:** 66 & 68



AQUAMETRO  
OIL & MARINI



### Multi-jet dry-dial water meter

- Magnetic drive reliable characteristic, long working life;
- Vacuum sealed register ensures the dial keep free from fog and frost, keep the reading clear in a long term service;
- Technical data conform to international standard ISO4064 Class B

**Size:** 15 ... 50 mm

**Flow rate:** 3 m<sup>3</sup>/h ... 30 m<sup>3</sup>/h

**Medium temp:** 0.1°C ... 90 °C

### LXLC(R)

Removable element structure, easy installation and maintenance, register for universal use within this range detachable without Removing the meter from the pipeline, Dry-dial, Magnetic drive sensitive action, negligent pressure loss.

**Size:** 15 ... 300 mm

**Flow rate:** 15 m<sup>3</sup>/h ... 600 m<sup>3</sup>/h

**Medium temp:** 0.1°C ... 90 °C



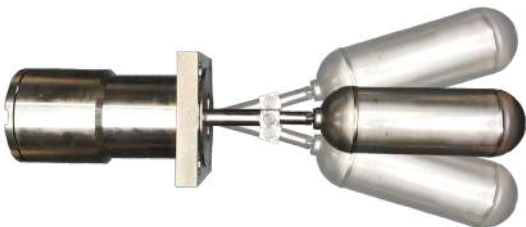
# Magnetic Float Switch



Float switches are used for the point-based limit level detection of one or several levels. They work independently of foaming, conductivity, dielectric, pressure, vacuum, temperature, vapours, condensation, bubble formation, boiling effects and vibrations and are suitable for almost all liquid media. The switching operation is contact-free, free from wear, and needs no power supply. The simple and proven functional principle of the float switches enables an extensive range of applications, from general industrial applications through to use in process plants.

<b>Pressure:</b>	$\leq 40$ bar max.
<b>Density:</b>	$\rho \geq 600$ kg/m <sup>3</sup>
<b>Temperature:</b>	-196 °C ... +350 °C
<b>Material:</b>	Gun metal, Stainless steel, Plastic
<b>Approvals:</b>	DNV . GL, Lloyd's Register, Bureau Veritas, Russian Register, RINA, ABS, ATEX - IBExU

## MOST POPULAR



# Magnetic Level Switch



Magnetic level switches operate by having a float that will float on the surface of the surface of the liquid of which the level needs to be monitored. When the threshold is reached, the float will start to rise along with the liquid and at some point the float will make contact, sending a signal to the control room that the level has been reached. The wide variety of options and the simplicity of the operation means that these instruments last for a very long time and little to no maintenance during their lifetime.

## WIKA FLS Magnetic Float Switch

A float with a permanent magnet moves reliably along with the liquid level on a guide tube. Within the guide tube is fitted a reed contact (inert gas contact), which is energised, through the non-magnetic walls of the float and guide tube, by the approach of the float magnet. By using a magnet and reed contact the switching operation is non-contact, free from wear and needs no power supply.

**Operating temperature:** -196 °C ... +350 °C

**Operating pressure:** Vacuum up to 40 bar

**Limit density:**  $\rho \geq 300 \text{ kg/m}^3$



## WIKA HLS Magnetic Level Sensor

The model FLR sensors with reed measuring chain are used for level measurement in liquid media. They work on the float principle with magnetic transmission. The float's magnetic system in the guide tube actuates a resistance measuring chain that corresponds to a 3-wire potentiometer circuit. The measurement voltage generated by this is proportional to the fill level.

**Operating temperature:** -80 °C ... +200 °C

**Operating pressure:** Vacuum up to 80 bar

**Limit density:**  $\rho \geq 400 \text{ kg/m}^3$

## DCU 210E Engine Controller

The DCU 210E is a complete, standalone engine supervision unit, with a daylight-capable and responsive touch screen, configurable input and output channels and a new lightning-fast CPU. The new design is modern, effective and provides installation possibilities in all outdoor and exposed locations.

**Size:** w 167 x h 135 x d 68 mm

**Cut out:** w 156 x h 124, access depth 90 mm

**Screen:** 262144 colors, 5.7", Resolution 640 x 480 pixels

**Power supply:** 24/12 VDC, Min 8 VDC, Max 32 VDC

**IP:** 56



# Submersible Transmitter for Tank Gauging



Submersible pressure sensors, sometimes also referred to as a level probes, are a particular type of pressure sensor for hydrostatic level measurement in tanks, wells, shafts and boreholes. For this, the submersible pressure sensor is submerged directly in the liquid to be measured and positioned as close as possible to the bottom. There, the submersible pressure sensor measures the hydrostatic pressure, which enables a direct conclusion regarding the current level, i.e. the height of the liquid column above it.

	LS-10	IL-10	LH-20	4H/L
<b>Accuracy:</b>	0.5%	0.5%	0.1%	
<b>Measuring range:</b>	0 ... 1.6 bar	0 ... 0.6 bar	0 ... 0.6 bar	
<b>Power supply:</b>	DC 10 ... 30 V	DC 10 ... 30 V	DC 8 ... 30 V	DC 6 ... 250 V
<b>Output signal:</b>	4 ... 20 mA, 2-w	4 ... 20 mA, 2-w	4 ... 20 mA, 2-wire	1 ... 100 mA
<b>Permissible medium temp:</b>	-10°C ... +50°C	-10°C ... +60°C	-40°C ... +80°C	0°C ... +55°C
<b>IP:</b>	68	68	68	67
<b>Wetted parts:</b>	Stainless steel, PUR, PA			



## WIKA LS-10

It has been designed to the current demands of the industry and has a 4 ... 20 mA output as standard, an accuracy of 0.5% and PUR cable. With IP 68 ingress protection, it is suitable for permanent level measurement up to 100 m water column.



## WIKA IL-10

The WIKA IL-10 intrinsically safe submersible pressure transmitter has been designed for the highest requirements of level measurement. Owing to their high accuracy, reliability and their excellent media resistance, it is the ideal solution for almost all level measurements in hazardous areas.



## WIKA LH-20 HP

A slender design, highest accuracies, low temperature errors and an adjustable measuring range ensure the suitability of the LH-20 for all submerged level measurements. For operation in hazardous environments, the model LH-20 submersible pressure transmitter is also available in an intrinsically safe version.



## Kari Finn 4H/L Float Switch

The KARI Float Switch is a control device for charging and discharging pumps and motor and magnetic valves. It is also an alarm device that alerts the user at specified surface levels. Thanks to its large float casing (Ø 170 mm), the KARI Float Switch has a buoyancy that guarantees smooth, troublefree operation under all conditions.

# Ultrasonic Level Measurement



Ultrasonic waves are used to measure level of liquids and solid objects in industries. Ultrasonic level measurement is contactless principle and most suitable for level measurements of hot, corrosive and boiling liquids. The normal frequency range used for ultrasonic level measurements is within a range of 40 200 KHz.



## KATflow 200

The U-F-M KATflow 200 is an innovative portable flow meter providing engineers with a robust, easy-to-use and lightweight instrument that offers the measurement performance of more complex and expensive devices. With a weight of less than 700g, the KATflow 200 of U-F-M is a light, portable flow meter which can be carried in one hand.

<b>Size (mm):</b>	228 x 72 x 58
<b>Accuracy:</b>	0.5%
<b>Output:</b>	USB connectivity
<b>Sensor temperature range:</b>	-30°C ... +250°C
<b>IP:</b>	65



## Katflow 230

In contrast to its handheld counterpart, the U-F-M KATflow 230 offers two measurement channels which enable the instrument to monitor two pipes simultaneously. This dual-channel measurement function can also be used to monitor one single pipe in a two-path sensor mounting configuration to increase the accuracy under difficult flow conditions with disturbed flow profiles.

<b>Size (mm):</b>	266 x 168 x 37
<b>Accuracy:</b>	0.5%
<b>Measurement channels:</b>	1 or 2
<b>Sensor temperature range:</b>	-180°C ... +650°C
<b>IP:</b>	67



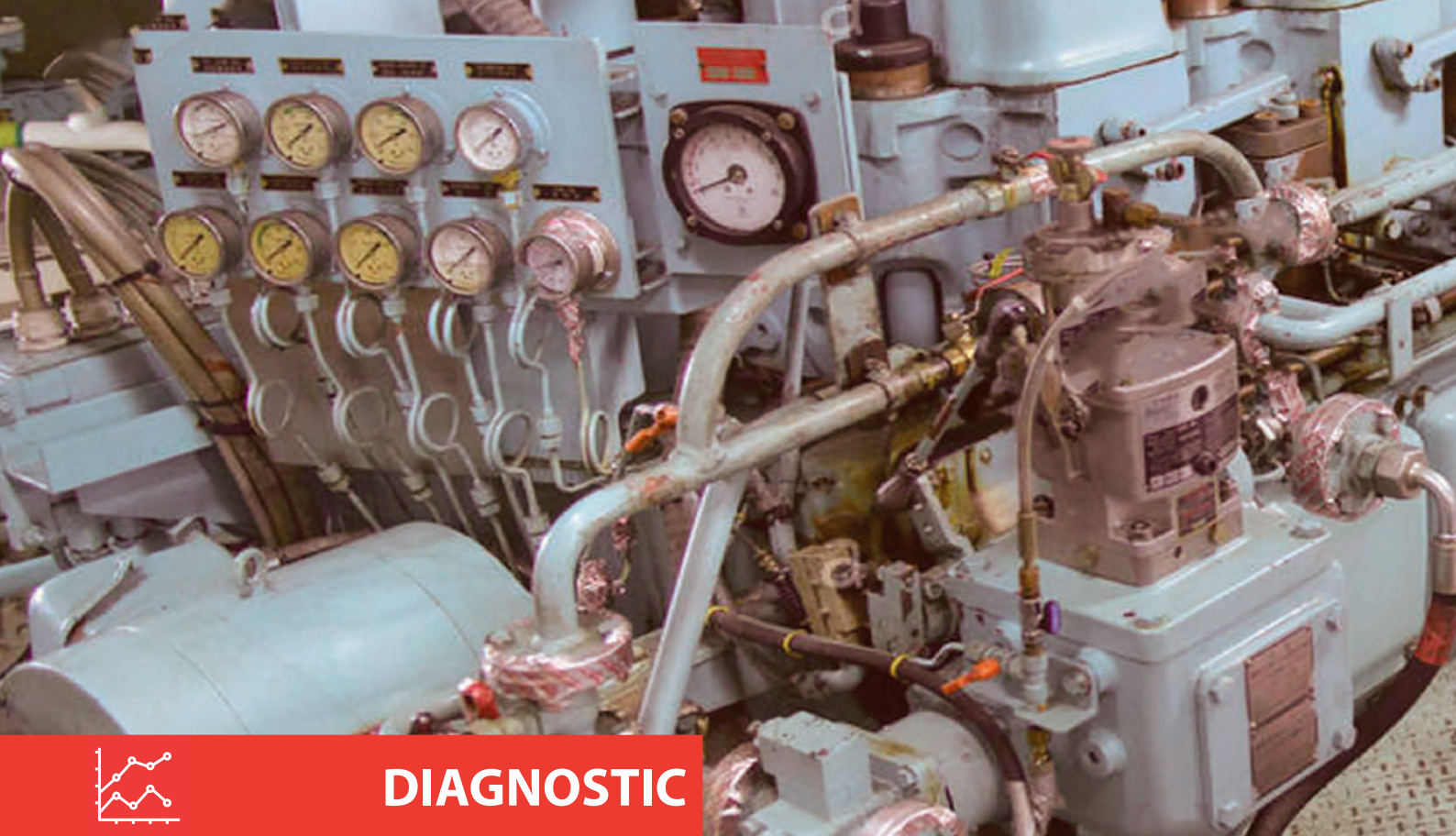
## UFM70-FS

The UFM-70 FS is a multi-functional ultrasonic flow metering system for non-invasive and non-intrusive flow measurements of liquids and liquid gases in fully-filled tubes. The UFM-70 FS works on the transit-time method and can be supplied with one or two measuring channels. This allows the flowmeter to monitor two separate pipes at the same time. Also, the UFM-70 FS offers functions for measuring level, energy and pressure flows. This modular flow metering system can be customised for you, with different types of inputs and outputs.

<b>Accuracy:</b>	0.5%
<b>Measurement channels:</b>	1 or 2
<b>Sensor temperature range:</b>	-180°C ... +650°C
<b>Power supply:</b>	cable or battery ( lifetime of 14 days)







## DIAGNOSTIC

Indicators | Meters | Multimeters | Videoscopes

### BRANDS





On today's processes and industries, maintenance is not merely a reaction to a fault or breakdown. Prevention of a maintenance stop or disruption of your process is significantly more cost-efficient and faster. For this reason, the development of diagnostic equipment has radically increased in the last decades, and with this the scope of supply of diagnostic equipment and tools within GMS Instruments. GMS Instruments is an official distributor of some of the world's best and most innovative manufacturers of diagnostic equipment.

As an official distributor and service partner of diagnostic equipment manufacturers such as AMOT, Cygnus Instruments, Extech, FLIR, Siemens, Opticon Benelux, QMI, Rivertrace Engineering and WIKA, we can quickly anticipate on service requests, calibrations and deliver from stock.

# Deflection Indicator



## PRISMA DI-5 / DI-5 C

Most engineers are familiar with the importance of regular checks on diesel and gas, liquefied natural gas (LNG), engine crankshafts and cylinder liners. The old dial gauge crankshaft alignment checks were time-consuming, unpleasant, dirty and inaccurate. With Prisma Tibro's electronic deflection indicators Prisma DI-5 and DI-5C, the task is much easier and more accurate. The series also features an optional Prisma Ovality Kit to check cylinder liner ovality and wear. Prisma Deflection Indicators are used by hundreds of engineers in over 90 countries worldwide.

Prisma Tibro's electronic deflection gauge makes crankshaft alignment checks simpler and more convenient compared to the old dial gauges, as they don't require engines to be opened to take a reading. After fitting the transducer between the crankshaft webs at any of the positions A-E, the result is shown for each position on an exterior display, which is connected to a transducer with a 7m cable.

Prisma DI-5C saves the measured data, which can then be uploaded onto a computer via USB connection, and exported to Excel for further data processing and comparison. The deflection evaluation software provides the crankshaft alignments for all cylinders and is outlined with red and green status indications for easy comparison.

### Features:

- Reliable and easy to use
- Smooth mounting
- High flexibility
- Large measuring range
- Storing up to 45 measurements internally
- Windows PC interface
- Easy to reset
- Backlight function
- Turns off automatically after 45 minutes of inactivity
- Battery indicator
- Export as Excel

# Ultrasonic Thickness Gauges



## Cygnus Ultrasonic Thickness Gauge 2+

The Cygnus 2+ is a simple to use, multi-mode thickness gauge having Multiple-Echo, Echo-Echo and Single-Echo capabilities. The high durability end-mounted rotatable LCD makes it ideally suited for climbing and rope access. The twin shot injection moulded enclosure has a soft but durable TPE outer skin which is comfortable to hold and protects against bumps. This while the hard internal shell offers maximum strength and environmental protection certified to the demanding US MIL-STD 810G standard.

Perfect for use on a flat plate, curved surfaces or pipes our Multiple-Echo single crystal probe technology means you can measure through thick coatings and only the remaining metal thickness is displayed.

## Cygnus Ultrasonic Thickness Gauge 4+

The Cygnus 4+ is a small and robust multi-mode ultrasonic thickness gauge which features an A-scan display, simple to use sequential data logging and manual and automatic gain control. Designed for the harshest of environments, with a simple to use keypad, intuitive menus and a colour LCD which can be viewed in all lighting conditions. The unit still relies on Multiple-Echo to provide accurate and straightforward measurements, with the added benefit of Echo-Echo and Single-Echo using twin crystal probes for extreme corrosion.



## Cygnus Ultrasonic Thickness Gauge 6+

The Cygnus 6+ PRO has a range of features for the professional user including, multi-mode measuring capabilities, A-scan, real-time B-scan, manual and automatic gain control and comprehensive data logging.

Designed for the harshest of environments with a simple to use keypad and intuitive menus. It incorporates a bright colour LCD and a high durability end-mounted rotatable LCD for easy viewing in hands-free and rope access applications.

The twin shot injection moulded enclosure has a soft but durable TPE outer skin which is both comfortable and extremely durable. This while the inner shell is strong, keeping the electronics totally sealed from the outside world.



## Cygnus HATCH SURE

Cygnus Hatch Sure is an ultrasonic leak detector able to perform a quick and effective evaluation of cargo hold hatch covers and door seals to determine water leaks and weather tightness.

The system consists of a battery-powered transmitter containing 19 ultrasound emitters (40 kHz). The emitters are arranged to produce an omni-directional sound field, uniformly distributed throughout the cargo hold. The receiver part of the system displays the sound energy level that passes through gaps in the enclosed cargo hold to enable the location of leaks to be quickly and accurately identified.



# Electrical Tools



## Extech HDV640 HD VideoScope Kit

The Extech HDV640 is an inspection camera with wired handset and 6 mm Semi-Rigid, Articulating (240°) Probe (1 m). The HDV640 includes a wired handset with non-detachable 6mm semi-rigid probe (1 m) with macro lens. Articulating probe tip adjusts up to 240° viewing angle. 5.7 in. color LCD TFT with high definition 640 x 480 resolution. Compact, high-resolution waterproof camera probe. The SD memory card included stores more than 14,600 images. Video and images can be transferred to a PC via the SD card or USB output.

## Extech MG320 Multimeter

The Extech MG302 is a true RMS multimeter with a built-in insulation resistance tester and the added safety of wireless data streaming for remote monitoring and data recording. By adding insulation testing capabilities to this CAT IV-rated digital multimeter, electrical troubleshooters will always be equipped for insulation testing, helping to make it a more routine part of predictive maintenance with faster troubleshooting and repairs without the need for additional tools.



## Extech RF20 Portable Salinity Refractometer

The Extech RF20 measures the concentration of dissolved salt in fluids. The RF20 is compact size and easy to operate. Automatic Temperature Compensation (ATC) from 10 to 30°C. Comes with case, calibration screwdriver, plastic pipette calibration solution, and user guide.



## Extech EX520 Multimeter

Designed to withstand harsh environments and usage, the meter's rugged, double-moulded housing is IP67-rated (waterproof and dustproof) and drop-tested to 6 ft. The large, illuminated LCD displays 4-digit readout (to 6,000 counts). The Extech EX520 offers various must-have measurements. The meter features 0.09 percent accuracy and a CAT IV 600-volt safety rating, protecting users even on outdoor wiring.



## Extech EX830 Clamp Meter with IR Thermometer

The Extech EX830 clamp meter features a unique, built-in, non-contact Infrared thermometer with a laser pointer to monitor temperature and locates hot spots on motors and electrical devices. A large 4000 count LCD with bright backlighting allows you to see the reading in dim light. The ergonomically designed double-moulded housing offers a better grip for one-hand operation. The 1.7 Ft. (43 mm) diameter jaw opening is large enough for conductors up to 750MCM. In addition to AC/DC current, it measures AC/DC voltage, resistance, temperature, capacitance, and frequency. It features diode test, audible continuity beeper, data hold, and a quick peak hold that captures inrush currents and transients.



## Extech IR267 Mini Infrared Thermometer

The Extech IR267 compact non-contact InfraRed (IR) thermometer measures up to 1112°F (600°C) with a built-in laser pointer to identify target area and improve aim. The type K input allows for high-temperature measurements up to 1832°F (1000°C). Built-in temperature sensor also measures Air Temperature. Adjustable emissivity feature allows for higher accuracy when measuring temperature on various surfaces.



## Extech EC500 Waterproof ExStik® II pH/Conductivity Meter

The Extech EC500 is a conductivity/TDS/temperature meter. The EC500 measures five parameters including conductivity, TDS, salinity, pH, and temperature using one electrode. Analog bar graph indicates trends. The Extech's EC500 build-in memory stores up to 25 labelled readings. The EC500 is a waterproof meter with a high-accuracy multi-ranging sensor. Features Auto Power off with disable.

## Extech PRC 10/15 Current (Voltage) Calibrator/Meter

The Extech PRC10/PRC15 enables plant maintenance and electrical technicians to test and calibrate a wide variety of process control equipment, including transmitters, transducers, indicators, sensors, instrumentation, robotic systems, thermocouples, and other industrial system components.



## Extech RHT10 Humidity and Temperature USB Datalogger

The Extech RHT10 data logs humidity and temperature readings (up to 16,000 each) with user programmable sample rates from 2 seconds up to 24 hours for days, weeks and months. The RHT10 has a USB interface for easy setup and download. Dew Point indication via the included Windows software. User-programmable High/Low alarm thresholds for RH and temperature.

## Extech TM500 12-Channel Datalogging Thermometer

The Extech TM500 is a 12-Channel datalogging thermometer. The TM500 datalogging thermometer features 6 thermocouple types (J, K, E, T, R, S). Displays CH1 to CH8 or CH9 to CH12 on screen, data can be recorded from all 12 channels simultaneously onto an SD card in Excel format for further analysis.



# Cat Fines Test Kit

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## CMT Cat Fines II

In general, marine diesel engines burn residual fuel oils. Some may contain higher levels of contaminants, such as water and abrasive solids, than others. It is necessary to clean all residual fuel oils before injection into the engines to achieve reliable and cost-effective operation.

The leading cleaning method used on board ships today is centrifugal separation. According to ISO 8217, the maximum allowable content of catalytic fines is 60 ppm. Engine builders anticipate that the fuel cleaning system will reduce this to a maximum of 10 - 15 ppm.

Catalytic fines are small particles of the spent catalyst after employing catalytic cracking processes. They are robust and capable of severely scratching, if not cutting, metal. All catalytic fines that remain in the fuel oil after centrifugal separation have the potential to cause abrasive wear and damage to the engine.

With the new Electronic Cat Fines II Test Kit, you are capable of determining the concentration of catalytic fines in fuel. The affordable test is easy to perform, and the device displays the measured values directly in "ppm" with high accuracy.

### Benefits:

- Revolutionary new system
- Allows multiple tests at different sampling points
- Low costs per test
- Only small fuel sample size needed

### Cat Fines II Test Kit

- Range: 8 - 70 (140) ppm
- Accuracy: +/- 5 ppm (AI)
- Test Time: 10 minutes
- No. of Tests: 30

# Compatibility Tester



## CMT Compatibility Tester

With the growing use of low sulphur fuels and increased frequency of bunkering, testing the stability of the fuel oil and its compatibility for blending is becoming increasingly important.

While every fuel oil is manufactured to be stable - in that it does not have the tendency to produce asphaltenic sludge - two stable fuel oils are not necessarily compatible when blended or mixed. A blend is regarded as being stable only if it is homogeneous immediately after preparation, remains so in standard storage and at no time produces or tends to produce sludge on a significant scale. If behaving in this way, the fuels forming the blend can be considered as compatible with each other. Incompatibility is the tendency of residual fuel oil to produce a deposit on dilution or on blending with other fuel oils, and typical incompatibility problems include sludging and blockage of bunker and service tanks, pipe runs, filters and centrifuge bowls. In extreme circumstances, the only remedy is the manual removal of the sludge build up, which is both time-consuming and extremely costly.

Onboard fuel oil compatibility testing is straightforward and can take just 20 minutes, providing engineers with crucial information that can confirm that the fuel oil delivery will remain stable in the bunker tanks or identify possible stability problems before blending and mixing two fuel oils. Compatibility fuel oil testing can prevent sludge build up, damage or problems of fuel oil systems and ensure smooth engine operation by ruling out any issues with fuel combustion in advance.

The Oil Compatibility Tester is easy to use and supplies essential information no marine engineer responsible for fuels can live without. A small quick test will save you from the consequences of having an incompatible fuel mix in the tanks

# Water Tests



## Marine Potable Water Test

The CMT Marine Potable Water Test kits were introduced specifically to take care of the testing needs of the Marine industry and to offer a solution to the problems the industry faces with the introduction of the new legislations. The base kits testing parameters can be extended by adding various available options including a MLC 2006 Full Compliance Option. Coming with an extensive manual and log book the kit will aid with the compliance of the current ILO MLC (2006), IHR (2005) and ILO 178 (2009). Put together with the user on board in mind all tests are easy to perform and require no special training.

### Features

- Test kit for E.coli and coliforms.
- Helps you meet MLC 2006 recommendations for drinking water quality.
- Reveals a complex and robust sample incubator.
- USB with training material

## CMT Water in Oil

CMT's Oil Test Kit range takes care of your routine analysis, with a high level of accuracy. Oil test kits are a valuable condition monitoring tool enabling you to make informed operational and maintenance decisions about your critical plant and equipment. The ability to test on-site at the point of use enables engineers and facilities managers to conduct oil analysis quickly and easily. Detecting out-of-spec fuels and lubricants can identify potential problems before they become critical.

Range	0 ... 1500 ppm 0 ... 6000 ppm
Accuracy	+/- 0.01% free water
Weight	490 gr.
Test Time	5 minutes



# Fuel Drip Sampler



## CMT Fuel Drip Sampler

One of the most important aspects of any oil analysis program is the sampling method and the sampling equipment used. The sample needs to be representative of the total amount and uncontaminated. Oil samples are required for regulatory analysis but also for commercial and regulatory purposes. A representative oil sample will provide an accurate representation of the contaminants, additives, oxidation, particulates and wear condition.

If a sample does not represent the real condition of the oil and component at the time of sampling, the reliability of both the test result and its interpretation is in doubt. Representative fuel oil samples are required for both regulatory and commercial purposes. Crucial aspects of the sampling process include taking the sample, the sampling location and witnessing the process. CMT's sampling solutions provide you with everything you need to quickly gather an uncontaminated, representative sample of your running liquids.

Commonly samplers are installed at the ship's manifold between the manifold flange and the flange from the bunker hose. However, sometimes, it is more practical to install the sampling device permanently at a different place. The CMT Fuel Sampler is designed to be installed directly into an existing fuel pipe anywhere in the supply line.

# Videoscopes



## It Concepts IRIS DVR-System

The iris DVR 5 video endoscope strikingly features extremely compact dimensions, minimum weight (1.35 kg), lithium-ion battery, 3-stage controllable LED light source and simple operation. The endoscope system is available in various designs, endoscope diameters of 4, 6 and 8 millimetres and working lengths of 1.5 to 7.5 metres.

iRIS DVR video scopes have exchangeable lenses with the unique SmartFocus system. Without the need to change a lens, the focus distance can be easily adjusted from macro to infinite.



## It Concepts iTOOL DVR System

The new iToolDVR System supports a great many industrial applications. The base unit consists of a 17 centimetre (6.8") high-resolution TFT display and a very powerful integrated 24W Metal Halide light source.

At the push of a button, you can make a digital recording of inspection images in video (.avi) or photo format (.bmp) on a high-capacity 32GB SD memory card. Intuitive operation and user-friendly software for text notations on inspection images. The 3.5x zoom function shows every detail.

iSeries video scopes for iTool have exchangeable objectives with the unique SmartFocus system. Without the need to change a lens, the focus distance can be easily adjusted from macro to infinite.

## It Concepts Industrial Line Rigid Endoscopes

The extremely robust rigid and semi-flexible endoscopes of the industrial line of endoscopes are specially developed for the industrial sector. The advanced lens system ensures very clear images with negligible deformation. These rigid and semi-flexible endoscopes are characterised by a high image quality and durable design.





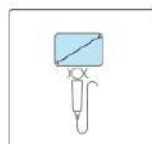
## It Concepts IRIS 7 Pro

The Iris 7 PRO is a compact and portable video endoscopy system with a high-resolution CCD sensor from the modular system of IT Concepts. The system is available with a choice of probes with diameters ranging from 4.0 mm, 6.0 mm or 8.0 mm and working lengths from 1.0 to 15.0 m. It can be equipped with interchangeable, focusable lenses as well as side view tip adapters. EIOS (Endoscopic Imaging Operating System) The self-explanatory software is intuitively operated via the 7" touchscreen display.

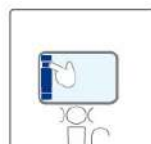
2-way / 4-way articulation

2.4 | 3.0 | 4.0 | 6.0 | 8.0mm  
probe diameter

Digital sensor/full format  
sensor  
Interchangeable objectives  
DUAL VIEW option



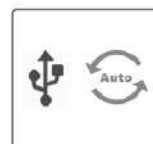
7" Touch display



EIOS Software



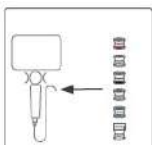
WiFi Live stream



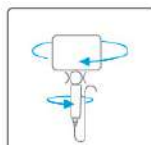
USB Auto-



USB



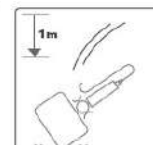
Interchangeable



360° swivel



Compact



Shock proof



Splash proof



## ENVIRONMENT & ENGINE CONTROL

Liquid Testing | Monitoring

### BRANDS

amot



imes

RIVERTRACE  
ENGINEERING



QMI

Clorius  
CONTROLS



The operational activities of all the different industries and shipping are today more than ever guided by rules and regulations issued by governments and agencies. Environment and engine control are issues all shipping and industry companies get to deal with. Whether it is on checking combustion of engines, measure and control output of exhaust gasses (like Nox) or treatment systems for oily water, sludge and sewage. Environment and engine control is to implement in numerous applications.

At GMS Instruments we believe in the importance of a healthy ecosystem and the environment. For that reason, we give engineering support and have a large assortment of equipment to ensure responsible use of water, oil and other valuable commodities.

# Cylinder Pressure Indicator



## LEMAG ECI Electronic Cylinder Pressure Indicator

The LEMAG ECI is an electronic cylinder pressure indicator which improves engine uptime and lowers operating costs as it allows technicians to balance, fine tune and monitor auxiliary and main engines.

It offers reporting on performance for all large 2- and 4- stroke engines no matter if they are running on natural gas, LPG or HFO/MDO, as long as they are equipped with an indicator valve.

### The Electronic Cylinder Pressure Indicator:

- enables fine tuning of engine performance and lowers operating costs
  - is designed to withstand the harsh conditions found on ships and power plants
  - has the ability to take continuous engine readings without the risk of overheating the sensor
  - detects problems before downtime occurs
  - has a safe, innovative and precise crank angle sensor (optional), which delivers unmatched reading accuracy
- is intuitive and easy to use

### Intuitive & easy to use

The LEMAG ECI is easy to use even while wearing gloves. The ergonomic handheld unit shows measurements on a large colour display enabling confirmation on site in real time that the measurement process was successful. The results can be copied to a PC and analysed with the included software, or sent to the superintendent for further comparison with historical or reference data. The step-by-step graphic instructions for different tasks, as well as easy-to-understand menus, makes LEMAG ECI easy to handle, even for new operators.

# Cylinder Pressure Indicator



## IMES EPM-XP Electronic Indicator

The battery powered, hand-held EPM-XP Electronic Indicator is designed for periodic monitoring of cylinder pressures on large diesel, gas and dual-fuel engines. It provides valuable measurement data for engine diagnostics and condition monitoring directly at the point of use.

EPM-XP gives immediate read-outs for peak pressure (Pmax) and (Pcomp) from some pressure cycles per cylinder.

The acquired data can then be downloaded to a computer where the IMES visualisation and evaluation software is used to calculate IMEP and IPOWER including p/v diagrams. The EPM-XP electronic cylinder pressure indicator is designed for use on 2-stroke engines in the speed range 40 – 300 rpm and 4-stroke engines in the speed range 200 to 1500 rpm.

<b>Measuring range</b>	0 ... 300 bar
<b>Accuracy (EPM-XP unit incl. HTT sensor)</b>	+/- 0.5% full scale
<b>Max. temperature at measuring cell</b>	300 °C
<b>Storing capacity</b>	20 measurements / engine
<b>Interface</b>	USB
<b>Battery</b>	E-Block re-chargeable NiMh 270 mA
<b>Weight incl. sensor and adaptor</b>	1100g
<b>Dimension</b>	210 x 100 x 80 mm

# Engine Monitoring



## CMT PREMET® M

Newly developed and part of CMT's new range of Premet diesel performance analysers. The PREMET® M is the way to go if you are looking for an economical approach to monitor your engines without sacrificing quality and accuracy. Designed by marine engineers to be used by marine engineers. The PREMET® M helps to balance cylinder load, optimise injection timing and detect worn or damaged engine components and thus reducing the engine's operating cost.

Balancing the cylinder load helps extend engine life, increases efficiency, and reduces emissions to assist with environmental compliance. Proper ignition timing reduces exhaust gas temperature and the rate of excess carbon build-up. Tuning the engine may reduce specific fuel oil consumption (SFOC). For each degree that the ignition is retarded, SFOC increases by approximately 2%. The PREMET® M may protect against costly downtime by implementing predictive maintenance. Major defects can be easily detected. Engine maintenance can be planned, thus saving in parts and labour by changing engine parts based on need, not on timed intervals.

The PREMET® M has a rugged housing and uses a Kistler PiezoSMART pressure sensor of latest design which is being connected to the indicator valve of the cylinder for a measurement. 4-stroke engines can be measured without pick up with high accuracy. The non-volatile memory stores up to 18 engine records with up to 20 cylinders per engine. The angle precision of the PREMET® M is 0.17 deg. The max. cylinder pressure the sensor can be used with is 350 bar.

The PREMET® M is compact, easy to use and very intuitive. Data is being exported via USB and can be analyzed further with the software supplied together with the device. For personnel managing multiple vessels CMT offers a Fleet Management Software.

Ignition pressure range	0 ... 350 bar
Speed range	20 ... 3000 rpm
Max. number of engines	18
Max. number of cylinders over all engines	125
Max. temperature	400 °C
Accuracy	0.17% degree crank angle

# Engine Monitoring



## CMT PREMET® X

The newly developed PREMET® X now adds new software, new sensor technology and connectivity to obtain, show, analyse and export the relevant pressure data of your diesel engine during operations. The PREMET X allows you to fine-tune your engine to a higher efficiency resulting in lower costs.

Compatible with low-, medium- and high-speed engines the PREMET® X is the perfect system to optimise your fuel injections, to reduce fuel consumption but also to avoid repairs and damages as part of a condition monitoring regime. Latest designed engines run with peak pressures up to 300 bar and high exhaust gas temperatures. The new sensor technology ensures high performance and accurate results for the complete range. The storage of calibration data inside the sensor makes it possible to exchange sensors without calibration of the device easily. The new software allows doing an in-depth analysis of your engine, ensuring you will be in control of the condition of the engine without being an expert user. The integrated WiFi connection increases the ease of data transfer considerably.

Using an acoustic emission sensor, the fuel injection can be monitored with no need to tamper with the high-pressure fuel lines during installation. Ignition delay and other critical timings during combustion will become visible. The newly developed PREMET® X now adds new software, new sensor technology and connectivity to obtain, show, analyse and export the relevant pressure data of your diesel engine during operations. The PREMET X allows you to fine-tune your engine to a higher efficiency resulting in lower costs.

After reading your analysis of the full-colour display (160x90 mm). Data can easily be transferred through a WiFi- or USB connection.

Ignition pressure range	0 ... 350 bar
Speed range	20 ... 3000 rpm
Max. number of engines	Unlimited
Max. number of cylinders (per engine)	40
Max. temperature	400 °C
Accuracy	0.17% degree crank angle

# Bilge Alarms

**RIVERTRACE**  
ENGINEERING



## Smart Cell Bilge Alarm

The Rivertrace Smart-Cell Bilge Alarm meets the requirements of MEPC 107 (49) for the monitoring of three oil types: fuel oil, diesel and emulsions. By utilising the Smart-Cell Detector Array Technology, developed by Rivertrace, the Bilge Alarm analyses all three oil types simultaneously without the need for re-calibration. Since optical cell fouling is recognised as a leading cause of monitor malfunction or incorrect reading a manual cell cleaning device is included as standard to simplify routine maintenance. By simple operation of the manual clean device, the Smart-Cell remains in optimum operating condition.

## Smart PFM 107 Oil-in-Water Monitor

The monitor measures particulates in the sample stream on a continuous basis by passing the process fluid through a proprietary photo optical measuring cell developed by Rivertrace Technologies.

Using a combination of optical recognition algorithms and light intensity it is possible to differentiate between Oil particles, Gas/Air Bubbles and Solid particulates in the range 0-500 microns. Flow and particulate characteristics can be visualised live via remote access and optional dedicated software on any Windows PC.

The Smart PFM offers a choice of auto cleaning methods to ensure the accuracy is maintained at all times. Dependant of the utilities available you can choose from an air driven solenoid, electronic actuator or high power ultrasonic cleaning method. The cleaning is fully automatic and operates whenever it senses contamination of the optical windows.



# Peak Pressure Indicator



## CMT Peak Pressure Indicator

The CMT Peak Pressure Indicator is an easy, fast and cost-effective way to maintain your diesel engines. It measures the maximal firing pressure and the compression pressure of two and four stroke combustion engines. It helps to balance and optimising your engine, and with that, you will be able to make the most out of your engine and fuel. By cutting the fuel for one cylinder for a short time, you can easily detect any possible blow to avoid unwanted loss of energy. Optimizing your engine cannot be easier with the help of the CMT Peak Pressure Indicator.

The CMT Peak Pressure Indicator is designed with the engineer on site in mind. It has been designed for easy operation and to protect its user in case of excessive cylinder pressure. A safety glass gauge and protection by a blow out back wall are just two examples of our features to avoid accidents during the usage. Every device will be tested and calibrated according to our ISO 9001 quality standards and will be supplied with a calibration certificate proving the accuracy of the device.

### Ranges:

- 0 ... 140 bar
- 0 ... 180 bar
- 0 ... 220 bar
- 0 ... 250 bar
- 0 ... 150 bar / 0 ... 2000 psi
- 0 ... 225 bar / 0 ... 3000 psi

# Ballast Water Test Kit



*Obligated by IMO law since 2020*



## CMT Ballast Water Test Kit

Ballast water exchange is an essential process, but it's one which involves several complex processes. There are some acknowledged guidelines which need to be followed to ensure the water is as safe and hygienic as it can be. The presence of any harmful bacteria, viruses and invasive species on a ship can have catastrophic effects, so CMT's highly developed ballast water test kits are vital. Easy to use and reliably accurate, the kit enables user companies to remain compliant with current and future legislation and guidelines. Exchanging ballast water in a timely, efficient and safe manner is an essential aspect of modern marine life, but it should always be monitored effectively. With the CMT ballast water test kit on your side, you can be sure that your vessels and offshore installations are operating correctly.

The Ballast Water Certificate is issued after successful inspection and is valid for five years. For renewal and random inspections, maintaining the ballast water system operating requirements in line with the IMO Ballast Water Convention (2004) will be required. The IMO Ballast Water Convention (2004) specifies three different standards:

Ships are required to have a Ballast Water Management Plan and a Ballast Water Record Book. The Ballast Water Record Book is essential to prove compliance with the three Ballast Water Standards. The CMT Ballast Water Test Kit will provide all equipment to ensure and prove compliance with the IMO Ballast Water Convention (2004) With this in mind, the CMT Ballast Water Test Kit will provide simple and accurate testing for:

- E.Coli bacteria test
- Enterococci bacteria test
- Cholera test (01/0139)
- HPC / TVC
- Salinity test
- Viability of organism - 50 µm or above - 10 µm or above

# Combined Oil and Moisture Sensor



## CMT Rapid Ballast Water Test

Utilizing three instruments, the MTS Ballast Water Validation Kit satisfies the testing protocol for the D1 standard, allows a user to quickly and easily decide if a system is in gross exceedance of the D2 standard, and provides a simple solution to test total residual oxidant levels in chemical disinfection systems. A salinity refractometer provides a simple test to confirm that exchange occurred.

A portable, pocket-size digital fluorometer tests for photosynthetically active chlorophyll, like that found in living phytoplankton, in less than 3 minutes.

A waterproof colourimeter tests for Total Residual Oxidant (TRO) with a range of 0 to 5ppm free & total chlorine in less than 3 minutes. The handheld fluorometer requires no training before use - just place the sample in the cuvette, press "Read" and view the risk of discharge (Fail, High, Low).

Compliance officers can quickly determine whether a ship exceeds D2 standards. In case of positive results, further in-depth laboratory analysis can then be performed.

## Combined Oil Condition and Moisture Sensor

It is a permanent sensor for the continuous determination of the oil condition, humidity and temperature in hydraulic and lubricating oils. It permanently monitors dissolved water and oil quality at the same time. It puts you in control of your lubricant. You know exactly when to change the oil based on condition, not on historical schedules.

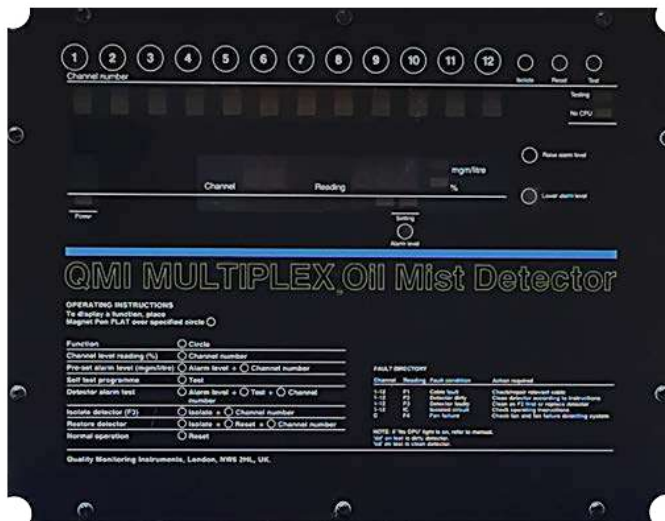
Monitoring of changes in hydraulic fluids and lubricants are essential for condition-based maintenance. Data is continuously documented evaluated and stored. In that way deterioration and changes in the oil (e.g. water leakage, oil change) can be indicated.

Through this, damage can be recognised or wholly avoided at an early stage. This offers the opportunity to prevent machine failures as well as to prolong maintenance and oil change intervals using appropriate measures. Furthermore, by monitoring the lubricant, correctly performed maintenance work and the use of the essential lubricant quality may be documented.



# Oil Mist Detection

## QMI



### QMI Multiplex Monitor

The QMI Multiplex monitor Provides rapid 500 millisecond response times when the detectors are correctly mounted. The Multiplex monitor Can monitor up to 12 detection points simultaneously and can be installed in the engine control rooms or on the bridge away from danger zones without a single problem. The Multiplex monitor do not require a pressure regulator or heater to deal with condensation or clean compressed air. The Multiplex screen also features an early warning and central alarm together with an engine shut/slow down facility.

### QMI Atmospheric Sensor

The QMI Atmospheric Sensor detects accumulation of oil mist in machinery spaces, and can be placed in air flow channels or near to ventilation systems and known points of failure. The Atmospheric sensor sets the alarm at 0.05mg/l to provide adequate warning of a potential fire/explosion hazard. Atmospheric oil mist leaks can ignite immediately.

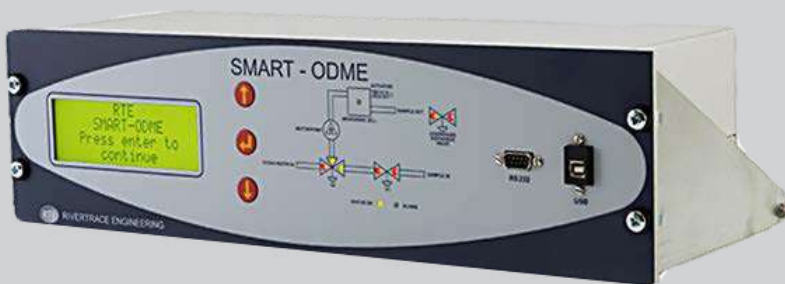
#### Features:

- Alarm set at 0.05mg/l
- Can be placed near ventilation
- Smoke generators can be provided



# Oil Discharge Monitoring

**RIVERTRACE**  
ENGINEERING



## Smart ODME

The Oil Discharge Monitoring Equipment (Smart ODME) has been designed to provide means of monitoring, recording and controlling the ballast discharge in accordance with the requirements of MEPC 108(49). The Smart ODME includes all components required to meet MEPC 108(49) and is designed for ease of installation and maintenance. The requirements in IMO Resolution MEPC 108(49) apply to tankers with a date of keel laying or equivalent stage of construction of 1st January 2005 or later.

### Features:

- 0 - 1000 ppm
- 4 line x 20 alphanumeric black LCD
- 3 button keypad
- USB/RS232 output

## OCD 50M

The OCD 50M is a monitor designed to cater for the special conditions associated with high sample temperatures. This unit will detect oil in much smaller quantities excellent reliability and repeatability, and offers increased boiler protection from oil contamination. Applications include the monitoring of engine cooling water, boiler feedwater and condensate, as well as fresh water monitoring. The unit can be installed in safe and hazardous areas.

### Features:

- 0-10ppm or 0-200ppm
- External sample cell
- Display resolution of 1 ppm
- High temperature optic cell glass and cell seals
- Stainless steel wetted parts
- Automatic cell cleaning
- DNV-GL approved





## TEST & CALIBRATION

Digital Pressure Gauges | Hydraulic & Pneumatic Hand Pumps | Pressure & Temperature Calibration

### BRANDS



# SIEMENS



Pressure, temperature and other factors are vital parameters in practical workplaces and an industrial process. These parameters make why test and calibration equipment plays an essential part in the monitoring and protection of processes and environments. Accurate testing and calibrations ensure that equipment functions perfectly, every time.

It's not just quality and process monitoring or indications for preventive maintenance that is at stake, but people's lives as well. For properly functioning equipment, it is essential that it is regularly tested and calibrated. Various internationally recognised inspection bodies also require that critical measurement equipment is to be tested and calibrated at regular intervals.

**Certification**

GMS Instruments has a certification service to help you with the certification of your equipment. We have our own Service Center where equipment can be traceably tested, calibrated and certificated. Maintenance will be done by manufacturer certified/ trained service technicians. The inspection of the GMS Instruments calibration service is annually compiled by NMI or NKO, which means that all certificates are traceable.

# Temperature Calibrators



Temperature sensors are subject to mechanical, thermal and chemical stress. This results in a drift the longer the sensors are in use. Only the regular calibration of the sensors provides information on the difference between the actual temperature and the measured temperature and makes the specific drift visible.

Dry block calibrators and micro calibration baths are used to check and calibrate a wide range of temperature measuring instruments and temperature sensors. Mechanical, electro-mechanical or electronic measurement equipment can be checked with ease. The compact and robust SIKA instruments are easy to transport, simple to use and offer all the features required for the specific test.

A temperature calibrator needs to meet a wide range of requirements: as a portable device, it has to cope with frequently changing operation locations in the test bay or in production, while being equally suitable for stationary use in the measuring workshop and testing and inspection laboratory. For this reason, the instruments must be lightweight and handy for quick and easy use on site. There are several temperature calibrators to cover the range from -55 °C to 1300 °C.

The following can be tested directly:

- Contact-based immersion or surface temperature sensors
- Sensors with special shapes and sizes
- Non-contact infrared instruments and thermal imaging cameras

<b>Temperature range:</b>	-55 °C ... + 1300 °C	(divided over several ranges)
<b>Tolerance:</b>	$\pm 0.1$ °C ... $\pm 2$ °C	
<b>Ø diameter:</b>	18, 28, 60 7 x 6.5 mm	
<b>Depth:</b>	100, 150, 170, 200 mm	

**MOST POPULAR**



**SIKA**

SIKA TP17 165M



**SIKA**

SIKA TP17 650



**SIKA**

SIKA TP37 200E

# Hand Test Pumps



## Pneumatic hand test pumps

Air is used as pressure media. Especially in application areas in which wetting of the test sample is not allowed or the use of aggressive or ionising substances must be avoided, air is the ideal test medium. Pneumatic test pump fulfils requirements that in many cases, can only be covered by several pumps from other suppliers.

## Hydraulic hand test pumps

Water and oil are used as pressure media. The easily operated hydraulic test pumps and pressure generators are specifically designed for the medium to high-pressure range. They have a built-in reservoir for the hydraulic fluid. Pressures up to 350 bar, 700 bar or 1000 bar can be generated, depending on the model. SIKA test pumps and pressure generators are suitable for testing, adjusting and calibrating pressure sensors, pressure gauges, pressure switches, safety valves and all types of pressure devices. They are optimised in their function and use and assist in the performance of specific tests and inspections.

	<b>Pneumatic</b>	<b>Hydraulic</b>
<b>Pressure medium:</b>	Air	Demineralized water or hydraulic oil
<b>Pressure range:</b>	-0.3 ... 4 bar	0 ... 1000 bar
<b>Dimensions:</b>	225 x Ø 55 mm	255 x 225 x 85 mm
<b>Weight:</b>	0.9 kg	1.9 kg
<b>Adapter kit:</b>	Stainless steel, G $\frac{1}{8}$ , G $\frac{1}{4}$ , G $\frac{3}{8}$ , G $\frac{1}{2}$ , $\frac{1}{8}$ NPT, $\frac{1}{4}$ NPT, $\frac{1}{2}$ NPT, M12 x 1.5, M20 x 1.5, G $\frac{1}{8}$ , G $\frac{1}{4}$	



SIKA Type P4



SIKA Type P60



SIKA Type P700

# Process Calibrators



Process calibrators measure and generate diverse process variables. These portable and convenient instruments are ideal for on-site use. In addition to electrical signals such as current, voltage and resistance, further variables such as temperature, pressure and frequency can be measured and additionally generated.

The implemented sensor functions simulate specific supply variables and display an exact given value. This distinguishes a signal calibrator from the normal measuring functions of a multimeter. The combination of different types of signals determines the process calibrator type and its specific features. Whereas monofunctional process calibrators can only process one type of signal, multifunction Process calibrators can process different types of signals.



## SIKA UC RTD.2 Monofunction Simulator

<b>RTD signals:</b>	Pt50, Pt100, Pt200, Pt500, Pt1000, Cu10, Cu50, Ni100, Ni1000
<b><math>\Omega</math>-generator function:</b>	0 ... 3500 $\Omega$
<b><math>\Omega</math>-measurement function:</b>	0 ... 3600 $\Omega$
<b>Accuracy (of rdg. + const.):</b>	$\pm 0,0012 \%$
<b>Multi-wire connections:</b>	2 / 3 / 4

## SIKA UC TC.2 Monofunction Simulator

<b>TC signal:</b>	J, K, T, R, S, B, N, E, U, L, C
<b>mV generator function:</b>	-9.5 ... 80 mV
<b>mV measurement function:</b>	-10 ... 100 mV
<b>Accuracy (of rdg. + const.):</b>	$\pm 0.02 \%$
<b>Internal comparison point:</b>	$\pm 0.3 ^\circ\text{C}$



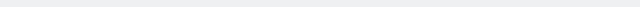
## SIKA EC25 Multifunction Simulator

<b>RTD signals:</b>	Pt100, Pt200, Pt500, Pt1000, Cu10, Cu50
<b><math>\Omega</math>-generator function:</b>	0 ... 40.000 $\Omega$
<b><math>\Omega</math>-measurement function:</b>	0 ... 5500 $\Omega$
<b>Accuracy (of rdg. + const.):</b>	$\pm 0,05 \%$
<b>Multi-wire connections:</b>	2 / 3

## SIKA MC50.2 Multifunction Simulator

<b>RTD signals:</b>	Pt50, Pt100, Pt200, Pt500, Pt1000, Cu10, Cu50, Ni100, Ni1000
<b><math>\Omega</math>-generator function:</b>	0 ... 4000 $\Omega$
<b><math>\Omega</math>-measurement function:</b>	0 ... 4000 $\Omega$
<b>Accuracy (of rdg. + const.):</b>	$\pm 0,012 \%$
<b>Multi-wire connections:</b>	2 / 3 / 4





	Pressure	Temperature
<b>MCK 60/200:</b>	-1 ... 60 bar	200 °C
<b>MCK 60/650:</b>	-1 ... 60 bar	650 °C
<b>MCK 300/650:</b>	0 ... 300 bar	650 °C
<b>MCK 700/650:</b>	0 ... 700 bar	650 °C
<b>MCK 700/850:</b>	0 ... 700 bar	850 °C



## GASDETECTION

Portable | Fixed | Calibration | Alcohol Testing | Accessories

### BRANDS





Since the discovery of the harmful effect of gases on human beings, gas detection has taken huge steps ever since. Gas detectors can be used to detect flammable gasses, toxic gasses and oxygen gases. Gas detection instruments, both portable and fixed gas detection systems are of use in the maritime, industrial and offshore industry.

GMS Instruments has a variety of gas detectors. Tell us what your gas detection challenge, requirement or installation is, and we will provide you with the best solution.

# Calibration Gas



Calibration gas is a reference gas or a mixture of gases which are usually compressed. The composition of calibration gas exists of one initial gas and is enhanced by one or more component(s). Calibration gas is used to calibrate gas analysers or gas detectors. All SEMA calibration gases are traceable according to national (Dutch) as well as international criteria.

You can divide calibration gases into two categories; zero calibration and span calibration. Zero calibration gas is a gas which is free of flammable gases. Zero calibration gases are performed when gas detectors or gas analysers get calibrated with none of the analyte gas structures to which the analyser or detector will respond. For example, you perform a zero calibration of an oxygen-, or carbon dioxide analyser with pure nitrogen. Because nitrogen does not hold either oxygen or carbon dioxide, a zero point can be confirmed this way.

A span calibration is a more advanced type of calibration gas by which there is a precisely composed concentration of detectable gas exposed towards the gas detector or gas analyser. SEMA Gases delivers multiple types of calibration gases suitable for the shipping industry, offshore industry, chemical industry, laboratories, and universities.

## FLAMMABLE GAS

Methane (CH<sub>4</sub>), Propane (C<sub>3</sub>H<sub>8</sub>),  
Butane (C<sub>4</sub>H<sub>10</sub>). (LEL or Volume mixtures)

## OXYGEN

% Volume mixtures for oxygen meter and IGS  
instrument testing

## TOXICS

CO, H<sub>2</sub>S, Cl<sub>2</sub>, SO<sub>2</sub>, NH<sub>3</sub>, CO<sub>2</sub> & many more

## MIX GAS

LEL, H<sub>2</sub>S, CO, O<sub>2</sub>  
2, 3, 4 or 5 gas mixtures available

Type	10L	34L	58L	110L
Size	230 x 80 mm	281 x 74 mm	359 x 90 mm	359 x 90 mm
Weight	0.14 kg	0.56 kg	1.12 kg	1.11 kg
Material	Aluminium Alloy	Aluminium Alloy	Aluminium Alloy	Aluminium Alloy
Water Capacity	1.0L	0.9L	1.6L	1.6L
Max Fill Pressure	10 bar / 145 PSIG	34 bar / 500 PSIG	34 bar / 500 PSIG	68 bar / 1000 PSIG
Outlet	7/16"	5/8"	5/8"	5/8"
	28 NS/2	18 UNF	18 UNF	18 UNF
	male	C10	C10	C10



This is a short overview of the types of gases that are available at SEMA Gases. Other types of gas (flammable gases, oxygen, toxic gases) and gas mixtures (2, 3, 4 or 5 gas mixtures) in various cylinder sizes 10 ltr, 34 ltr, 58 ltr or 110 ltr are on request.

#### **Acetylene (C<sub>2</sub>H<sub>2</sub>)**

0.5 % Acetylene // Air

0.1 % - 0.92 %

#### **Ammonia (NH<sub>3</sub>)**

25 ppm Ammonia // Air

25 ppm Ammonia // Nitrogen

50 ppm Ammonia // Air

50 ppm Ammonia // Nitrogen

100 ppm Ammonia // Air

100 ppm Ammonia // Nitrogen

500 ppm Ammonia // Air

500 ppm Ammonia // Nitrogen

1000 ppm Ammonia // Air

1000 ppm Ammonia // Nitrogen

0.5 % Ammonia // Air

0.5 % Ammonia // Nitrogen

1 % Ammonia // Air

1 % Ammonia // Nitrogen

5 % Ammonia // Air

#### **Argon (Ar)**

100 % Argon "Premier" (5.0)

#### **Benzene (C<sub>6</sub>H<sub>6</sub>)**

5 ppm Benzene // Air

#### **Butane (C<sub>4</sub>H<sub>10</sub>)**

0.4 % Butane // Air

0.6 % Butane // Air

0.7 % Butane // Air

0.75 % Butane // Air

0.9 % Butane // Air

8 % Butane // Nitrogen

8 % Butane / 13.8 % CO<sub>2</sub> // Nitrogen

#### **(Iso-Butane (I-C<sub>4</sub>H<sub>10</sub>))**

0.75 % Iso-Butane // Air

0.9 % Iso-Butane // Air

7.5 % Iso-Butane // Nitrogen

8 % Iso-Butane // Nitrogen

10 % Iso-Butane // Nitrogen

#### **Iso-Butylene (I-C<sub>4</sub>H<sub>8</sub>)**

8 ppm Iso-Butylene // Air

10 ppm Iso-Butylene // Air

100 ppm Iso-Butylene // Air

1000 ppm Iso-Butylene // Air

#### **Carbon Dioxide (CO<sub>2</sub>)**

500 ppm Carbon Dioxide // Nitrogen

500 ppm Carbon Dioxide // Air

1000 ppm Carbon Dioxide // Air

5000 ppm Carbon Dioxide // Air

5000 ppm Carbon Dioxide // Nitrogen

1 % Carbon Dioxide // Air

1 % Carbon Dioxide // Nitrogen

1 % Carbon Dioxide // Nitrogen

1.5 % Carbon Dioxide // Air

2 % Carbon Dioxide // Air

2 % Carbon Dioxide // Nitrogen

3 % Carbon Dioxide // Nitrogen

3 % Carbon Dioxide // Air

5 % Carbon Dioxide // Air

5 % Carbon Dioxide // Nitrogen

10 % Carbon Dioxide // Air

10 % Carbon Dioxide // Nitrogen

18 % Carbon Dioxide // Argon

20 % Carbon Dioxide // Air

30 % Carbon Dioxide // Argon

40 % Carbon Dioxide // Methane

50 % Carbon Dioxide // Nitrogen

50 % Carbon Dioxide // Methane

60 % Carbon Dioxide // Nitrogen

80 % Carbon Dioxide // Nitrogen

100 % Carbon Dioxide (3.0)

#### **Carbon Monoxide (CO)**

20 ppm Carbon Monoxide // Air

20 ppm Carbon Monoxide // Nitrogen

50 ppm Carbon Monoxide // Air

60 ppm Carbon Monoxide // Air

100 ppm Carbon Monoxide // Air

100 ppm Carbon Monoxide // Nitrogen

150 ppm Carbon Monoxide // Air

200 ppm Carbon Monoxide // Air

200 ppm Carbon Monoxide // Nitrogen

250 ppm Carbon Monoxide // Air

300 ppm Carbon Monoxide // Air

500 ppm Carbon Monoxide // Air

500 ppm Carbon Monoxide // Nitrogen

1000 ppm Carbon Monoxide // Air

1000 ppm Carbon Monoxide // Nitrogen

2000 ppm Carbon Monoxide // Nitrogen

1 % Carbon Monoxide // Air

5 % Carbon Monoxide // Air

5 % Carbon Monoxide // Nitrogen

#### **Chlorine (Cl<sub>2</sub>)**

5 ppm Chlorine // Nitrogen

10 ppm Chlorine // Nitrogen

20 ppm Chlorine // Nitrogen

50 ppm Chlorine // Nitrogen

#### **Ethane (C<sub>2</sub>H<sub>6</sub>)**

100 % Ethane (2.5)

#### **Ethanol (C<sub>2</sub>H<sub>6</sub>O)**

130 ppm Ethanol // Nitrogen

192 ppm Ethanol // Nitrogen

260 ppm Ethanol // Nitrogen

#### **Ethylene (C<sub>2</sub>H<sub>4</sub>)**

Ethylene Oxide (ETO) (C<sub>2</sub>H<sub>4</sub>O)

10 ppm Ethylene Oxide // Nitrogen

10 ppm Ethylene Oxide // Air

100 ppm Ethylene Oxide // Air

#### **Helium (He)**

100 % Helium "Premier" (5.0)

#### **Heptane (C<sub>7</sub>H<sub>16</sub>)**

0.2 % Heptane // Air

0.44 % Heptane // Air

0.45 % Heptane // Air

0.55 % Heptane // Air

#### **Hexane (C<sub>6</sub>H<sub>14</sub>)**

1000 ppm Hexane // Air (pressure restricted 600 psig)

1200 ppm Hexane // Air (pressure restricted 450 psig)

0.5 % Hexane // Air (pressure restricted 100 psig)

#### **Hydrogen (H<sub>2</sub>)**

100 ppm Hydrogen // Air

100 ppm Hydrogen // Nitrogen

200 ppm Hydrogen // Air

500 ppm Hydrogen // Air

0.1 % Hydrogen // Air

0.2 % Hydrogen // Air

0.4 % Hydrogen // Air

0.5 % Hydrogen // Air

0.8 % Hydrogen // Air

1 % Hydrogen // Air

1 % Hydrogen // Nitrogen

1.2 % Hydrogen // Air

1.6 % Hydrogen // Air

2 % Hydrogen // Air

10 % Hydrogen // Nitrogen

100 % Hydrogen "Premier Plus" (5.0)

#### **Hydrogen Chloride (HCl)**

5 ppm Hydrogen Chloride // Nitrogen

10 ppm Hydrogen Chloride // Nitrogen

20 ppm Hydrogen Chloride // Nitrogen

25 ppm Hydrogen Chloride // Nitrogen

50 ppm Hydrogen Chloride // Nitrogen

#### **Hydrogen Cyanide (HCN)**

5 ppm Hydrogen Cyanide // Nitrogen

10 ppm Hydrogen Cyanide // Nitrogen

20 ppm Hydrogen Cyanide // Nitrogen

25 ppm Hydrogen Cyanide // Nitrogen

#### **Hydrogen Sulphide (H<sub>2</sub>S)**

5 ppm Hydrogen Sulphide // Air

5 ppm Hydrogen Sulphide // Nitrogen

10 ppm Hydrogen Sulphide // Air

10 ppm Hydrogen Sulphide // Nitrogen

15 ppm Hydrogen Sulphide // Nitrogen

20 ppm Hydrogen Sulphide // Air

20 ppm Hydrogen Sulphide // Nitrogen

25 ppm Hydrogen Sulphide // Air

25 ppm Hydrogen Sulphide // Nitrogen

40 ppm Hydrogen Sulphide // Air

40 ppm Hydrogen Sulphide // Nitrogen

50 ppm Hydrogen Sulphide // Air

50 ppm Hydrogen Sulphide // Nitrogen

100 ppm Hydrogen Sulphide // Air

1000 ppm Hydrogen Sulphide // Nitrogen

1400 ppm Hydrogen Sulphide // Nitrogen

1 % Hydrogen Sulphide // Nitrogen

#### **Krypton (Kr)**

100% Krypton (4.0)

#### **Methane (CH<sub>4</sub>)**

100 ppm Methane // Air

1000 ppm Methane // Air

0.44 % Methane // Air

0.5 % Methane // Air

0.88 % Methane // Air

1 % Methane // Air

1 % Methane // Nitrogen

1.25 % Methane // Air

1.5 % Methane // Air

1.8 % Methane // Air

2 % Methane // Air

2.2 % Methane // Air

2.5 % Methane // Air

2.5 % Methane // Nitrogen

3 % Methane // Nitrogen

5 % Methane // Nitrogen

8 % Methane // Nitrogen

10 % Methane // Nitrogen

20 % Methane // Nitrogen

50 % Methane // Nitrogen

50 % Methane // Carbon Dioxide

60 % Methane // Carbon Dioxide

100 % Methane (2.5)

#### **Nitric Oxide (NO)**

10 ppm Nitric Oxide // Nitrogen

25 ppm Nitric Oxide // Nitrogen

50 ppm Nitric Oxide // Nitrogen

100 ppm Nitric Oxide // Nitrogen

500 ppm Nitric Oxide // Nitrogen

1000 ppm Nitric Oxide // Nitrogen

4000 ppm Nitric Oxide // Nitrogen

#### **Nitrogen (N<sub>2</sub>)**

100 % Nitrogen "Technical" (5.0)

#### **Nitrogen Dioxide (NO<sub>2</sub>)**

5 ppm Nitrogen Dioxide // Air

5 ppm Nitrogen Dioxide // Nitrogen

10 ppm Nitrogen Dioxide // Air

10 ppm Nitrogen Dioxide // Nitrogen

20 ppm Nitrogen Dioxide // Air

25 ppm Nitrogen Dioxide // Air

100 ppm Nitrogen Dioxide // Air

100 ppm Nitrogen Dioxide // Nitrogen

500 ppm Nitrogen Dioxide // Nitrogen

1000 ppm Nitrogen Dioxide // Air

#### **Nitrous Oxide (N<sub>2</sub>O)**

100 ppm Nitrous Oxide // Nitrogen

200 ppm Nitrous Oxide // Nitrogen

1 % Nitrous Oxide // Nitrogen

#### **Oxygen (O<sub>2</sub>)**

100 ppm Oxygen // Nitrogen

0.4 % Oxygen // Nitrogen

1 % Oxygen // Nitrogen

2 % Oxygen // Nitrogen

4 % Oxygen // Nitrogen

5 % Oxygen // Nitrogen

20.9 % Oxygen // Nitrogen

23.5 % Oxygen // Nitrogen

#### **Pentane (C<sub>5</sub>H<sub>12</sub>)**

0.7 % Pentane // Air

#### **Phosphine (PH<sub>3</sub>)**

0.5 ppm Phosphine // Nitrogen

5 ppm Phosphine // Nitrogen

10 ppm Phosphine // Nitrogen

#### **Propane (C<sub>3</sub>H<sub>8</sub>)**

0.1 % Propane // Air

0.5 % Propane // Air

0.68 % Propane // Air

0.85 % Propane // Air

0.9 % Propane // Air

1 % Propane // Air

1.1 % Propane // Air

50 % Propane // Nitrogen

100 % Propane (2.5)

#### **Propylene (C<sub>3</sub>H<sub>6</sub>)**

1 % Propylene // Air

#### **Refrigerant R....**

#### **Silane (SiH<sub>4</sub>)**

5 ppm Silane // Nitrogen

10 ppm Silane // Nitrogen

15 ppm Silane // Nitrogen

#### **Sulphur Dioxide (SO<sub>2</sub>)**

10 ppm Sulphur Dioxide // Nitrogen

20 ppm Sulphur Dioxide // Nitrogen

100 ppm Sulphur Dioxide // Nitrogen

2000 ppm Sulphur Dioxide // Nitrogen

500 ppm Sulphur Hexafluoride

// Air

1000 ppm Sulphur Hexafluoride

// Air

1 % Sulphur Hexafluoride // Air

100 % Sulphur Hexafluoride (4.0)

#### **Toluene (C<sub>7</sub>H<sub>8</sub>)**

100 ppm Toluene // Air (pressure restricted 750 psig)

200 ppm Toluene // Air (pressure restricted 400 psig)

#### **Vinyl Chloride (VCM) (C<sub>2</sub>H<sub>3</sub>Cl)**

10 ppm Vinyl Chloride // Nitrogen

#### **2-gas mixes**

#### **3-gas mixes**

#### **4-gas (Quad) mixes**

#### **5-gas (Quint) mixes**

# Portable Gas Detectors



## Riken Keiki Serie-03 Personal Single Gas Monitor

The 03 Series single gas monitors are designed for LEL, O<sub>2</sub>, H<sub>2</sub>S, or CO detection. Individuals need personal protection in hazardous areas at all times without adding extra bulky equipment, and the 03 Series can provide that kind of protection. The GP-03, OX-03, CO-03, and HS-03 models are personal single gas monitors designed for protection from exposure to combustible hydrocarbons, oxygen deficiency, hydrogen sulphide, or carbon monoxide.

### Features:

- suitable for:
  - Combustible
  - Carbon Monoxide
  - Hydrogen Sulfide
  - Oxygen
- Gas alarm, trouble alarm

## Riken Keiki GX-2012 Personal Four Gas Monitor

Built around high-quality micro-sensor technology, the Riken Keiki GX-2012 is the smallest personal 4 sensor gas monitor with a built-in sample pump. Weighing only 350g, two operating modes: Normal (for confined spaces) and bar hole.

The GX-2012 can monitor the standard confined space gases (LEL combustibles, Oxygen content, Carbon Monoxide, and Hydrogen Sulfide), and it can also measure 100% volume Methane and dynamically display either % LEL, or % volume with its auto-ranging ability. The GX-2012 can be used for gas line purge testing as well as standard safety testing.



## RKI Eagle 2 Six Gas Sample Drawing Monitor

Detection combinations that were never before offered in a portable gas monitor are now available featuring the industry's widest selection of high quality, long life and field proven sensors.

The RKI Instruments EAGLE 2 available features include a PID sensor for detecting high or low ppm levels (0-50 & 0-2,000) of VOC gases; % volume capability for CH<sub>4</sub> and H<sub>2</sub> using a TC (thermal conductivity) sensor; ppm or LEL hydrocarbon detection at the push of a button; infrared sensors for CO<sub>2</sub> (ppm or % volume), methane or hydrocarbons in LEL and % volume ranges; Optional LEL / ppm H<sub>2</sub> specific sensor, methane elimination feature for environmental applications; and a variety of super toxic gases including NH<sub>3</sub>, AsH<sub>3</sub>, CO<sub>2</sub>, Cl<sub>2</sub>, F<sub>2</sub>, HF, HCl, NO<sub>2</sub>, O<sub>3</sub>, PH<sub>3</sub>, SiH<sub>4</sub>, and SO<sub>2</sub>.



# Portable Gas Detectors



## Riken Keiki GX-2009 Four Gas Personal Monitor



The Riken Keiki GX-2009. Weighing only 130 grams, it fits in the palm of your hand (2.75" H x 2.95" L x .98" D). It simultaneously monitors and displays combustibles, oxygen, carbon monoxide, and hydrogen sulphide. The Riken Keiki GX-2009 represents the latest evolution of gas detection technology. Advancements include dual audible alarm ports and alarm LED's on three sides of the instrument so that alarm conditions are visible from multiple perspectives, especially in high noise environments. Other features include a water-resistant and dustproof design with IP 67 rating, an impact resistant rubber over-mould body that is RFI resistant, and a large capacity data logging system included as standard.

## Riken Keiki GX-3R Four Gas Personal Gas Detector

The new Riken Keiki GX-3R is the smallest and lightest 4 Gas Confined Space monitor available today. With a size of 58 cm wide, 65 cm high and weighing 100g, the Riken Keiki GX-3R can be defined as true craftsmanship. The Riken Keiki GX-3R is perfect for confined space work as its size means it does not interfere with work even if it is attached in the breathing zone.

The GX-3R uses 3 compact sensors, including a brand new Electrochemical Oxygen Sensor. The Riken Keiki GX-3R Confined Space Monitor will detect, Combustibles, Hydrogen Sulphide, Oxygen as well as Carbon Monoxide. A 3-year sensor warranty is now standard.



## Riken Keiki GX-3R Pro Five Gas Personal Gas Detector



The Riken Keiki GX-3R PRO is the smallest and lightest 5 Gas Space monitor available today. The Riken Keiki GX-3R pro is in comparison to the GX-3R capable of detecting five gas types separately. With a size of 73 cm wide, 65 cm high and weighing 140g, the Riken Keiki GX-3R PRO can be defined as true craftsmanship. The Riken Keiki GX-3R PRO is perfect for confined space work as its size means it does not interfere with work even if it is attached in the breathing zone.

The GX-3R PRO uses 3 compact sensors, including a brand new Electrochemical Oxygen Sensor. The Riken Keiki GX-3R PRO Confined Space Monitor will detect, Combustibles, Hydrogen Sulphide, Oxygen as well as Carbon Monoxide. A 3-year sensor warranty is now standard.

## Riken Keiki SDM-2009 Calibration Station

Riken Keiki's SDM-2009 calibration station for the GX-2009 is available with advanced features for charging, calibration, & bump testing. Once you power up the GX-2009 inside the SDM-2009 calibration module, the GX-2009 display will indicate whether it's transmitting data, bump testing, calibrating, as well as the results of the bump test or calibration. The SDM-2009 can also be connected to a PC for automated calibration, bump testing, and archive of logged data including calibration and bump test records, interval and alarm trends. Network up to 10 SDM-2009 stations to charge, calibrate, and bump test 10 instruments simultaneously.



# Portable Gas Detectors



## Riken Keiki GX-8000 Portable Single Gas Monitors

The Riken Keiki GX-8000 sets a new standard for rugged, reliable portable gas detection. It's tough water proof design utilized features based on years of gas detection design experience, to assure that the instrument will operate properly to protect workers and property in all kinds of harsh gas detection applications. The integrated pump with 0,75 l/min suction flow lets you take samples from up to 30 m. On top of that, GX-8000 configuration is also very versatile due to the simple sensor replacement. Additionally, alarm levels are freely adjustable adjusted to your needs. Because of the wide accessory range, you can also customise the GX-8000 for special applications and to fit your requirements.

## Riken Keiki RX-8000 Portable HC/O2 Gas Detector

Building on and improving the very successful Riken model RI-415 / RX-415, RX-415 the Riken Keiki RX-8000 is designed for measuring hydrocarbons and oxygen in inert or air atmospheres using Riken Keiki's proven IrDA sensor technology. Typically used for measuring gas concentration in tanks or piping during inserting/purging applications, and tank maintenance work.

There are two versions of the RX-8000 with either an HC iso-butane (i-C<sub>4</sub>H<sub>10</sub>) or CH<sub>4</sub> methane (CH<sub>4</sub>) NDIR sensor; both are auto-ranging between 0-100%LEL and 0-100 vol%. The optional Oxygen sensor has a range of 0-40%vol.



## Riken Keiki RX-8500/RX-8700 Portable Gas Monitor

The Riken Keiki RX-8500 is a portable gas analyser of four gases (CH<sub>4</sub> / O<sub>2</sub> / CO / CO<sub>2</sub>) with a built-in pump. Optical sensors for combustible gases and carbon dioxide allow the gas analyser to be used in an inert environment, for example, on tankers, bulk carriers and dry cargo ships.

The Riken Keiki RX-8700 is a portable gas analyser for three gases (HC / O<sub>2</sub> / H<sub>2</sub>S) with a built-in pump. The presence of an optical sensor of combustible gases allows using this gas analyser in an inert environment, for example, on tankers, bulk carriers and dry cargo.



## Riken Keiki GX-6000 Portable Multi Gas Detector

The Riken Keiki GX-6000 is capable of simultaneously monitoring up to 6 gases. In addition to the standard 4 confined space gases which include combustibles, O<sub>2</sub>, CO, & H<sub>2</sub>S, the GX-6000 has 2 additional smart channels that accept PID, IR or super toxic sensors.

Equipped with a high internal sample pump, a man-down alarm, a panic alarm, an LED flashlight, and large auto rotating LCD display, the GX-6000 can operate as a single gas PID unit or a multifunctional tool utilising all 6 channels. The GX-6000 with a PID sensor will come equipped with a library of over 600 VOC gases to choose from as standard. Choosing from the library is easy with a personalised favourites list of 30 commonly used VOC's as well as a list of 8 of the most recently used VOC's.



# Portable Gas Detectors



## Riken Keiki SP-220 Gas Leak Tester

The Riken Keiki SP-220 is a Portable Gas Leak Checker designed to simply check for Super Toxic, Combustible and Freon Gas leaks. The SP-220 is the replacement for the popular SP-205ASC. With 12 hours operation on 2 AA size Alkaline batteries and weighing in at only 215 grammes this instrument is ideal for Super Toxic, Combustible and Freon Gas Leaks.

## Riken Keiki NP-1000 Portable Gas Detector

The Riken Keiki NP-1000 portable gas detector features a base gas selectable function, Target gas selection function, pump booster function, auto range switching and optional filter can be used with standard gas sampling probes.

### Key Features:

- Base gas is selectable
- Target gas is selectable
- Pump booster function
- Barhole test mode
- Auto range switching
- Filters (optional) can be used with standard gas sampling probe



## Riken Keiki NC-1000 Portable Gas Detector

The NC-1000 portable combustible gas detector has attractive features, including direct reading of 25 target gases, data logging, pump boost, ingress proof rating IP67, Intrinsically safe with ATEX approval for hazardous areas. Ideal for checking gas leaks or monitoring the presence of gas in hazardous areas typically found in oil refineries and petrochemical plants.

The Riken Keiki NC-1000 portable combustible gas detector builds on the previous model GP-88A, using the latest technology and advanced features. Calibration is to one gas only, then any one of 25 target gases can be selected by a simple button operation.



## Riken Keiki GP-1000 Portable Gas Detector

The Riken Keiki GP-1000 is a compact and lightweight gas detector with high sensitivity for the detection of hydrocarbons. The measurement is performed for this purpose by means of catalytic sensor.

The GP-1000 has a built-in pump with pump booster function and a direct selection from a list of 25 hydrocarbons for exact alignment of the target gas  
- Only calibration on CH4 necessary.



# Portable Gas Detectors



## **BW Clip Single-Gas Detector**

The BW Clip maintenance-free single-gas detector is the most reliable, user-friendly, cost-effective way to keep workers safe and operations compliant. The BW clip delivers up to three years of protection — with no need for calibration, sensor replacement, battery replacement or battery charging.

## **BW GasAlert Extreme**

Designed with durability and comfort in mind, the GasAlert Extreme reliably monitors for any single gas hazard within its wide range of available toxic gas models. With easy on/off operation, this single gas detector offers extended longevity with a two-year field-replaceable battery and sensor. Calibration is a simple automatic procedure. A wide range of user options, multilanguage display and data logging functionality make the GasAlert Extreme an ideal solution for many applications.



## **BW GasAlertMicroClip XT/XL**

The comfortable to wear, slim and compact GasAlertMicroClip provides affordable protection from atmospheric gas hazards.

For standard operation with features, you can count on, opt for the GasAlertMicroClip XT. For extended battery life, especially in cold weather, choose the GasAlertMicroClip XL. Both offer visual compliance at a glance with the flashing, green IntelliFlash™.

## **BW Clip 4**

When you've got your hands full in the field, you need no-hassle gas detection you can count on: the Honeywell BW™ Clip4 four-gas detector. Wearable, easy multi-gas detection that's always on. No charging, no battery or sensor replacements, no hassle. Simpler, low cost of ownership guaranteed by the Honeywell commitment to quality, and backed by a full ecosystem of supporting technologies.



## **BW GasAlertMax XT II**

The BW GasAlertMax XT II is the smart, simple, economical way to compliance. Workers feel safe, and incidents are minimised, so everyone will be able to do more. That means savings realised from business continuity and productivity.

GasAlertMax XT II reliably monitors up to four hazards and combines straightforward one-button operation with our robust, motorised pump for quick, remote sampling, ideal for confined spaces. The GasAlertMax XT.



# Portable Gas Detectors



## **BW GasAlertQuattro**

Rugged and reliable, the GasAlertQuattro four-gas detector combines a comprehensive range of features with a simple one-button operation. With flexible power options, the GasAlertQuattro is always ready. The graphic LCD displays easy to identify icons that indicate operational information, such as bump test and calibration status for simplified onsite auditing. IntelliFlash provides continuous visual confirmation of detector operation and compliance. Suited to a wide range of industrial applications including confined space entry, the GasAlertQuattro is fully compatible with BW's MicroDock II automatic test and calibration system.

## **BW GasAlertMicro 5 Series**

The BW GasAlertMicro 5 Series protecting from up to 5 potential atmospheric hazards including oxygen, combustibles and toxic gases, this portable gas detector is unmatched in its versatility.

### **Features:**

- Monitors H<sub>2</sub>S, CO, O<sub>2</sub>, SO<sub>2</sub>, PH<sub>3</sub>, Cl<sub>2</sub>, NH<sub>3</sub>, NO<sub>2</sub>, HCN, ClO<sub>2</sub>, O<sub>3</sub> and combustibles
- Integral concussion-proof boot
- Triple alarms (audible, visual, vibrating)



## **BW Ultra**

The Honeywell BW™ Ultra is a five-gas detector from Honeywell that is explicitly designed for sampling and monitoring confined spaces, before and after entry. It benefits from unmatched sensor technology, visibility on gas readings, comfort, and connectivity – even in most extreme working conditions. The Honeywell BW™ Ultra simultaneously detects the four gases you're required to monitor in confined spaces. Plus there is a fifth sensor for the gas of your choice. This way you can add a fifth level of protection for your confined-space entries.

# Portable Gas Detectors



## Crowcon Tetra 3 Multigas Detector

The Crowcon Tetra 3 multigas monitor is a compact, robust and easy-to-use diffusion based detector. Single button operation, small size and clear top-mounted display make it a favourite in the market amongst those working in demanding industrial environments, such as those in the water, telecoms, food, brewing or hydrocarbons sectors.

## Crowcon T4 Portable Multigas Detector

Crowcon's toughest portable yet, the T4 portable multigas detector is durable by design and includes an integrated rubber boot as standard. An optional clip-on filter cover, which is easily removed and replaced, ensures sensors are protected in the dirtiest environments. Drop tested to 4m, well protected from water ingress through IP65 and IP67 certification and ATEX Zone 0 approved, the T4 allows uninterrupted working in the most demanding environments.



## Crowcon Clip SGD

The Crowcon Clip Single Gas Detector (SGD) is designed for use in hazardous areas and offers reliable and durable fixed life monitoring in a compact, lightweight and maintenance-free package. Crowcon's Clip SGD has a 2-year life and is available for hydrogen sulphide (H<sub>2</sub>S), carbon monoxide (CO) or oxygen (O<sub>2</sub>). The Clip SGD is designed to withstand the harshest industrial working conditions and delivers industry-leading alarm time, changeable alarm levels and event logging as well as user-friendly bump test and calibration solutions.

## Crowcon Tank Pro Portable Multigas Detector

Tank-Pro integrates innovative safety features and an intuitive, rugged design to provide advanced protections for those working in harsh environments. This portable multigas detector, which is exceptionally easy to use and service, protects against the four most prevalent gas hazards: carbon monoxide (CO), hydrogen sulphide (H<sub>2</sub>S), flammable gases and oxygen (O<sub>2</sub>) depletion.



## Crowcon Gasman

The Crowcon Gasman full function personal single gas monitor is compact and lightweight yet is fully ruggedised for the toughest of industrial environments. Featuring simple single button operation, it has a large easy-to-read display of gas concentration and audible, visual and vibrating alarms.

## Crowcon Gas Pro PID/IR

The Gas-Pro IR is ideal for the oil and gas industry. This personal multigas monitor can detect methane, pentane or propane using infrared (IR) sensor technology. The Gas-Pro IR is for detecting potentially explosive gases where traditional, "pellistor", catalytic sensors will struggle - especially in a low oxygen environment. The Gas-Pro PID gives you full flexibility with a wide range of gas types to choose from. With an optional pump, the Gas-Pro PID is the perfect product addressing the requirements of a wide range of applications.



# Portable Gas Detectors



## MSA ALTAIR 4XR Multigas Detector

Outfitted with rapid-response MSA XCell® sensors, the ALTAIR 4XR Gas Detector is the toughest 4-gas monitor on the market and is backed by a 4-year warranty. The ALTAIR 4XR can also provide real-time incident awareness to team members, supervisors, safety managers and others when paired with the MSA ALTAIR Connect app via a Bluetooth® wireless connection.

## MSA ALTAIR 5X Multigas Detector

The ALTAIR 5X Gas Detector is capable of measuring up to 6 gases simultaneously and is now available with integrated PID sensor for VOC detection. Driven by advanced MSA XCell® Sensor Technology, the ALTAIR 5X Gas Detector delivers faster response time, better stability, accuracy, longer service life, and cost savings over the life of the instrument.



## MSA AirGo Compact

This high-quality preset provides comfortable, outstanding respiratory protection. Ruggedly reliable and flexible, it's a popular choice for a wide range of maintenance or rescue operations, including firefighting. Designed to reduce stress and fatigue.



## MSA 200 LS Half-Mask Respirator

The MSA 200 LS is a comfortable, efficient and economic half mask. It is ideal for applications where workers are exposed to various hazards from job to job, such as high concentrations of fumes, mists and gases. With its patented MultiFlex system, the Advantage 200 LS offers maximum protection and high wearing comfort. The soft, pliable combination of rubber and plastic provides a customised and pressure-free fit, instantly conforming to the wearer's unique facial characteristics. The Advantage 200 LS comes in three sizes and has a complete and exclusive filter programme to protect against harmful particles and/or gases.



# Fixed Gas Detectors



## Riken Keiki SD-1 Series

The Riken Keiki SD-1RI (Type HS) Smart Transmitter / Gas Detector line of smart transmitters features state-of-the-art gas detectors with durable flameproof enclosure, best operability and maximum safety, especially in hydrogen/acetylene atmospheres.

A simple magnetic control key is placed over clear marked positions on the surface plate to test and adjust the instrument without opening the transmitter in situations with the danger of explosion. This "single-man-calibration" is already in use and appreciated with other Riken Keiki gas detectors for easy maintenance. The built-in microprocessor features a self-diagnosis function and automatic zero setting to minimise maintenance work and costs compared to other sensors.

## Riken Keiki GD-A80 Series

The Riken Keiki GD-A80 is a developed to prevent an explosive accident in hazardous areas of various industries.

### Features:

- Explosion class Exd IIC T4 Gb
- Sample draw, aspirating type available
- Small, rugged



## Riken Keiki RM-5000 Series

The Riken Keiki RM-5000 Multichannel Gas Monitoring System is a fixed gas detector developed to detect combustible, toxic and oxygen gas types. The Riken Keiki RM-5000 has a high level of visibility and is compatible with the Riken Keiki RM-570A/580. The RM-5000 has low power consumption.

### Features:

- Compatible with RM-570A/580 series
- Bar meter and digital multi-indication
- Support RS-485 communication function
- RoHS Compliant
- Global standard

## Riken Keiki GD-70D Series

The Riken Keiki GD-70D smart gas detection transmitter series sets a new standard for performance, flexibility, and versatility. The Riken Keiki GD-70D sample-draw transmitter offers an array of sensor technologies unmatched in the industry, including unique offerings, such as our hydrogen-specific or LEL versions.

The long life high capacity pump and the wide variety of sensing elements are replaceable in a few seconds, with no tools required! The smart sensors retain all calibration and sensor-specific data in non-volatile memory so that sensors can be hot-swapped in the field with no programming required.



# Fixed Gas Detectors

SERVOMEX 



## Servomex 1800 Oxygen Analyser

The Servomex 1800 Oxygen Analyser is a stable, accurate and highly precise oxygen analyser for safe area use. It is designed to measure percent oxygen in many safety critical industrial applications reliably. The technology that has been used in the SERVOTOUGH 1800 Oxygen Analyser is Servomex's unique paramagnetic cell, which offers a fast, linear, accurate, highly stable and selective response in a non-depleting rugged package.

- Designed for safe area oxygen analysis
- Low maintenance and recalibration requirements
- Special version for solvent bearing samples
- Range of alarm outputs to aid integration with other systems
- Easy to set up and operate

### Features:

- Fast response
- Low cross sensitivity to background gases
- Extremely low drift
- Isolated 4-20mA analogue output
- Concentration, range indication and flow fail alarm relay outputs
- Reliable analogue based electronics
- Solvent vapour tolerant version available
- Weatherproof enclosure

# Breath Analyser

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## Lion AlcoBlow

The AlcoBlow is a simple to use, rapid response instrument that is used simply to determine whether or not a person has any alcohol in their breath at all. It uses the Lion fuel cell sensor, so the reading is implausible to be affected by anything but alcohol in the subject's breath. There is no physical contact between the subject and instrument, so there is no mouthpiece to replace for each test. The AlcoBlow® is ideally suited for use in situations where a large number of people have to be tested.



## Lion Alcolmeter 500/500P

The Lion Alcolmeter 500/500P is for fast yet accurate, fully quantitative breath analysis, and can be used anywhere. It uses the Lion fuel cell sensor, so the reading is implausible to be affected by anything in the subject's breath other than alcohol. The 500 is fully automatic, through microprocessor control, so it is straightforward to use.

The operator switches the instrument on and, when instructed, attaches a new mouthpiece to the small sampling port. He or she then tells the subject to blow through it until the sample is taken. A short time later their alcohol level is shown on the bright, easy-to-read display: this is illuminated, for use at night.

## Lion Alcometer 600/600P

The Lion alcolmeter 600 is a powerful breath alcohol analysis instrument that supports multiple sampling modes, with a fast response and recovery time. The optional GPS system records the exact location (within 10m) of each breath test - quickly, accurately and fully automatically. The GPS and breath analysis data can then be transferred to a PC for statistical analysis, enabling you to build up a complete picture of the alcohol problem in your area or jurisdiction.

The simple operation, ergonomic design, colour touch screen display and evidential results make this device a perfect fit for law enforcement, healthcare and commercial health and safety applications.



# Breath Analyser

ALCOMATE



## Alcomate Prestige AL6000

The AlcoMate® Prestige (AL6000) is the original breath tester that introduced pre-calibrated replaceable sensor module technology to the market. Pre-calibrated replaceable sensor modules eliminate the need for traditional mail-back calibration service that is required of all other typical breathalysers.

### Features:

- No Calibration Required
- Easy-Replace Sensor Panel and Sensor Modules (PRISM Technology)
- Large 3-Digit Decimal Display (0.00%)
- DOT Approved for Law Enforcement
- Active Pressure Sensor
- Deep-Lung Air Sampling
- Cumulative Test Counter
- Audible Alerts / Low Battery Indicator
- Auto Power Off
- Disposable Mouthpieces

## Alcomate Premium AL7000

The AlcoMate® Premium AL7000 alcohol tester is a great selection for both professional and personal users alike. With the unique Easy-Replace Sensor Panel, module replacement takes just a few seconds. The AL7000 is one of a few breath analysers that features the unique click in/click out sensor replacement possibility. When the AL7000 requires a calibration, just click in a new pre-calibrated sensor.

### Features:

- Accuracy  $\pm 0.01$  at 0.10 g/dL (%BAC)
- Pre-Calibrated Replaceable Sensor • Module Technology
- 2nd Generation Re-Inforced Sensor • Modules
- Easy-Replace Sensor Panel
- 4-Digit LCD Results Display
- Active Pressure Sensor / Deep Lung Air Sampling
- Cumulative Test Counter
- Low Battery Indicator / Auto Power-Off



# Detector Tubes



## Test Tubes

The combination of KWIK-DRAW™ detector tubes and pumps offers a quick yet precise measuring system to detect hazardous gases and vapours. The filling material in detector tubes is calibrated and adjusted to the required test gas and will change colour if this gas is present. The length of this discolouration indicates the concentration of the hazardous gas or vapour and can be measured by a printed scale on most of the tubes.

## Test Tubes

Over 200 various Uniphos Gas Detection Tubes are available to make spot measurements for over 500 gases and vapours correctly. The short-term Uniphos Gas Detection Tubes are employed with the ASP-40 Air Sampling Pump. A large number of different gases and vapours can be measured by the short Uniphos Gas Detection Tubes. Those tubes are used, e.g. for the determination of concentration peaks, the measurement of exposures in the inhalation area, the determination of possible leakages as well as for the analysis of the air in sewers, shafts, tanks or other confined spaces.







## THERMAL IMAGING

Infrared Camera | Thermal Camera

### BRANDS





Thermal imaging is the use of an infrared imaging and measurement camera to “see” and “measure” thermal energy emitted from an object. Infrared allows us to see what our eyes can not. Infrared thermography cameras produce images of invisible infrared or “heat” radiation and provide precise non-contact temperature measurement capabilities. Nearly everything gets hot before it fails, making infrared cameras extremely cost-effective, valuable diagnostic tools in many diverse applications. And as the industry strives to improve product quality, and enhance worker safety, new applications for thermal imaging continually emerge. GMS Instruments has a complete product range of thermal cameras for night time navigation, anti-piracy, iceberg navigation, oil spill detection, safety onboard and man-overboard situations for maritime applications.

# Thermal Imaging Camera's



## FLIR C3 Compact Thermal Imaging System

The FLIR C3 is designed to be your go-to tool for building inspections, facilities maintenance, HVAC, or electrical repair. This slim camera fits easily in your pocket so you can take it anywhere. Its integrated touch-screen is a snap to learn, so you can quickly get to the job of finding hidden problems, documenting repairs, and sharing images over Wi-Fi. Connect the C3 to a smartphone or tablet with the free FLIR Tools Mobile app and instantly transfer images, build a report, and send them off right from the job site.

The C3 features FLIR's unique MSX® that adds key details from the onboard visible light camera to the entire infrared image in real time. The result: an all-in-one, undiluted thermal picture with visible light features that lets you instantly recognise where the problematic heat pattern is.



## FLIR T500 Infrared Camera

The FLIR T500-Series has the features professionals need to accurately troubleshoot hot spots and potential faults. With the 180° rotating lens platform and a bright 4" LCD, FLIR T530/T540 cameras are engineered to help users diagnose hard-to-reach components in any environment. Advanced on-camera measurement tools, laser-assisted autofocus, and FLIR's industry-leading image quality ensure you'll find and diagnose problems quickly.

The T500-Series optical block rotates 180°, making these cameras the most versatile and ergonomic camera in the T-Series line-up. Image targets at any angle - comfortably - all day long, without bending your body or wrist.



## FLIR TG165 Spot Thermal Camera

The FLIR TG165 Imaging IR Thermometer bridges the gap between single spot infrared thermometers and FLIR's legendary thermal cameras. Equipped with FLIR's exclusive Lepton® micro thermal sensor, the TG165 lets you see the heat, so you know where to measure it reliably. Quickly and unseen hot and cold spots for instant troubleshooting and store images and data to show customers and include in reports.

The TG165 is Intuitive to operate - no special training required. Easily save images and data for documentation, and download your images fast over USB or via removable micro SD. Designed for the harshest environments, the TG165 is durable enough to withstand a 2- meter drop for your toughest jobs.



#### MOST POPULAR



#### FLIR E4 Infrared Camera with MSX

The FLIR E4 infrared camera has an infrared resolution of 80x60 pixels and a thermal sensitivity of fewer than 0.15°C. The FLIR E4 includes fast image downloading through USB or document sharing by Wi-Fi.



#### FLIR E6 Infrared Camera with MSX

The FLIR E6 infrared camera has an infrared resolution of 120x90 pixels and a thermal sensitivity of fewer than 0.10°C. The FLIR E6 includes fast image downloading through USB or document sharing by Wi-Fi.



#### FLIR E8 Infrared Camera with MSX

The FLIR E8 infrared camera has an infrared resolution of 320x240 pixels and a thermal sensitivity of fewer than 0.06°C. The FLIR E8 includes fast image downloading through USB or document sharing by Wi-Fi.

#### FLIR E53 Advanced Infrared Camera

The FLIR E53 is your entry into the Exx-Series, with the resolution and sensitivity you need at the right price. The 240 × 180 true native resolution offers more than 43,200 points of temperature measurement and produces crisp, vibrant imagery, which can be enhanced with FLIR's patented MSX® for added perspective.

The FLIR E53 advanced infrared camera features a big, brilliant touchscreen with a 160° viewing angle, to help you keep an eye on the thermal image as you work. Plus, with MSX® image enhancement, you'll get the best image clarity every time.

The E53 measures up to 650°C (1200°F), offers 3 spotmeters and displays the max/min temperature within an area live, on-screen.



#### FLIR E75 Advanced Thermal Imaging Camera

The FLIR E75 camera is packed with 320x240 pixels and features you need to find hot spots, detect the early signs of building deficiencies, troubleshoot electrical and mechanical systems, and prevent problems before they cause serious damage.



#### FLIR E85 Advanced Thermal Imaging Camera

The FLIR E85 camera is packed with 384x288 pixels and features you need to find hot spots, detect the early signs of building deficiencies, troubleshoot electrical and mechanical systems, and prevent problems before they cause serious damage.



#### FLIR E95 Advanced Thermal Imaging Camera

The FLIR E95 camera is packed with 464x348 pixels and features you need to find hot spots, detect the early signs of building deficiencies, troubleshoot electrical and mechanical systems, and prevent problems before they cause serious damage.

# Thermal Imaging Camera's



## FLIR First Mate II HM

With the power of FLIR First Mate II HM, you can see at night like never before. Use it on any vessel. This light weighted and easy to use handheld thermal night vision camera runs on batteries and displays video on a built-in screen. The First Mate II HM has a rugged and all-weather design. The First Mate II HM is even submersible.

The FLIR First Mate II HM provides go-anywhere thermal imaging for clear vision in total darkness, and through smoke and light fog. Since it's not permanently mounted to your vessel, you can take it anywhere.

## FLIR Ocean Scout

The FLIR Ocean Scout helps you see marine traffic and spot navigational aids on even the darkest nights. Visual awareness on the water can be critical to avoiding danger. Use the Ocean Scout to quickly scan your surroundings for other vessels, look for buoys and other navigational aids, and detect key landmarks such as islands or docks.

The FLIR Ocean Scout is a lifesaving tool for "man overboard" emergencies. The Ocean Scout can detect the body heat of anyone in the water, allowing you to identify and rescue people or pets quickly. Use InstAlert™ mode to highlight the hottest objects in red – and make the search and recovery go even faster.



## FLIR BHM-Series Night Vision Camera

The FLIR BHM-Series imagers make pictures from heat, not light, letting you see other boats, obstructions, land, buoys, and floating debris in total darkness, as well as through haze, smoke, and light fog.

Available with high-resolution 640 × 480 thermal sensors, the BHM-Series thermal imagers are the best search and rescue tools on the water, giving you the power to search for disabled vessels and people in the water regardless of lighting conditions. With powerful interchangeable lenses, BHM-Series cameras are the most powerful handheld, battery-powered, thermal night vision cameras available, making them the right choice for use on vessels of any size, and giving you the edge in all of your nighttime travels.



## FLIR AX8 Thermal Imaging Camera

The FLIR AX8 is a thermal sensor with imaging capabilities. Combining thermal and visual cameras in a small, affordable package, the AX8 provides continuous temperature monitoring and alarming capabilities to protect critical electrical and mechanical equipment.

The AX8 helps you guard against unplanned outages, service interruptions, and equipment failure. You'll get the benefits of continuous condition monitoring and hot spot detection without the need for periodic manual scans.



# Fixed Thermal Imaging Camera's



## FLIR MD-Series Thermal Imager

The affordable, FLIR MD-series (MD-324 or MD-625) fixed-mount thermal night vision system helps with steering around obstacles, collision avoidance and finding people in the water at night. The FLIR MD is simple to instal and easy to integrate into your existing electronics because of its ethernet possibilities. The MD-Series display can be installed separately on your dashboard, or the feed can be integrated into an existing display to save space. The FLIR MD series is available in a 320 × 240 and 640 × 480 resolution.

## FLIR M-Series Multisensor Thermal Night Vision System

The M-Series pan/tilt re-defines maritime multi-sensor system design, drawing on FLIR's 25 years of experience. With up to 640x480 thermal imaging, M-Series cameras provide four-times the thermal resolution and more than twice the range performance compared to other systems. M-Series cameras let you see more – and see farther – than ever before. Even in the dead of night. All FLIR M-Series cameras come with standard Gyro-stabilization.



## FLIR M132 Adjustable Tilt Thermal Camera

The FLIR M132 adjustable tilt marine thermal camera is FLIR's smallest installed marine thermal night vision camera. Using FLIR's latest generation Boson™ thermal core, the M132 lets boaters see at night in the 320 x 240 thermal resolution. When the M132 is combined with a Raymarine Axiom MFD, FLIR's new ClearCruise™ intelligent thermal analytics technology offer boaters an entirely new level of awareness and safety. The M132 also use IP video technology and simplifies installation by eliminating extra video signal cables. The M132 offers adjustable tilt to compensate for when the boat is running with the bow high, and the camera

## FLIR M232 Pan and Tilt Thermal Camera

The FLIR M232 marine thermal camera is FLIR's smallest and most affordable pan and tilt marine thermal night vision camera. Using FLIR's latest generation Boson(TM) thermal core, the M232 lets boaters see at night in 320 x 240 thermal resolution and also features 4x digital zoom. When the M232 is combined with a Raymarine Axiom MFD, FLIR's new ClearCruise™ intelligent thermal analytics technology offer boaters an entirely new level of awareness and safety. The M232 also uses IP video technology and simplifies installation by eliminating extra video signal cables.



## FLIR M400 Series Multisensor Thermal Night Vision

The FLIR M400 series advanced 640 x 480 sensor delivers crisp thermal video images in total darkness and lowlight conditions. An integrated HD Color visible camera and tight-beam LED spotlight to augment target identification for added safety. The M400 has a continuous optical, thermal zoom lens (up to 4x) that allows operators to see other vessels and objectives at longer ranges. Active gyro-stabilisation ensures a steady image, plus radar tracking keeps potentially dangerous targets in view at all times.

### Notes:

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

### Drawings:







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