



# Product Catalogue 2021/2022

## Insatech Marine

# Content Overview

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Other booklets can be found at [www.insatechmarine.com](http://www.insatechmarine.com).

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# About Us



## Who We Are

Insatech has provided instrumentation, calibration and service to the industry since 1989. We have a wide range of instruments within flow, level, analysis, pressure, temperature and more.

In addition, we have our own calibration laboratory, which performs accredited calibrations for the pharmaceutical industry. We can also help develop new systems and controls for a process or replace existing ones. In short, we are driven by our passion for instruments, process optimization and our desire to be your complete instrument partner.

Our customers benefit from more than 30 years of experience, which enables us to offer technical expertise in industry-specific applications and documentation requirements.

We work within the food, pharmaceutical, energy, marine, water, wastewater, oil and gas industries. We also develop, produce and deliver our own solutions globally to marine and pharmaceutical companies.

## Did you know that:

- Insatech stands for Instrumentation and Automation Technology
- We currently employ over 80 specialist staff in Denmark
- We have agents all over the world
- We are distributor for more than 35 brands, including some of the world's largest instrument manufacturers, such as VEGA, Yokogawa and GE

## In 2020/2021 we:

- Helped 943 customers
- Sold 298,871 products/items
- Shipped 4,099 packages from our warehouse
- Carried out 22,043 service and project hours
- Performed service in Tanjung Pelepas in Malaysia 10,442 km from our head office
- Had five 5-year jubilees, one 15-year jubilee, two 20-year jubilees and one 30-year jubilee
- Had more than 720 years of experience working in Insatech
- Had the pleasure of our longest standing Insatech employee for 31 years

We have been ISO9001 approved since 1994 and audited annually by Bureau Veritas.



## ADDTECH

We are owned by the Addtech Group, which consists of more than 140 independent companies, all specialized in high-tech products and solutions for customers primarily in the industry.

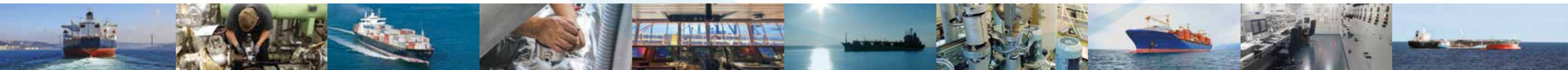
# Sales Network

In order to provide the best possible customer support Insatech Marine works closely together with selected agents. This network of dedicated agents will help to ensure your positive experience with our support functions. The agent network will be developed continuously to serve you locally wherever you may operate.

- Denmark**  
Insatech  
marinesupport@insatech.com  
[www.insatechmarine.com](http://www.insatechmarine.com)
- Croatia**  
Oreco  
nenad@oreco.hr  
[www.oreco.hr](http://www.oreco.hr)
- Cyprus**  
Interglobe Marinet Services  
g.savvides@interglobe.com.cy  
[www.interglobe.com.cy](http://www.interglobe.com.cy)
- Estonia / Finland**  
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- Germany**  
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- Latvia**  
BAS-Automation  
info@basa.lv
- Netherland**  
Theunissen Technical trading  
h.volmerink@tttbv.nl  
[www.tttbv.nl](http://www.tttbv.nl)
- Norway**  
Scanvi Interyards  
tarald.hoy@scanvi-interyards.no  
[www.scanvi-interyards.no](http://www.scanvi-interyards.no)
- Poland**  
Trent  
office@trent.com.pl  
[www.trent.com.pl](http://www.trent.com.pl)
- Romania**  
s. c. Technoind s.r.l.  
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- Sweden**  
Energy Survey & Solutions enyssel AB  
lars-erik.hellring@enyssel.com  
[www.enyssel.com](http://www.enyssel.com)
- Thailand / Vietnam**  
Contrologic Co. Ltd  
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[www.contrologic.co.th](http://www.contrologic.co.th)
- Turkey**  
Esko Marine  
eesinduy@eskomarine.com.tr  
[www.eskomarine.com.tr](http://www.eskomarine.com.tr)
- United Arab Emirates**  
Technology Ventures  
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- USA**  
Rainier Marine  
oakley@rainier-marine.com  
[www.rainier-marine.com](http://www.rainier-marine.com)



# Facilities



## 1,200 m<sup>2</sup> of production facilities:

- Electrical workshop
- Metal workshop
- Mechanical assembly
- Pressure test facilities
- Flow test facilities
- Calibration facilities
- Warehouse



Insatech is situated in modern facilities in the southern part of Zealand, a one-hour drive from Copenhagen Airport. Insatech is located near the highway at the edge of the small town Baarse, beautifully placed in calm and open surroundings with fields on two sides and a football field on the third.

Administration, Sales, Product Management and R&D are housed in a new building, with an open and friendly environment, ensuring close corporation between different departments. Production, Laboratory and Warehouse activities are housed in a former machine workshop right next door, where everything has been renovated and updated to our needs.

Here, we build prototypes in our metal workshop, test setups on our own flow rig, assemble control cabinets in our electrical workshop, arrange service and calibration both in-house and on-site as well as handle your orders and make sure they are sent on time.

In addition to the two main buildings, we have a separate large heated warehouse as well as an unheated warehouse. In many cases, we utilize the capabilities of other local and domestic companies in order to enhance our production capacities during large orders or when the general workload is heavy.

# Suppliers

**YOKOGAWA** ◆

Japanese Yokogawa is a developer and manufacturer of practically all automation and process control related hardware and associated software and programming. Being an international brand with a network consisting of 112 companies across 61 countries and an annual sale of US\$ 3.8 billion (2017), Yokogawa has become the preferred supplier of Coriolis Mass Flow Meters and pressure sensors for Insatech and many of our customers.

A family owned German manufacturing company. Their solution-oriented approach to measurement instrumentation, has been a key factor in our decision to add TX Marine Messsysteme GmbH to our product portfolio. If an instrument does not exist TX Marine is the kind of company that will develop it.



**VEGA**

As a world leader of instrumentation for level measurements, VEGA has been the obvious choice for Insatech for several decades. With representation in over 80 countries, VEGA instruments are found all over the globe and no matter what level or level switching needs you have, we can find the right solution for you.

For VAF Industries, it all started with a flow meter for measuring deliveries of milk. Today VAF Instruments is known as a major player in the maritime industry, particularly for their viscosimeter and their sturdy volumetric flow meters. Not many manufacturers can match VAF Instruments build quality, experience with volumetric flow and viscosity measurement.



**Parker Kittiwake**

UK based Parker Kittiwake mainly focusses on condition monitoring. This focus has allowed them to create highly specialized products, that gives you insights into the condition of your vessel. So, whether you are looking for equipment for analysis of lube oil, fuel oil or bearing condition, Parker Kittiwake's products can help you.

Parker Hannifin is by all accounts one of the biggest global players when talking components for anything that moves. Parker Hannifin is active within all industries, from laboratories to logistics, production and aerospace, and although filtration units are one of their major divisions, they are engaged in practically anything related to hydraulics, pneumatics and electromechanics.



**BRANNSTROM**  
SWEDEN

The Swedish manufacturer of oil discharge monitoring equipment (ODME) and 15 ppm bilge alarms, has ensured themselves a noticeable market share by approaching their designs with user-friendliness and ease of use as their main parameters. Their experience and can-do attitude has also made Brannstrom a go-to development house when it comes to customized automated systems based on client specific requirements to computing, control and software.

Chelsea Technologies, based in UK, offers a broad selection of environmental sensing technology spanning markets from fresh and waste water to oceanography, defense and a wide range of industrial applications. The company's deep engineering expertise is ingeniously applied to create the world's most sensitive, accurate and reliable environmental monitoring sensors and systems. One of them being what might be the most accurate and reliable tester for portable ballast water treatment compliance.



# Suppliers



With more than 30 years of experience within instrumentation, IKM Instrutek knows calibration equipment and how it should work. This fact, combined with the extend of available products and their in-field capabilities, is why they are our primary supplier of calibration equipment. By working with a renowned quality supplier of calibration equipment, we can make sure that your pressure gauges and temperature sensors are always on point.



MSF is a specialized company for filtration products, and all involved spare parts. It's their strength to source all required spare parts related to your filtration needs. MSF is able to supply low-cost spare parts from stock all according to German quality standards. They are confident to find a satisfying solution to your filtration requirements.



Danfoss IXA A/S develops intelligent sensors and systems ideally suited for an industry with constantly increasing focus on the environment and performance optimization. The Danfoss IXA product portfolio consists of two product lines that contribute to optimizing processes on board; the Dynamic Ventilation System (DVS) and the Marine Emission Sensor (MES 1001).



The market disrupting developments in UV treatment of water applications from Atlantium, has gained them substantial traction in the global market, due to the efficiency of the system they manufacture. Atlantium's intelligent and effective utilization of each of their UV-sources also applies to their unique and one of a kind Ballast Water Treatment System.



BD I SENSORS is the global address for accurate use of pressure measurement technology and hydrostatic level measuring. Reliable pressure and level measurement. With this single competency in mind, the company is the universal supplier of a huge range of products ranging from electronic measuring instruments on the one hand, to the most precise data evaluation and display technology on the other. The fact that the products are versatile for a wide variety of industries and challenges underscores the long-term vision of their design.



# Business Partners



The experience of Copenhagen Engineering goes beyond just being a blacksmith workshop – Copenhagen Engineering has vast experience in steel works oriented projects, whether it is prototype manufacturing, one-off builds or complex repairs. Their great understanding of our philosophies and way of working, has made Copenhagen Engineering a preferred partner of Insatech.

With strategically placed hubs around the globe, Callenberg’s network of skilled and experienced technicians is an added security for your installed Insatech Systems, as they are ready to attend with technical manpower with short notice.



DMA International provides manpower for all sorts of tasks globally. For larger installations on board vessels, Insatech has chosen to work closely with DMA International to get the right crews of welders, electricians and fitters, specifically chosen for the individual job.

A local blacksmith with competences primarily within welding of black and stainless steel. Faxe Smeden provides Insatech with production capacity in larger projects with high degree of mass production, i.e. bypass constructions for flow meters.



The globally presence of Goltens combined with their knowhow and large base of technicians and manpower benefits Insatech, as it opens the door for worldwide fast response service, regardless of where your vessel might be located.












Projects that require heavy modification of pipework can put any company to the test, and Knaack & Jahn has proven many times that they are more than capable of carrying out such tasks. From first survey to final weld, Knaack & Jahn supports Insatech when needed.





# What We Do

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# Calibration

## Why Is Calibration Important to Vessels in Operation?

The zero point, stability and the accuracy of measuring devices degrade over time, from the fresh water temperature sensors to the engine and HVAC pressure transmitters. This is typically caused by wear and tear, but can also occur from electrical or mechanical shock. Depending on the type of sensor, environment and placement, it may drift rapidly or over a longer period of time. At the end of the day you have to perform your calibrations if you want to trust your instruments on board.

### What Is a Calibration?

A calibration is a comparison between a known measurement (a more accurate standard) and the measurement using your instrument.

A general rule of thumb is that the standard should be ten times more accurate than your own instrument. However, accuracy ratio of 3:1 may also be used in some cases. The objective of a calibration is simply to determine the accuracy of your measuring device.

### When Should You Calibrate?

Your instrument should be calibrated:

- According to recommendation of the manufacturer.
- According to class demands, IOPP certification etc.
- After any electrical or mechanical shock.
- Periodically (annually, quarterly, monthly).

Hidden costs and risks associated with un-calibrated devices could be much higher than the cost of the calibration.



# Calibration

## Kits

### Calibration Kit Case 1



The Marine Calibration Case 1 makes it easy to test and calibrate equipment, enabling your vessel to comply with the requirements of the SOLAS ISM regulation.

Contains pressure indicator and pneumatic pump.

**Range: Multiple**



### Calibration Kit Case 2



The Marine Calibration Case 2 makes it easy to test and calibrate equipment, enabling your vessel to comply with the requirements of the SOLAS ISM regulation.

Contains pressure indicator and pneumatic pump.

**Range: Multiple**



### Calibration Kit Case 3



The Marine Calibration Case 3 makes it easy to test and calibrate equipment, enabling your vessel to comply with the requirements of the SOLAS ISM regulation.

Contains a digital pressure calibrator, pneumatic pump and temperature calibrator.

**Range: Multiple**



### Calibration Kit Case 4



The Marine Calibration Case 4 makes it easy to test and calibrate equipment, enabling your vessel to comply with the requirements of the SOLAS ISM regulation.

Contains a pressure calibrator and 700 bar hydraulic pump.

**Range: Multiple**



### Tanker/FPSO Calibration Kit



Specialized kit made for Tankers and FPSO. The kit includes temperature and pressure calibrators incl. multimeters, loop calibrators and insulation testers.

**Range: Multiple**



### Supply/AHT/PSV Calibration Kit



Specialized kit made for supply vessels and alike. The kit includes all the necessary equipment to do your pressure, temperature and electrical calibrations on board. A long range 700 bar pump is included in this kit.

**Range: Multiple**



### Bulk/Cargo/Container Calibration Kit



Specialized calibration kits made specifically for bulk, cargo and container vessels.

**Range: Multiple**



# Calibration

## Instruments

### Temperature Calibrators



Dry block calibrators that meet all classification requirements. The calibrator is delivered in a solid carrying case so it is very easy to transport and utilize on board. The low weight makes it suitable for calibration on the spot.



Range: -30 °C ... 600 °C

### Digital Pressure Calibrator



The PM205 Series Digital Manometer is an excellent option for pressure testing. It has a ZERO function that allows the user to set any value as a new zero reference, which means you can compensate for barometric pressure variations.



Range: -1 ... 1000 bar(g)

### Multifunction Loop Calibrator



This calibrator is an ultra-compact, rugged, and best of all, easy to use hand-held device that will source, simulate and measure loop current, mV/V, loop integrity, and performs switch testing. Its smart phone-like menu and interface makes it simple and easy to use.



### Pneumatic Calibration Pumps



We offer a range of hand held pressure pumps for the calibration instruments. The pumps are durable and suited for the demanding environments on board ships and in the offshore/Industrial fields. All pumps are available in a kit configuration with case and all necessary fittings, hose and adaptors.



# Condition Monitoring

## No One Wants a Vessel Taken Unexpectedly Out of Operation. Enter Maintenance!

Breakdowns and malfunctions are never welcomed and can lead to heavy repair costs and loss in earnings, which is why maintenance of equipment is critical. Maintenance schemes and programs have become better over time as focus has shifted from reactionary maintenance towards a more preventive oriented approach.

By avoiding shutting down systems for repairs and planning maintenance work based on experience and calculations, a lot of time and money has been saved, as well as many stressful situations for the crew has been dodged. But, how do you actually know that the preventive maintenance carried out, is not done too excessively and too often, thus actually costing more than necessary? By implementing condition monitoring as a concept, you can enable crew and operators to gain an insight in the actual 'health' of main and auxiliary systems on board.

### What Is 'Condition Monitoring'?

The term 'condition monitoring' covers a very wide array of products that are designed to provide indications about a systems' operational health. When using condition monitoring, the crew and operators can get actual insight about a particular system's condition by directly analyzing the system or component.

The condition monitoring equipment will provide you with information about wear, tear and present failures. By carrying out systematic and periodical analysis of your equipment you can prevent unexpected failures and plan your maintenance more wisely, saving time for your crew and money on equipment repairs.

### How Does it Work?

As condition monitoring is a definition that includes many different products, it can work in just as many ways. But in general the condition monitoring equipments look for things that are out of the ordinary for example particles in lube oil, contaminants in fuel oil or specific vibrations of engines, shafts and generators.

By continuously monitoring the day to day operation the crew cannot only determine if maintenance is required but also identify the root cause.

This following section contains a collection of condition monitoring equipment, that can assist in optimizing maintenance efforts, identify and prevent critical failures before they happen and minimize down-time by scheduling optimally. If you are looking for something specific and it is not found here, please contact us and we will see what we can do to help you.



# Condition Monitoring

## Fuel

### Portable Sulfur Analyzer



A fully portable XRF device (about the size of a bowling ball) that gives you a laboratory grade sulfur level. The device only needs 10 ml fuel and 3 minutes to give you a four decimal result. No reagents or accurate sample sizes required, and with the push of a button it will give you the result.



Range: > 60 ppm

### Fuel Density Meter



A fast and reliable device to accurately measure the density of fuel. The Kittiwake Density Meter is suitable for both distillate and residual fuel oils.



Range: 800...1010 kg/m<sup>3</sup> @ 15 °C

### Compatibility Tester



The Compatibility Tester is a good way to measure the compatibility of marine fuels, incl. distillates and residual fuel oils within minutes. This helps protect your assets from harm.



Range: As per ASTM D-4740

### Flash Point Tester



A uniquely designed flash point tester for the determination of flash points of fuels, is an automated closed cup instrument that uses small sample sizes and 1 or 2 minute standard test time. The flammability of a material determines its safety classification and the regulations under which it must be handled, stored and transported. Can also be used to help detect fuel dilution.



Range: 0...800 °C

### Viscometer



Heated viscometer. Testing fuel and oil viscosity is very necessary to identify the grade of fuel delivered. The heated viscometer can be used to test lube oil and residual fuels in all applications including diesel engines, gas and aeroplane turbines, gear boxes, hydraulics and marine fuels.



Range: 20...810 cSt @ 50 °C

### Cat Fines Test Kit



The Parker Kittiwake Cat Fines Test Kit detects catalytic fines to prevent irreparable damage to fuel pumps, injectors and liners. The test is simple to perform, cost effective and can easily be completed within a few minutes.



Range: > 20 ppm (Al + Si)

### Drip Samplers



The fuel drip sampler makes taking a representative sample very easy and economic. Fuel drip samplers can be found on thousands of ships worldwide. It helps you comply with the legal requirements of bunker fuel sampling. Easy and quick to install.



Range: DN50 - DN300 (2" - 14")

### Sample Bottles



Appropriate sample bottles are very important for obtaining representative oil samples. All that is needed for bunker fuel systems and consumables are available. Sample bottles include sealing and labels.



# Condition Monitoring

## Fuel

### Sampler Accessories



We offer a long list of sampler accessories such as cubitainers, valve locks, converter robins, sampler gauges and elbow kits.



### Power Plant Lab



The idea of this cabinet is to install it in a remote place or inhospitable location, as it offers the ability to test oil and fuel on-site. This rugged cabinet contains a range of electronic QC tests lubricants and residual fuel oils. Developed for use in harsh conditions. Simple to use and quick analysis for bunker fuel.



### Fuel and Lube Lab



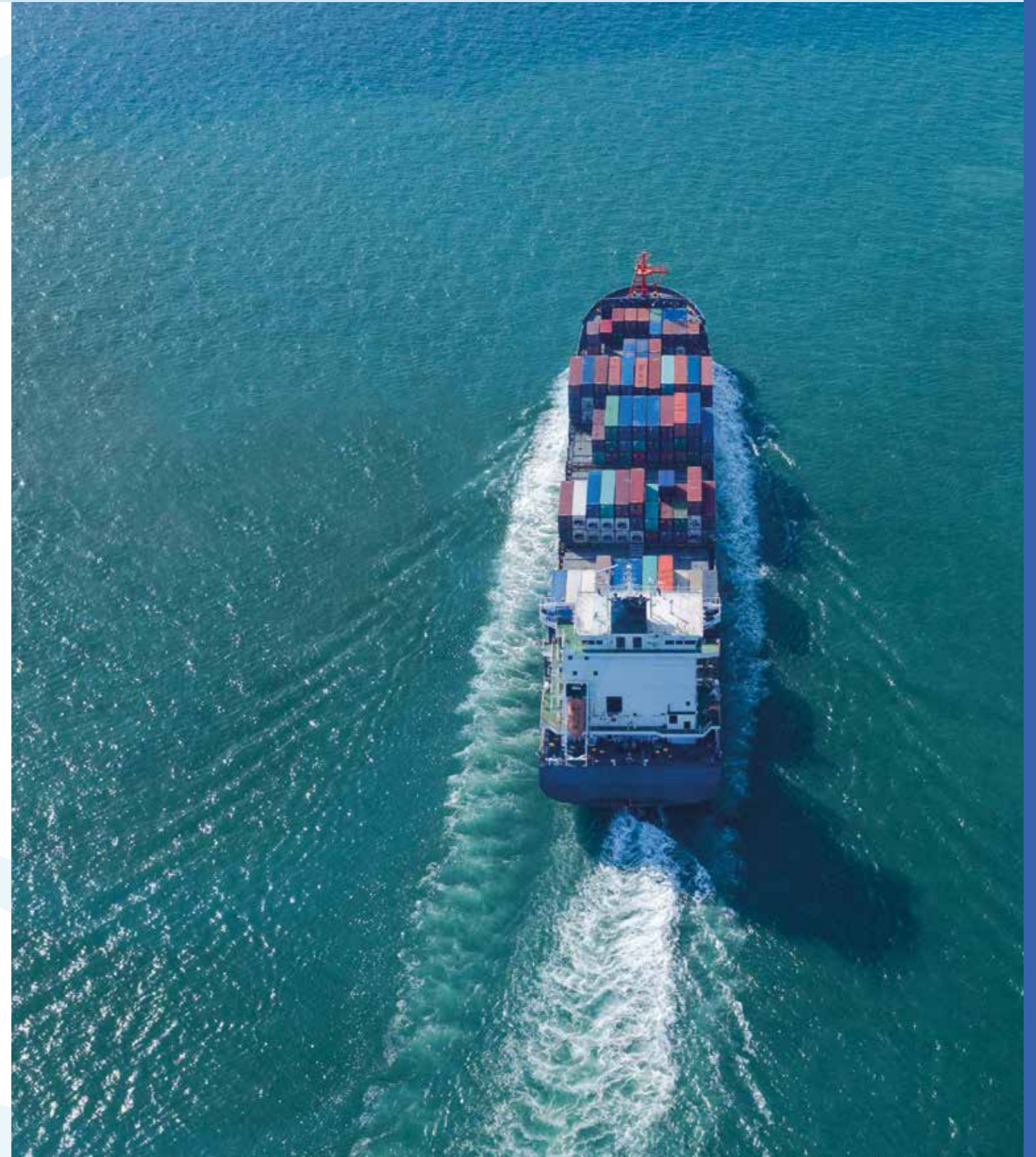
A unique wall mounted cabinet containing core QC tests lubricants and residual fuel oils. A rugged design suite, developed for use in harsh conditions. Simple to use and a good choice for operation by ships' engine room crew.



### Oil Test Centre (OTC)



OTC gives a near laboratory measurement of critical lubrication and fuel oils parameters on board. A rugged design suite, developed for use in harsh conditions. Simple to use and a good choice for operation by non-technical personnel.



# Condition Monitoring

## Lube Oil

### ATR Analyser



Truly reagentsless testing! Measure (5-10ml) of lube oil placed in a postage stamp size well and requires a single button push to achieve simultaneous results for Base Number, Total Acid Number Insolubles, Soot loading, Viscosity, FAME and Water Content all within one minute.



### ANALEXpql Debris Monitor



The ANALEXpql is developed to replace the widely used pqM and pqA. Using all new hardware, software and the latest technology, the highly accurate is an essential addition to the modern used oil analysis laboratory. Ferrous wear debris measured, irrespective of particle size and distribution.



### Pql Stacker



The ANALEXpql Stacker offers the user many benefits such as automatically perform 20 sample pot measurements, double magazines enable unattended measurements and a unique locking mechanism holds pots in place in the magazine until loaded onto the instrument.



### MS150 Moisture Sensor



Parker's Moisture Sensor range offers fast, reliable and accurate in-line detection of moisture in fluids. The sensor will measure relative humidity (RH), moisture content in oils. The measurements offers benefits over the current standard form of water content reporting in ppm.





# Condition Monitoring

## Lube Oil

### Ferrous Wear Meter



A device to determine if there are metal particles in oil samples from lubricated machinery. The FWM is simple, accurate and easy to use; using a sophisticated magnetometer. This device is the optimal solution for taking oil sample tests on-site, on board or in remote locations where you don't have access to a laboratory.

**Range: 0...150,000 ppm**



### Hydraulic Particles Test Kit



A small self contained kit specifically made for on-site care of hydraulic systems. Quickly identify hydraulic system contamination for a variety of metallic and non-metallic contaminants and determine if you can continue using it or need additional filtration.

**Qualitative**



### Cold Corrosion Test Kit



The Cold Corrosion Test Kit is a good way to accurately analyze the level of corrosive elements in cylinder oil, which can help prevent serious damage. The kit gives a result within 5 minutes and you avoid sending the sample to a laboratory.

**Range: 0 - 800 ppm**



### Fluid Condition Sensor



The Fluid Condition Sensor is an online device designed for constant, real-time monitoring of critical fuel and oil parameters in hydraulic and marine applications, including conductivity, permittivity, moisture content, temperature and pressure.

**Range: AC Conductivity: 0-999 (nS/m), Permittivity : 0-8, RH (0-100 %)**



### Economy Total Iron kit



A cost effective unit for total iron testing. The unit provides the ship owner and operator with accurate results of the level of iron present in the used cylinder oil. By using color matching tests the kit can give you a precise measurement of the iron content in parts per million (ppm).

**Range: 50 - 800 ppm**



### Metallic Wear Debris Sensor



The Parker Kittiwake Metallic Wear Debris Sensor goes beyond the scope of normal wear debris sensors and offers a high size resolution. With an unbeaten detection range, the sensor provides a debris count for both ferrous and non-ferrous metals.

**Range: 40...135 Micron**



### DIGI Test Kits



A complete oil analysis kit that can be used on-site for measuring and monitoring the amount of water in oil and TBN for industry, marine and offshore equipment, which enable you to conduct oil analysis quickly and easily.

**TBN Range: 150 TBN, Water in oil Range: 0-20 %**



### LinerSCAN



Kittiwake's LinerSCAN system is designed to remove the uncertainty on cylinder damage resulting from low fuel quality, slow steaming, low sulfur levels, lower oil feed rates and cylinder oil formulation changes.

**Range: 0...1000 ppm**



# Condition Monitoring

## Particle Counter

### Icount LCM30 Particle Counter



The new Parker icountLCM30 is a particle contamination monitoring solution that measures the cleanliness of oil – in just 90 seconds. The portable unit can be used in the field as a user-friendly diagnostic device, giving you a quick way to assess the cleanliness of the hydraulic fluid or oil in a wide range of applications.



### Icount Particle Detector



A particle sensor for permanent installation. The IcountPD Particle Detector is an innovative product, and the latest technology in solid particle detections and contamination control, with dynamic design, for use in all applications.



**MTD Range: 4+, 6+, 14+, 21+, 38+ and 70+ microns**

### Icount ACM20 Particle Counter



The Icount ACM20 is the benchmark particle counter and is used to monitor the level of contamination in fuels and offers the multi standard ISO reporting in 2 minutes. Monitors aviation fuel contamination to DEFSTAN 91-91 Issue 6 Jet A-1 fuel specification.



### Icount Oil Sampler



A compact and robust unit for measuring the quality of hydraulic oil in different applications. It uses laser detection technology for fast contamination detection.



**MTD Range: 4+, 6+, 14+, 21+, 38+ and 70+ microns**

### Icount IBS Water Glycol



This unique and complete solution provides laboratory quality on board with laser based technology. The IcountBSplus Water Glycol provides a valuable and extremely effective tool for use in many different oil & gas applications. It reduces the risk and improves the safety, to let you make the right decisions. Used for all common oil and gas industry water-glycol fluids.



### Oil Check Monitor



A handheld monitor that uses a numerical display to visualize the negative or positive increase in dielectrics. Ideal for fleet owners and garages.



**MTD Range: 4+, 6+, 14+, 21+, 38+ and 70+ microns**

**Oil Quality Scale: 0-100 %**

### Icount Bottle Sampler



The revolutionary Icount BSplus is an advanced, fully contained bottle sampling system that ensures fast, accurate and repeatable detection of contamination in hydraulic oils and hydrocarbon fuels.



**MTD Range: 4+, 6+, 14+, 21+, 38+ and 70+ microns**

# Condition Monitoring

## Acoustic / Vibration

### Bearing Checker



The MHC Bearing Checker is a unique hand-held instrument, that provides Maintenance Engineers with a quick and easy method to analyze bearing condition and lubrication state.



**Dynamic Range: 0...80 dB**

### Memo Pro



The Memo Pro is a top of the range hand-held device, featuring enhanced analysis capability, for those looking for an instrument to assist their condition monitoring program. The Memo Pro provides information related to the mechanical condition of rotating machinery.



**Dynamic Range: 0...92 dB**

### MHC Sensors



The MHC series of permanently installed acoustic sensors from Parker Kittiwake are designed for hard-wired input to continuous monitoring system condition.



**Dynamic Range: 0...90 dB**

### MHC Display / Logging Box



Parker Kittiwake's Human Machine Interface (HMI) box allows easy interfacing and display of multiple smart sensors allowing monitoring of machinery condition from one central location. The HMI can read and record data from up to 10 sensors and process it to provide a Red/Amber/Green status for each sensor, based on user specified alarm levels.



### Vibration Sensor



Conventional high quality accelerometer. These sensors are also available in a wireless configuration.



**Range: 0-100 mm/sec**

### Wireless Vibration Measurement



The EAGLE Wireless online vibration monitoring system is perfect for monitoring of generators, HPU motors, pumps, intervention towers, drilling machinery, cranes etc.



**Range: 0-100 mm/sec**

### Handheld Vibration Data Collection



This vibration data collector is the most innovative and easy to use data collector on the market. The data collector is especially developed for nonexpert users, but at the same time it has plenty to offer to the expert user. It is available in a wireless or wired version.



**Range: 0-100 mm/sec**

### Accelerometer Cable & Bias Checker



This instrument can used to check functionality of your vibration sensors.

The VS660 key features:

- Verifies the functionality of an accelerometer
- Compact and portable
- Rechargeable battery



# Condition Monitoring

## Acoustic / Vibration

### Type KIV100



The KIV100 vibration sensor is a wireless high quality accelerometer which can connect through bluetooth. A gateway between the vibration sensors and a network has been developed. The gateway is called Bluegate. Bluegate can communicate data on Bluetooth between a sensor and itself and communicate on data a network to data collecting system.



## In-line Oil Analysis

### OILCOL



Kytola OILCOL Oil Color Analyzer is an online instrument based on visible light absorbance (transmittance) to indicate the ASTM D1500 color value of oil. As the measurement is performed online, the response is continuous and fast, which can be crucial in order to detect sudden changes in oil quality and further to be able to react before any failures of the oil using equipment occur. Timeconsuming and expensive sampling and laboratory analysis are also avoided.

**Range: ASTM D1500 scale from 0.5 to 8.0**



### EAZY-2



This water-in-oil analyzer uses the differences in dielectric constants between water and oil to create a highly accurate measurement of the water content in oils. With a scalable range and measuring free water (as opposed to moisture), the EAZY-2 is a useful tool when determining characteristics of fuel and oil.

**Range: 0...10% (10,000 ppm) Water in oil**



## In-line Oil in Water Analysis

### OILAN A4



OILAN A4 detects water leaks in their early stages and helps to prevent expensive failures and down time of the lubricated machinery and equipment. It is an excellent instrument for supporting preventative maintenance.



### Oil Detector – OILCAP 158



The oil contamination alarm type OILCAP 158 measures capacitance between its rod and the walls of the water tank where it is installed. Lower capacitance indicates a higher concentration of oil in the water.



# Ferrous Wear Meter

To perform the test just add 5 ml of oil sample to the tube and place it in the test chamber of the unit. The metallic content of the sample will be shown in ppm on the LCD screen in less than 2 seconds.

## Parker Kittiwake Ferrous Wear Meter

### Main benefits:

- Appropriate for use on-site, on board and in remote locations
- Very simple and easy to use
- With LCD screen to give ppm
- Reduced operating costs
- Decreased downtime
- Reduced scrape down oil usage
- Immediate ferrous wear measurement in ppm on the LCD screen.

### Specifications

**Display Resolution:** 5 ppm

**Sample Detection method:** Magnetometry

**Measurement Range:** 0 - 2500 ppm

**Operating Temp. Range:** 15°C - 40°C (60°F - 104°F)

**Power:** 24 V DC – Power supply provided including UK, EU and US power adaptors

**Repeatability:** ±10 ppm (0 - 1000 ppm), ±20 ppm (>1001 ppm)

**Sample Bottle:** Standard 5 ml test tube

**Test Time:** < 3 seconds per sample

**Weight:** 1.1 kg

### Ordering Information

Part Number	Description
FG-K30258-KW	Ferrous Wear Meter

### Spares and Consumables

Part Number	Description
FG-K30362-KW	FWM pack (500 test tubes, 500 pipettes)
FG-K30366-KW	FWM Power Adapter (UK, EU and US adaptors included)
FG-K30368-KW	FWM Recalibration



### Prevent breakdown and plan your maintenance

With the Ferrous Wear Meter from Parker Kittiwake, you can equip your vessel with a strong and incredibly simple tool for breakdown prevention and wear monitoring of all lubricated parts on board. Designed specifically for use by crew on board, the Ferrous Wear Meter is ideal to monitor the wear on engines, gear boxes and bearings.

### Base your maintenance decisions on data

By performing an analysis on a sample of lube oil, the Ferrous Wear Meter detects the content of ferrous debris from abrasive wear in moving parts. With sample as small as 5 ml, the instrument utilizes a magnetic principle to

determine the amount of debris in the lube oil. By performing the analysis frequently and in fixed intervals, an increase in wear can be detected at an early stage. This will allow the crew to base their maintenance on the actual conditions of the equipment, rather than on conservatively recommended service intervals.

### Easy operation that everyone can do

The test itself could not be more straight forward or simple. A sample is drawn from the equipment you wish to analyze and is transferred to one of the disposable test tubes that comes with the analyzer. The Ferrous Wear Meter just need to be powered up, and once it is ready for use, the test tube is inserted into the test tube slot. In a matter of seconds, the instrument will display a reading, showing the content of ferrous material in ppm.

Contact our experts on +45 55 37 20 95 for more information about utilization, implementation and price.



### Watch

the video to see how the Ferrous Wear Meter works





# Particle Counter

## Parker icount LaserCM30 Particle Contamination Monitoring

The Parker icountLCM30 is a particle contamination monitoring solution that measures the cleanliness of oil – in just 90 seconds.

The portable unit can be used in the field as a user-friendly diagnostic device, giving you a quick way to assess the cleanliness of your hydraulic fluid or oil in a wide range of applications.

You can even use it while your equipment is in operation. The icountLCM30 complies with multiple ISO, NAS, AS and GOST standards for cleanliness reporting, has an integral printer and a built-in memory storage.

IcountLCM30 uses laser technology to measure the amount and size of particles in the oil, and can be a very important tool in order to avoid damage on machinery.



### Main Benefits:

- Start an automatic test directly from the handset
- Perform a test in just 90 seconds
- Integrated RH% moisture and temperature sensor
- Complies with ISO, NAS, AS and GOST
- Easy clip-on rechargeable battery
- Integral thermal printer
- RS232 data transfer via USB



Contact our experts on +45 55 37 20 95 for more information about utilization, implementation and price.



**Watch** the video to see how the Parker icount Laser CM30 works



# Emissions & Discharge

## Environment Protection Regulations and Their Implications

As the world's political agenda continuously moves towards a greener profile with higher focus on environmental sustainability, the shipping industry has been subject to more regulation which purpose has been to limit the individual vessel's pollution. Not only from the combustion of fossil fuels but also any kind of discharges that stem from operating the vessel. These regulations applies an additional workload and extra costs on owners and operators as they have to install systems and equipment that do not add direct operational value to the vessel, but rather make some procedures more difficult. Regardless of the trouble these regulations put on the operation, it is rarely an economic advantage to work around them as this can result in not only heavy fines, but also incarceration of responsible crew.

Having the systems and following the procedures set out by international and local authorities is not always enough to avoid unexpected interest from port authorities, as malfunctioning equipment or an unexpected change in operating conditions may have influenced the desired effect. Therefore, it can be of interest to some, to implement further measures of emissions or discharge to ensure that everything is as expected.

A given example where extra control from crews side could be beneficial is the delivered fuel. Regulations dictate, that the sulfur content can only be of a certain concentration and of course this is something that is stated when a fuel delivery is ordered. But in the case that the delivered oil is either off spec or is mixed with the previous batch in the tank and ends up with a too high sulfur content, it will be the vessel that is responsible and will have to suffer the consequences in case of a surveyor's penalty. Since this is not something that can be passed on to the fuel supplier it would make sense for the vessel to have the capability to measure the sulfur content on board.

Some of the regulations require that specific instrumentation or systems are in place on board, and since measurement is our core competence, it is obvious that we provide some of these. Often the systems and instrumentation that is mandatory are also required to follow a calibration and/or functionality check scheme, we naturally offer these services to ensure your compliance with international regulations.

In the following section, you can see a selection of the systems and instrumentation that we offer to ensure that your vessel is in compliance with the regulations.



# Emissions & Discharge

## Bilge & Wash Water

### BilgeMon 488



This no-hazzle 15 ppm Bilge Alarm used with the vessel's water separator is the perfect retrofit replacement. A minimum of components, compact design, an easy to change measuring cell and straight forward operation along with full IMO MEPC.107(49) compliance makes this Bilge Alarm the preferred product for many vessels.

Range: IMO MEPC.107(49)



### MasterTrack 588



This tamper proof system controls and monitors the oil content of the bilge water discharge, ensuring compliance with MARPOL 73/78, i.e. making sure the vessel does not exceed legal overboard discharge limits. This unit is required for vessels above 10,000 gross tons when operating in certain areas.

Range: IMO MEPC.107(49)



### GreenMon



The GreenMon is a different instrument from the regular 15 ppm monitor. The instrument is mainly used for dirty water applications where the optical measuring principle of the regular 15 ppm instrument cannot be used.



## ODME

### CleanTrack 1000B



Overboard discharge monitoring equipment is used to measure and monitor the oil content of cargo hold wash and ballast water to prevent discharge of water with an oil content exceeding regulation limits (30 L / nm). Brannstrom's CleanTrack 1000B is probably the most straight forward and operator friendly ODME on the market.

Range: IMO MEPC.240(65)



### Oilcon Mark 6M



Overboard discharge monitoring equipment is used to measure and monitor the oil content of cargo hold wash and ballast water to prevent discharge of water with an oil content exceeding regulation limits (30 L / nm). VAF Instrument's Oilcon Mark 6M is most likely the most sturdy and mechanically reliable ODME on the market.

Range: IMO MEPC.240(65)





# Emissions & Discharge

## Scrubber

### Sea Sentry



The DNV-GL and ClassNK type approved IMO MEPC 259(68) compliant wash water monitor (WWM) from Chelsea TG is a complete scrubber wash water monitor, measuring all the required regulations parameters; PAHPHE, pH, turbidity and temperature. The Sea Sentry is the only WWM that corrects the PAHPHE fluorescence for interference, and it is suitable for closed loop, open loop and hybrid systems.



**Range: MEPC.259(68)**

## Ballast Water

### bw monitor



Automated in-line, on time data on the performance of your ballast water treatment system. This in-line ballast water monitor continuously measures the presence of phytoplankton.



### Purestream™

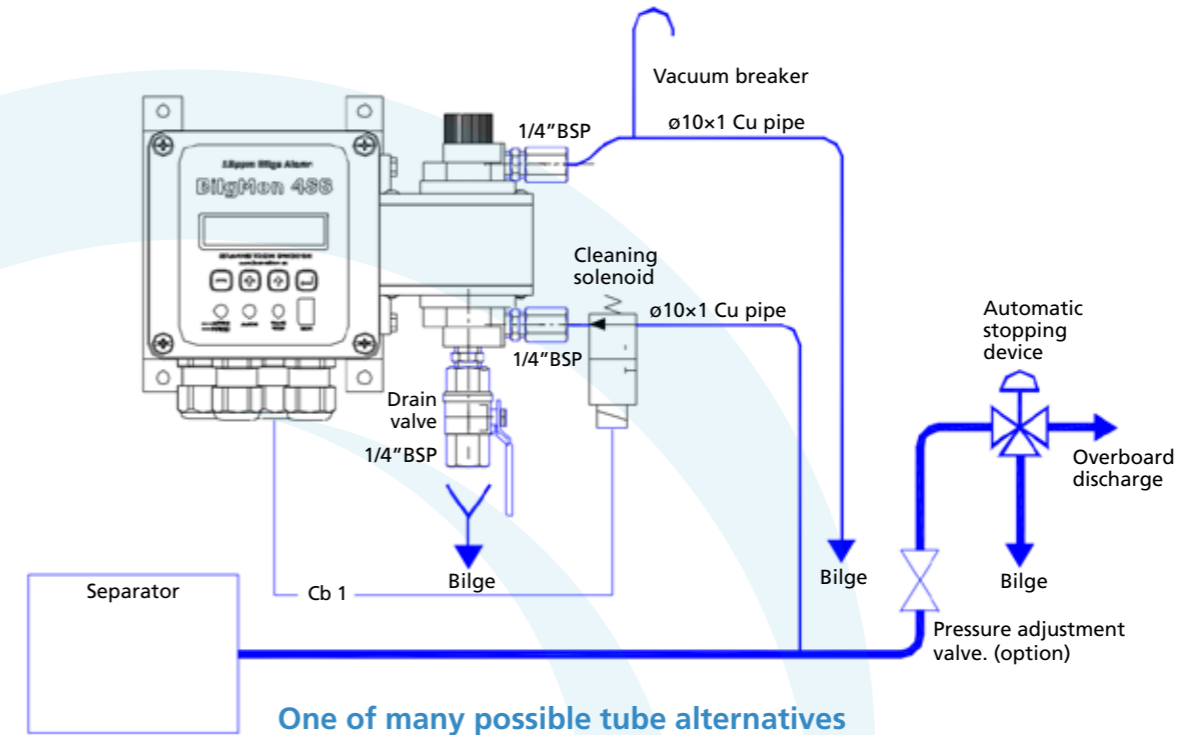


Atlantium's Ballast Water Treatment System is a one of a kind system, featuring full functionality with minimum retention time under all water conditions, unparalleled power performance for an UV system and the IMO approved One-Pass™ operation. With One-Pass™, the ballast water is only treated during intake and is hereafter treated and ready for deballasting - with zero retention time.



## Bilgmon488 Bilge Monitoring and 15 ppm Bilge Alarm

Contact our experts on +45 55 37 20 95 for more information about utilization, implementation and price.



### Bilge Monitoring – 15 ppm Bilge Alarm

A 15 ppm Bilge Alarm is normally used in connection to a ship's oil filtering equipment (also known as "bilge water separator"), monitoring the oil content of the separated/filtered water and stopping the discharge into the sea if the oil content exceeds 15 ppm (parts per million).

The BilgMon 488 is type approved for this purpose according to latest IMO Rules MEPC.107(49).

Furthermore the 15 ppm bilge alarm can in principle be used as a simple oil content alarm for other applications where the water does not contain solids or other substances disturbing the operation.

### Cheaper to Replace than Repair

When a complete new bilge water separator is delivered to an existing ship or to a new building, the separator already contains a 15 ppm bilge alarm. However, when the 15 ppm bilge alarm on an existing ship is broken beyond repair, or repairing the bilge alarm would be almost as expensive as a new one, the best solution is to replace the old alarm with a new one.

### Simple to Install

The BilgMon 488 is compact and simple to install as a replacement for most old 15ppm alarms. The ship's crew can normally do it in less than an hour. A competitive price and immediate availability makes it an attractive choice for any ship having trouble with the old 15 ppm bilge alarm.

- Simple design
- Easy to operate
- Compact system, optimal for a retrofit
- Fast delivery
- Competitive prices

### Spare Part List for the BilgMon488

You can quickly and cost effectively order all necessary spares for the bilgemon488 by using the product codes below:

- Sensor unit: BM201001A-1
- Master Unit: BM201001A-2
- Magnetic valve assembly: BM201001A-3
- Calibration check kit: BM201001A-4

### Rules and Regulations for 15 ppm Bilge Alarms

According to MARPOL Annex I, ships of 400 gross tonnage and above must be fitted with a bilge water separator, and on ships of 10,000 gross tonnage and above the bilge water separator must additionally be fitted with a 15 ppm bilge alarm. However, ships between 400 and 10,000 gross tonnage are also required to have the 15 ppm alarm in order to be allowed to operate the bilge water separator when the ship is in one of the following "Special Areas" as defined by MARPOL.

- The Mediterranean Sea
- The Black Sea
- The Baltic Sea and the North West European waters
- The Red Sea and the Gulf of Aden
- The Arabian Gulf
- The Oman area of the Arabian Sea.

For details see Reg.14 & 15 of MARPOL Annex I (Consolidated Edition 2006).

Ships built before 2005 may operate with equipment meeting the requirements of older IMO Rules, but ships built in 2005 and later must be fitted with bilge separators and 15 ppm bilge alarms type approved according to MEPC.107(49).

For details see paragraph 1.3 of MEPC.107(49).

# Flow Meters

## Flow Basics

In order to use or add something to a process, you will have to move it and by moving it, a flow will be generated. This is universal, and regardless of what is being consumed or added to a process, a flow is inevitable as flow is an indication of movement. As a consequence, if you wish to measure what is being consumed it is often the easiest to measure the flow of supply.

Depending on which flow you want to measure, in which application and under what conditions, different types of principles can be used, their common denominator is that they are flow meters. Each type of flow meter has its own benefits and disadvantages, to choosing the correct flow meter is quite important – in the worst case you could end up with a flow meter that does not measure correctly or not as expected, which can potentially affect your production or process negatively.

In general there are two 'parent types' of flow meters: **Mass Flow** and **Volumetric Flow** instruments. As their names indicate, they measure the flow of the media by how much volume is displaced or by how much mass is displaced.

### An Endless Flow of Possibilities

Using the correct flow meter for your application can greatly enhance the productivity of your operations. In some cases, a general indication of the flow might be sufficient for the process, and in others high accuracy can greatly improve efficiency. By using high accuracy flow meters in a production or operation, you can gain insights into the effects of even minor changes in behavior or routines – this is especially true on board ships. Imagine being able to see the impact of your efforts from maintenance of main components, implementing new tech or even changes in crew behaviour, in the fuel you consume – this is actually possible with the right flow meter in the right place.

### We Will Gladly Guide Your Flow Measurements

We have been supplying most flow meter types for decades, and we know which type of instrument would be best suited for your application. We will gladly assist you in choosing the correct flow meter and whether you focus on accuracy, special ambient conditions, ease of installation or price, we aim to provide you with the right solution the first time. As we have all supporting functions in-house, we can even help you with installation, maintenance, repair or up-stream signal integration.



# Flow Meters

## Mass – Liquid and Gasses

### ROTA<sup>mass</sup> Low Flow

**YOKOGAWA** ◆

Coriolis based mass flow meter with measuring flow directly in mass. The flow meter also measures density and provides selfdiagnostics via Modbus output signal.

Suitable for measuring additives and dosing on all liquids and gasses.

**Flow Range: 0 ... 1.5 t/h**



### ROTA<sup>mass</sup> Medium Flow

**YOKOGAWA** ◆

Coriolis based mass flow meter with unique box-in-box design, measuring flow directly in mass. Also measures density and provides selfdiagnostics via Modbus output signal.

Suitable for measuring fuel consumption on all fuel types.

**Flow Range: 0 ... 170 t/h**



### ROTA<sup>mass</sup> High Flow

**YOKOGAWA** ◆

Coriolis based mass flow meter with unique box-in-box design, measuring flow directly in mass. Also measures density and provides selfdiagnostics via Modbus output signal.

Suitable for measuring bunker deliveries of all fuel types.

**Flow Range: 0 ... 600 t/h**



## Volume – Oil and Fuel

### OM-series

**FLOMEC**

Mechanical oval gear volume flow meter for clean and filtered liquids. The low pressure drop makes the meter suitable for measuring fuel consumption and lube oil flow - even for gravity driven applications.

**Range: 1.0 ... 2,500 l/min**



### YEWFLO

**YOKOGAWA** ◆

Highly durable and reliable Vortex flow meter from Yokogawa. The Vortex flow meter is accurate and stable, even in harsh process conditions, and has a highly reliable and robust design that delivers improvements in plant efficiency and reduced operating costs. The instrument is mainly used for gas and steam applications.

**Range: 0.3 ... 3,547 m<sup>3</sup>/h**



### Proflow

**VAF**  
INSTRUMENTS

Small to medium mechanical positive volume displacement vane flow meter with high accuracy and digital display with flow rate and totalization.

Suitable for measuring liquid fuel consumption and lube oil flow.

**Range: 1.0 ... 375 l/min**



### Midflow

**VAF**  
INSTRUMENTS

Small to medium mechanical positive volume displacement vane flow meter with temperature compensation for enhanced accuracy, the flow meter can be delivered with a mechanical counter or a digital display for flow rate and totalization.

Suitable for measuring liquid fuel consumption and lube oil flow.

**Range: 1.0 ... 50 l/min**



# Flow Meters

## Volume – Oil and Fuel

### Highflow



Large mechanical positive volume displacement vane flow meter with high accuracy, the flow meter can be delivered with a mechanical counter or a digital display for flow rate and totalization.

Suitable for measuring bunker deliveries of HFO and MGO/MDO.

Range: 8.0 ... 2,000 l/min



### Miliflow



Mechanical positive volume displacement piston flow meter for low flow.

Suitable for measuring liquid, fuel consumption and oil flow.

Range: 1.0 ... 20 l/h



### Clamp On



Clamp-on ultrasonic flowmeters, non invasive measurement. Our permanent and portable clamp-on flow meters are the ideal measuring systems even for the most challenging applications. This instrument offers no installation costs and very low cost flow measurement on large pipe diameters.



## Volume – Water and Other Low Viscosity Liquids

### G-series



Cost efficient turbine type flow meter for low viscous liquids of up to 100 cSt. with better accuracy than the Flomec G2-series turbine meters. Available with threaded or flanged connections in sizes 1/2" - 2".

Display only available as accessory.

Range: 2.2 ... 1,250 l/min



### G2-series



Cost efficient turbine type flow meter for low viscous liquids of up to 100 cSt. Available with threaded or flanged connections in sizes 1/2" - 2".

Available with built-in display.

Range: 3.8 ... 760 l/min



### TM-series



Cost efficient turbine type flow meter with built in display, specifically designed for water applications. Suitable for water temperatures from 0 °C ... 60 °C.

Range: 3.8 ... 2,271 l/min



### A1-series



The A1-series from Flomec is a cost efficient turbine type flow meter with built-in display and a compact design. The meter is ideal where a basic and accurate flow meter is needed for measuring low viscous medias, and can even be delivered in a nylon-version for use in water or non-aggressive chemical applications.

Range: 1.0 ... 190 l/min



# Flow Meters

## Volume – Water and Other Low Viscosity Liquids

### ADMAG

YOKOGAWA

Highly durable and reliable magnetic flow meter from Yokogawa. The world's first dual frequency excitation magnetic flow meter with many advantages. This instrument offers high accuracy and reliability with no pressure loss in your pipeline.



Range: 0 ... 4,523.89 m<sup>3</sup>/h

## Volume – Gases and Steam

### Pitot tube / dP flow measurement

systemec

Averaging pitot tube for flow measurements of steam, gas and liquids. Due to the special probe profile the flow measurement can assure the highest level of precision and excellent process liability, even under extreme conditions. Averaging pitot tubes have the lowest pressure loss of all dP-flow meters and are therefore highly energy efficient. Typical applications are flow measurement of steam and gas.

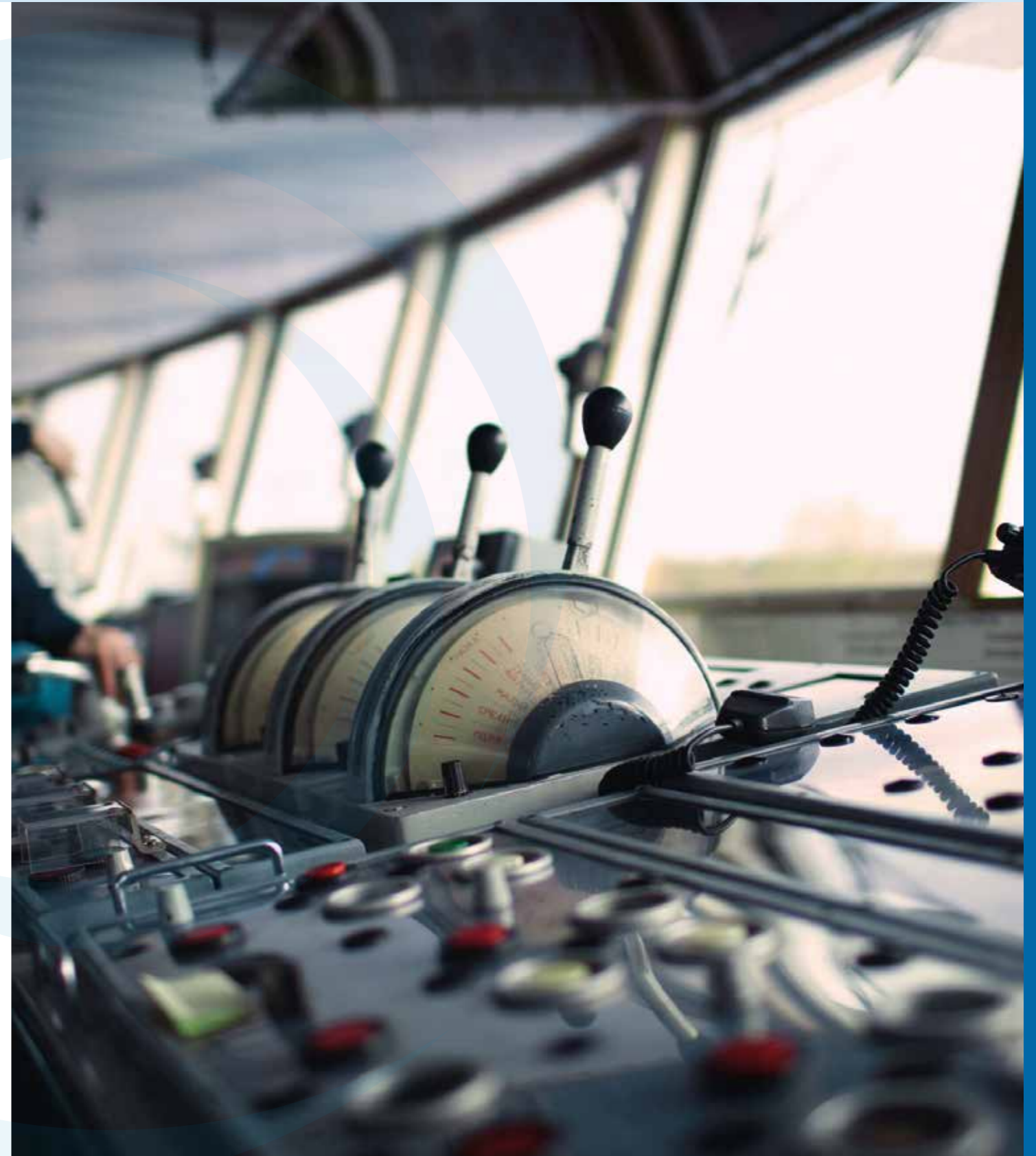


Range: 1.0 ... 190 l/min

### Differential Flow

YOKOGAWA

The differential flow meter is the most common device for measuring fluid flow through pipes. We can offer a long list of different orifices or venturi setups.





# Coriolis Mass Flow Meter

## Precise Fuel Flow Measurement

The Yokogawa ROTAMASS-series of Coriolis mass flow meters is an excellent choice for fuel measurements. It's a highly accurate and reliable flow meter, and the box-in-box design makes it less sensitive to stress, movement, and vibrations.

The patented Yokogawa design has been used in 1,000's of both industrial and marine installations and with our application experience, you are sure to get one of the best possible setups for measuring flow on board your ship. Naturally the flow meter is DNV-GL approved.

### Accurate and Reliable Fuel Flow Measurement

With Coriolis based flow measurement you will get direct measurement of density and actual mass flow. This eliminates the need for various conversions such as temperature and density, factors that are typically needed for volume flow meters and can be a source of incorrect calculations and offsets.

The Coriolis principle will work with very low flow rates therefore the measuring span of the Coriolis mass flow meter is often greater than other measuring principles, while simultaneously maintaining a higher accuracy across the entire range.

### No Compensation Means it is Less Prone to Miscalculations

The fact that the mass flow meter can measure density and calculated volumetric flow, in addition to the mass flow,



Contact our experts on +45 55 37 20 95 for more information about utilization, implementation and price.

### Main Benefits:

- Direct mass, density, and temperature measurement
- Vibration-resistant due to the box-in-box system
- No straight pipe runs required
- Fast and uncomplicated commissioning
- Maintenance-free operation
- Self-monitoring

means that all measurements can be translated to a signal directly without the need of a flow computer or another source of compensation or conversion. This provides you with a setup that has fewer sources where errors can occur. Furthermore, the flow meter has a self-diagnostic function that ensures that the signals you get are less likely to get tampered with and are ready more or less as they are for further use in other systems.

### Suited for Demanding Environments

In general terms, Coriolis mass flow meters are relatively sensitive instruments. They need to be installed in well-aligned piping, so they are not subject to stress, minor movements or vibrations. The ROTAMASS-series, on the other hand, is designed with a unique and patented box-in-box feature, that makes it far less sensitive to stress, movement, and vibrations. This means that it is ideal to use on the harsh condition on board a ship and the robust layout has proven itself many times.

### Minimize Maintenance on Board

A Coriolis mass flow meter is in general an instrument that requires very little attention once it is installed

correctly. As it has no moving parts and no sub-millimetre tolerances, the risk of breakdown or clogging is minimal. Within the flow meter itself, there are no parts that needs to be replaced over the lifetime of the instrument and since the sensor is insensitive to particles and debris in the stream, there is no requirements to filter the fuel before the flow is measured.

### Cost Effective Setup

Since there is no need for regular maintenance of the flow meter you save time on servicing it and because you do not need a filter before the flow meter, you save even more time that you would have spent on monitoring the pressure over the filter or periodically changing the filter cartridge. The time and attention a typical volumetric flow meter with a pre-filter installation requires, your crew can spend on more productive and performance enhancing initiatives.

### The Cost of Saving Money on Instruments

When it comes to instrumentation you most often get what you pay for. But there is also the factor of sourcing the correct instrument with a suitable setup. So, the total cost of an instrument can be divided into two categories; the actual cost of the instrument in

### Key Features

- Box in Box system
- DNV-GL Approved
- Field proven through 1000's of on-board installations
- Extremely reliable





## Coriolis Mass Flow Meter

monetary terms, and the cost of time spend on making sure the suitable instrument is selected and installed correctly. And cutting cost too much on either of the two categories can result in an excessively high final cost.

### Select an Instrument That Meets Your Needs Now and in the Future!

Taking your time to find the right flow meter that meet your needs, not only now but in the future as well is always a financially sound investment.

In some cases, your needs might require a simple and low-cost instrument that provides a flow rate indication, and in that case, you shouldn't pay for more than that. But for most applications, a future-proof and reliable flow meter will give both operator and owner a much greater value.

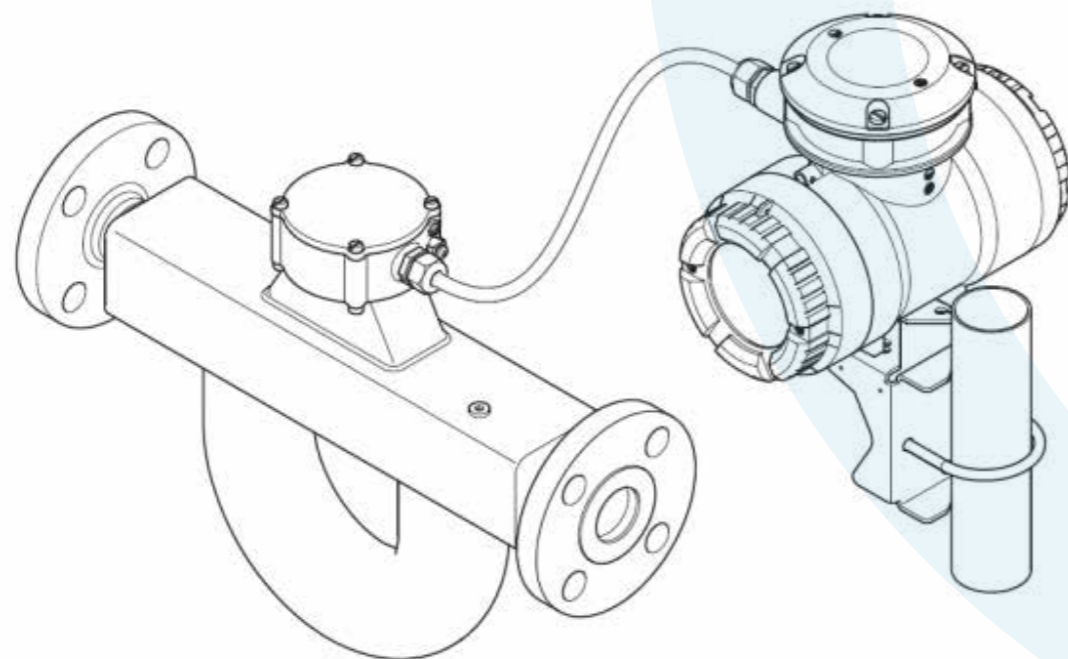
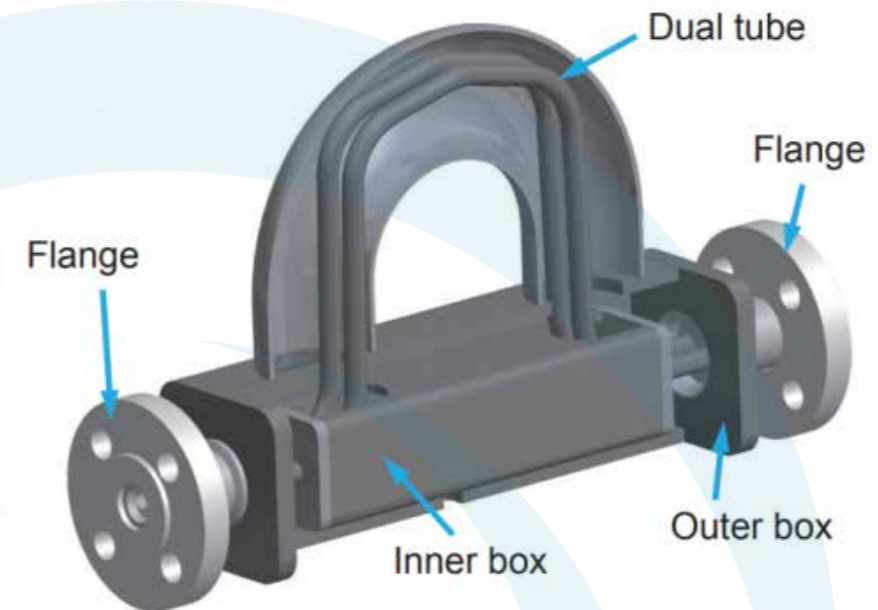
Getting the right flow meter for the intended use and application, can not only ensure that the implementation is executed with a minimum of effort, but will also prevent the need for an upgrade to a more suitable instrument in the early stages of the instruments expected lifespan.

For the flow meter setups, we install on board vessels we use a separate converter, this makes the flow meter much more resistant to vibrations in the fuel line, see the picture below.

### How a Coriolis Mass Flow Meter Works

The Coriolis effect is a universal physical phenomenon found in masses moving within a spinning or moving frame. In this case, the Coriolis Effect is present as we have fuel flowing through a pipe – but it is only present because the sensor pipe is oscillating. The oscillation is key to obtaining the Coriolis Effect, and since the Coriolis Effect is a well-understood phenomenon, it can be used to accurately determine the mass flow in the sensor pipes.

The sensor pipes of a Coriolis mass flow meter are typically a set of paired and U-shaped pipes, but many shapes of sensor pipes are used by different makers in a wide variety of Coriolis mass flow meter models. At the bottom of the 'U' an electromagnetic vibration generator oscillates the sensor pipes, and on each of the 'legs' of the U-shaped pipe a sensor detects the frequency of the oscillation.



At zero flow, the oscillation of the 'legs' will be synchronized with both sensors registering the same pulse frequencies at the same time. When a flow is introduced through the sensor piping, the U-shaped sensor pipe will start to 'wobble' due to the Coriolis Effect, as the moving mass will 'delay' the upstream pulse. The two sensors will now experience an offset in the pulses, and the larger the offset the larger the flow is.

Depending on the density of the media in the pipe, the electromagnetic vibration generator will have to adjust the power (current) applied to get the oscillation characteristics needed. The current applied to the electromagnetic vibration generator is directly correlated with the density of the media and can therefore be directly translated into a density measurement – and this applies regardless of flow.

Combining these two factors provides the Coriolis mass flow meter the ability to measure mass flow directly.

### Useful Applications

In general, a Coriolis based mass flow meter can be

utilized to measure flow in most cases and with both liquid and gas. The Yokogawa ROTAMASS can be used for all types of fuel, whether it is heated oils or very cold liquid natural gas.

Insatech Marine uses the ROTAMASS Coriolis mass flow meter for fuel consumption measurement on all fuel types, fuel transfer measurements on all fuel types, bunker operations on all fuel types and for some lube oil applications.

The ROTAMASS is available for use in safe as well as for hazardous areas, and as there are no requirements regarding straight piping before or after the Coriolis mass flow meter it can be retrofitted into almost any pipeline.

The only requirements for the Coriolis mass flow meter, regardless of maker, is that the flow must either be horizontal or upwards vertical, and the media flow must be air free.





## Coriolis Mass Flow Meter

### The Rotamass Box-in-Box Mass Flow Meter Design

The unique and patented box-in-box design of the ROTAMASS mass flow meter provides numerous advantages. The principle of the design is quite simple. An outer box has the inlet and outlet connections attached to it. The inner box has the sensor pipes connected to it. This way, the outer box becomes the part that ensures the position and fixation of the instrument, while the inner box secures the sensor pipes in a fixed position, isolating them from any stress in the piping system.

Installation is simplified as the instrument is less sensitive to stress caused by misalignment in the pipeline. Furthermore, any minor motion and movement in the pipeline will have significantly less influence on the flow meter, as the stress caused by these factors, are absorbed by the outer box, and deflected from the inner box. As most of the stress from the surrounding piping system is diverted around the sensor piping, the result is a more accurate measurement and less frequent need for zero-point adjustments.

### Installation and Beyond

The ROTAMASS mass flow meter is easy to install. As with most instruments, it does require that the piping, is somewhat aligned, but compared to other similar instruments, the box-in-box design does expand the tolerances to a great extent. We will guide you to make sure that the flow meters are installed correctly. We typically attend to finalize installation and do commissioning, but if you feel safer in letting us perform the entire installation, we are more than capable of doing so.

Once the installation and commissioning are completed, and the flow meter has been put into use, Insatech Marine is always ready to assist with any troubleshooting, fault-finding and service if needed – our delivery does not stop with the flow meter – we want you to benefit from your Coriolis mass flow meters for many years and we are sure that you will.



The unique and patented box-in-box design of the ROTAMASS Mass Flow Meter provides numerous advantages



# Filtration

## System Health Prevention

In these challenging markets it is key to use a proactive approach to maintenance to stay ahead of the competition. With issues such as extreme conditions, inspection challenges and workforce safety, on-line sensor and on-site testing technology provide an assured method of protecting assets and profits.

Selecting the correct filtration solution is vital to preserving the desired performance of your system. Preventing component deterioration or even failure depends on the quality of your filtration solution. Insatech is your single-source supplier to manage your total system health.

### Your Single Source for Quality Filtration

We supply replacement spare parts for all existing filters. Our spare parts are quality tested and in compliance with a high-quality standard. We can provide any filter you need for example automatic, duplex or simplex for most vessels.

Our close filtration partners are the leading filtration suppliers worldwide. They have a powerful reputation, unparalleled breadth of products, and worldclass customer service. However, their greatest distinguishing benefits can be found in its Value Proposition. We believe that it takes more than our great products, competitive prices, and on-time delivery to satisfy customer demands. It takes a commitment to provide exceptional value.

Summing up, we can deliver Baldwin filters at very good price with even better delivery times. To prevent engine failure and to keep high performance, filtration the key to keep everything running smoothly.

We stock a wide range of types:

- Lube oil filters
- Hydraulic oil filters
- Air filters
- Fuel filters
- Coolant filters
- Fuel Filter/Water Separators



# Filtration

## Baldwin filters



We offer Baldwin filters for all applications, types, and branches. The range covers lube, air, hydraulic, coolant and transmission filters. Baldwin filters are unsurpassed in quality and performance. Each product is designed specifically to meet or even exceed the application requirements.



## Candle Filters



We offer a large range of marine candle filters that are mainly used for fuel and lubrication oil. The candle filters are of high quality and with high precision. The usual applications include multi-mantle elements, star-pleated elements, filter candles, by-pass elements and many more.



## Parker Filters



Insatech offers the full range of all Parker Hannifins filtration solutions. Every Parker product is engineered and manufactured to the highest standards. It's a quality commitment that drives efficiency, reliability and profitability gains for you and your customers. Parker helps to keep all the essential on-deck and below-deck machinery and safety equipment operating.



## Fuel Filters



We offer a large range of fuel / engine filters to most engines; Wärtsilä, Bergen, B&W, MAN, Cummins, MAK, Sulzer, Caterpillar. Let us know and we can deliver the requested filters to the quality and specification needed.



## Racor Filters



Racor technology takes the guesswork out of engine protection and Racor manufacturing quality and attention to detail ensures every customer gets the filtration and separation solution they are looking for. Filter solutions for both leisure and commercial marine applications.



## Hydraulic Filters



In most of the cases fluid power systems easily fail because the contamination is too high. Poor plumbing, the usage of the machines or new fluid are only a few possibilities. In order to run your system efficiently hydraulic filters are required. We can offer competitive solutions for all known brands according to your requirements.



## Portable Filtration Trolley



The 10MFP Series portable filter cart is a mobile filtration device that removes free water and contaminants from hydraulic fluid. The 10MFP hydraulic trolley is the ideal way to pre-filter whilst transferring fluids into reservoirs or to clean up a system and is capable of pre-filtering and transferring fluid at 38 l/min.



## Water / Air and Oil Separator Filters



We can offer a full range of water, air and oil separator filters for all needs. Our filters provide superior filtration solutions in a lightweight, compact design for easy installation in less space. From the broad range of suppliers, we can select exactly the water, air or oil separator filter will fit your need.



# Level

## The Basics of Level Measurement

Level measurement is basically measuring the quantity of a product within a vessel/tank. This could be either a solid or liquid substance like oil, chemicals or coal. The level measurement device is usually placed on the top of the vessel or the bottom/side depending on the measuring principle.

When doing a continuous level measurement a level transmitter detects the level of a medium in a tank and converts it into an electrical signal. The level signal can be displayed locally or incorporated into an on board management system.

A point level detection is a level transmitter which detects when a certain predefined level is reached. A switching command starts or stops filling equipment or similar from the sensor signal.

**We offer level sensors across all the different measuring principles which includes:**

- Radar
- Guided Wave Radar
- Ultrasonic
- Capacitive
- Hydrostatic
- Radiation-based
- Vibration
- Conductive

### **Guidance to Choosing the Correct Level Sensor**

We have been supplying level sensors of almost all types for decades, and we know which type of instrument would be most appropriate for your application, based on your requirements to accuracy, conditions where it should be used and what your end-purpose with the sensor is. We will gladly assist you in choosing the correct instrument with the desired characteristics and features, and we aim to provide a satisfactory solution to your needs the first time. Regardless if your focus on accuracy, special ambient conditions, ease of installation or price. As we have all supporting functions in-house, we can even help you with installation, maintenance, repair or up-stream signals integration.



# Level

## Radars

### Guided Microwave Radar

**VEGA**

Guided radars for level and interface measurement in both liquids and solids. The flex radars from VEGA can be offered for any type of application such as high temperature, high pressure, aggressive media and harsh environment.

Range: 0...75 meters



### Rugged Guided Microwave Radar

**VEGA**

Guided radars developed and manufactured for the most extreme process conditions. Its robust, mechanical design and the second process seal, the Second Line of Defense, protects the sensor for demanding measurement tasks.

Process temperature: -196 ... 450 °C; process pressure: -1 ... 400 bar.

Range: 0...75 meters



### Non-contact Radars

**VEGA**

All-around radar sensors for continuous level measurement of liquids. It is suitable for level measurement in storage containers, reactors and process vessels, even under difficult process conditions, with its various antenna versions and materials.

Range: 0...35 meters



### Rugged Non-contact Radars

**VEGA**

Non-contact radars developed and manufactured for the most extreme process conditions. The extended selection of process fittings and materials allows use in extreme temperature and pressure ranges.

Range: 0...35 meters



## Radiometric

### VEGA Fiber- and Pointrac Series

**VEGA**

The radiometric measurements is a flexible detector for continuous level and interface measurements on round and tapered containers. It is suitable for liquids, solids and sludge just to name a few. Radiometric measurements are used in cases where other "traditional" methods give up. It can be pressure, temperature, corrosive or toxic media, abrasive media, etc.

Range: 0...7 meters



## Level Switches

### Vibration Sensor for Level Detection

**VEGA**

The SWING Sensor detects the limit level reliably and with millimetre accuracy directly at the mounting position. Numerous process fittings, approvals as well as housing and electronic versions.

Range: 0.5...2.5 g/cm³



### Capacitive Rod Probe for Level Detection

**VEGA**

The VEGA capacitive sensor is a point level sensor that can be used in all areas of industry. The partly insulated probe is suitable for measurement of bulk solids and liquids. The proven mechanical construction offers high functional safety.



# Pressure

## Pressure Basics

Pressure measurement is a widely used application on board. Pressure measuring techniques can be used to measure not only process or differential pressure but also to calculate level, volume, density or even mass flow in all areas of a process.

The measuring ranges of pressure transmitters start at a few mbar and extend to extreme pressures up to 1,000 bar. The range of pressure sensors can be used on all stages of media, from gas to liquid and even solids if needed.

Different applications require different sensor conditions, ranges and materials. The sensors have different measuring principles as well, often the pressure is converted to some intermediate form, such as displacement, by detecting the amount of deflection on a diaphragm, from this you can calculate the pressure. Other sensors can have a variety of different measurement principles such as bridge transducers (strain-gauge), variable capacitance or the common piezoelectric.

### Guidance to the Correct Pressure Sensor

We have been supplying pressure sensors of almost all types for decades, and we know which type of instrument would be most appropriate for your application, based on your requirements to accuracy, conditions where it should be used and what your end-purpose with the sensor is. We will gladly assist you in choosing the correct instrument with the desired characteristics and features, and we aim to provide a satisfactory solution to your needs the first time. Regardless if your focus on accuracy, special ambient conditions, ease of installation or price. As we have all supporting functions in-house, we can even help you with installation, maintenance, repair or up-stream signals integration.



# Pressure

## Process Pressure

### VEGABAR 14 & 17 Series



The small pressure transmitters VEGABAR 14 og 17 are a cost-effective solution with the advantages of a ceramic measuring cell. The sensors can be used universally for measurement of gases, vapours and liquids. The small pressure transmitter offers maximum reliability and operational safety.

Range: -1...1,000 bar



### VEGABAR 80 Series



The VEGABAR 80 series pressure transmitters are extremely versatile and offer an instrument setup to fit any application. High pressure, high temperature with the option of both ceramic or metallic measuring cell.

Range: -1...1,000 bar



### Pressure Series 530-440



High quality process pressure transmitters. Yokogawa gauge pressure transmitters use digital DPharp sensor technology to get accurate, reliable readings to you quickly. A ten year guaranteed  $\pm 0.1$  percent stability.

Range: -1...500 bar



### Pressure incl. Seal Mount



Gauge pressure direct mounted seal. The direct mounted diaphragm seal system consists of a gauge pressure transmitter with single direct mount diaphragm seal. Suitable for various kinds of pressure measurement.

Range: 0...70 bar



### Sensor Compact Pressure Series



These pressure transmitters from BD are designed for rough conditions occurring especially in shipbuilding and offshore applications. All gaseous and liquid media, which are compatible with stainless steel 1.4404 (316L) can be measured.

Range: 1...1,000 bar



### Valves and Manifolds



Christian Bollin produces and markets a wide range of valves and manifolds for the process and marine industry.



### Manometers



Manometers are well-suited for all industrial applications, e.g. pumps, compressors, diesel engines and other types of machines with conditions involving pulsating pressure and/or vibrations. The manometers measure pressure in pure gasses and liquids.

Range: 0...1,000 bar



# Pressure

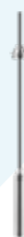
## Hydrostatic Pressure

### VEGAWELL 52



The VEGAWELL 52 is suitable for continuous level measurement of liquids. Typical applications are measurements in water/waste water, deep wells and in the shipbuilding industry.

Range: 0...60 bar



### VEGABAR 86 and 87



Submersible pressure transmitter with a ceramic or metal measuring cell. The VEGABAR 86 or 87 is a submersible pressure transmitter for level measurement in wells, basins and open vessels. Thanks to the flexibility through different cable and tube versions, the sensor can be used in various applications.

Range: 0...25 bar

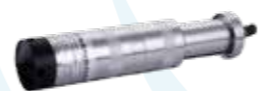


### Submersible Sensor



The separable and submersible stainless steel probe sensor from BD is designed for the continuous level measurement of water and low-viscosity fluids.

Range: 0...25 bar



### The Hydrostatic Probe



This hydrostatic sensor from BD has been developed for measuring level in service and storage tanks and is certified for shipbuilding and offshore applications. The sensor can be used in intrinsically safe areas and with an operating temperature of up to 125 °C for pressure measurement of various fluids under extreme conditions.

Range: 0...20 bar



## Differential Pressure

### 110 Series dP Transmitter



Traditional-mount differential pressure transmitter. It continues to offer high performance and high reliability for any application. With an installed base of over 4,5 million EJA-A transmitters worldwide.

Range: -5,000...5,000 mbar



### 130 Series dP Transmitter



High static pressure dP transmitter. The high performance differential pressure transmitter features single crystal silicon resonant sensor and is suitable to measure liquid, gas, or steam flow as well as liquid level, density and pressure.

Range: -5,000...5,000 mbar



### VEGABAR 82 dP Measurement



Universally applicable pressure transmitter. The ceramic measuring cell is resistant to temperature shocks. Can be combined with any other sensor of VEGABAR Series 80 for electronic differential pressure measurement.

Range: -100...100 bar



### VEGADIF 85 dP Pressure Series



VEGADIF 85 is a universal differential pressure transmitter for measuring in liquids, gases and vapors. Typical application areas are level measurement in pressurized tanks, flow measurement, pressure monitoring over filters, density and interface measurements.

Range: 0...25 bar





# Marine Instrumentation

## Proper Use of the Correct Instrumentation Is Important – a Sensor Is Not Just a Sensor

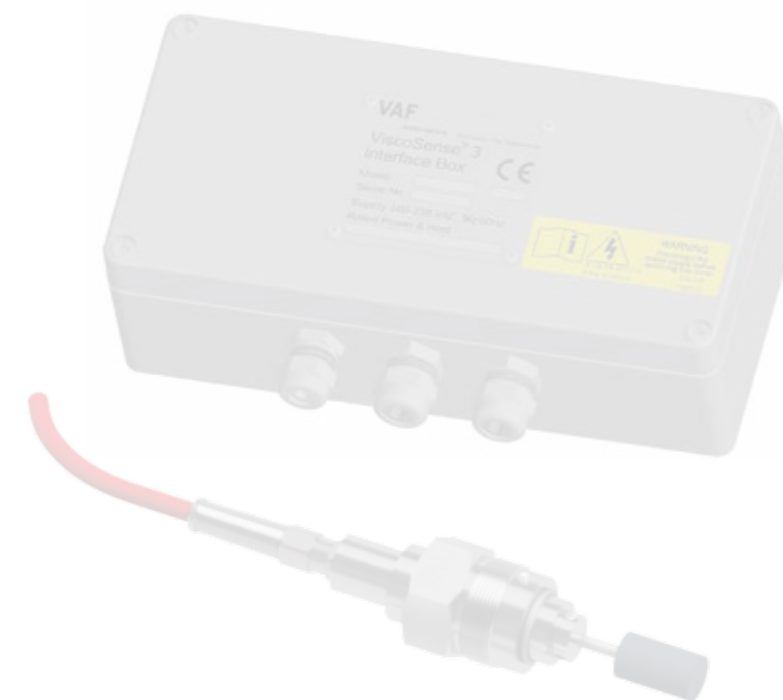
Today's fleet is generally becoming highly sophisticated operations with equally sophisticated equipment on board. And controlling all this sophisticated equipment correctly and preventing breakdowns is crucial to a smooth and cost-effective operation. Choosing the correct instrument for measuring the processes on board is not only a good idea seen from a practical aspect, but investing the time and possibly a little extra money on instrumentation that is ideal for the task, can ultimately save the vessel both cost and unnecessary interference for the crew on board.

Measurements are used all over the modern ship in order to keep equipment running at optimum conditions. Everything from critical installations such as main engines, auxiliary engines, steering and navigation to other installations such as cranes, cargo pumps and wastewater handling can and should be monitored with optimization in mind. Optimization of processes on board a ship can contribute to better earnings and lower emissions – even if the realized optimization is only constituted by fewer unplanned interruptions such as maintenance works and breakdowns.

A malfunctioning viscosity sensor can cause lower exploitation of the fuel due to wrongful combustion; a hydraulic failure on a crane can cause delay in port operations and interrupt the planned schedule; incorrect ballast control can impact vessel stability and trim causing anything from slightly lower performance to accidents and undetected leaks in cargo and fuel tanks can cause dangerous situations or even lead to disaster.

Choosing the correct instrument for a specific task can be challenging, as a myriad of variations of a single instrument often exist. And just going by the most expensive option or for something that has been recommended, is not always the right way, as the process and media in which the instrument should be installed is what determines what measurement principle and setup should be chosen. Degradation is caused very differently based on what the instrument is exposed to, and one instrument suited for one place on board might be unsuitable for another; a different pressure might cause inaccurate reading or mechanical failure and a different media could do the same.

Across the specialists at Insatech, we have the knowledge and experience to find the right instrument for your specific application as well as we can guide you to install it correctly. Making your operation as smooth and efficient as possible is always our goal with our counselling and services, as your success leads to our success!



# Marine Instrumentation

## Viscosity

### Viscosense 3



The proven and widely used viscosimeter from VAF Instruments, is a compact and reliable instrument for measuring and controlling the viscosity of fuel on board ships.

Range: 0 ... 1,000 cSt



### Viscosense 3D



The newest development in the Viscosense series is the Viscosense 3D, which in addition to the viscosity readings also provide a measurement of the fuel density.

Range: 0 ... 1,000 cSt



### VS3 Interface Box



The Viscosense 3 Interface box is a wall mounted electronic unit, that processes the signals to and from the Viscosense sensors. It provides 4...20 mA signals for remote read-out of viscosity and temperature for a flow computer, controller or other system elements.



### Viscosity Controller



The viscosity controller is a microprocessor-based instrument with a proportional and integrating control action. Two types are available (1 channel or 2 channels) to match the specific requirements for different viscosity control systems.



## General

### Silster168



The SILSTER 168 automatically sterilizes the water of the fresh water holding tank with no need for crew interaction and practically no maintenance need. Also bunkered water can be sterilized without manual setting of current and time.



### UltraSonic Analysis



DeltawaveC-WD is the new ultrasonic thickness gauge for precise and easy measurements of thickness of pipes and components. The gauge can be used with most materials like steel, metals and plastics. DeltawaveC-WD offers a broad measuring range and a convenient and easy user interface.



### Cylinder Pressure Analysis



The handheld PMI mk2 MIP (Mean Indicated Pressure) device from TX Marine allows the user to analyze the dynamic cylinder pressure without the need for several sensors installed. By connecting the PMI mk2 instrument to each cylinders indicator valve1, the PMI mk2 records and displays the pressure.



### Fuel Additive Dosing



Cori-Flow Dosing Box for fuel/water additive dosing. The system is based on a fuel flow or water meter combined with an additive dosing unit, consisting of a second flow meter directly controlling a pump, that doses the additive.



# Marine Instrumentation

## Torque & Thrust Meters

### T-Sense



The T-Sense is a torque meter which can be mounted on propeller or drive shafts. A LED and an extremely accurate optical cell can detect small movements of the shaft surface. The measured values are transferred continuously from the rotating shaft to the stator part through a 2,4 GHz wireless data connection. Power transmission from the stator to the rotating shaft is performed by means of induction.



### TT-Sense



The TT-Sense is a torque and thrust meter which can be mounted on the intermediate shafts after the thrust bearing. LEDs and extremely accurate optical sensors can detect these small displacements, in both axial and radial directions. The measured values are transferred continuously from the rotating shaft to the stator part through wireless data connection.



### ShaftTRQ



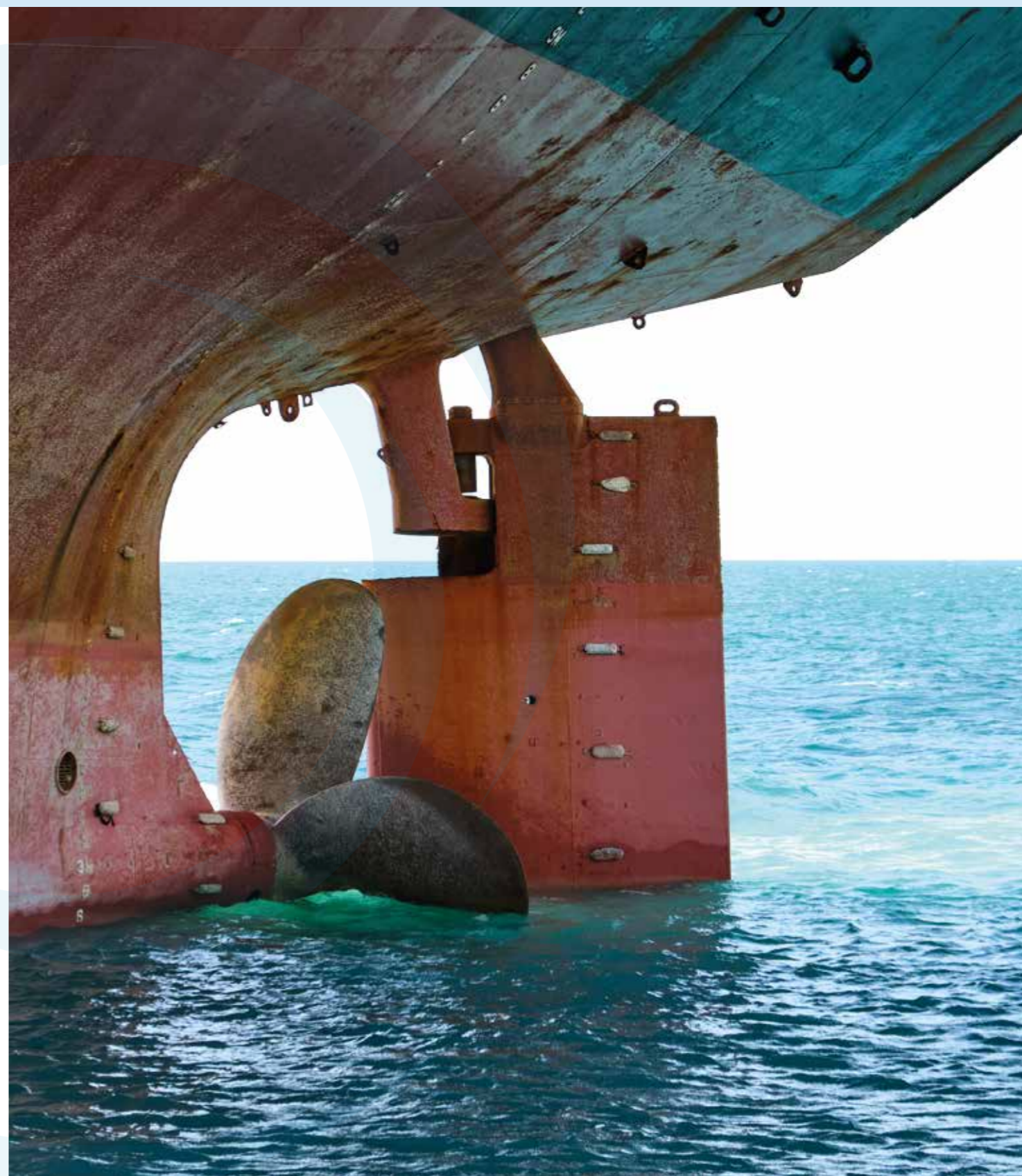
The ShaftTRQ consists of two magnetic sensor belts and a terminal box with a screen. The touch screen display is intuitive to use and can display KPI's such as: Torque [kNm], RPM, shaft power [kW] and live load diagram. Additionally, it can automatically generate reports (daily or sea trial). The design allows for easy installation and is done by strapping the two magnetic belts to the propeller shaft.



### ShaftTRHST



The ShaftTRHST is a torque and thrust meter which can be mounted on or over the intermediate shafts after the thrust bearing. The instrument offer permanent monitoring of the ratio of generated engine torque to propeller thrust. The contactless measuring system measures elastic compression of the ship's shaft as well as elastic torsion through the use of high-resolution HD sensor technology.



# Signal Processing

## Control and Treatment of Signals and Data

Handling of collected signals and the data they represent is generally considered as the “manipulation” of information, and is essential to convert raw data into something useful for the everyday user and operator of the vessel. So data processing basically occurs when data is collected and translated into usable information.

Shipping is a tough competitive market and maintaining a financially viable business has become increasingly difficult. The market is turning to big data to get a competitive edge. But data tends to be fragmented, placed in different systems or exists only in hard copy. This lack of operational overview makes it very difficult for Captains, Operators and Fleet Managers to make the decisions that could give your business an edge.

### From Instrument to On Board Server and on Shore Office

There are many ways to store and transfer data from a system. We offer a long list of solutions which are widely used in the industry. One example is our own DataLink option that transfers data through the vessels internet connection. This solution is automatic once it is set up, and it requires nothing more than the standard hardware package you get with our on board system.

The DataLink consists of two databases, one installed on board the vessel (master database) and one in the on shore office (slave database). The data on board the vessel will automatically synchronize with a database on shore, via the internet, ensuring both vessel and shore has the same set of data.

If the vessel loses the internet connection, data will merely be stored and synchronized once the connection is reestablished. Thus data is always mirrored from the vessel to shore and no data will be lost.



# Signal Processing

## General

### NMEA2MOD



The NMEA2MOD is a converter that can handle the conversion of multiple NMEA 0183 signals to a single Modbus string. With 32 digital, 4 analogue and ethernet input channels the unit can handle a large amount of input signals, and the built in GUI and switch makes it a powerful conversion and collection unit, ideal for collection and homogenization of multiple and unlike signal strings.



Multiple signals in to single out

### PRO-MUX-1



The PRO-MUX-1 is a standalone NMEA 0183 signal multiplexer, listening on and collecting up to 8 NMEA strings to a single output NMEA string. The unit is RS422 & RS232 compatible, and RS485 on the listening side.



8 x NMEA 0183

### 750 Series Controller



The WAGO 750-8202 is a compact and modular PLC, that can be customized and expanded according to needs by use of I/O cards. The modular build and the available array of I/O cards allows the controller to virtually take in any signals and process it in real-time.

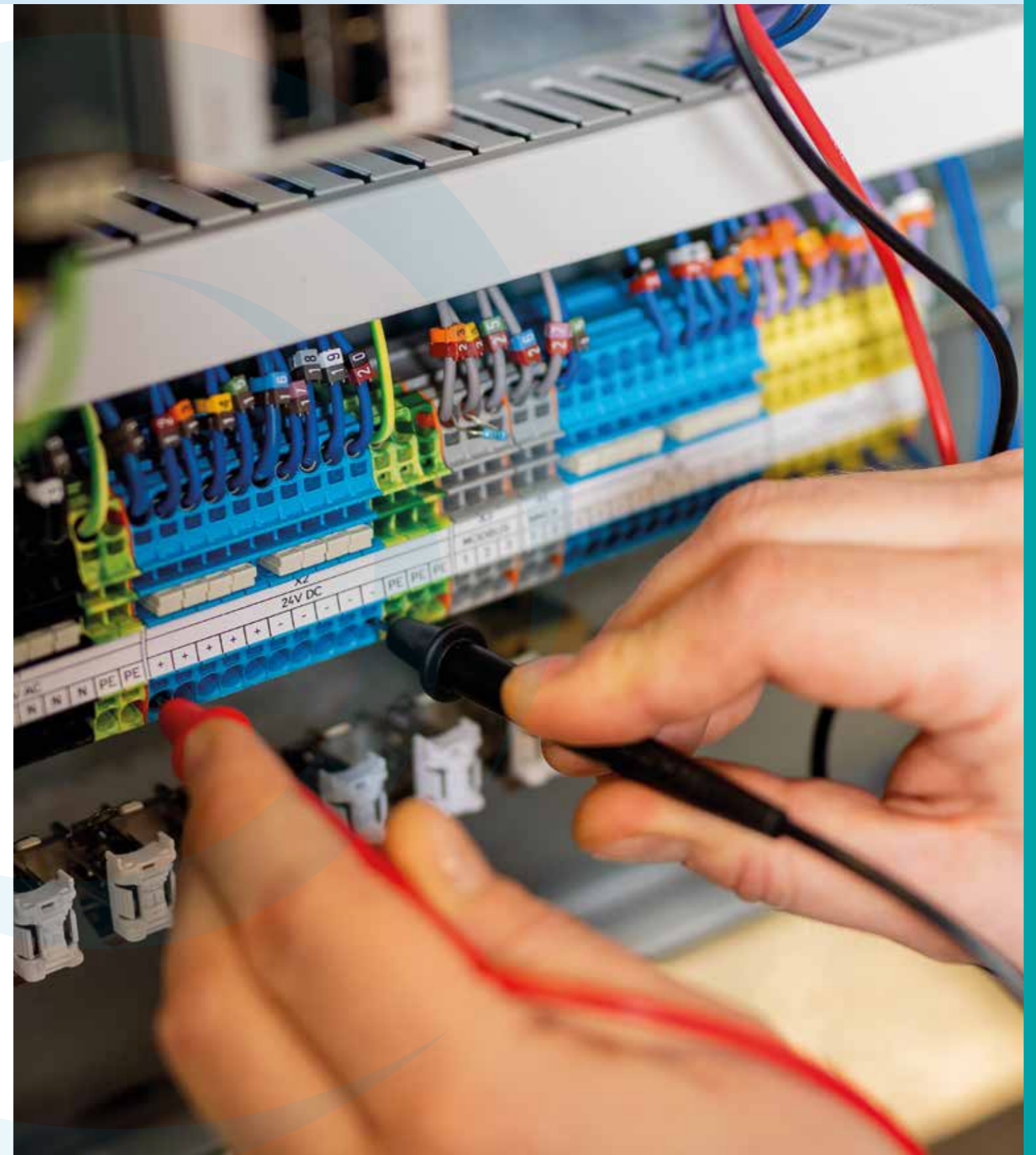


All signal types

### On board Marine Server



The BOX810-838-FL fanless marine box PC is built for a harsh environment and can be used for many different applications such as data logging, online support capabilities and all sorts of software programming in connection to new or existing systems on board.



# Temperature

## The Basics of Temperature Measurement

Temperature is often one of the most measured values on board and in many cases also one of the most critical factors. An inaccurate or wrongfully positioned/designed sensor can have a huge negative effect on efficiency or operation and in worst case scenarios also lead to breakdowns or malfunctions.

Temperature measurements is the process of measuring a current local temperature for immediate or later usage. The most common sensor is the resistance temperature detectors (RTD's) and the thermocouples. RTD which have higher accuracy and repeatability are slowly replacing the thermocouples in applications below 600 °C.

The RTD typically contains either platinum, nickel or copper wires, as these materials have a positive temperature coefficient. This means that a rise in temperature results in an increased resistance. This change of resistance is then used to detect and measure the temperature changes.

Temperature sensors are used for most systems on board, the most common ones would be the engine and the surrounding equipment, tank, storage room, HVAC and stern tube system.

### Guidance to Choose the Correct Temperature Sensor

We have been supplying temperature sensors of almost all types for decades, and we know which type of instrument would be most appropriate for your application, based on your requirements to accuracy, conditions where it should be used and what your end-purpose with the sensor is.

We will gladly assist you in choosing the correct instrument with the desired characteristics and features, and we aim to provide a satisfactory solution to your needs the first time. Regardless if your focus on accuracy, special ambient conditions, ease of installation or price. As we have all supporting functions in-house, we can even help you with installation, maintenance, repair or up-stream signal integration.



# Temperature

## Sensors Type-A and B



For measuring temperatures in closed pipelines and containers with gaseous or liquid media, e.g. air, steam, gas, water or oil.

Field of application up to 1,150 °C, max 50 bar and media velocities of up to 25 m/sec.

**Range: 0...1150 °C**



## Multi-spot Sensor Type RST



The RT-RST-TS is a multi-spot temperature sensor used for measuring the average temperature, primarily in stationary tank systems, with requirements to the tolerance and response time of the temperature measurement.

**Range: -50...250 °C**



## Stern Tube Sensor



Stern tube bearing sensor with mechanical connection via two adjustable couplings.

Highly robust and flexible/bendable with quick reaction time.

**Range: 0...600 °C**



## Sensor Type RR1



For measuring indoor and outdoor air temperatures, HVAC, engine room, tanks/containers etc.

PT100 sensor with IP67 silumin-box that resists shocks and vibrations.

**Range: -40...80 °C**



# Valves

## Basic – but Essential to Operations

Valves are used for many purposes and are available in just as many varieties. The basic function of a valve is to create a variable barrier between the two sides of the valve. Valves are most commonly used for three purposes; open/close, control or safety. Depending on what the valves' intended use is, the characteristics can be very different in regards to shape, size and materials.

As valves are one of the most common items found on board most ships, they are crucial for the operation, functionality and safety of the vessel. It is therefore, critical to have them functioning and well maintained at all times. If the wrong valve malfunctions at the wrong time, it could lead to delays, additional cost and in the extreme case even disaster. Apart from the valves themselves, all the directly related components are just as vital, and whether it is an actuator, a positioner or a switch, the failure of one of these 'sub components' could have the same affect as a failing valve.

### How Can We Help?

We offer some of the most commonly used quality manufacturers of valves and supporting components in our product portfolio, and we support all of them with spares and replacements. In addition, we can be of assistance with replacement valves of alternative make and model, as well as consulting on valve solutions for new/optimized systems. We have a dedicated valve team in-house, so regardless if you are looking for spares or a complete valve we can help you.

In the following section, we cover most of the valve needs you might have. Should you have a need for a specific valve type or model that is not listed, you are more than welcome to contact us, and we will do our best to help you.





# Valves

## 21000 Series Control Valves



The Masoneilan 21000 series control valves from Masoneilan are very efficient. Optimal performance for a wide range of automatic applications. ¾" to 8" flanged, welding ends or threaded.



## High Performance Butterfly Valves



Double eccentric butterfly valves. DN 50 - 300 for flanges PN 10-16-25, A150 (DN 300 PN 10-16, A150).

Working pressure max 25 bar. Wafer and lug execution.



## CamFlex II Control Valves



The CamFlex II control valve from Masoneilan, consists of valve, actuator and positions, built together in a compact unit. The design of the plug means that it does not have contact with the seat before it is in position for full closing.



## Butterfly Valves



Gibson valves KI series with manual operated handle. DN 40 - 800 for flange PN 10 - 16, A150.

Working pressure max 16 bar. Can also be used for vacuum.



## UBAN Control Valves



UBAN control valve from Carraro is a spring-loaded, direct-controlling, pressure-reducing control valve. Can be supplied with softening and metallic seat. Wide selection of actuators to achieve the desired control range.



## Pneumatic Actuators



Double and single acting actuators for valves with 90° rotation from Gibson. The actuators are lifetime lubricated.



## MAXOMATIC Control Valves



This valve type MAXOMATIC is characterized by the fact that there are no mechanical moving parts or sliding guides, thereby ensuring an extended service life and a unique reliability.



## Hydraulic Actuators



Quarter-turn electric actuator is especially suitable for ball valves and butterfly valves. Various accessories, such as Proportional Control Unit (CPU) or LCU (Local Control Unit) can be purchased.



# Valves

## CS 35 Safety Valves



The proportional safety valve type CS 35 gradually opens from the set pressure to full lift at 10-20 % overpressure and is recommended for viscous liquids such as oil.



## VariFlow Conditioning Valves



VariFlow series from Carraro is a multi-jet desuperheater system, designed to combine efficient water atomization with high regulating power.



## CSV 55 Safety Valves



Safety valves steam and gases. Type CSV 55 is made of cast iron and with open spring housing. Type CSV 88 is made of cast steel, also with open spring housing.



## VariVent Conditioning Valves



VariVent desuperheater for control and reduction of steam temperature. The venturi-shaped nozzles efficiently atomize the water and are activated by a control valve mounted before the desuperheater.



## Disc Type Check Valves



Standard check valve with a max pressure of 52 bar.  
Can be used in sizes DN15-DN100.



## Masoneilan Positioners



Masoneilan's digital positioner is a high-end lightweight, simple and precise positioner with built-in diagnosis of valve health.



## Swing Type Check Valves



These check valves can be offered in small sizes and low weights.  
Sizes from DN40-DN500.



## Masoneilan Air regulators



Compact air filter regulator with high performance. Used mainly to ensure a stable supply of compressed air to e.g. transducers and positioning on control and control valves.



# Valves

## Meson Ball Valve



We can offer a wide range of full bore flanged ball valves from sizes 8 - 2,000 mm. The valve can be delivered with inspection certificate or class approval if needed.



## Meson Gate Valve



We can offer a wide range of Gate valves from sizes 15 - 500 mm. A gate valve is a multiturn valve meaning that the operation of the valve is done by means of a threaded stem.



## Valtor Ball Valve



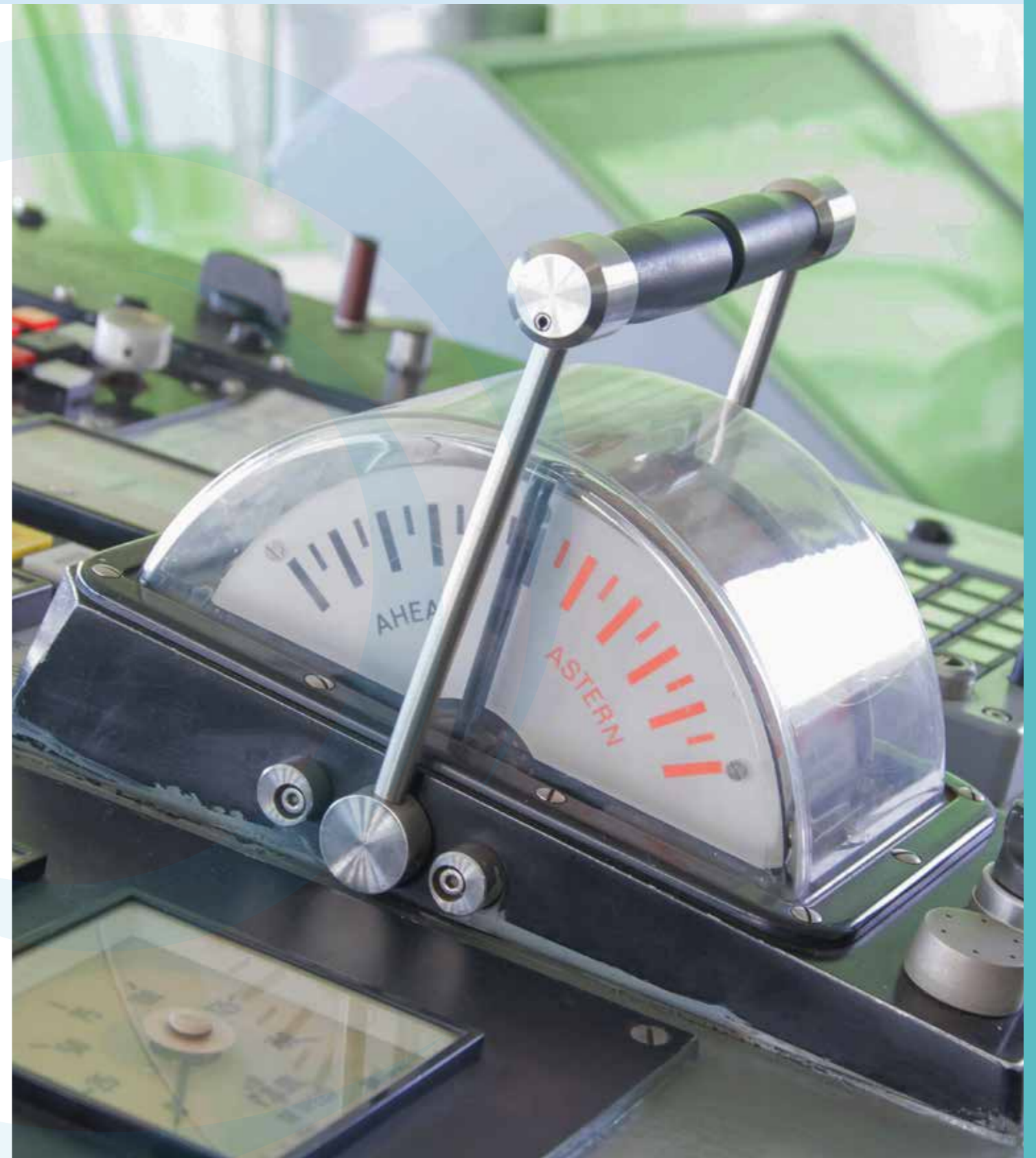
We can offer a wide range of full bore flanged ball valves from sizes 15 - 300 mm. The valve can be delivered with inspection certificate or class approval if needed.



## Valtor Filter / Strainer



We can offer a wide range of filters / strainers from sizes 8 - 600 mm. Everything from basket strainer to simple Y-strainer filters. The filters / strainers can be supplied in required pressure ranges and process connections.



# Water Testing

## Water is Essential to Life – and to the Shipping Industry

The operation of a vessel is deeply dependent on water – and not only for buoyancy! Water has many uses on board, from drinking water for the crew, to cooking, washing, cleaning, cooling and heating. Using water on board is in other words essential and necessary. But with use comes contamination and waste, as the water needs to be cleaned, exchanged or disposed after use. This fact has resulted in globally ratified regulations on how water should be treated, either before disposal or before, consumption or use in the galley. Depending on the use of the water, different limits for content of particulates, chemicals and biological matter are defined, and often it is also a regulatory requirement that the used water is monitored for these contaminants. Depending on the regulations, the port state and water use, a situation with non-compliance could lead to fines or worse; the risk of health and life.

### A Test Kit for Every Need

More or less regardless how the water is used and under which regulations it is governed, we can provide a means to test for compliance. From the more advanced state of the art and automated analyzing units to cost-friendly easy-to-use test kits, we are able to assist.

As environment, health and safety are continuously evolving subjects, where new research leads to new requirements and restrictions, we are also continuously expanding our product portfolio within the water testing segment and adding new testing equipment as it becomes relevant. By choosing reliable and proven testing equipment, we can be your one-stop supplier of all water-related testing equipment, and in case there is something that you wish to test that is not in our portfolio, we are happy to help and find exactly what you are looking for.

### More Than Just Enough – Our Kits Have Got You Covered

With more than 70% of the earth's surface covered with water, it is a resource we need to protect. By implementing water testing equipment supplied by us you can be certain that you not only get what you need and must have, but also that you get products that work and provide value to your operation. In addition, to avoid the potential fines.



# Water Testing

## Portable Testing Units

### Fast Ballast



Portable ballast water analyzer that measures the viable cells directly. Providing info on both count and sizes of viable cells in the analyzed sample in order to ensure compliance with D-2. Initial 'fast' test in less than 2 minutes and full test for high confidence results in less than 10 minutes.

**Range: 0-4,000 cells/ml**



### Ballast Water Test Kit



The Ballast Water Test Kit is a cost effective pass/fail test kit, that provides the crew on board with the possibility to monitor efficiency and functionality of the vessel's Ballast Water Treatment System, all according to regulations and requirements (D-1 & D-2), incl. US Coast Guard. Content can be modified according to your needs.

**Range: Multiple**



### Sewage Water Test Kit



With the cost effective Sewage Water Test Kit, the crew on board can perform pass/fail test of the vessel's sewage effluent. All tests are easy to perform and can be executed by the crew. Thereby, it is easily documented that all discharges are in compliance with relevant regulations. Content can be modified according to your needs.

**Range: Multiple**



### Potable Water Test Kit



As the crew's health is a key factor to operate a vessel, it is essential that you can test the potable water for possible contamination efficiently and reliably. The cost effective Potable Water Test Kit is an easy to use test kit containing all necessary tests to document and monitor bacterial and chemical contents of the water used on board by crew. Content can be modified according to your needs.



### Boiler Water Test Kit



The most common issues with boilers and heating systems are scale formation and corrosion, resulting in reduced efficiency, safety and system life. It is therefore necessary to develop a maintenance and treatment regime to mitigate these effects, and the Boiler Water Test Kit can aid in this matter with simple and easy to perform tests of boiler water.

**Range: Multiple**



### Cooling Water Test Kit



Cooling water systems require consideration of scale formation, corrosion and microbiological contamination, affecting heat exchangers. Corrosion control is usually achieved through chemical treatment based on a number of different parameters including nitrite, molybdate and phosphate. Monitoring of these factors is essential to prevent overdosing.

**Range: Multiple**



Watch all our water test kit, how-to guides here





Insatech has provided instrumentation, calibration and service to the industry since 1989

# Insatech Solutions

## Do You Need a Solution?

Insatech Marine was founded on the basis of a need for solutions; solutions our customers asked us to make, because they did not exist or the ones that existed did not quite meet the standards required or did not have the features that were needed.

Since the first prototypes of our Bunker Management Systems and Fuel Blending Units were made based on high accuracy coriolis mass flow meters, many more systems from Insatech has seen the light of day. Still today many of our solutions use the coriolis mass flow meters as main or significant components, but this is not the only common denominator they have. We still base all of our products on actual measurements and existing need in the maritime industry.

The collection of data in signals and the following distribution of this data has become a big part of Insatech. Not only as a part of our own system, but also as a product and service in itself. This has provided us with a rather extensive experience with signals and electrical communications on board, and this experience is being put into all of our systems.

### Our Systems Serve a Purpose

The 'urge' to help our customers and solve their measurement related challenges, has resulted in a range of modular and highly customizable solutions. Our goal has always been to listen and understand your challenges and then provide solutions that will help solve them. For us, each delivery is considered a project, since no two systems are identical. We adapt not only to the individual customer, but to the individual vessel. This is to make sure that our systems are based on one thing and one thing only; providing our customers with a tool that works for you. We want our customers to change their way of operating the vessel, but not in order to use our systems; we aim to have our systems provide the operators with knowledge and information that will make them want to optimize their operation, in order to do better because they can see they can!

### We Like to Think That We Are Very Cooperative

Even though we are also a supplier of instrumentation, we are aware that it is not always financially or practically possible to exchange either rather new or heavily customized instrumentation to our preferred makers and models. Therefore, we are very accustomed to working with all sorts of different brands and suppliers. To this date, we have not encountered any instrument that we cannot communicate with. We like to think that we work with a 'double open ended' principle, where we can adapt our system (and instruments) to work with other makers equipment, both upstream and downstream.



# Bunker Management System



### Main Components:

- Touch Screen Operator HMI
- Yokogawa ROTAmass Coriolis Mass Flow Meter
- Yokogawa Pressure Transmitter (2 pcs)
- Kjaerulf Pedersen Temperature Transmitter
- Ghibson Butterfly Valve
- Control Cabinet

### Do Not Pay for More Than You Get!

As fuel consumption is by far the single largest OPEX post, it is not only obviously beneficial to know how you use the fuel on board, it is also a clear advantage to make sure that you do not pay for more than you get. And this is where our Bunker Management System comes in handy.

Designed as a pro-active tool, our Bunker Management System, will continuously monitor all relevant parameters, such as mass flow, density and pressure. Should any of the parameters that are monitored for any given reason off-set from the characteristics agreed upon before the delivery operation has begun, the system will alert the operator hereof. Depending on preferences, the system can be set up to take further steps if no corrective action or acknowledgement is done, such as sound an alarm, send a message to a predefined recipient or something else completely.

In this way, the system helps you control the bunker delivery and keep it within the agreed upon specifications, which in the end means less disputes and legal claims.

The system relies on a series of instruments and our in-house developed software, that in combination has proven itself a very accurate and trustworthy tool. Since the functionality, the controls and the operator's interface are developed and produced at our own facilities, customization is one of the advantages to our system.

Almost regardless of the circumstances and requirements from users, we can find a way to fit the system on board.

As implemented instruments are reduced greatly in value if the data they generate is not available, we make sure that you can get access to it. We have more than 30 years of experience with instrumentation, and we know how useful the insights can be, and therefore one of our main philosophies is, that the data generated by the instrument purchased by you, also belongs to you.





# Blending System

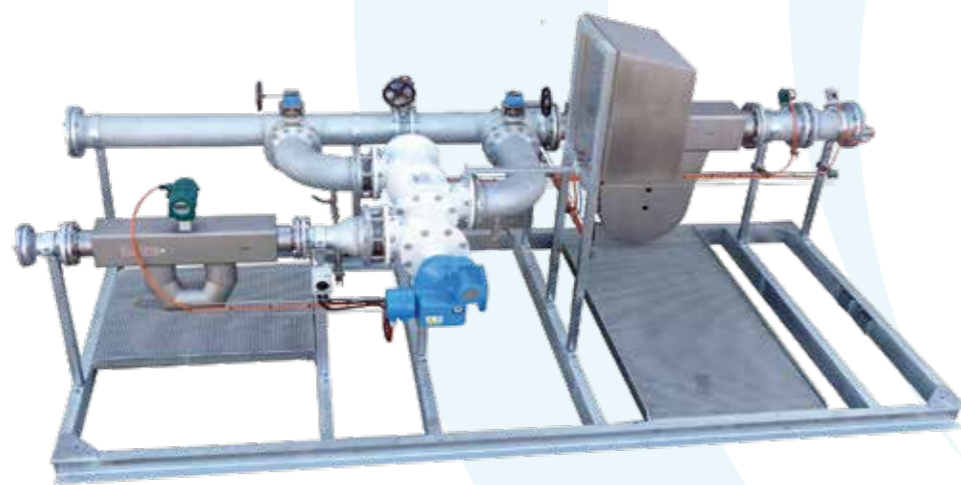
## Product Characteristics Compliance – On Demand!

The development in regulations on fuel for ships has resulted in a substantial increase in the available types of fuel, and subsequently a more diverse matrix of requirements regarding fuel characteristics.

Geographical restrictions, availability and price are some of the most common drivers when it comes to determining which fuel type to take on board vessels, and depending on vessel itinerary, previous deliveries and environmental concerns the availability of what is needed might vary greatly. For some operators the ability to have the supplier customize a pending delivery to current requirements can be of great value, and this is the capability our Blending System provides.

Our Blending System can be used to blend any type of fuel and the limitations are few. Typically, blends are made of a distillate and a residual fuel that are blended to reach a setpoint value in viscosity or two residual types with different sulfur concentrations, where the sulfur content defines the blend ratio. The blending process can either be completely controlled by actual measured parameters, or strictly by a fixed blend ratio – it is up to you.

All operations are to some extent unique, and for every operation our system partakes in our knowledge expands. This we prefer is a part of your benefits, and as such we offer to continuously improve and assist with your blending system. We believe we are all better off, if our delivery does not end with the shipment and installation of hardware.



We know that reliability is crucial, which is why we only use high quality instruments and components for which we have many years of experiences with, both as a supplier and as a system and service provider. In addition to this, the parts that are most exposed to stress and wear, are standard components that could easily be momentarily replaced by alternatives in the unlikely case that we are unable to provide spares or replacements within a short timeframe.

## Main Components:

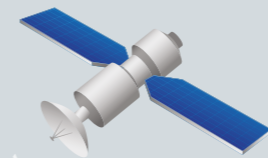
- Touch Screen Operator HMI
- Yokogawa ROTAmass Coriolis Mass Flow Meter (0-3 pcs)
- VAF Instruments Viscosense 3 viscosity meter
- Rigaku NEX XT inline continuous sulfur analyzer (optional)
- Yokogawa Pressure Transmitter (0-6 pcs)
- Kjaerulf Pedersen Temperature Transmitter
- Ghibson Butterfly Valve (2 pcs)
- Insatech Short Pipe Static Mixer – optional
- Control cabinet



## On board



## DataLink



## On shore



### Fuel and Performance Monitoring

Real-time Decision Support



#### On board server

with database containing vessel data, model etc.



Bulk



Tanker



Cruise

...and many more.



#### On shore server or cloud storage

with data from entire fleet connected to the system.

### Fuel Consumption System

The system presents past, present and accumulated consumption based on flow meter measurements for which error, alarm and warning logs are included to ensure the system integrity and reliability. The system also provides you with immediate cause and effect feedback.

### Performance Monitoring System

The system utilizes a variety of sensor inputs to help you make real-time decisions and improve your vessels performance on speed, consumption, power, steam, charter party and behavior, through customized KPI calculation and visualization.

### On board server

Vessel specific server that handles all data exchange between ship and shore.

### DataLink

Linking vessels to shore operations, ensuring both sides have access to the same data. Intelligent connection monitoring and minimized data transfers with zero loss.

### On shore server

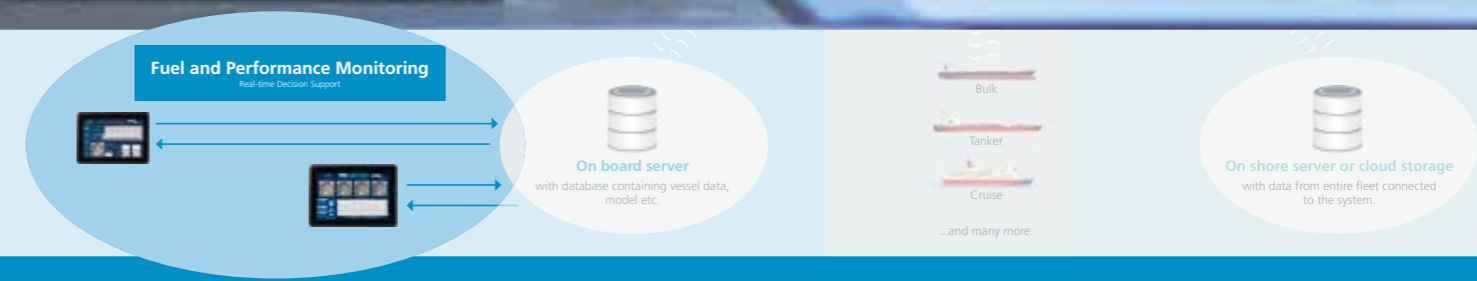
Customer specific server or cloud storage that handles all data exchange between the fleet and Insatech.

# Fuel Consumption System



- Advantages:**
- Optimize your operation by continuously collecting and recording vessel data
  - Get real-time decision making
  - Change behavior
  - Reduce your fuel consumption and running costs (OPEX)
  - Experience shows cost savings around 3-5%
  - Reduce carbon footprint
  - Increase competition

The Insatech **Fuel Consumption System** is the first step in knowing what your performance is right now.



The Fuel Consumption System (FCoS) consists of several sturdy, reliable and accurate Coriolis mass flow meters and an operator panel that gives you real-time information about consumption and can alert you about possible issues with the flow measurement, such as leakages.

**Increase Crew Awareness and Save Fuel**

The real-time fuel consumption measurement can help increase crew awareness, for example, if you place the operator panel on the bridge, it will give the duty Officer immediate feedback about the fuel consumption when he makes changes to the vessel's speed and trim or even changes in weather conditions. This will continuously increase the crew's awareness about how operational changes affects the fuel consumption and can help them save fuel.

**We Recommend Coriolis Mass Flow Meters**

The Fuel Consumption System works by installing one or several flow meters, depending on how granular you want your measurement. The system can utilise your current flow meters, but we usually recommend installing Coriolis mass flow meters, at least on main consumers, because it gives you certain advantages.

The two most obvious advantages are the accuracy and that the flow meters measure mass directly. Volume based flow meters need additional temperature measurements and conversion tables to calculate mass, which increases the uncertainty of the measurement.

Another advantage of the Coriolis mass flow meter is that it can give you additional information about its operational status such as air bubbles in the fuel, when it was last zero-point adjusted and unexpected flow, just to name a few.

**Accuracy Is Important**

The accuracy is important, especially if you measure the fuel consumption as a partial flow, of a larger circulated flow, because this greatly amplifies the inaccuracy of the flow meter. The circulated flow can be as much as 50 times greater than the consumption, amplifying the inaccuracy 50-fold. If the circulated flow is 5,000 kg/h and the consumption is 100 kg/h then an accuracy of 1% corresponds to  $\pm 50$  kg/h. Since the circulated flow is measured as the difference between inlet and outlet, you need two flow meters, and if you are lucky,

they cancel each other out, but in the worst case, they amplify each other resulting in an inaccuracy of  $\pm 100$  kg/h on a consumption of 100 kg/h.

**Detect Leakages**

Depending on your setup, you can detect leakages in your system by cross referencing flow from several flow meters in your circulation loop, for example a leaky bypass or pressure relief valve.

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# Fuel Consumption System



### Main Engine Consumption

The display of the main engine overview provides a total view of the main engine's fuel consumption. A consumption trend line shows an accumulation of the most recent data. The setup is dependent on the number of installed meters.



### Service Parameters

The service parameters displays raw data for each flow meter related to consumers. It shows the main menu data and provides a manual totalizer. From here the alarm status screens are set up. Furthermore the green light shows that the communication between flow meter and system is intact.



### Generator Engine Consumption

From the Aux engine screen, you get an overview of all your auxiliary engines' consumption. As with the main engine overview, this also provides an easy to read display of consumptions, trends and engine loads.

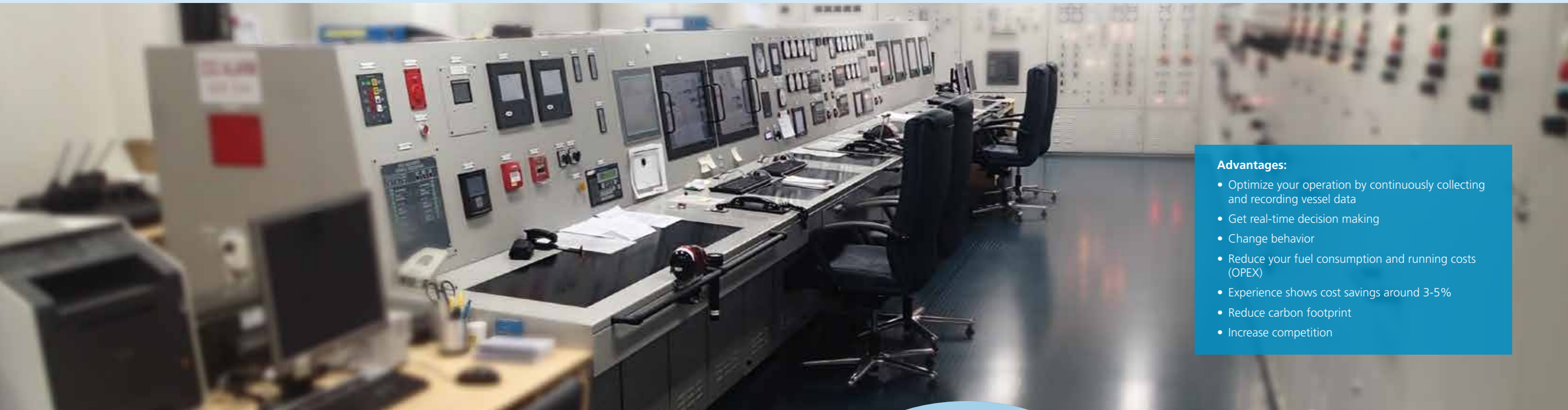


### Detailed View

If you want a more detailed view, simply select an engine from the overview screen. From here it is possible to get the actual and total consumption of the given engine, as well as values for engine inlet and outlet such as mass flow, volume, density, temperature and total mass.

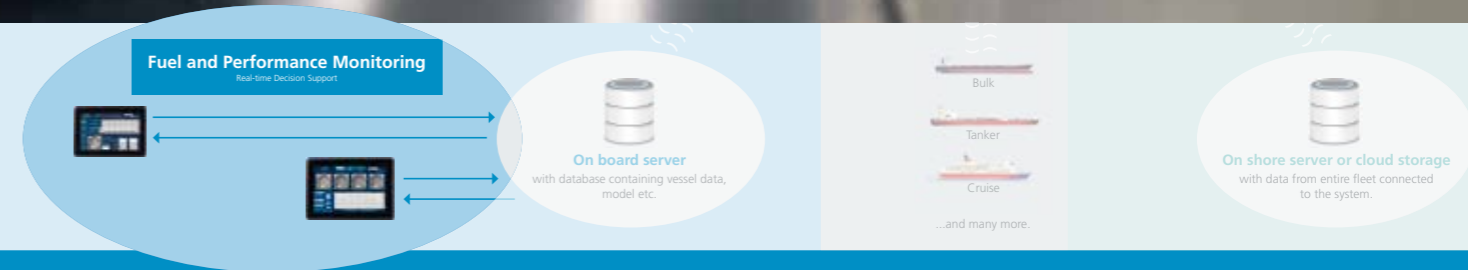


# Performance Monitoring System



- Advantages:**
- Optimize your operation by continuously collecting and recording vessel data
  - Get real-time decision making
  - Change behavior
  - Reduce your fuel consumption and running costs (OPEX)
  - Experience shows cost savings around 3-5%
  - Reduce carbon footprint
  - Increase competition

The Insatech **Performance Monitoring System** gives you the flexibility to collect data from any source and makes it possible to implement ship wide performance improvements.



The second step of getting to know your performance is the Performance Management System (PMoS), which builds upon the FCoS platform and gives you the flexibility to collect data from any sensor on board. PMoS includes an expanded operator panel, that allows you to specify and calculate any Key Performance Indicator (KPI) imaginable. If you are missing data points for your KPI's we can help you collect that data by installing new sensors.

The KPI's you create, can help your crew improve the operation of the ship and help you save money by optimizing performance. The system contains a lot of valuable KPI's, and we are always ready to help you create new KPI's that support your business.

**Compare Charter Party Terms with Actual Performance**  
By using the PMoS you can compare contractual charter party speed, consumption and weather clause with the current or

overall voyage performance. This can help your crew keep within the charter party conditions. You can also see the accumulated consumption in- and outside the weather clause. When your vessels perform better your charterers can save money on consumption and you can earn money by increasing charter rates.

**Increase the Flexibility of Your Current Data**  
The system can also give you more flexibility than your current systems. For example, your engine control system might measure exhaust gas temperatures across cylinders or banks of cylinders to ensure, they do not deviate too far from the average. But it might not be possible to monitor any other KPI's than the ones that are available. With the PMoS you can gather the sensor data and use it to make your own KPI's or set your own warning and alarm thresholds without the need to involve any third party. This gives you the power to create even better insight into your performance.

**Shut It Down and Save Money**  
PMoS can also help create awareness about how the base load of the vessel impacts expenses. This can be done by showing how much it costs to run machinery and how much can be saved by shutting it down. This can be done calculating the price of running the machinery using the current consumption and the price of the fuel, which will make it easier for the crew to see, how running the machinery affects the costs.

**Collect and Validate**  
The system is built by collecting data from available instrumentation, manual logs, meta and third-party data. The increase of signals makes it possible to cross reference data to identify faulty and inaccurate sensors. This is done to validate the dataset and make sure the KPI's are correct before you start drawing conclusions from it.

- Typically, data comes from:
- Shaft power meter
  - kWh counters on production and consumption
  - GNSS signals
  - Speed log
  - Echo sounder
  - Anemometer
  - Gyro and gyro compass

Data can also include motion sensors and draught sensors, as well as any signal that goes into the engine control system, including alarm logs etc.

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# Performance Monitoring System



### Power Production

Discover how much time you spend running generator engines parallel on low load, costing you fuel and wasting running hours that impacts maintenance costs. Set up KPI's for low load parallel running, and configure the thresholds for target, minimum and maximum load for each vessel individually, sister vessel groups or fleet wide. See your historical performance and compare it to your current.



### Trim and List

Monitor your dynamic trim in real-time and compare it with your trim table to highlight any savings potential from changing your trim. Enable the crew to detect even minor angles of list, even when the vessel is rolling, to allow them to right the vessel and save fuel. Get an objective insight into how much the bow is pitching and how much the vessel is actually rolling, with indicators for maximum and average angels as well as angular velocity.



### Boilers

Optimize your boiler operation by ensuring that the boiler is not starting and stopping unnecessarily often. Adjust steam pressure set points to reflect your current operational condition. Set up triggers to alert you to undesired running patterns.



### Propulsion

Under sea passage conditions, your combinator curve may not offer the optimum pitch settings at the given speed. Improve your propeller performance by optimizing your propeller pitch. Benefit from constant power speed instruction, by adjusting your engine speed to changing external conditions to run at constant power. Ensure that you are running on or below your nominal propeller load index, to avoid heavy run on the propeller, stressing the engine and lowering performance.



# Projects

## The Hassle of New Equipment

It can be quite a challenge to find the type of equipment you need for a specific task. In addition, it can be even more challenging to find the exact model of an instrument, as there is often so many makers that all provide benefits and special features. And even so, once you have settled for an instrument, it can be demanding to make it work as intended and therefore also with the desired results. Particularly if your requirements are a bit out of the ordinary or is something that you might not have too much experience with, the result of the process can be countless hours spent on research and comparison of possible supplier's suggestions.

### Optimization of the Implementation Process

Gathering several aspects of a new measurement installation process can be a big advantage. Letting someone with experience with the measurements you wish to make advise you, sets your own resources free, as you have a lot less research to do. Furthermore, having an advisor and supplier with all necessary capabilities inhouse, from sourcing to prototyping, installation and commissioning will enhance the chances of a successful implementation, with a much lower total process time. This could in the end save your operation a lot of money. And all the while, it will allow you to do what you should be doing; operating your vessel.

### Our History and Experience Is Your Advantage

We house a lot of different products, almost all of them for some sort of measurement, analysis or process control, and for each of these products we have a dedicated expert that has extensive knowledge and a close connection to the manufacturer. This is the core of Insatech as a whole; instrumentation. Not long after the birth of the company, service and thereby hands-on practical experience with the individual instruments was added as a main business of the company. The third step in the natural evolution of Insatech was data collection and distribution from all sources. At this point, Insatech was more than just an instrumentation provider, but had become a full-on counselling and solution supplier, aiding many of our clients with custom designed setups for specific purposes. Our inhouse Workshop works close together with our Sales, Advisory and Project Departments, enabling us to make unique solutions, containing all you need to get the best out of your instrumentation. Our inhouse Programmers and Developers, can customize user interfaces and signal control, making sure that the functionality and operation of your equipment is exactly like you expect and according to requirements and specifications.



# Projects



The Project Manager and our Project Department will plan everything from purchase of parts, components and consumables, to plan and allocate the necessary resources, e.g. Technicians, Engineers, Programmers and Supervisors and they will align their tasks with your requirements and schedule.

Implementing new technology and systems often prove themselves more complex and demanding than what would be the immediate thoughts. The facts that new equipment often needs to be placed in tight spaces in hard to get to locations combined with the requirement of as little down-time as possible, in itself demands for thorough planning. Add to this, that the installation site is on the move most of the time, as it is a ship, and a rather simple task can become rather hard to overcome. To make matters worse, you risk encountering further challenges as manufacturer, suppliers, logistics, technicians and crew on board has to plan and cooperate.

### One Stop Shop

Choosing to work with a 'one stop shop', where all necessary tasks are handled from one central place, ensures a streamlined workflow, lower risk of misunderstandings, eliminates large parts of the overall logistical puzzle and gives you one place to deal with as a client. When not only the knowhow of the instrumentation and its installation but also all aspects of an installation and insight into how the newly installed equipment should be used and for what is gathered at the same place, it is your guarantee that not only will the experience be a lot smoother and simpler for you, but you also lessen the

chances of wasted time, reduce waiting time and enhance the efficiency of the entire process. All in all, it should not only save you time and money, but also a lot of headaches, phone calls and e-mails.

### Project Management

When we get involved in your project, regardless of its size, a Project Manager will be appointed. This Project Manager will be given all the information from the Sales Department, and all functionalities and expectations are explained and handed over. From here on, the Project Manager will be your point of contact, for all purposes. The Project Manager and our Project Department will plan everything from purchase of parts, components and consumables, they will plan and allocate the necessary resources, e.g. Technicians, Engineers, Programmers and Supervisors and they will align their tasks with your requirements and schedule. The entire process will be planned, from start to end – and even after the final delivery; support and assistance for installed systems is naturally a part of our scope.





# Turn-key Solutions

Turn-key system implementation is one of the main reasons Insatech Marine is experiencing the current success. By allowing Insatech Marine to manage the installation of your new system and equipment, you put yourself in the fast track lane and minimize the time from purchase to implementation.

Our job begins even before you have decided the shape and size of your system, as we will do our best to identify your needs and requirements and put together a solution that fulfills just that.

By getting involved in your project as early as possible, it will enable us to tailor the exact setup defined by the requested functionality, without any unnecessary features or components.

By being involved in the design-phase, we can ensure that the final product can in fact be installed with a minimum of hassle and on board modifications. We usually start with an on board survey where we will familiarize ourselves with your ship and then design the setup according to the actual conditions. By making use of prefabricated pipe sections we can minimize pipework, and by clearly distributing different tasks between your crew, our Technicians and our Supervising Engineers, we will put together the most efficient and appropriate installation plan.

We can also fit the installation according to your schedule and possibilities. The optimal would probably be considered doing all installations during a planned

dry-dock stay, but as those are not always scheduled within a foreseeable future, we can accommodate other solutions as well.

A sail-along is perfect for more complex installations where it is possible to stay for a longer period of time on board the vessel.

When we are installing several systems on vessels operating in or passing through the same geographical area, we can set up a hub-installation, where we place our Technicians and Supervisors in a strategically advantageous port and then embark the vessel and do our installations during port operations and disembark before the vessel takes off again. If the installations are larger and the individual vessel schedules allow it, we can do the installation over more than one port stays.



Our commitment to a project does not end with the commissioning. We are dedicated towards our systems and our work, and we are always available for support.

If you are happy with our work – we are happy. And we prefer keeping it like that throughout the lifetime of our equipment and installations.

## We are with you all the way



# Service & Installation

## The Supplier Jig-saw

Operating a vessel is a complex process, and with a vast amount of equipment follows a great deal of maintenance. Even though we aim to supply equipment that requires a minimum of maintenance – or at least can be easily maintained by the crew on board, some equipment will from time to time require that external service is called upon. Either on-premises service or service by sending the equipment to the supplier or a designated service provider.

Keeping track of which service provider is required for which equipment can be a hassle in itself, since different manufacturers and suppliers has to be contacted and consulted when a piece of equipment needs further attention than what the manual can guide the crew to perform. Keeping your bits and pieces in good working conditions can be a both time consuming and a costly affair.

### One Contact Service

As your one-stop-shop we offer not only to provide the instrumentation and systems required to operate your vessel in the best possible way, we also offer to consult and support all supplied parts. Remote support by phone or e-mail is typically our first step in fault finding and trouble shooting, and in the rare cases where this is not enough, we also have the resources to perform service, maintenance and repairs on-site.

Our Technicians travel world wide to make sure your equipment is performing as intended and expected, but we also have global partners we can use in case of urgent matters. In the event of more planned maintenance and repairs of non-critical components, we have the facilities to do what needs to be done by sending the instruments to us.

Even in case that it is inevitable to have the equipment sent to the manufacturer, this is something that we will facilitate and handle, without the need of you communicating with them. As we know both the manufacturers and their products very well, we can often carry out the necessary clarifications with them easier and more efficiently.

### We Exist Only Because of You

Eliminating your need for keeping track of each instrument's manufacturer and who to contact in case of need of support, can save you a lot of time and trouble and let you focus on the operation of the vessel. By assuring that in case of challenges with a specific instrument or part, you will only have to contact one service provider, we can add value to the wide portfolio of instruments that we are involved with. In many cases we can even assist and advise on items that is not a part of our normal selection of products, as our experience allows us to do so and because our primary focus is to provide exactly what you expect: Service and assistance!



# On Board Service

### Should We Check That For You?

As a supplier, installer and service partner of a broad range of instruments and suppliers, we have gathered an equally broad range of experience with the instruments.

This means that we know how they work, how they should work and what to do when they do not. As your preferred partner in instrumentation, we can naturally offer to service and check your instrumentation and equipment on board. And while we are on board doing something planned, we are more than open to do other stuff too, so you get the most efficient check-up of your sensors and instruments.

### Is Everything OK?

If you prefer not to own testing equipment otherwise necessary for regulation required tests, we can also offer using the test equipment we have available on your vessel, eliminating your need for maintaining the test equipment and attached certifications. Or, if you have doubts whether the equipment, we offer is something you might want or not, we can do live and actual tests, which you can then use to assess the need to purchase your own.

Combine two or more of our services listed below and get more value for your money!

## Fuel Oil Tests

### Sulphur

With our handy Parker Kittiwake XRF6111, we offer spot test of your fuel on board to check if the quality complies with what is promised from the supplier. No labs are involved, although the test is almost lab-grade quality.

### Density

Using our density meter, we can measure the actual density of your fuel on board, so you can rest easy that your paperwork coheres with what you have, and that any conversions that need to be made between volume and mass are done without loss of accuracy.

### Viscosity

As viscosity is one of the most important factors you need to know in order to achieve optimum combustion in your engines, we can check your fuel, so you know exactly how to treat it prior to consumption.

### Compatibility

Do you have more than one type of fuel on board? Are you planning on mixing them or do a change-over from one to another? Or are you concerned about the stability of a batch of fuel? We will do a compatibility check to see if there are any stability issues or risk of unwanted effects such as asphaltenes while doing so.

### Cat Fines

As fuel today are getting more and more diverse and the manufacturers are continuously trying to extract more product from the crude oil, the risk of cat fines carry-over also becomes a higher concern for the end-users. We can do a spot-check of your fuel oil to see if you have reasons to concern on this behalf.



## Lube Oil Tests

### Ferrous Wear

As engine lube oil wears over time there will be different telltale signs hereof – one of them is in the form of metal particles picked up by the lube oil. We can test your lube oil for ferrous metal particle content, and thereby give you indications on the health of your system. High content of ferrous particles could be indications on presence of cat fines, lowered lubrication abilities or insufficient lube levels or flow.

### Water in Oil

Getting water into your oil is one of the most undesired situations talking both lube oil and hydraulics. Our Technicians can do a spot test, so you know whether your system is watertight or needs some attention.

### Total Base Number

Topping up or changing your lube oil is often something that is done based on either experience or supplier's recommendation. But is it in reality the best approach? Let us measure your Total Base Number so you can get an idea on the actual state of your lube oil – maybe you can extend the cycle and still maintain an optimal lubrication or if you need to shorten it to prevent critical failure.

### Viscosity

If you doubt that the lube oil in use or in stock is on spec, or if you just want a spot test of the lube oil in general, we can perform this test from a small sample.



# On Board Service



## Bearing Check-up

All moving parts on board a vessel is subject to wear and tear, and therefore also possible failure and subsequent system malfunction.

Often wear is identified once breakdown is eminent or has already happened.

By using acoustic-based analyzers, we can check all bearings and possibly identify otherwise undetectable wear, all without taking any equipment out of operation.

## Ballast Water Treatment System

Regardless of which self-controlling measurements a Ballast Water Treatment System (BWTS) might have, it is at all times the ship operator's responsibility that functionality is in compliance with regulations. We can offer spot-checks of your BWTS' performance by measuring both human health parameters (D2 part one) and living cells (D2 part two).

## Potable Water

The cleanliness of the potable water on board is critical for the crew's health and thereby the operation of the vessel. If you have any suspicions or just want to be sure your crew is not at risk of being infected, we can perform bacteriological test and inspect for legionella, e. coli, enterococci, pseudomonas and total biomass.

## Sewage Water; Black and Grey

Storage and disposal of sewage water must be done correctly in order to comply with regulations and to minimize human health hazards. With our Sewage Water Test Kit, we can ease your mind by checking if your sewage treatment system is performing according to expectations.

## Boiler Water

With steam being a vital resource on board for various purposes, the boilers are often a key consumer on board. Scale formation in the boilers are one of the main reasons for lower performance and must be treated. We can check the state of your boilers and of your treatment, so you can adjust it accordingly.

## Cooling Water

Corrosion, pitting and scale formation are the main concerns when it comes to cooling water systems. If you would like to get an indication whether your preventive work and maintenance is sufficient, we can do a spot-test for you and provide some ease of mind.

## Pressure and Temperature Calibration

Measuring pressure and temperature is the most common and widely used measurements on board ships. These measurements are often essential for the operation and often used as critical components in safety arrangements.

As with almost all instrumentation, there is a chance that a drift in the instruments' measurements, and a measurement with an offset compared to the actual conditions could lead to lower efficiency, breakdowns or even in worst cases fatal catastrophes.

As an instrumentation specialist, we can of course offer to go on board your vessel and calibrate all your pressure and temperature sensors.

We use our own certified calibration equipment to ensure that your pressure and temperature measurements are in fact reflecting reality.



# On Board Service



## Viscosity Systems

The fuel system viscosity measurement is critical for optimum fuel combustion, and as such the viscosity sensor needs some maintenance every now and again. When on board, we can do an overhaul of the sensor unit comprising of a thorough cleaning, O-ring exchange and performance check, making sure it functions according to expectations.

## Flow Meter Check and Service

Flow meters wear over time – some more than others – and as with all other instrumentation, their measurement can drift from their calibration.

We have 30+ years of experience with flow meters, and we can ensure that your flow measurements are according to expected performance. From the simpler differential pressure flow measurements to the highly accurate Coriolis based flow meters, we can often do maintenance, repairs and calibrations while we are on board, thus minimizing your interruption in the media flow.

In case of more serious damages or malfunctions on older or obsolete flow meters, we can also advise on replacements, whether you want something of similar quality, and upgrade or need something more cost effective than the installed.

## ODME

Overboard Discharge and Monitoring Equipment (ODME) is mandatory on board all tankers today, and due to regulatory requirements, their accuracy must be checked once a year and recalibrated every 5 years. A malfunctioning ODME or an expired certificate can lead to a suspended IOPP, and thereby put an effective halt to the vessel's operation. Through our many years of experience with ODME, we are manufacturer approved service provider for both VAF Instrument and Brannstrom's ODME and we are happy to do either an accuracy check, a 5-year recertification or repairs on board your tanker.

## 15 ppm Bilge-alarms

In order for vessels to discharge purified and cleaned bilge water, it needs to be checked for oil and impurities. The measurements must be logged for port authority and surveyor controls. To achieve this functionality, a 15-ppm bilge alarm must be installed and have a valid certificate. In case the bilge alarm is malfunctioning, or the attached certificate has expired, it might cause suspension of the IOPP. If you are having technical problems with your 15-ppm alarm, we can service it and if necessary, replace with a new retrofit.



# Service

Maintaining your individual components in a good state is key to optimal operation. No piece of equipment can add value to your operation if it is not working or functioning properly, and failure of even a small component can be critical to your operation.

Often equipment fails either because it is not used correctly or because the recommended maintenance has not been carried out, which are two fairly 'easy fix' problems.

**Yes We Can!**

We have our own Service Department, not only with extensive knowledge and experience with the products in our portfolio but also a high level of insight into how and for what the instrumentation is used on board. Combined with a general 'can do'-attitude and willingness to fix problems, it gives our Technicians the opportunity to provide more than just 'repair and leave'-services. Advise and general assistance in understanding the equipment they work with, is something that is delivered daily by our travelling personnel.



**We Are Just a Phone Call Away**

Our Service Department travels world wide to support our clients and to perform manufacturer approved technical assistance, regardless if it is for complete systems delivered by ourselves, or if it is smaller single instrument.

**Get in Touch**

If you have questions or inquiries regarding the service we provide, please do not hesitate to contact us at:

**Phone:** +45 55 37 20 95  
**E-mail:** marinesupport@insatech.com

In case of urgent need of service for either repairs or unplanned maintenance, our service department is available 24/7 via e-mail and phone, and we are ready to travel on short notice.



# Installations



## New Equipment

When you invest in new equipment or systems, the initial purchase cost is only half of the headache. Once the commercial part is in place, the new acquisition needs to be put to use so it can earn its cost as improved performance or regulations compliance. Often, this means lengthy periods of time where operations cannot be carried out and income is therefore put on hold. Furthermore, any unexpected delays in the installation can cause a shift in plans and difficulties in upholding otherwise planned jobs. All in all, updating or upgrading your vessel, can be a lot more expensive than just the invoice for the equipment.

## Your Plans Can Shift – So Ours Can as Well

We have developed a particular skillset regarding installations, and we provide different ways of performing installations, all depending on your requirements and preferences. Our foremost priority is to adapt our job to allow for your operations to run as smoothly as possible within the given circumstances. By allowing you to operate your vessel, we can often not only save you money but also allow you to continue operations as planned.

## Different Situations Require Different Solutions

We offer different types of installations, and we can tailor a job, so it suits you best.



### Installation During Dry-dock

When your vessel visits dry-dock for planned maintenance, it is a golden opportunity to do installations, as the restrictions are few and it is possible to work continuously. Usually we will perform this type of installation with a Supervisor from our team and then make use of the opportunity to source further Technicians on site.



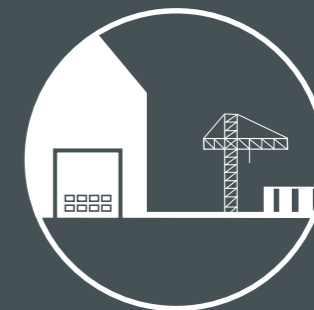
### Installation as Sail-along

Installing larger systems or instrumentation that requires larger modifications can often be done during sail-along. We will board the vessel in one port with our crew, who will have an action-plan ready beforehand. This plan will be developed and adapted in coordination with the vessel's crew up front, allowing to work on piping during the normal operation – with no interruptions of the daily itinerary.



### Hub-installation at a Strategic Location

In the case of multiple installations of systems on a fleet (or part of it), we can set up a hub in a strategic and logistically central location, from where our crew will board the vessels as they arrive, and then perform installations during cargo operations. In this setup, we will typically bring a crew that is specifically chosen for the specific installation along with a skilled Supervisor of our own.

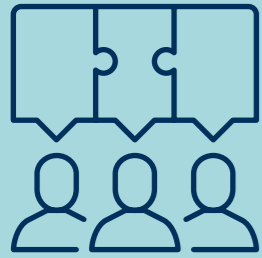


### Pre-fabrication

Any disruption in the operation of a vessel can be a costly affair – planned or unplanned. To minimize the time required to install our equipment, i.e. fuel flow meters for a main engine, we do our best to plan and bring in as much piping pre-fabricated as possible. Thorough surveys and measurements allow us to bring down the amount of time necessary to complete installations in critical locations.

# Training

## Get Training



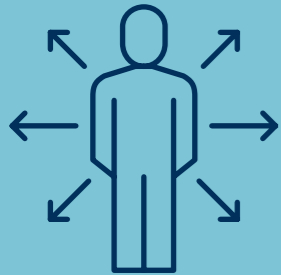
Owning the best equipment on the market is not always enough if you do not understand how to use it. That is why we offer training in the use of our equipment and because we know, that the more you know about the equipment and systems you buy from us, the more you will value and benefit from it.

## Distance Is Not a Problem



If you should have a need for training, product information or system introduction, and distance might be an issue, we are also ready to facilitate via a variety of online solutions; video conference calls, webinars and even live streaming with multiple presenters. As the world continuously gets more connected and within digital reach, we try to stay available where you are.

## Expand Your Knowledge

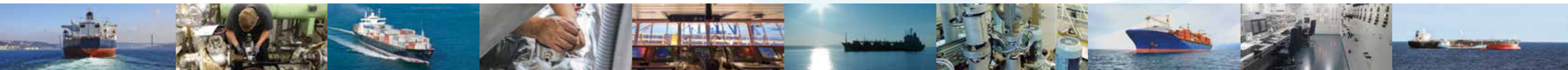


As a provider of instrumentation and systems to a broad range of vessel types and most land-based industry, we have a lot to offer. That is why, we arrange seminars where we introduce either new products or developments in known products. We do this in collaboration with the manufacturers, and we aim to broaden our collective knowledge of the available technological possibilities.

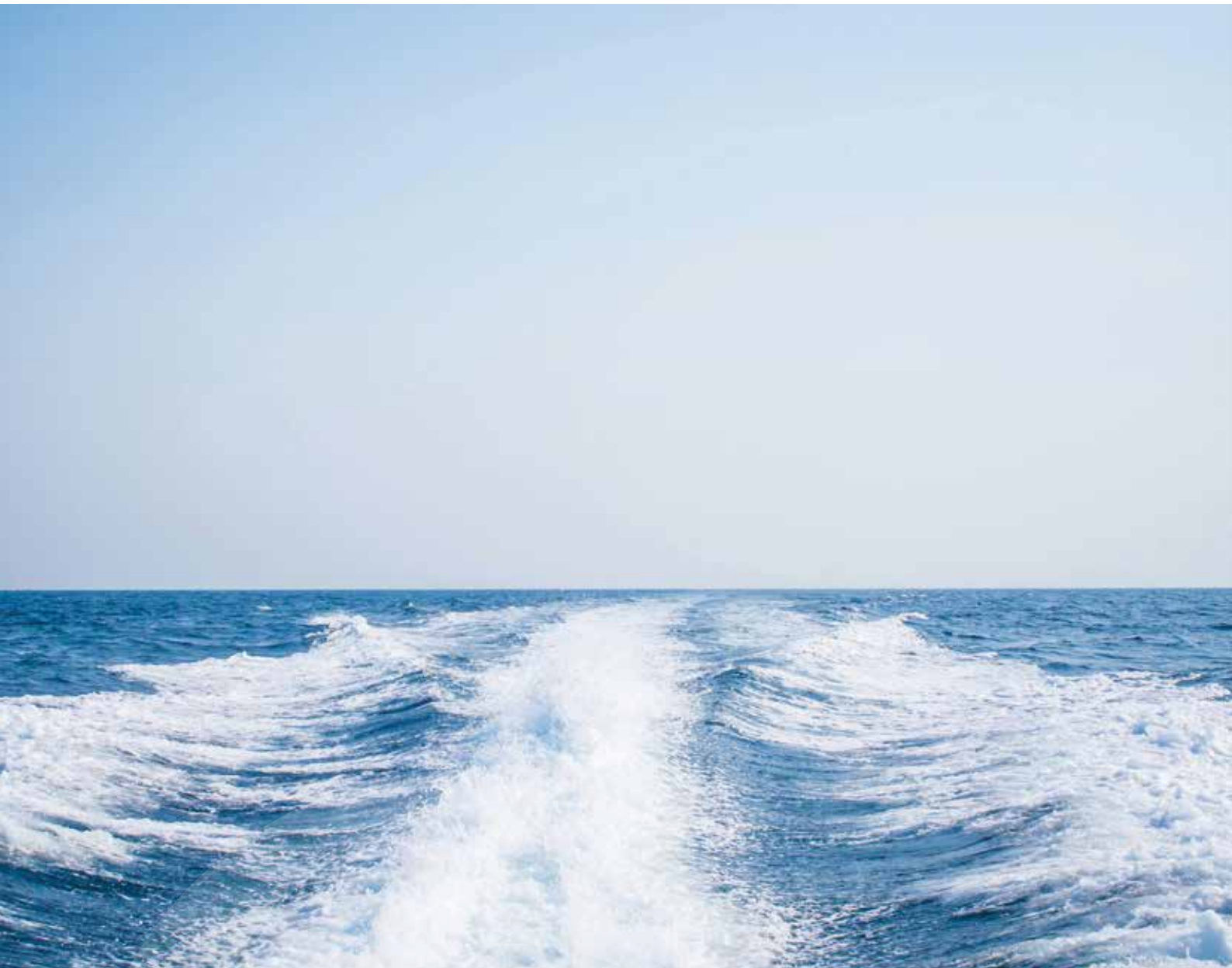
## Come by and Say Hi!



At the end of the day, as we are basically a very local company from the rural parts of Denmark, we do prefer – if possible – to meet and look our partners in the eye. If you should feel the same way about your suppliers, then we are more than happy to welcome you to our facilities and show you around. We are actually quite proud of what we have built.







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