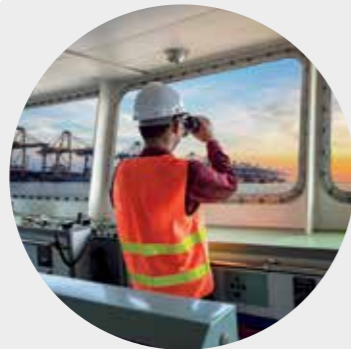




**– For a better shipping**

COMPANY PROFILE AND PRODUCT GUIDE



## Our heart beats in the engine stroke

For a better Shipping - in our globalized world, reliable shipping and freight transport has become more than essential. We have made it our business to support you in this respect.

**With a personal and customized approach, minding your needs - we advise you - OUR MISSION - YOUR SUPPORT.**

Now in the second generation, we develop and produce innovative in-house products in the field of technical measuring and analysis equipment for the maritime industry. You can benefit from our long-term cooperations with reliable manufacturers in the industry.

**Especially marine engines make our heart beat faster.**

The many years of worldwide activity of the family and our dedicated staff in the market of measurement technology and the feedback from customers, flows into every procedure or work step. Therefore, the product range has been steadily expanded to include trade goods. International partnerships for global availability are constantly being expanded. This makes TX Marine Messsysteme GmbH an experienced partner and system provider for complete solutions in the field of on-board measurement technology.

**Not the wind, but the sail determines the direction (Chinese proverb).**

After all, it makes a big difference which course you set in the operation of a ship. Set the sails in the direction of sustainability and the greatest possible efficiency? With foresight, we advise, train and support and assist you as a measurement technology - service provider in your project!

We all love the sea and do our best every day to keep global shipping moving for the people of the world.

**Let's sail together.**



**Kay Paschen (Founder)**  
Owner-manager



**Nadine Paschen (2nd Generation)**  
Owner-manager

## Our Products



### Engine Performance Monitoring

Shaft Power | Thrust | Torque  
Cylinder Pressure | Combustion



### Emission Measurement

Portable equipment  
Certified by class



### Performance Software & Hardware

Special software solutions and  
data acquisition units



### Service

Engine Diagnostics  
Installation | Service | Training  
Worldwide



### Flow Measurement

Fuel | Oil | Water  
Volume and Mass  
Flow Meter



### Condition Monitoring

Crankshaft Deflection | Oil Condition  
Cylinder Liner Ovality | Oil Mist  
Overspeed Tester | Videoscopes  
Oil and Fuel Test kits

### Set sail for sustainability and maximum efficiency?

With TX Marine's technology you ensure Target-oriented and reliable solutions.

We advise you with passion as if it were our own lifeblood.



## Our Service

Our goal is to provide you with a full range of support services. **OUR MISSION - YOUR SUPPORT**

We would like to satisfy you not only in the field of measurement technology and its selection but also with our range of services

As services we can offer you the following:



### Measurement data evaluation / engine diagnosis

Programs for measurement data evaluation are helpful, but can also be completely useless if the data basis is not correct or the measured values are wrongly interpreted.

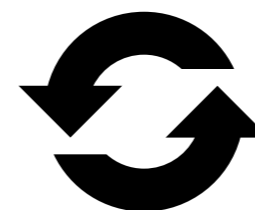
Experienced technicians and engineers help to bring light into the darkness and help to analyse your measurement data.



### Maintenance and repair

Maintenance and inspection of measurement equipment is important to guarantee a high availability.

If you have a measuring device that is not working properly, we are happy to help!



### Rental devices or reconditioned devices

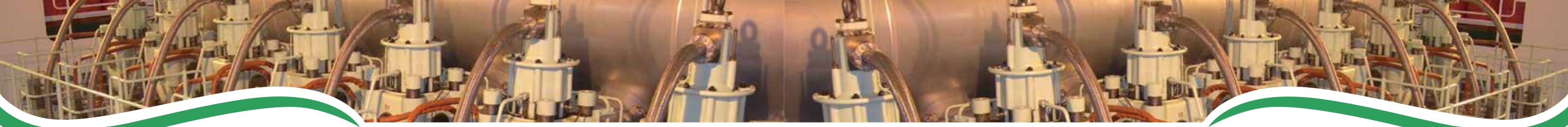
You would like to carry out measurements, but you do not have the right equipment at hand or no budget to purchase it.

We can support you with rental and refurbished equipment.



### Training

Training is the key to sustainable personnel development. We can help you bring you or your staff up to date, or refresh basic knowledge



## Engine Performance Monitoring

Getting from A to B on time can be a challenge in wind and weather. A well-coordinated team on a reliable ship is the be-all and end-all in seafaring.

Just like the sensory impulses our body sends us, our measured values from the analysis tools serve you.

How fit am I, how high is my load, ...?

The engine is the heart of the ship and requires special care.

If the individual component groups are well coordinated and monitored, you can not only improve performance, but also increase longevity and efficiency and get the last out of your machines.

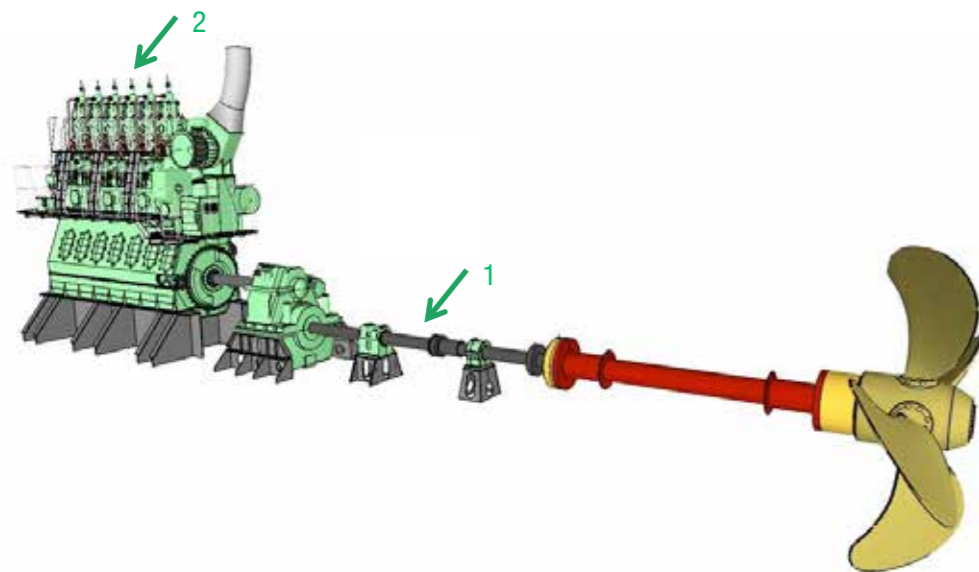
Reporting and internal reports can be generated at the push of a button. Maintenance can be planned (at an early stage and considered in the scheduling in good time.

Let's get the best out of your engine together.

The recording and processing of the following engine measured variables help us to do this:

- Shaft Torque
  - Shaft Speed
  - Shaft Power
- our solution for you the **TORXmeter® mkII shaft power meter** (1)

- Cylinder pressure
  - Combustion characteristics
- our solution for you are electronic and mechanical indicators **PMImkII , Type 50 and MSI-3** (2)



## TORXmeter® mkII

### Shaft power meter

#### Application:

Shaft power is an essential input for Ship Performance Monitoring Systems and ship efficiency. Actual shaft power measurements levels provide an accurate reference point to assist with the assessment of:

- Engine Performance Monitoring
- Hull Condition
- Propeller Condition
- Specific Fuel Oil Consumption
- Operational Efficiency Planning
- Ship Condition Changes

#### Features:

- Easy to install and operate (training video available)
- No electronic parts on the rotating shaft
- Full contactless
- Maintenance free
- Can be Installed in 1 day
- All Components can be replaced individually
- Easy error diagnosis via email due to fault indicators on the components
- Zeroing (new calibration) can be done by ship's crew

#### Technical Specification:

Sensor Accuracy: <0,1% (Shaft Torque, Shaft RPM, Shaft Power)

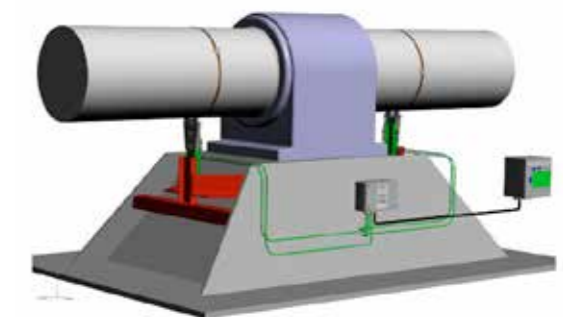
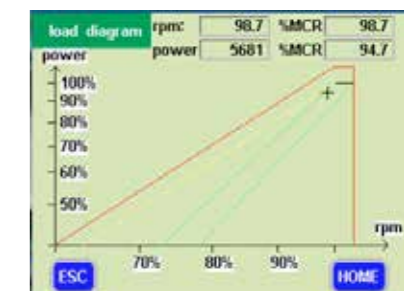
Shaft diameter: 150mm up to 3000mm

Speed Range Up to 1200 rpm

Data Output: 4x4-20mA outputs (Torque, shaft power, rpm and bipolar rpm); RS485 NMEA protocol, Alarm output (Overload and system failure)

Data storage: Mini SD card in the Terminal Box mkII control board

Measurement technique: extreme fast response magnetic pattern scanning with 2x2 Sensors





## Performance Software and Hardware

The ship must follow a time table. The route is planned, the captain is checking the weather conditions and planning his voyage from port to port.

The captain and crew now have a lot of work to do.

Due to the ever-increasing requirements of the international authorities, such as regulations like SOLAS, ISPS or MARPOL, a large number of reports have to be prepared and sent during ongoing operations. Additionally, shipping companies, ship owners or charterers are required to provide a large number of key performance indicators to document the status of the ship and the sea voyage.

Through comprehensive data recording and visualization on board, important information can be collected and reports and the Key Performance Indicators (KPIs) can be easily generated and displayed. This not only simplifies the work on board, but also saves time and money. Especially when it comes to the constantly more stringent regulations on emissions, solutions are required.

With special monitoring systems, a wide variety of data can be collected on board, either manually or automatically, and a database can be generated. A comprehensive view of the ship is only possible if sufficient data is available, e.g., through permanent recording of measurement data and plausibility checks.

**Here, the performance monitoring systems are the key components for all parties involved in ship operation, from the captain to the ship owner.**

With our systems, all available data from on board can be collected.

The information can be used for a variety of purposes.

- Plan maintenance intervals and thereby save time and costs.
- To make optimal use of engine and propulsion systems and as a result save fuel.
- To make recommendations to the captain before the start of a voyage to run weather-optimized routes.

This not only results in fuel and operating cost savings, but also in emission reductions due to the more efficiently operated ship

**Efficient ship ahead!**

Here we see ourselves as your supporter, to advise you to choose the best possible solution for you.

## Performance Software

### PIM OBU – Performance Indication Onboard Unit

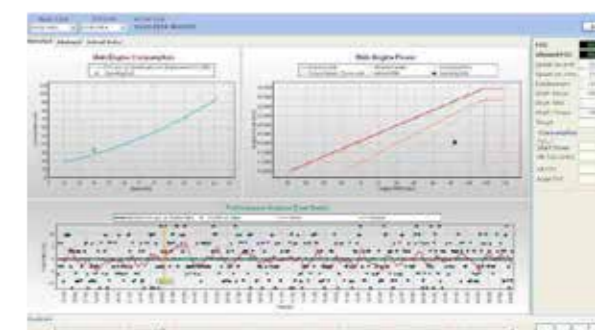
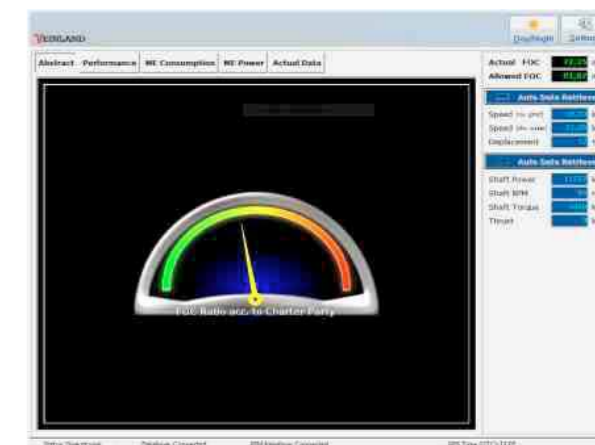
#### Application:

Displays nautical data, fuel consumption and engine data in real time.

- One data collector unit
- One onboard unit with Touchscreen system

#### Features:

- Provides detailed information about actual ships performance
- Compares fuel consumption with the data of the charter party
- Easy transport to owners' office for further analysis and replay
- Data transfer to Cloud software solutions possible, e.g. Storm Geo, Podium



## Performance Hardware

### Data Control and Logging Unit

#### Application:

Modular data acquisition system consisting of digital and / or analogue inputs and / or output modules, depending on customer's request.

#### Features:

- Different modules can recognize currents, voltages, temperatures, pulses, potentiometers or resistors
- Detected signals are transmitted, e.g., NMEA telegram via network for further processing



## Flow measurement

On board of ships are a lot of flows in different areas which have to be used and monitored.

As medium there are liquids or gases which are measured, these are for example:

- Fresh Water
- Bilge Water
- Refrigerants
- Cylinder oil
- Fuel

Comprehensive and accurate fuel measurement in particular is becoming increasingly important on board.

Fuel costs are one of the biggest operating expenses in ship operation. Due to constantly rising fuel prices and stricter environmental guidelines, it is becoming increasingly important for shipping companies to permanently monitor and document fuel consumption. In this way, deviations can be detected in time and in advance actions can be taken. There are a variety of measurement methods to measure these consumptions. Not only the actual flow rate can be measured, but also temperatures and densities. Depending on the application and specification of the medium, the measuring devices can be selected.

By checking your on-board fuel systems, we can determine the best solution for you.

A flowmeter consists of two main components, the actual sensor and an evaluation unit, usually known as transmitter or transducer. In addition, a categorization is made between the version's compact devices or separate versions (measuring sensor separated from evaluation unit) and the accuracy class.

We can offer you the following measuring devices for the different purposes of use:

- Coriolis mass flow meter
- Ring piston volume flow meter
- Screw spindle volume flow meter
- Magnetic-inductive flow meter
- Vortex flow meter
- Variable area flow meter
- Ultrasonic flow meter

Investing in the right measurement technology can help you keep an eye on total cost of operation (OPEX)!

## ROTAMASS TI

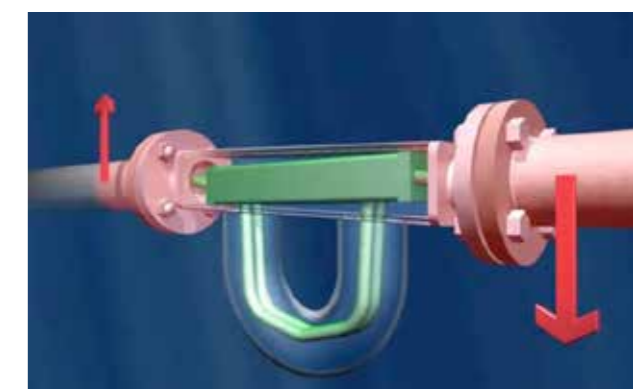
**Mass flowmeters with the Coriolis measuring principle, for measuring liquids and gases.**

### Application:

The ROTAMASS TI series - determine the mass and density of liquids, and gases directly, without by-passes. The devices have a wide range of applications, as appropriate tube materials and pipe diameters are available for the different media.

- Line sizes: DN 15 to DN 200
- Flow range: 1,5 t/h to 600 t/h
- Temperature range: -70 °C bis +150 °C
- Medium: Liquids and Gases
- Accuracy mass flow for liquids: up to  $\pm 0.1 \%$
- Accuracy mass flow for gas: up to  $\pm 0.35 \%$
- Accuracy Density for liquids: up to  $\pm 0.5 \text{ g/l} / \pm 1 \text{ g/l}$
- Approvals: Marine application (DNV GL), Functional safety and Hazardous area approvals
- Different communication interfaces
- Box-in-Box Design, this means decoupling of the measuring sensor from the housing. This avoid malfunctions due to a wrong installation or vibration.

# YOKOGAWA



## CONTOIL®

**Volume flowmeters with the Rotary piston measuring principle, for measuring liquids.**

The CONTOIL® series is a wide range volume flow meter for efficient consumption measurement.

- Line sizes: DN 4 to DN 8 and DN 15 to DN 50
- Flow range: 4l/h to 600 l/h and 20 l/h to 30000 l/h
- Temperature range: -40 to 80°C and 130°C or 180°C
- Max. permissible error:  $< \pm 1,0 \%$  or  $\pm 0,5 \%$  of actual value
- Approvals: Marine application, Functional safety and Hazardous area approvals

### Product lines:

CONTOIL® VZF II with electronic display and outputs  
CONTOIL® VZO with Roller counter and outputs.

# AQUAMETRO

OIL & MARINE





## Emission measurement

Depending on the type of fuel used, ships emit a wide variety of exhaust-gases such as nitrogen oxides (NO<sub>x</sub>), carbon dioxide (CO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), but also soot and particulate matter. This has an impact on the environment and the climate

Regulations to protect against pollution of the marine environment by shipping were therefore international agreed already years ago (MARPOL). Due to these regulations' emission values are limited and therefore need to be monitored.

**The environmental protection therefore increasingly becoming a focus for your shipping company!**

An important factor in complying with the regulations is the maintenance and operation of the ships and thereby the prevention of environmental damage. If the equipment is maintained carefully, there are opportunities to reduce or save costs. The ship' s crew should therefore be provided with measuring equipment that enables emission values to be recorded and documented quickly.

Regular monitoring of the combustion on board can quickly identify problems in the combustion process. For example, by implementing inner-engine modifications on board, combustion can be improved and large investments in costly maintenance operations can be kept to a minimum. The combustion process can consequently be optimized and fuel consumption as well as specific emissions can be reduced.

Furthermore, the measurement and documentation of emission values should make it possible to prove the level of operation of machinery within the permissible limits.

**The composition of the ship's exhaust gases identifies problems with the heart - the engine!**

Portable analyser's, for measuring exhaust emissions, are easy to use and quickly ready for use without extensive training.

Measured variables that can be determined are:

- Exhaust gas temperature
- O<sub>2</sub>
- CO
- NO<sub>x</sub> (NO / NO<sub>2</sub> separately)
- SO<sub>2</sub>
- CO<sub>2</sub>
- CH<sub>4</sub>

These measuring devices allow to generate a report of the measured emissions by pressing a button and to document the compliance with the guidelines. As our systems are also certified by classification societies, the operator has an officially approved measurement result and report and can confirm that the maximum prescribed emissions have been complied with.

**Invest in an analyser – and notice your emission footprint.**



## Condition Monitoring and Predictive Maintenance

Planning and performing regular maintenance is one, however, not the best way of performing maintenance. For this purpose, there are many instructions and maintenance programs on board.

Is it enough to rely on these programs? Especially the operating equipment on board of the ship is sensitive to failures and defects. Maintaining them is hard work!

**Proactive thinking, monitoring and condition-based maintenance can prevent unplanned problems and failure.**

Condition monitoring is based on collecting real-time conditions of machines or equipment. On the other hand, predictive maintenance focuses on early detection of damage.

**Permanently installed or periodically used measurement technology can be very helpful solutions and can avoid expensive repair costs and costly failures of the propulsion system or other systems.**

Both methods of monitoring and maintenance help to increase the reliability of operating equipment and reduce downtime. This not only saves valuable resources, this also saves money.

The variety of information already available on ships is used to evaluate the current condition and to fulfil maintenance schedules.

Through the implementation of additional measurement technology, damage and problems can be detected in time and maintenance work can be initiated in order to prevent them. Thus, the investment will be amortized in a short time.

We are in this topic well prepared and can offer you the following:

- Crankshaft and Ovality measurement (analogue and digital)
- Metal Thickness gauges (metal and glass reinforced plastics)
- Overspeed tester
- Pressure calibrator
- Temperature calibrator
- Oil sampling tester
- Oil condition sensors
- Oil mist detectors
- Videoscopes

If something is missing in the list which you still need, we will help you to find the right instrument.

**We will be glad to advise you about the possibilities of condition monitoring and predictive maintenance.**







# For a better shipping – a steadily growing global network



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- Hong Kong
- USA
- Cyprus
- India
- Canada
- Denmark
- Korea
- Singapore
- Germany
- Turkey
- U.A.E.
- Greece



- Headoffice
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- Sales

