

*Our Mission - Your Support*

# SHAFT POWER MEASUREMENT SYSTEM

## TORXmeter® mkII

*The shaft power measurement system measures the power transmitted through a shaft, enabling the measurement of actual engine power delivered to the propeller.*

*The cost of a maintenance free and accurate permanently installed torsion meter is very reasonable, in comparison with potential saving in operational costs.*

- ⇒ ***Fuel Savings***
- ⇒ ***Improved Maintenance Scheduling***
- ⇒ ***Equipment Protection***

*Shaft power is an essential input (KPI) to Ship Performance Monitoring Systems for the ship efficiency. Actual shaft power measurements levels provides an accurate reference point to assist with the assesment of:*

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

*Fitted at an earlier stage, the shaft power meter can be used for Ship Acceptance Trials and, from that point on, be a KPI of the condition of the ship, troughout it´s lifecycle.*

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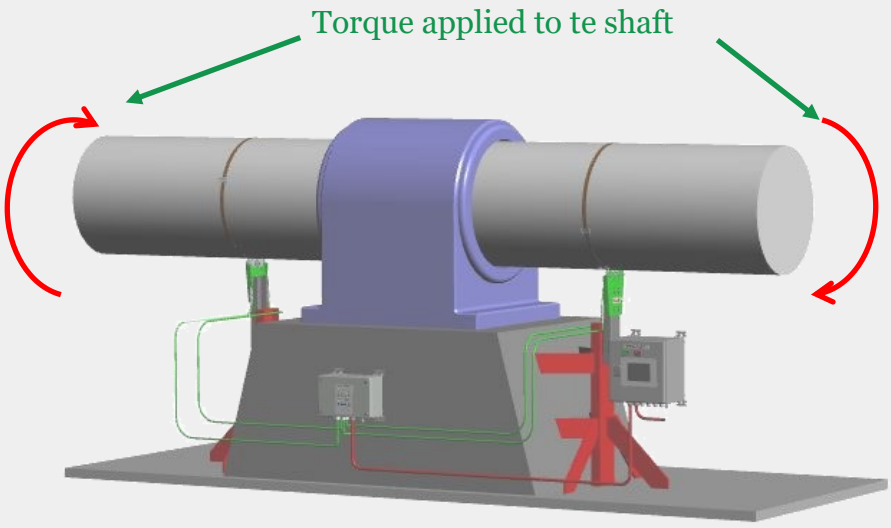
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# SHAFT POWER MEASUREMENT SYSTEM
## Principle of operation

Flexible shaft will deform under the action of torque and a twist angle is generated. The angle of twist is measured by mounting two magnetic belts on the shaft.



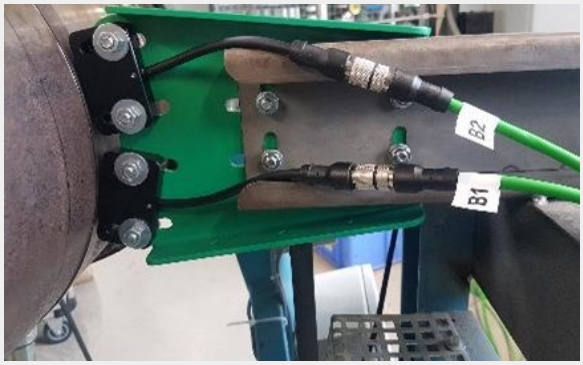

The measurement principle is an extreme fast response (EXFR) magnetic scanning of the magnetic pattern of the belts. The EXFR sensors mkII uses the magnetic pole changing and the zero crossing (change of the magnetic fields) between the two EXFR sensor belts for angle measurement. The signals are working with a resolution of 24 bit.

Because of the measurement of torque (twist angle) the measurement system has two EXFR sensors mkII with two sensor heads and EXFR sensor belts, installed on the shaft.

*The TORXmeter® mkII, is the further development of the TORXmeter® which offers new functions:*

- ⇒ ***New advanced EXFR sensor technology, now with 2 separate sensor heads per side. More flexibility for installation and smaller shaft diameter***
- ⇒ ***Extended LED status on the MWE mkII Box for simplified commissioning and error diagnosis***
- ⇒ ***Optional : repeater display for ECR etc.***






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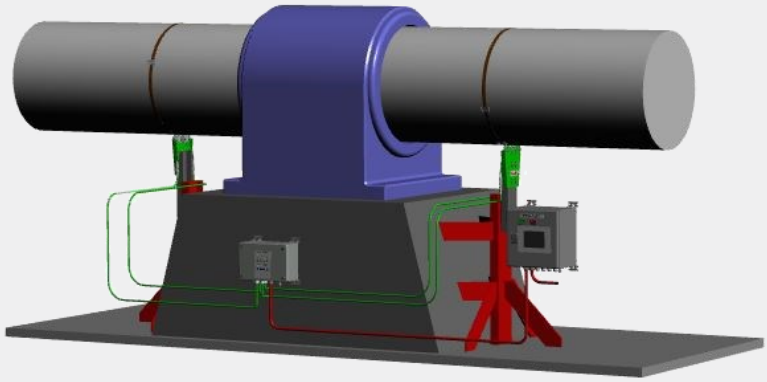
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# SHAFT POWER MEASUREMENT SYSTEM
## Benefits

*The TORXmeter® mkII, has been developed to meet the requirements of the Marine Market. The feedback from our customers are included in the revised system.*

- ⇒ ***Easy to install and operate***
- ⇒ ***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 diagnosos via email due to fault indicators on the components***
- ⇒ ***Zeroing (new calibration) can be done by ships crew***



Hundrets of systems installed on:

- Bulk carrier
- Tankers
- Container Vessels
- Ferries

## OUR MISSION—YOUR SUPPORT
## Self installation supported by video and detailed manual

A major cost factor is always the installation and commissioning of shaft power systems. The TORXmeter® mk II is designed for installation by crew. A set of training CD's are incl. in the scope of supply to lead the crew step by step to the installation & commissioning process.
In addition we will support with free of charge E-mail assistance and questionaries to guide the crew. As a matter of fact, we are offering installation and commissioning even by service technicians.



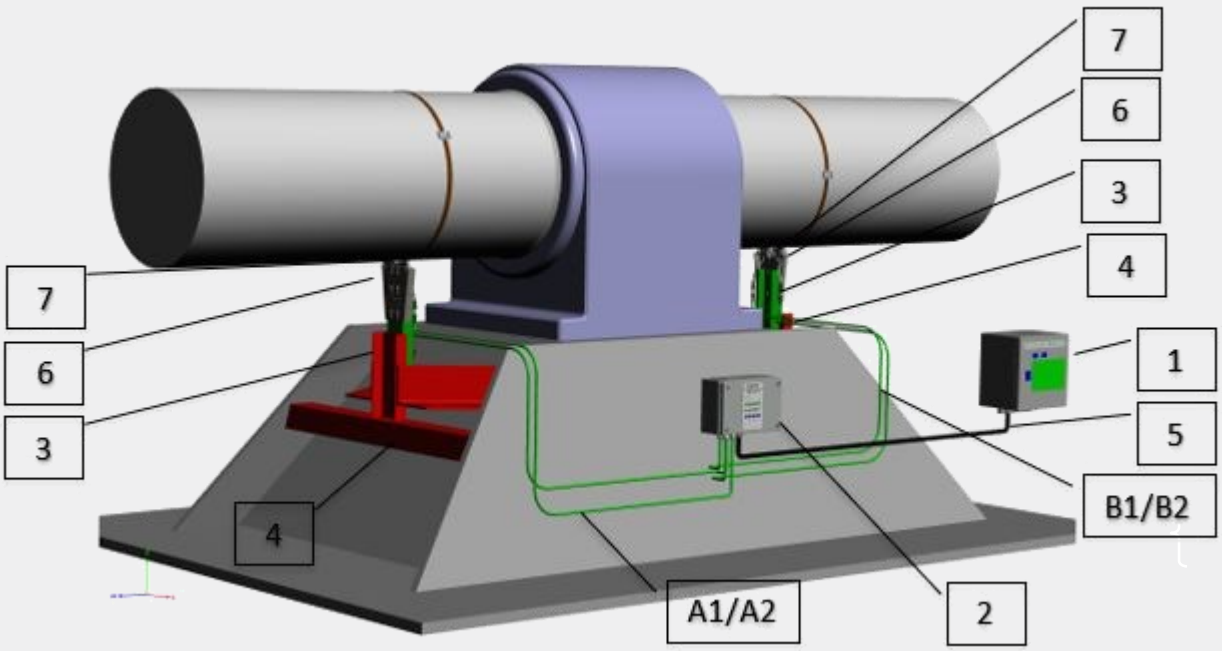

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# SHAFT POWER MEASUREMENT SYSTEM
## Scope of Supply

| | |
|---|---|
| No. 1 | Terminal Box mkII |
| No. 2 | MWE Box mkII |
| No. A1/A2 | Pre-wired cable between MWE Box mkII and EXFR sensors mkII (appr. 7,5 m) |
| No. B1/B2 | Pre-wired cable between MWE Box mkII and EXFR sensors mkII (appr. 7,5 m) |
| No. 3 | 2x Welding Brackets (bracket must be welded to ships structure –No.4) |
| No. 4 | 2x Support for Sensor holder |
| No. 5 | Cable between Terminal Box mkII and MWE Box mkII (4x2x0,75mm²) |
| No. 6 | 2x sensor holder (screwed on No.3) |
| No. 7 | 2 x Sensor holder with pre-mounted 2x2 EXFR sensors mkII (A1/A2) (B1/B2) |
| No. 8 | 2 x EXFR sensor belts mkII |
| **Remark:** | Green items scope of supply, ; red items not in the scope off supply |




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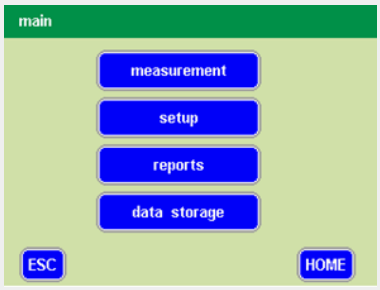
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# INFORMATIONS
# Terminal Box mkII/ MWE Box mkII

*The TERMINAL BOX mkII is a touchscreen operated system for the operation of the TORXmeter® mkII., with following functions:*

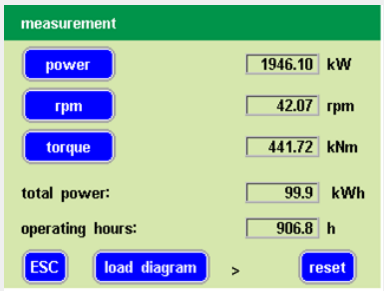
- ⇒ ***Permanent display oft shaft power, torque and shaft rpm***
- ⇒ ***Display of the Load diagram***
- ⇒ ***Entry of the ship specific parameter***
- ⇒ ***Calibration (Zeroing) of the system***
- ⇒ ***Carry out single and daily reports***
- ⇒ ***Software update via USB stick***
- ⇒ ***Datalogging on SD card***

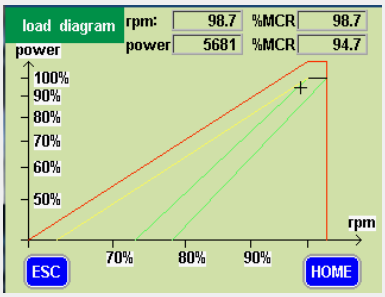




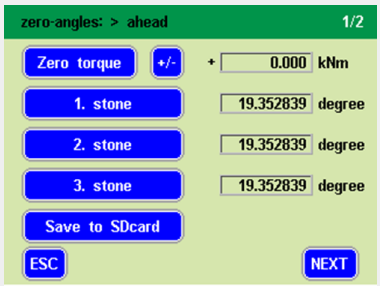











*The MWE BOX mkII with following functions:*

- ⇒ ***For connection of the EXFR sensors***
- ⇒ ***evaluation of the raw data and send to Terminal Box mkII***
- ⇒ ***Status LEDs on the front for health check of the MWE board and sensor board***




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# Technical Specifications

| | | |
|---|---|---|
| Sensor Accuracy | Shaft Torque | <0,1% |
| (2x2pcs high resolution sensors, contact free) | Shaft RPM | <0,1% |
| | Shaft Power | <0,1% |
| System Accuracy | Shaft Torque | <0,1% +Ke |
| | Shaft RPM | <0,1% |
| | Shaft Power | <0,1% + Ke |
| | Ke | Total error in shaft modulus constant and shaft diameter |
| Shaft diameter | | 150mm up to 3000mm |
| Speed Range | | Up to 1200 rpm |
| Data Output | Performance output | RS485 (NMEA183) protocol |
| | 4-20mA Output (4PCS) | Torque, shaft power, shaft rpm, bipolar shaft rpm |
| Data storage | Mini Sd card Terminal Box mkII control board | Measurement data and reports as .txt files |
| Measurement principle | | Extreme fast response magnetic belt scanning |
| Environmental | Operating temperature | 0°C up to 50°C |
| Environmental Sealing | Terminal Cabinet | IP67 |
| | Sensors | IP67 |
| Supply Voltage<br>Power consumption | | 100/240VAC, 5-60Hz, 16A;<br>24 Volts / <2A |
| Option: | Repeater Display for ECR or WH | |

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