
GESTRA Steam Systems

# OR 52-5
# OR 52-6

GB

## Installation Instructions 810731-02

Oil & Turbidity Detector
OR 52-5, OR 52-6

# Contents

Page

# Contents – continued –

Page

# Important Notes

## Usage for the intended purpose

Use oil & turbidity detector OR 52 only for monitoring transparent liquids to detect any ingress of light-scattering and insoluble foreign matter.

Chemical and corrosive influences have to be taken into account and the equipment must only be used within its rated pressure and temperature limits. Before installation and operation make sure that the equipment is resistant to the medium in the operational conditions that will exist.

Any type of use differing from the usage described above is considered as improper. The resulting risk will have to be borne by the user alone. The manufacturer hereby expressly rejects any claims for any resulting damage.

## Safety note

The equipment must only be installed, removed, commissioned, operated and serviced by qualified staff.

Qualified staff are those persons who – through adequate training in electrical engineering, the use and application of safety equipment in accordance with regulations concerning electrical systems and circuits, and first aid & accident prevention – have achieved a recognised level of competence appropriate to the installation and commissioning of this device.

For installation, removal, commissioning, operation and maintenance, every person who works with the equipment must have read and understood the complete installation manual. Furthermore, responsibilities must have been defined clearly and unambiguously and must be adhered to.

Usage of the equipment for the intended purpose includes compliance with the rules and notes in this installation manual for installation, removal, commissioning, operation and maintenance.

The operating company must ensure that, whenever the equipment is being operated, it is in perfect condition.

Working methods that jeopardise safety must not be used.

### Danger

If the measuring transducer and sensor are used in an inexpert or improper manner by unqualified staff, they can cause danger to life and limb for the user or for third parties, possibly resulting in death.

During operation, the sensor is under pressure. In this condition, screws, nuts or bolts must not be slackened. Hot water or steam could flow out and could cause severe scalding over the entire body.

The sensor might be hot during operation. If it is touched when in the operational condition, severe burns are possible.

Any installation or removal work may only be performed when the equipment is at zero pressure and has cooled down. When such work is to be done, the pressure in the pipes upstream and downstream must have been reduced to zero and the sensor must have cooled down sufficiently.

The terminal strips of the measuring transducer are live during operation. This presents the danger of electric shock. Cut off power supply before opening the cover or mounting/removing the terminal strips.

It must be ensured that during the work the system section in which pressure has been reduced to zero cannot be accidentally put back into operation. The shut-off valves needed for this purpose must be separately secured and marked. The connection to the energy supply must be disconnected and must be secured to prevent it from being operated accidentally. One or more warning notices, for example containing the text “DO NOT SWITCH ON” must be displayed in a clearly visible manner at each operating element.

# Explanatary Notes

## Scope of supply

- 1 Measuring transducer ORT 6
- 1 Measuring sensor ORG 12 or ORG 22 (depending on order)
- 3 Ball valves
- 3 Screwed unions and nipples with threaded ends
- 1 Vent nipple (screwed in ORG)
- 1 Turbidity standard 20 ppm (supplied but not fitted)
- 1 Drying cartridge (supplied but not fitted)
- 1 Installation manual
- Type approval certificates (according to order)

## Application

The oil & turbidity detector consists of the measuring sensor ORG 12 or ORG 22 and the measuring transducer ORT 6 (operating and display unit). The type of measuring sensor depends on the fluid to be used.

The oil & turbidity detector OR 52-5/-6 is used for monitoring transparent liquids to detect any ingress of insoluble foreign matter. The equipment is mainly used for industrial processes and in the foodstuff industry where high level of reliability and ease of maintenance are required.

The equipment combination can be used for marine applications in order to monitor microfiltering equipment in accordance with IMO (International Maritime Organization) resolution MEPC.60 (33) and EC directive 96/98/eec (MED) as 15 ppm oil content alarm.

In steam boiler plants condensate and feedwater can be monitored for oil and grease contamination (according to TRD 604 sheet 1 paragraph 2.1.1 with 3/5 ppm). In addition, the oil & turbidity detector is well suited for raw water monitoring and water treatment (sand filters, demineralization plants, reverse-osmosis plants) as well as waste-water monitoring.

The OR 52 is also used in breweries and the beverage industry (filtration, monitoring of wort, quality assurance etc.) and in the salad oil production for monitoring filtering processes.

### Attention

When using the equipment as 15 ppm oil content alarm acc. to IMO please take the following into consideration:

Microfilter installations usually consist of an oil/water separator followed by a filter, the so-called coalescer. Gravity coalescer systems cannot split up stable water/oil emulsions, which are formed with certain cold cleaning agents and then accumulate in the bilge. We therefore recommend suitable fast-separating cold cleaning agents which will not produce stable water-oil emulsions.

## Explanatary Notes – continued –

### Function

The measuring sensor is a photometric measuring device consisting of a light source (light emitter Q) and a light receiver D equipped with two photosensitive elements.

A constant light beam passes through the transparent liquid. Insoluble foreign matter scatters the light, which is then measured using the 15° forward light scattering method. The light intensity is transformed into an electric current which will be used by the measuring transducer to determine the concentration of foreign matter. The actual turbidity value is continuously compared with the adjusted setpoint and the result will be indicated visually and – if required – acoustically.

The measuring transducer is the operating and indicating unit for signal evaluation and the control of the measuring sensor. It serves as visual display unit for the measuring results and the adjustment of the measuring equipment, indicating the actual value, tripping the limit alarms ALARM 1 and ALARM 2 and releasing messages in the event of a malfunction in the measuring sensor. The measuring transducer is designed for setting and indicating the limit values.

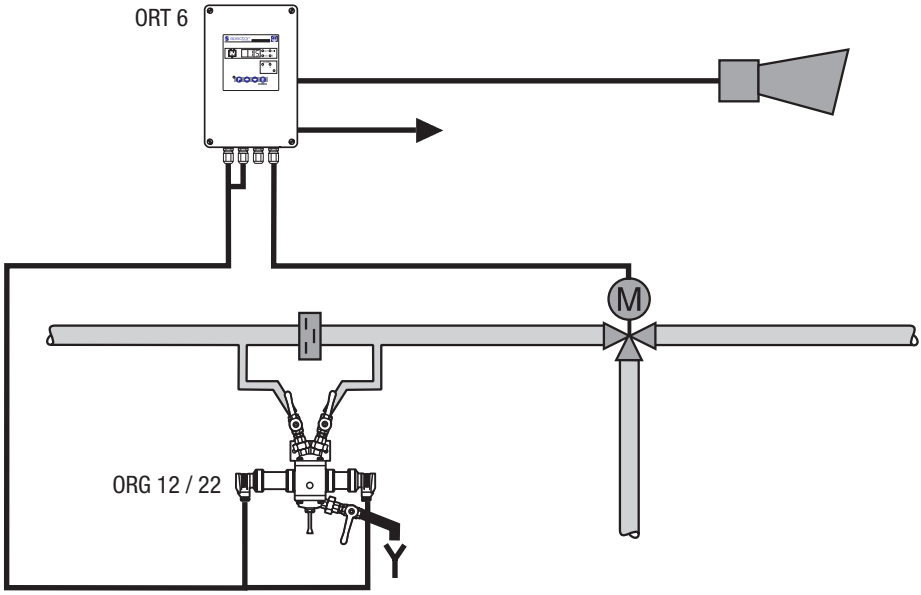



**Fig. 1** *Typical application of an oil & turbidity detector type OR 52-5/-6*

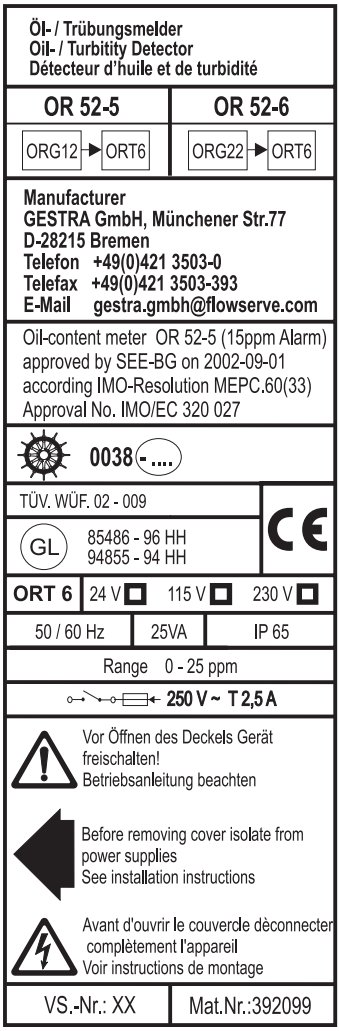
# Technical Data

## ORG 12 / 22

| Measuring sensor ORG 12, ORG 22 | | |
|---|---|---|
| Nominal pressure [barg] | 10 | |
| Nominal size [DN] | 10, screwed 3/8" BSP to EN ISO 228-1 | |
| Flowrate [l/min] | 0.5 – 50 | |
| Pressure drop [mbar] [1)] | 5 | |
| Corrosive resistance | Water, condensate, beverages, etc. | |
| Max. pH value of fluids [2)] | 10.5 | |
| Fluid temperature range [°C] [3)] | 0 – 60 (with drying cartridge) | 60 – 120 (with vent nipple) |
| Ambient temperature [°C] | 0 – 60 | |
| Weight [kg] | approx. 6.8 | |
| **Materials** | **ORG 12** | **ORG 22** |
| Housing | 0.6025 galvanized | 0.6025 galvanized |
| Cover | 0.6025 galvanized | 1.4580 |
| Wetted parts | 0.6025 galvanized | 1.4580 |
| Ball valves | Brass 58 | 1.4436 |
| Screwed unions | Steel | 1.4571 |
| Glass cylinder | Duran 50 | Duran 50 |
| Gaskets | Silicone | Silicone |
| Cleaning disc | EPDM | EPDM |
| Light emitter | Glow lamp 12V / 10 W BA 15s<br>Protection IP 65 | |
| Light receiver | 2 silicon-type photo-electric cells<br>Protection IP 65 | |

1) At a flowrate of 2 l/min and V-shaped flow through the sensor with a pipe length of 1 m (DN 10) and 4 bends, $\zeta = 6.1$.
2) A pH value above 10.5 can lead to wear of the glass, depending on the temperature.
3) Vent nipple Ⓕ screwed in measuring transducer as standard.

### Name plate / Marking



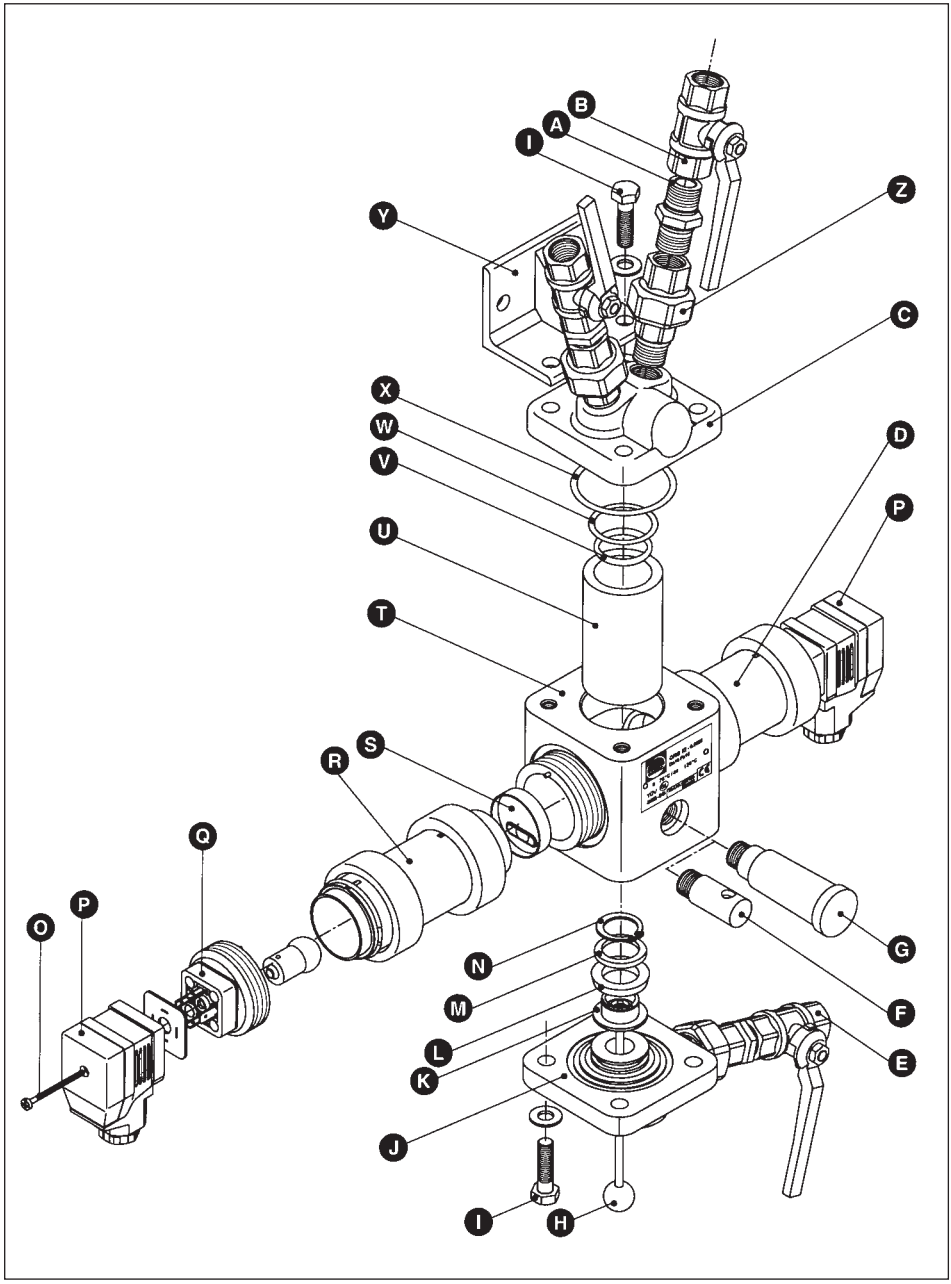
## Technical Data – continued –

### ORT 6

| Measuring Transducer ORT 6 | |
|---|---|
| Inputs | Directly transmitted light (D), scattered light (S) |
| Outputs | 1 voltage output for light emitter Q,<br>1 – 12 V pulse-amplitude modulated<br>3 volt-free change-over contacts<br>(alarm 1 + 2 and malfunction),<br>Contact material AgNi 0.15<br>Max. contact rating for switching voltages 24 V AC/DC,<br>115 V and 230 V AC. Resistive / inductive 4 A<br>1 current output 0/4 – 20 mA, max. load 500 ohm |
| Measuring range [ppm] | 0 – 25 |
| Actual value output | 0/4 mA ≙ 0 ppm, 20 mA ≙ 25 ppm |
| Adjustment range<br>Limit value alarm 1 and 2 | Adjustable between 0 and 15 ppm<br>Other ranges on request |
| Indicators and adjustors | 4 membrane keys,<br>8 LEDs for indicating operating modes and dimensions,<br>1 three-digit seven-segment display for actual value,<br>limit value and fault indication,<br>3 LEDs for monitoring system voltages |
| Adjustment range<br>Time delay alarm 1 and 2 | 0 to 20 sec.<br>Other ranges on request |
| Mains voltage | 230 V +10 / –15 %, 50 – 60 Hz<br>115 V +10 / –15 %, 50 – 60 Hz (optional)<br>24 V +10 / –15 %, 50 – 60 Hz (optional) |
| Power consuption [VA] | 25 |
| Fuse | Thermal fuse M 0.2 A 5 x 20 at 230 V<br>Thermal fuse M 0.4 A 5 x 20 at 115 V<br>Thermal fuse M 1.0 A 5 x 20 at 24 V |
| Housing | Field case for wall installation |
| Housing material | Die-cast aluminium |
| Protection | IP 65 (DIN EN 60529) |
| Admissible ambient temperature [°C] | 0 – 55 |
| Weight [kg] | approx. 3.6 |

## Component Parts

### OR 52-5, OR 52-6



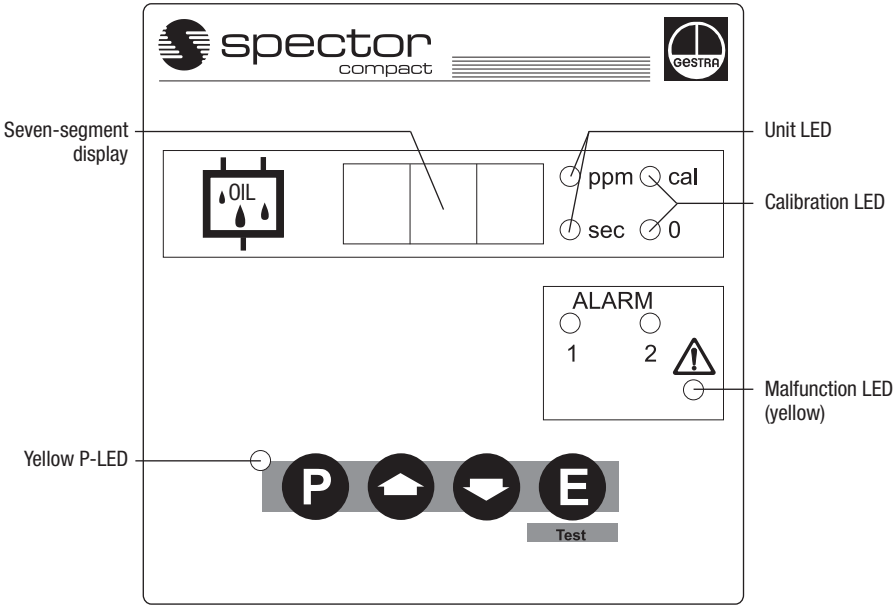
## Component Parts – continued –

### Key

- **A** Nipple with threaded ends
- **B** Ball valve ¾" BSP (EN ISO 228-1)
- **C** Upper cover flange
- **D** Light receiver with tube
- **E** Ball valve ¾" BSP (EN ISO 228-1) for purging
- **F** Vent nipple
- **G** Drying cartridge
- **H** Cleaning plunger
- **I** Hexagon-head screw M 8 x 30 EN 24017
- **J** Lower flange
- **K** Support for cleaning ring
- **L** Cleaning ring (wiper)
- **M** Ring
- **N** Retaining ring 19 x 1.2
- **O** Screw
- **P** Connector for light emitter / light receiver
- **Q** Light emitter
- **R** Tube
- **S** Turbidity standard
- **T** Housing
- **U** Glass cylinder
- **V** O-ring 25 x 3
- **W** O-ring 30 x 2
- **X** O-ring 37 x 2
- **Y** Mounting bracket
- **Z** Screwed union

# Functional Elements

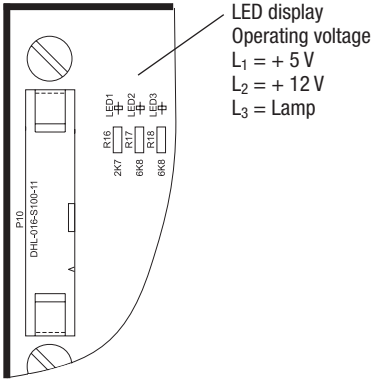
## Measuring transducer



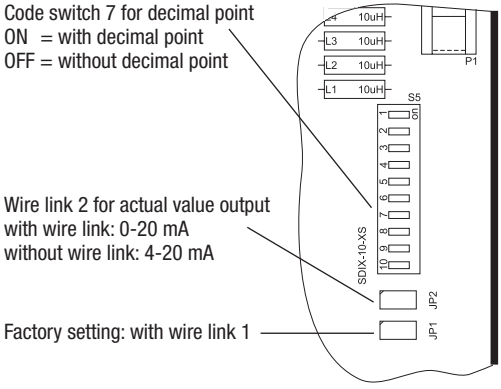

The push buttons have the following functions:

- P = Program
- = Increase
- = Decrease
- E = Enter/Test mode

## Partial view of base plate




## Partial view of front plate



# Installation

## Measuring sensor ORG 12, ORG 22

It is highly advisable to have the installation work done by qualified staff in the manner described by these installation instructions. The manufacturer will not accept liability for damage resulting from improper installation.

The measuring transducer is designed for wall mounting and should be installed close to the measuring sensor.
Install the measuring sensor and lines in accordance with the examples given in **figs. 2 to 7**.

Provide a throttling point – e. g. a non-return valve (GESTRA type RK 86) in the main line. Mount the measuring sensor in a bypass at a lower level than the main line so that any gas bubbles and flash steam can pass through the main line instead of the sensor. Tap main line at the side from the bottom to prevent air and dirt particles from flowing into the bypass.

If the fluid temperature is above the max. ambient temperature:
Screw in vent nipple Ⓕ.

If the fluid temperature is below the ambient temperature:
Remove the plastic lid from the drying cartridge Ⓖ (blue colour) and screw in the drying cartridge Ⓖ.

If the fluid temperature is very high:
Provide a non-insulated pipe upstream of ORG 12/ORG 22 which will allow the fluid to cool down to 120 °C when reaching the sensor.

In the presence of large amounts of gas:
Tapping point must be at the bottom of the line – use a welding pocket in accordance with DIN 2618 (see page 15 **fig. 5**).

If the condensate can be/is highly contaminated:
Ensure downward flow of the fluid through the glass cylinder Ⓤ (glass cylinder may be scratched), for installation see page 15 **fig. 3**.

If this does not help and/or a lot of flash steam builds up ahead of the measuring sensor fit a separator upstream of the equipment (see page 16, **fig. 6**).

**Attention**

Avoid flashing, outgassing and the presence of air due to a pressure drop upstream of the measuring sensor.

The additional connection of the cover flange Ⓒ must be reserved for the inlet of either wash water or calibration fluid.

### Measuring sensor ORG 12, ORG 22 – continued –

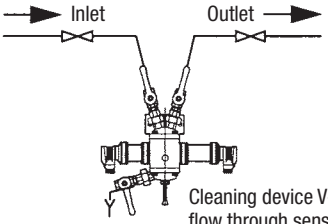



**Fig. 2**

Sensor installed in a sample line, e. g. water treatment, beer filtering, permeate downstream of reverse osmosis.

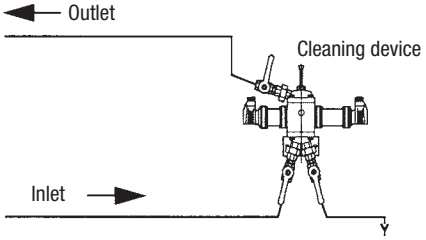



**Fig. 3**

Installation of sensor when the condensate contains suspended solids. If the sensor is installed in acc. with **figs. 4 – 6**, solids could deposit on the cleaning device and scratch the glass cylinder ❶.

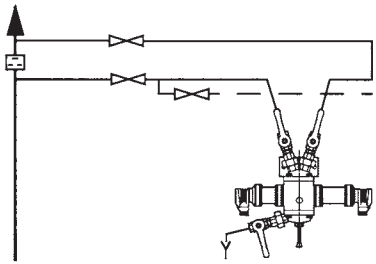


**Fig. 4**

Sensor installed in a bypass of a product line with upward flow.

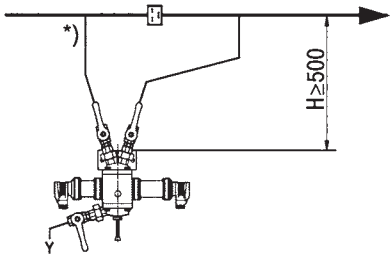



**Fig. 5**

Sensor installed below a product line carrying a slight amount of gas, e. g. sufficiently sized condensate line (flashing) downstream of steam traps.

*) Tap product line at the side (angle of 45°) from the bottom to prevent air and dirt from flowing into the bypass.

### Measuring sensor ORG 12, ORG 22 – continued –

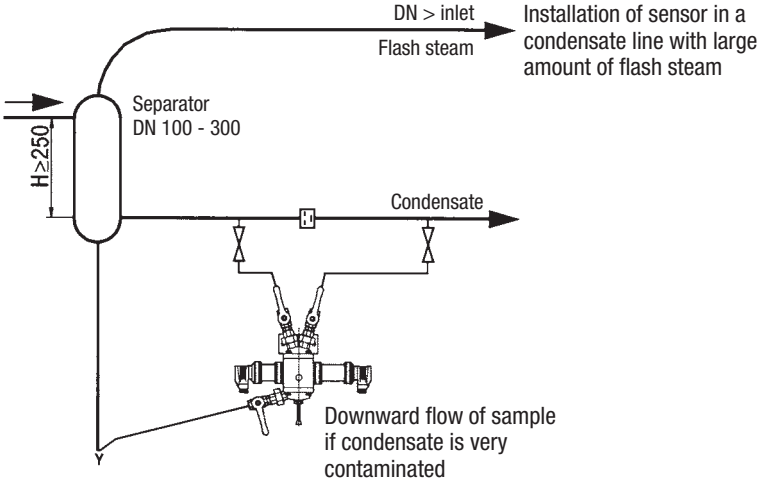



**Fig. 6**

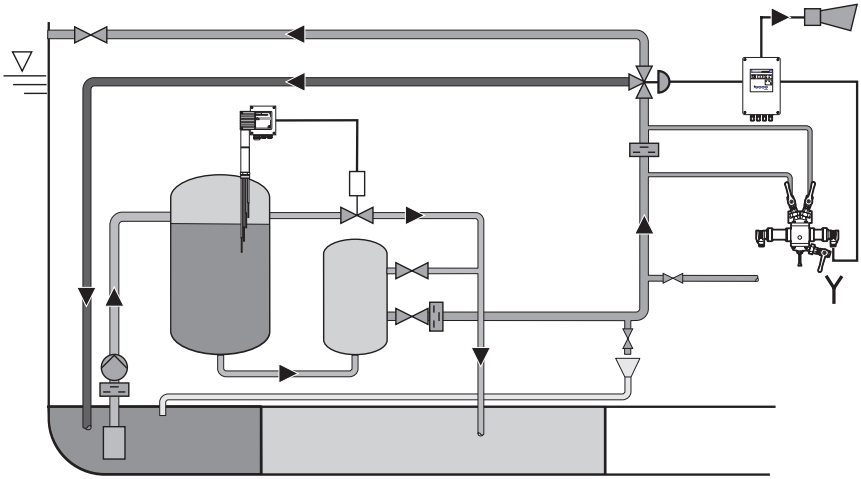



**Fig. 7** *Schematic layout of oily water separation system for bilge water with the oil and turbidity detector OR 52 as 15 ppm oil content alarm.*

### Measuring sensor ORG 12, ORG 22 – continued –

The cover flange Ⓒ and lower flange Ⓙ of the measuring sensor can be screwed turned through 90°.

1. Screw in nipples with threaded ends Ⓐ, screwed unions Ⓩ and ball valves Ⓑ supplied with the sensor into upper cover flange Ⓒ and lower flange Ⓙ or directly at the inlet, outlet or purging points. Use teflon tape for sealing.
2. The screwed unions Ⓩ facilitate positioning of the ball valves Ⓑ so that the levers can be arranged in one plane (front).
3. Fit the ORG 12 / ORG 22 with the mounting bracket Ⓨ provided in an accessible place. If the sensor is used on ships weld mounting bracket Ⓨ to its support.
4. For the inlet and outlet lines of the sensor use 12 mm OD Ermeto, 10 mm OD gas pipe or suitable flexible tubes (for rinsing purposes).
5. Fit the light receiver Ⓓ in an accessible place. It can then be easily removed so that visual inspection of the fluid is possible. The interchange of light emitter Ⓠ and light receiver Ⓓ is possible after loosening the union nuts (inside) from the housing Ⓣ. When refitting, take care of correct fit of locating pins of the housing Ⓣ in the grooves provided in light emitter Ⓠ and receiver Ⓓ. Tighten union nuts.

Be sure the equipment is damp proof – condensate on the outside of glass cylinder Ⓤ results in excessively high readings.

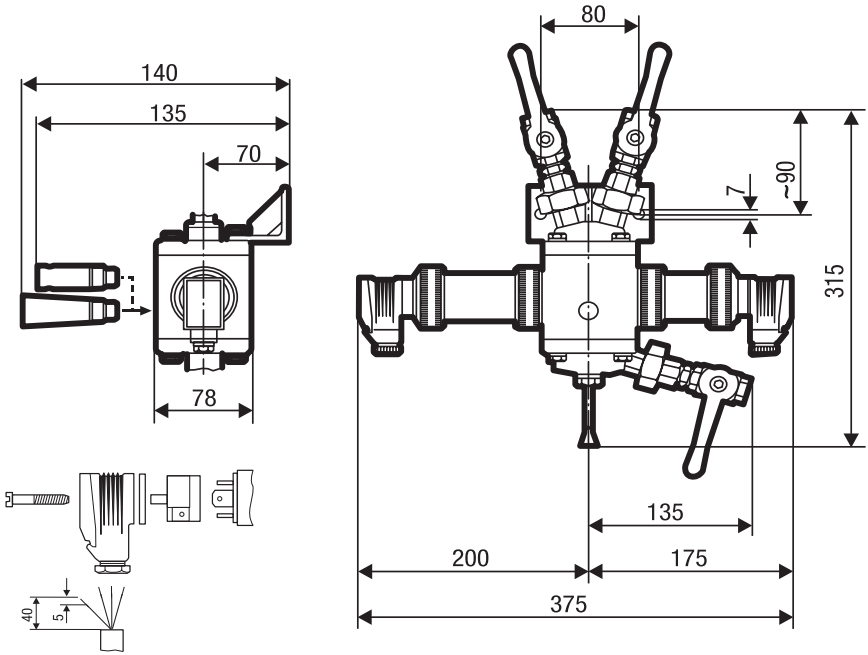



**Fig. 8**

## Measuring transducer ORT 6

Unscrew cover screws and swing up cover in order to gain access to the holes for mounting the equipment. The distance between the holes is indicated on the back of the case. Use suitable screws and wall plugs to mount the measuring transducer.

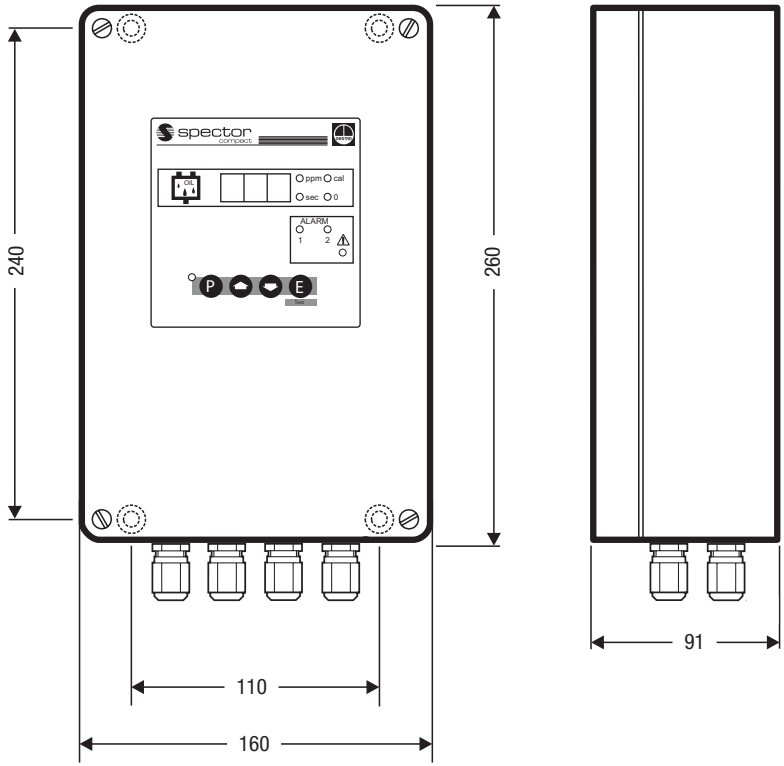



**Fig. 9**

# Wiring

## Measuring sensor ORG 12, ORG 22

Before installing the measuring sensor cut off power supply!

Connect light emitter Q and receiver D via connector P.

1. Wire light emitter Q with a screened two-core cable **(do NOT connect screen)**, e. g. LIYIC 2 x 0.75 $mm^2$, max. length 50 m).
2. Wire light receiver D with screened four-core cable **(do NOT connect screen)**, e. g. LIYIC 4 x 0.5 $mm^2$, max. length 50 m).

## Measuring transducer ORT 6

1. Unscrew lid screws and open lid.
2. Remove all three-pole terminal strips and pull connecting cables through cable glands.
3. Mark connecting cables: “Mains”, “Alarm 1” and “Alarm 2”.
4. Strip off approx. 40 mm of cable insulation coating and remove approx. 5 mm of conductor end insulation.
5. Connect terminal strips in accordance with wiring diagram and **connect screens**.
6. Connect PE with earthing screw in case.
7. Re-insert terminal strips.
8. Seal cable glands by tightening screws. Fit plug supplied with equipment to seal unused cable glands.
9. Close lid and tighten lid screws.
10. Mount disconnecting device (disconnecting switch).

### Attention

To protect the output contacts fuse circuits with 2.5 A (anti-surge).

Provide connected contactors and actuators with RC combinations (in accordance with manufacturers‘ specifications) in order to suppress interference.

Make sure that the disconnecting switch is easily accessible and in the close proximity of the equipment (EN 61010-1).

Mark respective switch as disconnecting device for the measuring transducer.

## Wiring – continued –

### Tools

- Screwdriver for cross-recess screws, size 1 and 2
- Screwdriver for slotted screws, size 2.5, completely insulated to VDE 0680
- Conductor end sleeve pliers
- Insulation stripper

### Wiring diagram ORG 12, ORG 22, ORT 6

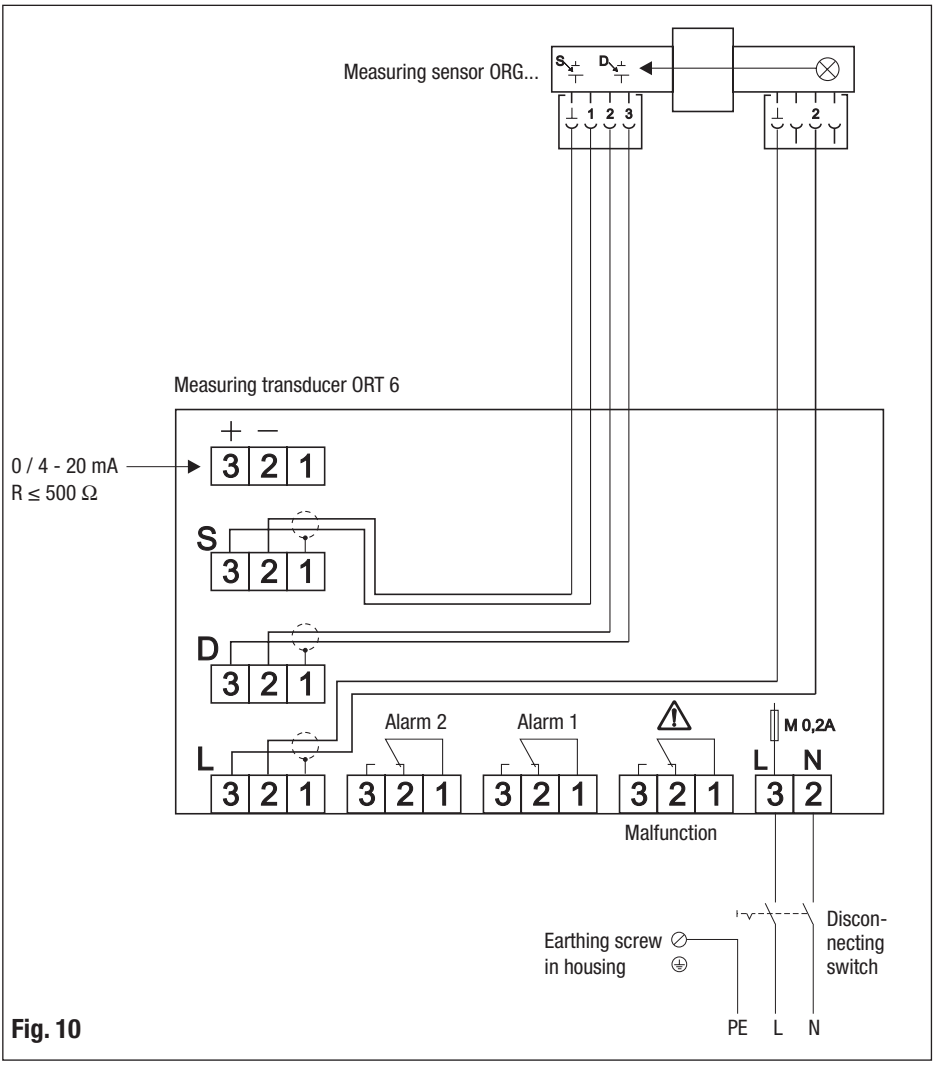



**Fig. 10**

## Wiring diagram ORG12, ORG 22, ORT6 with three-way valve

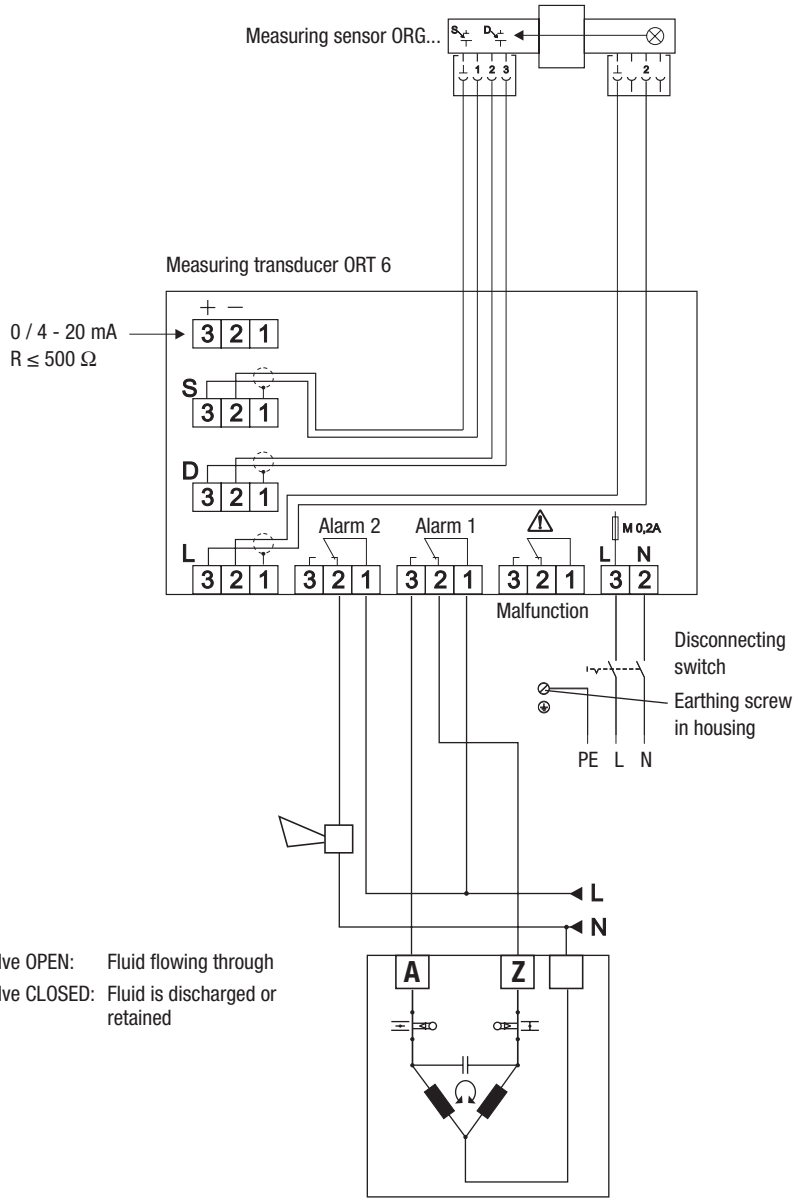



**Fig. 11**

## Commissioning Procedure

### Factory set default values

The measuring transducer features the following factory settings:

- Limit value: Alarm 1: 3 ppm
- Limit value: Alarm 2: 5 ppm
- Delay of response: Alarm 1: 1 sec.
- Delay of response: Alarm 2: 1 sec.
- Actual value output: wire link 2 established = 0 - 20 mA
- Seven-segment display without decimal point

**Attention**

The terminal strips of the measuring transducer are live during operation. This presents the risk of electric shock.

Cut off power supply before opening the housing lid!

Before commissioning rinse the measuring sensor. Do not use caustic agents for flushing unless the use of such agents is explicitly permitted by the manufacturer.

**Note**

Adjust two different limit values if you want to use for instance alarm contact 1 for a first alarm and alarm contact 2 for the main alarm.

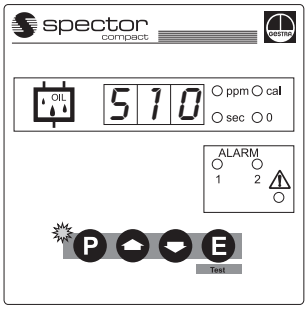
For condensate and bilge water monitoring alarm contact 1 can then be used to control a three-way valve, which will discharge the unusable condensate if the level of turbidity is too high (alarm caused by ingress of oil or start-up protection). Alarm contact 2 will trigger the main alarm / shut-down.

Valves with single-phase A.C. motor, max. power rating 50 VA (see wiring diagram on page 21, **fig. 11**) can be connected directly. If a three-phase actuator is used fit a reversing contactor in between. Pneumatically operated valves can be controlled via solenoid valves.

## Commissioning Procedure – continued –

### Start-up procedure

1. Switch on measuring transducer (disconnecting switch).
2. Rinse measuring transducer ORG 12/22 for at least 15 minutes and operate cleaning device Ⓗ if necessary.
3. Make sure that the ORG 12/22 is completely free of air. For visual inspection undo union nuts (inside) and remove light receiver Ⓓ. When screwing the light receiver in again make sure that the locating pin fits exactly in the corresponding groove at the front collar of the light receiver Ⓓ.

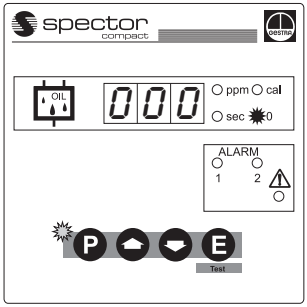



### 0 % calibration

Use tap water (with low fluid temperature) or oil-free condensate as turbidity zero.

1. Press Ⓟ until yellow P-LED lights up.
2. Use ⬘ ⬙ to change the LED display until the calibration LED 0 lights up. The calibration value (digits) saved last will be indicated.
3. Press Ⓟ, the yellow P-LED and the 7-segment display are flashing.
4. Press Ⓔ, the 0 % value is saved as basic turbidity. The P-LED and the 7-segment display are illuminated. If the basic turbidity is too high an error message will pop up.
5. Press Ⓔ, the equipment returns to normal operation, 0 ppm is indicated and the LED for ppm is illuminated.

To cancel press Ⓟ twice, the yellow P-LED will light up again.



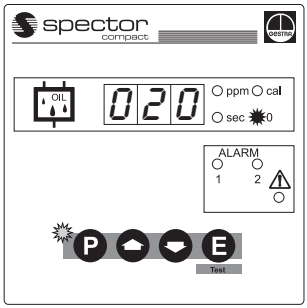
## Commissioning Procedure – continued –

### 100 % calibration

Fit turbidity standard 20 ppm Ⓢ supplied with the equipment to the light emitter Ⓡ. Unscrew union nut (inside) from tube Ⓡ and remove light emitter Ⓠ from housing Ⓣ of the sightglass. Place turbidity standard Ⓢ on black tube Ⓡ so that the screen fitted in the standard Ⓢ is exactly congruent with the screen of the tube Ⓡ. Screw in light emitter Ⓠ, making sure that the locating pin of the housing Ⓣ fits into the groove of the tube Ⓡ. Tighten union nuts (inside).
Make sure that the liquid used for the calibration of the zero point stays in the glass cylinder.

Further adjustments of the measuring transducer:

1. Press Ⓟ, the yellow P-LED lights up.
2. Press ▲ ▼ to change the LED display until the calibration LED cal lights up. The calibration value (digits) saved last will be indicated.
3. Press Ⓟ, the yellow P-LED and the 7-segment display are flashing.
4. Press Ⓔ, the 100 % value is saved. The P-LED and the 7-segment display are illuminated.
5. Press Ⓔ, the equipment returns to normal operation, 20 ppm is indicated and the LED for ppm is illuminated.




To cancel press Ⓟ twice, the yellow P-LED will light up again.

Remove turbidity standard from measuring transducer and store carefully. Make sure that it cannot be scratched.

## Commissioning Procedure – continued –

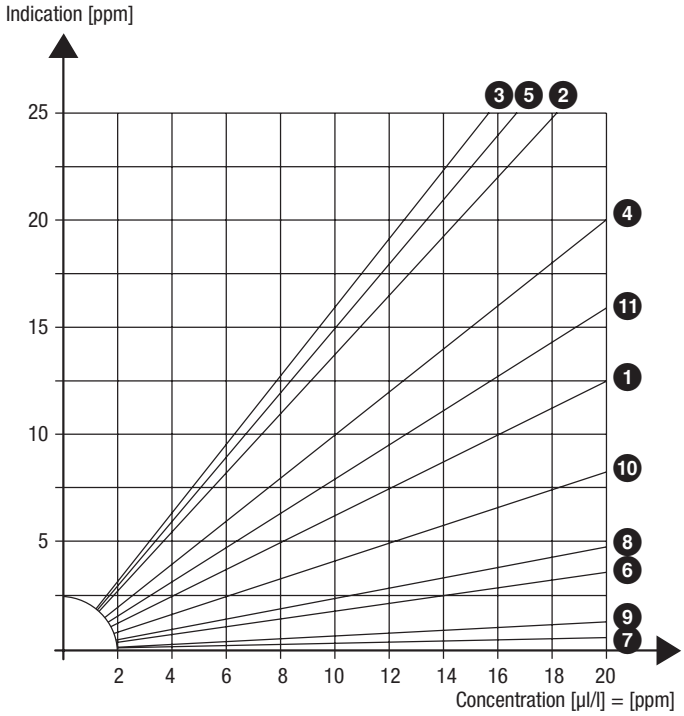
### Oil / turbidity curves

A light beam shines through the liquid and any foreign matter which is not dissolved scatters the beam. The scattered light intensity increases in proportion to the concentration of suspended particles, the degree of turbidity depending on:

- size of the particles (degree of emulsification)
- shape and composition of the particles
- optical properties of the particles

In the case of oils, fats and greases the degree of emulsification is a decisive factor.

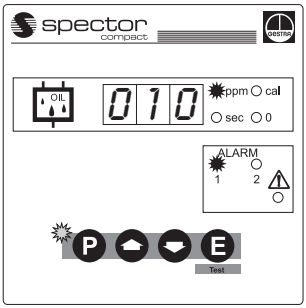
### Different suspended particles in the fluid




1. Fuel oil EL, 15 °C, coarse emulsification
2. Fuel oil EL, 15 °C, fine emulsification
3. Fuel oil EL, 80 °C, fine emulsification
4. Engine oil (medium), 15 °C, fine emulsification
5. Vegetable oil, 15 °C fine emulsification
6. Xylene, 20 °C, fine emulsification
7. Xylene, 80 °C, fine emulsification
8. Red-berry juice, concentrated
9. Black-berry juice, concentrated
10. Skimmed milk, fat content 0.1% referred to fat concentration
11. Turbine oil T 68, gear oil M 68

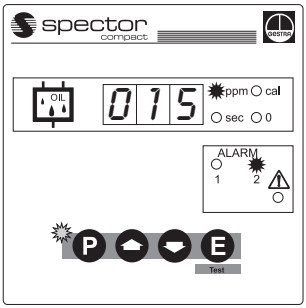
## Commissioning Procedure – continued –

### Adjusting limit alarm 1




1. Press P, the yellow P-LED lights up.
2. Use ▲ ▼ to change the LED display until LED Alarm 1 and LED ppm light up. The value saved last is shown.
3. Press P, the yellow P-LED and the second digit of the 7-segment display are flashing.
4. Use ▲ ▼ to change the digit, press E to save the setting and move to the third digit. The third digit is now flashing.
5. Use ▲ ▼ to change the digit, press E to save the setting. The P-LED and the 7-segment display are illuminated. A limit value of max. 15 ppm can be adjusted.
6. Press E, the equipment returns to normal operation, the actual value is indicated and the LED ppm is illuminated.

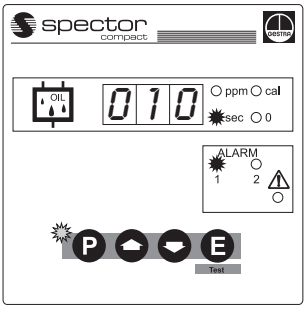
### Adjusting limit alarm 2




1. Press P, the yellow P-LED lights up.
2. Use ▲ ▼ to change the LED display until LED Alarm 2 and LED ppm light up. The value saved last is shown.
3. Press P, the yellow P-LED and the second digit of the 7-segment display are flashing.
4. Use ▲ ▼ to change the digit, press E to save the setting and move to the third digit. The third digit is now flashing.
5. Use ▲ ▼ to change the digit, press E to save the settings. The P-LED and the 7-segment display are illuminated. A limit value of max. 15 ppm can be adjusted.
6. Press E, the equipment returns to normal operation, the actual value is indicated and the LED ppm is illuminated.

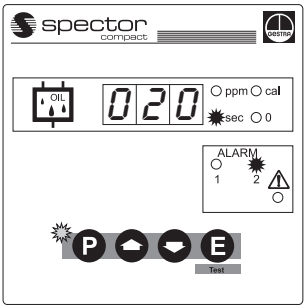
## Commissioning Procedure – continued –

### Adjusting time delay for alarm 1




1. Press P, the yellow P-LED lights up.
2. Use ▲ ▼ to change the LED display until LED Alarm 1 and LED ppm light up. The value saved last is shown.
3. Press P, the yellow P-LED and the second digit of the 7-segment display are flashing.
4. Use ▲ ▼ to change the digit, press E to save the setting and move to the third digit.
   The third digit is now flashing.
5. Use ▲ ▼ to change the digit, press E to save the setting.
   The yellow P-LED and the 7-segment display are illuminated.
   A max. time delay of 20 sec. can be adjusted.
6. Press E, the equipment returns to normal operation, the actual value is indicated and the LED ppm is illuminated.

### Adjusting time delay for alarm 2



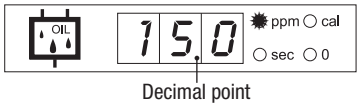

1. Press P, the yellow P-LED lights up.
2. Use ▲ ▼ to change the LED display until LED Alarm 2 and LED ppm light up. The value saved last is shown.
3. Press P, the yellow P-LED and the second digit of the 7-segment display are flashing.
4. Use ▲ ▼ to change the digit, press E to save the setting and move to the third digit.
   The third digit is now flashing.
5. Use ▲ ▼ to change the digit, press E to save the setting.
   The yellow P-LED and the 7-segment display are illuminated.
   A max. time delay of 20 sec. can be adjusted.
6. Press E, the equipment returns to normal operation, the actual value is indicated and the LED ppm is illuminated.

## Commissioning Procedure – continued –

### Indicating decimal point

The 7-segment display can show a decimal point.

This setting does not have any effect on the adjusted limit values and time delays.




Cut off power supply!

Open housing lid of the measuring transducer and set code switch 7 on lid plate to ON.

### Setting actual value output

The actual value output can be changed from 0 – 20 mA to 4 – 20 mA.

Cut off power supply!
Open the housing lid and remove wire link 2 from the lid plate.

Wire link 2 set: actual value output 0 – 20 mA
Wire link 2 removed: actual value output 4 – 20 mA

**Danger**

The terminal strips of the measuring transducer are live during operation.
This presents the risk of severe injuries due to electric shock.
Cut off power supply before opening the housing lid.

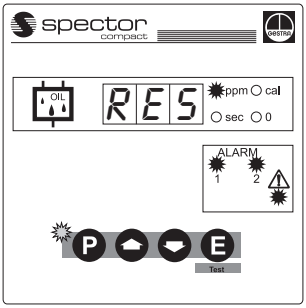
## Functional Test

### OR 52-5, OR 52-6

1. Push cleaning device Ⓗ slowly into mid-position to simulate a malfunction.
2. The LED “Malfunction” lights up and the relay contact “Malfunction” opens.
   First error code E 03 is indicated and then error code E 08.
3. Push cleaning device Ⓗ back to its initial position.
   The equipment must return to normal operation.

### Functional test relay alarm 1, alarm 2 and malfunction

1. Press Ⓔ briefly to activate the test mode for 10 sec.
   The 7-segment display shows *RES*.
2. Press Ⓟ. While the button is held down LED Alarm 1 lights up and relay contact Alarm 1 opens.
3. Press ⓤ. While the button is held down LED Alarm 2 lights up and relay contact Alarm 2 opens.
4. Press ⓓ. While the button is held down the LED Malfunction lights up and the relay contact Malfunction opens.



# Operation

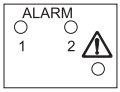
## Start

Apply power.

The 7-segment display shows briefly the version number of the software.

Then the indicator counts until the actual value is reached.

The LED ppm is illuminated.

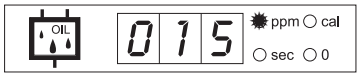



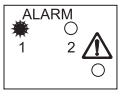

## Alarm 1 and 2

When the limit value for alarm 1 or 2 is exceeded the adjusted time delay is activated. The LED alarm 1 or LED alarm 2 is flashing.

After the time delay has elapsed LED alarm 1 or LED alarm 2 will light up.

The relay contact for alarm 1 or 2 opens.




### Attention

When the limit values are exceeded the measuring transducer will not interlock automatically. If the installation requires a lockout function, the latter must be implemented in the sequence circuit (burner protection circuit). This circuit must comply with the requirements of the DIN VDE 0116 regulations.

# Malfunctions

## Fault finding list for troubleshooting

1. The measuring transducer does not work – no function, no display

   ***Fault:*** Equipment fuse defective.
   ***Remedy:*** Replace equipment fuse with a new one. Check power supply.

   ***Fault:*** Power failure. Not all three green LEDs on the base plate are illuminated at the same time.
   ***Remedy:*** Check power supply or replace measuring transducer.

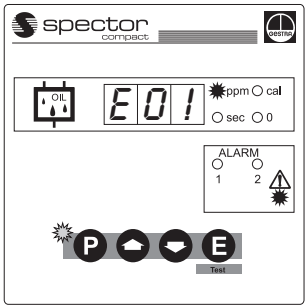
2. Measured value increases steadily by 1 ppm per day (or slower) – ingress of foreign matter can be ruled out

   ***Fault:*** Growing contamination of glass cylinder.
   ***Remedy:*** Operate cleaning device ❽ more often.

## Error code – Indication

In the event of a malfunction the yellow LED Malfunction lights up, the relay output Malfunction opens and the 7-segment display indicates the error code.

The raising of an alarm is not effected by a malfunction.




## Error code – Table

| Error code | Possible reason | Remedy |
|---|---|---|
| **E01** | Glow lamp in light emitter ❹ contaminated | Replace glow lamp |
| | Glass cylinder ❺ contaminated | Clean or replace glass cylinder ❺ |
| | Turbidity of fluid too high | Provide mechanical cleaning stage ahead of equipment |
| | Operating voltage too low | Check supply voltage |
| | Cleaning device ❽ not in its initial position | Return cleaning device ❽ to its initial position |
| | Ingress of solids | Provide mechanical cleaning stage ahead of equipment |

## Malfunctions – continued –

### Error Code – Table – continued –

| Error code | Possible reason | Remedy |
|---|---|---|
| E03 | Glow lamp in light emitter Q defective. A frequent occurrence of this problem indicates heat accumulation in light emitter Q (despite fluid temp. > 60 °C drying cartridge mounted) | Replace glow lamp. Remove drying cartridge G and install vent nipple F |
| | Cable connection to light emitter Q interrupted | Check connecting cables |
| | Cleaning device H not in its initial position | Return cleaning device H to its initial position |
| | Ingress of solids | Provide mechanical cleaning stage ahead of equipment |

| Error code | Possible reason | Remedy |
|---|---|---|
| E05 | Basic turbidity > 10 ppm | Provide mechanical cleaning stage ahead of equipment |
| | Glass cylinder U scratched (ingress of solids) | Replace glass cylinder U. Install sensor acc. to installation example **fig. 3** |
| | Glass cylinder U contaminated | Clean or replace glass cylinder U |
| | Ingress of solids | Provide mechanical cleaning stage ahead of equipment |
| | Presence of gas or steam bubbles (flashing) | Throttle outlet |

| Error code | Possible reason | Remedy |
|---|---|---|
| E06 | Light receiver D defective or incorrectly connected. | Replace light receiver D or check connecting cables |
| | Measuring transducer defective | Replace measuring transducer |

| Error code | Possible reason | Remedy |
|---|---|---|
| E08 | Glow lamp or light emitter Q defective | Replace glow lamp |
| | Connection to light receiver D / emitter Q interrupted | Check connecting cables |
| | Cleaning device H not in its initial position | Return cleaning device H to its initial position |
| | Ingress of solids | Provide mechanical cleaning stage ahead of equipment |

**Once the fault is eliminated the equipment will return to normal operation.**

## Malfunctions – continued –

### Replacing glass cylinder

1. Close ball valves Ⓑ for inlet and outlet. Open ball valve for rinsing Ⓔ.
2. Slacken (but do not remove) the eight hexagon head screws Ⓘ. Insert the cleaning device Ⓗ into the housing Ⓣ (for fitting pull out the cleaning device as shown on page 15, **fig. 3**), unscrew the four hexagon head screws Ⓘ on top and remove the housing Ⓣ.
3. Pull out the cleaning device Ⓗ and remove the glass cylinder Ⓤ. If the equipment has not been used for a longer period of time, the glass cylinder Ⓤ might be stuck due to dirt accumulated on the upper cover flange Ⓒ.
4. Check whether housing Ⓣ, upper cover flange Ⓒ and lower flange Ⓙ are completely dry inside. If not, dry housing Ⓣ with compressed air as any moisture remaining in the housing would lead to the glass cylinder Ⓤ becoming covered with mist when cold fluids are used and this would lead to faulty measurements.
5. Undo the four hexagon head screws Ⓘ at the bottom.
6. Take out the O-rings Ⓥ Ⓦ Ⓧ, clean seating surfaces and insert new O-rings Ⓥ Ⓦ Ⓧ.
7. Hold new and dry glass cylinder Ⓤ at the rim and push it over the seat of the upper cover flange Ⓒ.
8. Attach the housing Ⓣ to the upper cover flange Ⓒ using screws Ⓘ.
9. Insert the plunger Ⓚ of the cleaning device Ⓗ into the glass cylinder Ⓤ and screw the lower flange Ⓙ to the housing Ⓣ.
10. Close ball valve for rinsing Ⓔ, open ball valves Ⓑ for inlet and outlet.
11. Check 0 % and 100 % settings of the measuring transducer.

### Cleaning glass cylinder

1. Move ring Ⓛ of the cleaning device Ⓗ up and down. Note that dependent on the adjusted time delay Alarm 1 and/or Alarm 2 may be triggered off.
2. Move ring Ⓛ of the cleaning device Ⓗ back to its initial position (operating bar protrudes approx. 70 mm from the sightglass). If the glass cylinder is very contaminated replace the wiping ring Ⓛ of the cleaning device Ⓗ.

Clean glass cylinder Ⓤ at regular intervals – at least once a week, dependent on the degree of contamination of the fluid. Replace glass cylinder Ⓤ if it is strongly contaminated.

### Replacing cleaning plunger

1. Close ball valves Ⓑ for inlet and outlet. Open ball valve for rinsing Ⓔ.
2. Pull out cleaning device Ⓗ and unscrew the four hexagon head screws Ⓘ of the lower flange Ⓙ. Remove lower flange Ⓙ with cleaning device Ⓗ.
3. Use screwdriver for bending open the inside serrations of the fixing disc and remove the fixing disc.
4. Take out plunger Ⓚ and insert new plunger Ⓚ.
5. Mount new fixing disc. Make sure that the serrations point in the opposite direction of the plunger Ⓚ.
6. Remove O-rings Ⓥ Ⓦ Ⓧ from the lower flange, clean seating surfaces and insert new O-rings Ⓥ Ⓦ Ⓧ.
7. Push plunger Ⓚ of the cleaning device Ⓗ into the glass cylinder Ⓤ and screw lower flange Ⓙ firmly to housing Ⓣ.
8. Close ball valve for rinsing Ⓔ, open ball valves Ⓑ for inlet and outlet.
9. Check 0 % and 100 % settings of the measuring transducer.

# Malfunctions – continued –

## Replacing drying cartridge

Replace drying cartridge Ⓖ when its content turns pink. Should this happen too often check the following items for tightness:

- O-rings at light emitter Ⓠ and receiver Ⓗ
- Gaskets at connectors Ⓟ, front gaskets of glass cylinder Ⓤ
- Cable glands at connectors Ⓟ of light emitter Ⓠ and receiver Ⓓ

## Replacing glow lamp

1. Unscrew and remove union nut (outside) of tube Ⓡ of light emitter Ⓠ.
2. Replace glow lamp (12 V  10 W) with a new one.
3. Fit light emitter Ⓠ. Take care that the locating pin of the light emitter Ⓠ fits the groove provided on the tube Ⓡ. Tighten union nut.
4. Repeat calibration of zero point (0 %) and measuring range (100 %) at measuring transducer.

## Replacing equipment fuse

1. Open housing cover of the measuring transducer.
2. Turn fuse carrier to the left and take it off.
3. Replace equipment fuse with a new one:
   Type (anti-surge) 0.2 A 5 x 20 at 230 V, (anti-surge) 0.4 A 5 x 20 at 115 V,
   (anti surge) M 1.0 A 5 x 20 at 24 V.
4. Fit fuse carrier in place and turn it to the right. Close housing cover.

### Danger

The terminal strip of the measuring transducer is live during operation.
This presents the danger of severe injuries due to electric shock.

Cut off power supply before opening the housing cover.

## Tools

- Spanner for hexagon head screws, A. F. 13
- Screwdriver for slotted head screws, size 2.5

### Spare parts

A spare parts kit containing the following items is available on request:

| Item | Designation | Qty. |
|---|---|---|
| U | Glass cylinder | 1 |
| V | O-Ring 25 x 3 | 2 |
| W | O-Ring 30 x 2 | 2 |
| X | O-Ring 37 x 2 | 4 |
| | Glow lamp | 2 |
| For cleaning device | | |
| K | Plunger | 1 |
| M | Ring | 1 |
| L | Cleaning ring (wiper) | 1 |
| N | Retaining ring 19 x 1.2 | 1 |
| | Fixing disc | 1 |

# Annex

## Declaration of Conformity

GESTRA

### EUROPEAN COMMUNITY DECLARATION OF CONFORMITY

Issued in accordance with

**MARINE EQUIPMENT DIRECTIVE (MED) 96/98/EC**
**AND AMENDING DIRECTIVE 98/85/EC, DIRECTIVE 2001/53/EC,**
**DIRECTIVE 2002/75/EC AND DIRECTIVE 2002/84/EC**

This is to certify that in compliance with the Council Directive 96/98/EC of 20th December 1996 and amending Directive 98/85/EC of 11th November 1998, Directive 2001/53/EC of 10th July 2001 and Directive 2002/75/EC of 2nd September 2002 and Directive 2002/84/EC of November 2002 on marine equipment::

**GESTRA GmbH**
**Münchener Straße 77**
**D-28215 Bremen**
**Federal Republic of Germany**

Declares that the product detailed below has been manufactured in accordance with the requirements of an annex B Module D Production Quality Assurance system as approved by Lloyd`s Register (Notified Body No. 0038, Certificate Module D: MED 0200016) to conform to type as described in the following EC Type Examination Certificate as issued by SEE-Berufsgenossenschaft (Notified Body No. 0736) in accordance with Annex B Module B:

| | |
|---|---|
| **Certificate Number:** | **320.027** |
| **Product Reference:** | **Oil-content meter** |
| **Product Description and Specified Standard:** | **Type OR 52-5**<br>**Oil content meter ( 15-ppm alarm) for oily water separating eqipment on sea going vessels acc. MARPOL 73/78, Annex I, Reg.16** |

0038/YY

| | | |
|---|---|---|
| Signed: | i.V. | i.V. |
| Name: | Lars Bohl | Uwe Bledschun |
| Position: | Quality Manager | Design Manager |
| Location and Date: | Bremen, 2003-05-12 | |

## Declaration of Conformity – continued –

GESTRA

### Declaration of Conformity CE

We hereby declare that the equipment specified further down conform to the following European guidelines:

- **Low Voltage Directive (LVD) 73/23/eec (items of electrical equipment used within certain voltage ranges), version 93/68/eec**
- **EC Directive of Electromagnetic Compatibility (EMC) 89/336/eec, version 93/68/eec**

| | |
|---|---|
| Name and address of manufacturer: | **GESTRA GmbH**<br>**Münchener Str. 77, 28215 Bremen, Germany** |
| Equipment specification: | **Oil and Turbidity Detector** |
| Type designation: | **OR 52 – 5; OR 52 – 6** |
| Usage for the intended purpose: | **Equipment for monitoring oil content of boiler feedwater** |
| Applied harmonised standards: | **Guideline on LVD: EN 50 178**<br>**Guideline on EMC: EN 50 081-2, EN 50 082-2** |
| Other technical regulations applied: | **VdTÜV Bulletin (draft) "Water Level Monitoring 100", draft 10.2001** |

This declaration is no longer valid if modifications are made to the equipment without consultation with us.

Bremen, 8th January 2003
GESTRA GmbH

i.V. (Head of Design Dept.)

i.V. (Quality Assurance Manager)

GESTRA

## EG-Konformitätserklärung

Für das nachstehend beschriebene Gerät erklären wir hiermit die Konformität mit folgenden EG-Richtlinien:

- **EG-Richtlinie 73/23/EWG (Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen) in der Fassung 93/68/EWG**
- **EG-Richtlinie 89/336/EWG (Elektromagnetische Verträglichkeit) in der Fassung 93/68/EWG**

| | |
|---|---|
| Name und Anschrift des Herstellers | **GESTRA GmbH**<br>**Münchener Straße 77; D-28215 Bremen** |
| Gerätebeschreibung | **Öl- / Trübungsmelder** |
| Typenbezeichnung | **OR 52 – 5; OR 52 – 6** |
| Bestimmungsgemäße Verwendung | **Ölgehaltsmeßgerät für Kessel-Speisewasser** |
| Angewandte harmonisierte Normen | **NSP-Richtlinie: EN 50 178**<br>**EMV-Richtlinie: EN 50 081-2, EN 50 082-2** |
| Angewandte andere technischen Regeln | **VdTÜV-Merkblatt-Entwurf „Wasserüberwachungseinrichtung 100“, Entwurf 10.2001** |

Bei einer Änderung der Geräte verliert diese Erklärung ihre Gültigkeit.

Bremen, den 25.08.2002
GESTRA GmbH

i.V. [signature]
(Entwicklung & Konstruktion)

i.V. [signature]
(Qualitätsbeauftragter)

## Certificate of Type Approval

# TYPENZULASSUNGSZEUGNIS
## für Ölgehaltsmeßgeräte

**verwendet für Bilge-Alarme (15 ppm Alarm)**
*Certificate of Type Approval for Oil Content Meters intended for Bilge Alarms (15 ppm alarm)*

**Ausgestellt im Namen der Regierung der**
**BUNDESREPUBLIK DEUTSCHLAND**
**durch die SEE-BERUFSGENOSSENSCHAFT**
*Issued under the authority of the Government of the FEDERAL REPUBLIC OF GERMANY by See-Berufsgenossenschaft*

**Hiermit wird bescheinigt, daß das Ölgehaltsmeßgerät, das die nachstehend aufgeführten Anlageteile umfaßt, einer Prüfung unterzogen und gemäß den Anforderungen der technischen Beschreibung, enthalten in Teil 2 der Anlage zur Empfehlung der IMO-Entschließung MEPC.60(33) , erprobt wurde.**
*This is to certify that the oil content meter comprising the equipment listed below has been examined and tested in accordance with the requirements of the Specifications contained in Part 2 of the Annex to the Guidelines and Specifications contained in IMO-Resolution MEPC.60(33).*

**Dieses Zeugnis ist nur für nachstehendes Ölgehaltsmeßgerät gültig.**
*This certificate is valid only for an oil content meter referred to below.*

**Anlage geliefert durch:** **GESTRA GmbH, Münchener Straße 77, D-28215 Bremen**
*Oil content meter supplied by:*

**Typbezeichnung:** **OR 52-5**
*under type and model designation and incorporating:*

**Die Analyse-Einheit des Ölgehaltsmeßgerätes wurde hergestellt durch:** GESTRA GmbH
*Oil content meter analysing unit manufactured by:*

**Zusammenstellungszeichnung Nr.:** ORG 12, ORG 22; 1/385195.03 **Datum:** 04.1996
*to specification/assembly drawing No.:* *date:*

**Der elektronische Teil des Ölgehaltsmeßgerätes wurde hergestellt durch:** GESTRA GmbH
*Electronic section of oil content meter manufactured by:*

**Zusammenstellungszeichnung Nr.:** ORT 6; 3/306190.02; 3/306191.02 **Datum:** 30.04.02/02.04.02
*to specification/assembly drawing No.:* *date:*

**Versorgungspumpe hergestellt durch:** --
*Sample feed pump manufactured by:*

**Zusammenstellungszeichnung Nr.:** -- **Datum:** --
*to specification/assembly drawing No.:* *date:*

**Probenaufbereitungseinheit hergestellt durch:** --
*Sample conditioning unit manufactured by:*

**Zusammenstellungszeichnung Nr.:** -- **Datum:** --
*to specification/assembly drawing No.:* *date:*

**Das Ölgehaltsmeßgerät ist für die Verwendung als 15 ppm Bilgenalarm gemäß Regel 16(5) geeignet.**
*The oil content meter is acceptable for use with a 15 ppm bilge alarm in accordance with regulation 16(5).*

**Eine Kopie dieses Zeugnisses soll jederzeit auf jedem Schiff mitgeführt werden, das mit dieser Anlage ausgerüstet ist.**
*A copy of this certificate should be carried aboard a vessel fitted with this equipment at all times.*

**Für eingebaute Einrichtungen bleibt die Zulassung über das nachstehende Datum hinaus bis auf Widerruf in Kraft.**
*The approval of the installed equipment will be in force beyond the below mentioned date until it is recalled.*

**Daten und Ergebnisse der Erprobungen siehe Anhang.**
*Test data and results attachend as Appendix.*

**Dieses Typenzulassungszeugnis ist gültig bis:** **31.08.2007**
*This certificate of type approval is valid until:*

**Ausgestellt in Hamburg am:** 01.09.2002
*Issued at Hamburg on:*

**Zulassungs-Nr.:** 320027
*Certificate-No.:*

SEE-BERUFSGENOSSENSCHAFT II

**SEE-BERUFSGENOSSENSCHAFT**
**- SCHIFFSSICHERHEITSABTEILUNG -**

i. A.
**Unterschrift**
*Signature*

## Certificate of Type Approval – continued –



# Anhang zum Typenzulassungszeugnis für Ölgehaltsmeßgeräte verwendet für Bilge-Alarme (15 ppm Alarm)

*Appendix to the certificate of type approval for oil content meters intended for bilge alarms (15 ppm alarm)*

**Daten und Ergebnisse der Erprobungen, durchgeführt an einem Ölgehaltsmeßgerät gemäß Teil 2 der Anlage zu den Richtlinien und Anforderungen der IMO-Entschließung MEPC.60(33).**

*Test data and results of tests conducted on an oil content meter in accordance with Part 2 of the Annex to the guidelines and specifications contained in IMO-Resolution MEPC.60(33).*

**Ölgehaltsmeßgerät vorgestellt durch:** GESTRA GmbH
*Oil content meter submitted by:*

**Ort der Erprobungen:** GESTRA GmbH
*Test location:*

**Stelle, die die Prüfung durchgeführt hat:** See-Berufsgenossenschaft, Hamburg
*Organization conducting the test:*

**Verfahren der Probenanalysen:** IMO-Verfahren gemäß Entschließung MEPC.60(33), Part 4
*Method of sample analysis:* *IMO-method acc. to resolution MEPC.60(33), Part 4*

**Analysen der Proben durch:** Chemisch-Technisches Laboratorium Luers KG, Bremen, Germany
*Samples analysed by:*

**Die Erprobung des elektronischen Teils des Ölgehaltsmeßgerätes ist unter Umweltbedingungen gemäß Teil 3 der Anlage zu den Richtlinien und Anforderungen der IMO-Entschließung MEPC.60(33) durchgeführt worden. Die Anlage arbeitete bei Beendigung der jeweiligen Erprobung, die im Bericht über die Prüfung bei Umgebungsbedingungen festgelegt ist, zufriedenstellend.**

*Environmental testing of the electronic section of the oil content meter has been carried out in accordance with part 3 of the annex to the Guidelines and Specifications contained in IMO resolution MEPC.60(33). The equipment functioned satisfactorily on completion of each test specified on the environmental test protocol.*

**Empfehlungen und Informationen des Herstellers über den Gebrauch von Reinigungsmitteln.**
*Manufactures'recommendations and information concerning the use of cleansing agents*

**Verwendung von schnell trennenden Reinigungsmitteln.**

*Quick separating cleaners are to be used only.*

**Das Ölgehaltsmeßgerät Serien-Nr.:** _____ **entspricht dem geprüften Typ.**
*The oil content meter serial No.:* *complies with the tested type.*

| **Ort** *Place* | **Datum** *date* | **Firmen-stempel -** *Company stamp* | **Unterschrift** *Signature* |
|---|---|---|---|

## Certificate of Type Approval – continued –



| | Ablesungen (mg/kg) *Readings (p.p.m.)* | | | |
|---|---|---|---|---|
| | **Angezeigt** *Indicated* | **Gemessen** *Measured* | **Probe-entnahme** *Grab Sample* | |
| **Eichung** *Calibration* | 0 | 0,1 | 1 | **Temperatur des Testwassers:** 17 °C *Test water temperature:* |
| **Leichter Kraftstoff** *Light destillate fuel oil* | 15,5 | 20,2 | 2 | **Nullstellungs-korrektur** *Rezero* **ja** *yes* ☐ **nein** *no* ☒ |
| **Höchste Anzeige** *Full scale* | 23,8 | 26,5 | 3 | **Nacheichen** *Recalibrate* **ja** *yes* ☐ **nein** *no* ☒ |

**Einstellzeiten** *Response times* **15 ppm** 6,4 **Sekunden** *seconds*

**Verunreinigungs-Erprobung**
*Contaminants test*

**Ableseverschiebung während des Durchlaufs einer ppm-Mischung aus leichtem Dieselöl und Wasser u. Zusatz von**
*Meter reading shift during running with ppm light fuel oil-water mixture and added*

**Frischwasser** *Fresh water* 14,0 mg/kg *ppm* **angezeigt** *indicated* 11,0 mg/kg *ppm*

**Sehr salzigem Wasser** *Very salty water* 13,1 mg/kg *ppm* **angezeigt** *indicated* 8,4 mg/kg *ppm*

**Verschmutzung mit nicht-öligen Bestandteilen vermischt mit Wasser und leichtem Dieselöl in Ölkonzentrationen von:** *Non oil particulate contaminants (air cleaner dust) mixed with water and light distillate oil added in concentration of:* 15,8 mg/kg *ppm* **angezeigt** *indicated* 16,8 mg/kg *ppm*

**Farben-Erprobung**
*Colour test*

**Erprobung mit 2,5 mg/kg schwarzer Tinte** *2.5 ppm black ink test* **bestanden** *pass* ☒ **nicht bestanden** *fail* ☐

## Certificate of Type Approval – continued –



**Versuche bei Druck- oder Durchflußschwankungen**
*Sample Pressure or flow test*

**Ablesungsverschiebung bei 50 % des Normalwertes**
*Metering reading shift at 50 % normal*
0 **(mg/kg)** *(ppm)*

**Ablesungsverschiebung bei 200 % des Normalwertes**
*Meter reading shift at 200 % normal*
+0,3 **(mg/kg)** *(ppm)*

**Abweichungen von diesem Versuch sollten - soweit erforderlich - angegeben werden**
*Deviations from this test should be stated if necessary*

**Ablesung vor dem Abschalten**
*Meter reading before shut off*
15,8 **(mg/kg)** *(ppm)*

**Ablesung nach dem Einschalten (Minimale Abschaltzeit 8 Stunden)**
*Meter reading after start up (minimum dry period 8 hours)*
14,6 **(mg/kg)** *(ppm)*

**Folgende Schäden am Meßgerät:**
*Damage to meter as follows*
keine / *non*

**Versuche bei Änderungen der Energieversorgung**
*Utilities supply variation test*

**Auswirkung bei 110 % Spannung**
*110 % voltage effects*
± 0 **mg/kg** *ppm*

**Auswirkung bei 90 % Spannung**
*90 % voltage effects*
± 0 **mg/kg** *ppm*

**Auswirkung bei 110 % Luftdruck**
*110 % air pressure effects*
nicht anwendbar / *not applicable*

**Auswirkung bei 90 % Luftdruck**
*90 % air pressure effects*
nicht anwendbar / *not applicable*

**Auswirkung bei 110 % Flüssigkeitsdruck**
*110 % hydraulic pressure effects*
± 0 **mg/kg** *ppm*

**Auswirkung bei 90 % Flüssigkeitsdruck**
*90 % hydraulic pressure effects*
± 0 **mg/kg** *ppm*

**Weitere Bemerkungen**
*Other comments*
keine / non

**Eichungs- und Nullstellungsprüfung**
*Calibration and zero test*

**Eichungsabweichung**
*Calibration drift*
keine / non **(mg/kg)** *(ppm)*

**Nullstellungsabweichung**
*Zero drift*
keine / non **(mg/kg)** *(ppm)*

**Ausgestellt in Hamburg am:** 01.09.2002
*Issued at Hamburg on:*

SEE-BERUFSGENOSSENSCHAFT II

**See-Berufsgenossenschaft**
**-Schiffssicherheitsabteilung-**

i. A.

**Unterschrift**
*Signature*

## Type Approval Certificate

# *Type Approval Certificate*

Germanischer Lloyd

This is to certify that the undernoted product(s) has/have been tested in accordance with the relevant requirements of the GL Type Approval System.

| | |
|---|---|
| Certificate No. | **94 855 - 94 HH** |
| Company | **Gestra GmbH**<br>**Münchener Straße 77**<br>**D-28215 Bremen** |
| Product Description | **OIL CONTENT METER** |
| Type | **OR 52-5/-6**<br>**Oil in water monitor for boiler feedwater** |
| Environmental Category | **None** |
| Technical Data / Range of Application | **Technical Data:**<br>**Measuring Principle:** Optical by scattered light<br>**Main Parts:** Receiver ORT6, Transmitter ORG12 / 22<br>**Range of Measuring:** 0 - 25 ppm<br>**Signal Output:** 0 / 4 - 20 mA<br>**Alarm Contacts:** 2 potential-free contacts, adjustable 0ppm up to 15ppm<br>1 potential-free contact for error<br>**Max. Water Temperature:** 95°C<br>**Max. Water Pressure:** 10 bar<br>**Water Flow Range:** 0,5 to 50 l/min<br>**Ambient Temperature:** 0 - 55°C (ORT6), 0 - 60°C (ORG12/22)<br>**Degree of Protection:** IP 65<br>**Software according to GL requirement class 3, Software version 1.0**<br>**Range of Application:**<br>**Oil alarm monitor for boiler feedwater of ship steam plants** |
| Test Standard | **Partly IMO Resolution MEPC 60(33) and VdTÜV 100 issue 10.2001**<br>**GL Guidelines for the Performance of Type Tests, Part 1** |
| Documents | **- Test report of electrical tests dated Nr. 02 / 2012-4-1, dated 16.04.02/ Nr. 2012-8, dated 02.09.02**<br>**- Test report of performance tests dated 28.08.2002**<br>**- Erzeugnisbeschreibung OR 5-1.40, Version 01, 898908** |
| Remarks | **The monitor is suitable for alarm signals only** |
| Valid until | **2007-09-05** |

Page **1** of 1

Type Approval Symbol GL

File No. **II.F.09**

**Hamburg, 2002-09-06**

**Germanischer Lloyd** i.A. G. Hölzer i.A. H. Markus

This certificate is issued on the basis of "Regulations for the Performance of Type Tests, Part 0, Procedure".

# Annex – continued –

## Updates

| Index | Description | Date |
|---|---|---|
| 00 | New installation manual | 04-08-2003 |

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