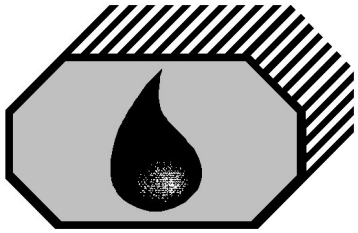

INSTRUCTION MANUAL

15ppm Bilge Alarm

OMD-2008

Standard Version
and Versions with
Electric Valve (EV)
Flow Control (FC)
Manual Cleaning Unit (MCU)

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IMPORTANT NOTICE

Replacement components for 15ppm Bilge Alarms.

General

All monitors in our range are inspected and tested to the related I.M.O. requirements at our factories prior to delivery. In normal use the units should operate correctly and without fault over a long period of time requiring only small amounts of maintenance to be carried out as outlined in the instruction manuals.

It is very important to correctly identify the Type and Version of the instrument for technical support, or for ordering spare parts. Please include instrument type, Version, and serial number, and if possible instrument date of commissioning into any communication.

Service Exchange Units

In the event of a monitor malfunction due to electrical or electronic component failure it is our recommendation that a service exchange unit be ordered.

The defective instrument should be returned to our works within 30 days of supplying the service exchange unit, then only the repair charge is payable. Otherwise the whole cost of a service exchange unit becomes payable.

This procedure is by far the easiest and most cost effective way of ensuring the monitor on board conforms to I.M.O. resolution MEPC.107(49).

Remark:

According the MEPC.107(49) § 4.2.11 the unit has to be checked at IOPP Certificate renewal survey by the manufacturer or persons authorized by the manufacturer. Alternatively the unit may be replaced by a calibrated 15 ppm Bilge Alarm.
The OMD-2008 EVFC is designed in that way, that only the measuring cell needs to be changed, as this unit carries the Calibration Certificate. The Calibration Certificate with the date of the last calibration check should be retained onboard for inspection purposes.

If for some reasons the computer unit needs to be changed, it has to be made sure, that the Memory Card will remain on board for at least 18 month. The new computer unit will carry its own memory card. The old card can be insert into the new unit only for reading. Writing is only possible with the card delivered with the new computer unit. For details see section 13.1.

Warranty

Our warranty terms are12 months after installation but maximum 18 months after delivery ex works. The maker undertakes to remedy any defect resulting from faulty materials of workmanship except wearing parts.
The maker's obligation is limited to the repairs or replacement of such defective parts by his own plant or one of his authorized service stations.
The purchaser shall bear the cost and risk of transport of defective parts and repaired parts supplied in replacement of such defective parts.

ANY DISMANTLING OR BREAKING OF A SEAL WILL VOID THE WARRANTY

Contents

1 Introduction

1.1 General

The OMD-2008 Bilge Alarm Unit has been designed specifically for use in conjunction with 15 ppm oil-water separator units and has a specification and performance which exceeds the requirements of the International Maritime Organization specifications for 15ppm Bilge Alarms contained in Resolution MEPC. 107 (49).

The unit is supplied with 2 works-adjusted alarms at 15 ppm. Other set points (10 ppm or 5 ppm) are possible and can be adjusted on site at any time by using the buttons at the front panel.

Instruments with maximum Alarm set-points of 10 ppm or 5 ppm respectively are available.

If an alarm set point is exceed, the alarms are visible at the front panel and the appropriate relays are switched. In case of malfunction the System LED at the front panel will change from blinking green to permanent red.

For the data logging function the unit requires a status input from the separator.

A 0(4) - 20 mA (equal to 0 - 30 ppm) signal output is available for driving a recorder or external meter.

1.2 Instrument Versions and Options

The OMD-2008 is available in different versions. It may be equipped with an electric switchover valve for clean water usage, and a Flow Sensor. A Manual Cleaning Unit (MCU) is available as an option. Different instrument versions are covered in this document. Please verify instrument version on site and refer to the relevant sections of this manual.

1.2.1 FC (Flow Control)

Some OMD-2008 instruments are equipped with a Flow Sensor. The Flow Sensor is positioned in the Drain line of the Measuring Cell. If the flow rate through the Measuring Cell is too low, or if the sample is not flowing at all, the Instrument will go to Alarm condition and issue a “Status: Flow?” message. OMD-2008 FC instruments have a special interface for the Flow Sensor, so that the current flow rate can be displayed.

It is possible to have a Flow Switch (similar to the Flow Sensor, but with a simple ON/OFF output) connected to all versions of OMD-2008.

1.2.2 EV (Electric clean water Valve)

OMD-2008 EV instruments are equipped with an electric switchover valve for the clean water stream. The valve can be controlled via the menus, or remotely using the control input.

1.2.3 MCU (Manual Cleaning Unit)

Optionally the instruments can be fitted with a Manual Cleaning Unit. The Manual Cleaning Unit allows to clean the sample glass tube without opening the Measuring Cell Head Screw, and without interrupting the normal sample flow. Maintenance is made easier with the MCU. Please note that operating the MCU may set the instrument to alarm condition for a few seconds.

2 Important Notes

a) This equipment must be installed and operated in strict accordance with the instructions contained in this manual. Failure to do so will impair the protection provided.

b) Installation and servicing must be undertaken by a competent and suitable skilled person.

c) The equipment must be connected to the ground according relevant requirements.

d) The unit must be isolated from the electrical supply before any maintenance of the equipment is attempted.

e) All National or local codes of practice or regulations must be observed and, where applicable, are deemed to take precedence over any directive or information contained in this manual.

f) In case of freezing conditions the measuring cell should be emptied completely.

3 Principle of operation

3.1 Measuring Principle

An optical sensor array measures a combination of light scattered and absorbed by oil droplets in the sample stream. The sensor signals are processed by a microprocessor to produce linearized output.

If an alarm (works set point 15 ppm, or 10 ppm or 5 ppm respectively) occurs, the two oil alarm relays are activated after the adjusted time delay.

The microprocessor continuously monitors the condition of the sensor components and associated electronics to ensure that calibration accuracy is maintained over time and extremes of environmental conditions.

3.2 Adjustment

The unit is delivered with a works calibration according the IMO-requirements. The alarm points are set to 15 ppm (or 10 ppm, or 5 ppm for certain versions).

The "Zero" point is also works calibrated and can be re-adjusted on site by using the programming mode and clean water. See Section 10.4 “Settings-Offset”. Calibration of the instrument is not permitted. According to IMO Regulations a calibration check has to be done by the manufacturer or persons authorized by the manufacturer. The recommended way to ensure a properly calibrated Measuring Cell on board is to exchange the Measuring Cell.

3.3 Displays and Alarms

In the unit there are two independent oil alarm circuits available. Both can be set separately from 1 to 15 ppm. From the manufacturing both alarms are set to 15 ppm (according IMO). The set points can be changed according to the requirements on site, for example to 10 ppm or 5 ppm. An alarm point setting above 15 ppm is not possible. Instrument versions with limited alarm setpoint range (10ppm, or 5ppm) are available. This alarm setpoint limit can not be changed.

Adjustment of the alarm setpoints can be done in the programming mode as described in Section 10.4. In this mode also the individual adjustment of the time delays for the alarms can be done.

Both alarm circuits are also related to an alarm LED on the front panel.

In case of malfunction the “System” LED will indicate any type of internal fault of the unit. This LED is flashing green in normal conditions and is red in alarm conditions.

Additional to the alarm LEDs each alarm circuit is equipped with a relay with potential free switchover alarm contacts. These contacts can be used for external processing of the signal or for control of further functions.

If a malfunction or failure of the power supply occurs, all three relays (both alarm relays and the SYSTEMFAULT relay) will switch to alarm condition.

3.4 Electronic record

The OMD-2008 keeps an electronic record. The recorded data can be viewed at the instrument at any time. Browsing the data does not interfere with the measurement or instrument operation. Data is stored in excess of 18 Months.

4 Specifications

Range:	0 – 30 ppm, Trend indication 50ppm
Accuracy	According IMO MEPC. 107(49)
Linearity	Up to 30 ppm better than ± 2 %
Display	Yellow Graphic Display
Power Supply:	24 V - 240V AC or DC Automatic Voltage selection
Consumption:	< 10 VA
Alarm Points 1 + 2:	Adjustable between 1 - 15 ppm (Works adjustment 15 ppm)
Alarm 1 Operating Delay: (for annunciation purpose)	Adjustable between 1 – 540 sec. (Works adjustment 2 sec)
Alarm 2 Operating Delay: (for control purposes)	Adjustable between 1 – 10 sec. (Works adjustment 10 sec)
System Fault Alarm:	Red LED
Alarm Contact Rating:	Potential free 1 pole change over contacts, 3 A / 240 V
Alarm Indication:	Red LEDs
Output Signal:	0 – 20 mA or 4 – 20 selectable ext. Load < 150 Ω
Sample Water Pressure:	0,1 – 10 bar
Sample Flow:	Approx. 0,1 - 3 l/min depending on pressure
Ambient Temperature:	+ 1 to + 55° C
Sample Water Temperature:	+ 1 to + 65° C
Roll:	Up to 45°
Degree of Protection:	IP 65
Pipe Connections:	for 6mm OD Cu or SS pipe

Specification changes for specific versions

OMD-2008 EV	
Sample pressure	max. 6 bar
Clean water pressure	max. 6 bar
Size (Computer Unit)	200 mm W x 200 mm H x 100 mm D
Size (EV-FC-Arrangement)	150 mm W x 290 mm H x 140 mm D
Weight:	5,9 kg

OMD-2008 EVFC	
Sample pressure	max. 6 bar
Clean water pressure	max. 6 bar
Size (Computer Unit)	200 mm W x 200 mm H x 100 mm D
Size (EV-FC-Arrangement)	150 mm W x 290 mm H x 140 mm D
Weight:	5,9 kg

OMD-2008 EVFCMCU	
Sample pressure	max. 6 bar
Clean water pressure	max. 6 bar
Size (Computer Unit)	200 mm W x 200 mm H x 100 mm D
Size (EV-FC-Arrangement)	150 mm W x 290 mm H x 140 mm D
Weight:	5,9 kg

Technical specifications are subject to change without notification

5 Construction

5.1 Overview

OMD-2008 instruments consist of two main components:

The Computer Unit contains the display PCB with the data logger and the terminals for external connections.

The Measuring Cell assembly consists of the Measuring Cell, a valve to select sample water stream, or clean water stream, and, depending on the version of the instrument, additional devices like a flow sensor.

5.2 Computer Unit

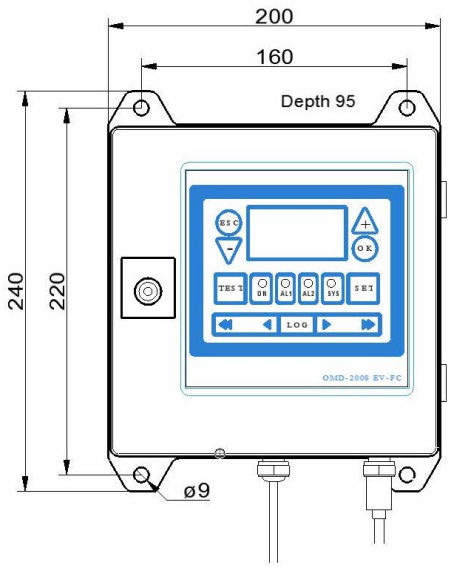


Fig. 2a:
Dimensions of Computer Unit

The Computer Unit contains Display, Power Supply, all external electrical connection terminals, and Memory Card for electronic record.

The Computer Unit is enclosed in a sheet metal housing, with several openings for metric cable glands underneath. The Computer Unit should be mounted so that the display and touch button area is easily accessible.

5.3 Measuring Cell

The measuring cell is built out of an all-aluminium, nickel plated body with inlet and outlet block from stainless steel. It contains optics and electronics and is connected with the computer unit via a plugged data cable. The Measuring Cell

has to be provided with a sufficient sample water stream. It measures the oil content, and transmits the measured data to the computer unit.

The Measuring Cell has all parameters and calibration data permanently stored, and the calibration certificate is tied to the Measuring Cell. The recommended way to renew a calibration is to exchange the Measuring Cell. Under no conditions should the Measuring Cell be opened or dismantled, doing so would void both warranty and calibration.

5.4 FW valve

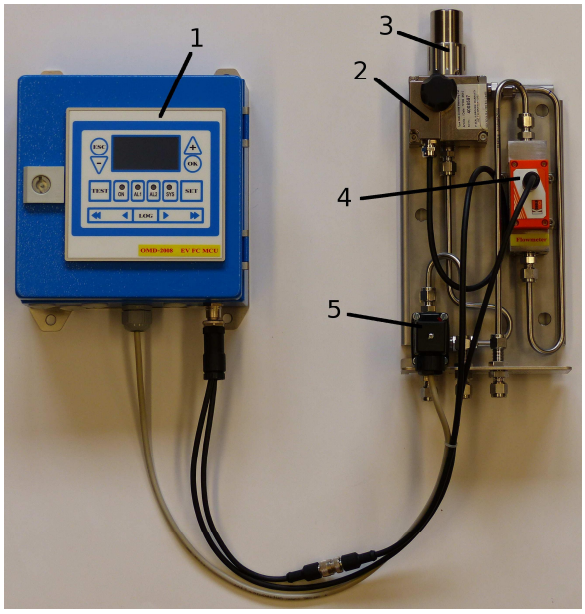
The OMD-2008 uses a switchover valve to control the usage of clean water for cleaning, or zeroing purposes. Whenever the FW valve is switched to Clean water position, and not to sample stream position (normal operating position), the instrument will be in alarm condition.

The valve can be manually operated (OMD-2008), or electrically operated (OMD-2008 EV). The electric valve can be switched using the programming mode.

5.5 Other devices

Measuring Cell and the valve to switch over from sample water stream to clean water usage (FW valve) are mounted onto a stainless steel support. The clean water valve may be a manual switchover valve, or an electric valve, and controls sample water and clean water usage. A Flow Sensor, or a Manual Cleaning Unit (MCU) may also be installed.

The OMD-2008 EV-FC can easily be mounted in wall or bulkhead installation.



	Computer Unit		Flow Sensor		
	Measuring Cell		Clean Water Valve EV		
	Manual Cleaning Unit (MCU) (Option)				

Fig. 1

6 Installation

See Section 2 for important notes concerning installation.

The OMD-2008 should be located as close as possible to the oily water separator to minimize response delays. According MEPC.107(49) the layout of the installation should be arranged so that the overall response time (including the response time of the 15 ppm Bilge Alarm, which is less than 5 seconds) between an effluent discharge from the 15 ppm Bilge Separator exceeding 15 ppm, and the operation of the Automatic Stopping Device preventing overboard discharge, should be as short as possible and in any case not more than 20 seconds.

The instrument has to be provided with a representative sample of the separator effluent water. A sample stream flow rate of approx. 2 Liters per Minute has to be provided.

Mount the OMD-2008 Computer Unit by means of M6 or M8 screws on to a rigid vertical surface and preferably with the display panel of the monitor at eye level. For service and maintenance sufficient space to all sides should be available.

Computer Unit and Measuring Cell assembly should be mounted close to each other.

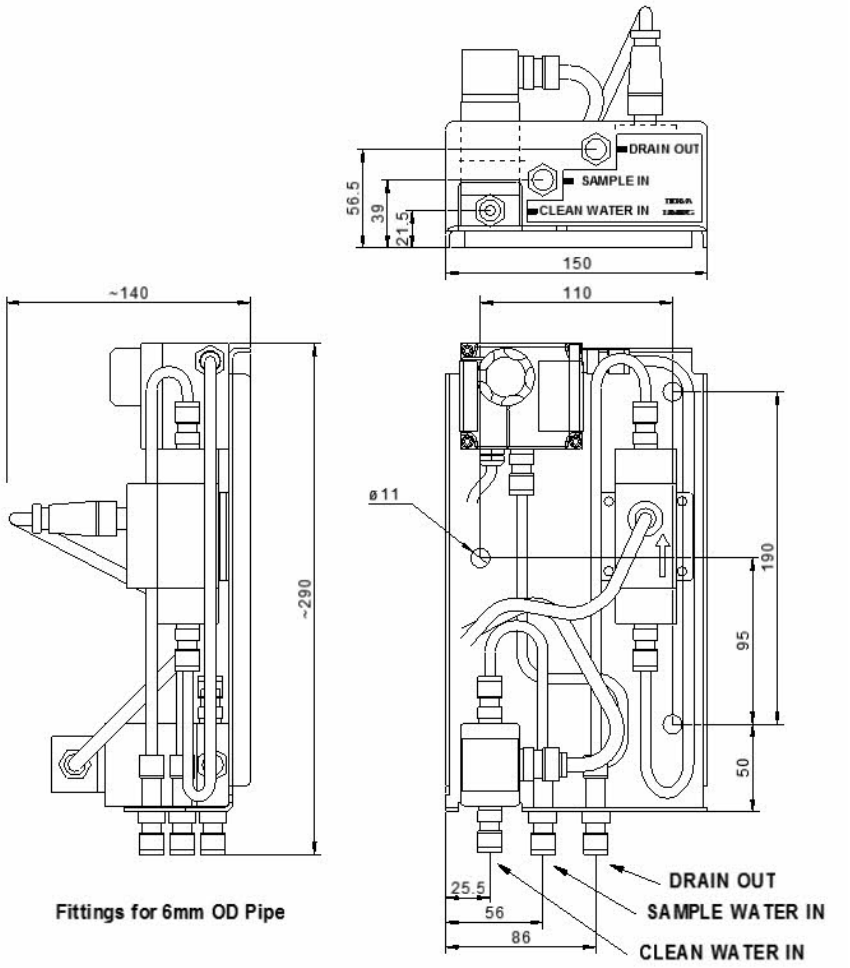


Fig. 2b Dimensions of Measuring Cell assembly

Pipe connections are prepared for 6mm OD stainless steel or coper pipes. Adapter fittings for other pipe diameters are available upon request. Working space for maintenance and operation is recommended in front of and above the instrument.

Care must be taken at mounting of the pipes connections to avoid any torsion of the housing and damage of the instrument.

7 Piping

The instrument has to be supplied with a representative sample of the separator effluent water stream. The sample stream through the instrument is recommended to be approx. 2 Liters per Minute.

Connect the OMD-2008 EV-FC Monitor to the sample point of the oily-water separator outlet and to a source of oil free water. Fittings on the Instrument are for 6 mm OD copper or stainless steel pipe. Adapter fittings for other pipe diameters are available upon request.

The sample point should be located on a vertical section of the separator outflow piping to minimize the effects of any entrained air. The tapping point should be at a level above the outlet of the monitor to ensure the sample cell is flooded at all times.

If connection to a vertical section of the separator outlet piping is impractical, the tapping may be made into the side of the horizontal pipe. Avoid top or bottom entry.

For separator discharge pipes up to 75 mm OD a standard "T"-type junction of the welded or screwed type is satisfactory for the tapping point. For the separator discharge pipes of 80 mm OD and above a sample probe should be employed which protrudes into the discharge piping by approx. 25 % of the ID of the pipe.

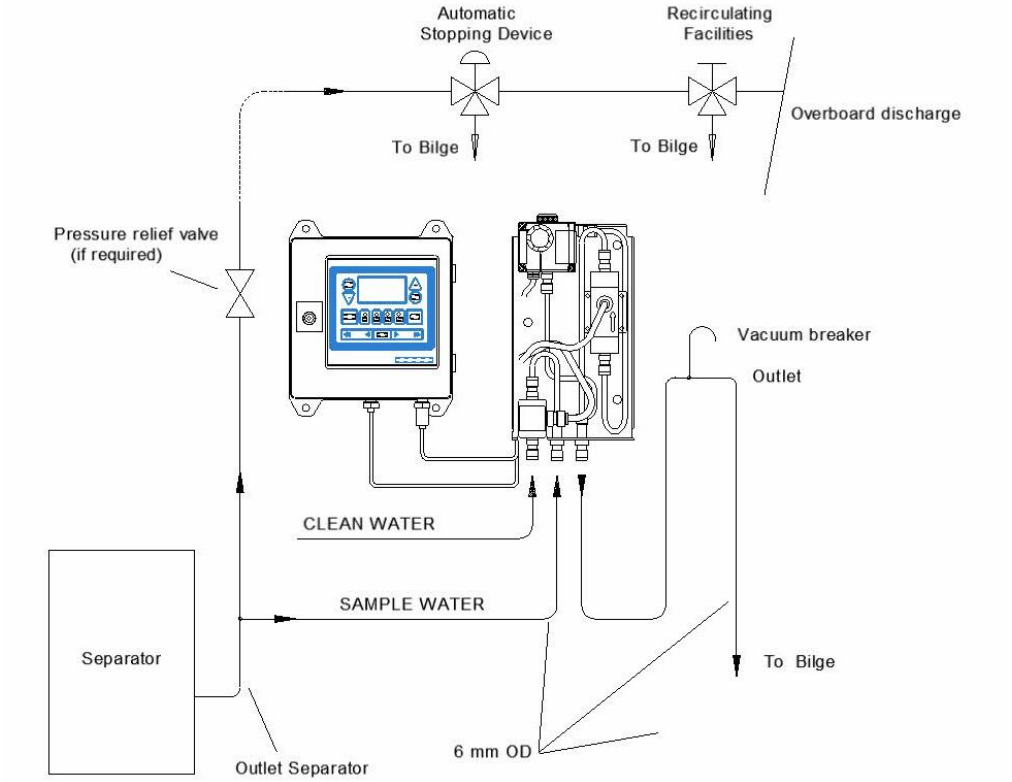

Automatic
Stopping Device
Recirculating
Facilities
Overboard discharge
To Bilge
To Bilge
Pressure relief valve
(if required)
Vacuum breaker
Outlet
CLEAN WATER
SAMPLE WATER
Separator
To Bilge
6 mm OD
Outlet Separator

Fig. 3

8 Wiring

See Section 2 for important notes concerning wiring.

This unit must be connected to the mains supply via a suitable rated and approved fused isolator unless such fusing / isolation is provided by associated equipment. When fitted, the isolator should be close, readily accessible and marked as to function.

Electrical connections are made through the metric cable gland openings prepared underneath the instrument. Not all openings may be free.

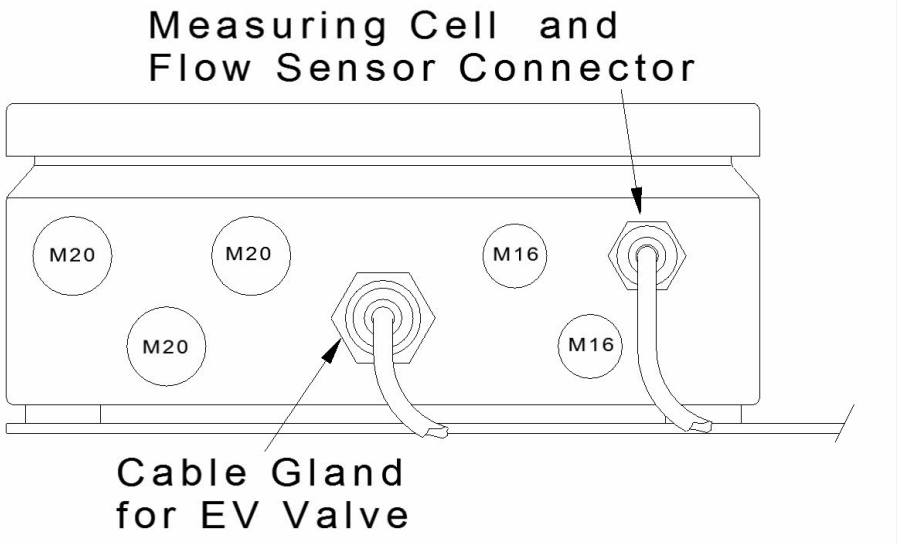


Fig. 4

Precise wiring details will vary dependent upon the control system to be employed but the most frequently used systems employ alarm relay 1 for alarm only and alarm relay 2 for control purposes.

Electrical connections are made to the terminal blocks inside the computer housing. Wires are connected to the terminals by pushing a suitable screwdriver into the clamp holes to release the internal spring loaded clamps. After the wire is inserted to the terminal and the screwdriver is removed, the wire is fixed.

If the instrument is operated at high voltages, additional care has to be taken to provide reliable ground connections. Ground (PE) can be connected direct to the terminal or, if this is not sufficient according local rules, to the computer housing (PE bolt inside, right side).

The instrument provides a pilot voltage output at Terminals 3&4. This is internally connected to the power supply input (Terminals 1&2 via Fuse T2A). The pilot

voltage can be used to supply additional external circuitry, e.g. alarm lamps or electrical valves.

Please note: any device connected to the pilot voltage output must be rated for the voltage the instrument is supplied with. Do not use the pilot voltage for driving motors, heaters or other high load devices. The pilot voltage is intended for alarm purposes only.

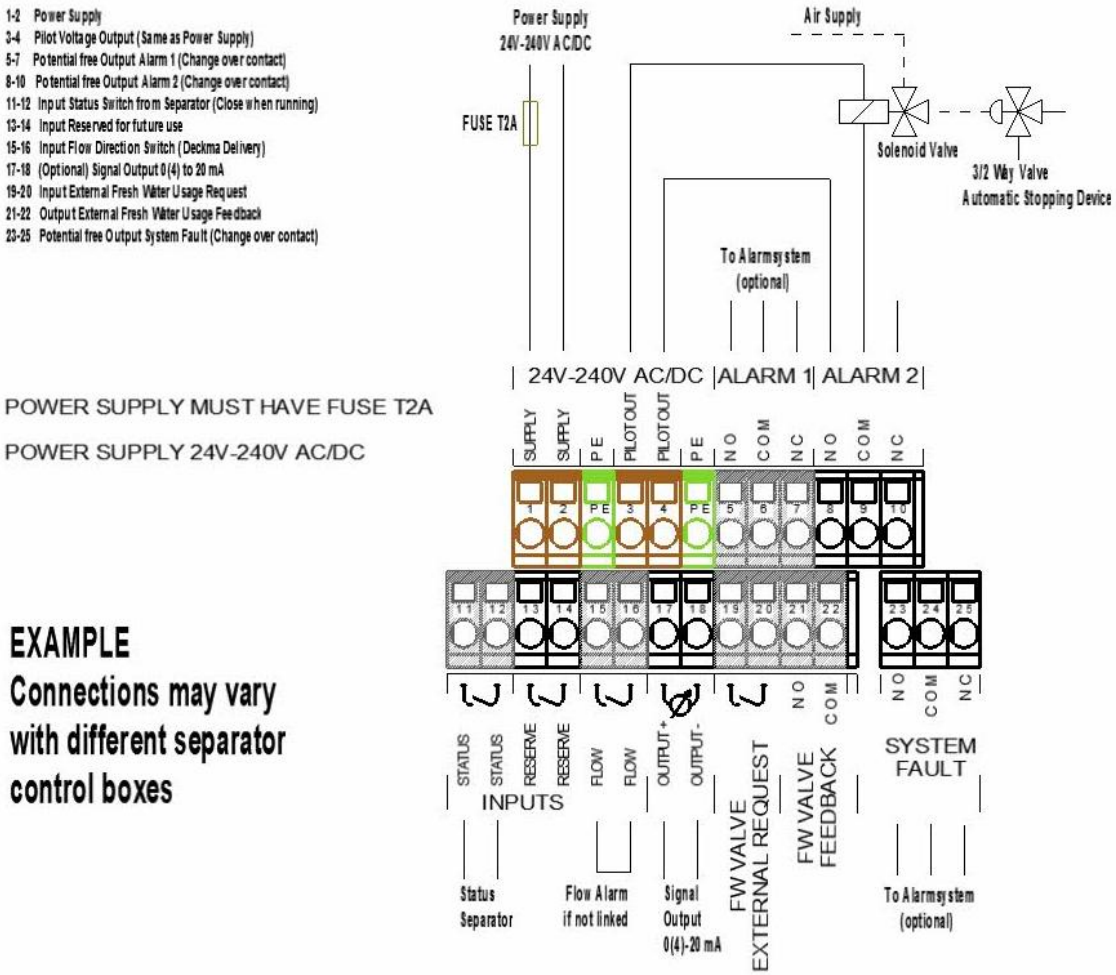


Fig. 5: Connection Example

Close front cover completely after electrical installation. Water inside the instrument may result in corrosion and malfunction. Alarm contacts description is in alarm (non-energized) condition.

Note: In case the OMD-2008 EV-FC is installed as replacement to a MEPC.60(33) approved separator and no "Status Separator" signal is available, a link across terminal 11 + 12 can be installed. Alternatively a "Status Separator" signal can be generated from the Separator control, and an auxiliary relay be operated with this signal. The Contacts of this relay then can operate the

"STATUS" input. Please refer to the Separator manual, or contact the separator maker for information regarding the separator.

8.1 Typical Control System

The installation on site has to make sure that in case of any loss of power supply and/or loss of air supply for the automatic stopping device the overboard discharge valve close the overboard line and open the re-circulating line.

The system showed in the example, employs alarm relay 2 to control a pneumatic solenoid valve which energises or de-energises a pneumatically operated 3 - way valve as depicted in Fig. 5.

The separation process will continue until such time as the pollution level falls below the alarm set point at which time the discharge will be directed overboard.

A pump stop system is not recommended.

8.2 Remote EV Electric Valve control

It is possible to remotely control the EV valve. Connect a switch to Terminals 19&20. If the Terminals are connected (linked trough the switch) the EV valve will switch to clean water. If the Terminals are open/disconnected, the EV valve will switch to sample stream. The instrument will be in alarm condition as long as it is switched to clean water usage.

9 Power Supply

See Section 2 for important notes.

The unit is designed for a power supply of 24 V to 240 V AC or DC. It has an automatic voltage selection. The power supply must have a fuse rated no more then 2A.

10 Commissioning

See Section 2 for important notes.

On completion of the installation, wiring, and piping carry out the following checks:

10.1 Electrical and Piping

a) Check that the power supply is connected to terminals 1 + 2 of the terminal block.

b) Check that the wiring of the automatic stopping device (back-to-bilge valve) and to the alarm system is according the IMO Requirements.

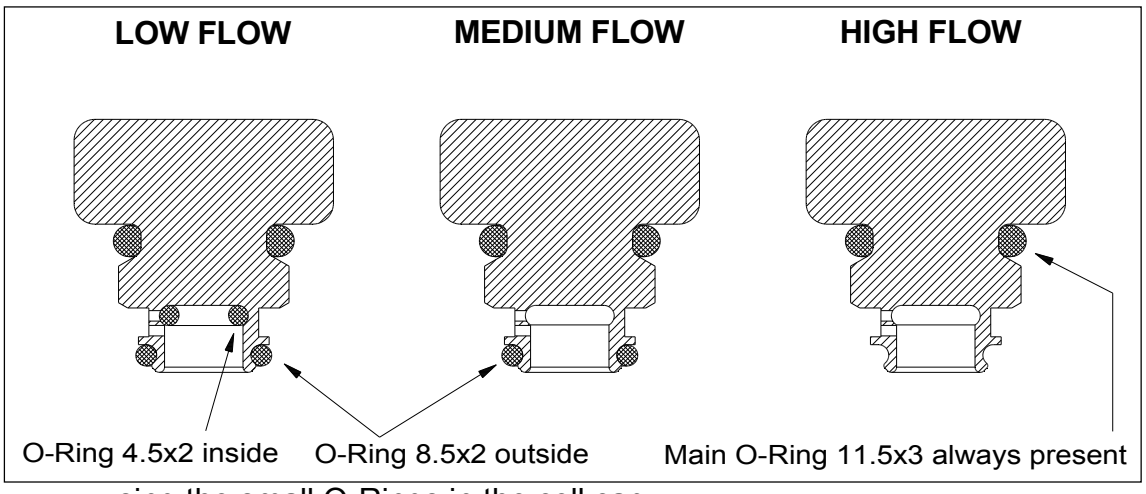
c) Check that the grounding (PE) connections have been made according to the relevant regulations.

d) Check all piping connections for leaks and rectify as appropriate

10.2 Flow rate adjustment

a) Run oil free water through the instrument to purge the system. Measure the amount of water flowing through the instrument per Minute. Flow rate for both sample stream and clean water stream should be approx. 2 Liters per Minute. On OMD-2008 FC instruments the flow rate can be read from the display.

b) On OMD-2008 EV-FC instruments adjust the flow rate through the unit by

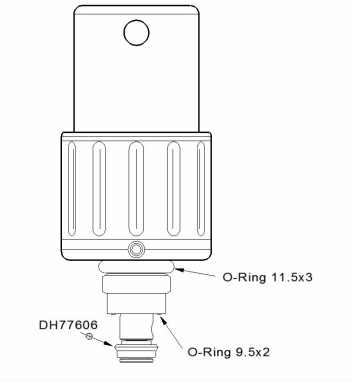


using the small O-Rings in the cell cap.

NB: The flow rate should be checked on both, the clean water supply and the separator sample supply. If the clean water supply is obtained from a high pressure source, the flow rate will be higher than from the sample point.

The flow rate adjustment is important for the time delay between the sample point and the monitor. If the sample flow rate is too small, the instrument will be in Alarm and display "Status: Flow".

On instruments fitted with Manual Cleaning Unit (OMD-2008 EV-FC MCU), sample a higher or a lower flow rate can be adjusted. To get the higher flow rate, remove the smaller O-Ring (9.5x2) from the Manual Cleaning Unit.



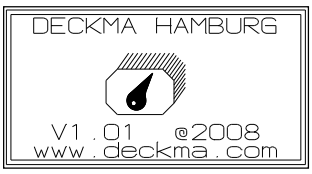
MCU
(Manual Cleaning Unit)

10.3 Functional Tests

a) Run oil free water through the instrument to purge the system

b) Verify that the water is flowing with the proper flow rate trough the instrument.

c) Switch on the instrument and make sure, that the Power LED is illuminated and the display is showing the initializing display for about 15 sec. After that time it will change to the standard display, showing the actual measurement.



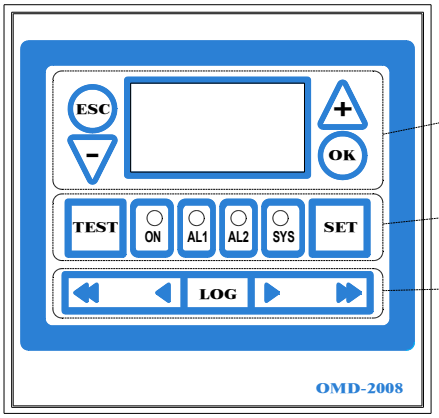
d) Switch the Clean Water Valve to clean water. While oil free water is running through the monitor check the Zero adjustment. The display should be "0" to "2" and the status will show "FW". If the display varies by greater amounts, it may be that air entrainment is present. If this is the case, the cause must be located and rectified.

e) If the Zero need to be adjusted, this can be done in the programming mode as described in section 10.4. (Settings – Offset)

f) If the flow rate is not sufficient, the instrument will display “Status: Flow”. Both sample flow rate and clean water flow rate are recommended to be approx. 2 Liters per Minute.

g) Switch the electric Valve (EV) back to sample stream.

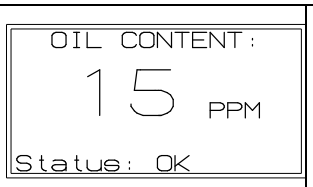
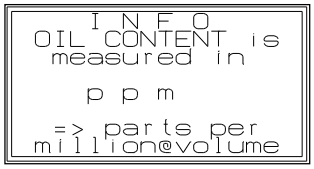
10.4 Programming Mode

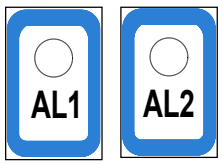


There are 3 groups of push buttons to control the functions of the display. Navigation buttons are in group 1. Functional buttons are group 2. Group 3 is for data logger operation.

In the programming mode the alarm set points, the time delays, and the offsets can be modified. It is also possible to reset to the factory default values at any time.

The clock is factory set for GMT, **G**reenwich **M**ean **T**ime, and cannot be changed.

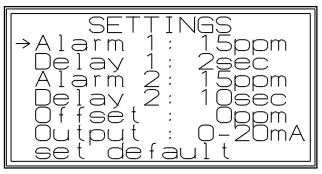
		
Initial Display. Will disappear a few seconds after power up.	Normal Operation Display. Pressing the button will display additional information. Pressing the button will display	Exit from SYSTEM-info menu by pressing Refer to Fault finding table in manual for explanations of status information.



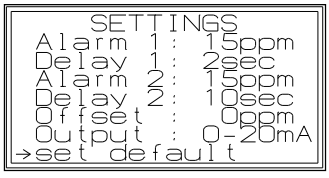
Pressing the AL1 button leads into SETTINGS menu, Alarm1 settings preselected.

Pressing the Al2 button leads into SETTINGS menu, Alarm2 settings preselected.

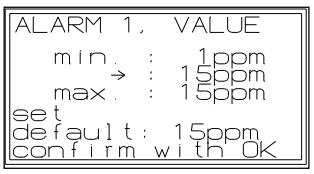
Pressing the SET button from Normal Operations Display leads into SETTINGS menu, set default option preselected.



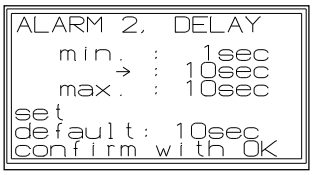
At the SETTINGS menu the alarms, time delays, the Offset and optionally the output signal can be modified within the limitations. Select the required point by using the „+“ or „-„ button. To modify settings press the button.



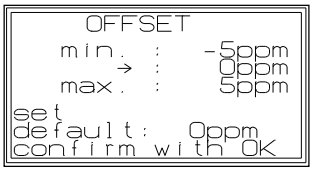
At the SETTINGS menu the all settings can be reset to the factory default values. To reset to factory values once



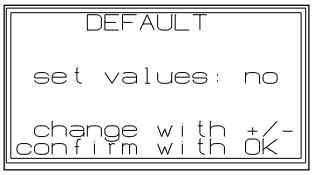
To change the value, press the “+” or “-“ button.



To change the value, press the

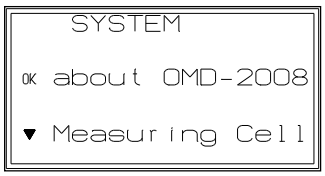


To change the value, press the

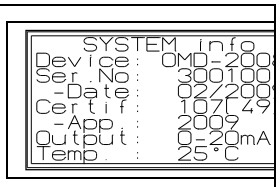


To change to “yes”, press the “+” button. Confirm with “OK” to reset all settings to the factory

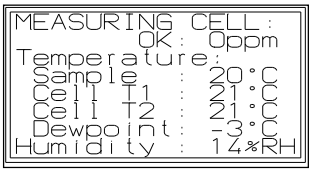
Pressing the SYS button directly leads into SYSTEM menu.



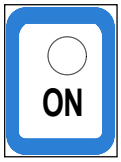
Select if you want information about the instrument or information about the measuring cell.



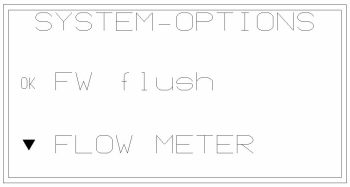
Exit from SYSTEM-info menu by pressing the ESC button



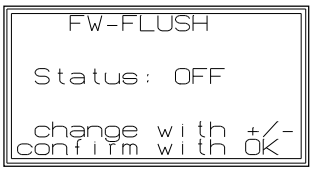
Exit from MEASURING CELL menu by pressing the ESC



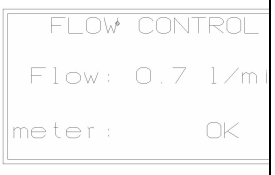
Pressing the ON button directly leads into the SYSTEM-OPTIONS menu.



Select if you want to activate the clean water valve or if additional information should be displayed.

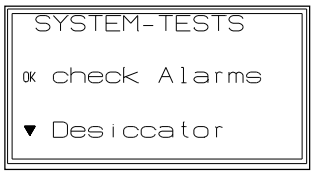


To change to “ON”, press the “+” button. Confirm with “OK”

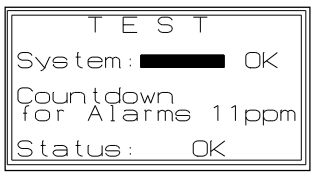


Flow rate and status of the meter is displayed. Exit from Flow display by pressing the

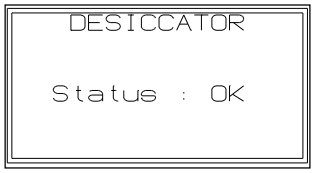
Pressing the TEST button directly leads into the SYSTEM-TESTS menu.



Select if you want to activate the Alarms Test or if Desiccator status information should be displayed.

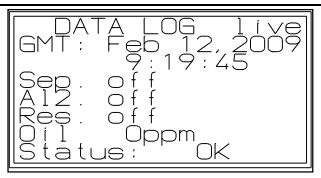


Wait until Alarms Test is completed, as indicated by



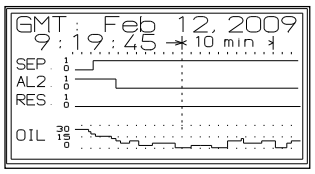
Exit from information

The LOG button leads into the data logger function.

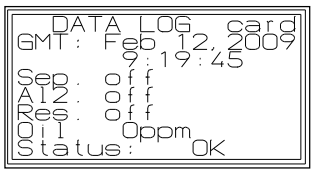


Initially the data logger displays the live data. With the

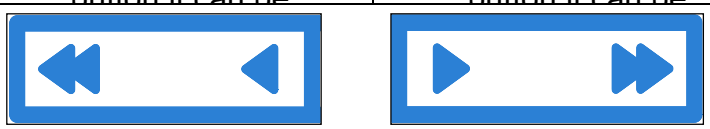
By pressing the LOG button twice the recorded data display mode is invoked.



The data logger displays recorded data. With the button it can be



The data logger displays recorded data. With the button it can be



In both data display modes the arrow buttons can be used to navigate to another date/time

NB: *Changed values have to be confirmed by pressing the "* OK *" button. Otherwise the existing values remain valid.*

11 Operating instructions

The OMD-2008 has a manual clean water switchover valve. Whenever ths valve is not in normal operation position, the instrument will be in alarm condition.

The OMD-2008 EV has an electric switchover valve to switch over from sample water to clean water. Whenever clean water is used, the instrument will be in Alarm condition.

The OMD-2008 EV-FC has an additional Flow Sensor to detect the flow rate of the water through the instrument. If the sample does not flow, the instrument will be in alarm condition.

The OMD-2008 EV-FC MCU has the Flow Sensor, and additionally it has the Manual Cleaning Unit.

Instrument start-up sequence:

a) Switch on the power supply.

b) Allow a period of time for water entering the sample tube.

c) Switch the Clean Water Valve to clean water stream and let oil free water flow through the system for a few minutes. Check that the display shows 0 to 2 ppm. If not, clean Measuring Cell sample Glass Tube properly.

d) Switch the instrument back to sample stream from to the separator sampling point connection.

e) The instrument is now ready for use.

11.1 Operator Notes

a) When oily water flows through the instrument the display will show the actual value of oil content.

b) If the oil concentration exceeds the adjusted threshold (works adjustment 15 ppm), the alarm indicator 1 will be illuminated in intervals during the selected time delay before it changes to steady light and the associated alarm relay will operate. Accordingly also the alarm indicator 2 will be illuminated and its associated alarm relay will take the appropriate shut down action.

c) Correct measurement is only possible if the instrument is maintained in good working order.

12 Operator Maintenance

12.1 Routine maintenance

a) AT WEEKLY INTERVALS:

b) Flush the cell with oil free water.

c) Stop sample and oil free water flow.

d) Unscrew and remove the cell cap. For instruments equipped with Manual Cleaning Unit (MCU), unscrew the MCU instead.

e) Insert a suitable Cell Cleaning brush (Art. No. 77555) into the cell and clean it with upwards and downwards motion through the entire length of the cell several times.

f) Remove the Cell Cleaning brush and replace the cell cap.

g) Open clean water valve and allow oil free water to flow through the instrument for a few minutes.

h) Observe that the display is showing "0" to “2”. If not, clean again.

i) Examine the status of the desiccator (Refer to chapter 10.4, Programming Mode). The Desiccator status display indicates if the desiccator is worn out and working insufficient. If the desiccator status is any other then OK, the desiccator should be replaced. Additionally, the Measuring Cell Dew Point Temperature can be checked. The Dew Point Temperature should be below 0°C, otherwise the desiccator needs to be exchanged.

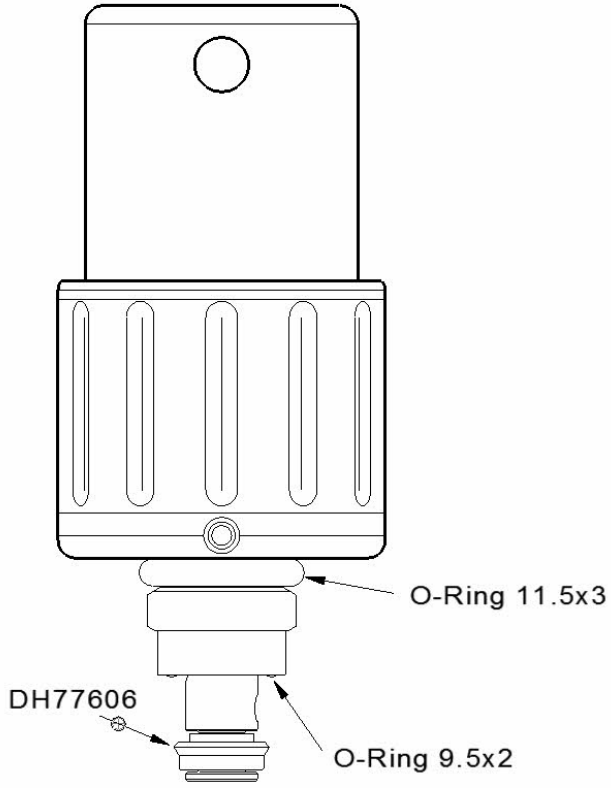
   Note: *Insufficient desiccator performance could result in condensation inside the measuring cell and wrong measurement and/or damage to optical components. Desiccator can easily be exchanged. Just unscrew the desiccator, replace the desiccator with a new one (Art. No. 79550). Make sure to close the desiccator cap properly. Allow the new desiccator some time to absorb the humidity inside the measuring cell. Please note that a desiccator package should never be opened unless it is installed immediately.*

j) Switch Clean Water Valve to SAMPLE setting.

12.2 Manual Cell Clean Unit (MCU)

Optional item if fitted

The Manual Cleaning Unit (MCU) facilitates cleaning of the cell without the need of removing the cell cap. Regular use of this device should prevent malfunction of the monitor due to common fouling mechanisms of the sample tube, and may allow longer maintenance intervals. The MCU (Order No. 77780) can be installed at any time.



Vergleichsbild: normale Kopfschraube

Operating Instructions

a) Ensure that there is a clean water supply through the cell.

b) Activate the manual cell clean unit by pressing the handle several times.

c) Check the reading is between 0 to 2 ppm.

d) Repeat a) to c) at least once a week or as necessary.

e) Additional conventional cleaning with the cleaning brush may be necessary.

NB: The Manual Cell Clean Unit may also be used during normal operation with sample water, but in this case an alarm occurs because the wiper is passing the light source.

MCU Spares: Wiper Seal DH 77606

12.3 Additional manual cleaning

Anything that is deposited or located on the surface of the glass tube may interfere with the measurement. For optimal performance and reliability of the instrument it is necessary to maintain a cleaned glass tube at all times.

Under normal operating conditions a clean glass tube can be achieved by following the procedures as described above. Using the Manual Cleaning Unit as described above can reduce the maintenance work even further, or may allow operation with low maintenance in more demanding applications.

However, in some cases it is necessary to perform additional cleaning. If an instrument has been without maintenance for a longer time, if conditions on site lead to deposition of material inside the glass tube, or generally if the overall condition of the instrument is to be checked, intensive cleaning is recommended.

Please note that under no conditions, and for no reason whatsoever, it is necessary or recommended to disassemble the instrument. All cleaning can be performed through the top opening of the Measuring Cell.

12.4 Indications for need of cleaning

Note: before any attempts to clean the instrument are started, the condition of the desiccator should be checked! A worn out or saturated desiccator is one of the most likely causes of unexpected high readings and low instrument performance.

In some cases of high reading with clean water the measuring cell has a problem with internal coating of the glass tube. Just cleaning with brush and clean water will not help in this case.

12.5 Cleaning of Glass Tube at 15 ppm Bilge Alarms OMD-2008 series

IMPORTANT:

NEVER DISASSEMBLE THE UNITS AS THIS MAY VOID THE CALIBRATION AND THE CERTIFICATION!

CLEANING HAS ONLY TO BE DONE TROUGH THE REMOVED CELL CAP BY USING THE CLEANING BRUSH!

Please carry out the following instructions to make sure, that the glass tube is really clean. Then the unit will show 0 to 2 ppm with clean water.

Clean the glass tube by using the cleaning brush under assistance from some cleaner.

12.6 Removal of Iron Oxide Layer with Citric Acid

In certain cases iron oxide can be deposited inside the glass tube (brownish surface deposit on the glass tube), depending on environmental conditions on site. Iron Oxide can not be removed mechanically. It is recommended to remove it chemically.

Iron Oxide can be converted into a water soluble compound using Citric Acid. Citric Acid is commonly used to remove calcite from Coffee Machines. Fill some Citric Acid into the drained Sample Glass Tube, add water, and let it soak overnight (the reaction takes some time). Flush with clean water.

Additional use of tooth paste may also assist in cleaning as a last resort. Do not use abrasive cleaners containing hard particles. Hard abrasive particles may scratch the glass surface, permanently damaging the instrument.

13 Fault finding

See Section 2 for important notes.

The OMD-2008 EV-FC will indicate several malfunctions in the status line of the display. Pressing the “OK” button will lead into an information window, similar to the items listed in the table below.

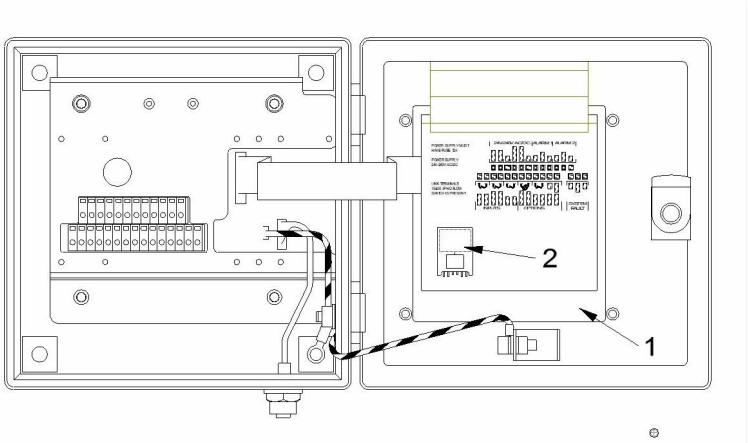
Status	Reading	System-Alarm-LED	Alarm-circuit 1,2	Reason	Servicing
OK	0..49	Green / Blinking	Normal operation	Normal operation	-
OK	EE	Green / Blinking	Alarm	Sample reading is out of range: Oil content too high, dirty sample tube	Wait until oil content is within the range, clean sample tube

FW!	0..49/EE	Green / Blinking	Alarm	Freshwater is enabled	-
FW!	0..49/EE	Green / Blinking	Alarm	remote freshwater input is linked (Terminals 19&20)	remove/check external wiring
EVALVE?	any	red	Alarm	FW valve position not detected	check connectors and wiring
Sample?	EE	Red / Steady	Alarm	Meter is not able to measure the sample: no water in, oil content much too high, no light transmission possible	Check sample, clean sample tube according Page 20
Flow!	0..49/EE	Green / Blinking	Alarm	Low Sample flow rate Flow Input (Terminals 15&16) open	Check sample flow rate
Com?	EE	Red / Steady	Alarm	No communication between computer	Check connection between computer unit and

				unit and measuring cell	measuring cell
Datalog?	0..49/EE	Red / Steady	Alarm	Datalogging is not possible:	Insert the active memory card
				Datalogging is not possible: a	Insert the active memory card
				Datalogging is not possible: a new DECKMA memory card has been inserted, but has not been activated	Activate card or insert the active memory card
Desicc	0..49/EE	Green / Blinking	Normal operation	Measuring Cell humidity critically high (>40%rH)	Check/Replace Desiccator
Humid	0..49/EE	Green / Blinking	Normal operation	Sample temperatur below dewpoint. Instantaneous condensation possible	Check/Replace Desiccator
Int.Err		Red / Steady	Alarm	Internal error	Restart the system

13.1 Memory Card

The Memory Card is on the backside of the Display PCB inside the computer housing. It is suitable for the life of the instrument, as it is calculated according MEPC 107(49) to the required storage time of at least 18 month. When the card is completely used, the oldest entry will be overwritten, so that a replacement is not necessary. Under normal use the card should not be taken out, as this is linked with the specific system. The card can be read in other OMD-2008 units, but writing is only possible in the related system.



1: Display PCB 2: Memory Card

Fig. 6

If no Memory Card is mounted or a card from another system is mounted, the unit will be in alarm condition.

14 Calibration

15 ppm Bilge Alarms built according MEPC.107(49) have to be protected against access beyond the checks of instrument drift, repeatability of the instrument reading and zero adjustment. For this reason the instrument is electronically sealed, so that only the manufacturer or his authorized persons, equipped with the related tools, are able to get access for changing the calibration.

To provide a simple procedure to check the instrument aboard ship, the OMD-2008 EV-FC is constructed in that way, that the zero check also confirms the instrument drift within the specifications.

14.1 Calibration and repeatability check

a) Switch off the power supply and stop any water flow.

b) Clean the sample tube accurately by using a suitable cell cleaning brush as described under Section 12.0. Make sure, that the offset is correct at ± 0.

c) Run clean water through the instrument.

d) If it is sure, that non aerated, clean water is in the instrument, the reading should be 0 ppm ± 2 ppm.

e) Continue as described under Section 11.0.

Note § 4.2.11 of MEPC. 107(49):

The accuracy of the 15 ppm Bilge Alarms should be checked at IOPP Certificate renewal surveys according to the manufacturers instructions. Alternatively the unit may be replaced by a calibrated 15 ppm Bilge Alarm. The calibration certificate for the 15 ppm Bilge Alarm, certifying date of last calibration check, should be retained onboard for inspection purposes. The accuracy checks can only be done by the manufacturer or persons authorized by the manufacturer.

14.2 Function Test at Classification Survey and Port State Control

All 15 ppm Bilge Alarms leaving our works are calibrated according the requirements with an accuracy of better than +/- 5 ppm within the measuring range. The alarm points are pre-set to 15 ppm (or 5 ppm for instruments limited to 5 ppm), and can only be changed to a lower value on site. A setting to a higher value is not possible.

To provide a simple procedure for check the instrument aboard ship, the OMD-2008 EV-FC is constructed in that way, that the zero check also confirms the instrument drift within the specifications. The Test button starts a self test routine and allows to put both alarms contacts into alarm condition. The instrument will count down from an assumed high reading (30ppm) downwards until the assumed value is equal to the actual measured ppm value. Note that this test will only switch the alarm contacts to non-alarm condition, if the sample contains less than 15ppm oil content and all other conditions for proper measurement are OK.

15 Spare Parts

When ordering spares, it is important to supply details of the type of monitor, part number of each spare required, its description and any relevant serial number.

DESCRIPTION	ART-NUMBER
Service Kit	18570
Desiccator	79550
Cell Cleaning Brush	77555
O-Ring Set	77775
Memory Card	79186
Service Exchange Measuring Cell (including new Calibration Certificate)	2277500
Optional Items	
Manual Cell Clean Unit	77780
Wiper Seal for Cell Clean Unit	77606
OMD-CR Memory Card Reader	75185
Function Test Kit	18510
Flow Sensor	16700

15.1 Recommended On Board Spares

DESCRIPTION	ART-NUMBER
1 off Service Kit	18570

16 REMARKS

All the modifications and deviations from the standard form, which have to be carried out in the supply, should be attached at this paragraph.

Commissioned on: ..... by: .....

Date Firm's Name

Remarks: