

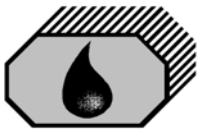
INSTRUCTION MANUAL

15ppm Bilge Alarm

Type OMD-2005

DECKMA HAMBURG GmbH

Kieler Straße 316, D-22525 Hamburg - Germany
Tel.: +49 (0) 40 54 88 76-0, Fax: +49 (0) 40 54 88 76-10
Internet: www.deckma.com eMail: post@deckma.com



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.

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-2005 is designed in that way, that only the measuring cell needs to be changed, as this unit carry the calibration onboard. 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 make 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.

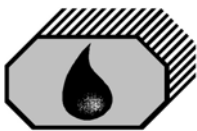
Warranty

Our warranty terms are 12 months after installation but maximal 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.

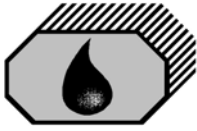
The purchaser shall bear the cost and risk of transport of defective parts and repaired parts supplied in replacement of such defective parts.

ANY DISMANTLING OR BREAKING OF A SEAL WILL VOID THE WARRANTY



CONTENTS

SECTION	TITLE	PAGE
1.0	Introduction	4
2.0	Important Notes	4
3.0	Principle of Operation	4
3.1	Measuring Principle	4
3.2	Features	5
3.3	Adjustment	5
3.4	Displays and Alarms	5
4.0	Specification	7
5.0	Construction	8
6.0	Installation	9
7.0	Piping	10
8.0	Wiring	11
8.1	Typical Control System	13
9.0	Power Supply	13
10.0	Commissioning	13
10.1	Electrical	13
10.2	Piping	13
10.3	Functional Tests	14
10.4	Programming Mode	15
11.0	Operating Instructions	17
11.1	Operator Notes	18
12.0	Operator Maintenance	18
12.1	Manual Cell Clean Unit	19
13.0	Fault Finding	20
13.1	Memory Card	22
14.0	Calibration	23
14.1	Calibration and Repeatability Check	23
15.0	Spare Parts	24
15.1	Recommended On Board Spares	24
16.0	Remarks	25



1.0 INTRODUCTION

The OMD-2005 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.

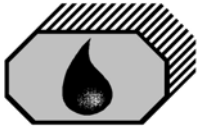
If an alarm set point is exceeded, the alarms are visible at the front panel and the appropriate relays are switched. In case of malfunction the System LED at the front panel will change from blinking green to permanent red and the appropriate relay will switch the contacts.

For the data logging function the unit requires an status input from the separator and a feedback signal from the valve position limit switch. (See Fig. 1, Pos.6)

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

2.0 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 complete.



3.0 PRINCIPLE OF OPERATION

3.1 Measuring Principle

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

If an alarm (works set point 15 ppm) 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 Features

- Robust construction
- Automatic voltage selection
- Solid suppression capability
- Low maintenance
- Easy installation
- Constant readiness
- Low spare part stock holding
- Watertight Housing
- Works adjustment
- Easy settings via menu

3.3 Adjustment

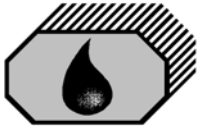
The unit is delivered with a works calibration according the IMO-requirements. The alarm points are set to 15 ppm.

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 "Service-Offset". A calibration is not permitted. This has to be done according IMO Regulations by the manufacturer or persons authorized by the manufacturer.

3.4 Displays and Alarms

In the unit 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. The adjustment 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 and the possible changing between 0 - 20 mA or 4 - 20 mA output can be done.

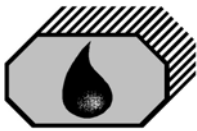


Both alarm circuits are also related to an alarm LED on the front panel.

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. Also this alarm is related to an relay output.

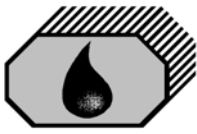
Additional to the alarm LED's each alarm circuit is equipped with a relay with potential free alarm contacts. These contacts can be used for external processing of the signal or for control of further functions.

If a malfunction or failure of the power supply occurs, all 3 relays will switch to alarm condition.



4.0 SPECIFICATION OMD-2005

Range:	0 – 30 ppm, Trend up to 50 ppm
Accuracy	According IMO MEPC. 107(49)
Linearity	Up to 30 ppm better than $\pm 2\%$
Display	Green Graphic Display
Power Supply:	24 V – 240 V AC or DC Automatic Voltage Selection
Consumption:	< 15 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 LED's
Output Signal:	0 – 20 mA or 4 – 20 mA for 0-30 ppm reversible, ext. Load < 150 Ω
Sample Water Pressure:	0,1 – 10 bar
Sample Flow:	Approx. 0,1 - 4 l/min depend. to pressure
Ambient Temperature:	+ 1 to + 55° C
Sample Water Temperature:	+ 1 to + 65° C
Roll:	Up to 45°
Size (over all):	360 mm W x 240 mm H x 100 mm D
Degree of Protection:	IP 65
Weight:	7,3 kg
Pipe Connections:	R ¼" Female



5.0 CONSTRUCTION

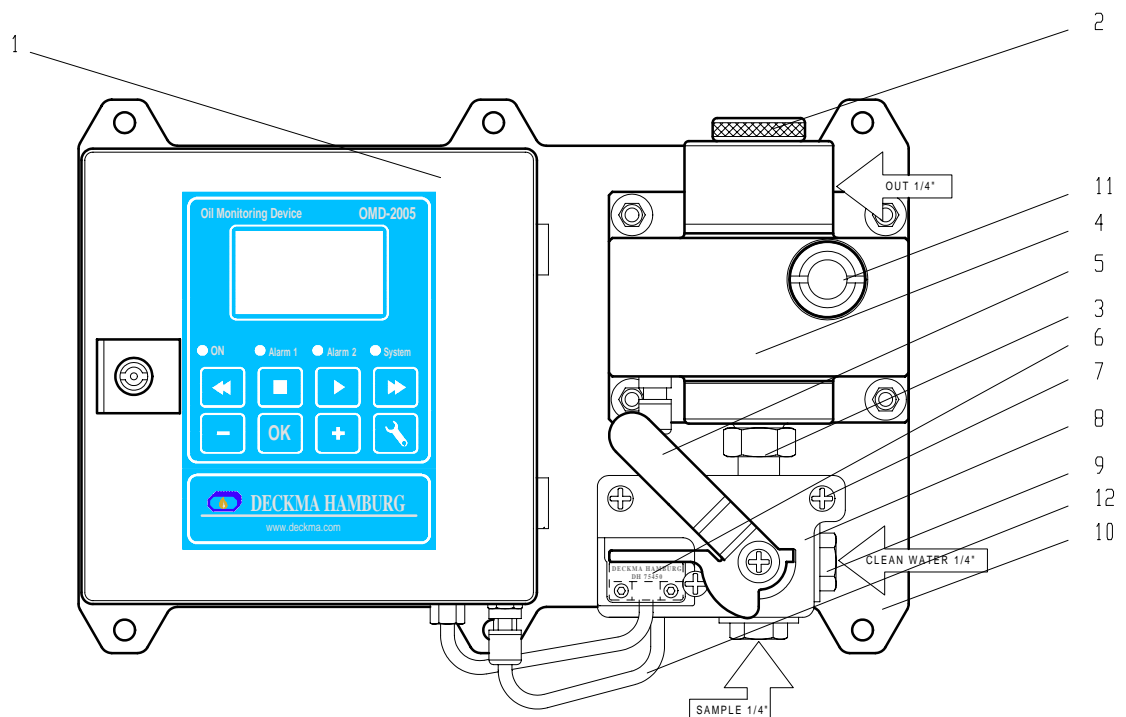
There are 3 main parts which contained in an OMD-2005:

The computer unit is mounted into an epoxy powder painted steel housing to protect the electronics of the display PCB with the data logger and the main board PCB with the terminals for external connections.

The measuring cell is built out of an anodized all-aluminium body with inlet and outlet block in stainless steel. This rugged cell contains the optical electronic and correspond with the computer unit via a plugged data cable.

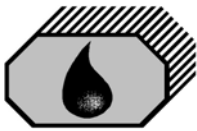
The valve assembly contains a special handle to sense the position of the valve. This assembly is connected to the measuring cell by an easy to handle fitting to enable the exchange of the cell for frequently adjustment according the IMO requirements.

All components are mounted to a stainless steel mounting plate for easy wall or bulkhead installation. It is also possible to split the computer unit from the measuring cell if the available space is not sufficient. For this version divided mounting plates are available.



1	Computer Unit	5	Handle	9	3/2 Way Valve
2	Head Screw	6	Limit Switch	10	Mounting Plate
3	Fitting	7	Spacer	11	Desiccator
4	Measuring Cell	8	Valve Plate	12	Communication Cable

Fig. 1



6.0 INSTALLATION (Refer to Fig. 2 and Fig. 3)

See Section 2 for important notes concerning installation.

The OMD-2005 Monitor 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 s.) 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 s.

Mount the OMD-2005 Monitor by means of 6 x 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.

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

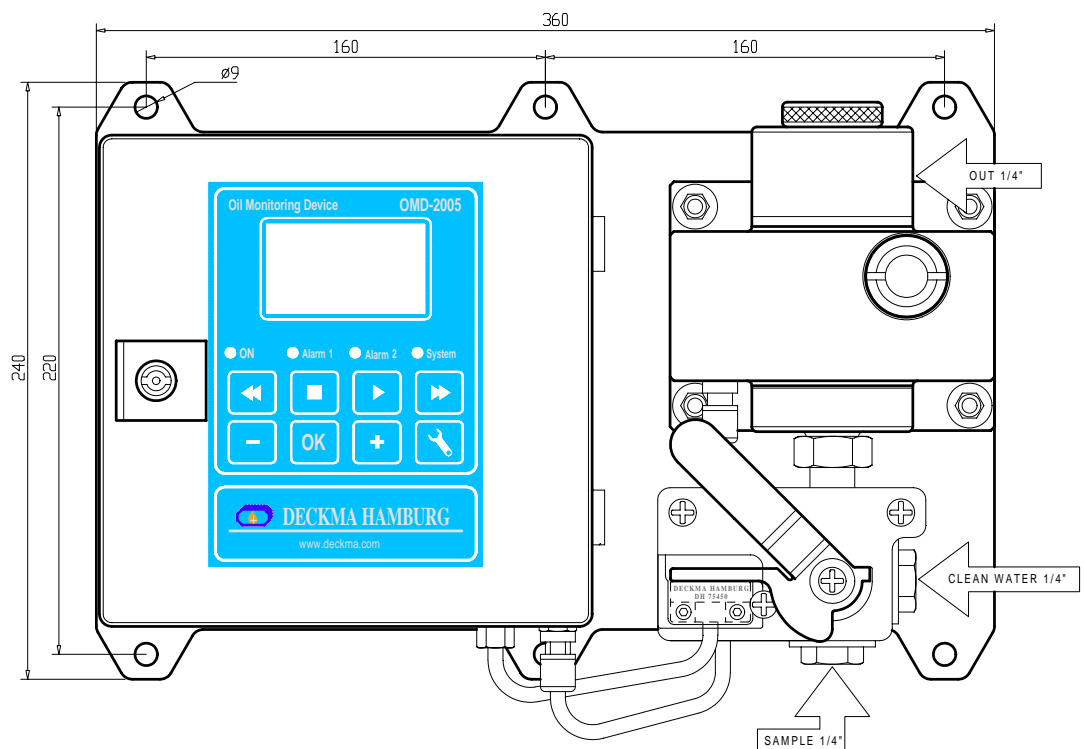
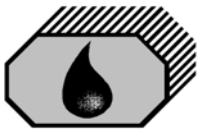


Fig. 2

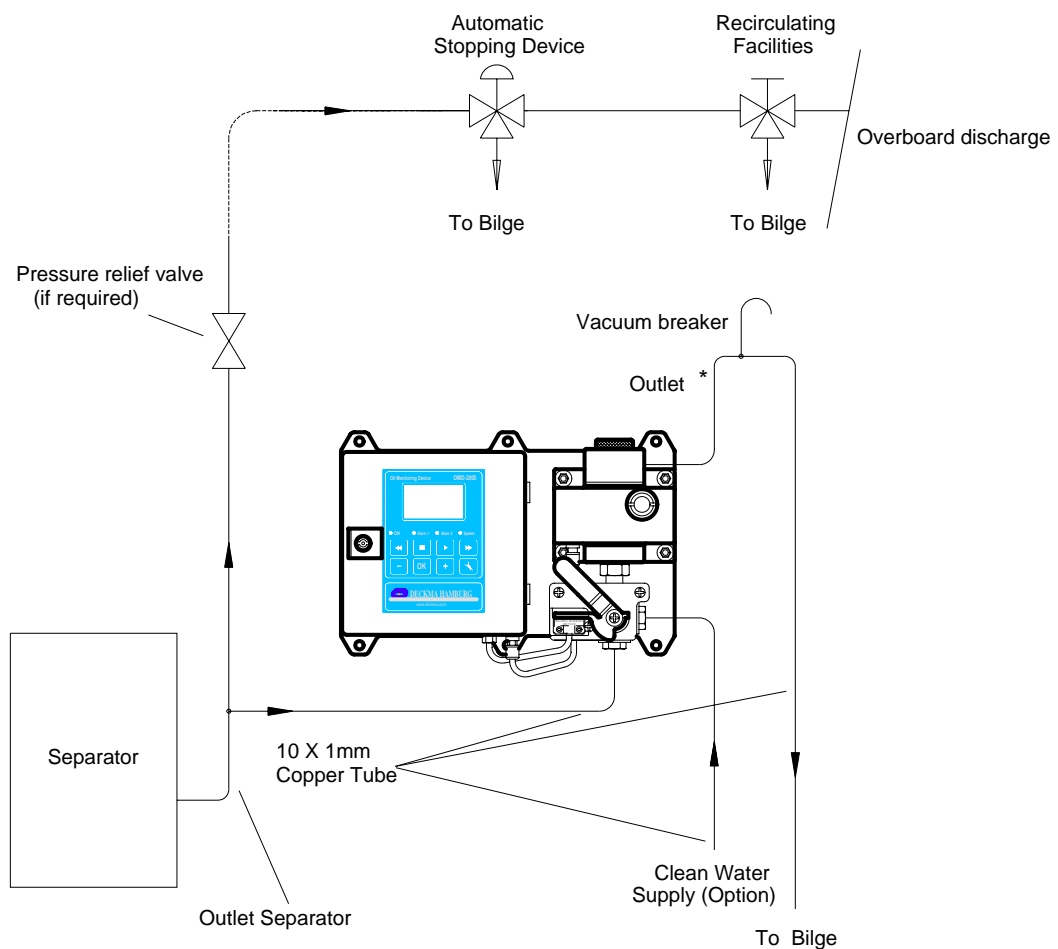


7.0 PIPING (Refer to Fig. 3)

Connect the OMD-2005 Monitor to the sample point of the oily-water separator outlet and to a source of oil free water employing 10 mm OD copper or stainless steel pipe. 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.

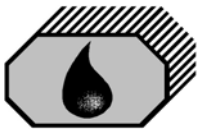
If connection to a vertical section of the separator outlet piping is impractical, the tapping may be made into the side of the horizontal pipe. Avoid top or bottom entry.

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.



* Inlet & Outlet connections R1/4" Female

Fig. 3



8.0 WIRING (Refer to Fig. 4 + 5)

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.

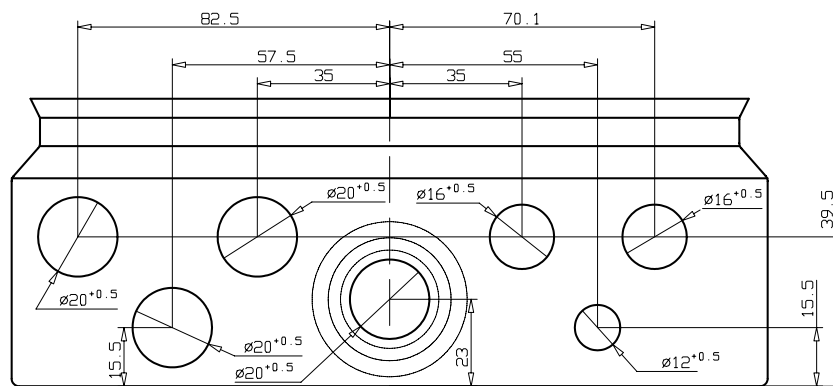


Fig. 4

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 left side. In this case the plug needs to be replaced by a M6 screw with nut and related washers.

The instrument provides a pilot voltage output at terminals 4&5. This is internally connected to the power supply input (Terminals 1&2), but is fused by Fuse F1 (2 A). 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.

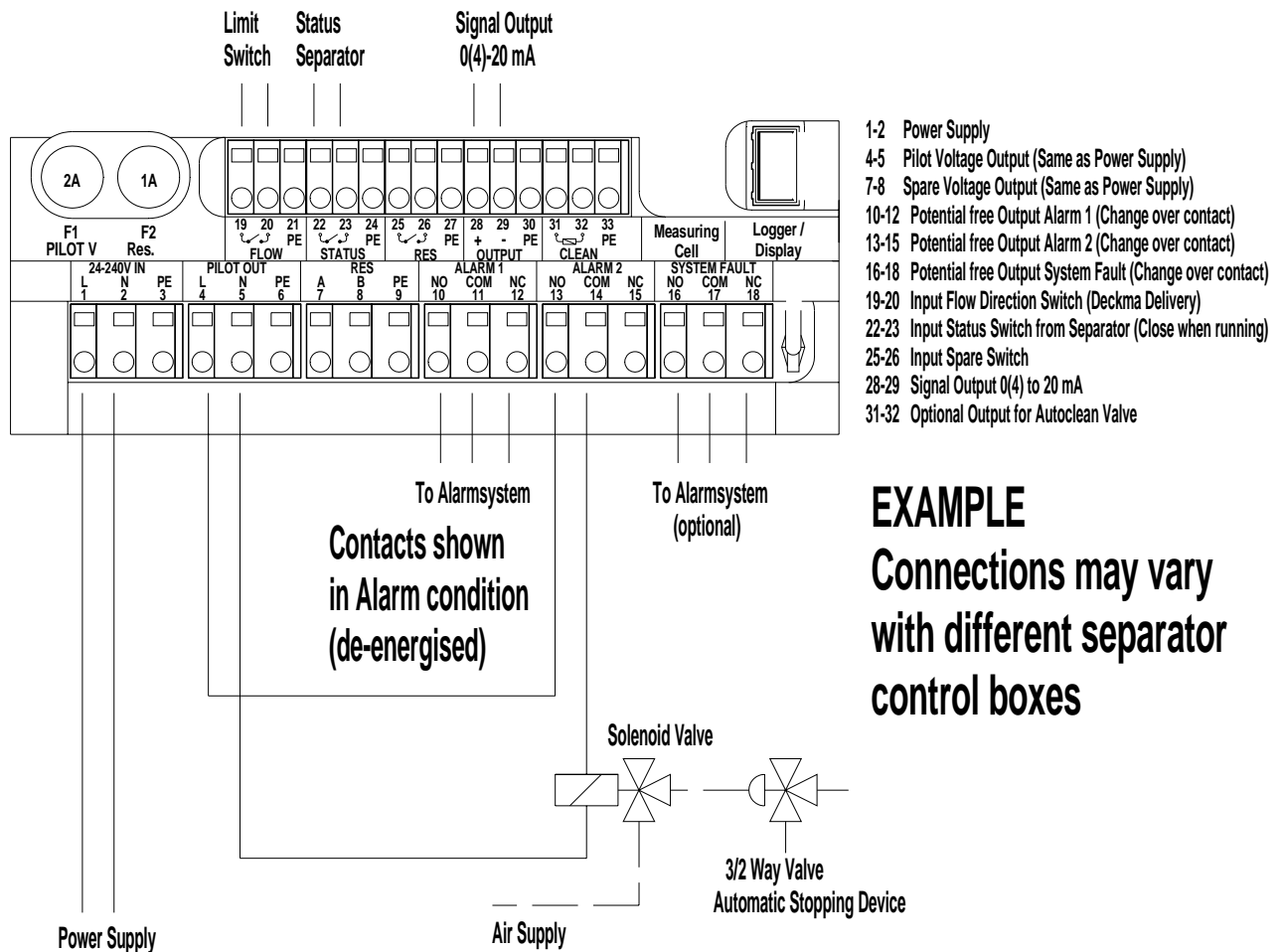
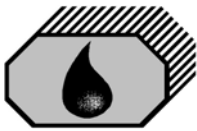
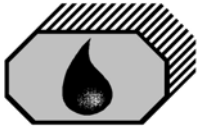


Fig. 5

Close front door complete after electrical installation. Water inside the instrument may result in corrosion and malfunction.



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 according MEPC.107 (49) not allowed.

9.0 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 power selection.

10.0 COMMISSIONING

See Section 2 for important notes.

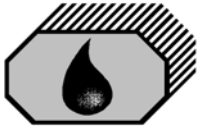
On completion of the installation, wiring and piping carry out the following checks:

10.1 Electrical

- a) Check that the power supply is connected to the terminals 1 + 2 of the terminal block.
- b) Check the wiring of the automatic stopping device and to the alarm system is according the IMO Requirements.
- c) Check that the grounding has been made according to the relevant regulations.

10.2 Piping

- a) Check all piping connections for leaks and rectify as appropriate.



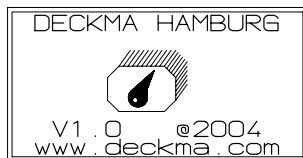
10.3 Functional Tests

- a) Run oil free water through the instrument to purge the system.
- b) Adjust the flow rate through the unit by using the small screws in the cell cap (Fig. 1, Pos. 2). Taking out a screw will increase the flow rate.

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 is not influencing the accuracy of the instrument. The adjustment is only important for the time delay between the sample point and the monitor.

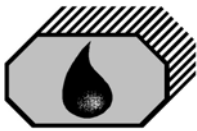
- c) Switch on the instrument and make sure, that the Power LED is illuminated



and the display is showing the initializing display for about 15 sec. After that time it will change to the standard display,

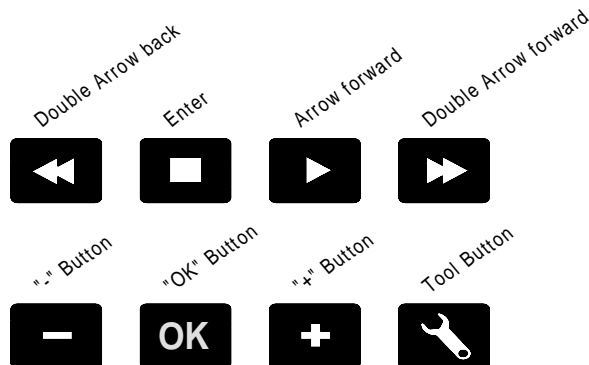
showing the actual measurement.

- d) During oil free water is running through the monitor check the Zero adjustment according Section 11. 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.
- f) If the Zero need to be adjusted, this can be done in the programming mode as described in section 10.4. (Service – Offset)



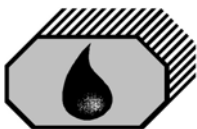
10.4 Programming Mode

In the programming mode the alarm set points, the time delays, the signal output and the zero can be modified. It is also possible to recall the factory default values at any time. The clock is factory set for GMT, **Greenwich Mean Time**, and cannot be changed.



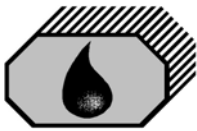
There are 8 push buttons to control the functions of the display. In general are the upper buttons for the data logger and the lower buttons for changing the display to the different pages of the menu.

	<p>Pressing the OK button will give more detailed information about the status</p>	
<p>After start the display will show the initial display followed by the actual measured oil content. This display also be shown, if no input at the different menu's has been done for a designated time</p>		
<p>To get into the menu press the tool button. Select the required point by using the „+“ or „-“ button. Press the „OK“ button.</p>	<p>At the service menu the alarms, time delays, the Offset and the output signal can be modified within the limitations. Select the required point by using the „+“ or „-“ button. Press the „OK“ button.</p>	<p>To change the value, press the „+“ or „-“ button. Confirm with „OK“.</p>



DECKMA HAMBURG GmbH

	Select the required point by using the „+“ or „-“ button. Press the „OK“ button.	To change the value, press the „+“ or „-“ button. Confirm with „OK“.
	Select the required point by using the „+“ or „-“ button. Press the „OK“ button.	To change the value, press the „+“ or „-“ button. Confirm with „OK“.
To get into the menu press the tool button. Select the required point by using the „+“ or „-“ button. Press the „OK“ button.	The display will show the actual status of the data logger. To get back to the standard display press the tool button or the OK button.	
<p>Function of the scrolling buttons for both operation time history displays:</p> <ul style="list-style-type: none"> > 15 sec Forward > and + 2 min Forward >> Fast Forward >> and + Very Fast Forward - 15 sec Backward - and + 2 min Backward << Fast Backward << and + Very Fast Backward 	<p>Press the “Enter” button to get into the history. Select the required date and time by using the buttons.</p> <p>The dotted vertical line shows the actual position.</p> <p>Press the “Enter” button to show details</p>	<p>The detailed information of the selected date and time will be displayed. To get back to the history graph, press the “Enter” Button again. To get back to the start display, press the “OK” button.</p>

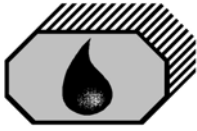


To get into the menu press the tool button. Select the required point by using the „+“ or „-“ button. Press the „OK“ button.	The temperature of the measuring cell and the sample water will be shown	
To get into the menu press the tool button. Select the required point by using the „+“ or „-“ button. Press the „OK“ button.	The details of the measuring cell will be shown.	
To get into the menu press the tool button. Select the required point by using the „+“ or „-“ button. Press the „OK“ button.	Information about the software version and the web address will be shown.	

NB: All changed values have to be confirmed by pressing the " OK " button. Otherwise the existing values are valid.

11.0 OPERATING INSTRUCTIONS

- Switch on the power supply.
- Allow a period of time for water entering the sample tube.
- Flow oil free water through the system for a few minutes and check that the display show 0 to 2 ppm. If not, clean proper before adjusting the unit according section 10.4 "Service - Offset".
- Switch the instrument sample supply from the clean water supply to the separator sampling point connection.
- 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 change 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.

12.0 OPERATOR MAINTENANCE

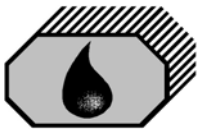
See Section 2 for important notes.

AT WEEKLY INTERVALS:

- a) Flush the cell with oil free water.
- b) Isolate the instrument from both, sample and oil free water supply.
- c) Unscrew and remove the cell cap.
- d) Insert a suitable Cell Cleaning brush (Art. No. 30102) into the cell and clean it with upwards and downwards motion through the entire length of the cell several times.
- e) Remove the Cell Cleaning brush and replace the cell cap.
- f) Reconnect the oil free water supply and allow this to flow through the instrument for a few minutes.
- g) Observe that the display is showing "0" to "2". If not, clean again.
- h) Examine the color of the desiccator (Fig. 1, Pos. 11). Blue color is indicating an active moisture absorber. If the color is light blue or white, the desiccator should be replaced.

The desiccator assures a humidity below 40% inside the measuring cell to avoid wrong measurement resulting due to condensation at the cell glass tube and damage of the electronics around the glass tube. The replacement is easy done without opening the instrument. Just unscrew the old desiccator out of the front panel and replace it by a new one. The protection cap of the spare unit can be also used as a tool.

- j) Reconnect the instrument to the separator sampling point.



12.1 Manual Cell Clean Unit

Optional item if fitted

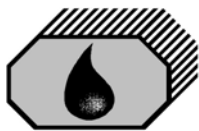
This unit facilitates cleaning of the cell without the need of removing the cell cap. Regular use of this device should prevent malfunction of the monitor due simply to fouling of the sample tube and all the inconvenience which this can cause.

Operating Instructions

- a) Ensure that the monitor is switched off and that there is a clean water supply through the cell.
- b) Activate the manual cell clean unit by pressing the handle several times.
- c) Switch the monitor back on and check the reading is between 0 to 2 ppm.
- d) Repeat a) to c) at least once a week or as 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.

Spares: Wiper Seal, Part. No. 30605

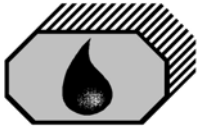


13.0 FAULT FINDING

See Section 2 for important notes.

The OMD-2005 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-circuit		Alarm-circuit 1,2	Reason	Servicing
		LED	Alarm			
OK	0..49	Green / Blinking	No	Normal operation	Normal operation	-
OK	EE	Green / Blinking	No	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	No	Alarm	Freshwater is enabled	-
Sample?	EE	Red / Steady	Yes	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 21
Com?	EE	Red / Steady	Yes	Alarm	No communication between computer unit and measuring cell	Check connection between computer unit and measuring cell
Datalog?	0..49 / EE	Red / Steady	Yes	Alarm	Datalogging is not possible: no DECKMA card in	Insert the active memory card
					Datalogging is not possible: a read only card is in	Insert the active memory card
					Datalogging is not possible: a new DECKMA card is in	Activate card or insert the active memory card
Int.Err		Red / Steady	Yes	Alarm	Internal error	Restart the system



Important Information!

Cleaning of Glass Tube at 15 ppm Bilge Alarms OMD-2005

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!

In most 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.

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

Remove the desiccator of the measuring cell and check the colour. It should be blue or light blue. If it is more white, it needs to be changed, as the humidity inside the measuring cell might be too high and creates condensation around the glass tube which leads to high readings.

Looking through the hole of the removed desiccator a small part of the glass tube is visible. Please check if it is really clean and clear.

If not, replace the desiccator to avoid humidity or water inside the measuring cell and clean the glass tube by using the cleaning brush under assistance from some cleaner.

If there is some brown coating visible at the glass tube, it could be iron oxide. In this case some citric acid, juice from a fresh lemon or vinegar may help, if you fill it into the glass tube and leave it at least over night before using the cleaning brush for removing the last dirt from the glass tube. Make sure, that the cleaning fluid will stay in the tube and is not draining. Sometimes the cleaning with citric acid or vinegar has to be doen 2 or 3 times for at least 12 hours, depending on the thickness of the coating.

Additional use of some slightly abrasive cleaning powder or tooth paste may also assist in cleaning.

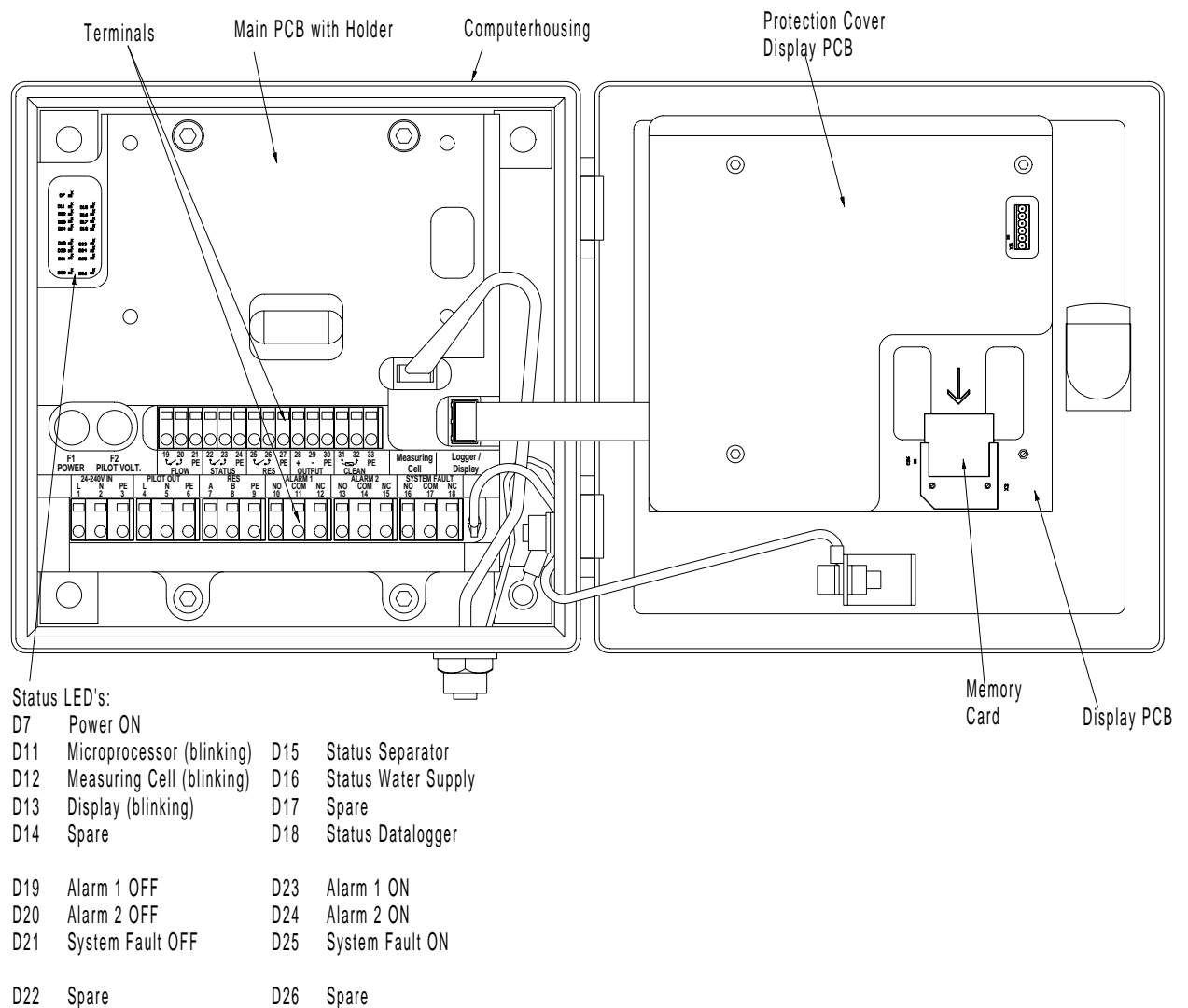
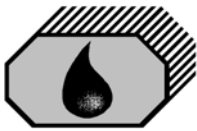
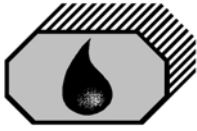


Fig. 6

13.1 Memory Card (refer to Fig. 6)

The Memory Card is located inside the door of the computer housing. It is suitable for the life of the instrument, as it is calculated to the according MEPC 107(49) required storage time of at least 18 month. When the card is full, 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-2005 units, but writing is only possible in the related system.

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



14.0 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 for check the instrument aboard ship, the OMD-2005 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 accurate 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 $0 \text{ ppm} \pm 2 \text{ ppm}$.
- e) Continue as described under Section 11.0.

Note § 4.2.11 of MEPC. 107(49):

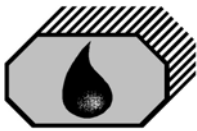
The accuracy of the 15 ppm Bilge Alarms should be checked at IOPP Certificate renewal surveys according to the manufacturers instructions. Alternatively the unit may be replaced by a calibrated 15 ppm Bilge Alarm. The calibration certificate for the 15 ppm Bilge Alarm, certifying date of last calibration 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 $\pm 5 \text{ ppm}$ within the measuring range. The alarm points are pre-set to 15 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-2005 is constructed in that way, that the zero check also confirms the instrument drift within the specifications.

A function test for checking the correct installation, can easy be done by changing the position of the 3 way valve. At the clean water position the unit will be in alarm status.



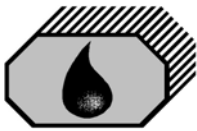
15.0 SPARE PARTS

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
Desiccator	65550
Cell Cleaning Brush	30102
O-Ring Set	75775
Fuse, T 2 A	40107
Fuse, T 1 A	40105
Measuring Cell	75500

15.1 Recommended On Board Spares

2 off Desiccator	65550
1 off Cell Cleaning Brush	30102
1 off O-Ring Set	75775
2 off Fuse T 2 A	40107
Optional item	
1 off Manual Cell Clean Unit	75780



16.0 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:

Date

by:

Firm's Name

Remarks:
