



DECKMA
HAMBURG

INSTRUCTION MANUAL

OMD-32 Series

Oil-in-Water-Monitor



- OMD-32
- Auto Clean – OMD-32 A
- (Optional: Manual Cleaning Unit MCU)

We help to protect the Environment





Usage of this instruction manual

This instruction manual will guide you how to use the OMD-32 Series. The instruction manual is split into sections. Every section handles a specific part of the OMD-32 Series. The first section gives you general information about safety before using and servicing the OMD-32 Series. Please take notice on this section.

You will also find information about the construction and the installation of OMD-32 Series. The programming mode is explained in detail at the end of the instruction manual.

This instruction manual also contains information about the service support and our contact details. The symbols below will accompany for a better understanding.

Disposal



The crossed-out waste container icon on waste electrical or electronic device indicates that this device must not be disposed of with household waste at the end of its life. There are collection points available in your area for free. The addresses can be obtained from your municipality or local administration. You can also email us at post@deckma.com to find out further return options provided by our company.

Separate collection of waste electrical and electronic equipment (WEEE) is intended to prevent the re-use, recycling other forms of use of WEEE as well as to avoid adverse effects on the environment and human health from the disposal of potentially hazardous substances contained in devices.

Symbols



This symbol is used for giving general advices.



This symbol is used to clarify a recommendation.



This symbol is used for giving advices about servicing.



This symbol is used to draw warning against hand injuries.



This symbol is used to show electrical voltage warnings.



This symbol is used to draw attention to hot surfaces.



This symbol is used for giving general warnings.



This symbol is used to draw attention to hazardous substances.



Safety hazard

Mechanical Risks

 Risk of hand injuries	While closing the front cover hand injuries could be possible.
--	--

Electrical Risks

 Electrical voltage warnings	Incorrect commissioning and wiring, touching live parts, and cable breakage or faulty components can lead to electrical hazards.
--	--

Thermal Risk

 Risk of scalding	High temperatures can occur on the surface of the measuring cell. Hot water may spill and cause scalding.
---	---

Chemical Risk

 Risk of chemicals	Material used during cleaning and maintenance can cause eye and skin irritation.
---	--

Risk reduction

Risks	Recommended reduction	Risk level (1)Low – (3)High
Risk of hand injuries.	While opening and closing the front cover care must be taken.	1
Electrical risks.	Works on the units should be only be done by a qualified person. Keep Terminal Cover closed at all times.	3
Risks of scalding.	It is recommended to wear protective clothing in the form of heat-resistant gloves and protective goggles, if high temperature sample is present.	1
High temperature risks.	Do not open the cell cap until the sample water has cooled down sufficiently. Stop any sample water flow prior to opening the cell cap.	2
Unexpected movement of the wiper piston.	Close pressurized air supply before working on the Autoclean System or dismantling the Autoclean System.	2
Chemical Risk.	Material used for Cleaning and Maintenance may cause eye and skin irritation. Cleaning solution may cause health problems if ingested.	1
Risk of environmental damage.	Use instrument strictly within its specification. Keep instrument properly maintained.	1
Risk of health damage.	Do not touch or ingest any residue from sample stream.	2



DECKMA
HAMBURG

IMPORTANT NOTICE

Replacement components for 15 ppm Bilge Alarms

General

All monitors in our range are inspected and tested to meet DECKMA HAMBURG 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 manual.

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 reliable and continuous operation of the instrument.

Remark

The OMD-32 Series is constructed in such a way, that exchanging the Measuring Cell with a calibrated Measuring Cell is considered a calibration of the instrument. The Measuring Cell contains all relevant parts and all information for the calibration.

If for some reasons the Computer Unit needs to be changed, it has to make sure, that the memory card will remain for at least 18 months. The new Computer Unit will carry its own memory card. The old card can be inserted into the new unit only for reading. Writing is only possible with the card delivered with the new Computer Unit.

Warranty

Our warranty terms are 12 months after installation but maximum 18 months after delivery ex works. The manufacturer undertakes to remedy any defect resulting from faulty materials of workmanship except wearing parts.

The manufacturer'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.

i

ANY DISMANTLING OR BREAKING OF A SEAL WILL VOID THE WARRANTY.



Content:

Usage of this instruction manual	1
Disposal	1
Symbols	1
Safety hazard	2
Risk reduction	2
Revision	6
1. Introduction	7
1.1 OMD-32	7
1.2 OMD-32 A	7
2. Important Notes	8
3. Principle of operation.....	9
3.1 Touch Panel.....	9
3.2 Measuring Principle	9
3.3 Display Visualization.....	9
3.4 Alarms	9
3.5 Adjustment	10
3.6 Active Current Interface.....	11
3.7 Inputs.....	11
3.8 Automatic Cell Cleaning Device	11
3.9 MCU (Manual Cleaning Unit).....	11
3.10 Features	12
3.11 Internal Back-Up Lithium Thionyl Chloride Battery	12
4. Specification	13
4.1 Specification OMD-32	14
4.2 Specification OMD-32 A	15
5. Construction	16
5.1 Construction OMD-32	17
5.2 Construction OMD-32 A	18
5.3 Manual Cleaning Unit (MCU)/ Automatic Cell Cleaning Device	19
5.3.1 Flow rate adjustment on MCU and Auto Clean System	19
6. INSTALLATION.....	20
6.1 Installation OMD-32	21



6.2	Installation OMD-32 A	22
7.	Piping	23
7.1	Piping OMD-32	23
7.2	Piping OMD-32 A	24
8.	Cabling	25
8.1	External Control System.....	29
9.	Power Supply	30
10.	Commissioning	31
10.1	Electrical and Piping.....	31
10.2	Instrument Start-Up Sequence	32
10.3	Flow Rate Adjustment	32
10.4	System Settings	34
10.5	Auto Clean Control Unit	34
10.5.1	Pressure Regulation	35
10.5.2	Using standard drainage SS	35
11.	OMD-32 Series Operating instructions	36
11.1	Cleaning Options	36
12.	Operator Maintenance	37
12.1	General Test	37
12.2	Normal Operation	37
12.3	Cleaning Process.....	37
12.4	Intensive Cleaning	38
12.5	System Test	38
12.6	Data Logger Checking	38
12.7	MCU and Automatic Cell Cleaning Device	38
12.8	Maintenance Recommendations.....	40
13.	Programming Mode	41
13.1	Buttons	42
14.	Memory Card	43
14.1	OMD-CR Memory Card Reader	44
15.	Fault finding.....	45
15.1	Automatic Cell Cleaning Unit Fault Finding	47
16.	Calibration	48
16.1	OMD-32 Series	48



16.2	Calibration and Repeatability Check.....	48
16.3	Function Test.....	48
17.	<i>Spare Parts</i>	49
17.1	Recommended On Board Spares	50
18.	<i>Optional Equipment</i>	51
19.	<i>REMARKS</i>	52
20.	<i>Appendix I</i>	53
20.1	Navigation Buttons.....	53
20.2	Functional Buttons	54
20.2.1	Functional Button “TEST”	54
20.2.2	Functional Button “ON”	55
20.2.3	Functional Buttons AL1/ AL2/ SET	56
20.2.4	Functional Button “SYS”	58
20.3	Data Logger Operation Buttons	59
20.4	Setting TIME / DATE	60
20.5	Activating the Memory Card	62
21.	<i>Appendix III</i>	63
21.1	ALARMS	63
22.	<i>Appendix IV</i>	64
22.1	Operator Maintenance Quick Checklist	64
23.	<i>Appendix V</i>	65
23.1	Servicing and Cleaning Manual.....	65
	<i>Index</i>	79
	<i>List of Figures</i>	80
	 <i>Sales & Service Locations</i>	81
	<i>Notes:</i>	82

Revision

Document-Name	Revision No.	Notation	Date
OMD-32 Series	R02_240903		03.09.2024



1. Introduction

The OMD-32 Oil-in-Water Monitor has been designed specifically for use in conjunction with oil-water separator units. The OMD-32 has been constructed using technology of the DECKMA HAMBURG OMD series industrial instruments and 15ppm Bilge Alarm Monitors, that have a specification and performance which exceeds the requirements of the International Maritime Organization specifications for 15ppm Oil-in-Water Monitors contained in Resolution MEPC. 107 (49).

The OMD-32 unit is supplied with 2 works-adjusted alarms at 10 ppm. Other set points are possible (e.g. 100 ppm) 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 “**SYS LED**” at the front panel will change from blinking green to permanent red, and a system fault relay contact is switched.

An analog 0(4) - 20 mA signal output is available for driving a recorder or external meter.

1.1 OMD-32

The OMD-32 is the basic version of the OMD-32 Series. It contains a Computer Unit and a Measuring Cell.

1.2 OMD-32 A

The OMD-32 A version of the instrument is equipped with an additional pneumatic cleaning device for the Measuring Cell sample glass tube.



2. Important Notes

- a) This equipment must be installed and operated in strict accordance with the instructions contained in this instruction manual. Failure to do so will impair the protection provided.
- b) Installation and servicing must be undertaken by a competent and suitably 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 instruction manual.
- f) In case of freezing conditions, the Measuring Cell should be emptied completely.
- g) Some components mentioned in this instruction manual may not be present on the instrument on site, and/or the instrument may have additional components.
- h) Technical specifications are subject to change without notification.
- i) If uncertain how to proceed, contact the manufacturer.



3. Principle of operation

3.1 Touch Panel

The OMD-32 Series Touch Display consists of several buttons and LEDs. Each button/LED has its own specific function. (For more information see 20. Appendix I.).

A.	+ button
B.	OK button
C.	AL1/2 button/ LED
D.	SYS button/ LED
E.	SET button
F.	Arrow Slider
G.	LOG button
H.	TEST button
I.	ON button/ LED
J.	- button
K.	ESC button
L.	Display

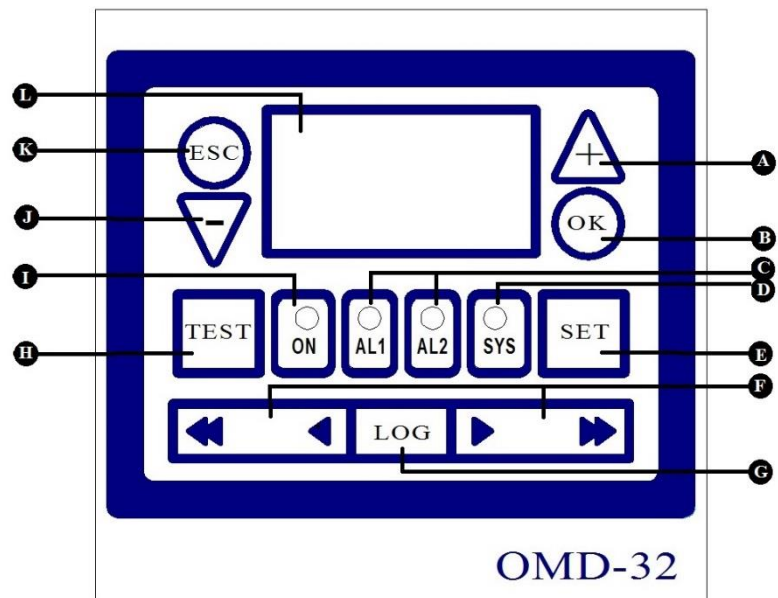


Figure 1 Touch Panel

3.2 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 (set point 10 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.

3.3 Display Visualization

The display visualizes the oil content status of the units. Using the buttons, it is also possible to see information about the settings.

3.4 Alarms

The units contain two independent oil alarm circuits. From the manufacturing both alarms are set to 10 ppm. The set points can be changed according to the requirements on site, to any point between 0.1 ppm and 198 ppm. The adjustment can be done in the programming mode as described in the appendix (See section 20.2.3 Functional Buttons AL1/ AL2/ SET).



The two alarm circuits can be set separately. In this mode also the individual adjustment of the time delays for the alarms can be done. An alarm delay is set to 4 sec.

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

In case of malfunction the **"SYS" LED** will indicate some 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 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. (See Section 21.

Appendix III. for an easily understandable example). If the unit is off, all three relays will be in alarm condition.

3.5 Adjustment

The unit is delivered with a works calibration. A customer calibration is not permitted, but this has to be done by the manufacturer or persons authorized by the manufacturer.

The alarm set points are set to 10 ppm.

The units contain two alarm delays. Alarm 1 is to be used for signing purposes and the delay can be set from 1 sec. to 9 min. Alarm 2 is limited to control overboard discharge. The Alarm 2 delay can be set from 1 sec. to 10 sec. max. (See Section 4.1 Specification OMD-32).

The "Zero" point is also works calibrated and is adjustable to ± 5 ppm.

In case that the reading value (e.g. 5ppm) is different than the lab sample (e.g. 10ppm), it is possible to correct the difference while setting the gain factor to 2.0. Possible settings are from 0.8 to 4.0). Standard delivery is 1.0.

By using the programming mode (See Section 20.2.3 *Functional Buttons AL1/ AL2/ SET*) and clean water you can adjust following settings on site:

Settings	Min.	Max.	Default
Alarm 1/ Alarm 2	0.1 ppm	198 ppm	10.0 ppm
Delay 1	1 sec.	9 min.	2 sec.
Delay 2	1 sec.	9 min.	10 sec.
Offset	-5 ppm	5 ppm	0.0 ppm
Gain	0.8	4.0	1.0
Output Range	5 ppm	199 ppm	-

Table 1 Adjustment



3.6 Active Current Interface

The active current interface represents a combination of measurements and interpretations. The active current interface is adjustable from 0 to 20 mA or 4 to 20 mA. This complies the oil content from 0 to 30 ppm. In case of malfunction e.g. EE means 20 mA.

The maximum open-load voltage is about 5 V and it is strongly recommended not to burden 150 Ω external load.

3.7 Inputs

The unit contains four active inputs, which can be used separately as well. The Unit will be in alarm condition, whenever Terminals are open / disconnected.

- a) Separator Input is dedicated to be used according the MEPC.107 (49).
- b) Optionally there is an active input for external flow switch (FLOW). Normally this input is delivered with a link.
- c) An Input for fresh water switchover for units with an Electric Valve is available.

3.8 Automatic Cell Cleaning Device

The Automatic Cell Cleaning Device is a useful addition to the OMD range of monitoring equipment. It was developed in order to ease the task of routine cleaning as described in the manuals and to ensure that the measuring system of the monitoring equipment is kept in good working order.

Auto Clean System provides a truly Automatic Cell Cleaning Device which is designed to run only when the system is on. The Auto Clean System consists of:

- a) Cylinder/ wiper piston assembly for physical cleaning of the sample cell.
- b) Air Regulation Filter Unit (different makes and types may be used) .
- c) Auto Clean logic control with valve. It determines the frequency of the cleaning cycles.

i

The Automatic Cell Cleaning Device does not replace the operator maintenance schedule but can reduce the maintenance workload.

3.9 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 Cell Cap, 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.

3.10 Features

OMD-32 Series Features	OMD-32	OMD-32 A
Solid suppression capability	✓	✓
Low maintenance	✓	✓
Easy installation	✓	✓
Constant readiness	✓	✓
Automatic supply voltage selection	✓	✓
Low spare part stock holding	✓	✓
Calibrated Measuring Cell	✓	✓
Easy settings via menu	✓	✓
Works adjustment	✓	✓
Auto Clean System		✓
MCU (<i>optional</i>)	✓	✓
Robust construction	✓	✓

Table 2 Features

3.11 Internal Back-Up Lithium Thionyl Chloride Battery

Further the printed circuit board (PCB) of the computer unit is equipped with an internal back-up lithium thionyl chloride battery, for the internal clock, if the computer unit is out of power.

The internal lithium battery of the OMD-32 Computer Unit has a low self-discharge (<1% per year) and should have a calculated lifetime over 20 years, if handled properly.



In case the lithium thionyl chloride battery fails, it must be replaced by a qualified technician in our factory. Please do **not** exchange the lithium battery by yourself. The battery cannot be replaced with a standard battery.

See Section Disposal for more information.



DECKMA
HAMBURG

4. Specification

Please take notice on the individual specifications listed below.



4.1 Specification OMD-32

Range:	0 – 200 ppm
Resolution:	1 ppm (0.1 ppm below 10 ppm)
Accuracy:	Up to ± 1 ppm below 10 ppm
Response Time:	< 5 sec.
Linearity:	0 – 200 ppm better than ± 2 %
Display:	Yellow Graphic Display
Power Supply:	24 V – 240 V AC or DC
Consumption:	< 10 VA
Alarm Points 1, 2:	Adjustable between 0.1 – 199 ppm (Works adjustment 10 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 – 540 sec. (Works adjustment 10 sec.)
Alarm Indication: (Alarm 1, 2, System Fault)	Red LEDs
Alarm Contact Rating: (Alarm 1, 2, System Fault)	Potential free 1 pole change over contacts, 3 A / 240 V AC
Output Signal:	0 – 20 mA, ext. Load < 150 Ω Output range adjustable
Cleaning System (optional):	Manual Cleaning Unit (MCU)
Cleaning System Air Pressure:	4 – 6 bar, typ. <0.1 l/ hour.
Sample/ Fresh Water Pressure:	0 – 6 bar
Sample Flow:	Approx. 2 l/min
Sample Water Temperature:	+ 1 to + 90° C
Ambient Temperature:	+ 1 to + 55° C
Size: (Computer Unit / Measuring Cell)	360 mm W x 240 mm H x 120 mm D
Weight:	4 kg
Degree of Protection:	IP 65
Pipe Connections:	R ¼" Female
➔ Technical specifications are subject to change without notification.	



4.2 Specification OMD-32 A

Range:	0 – 200 ppm
Resolution:	1 ppm (0.1 ppm below 10 ppm)
Accuracy:	Up to ± 1 ppm below 10 ppm
Response Time:	< 5 sec.
Linearity:	0 – 200 ppm better than ± 2 %
Display:	Yellow Graphic Display
Power Supply:	24 V – 240 V AC or DC Automatic Voltage selection
Consumption:	< 10 VA
Alarm Points 1 + 2:	Adjustable between 1 – 199 ppm (Works adjustment 10 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 – 540 sec. (Works adjustment 10 sec.)
Alarm Indication: (Alarm 1, 2, System Fault)	Red LEDs
Alarm Contact Rating: (Alarm 1, 2, System Fault)	Potential free 1 pole change over contacts, 3 A / 240 V AC
Output Signal:	0 – 20 mA, ext. Load < 150 Ω Output range adjustable
Sample/ Fresh Water pressure:	0 – 6 bar
Sample Flow:	Approx. 2 l/min
Sample Water Temperature:	+1 to +90° C
Ambient Temperature:	+1 to +55° C
Cleaning System	Automatic Cell Cleaning Device
Size: (Computer Unit / Measuring Cell)	360 mm W x 240 mm H x 120 mm D
Weight: (with Measuring Cell)	7,5 kg
Degree of Protection:	IP 65
Pipe connections:	R 1/4" Female
→ Technical specifications are subject to change without notification.	



5. Construction

OMD-32 Series generally consist of a Computer Unit, a Measuring Cell, and further equipment (Automatic Cell Cleaning Device).

The Computer Units contain the display PCB with the data logger and the terminals for external connections.

The Measuring Cell is built out of an anodized all-aluminium body with inlet and outlet block made from stainless steel. This rugged cell contains optics and electronics and is connected with the Computer Unit via a plugged data cable. The Measuring Cell is mounted on a Heat Exchanger. The Measuring Cell should be positioned vertical.

All OMD-32 units are mounted onto stainless supports and can be mounted on wall or as bulkhead installation. It is also possible to split the Computer Unit from the Measuring Cell if the available space is not sufficient. Optionally a connection cable for up to 5 m distance from Computer Unit and Measuring Cell is available.

Listed below there are more details about each specific Unit.



5.1 Construction OMD-32

The OMD-32 consists of a Computer Unit and a Measuring Cell.

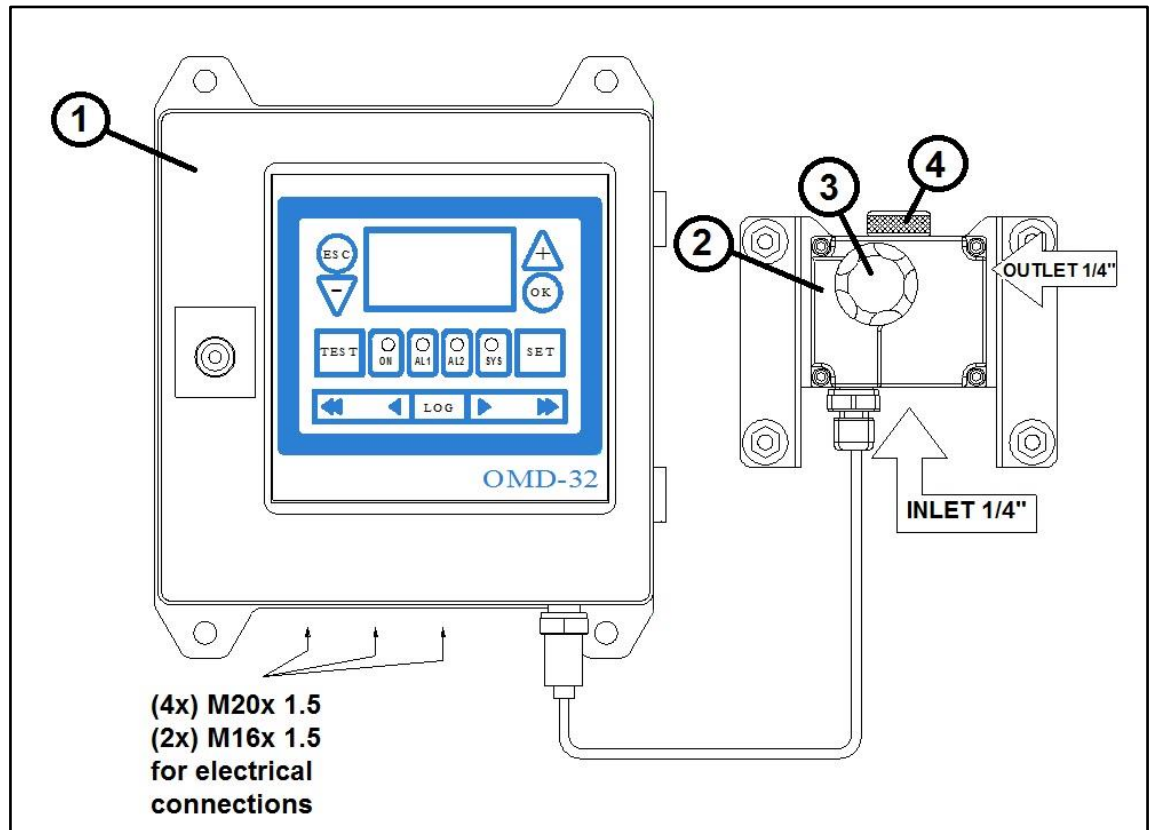


Figure 2. Construction OMD-32

- | | |
|-------------------|-------------------|
| 1. Computer Unit | 3. Desiccator Cap |
| 2. Measuring Cell | 4. Cell Cap |



5.2 Construction OMD-32 A

The OMD-32 A consists of a Computer Unit, and a Measuring Cell, which is equipped with an Automatic Cell Cleaning Device. Additionally, the components are mounted onto three separate supports.

The Automatic Cell Cleaning Device is electrically inserted between the Computer Unit and the Measuring Cell. The cable length is limited to typical about 1 m. The cable is connected with the Measuring Cell as well as with the Automatic Cell Cleaning Device consecutively.

The Automatic Cell Cleaning Device additionally needs a sufficient supply of dry, clean instrumentation air.

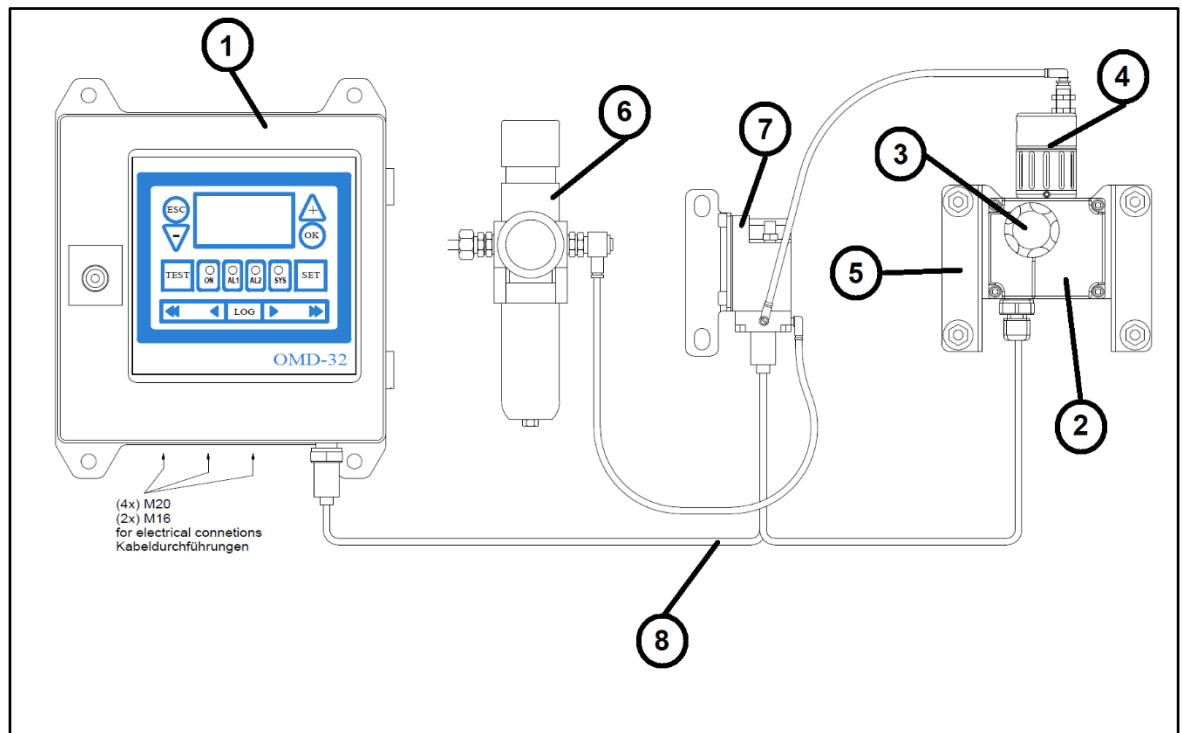


Figure 3. Construction OMD-32 A

- | | | |
|-------------------|---------------------------|---|
| 1. Computer Unit | 4. Auto Clean Device | 7. Auto Clean Controller |
| 2. Measuring Cell | 5. Measuring Cell Support | 8. Communication Cable (Measuring Cell) |
| 3. Desiccator Cap | 6. Air Regulator | |



5.3 Manual Cleaning Unit (MCU)/ Automatic Cell Cleaning Device

Optional item if fitted.

There are two optional Cleaning Units available. Both allow routine cleaning of the Sample Glass Tube. They are different in the way they are operated. The Automatic Cell Cleaning Device is driven pneumatically, while the Manual Cell Cleaning Unit has to be operated by hand. The cleaning mechanism is identical: a wiper moves through the Sample Glass Tube and removes deposits from the Sample Glass Tube surface. This unit facilitates cleaning of the Measuring Cell without the need of removing the Cell Cap. Regular use of this device difficulties in operation of the monitor due to simply avoiding fouling of the Sample Glass Tube and all the inconvenience this can cause.

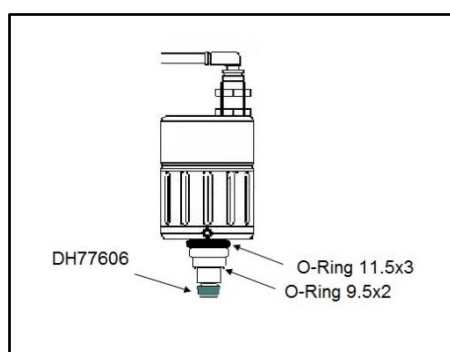


Figure 4. Automatic Cell Cleaning Device, pneumatically operated.

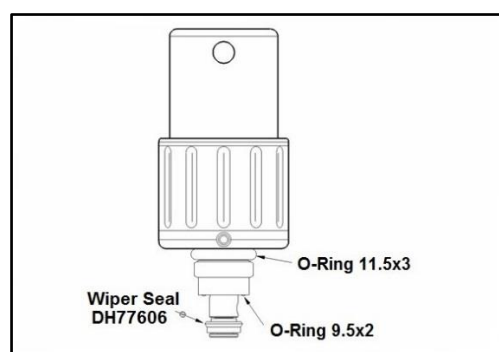


Figure 5. MCU DH77780 Manual Cell Cleaning Unit, operated manually.

5.3.1 Flow rate adjustment on MCU and Auto Clean System

Flow rate is regulated by using a small O-Ring inside the cleaning device. There is a groove for an O-Ring.

(For more information, see section 10.3 Flow).

If the installation has a clean water feed, the flow rate should be checked on both, the clean water supply and the 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.



6. INSTALLATION

➔ *See Section 2. Important Notes concerning installation.*

The OMD-32 Monitor should be located as close as possible to sampling point to minimize response delays.

Mount the OMD-32 Series instrument by means of M6 or M8 screws on to a rigid vertical surface or frame and preferably with the display panel of the monitor at user convenience. For service and maintenance sufficient space to all sides should be available.

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

Free airflow should be allowed to the Measuring Cell. Parts of the Measuring Cell may heat up if sample temperature is high. If high sample temperature is to be expected, warning signs and if necessary, means of protection against touching hot parts must be installed, to avoid danger of injury.



DECKMA
HAMBURG

6.1 Installation OMD-32

Please refer to the following drawing for mounting dimensions.

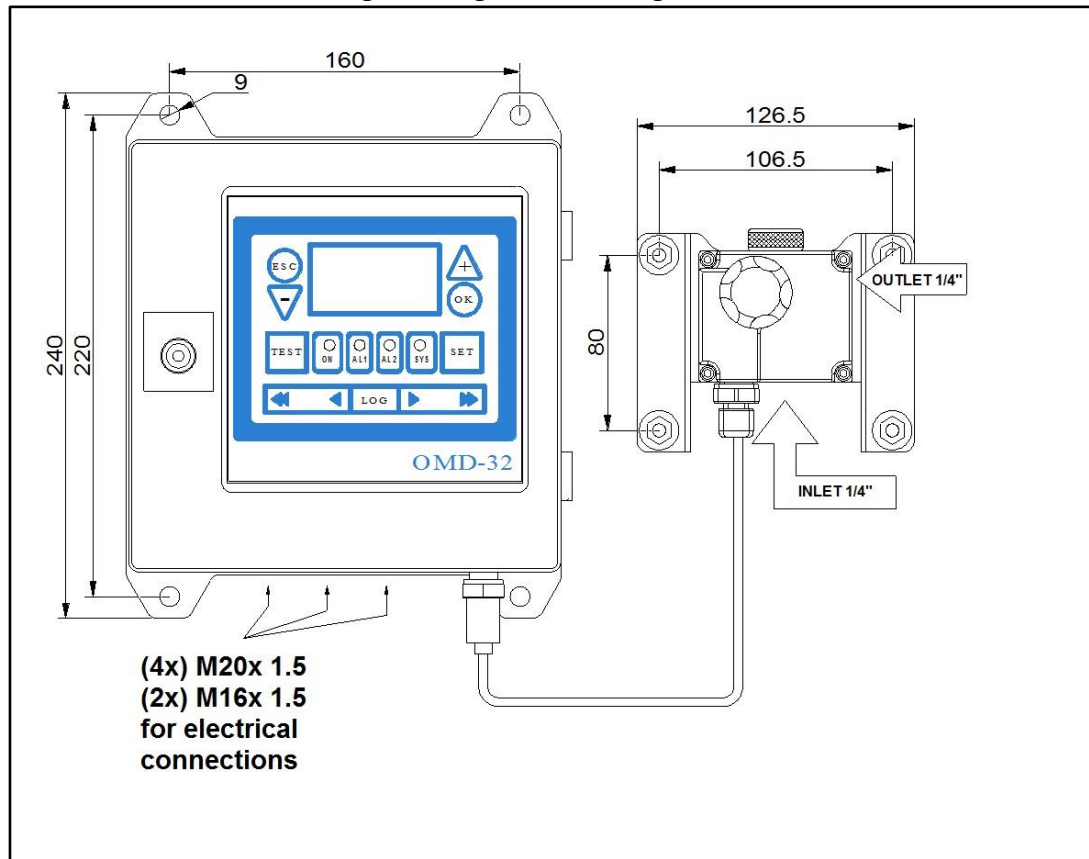


Figure 6. Installation OMD-32



DECKMA
HAMBURG

6.2 Installation OMD-32 A

Mount the OMD-32 with the Measuring Cell onto a OMD-32 Backplane. Take notice on the figure below. The stated measurements for the drillings should be considered.

The connector on top of the valve must not be removed under any circumstances, as that requires the breaking of the seal.

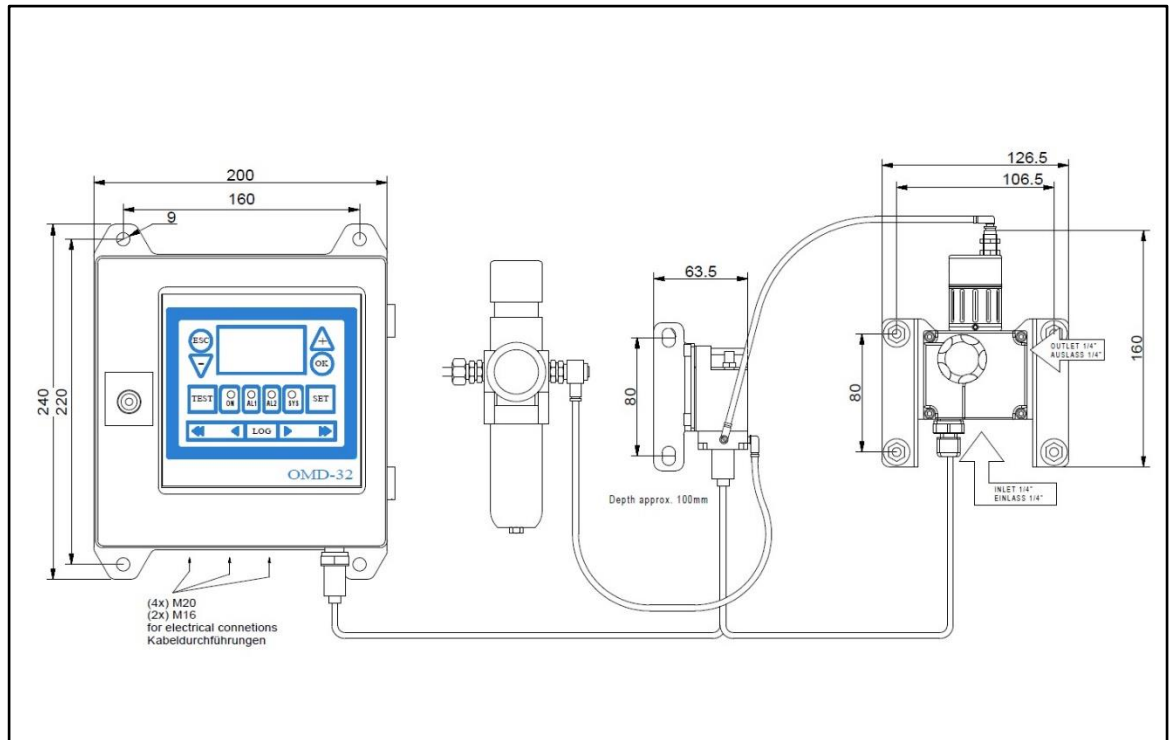


Figure 7. Installation OMD-32 A



7. Piping

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 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.

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

7.1 Piping OMD-32

Connect the OMD-32 Monitor to the sample point of the oily-water separator outlet and to a source of oil free water employing 6 mm or 10 mm OD copper or stainless-steel pipes. 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 be at a level above the outlet of the monitor to ensure a proper sample flow rate.

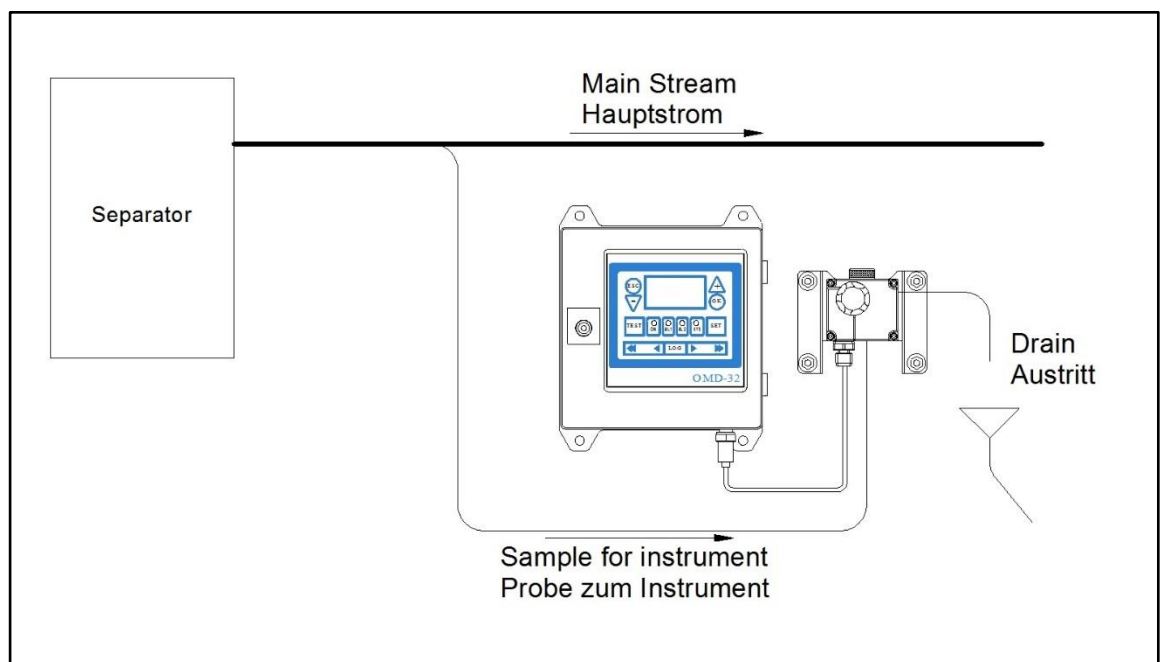


Figure 8. Basic example of OMD-32 piping/installation



7.2 Piping OMD-32 A

Connect the sample line to the left side input of the OMD-32 A. Connect the clean water line to the right-hand side input of the valve. Both inputs have 1/4" female threads. It is recommended to employ 6 mm or 10 mm OD copper or stainless-steel pipes. If it is possible, install a manual valve into the clean water line next to the OMD-32 A. For air regulation connect the air pipe to the Unit and the Measuring Cell. The air supply should be of 4 to 6 bars.

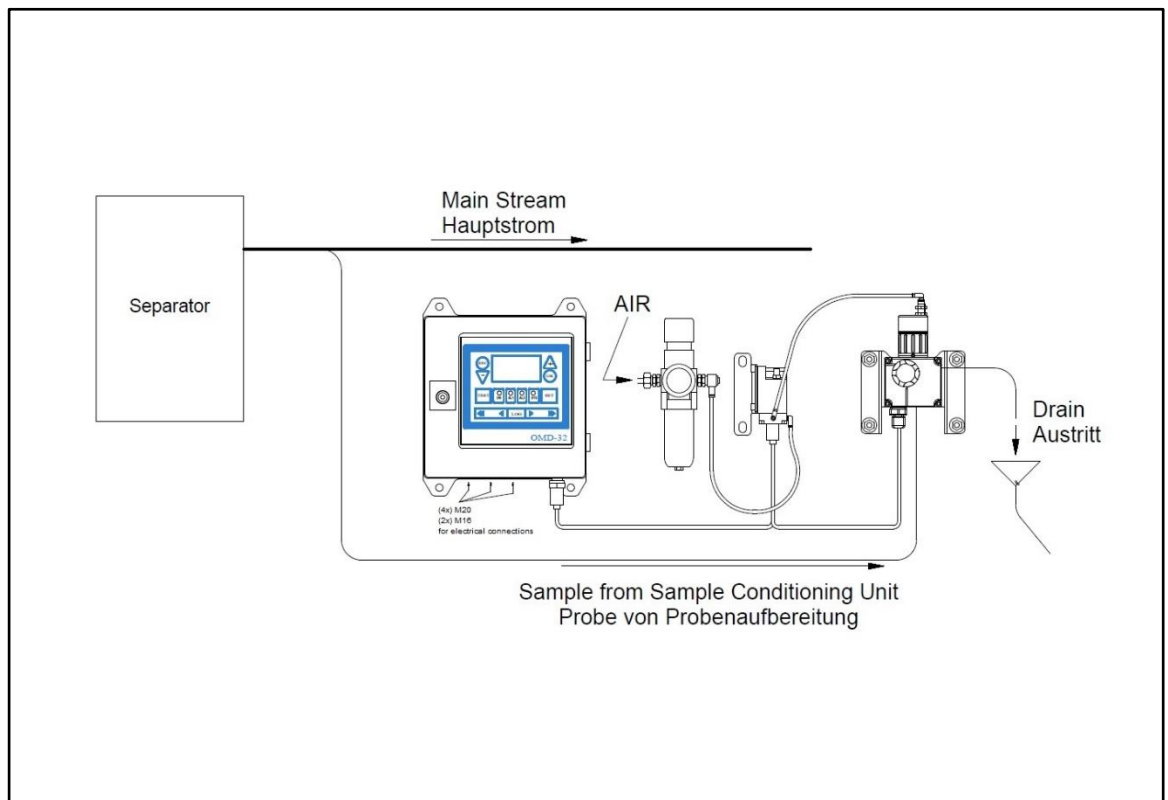


Figure 9. Basic example of OMD-32 A piping/installation



8. Cabling



Electrical connections are made through the metric cable gland openings prepared underneath the instrument. Not all openings may be free. The electrical connections are located inside the computer housing.

The Units 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.

Close front cover completely after electrical installation. Water and humidity inside the instrument may result in corrosion and malfunction.

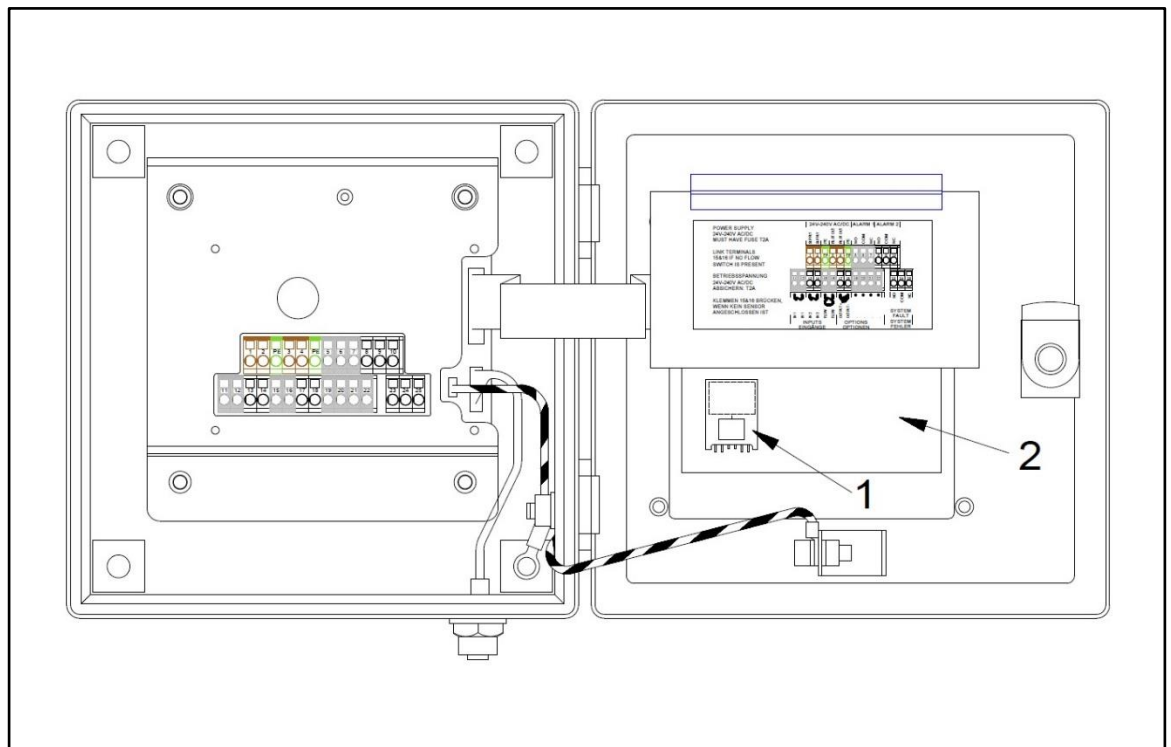


Figure 10. Cabling OMD-32 Series



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



The following figure illustrates a bottom view of the OMD-32 Computer Unit as delivered.

Use one of the M20 opening for the power supply voltage. Remove the plastic screw to attach the cable gland. Further openings can also be used with a cable gland.

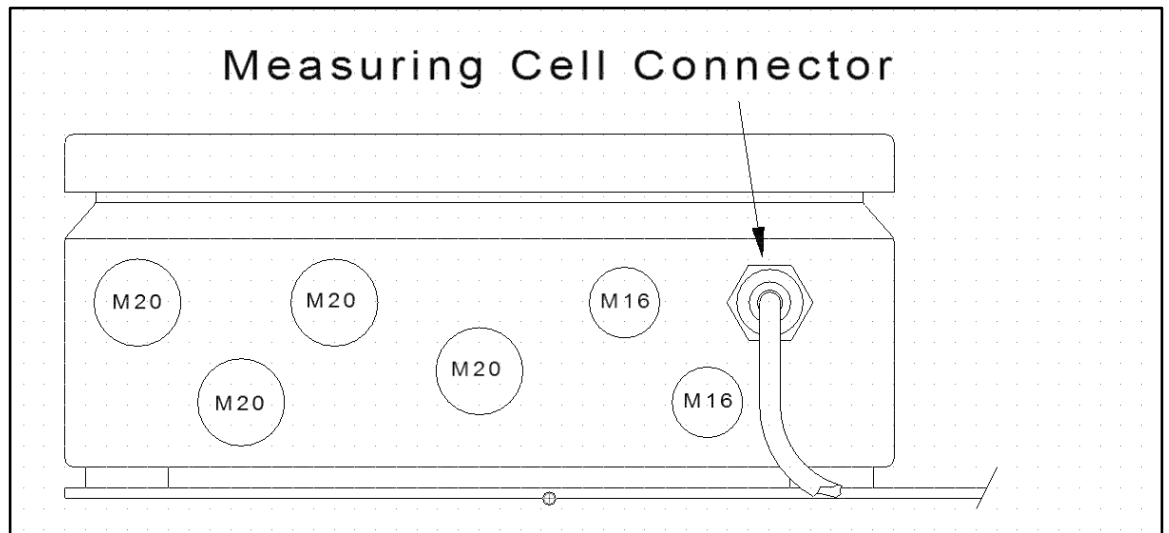


Figure 11. Bottom View: OMD-32



DECKMA
HAMBURG

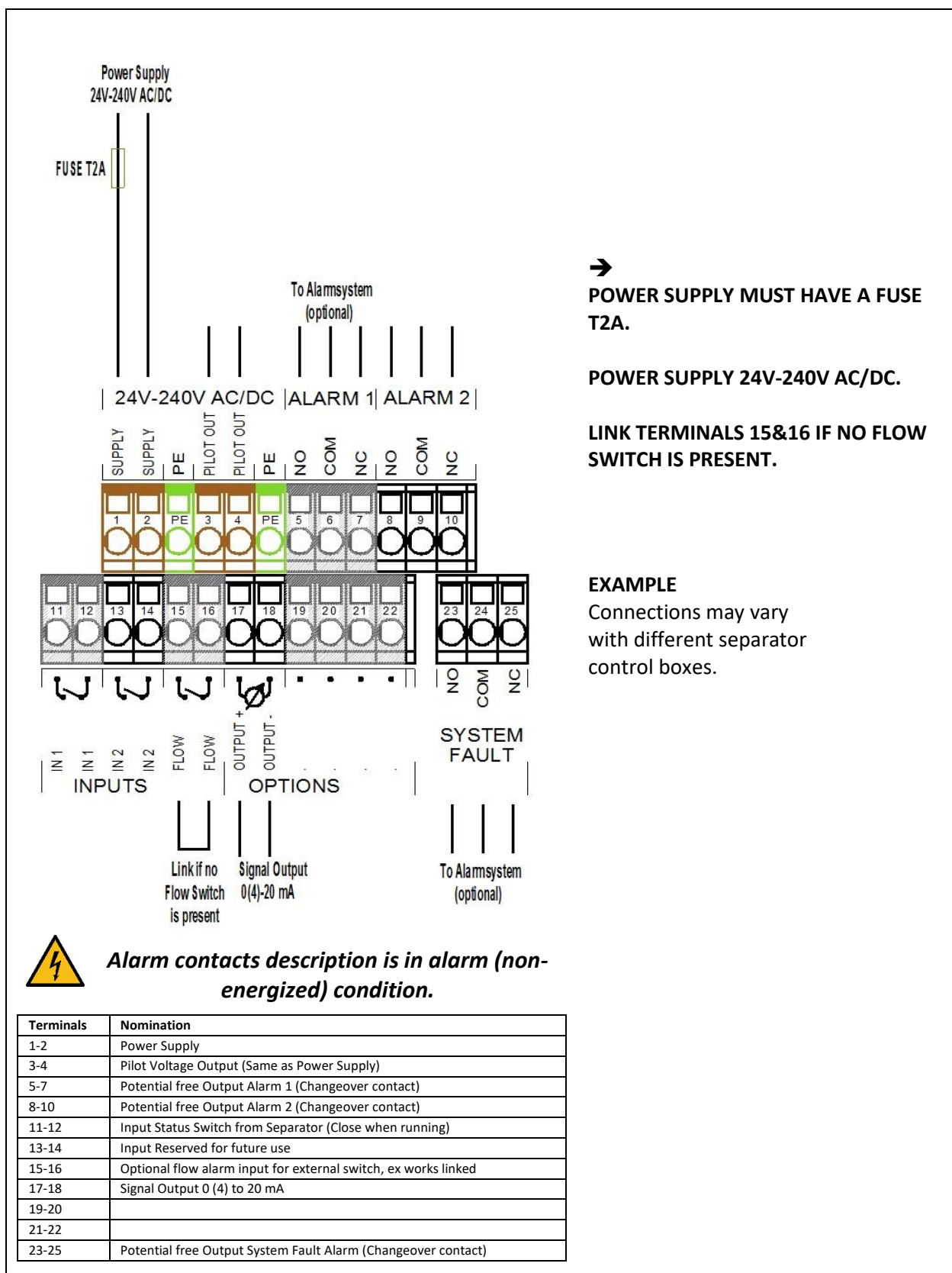


Figure 12. Connection Example



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 overboard valve 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.

Terminals 1&2 are reserved for power supply input. Up next is the first Ground connection (PE).

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. Up next is the second Ground (PE), which is connected to the Ground (PE).

i

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.

The Terminals 5 – 10 are for alarm 1&2. The changeover contact relays are reserved for alarm 1&2, respectively. These are free changeover contacts, which are labelled as followed: **NO** means “**Normally Open**”, **COM** means “**Common**”, and **NC** is “**Normally Close**”. The Terminals 5 – 7 are changeover contacts for the potential free output alarm 1. Terminal 5 is NO, Terminal 6 is COM, and Terminal 7 is NC. The Terminals 8 – 10 are the changeover contacts for the potential free output alarm 2. Terminal 8 is NO, Terminal 9 is COM, and Terminal 10 is NC. (For more information, see Figure 12. Connection Example).

The Terminals 11&12 are dedicated “STATUS” input for the STATUS SEPARATOR signal provided by the separator.

i

Note: The Contacts of this relay then can operate the “**STATUS**” input. Please refer to the separator manual or contact the separator manufacturer for information regarding the separator. Additionally, the separator status will be recorded into the data logger.

Input “RES” is reserved for future use. The state of the “RES” input is recorded in the electronic record.

Terminals 15&16 are the input for an optional external flow switch. Use a dry contact. The Unit is delivered with a link as standard. If the Terminals are open, the Unit will be in alarm condition.



Terminals 17&18 are for signal output of 0(4) to 20 mA. These are active outputs with an open-load voltage about 5 V. And it is recommended not to exceed the 150 Ω external load. The signal output complies the oil content from 0 to 30 ppm. In case of malfunction e.g. EE means 20 mA.

Note: The Feedback contact is not influenced from the system fault conditions.

The Terminals 23 - 25 are changeover contacts for the potential free system fault alarm. Terminal 23 is NO, Terminal 24 is COM, and Terminal 25 is NC.

i

Note: For any input it has to be used a potential free relay switch for the link to electrically insulate the OMD-32 from any external voltages.

Generally, the inputs and the output share a common potential, like Terminals 12, 14, 16, 18, 20, 22.

8.1 External 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 closes the overboard line and open the re-circulating line.

The system showed in the connection example, see Figure 12. Connection Example, employs alarm relay 2 to control a pneumatic solenoid valve which energizes or de-energizes a pneumatically operated 3 - way valve.

The same procedure starts when the alarm set point is reached. Then the separation process will continue until the pollution level falls below the alarm set point, where overboard discharge is possible again.



DECKMA
HAMBURG

9. Power Supply

→ (See Section 2. Important Notes).



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



10. Commissioning

For operating and servicing, please carefully read the instruction manual and ensure, that the safety recommendations are considered. Read important notice as well. Ensure that wires are correctly connected to the terminal blocks inside the computer housing and ensure that the connection to the Measuring Cell is in place, referring to Figure 2. Construction OMD-32 or referring to Figure 3. Construction OMD-32 A, respectively. On completion of the installation, cabling, and piping, carry out the following checks:

10.1 Electrical and Piping



- a) Check that the power supply is connected to the terminals 1&2 of the terminal block.
- b) Check that the grounding (PE) has been made according to the relevant regulations.
- c) Check that the cabling of the automatic stopping device and to the alarm system is according to requirements.
- d) Check all piping connections and rectify as appropriate.
- e) Check the sample supply and the fresh water supply.

For instruments equipped with an Automatic or Manual Cell Cleaning Device/ Unit, check the following points:

- f) Check, that the Cell Cleaning Device is fitted correctly.
- g) Check, that the push in connectors and hoses are fitted correctly (Automatic Cleaning System only).
- h) Check that the Air Supply is between 4 – 6 bar.



During the installation of the Unit, it is recommended to wear safety boots, as the Unit is about 6 kg and it could come to injuries.



DECKMA
HAMBURG

10.2 Instrument Start-Up Sequence

Switch on:

- a) Power Supply (24 – 240 V)
- b) Sample Flow
- c) FW Flow (Fresh Water Flow)
- d) Air Supply 4-6 bar (Automatic Cell Cleaning Device)

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 “normal operation” display, showing the actual measurement as shown below in Figure 13. Analyzing Display: DECKMA HAMBURG and Figure 14. Normal Operation Display.



*Figure 13. Analyzing Display:
DECKMA HAMBURG*

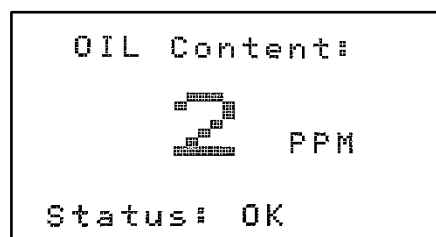


Figure 14. Normal Operation Display

Allow a period for water entering the Sample Glass Tube. It is recommended to let oil free water flow for about 10 minutes. Check, that the display shows 0 to 2 ppm. If not, see 12.3 Cleaning Process. Check the relative desiccator humidity. Switch the instrument back to sample stream flow to the separator sampling point connection.

10.3 Flow Rate Adjustment

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. The flow rate can be adjusted to compensate environmental changes and pump aging.

Measure the amount of water flowing through the instrument. Flow rate should be approximately 2 liters per minute.



Flow rate adjustments can be made by Cell Cap, MCU or the Automatic Cell Cleaning Device.

Adjust the flow rate through the Unit by using the O-Rings in the normal Cell Cap.

Low Flow: Let all three O-Rings inside the cap.
Medium Flow: Take out the inside O-Ring 4.5x2.
High Flow: Take out the outer O-Ring 8.5x2 and let the Main O-Ring 11.5x3 as figured below.

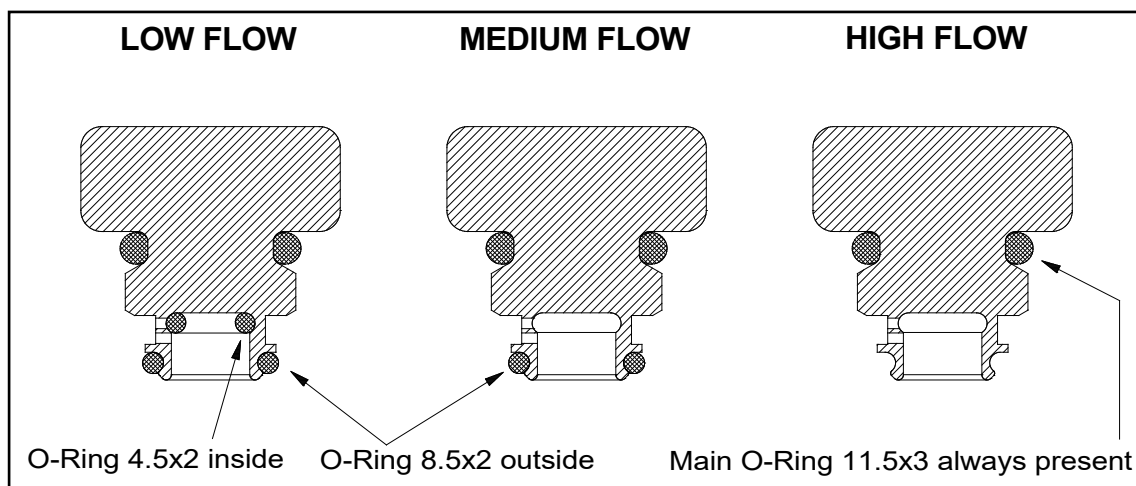


Figure 15. Flow Rate Adjustment Cell Cap

For instruments equipped with a MCU or an Automatic Cell Cleaning Device a high or a low flow rate can be adjusted.

Low Flow: Let the smaller O-Ring 9.5x2 inside the MCU/ Auto Clean.
High Flow: Remove the smaller O-Ring 9.5x2.

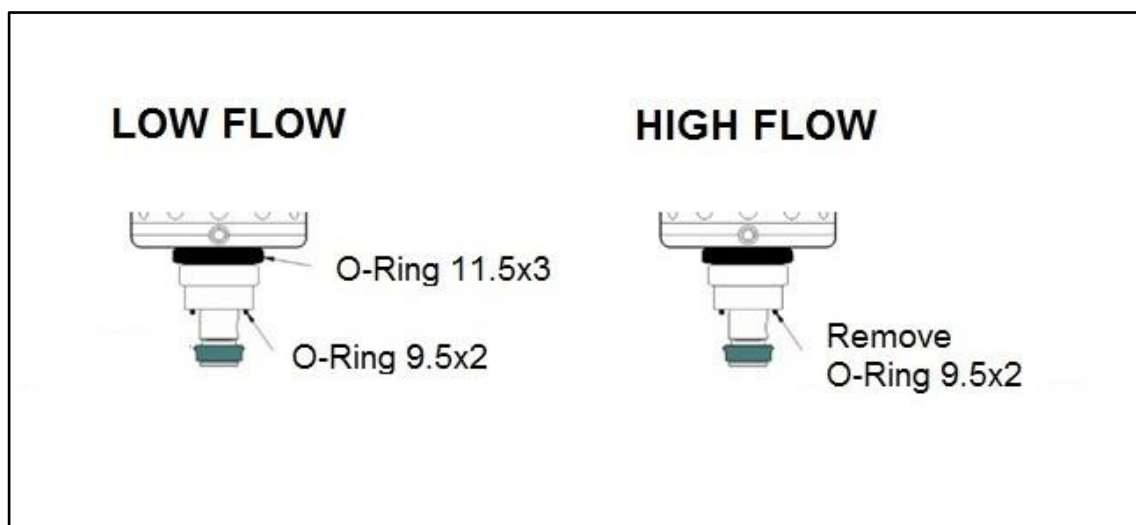


Figure 16. Flow Rate Adjustment Automatic Cell Cleaning Device/ MCU

For more information about the Cleaning Frequency, see 20.2.2 Functional Button "ON".



10.4 System Settings

At commissioning, alarm set points and alarm delays can be set. The signal output can be modified from 0 – 20 mA or 4 – to 20 mA. According to external requirements also the offset can be set from -5 to 5 ppm. Also, the settings can be reset to the factory default values, if needed.

For more information about the Settings, see 20.2.3 *SET*.

Functional Buttons *AL1/ AL2/*

10.5 Auto Clean Control Unit

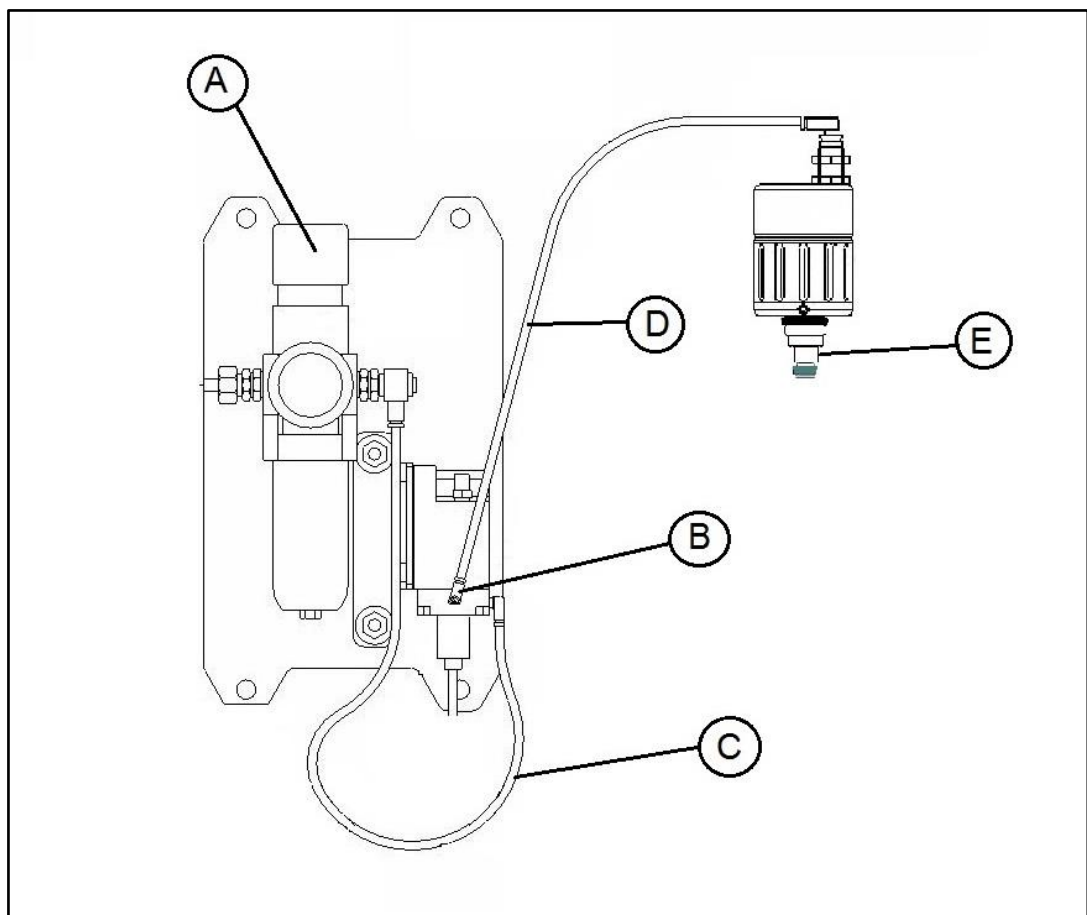


Figure 17. Auto Clean Control Unit

- | | |
|-----------------------|---------------------------|
| A. Air Regulator | D. Air Flow Adjuster Tube |
| B. Air Flow Adjuster | E. Wiper Piston |
| C. Air Regulator Tube | |



The Automatic Cell Cleaning Unit will not work without sufficient supply of pressurized instrumentation air. Make sure, that an air supply is installed. Further check, that the pipes are fixed correctly. Set the Air Regulator output pressure to a pressure of approximately 4 - 6 bar. Too high-pressure settings can cause unnecessary wear. Low pressure may make operation unreliable.

10.5.1 Pressure Regulation

1. Pull the knob upwards.
2. Rotate the knob and set the pressure
3. Lock the set pressure by pushing the knob down.

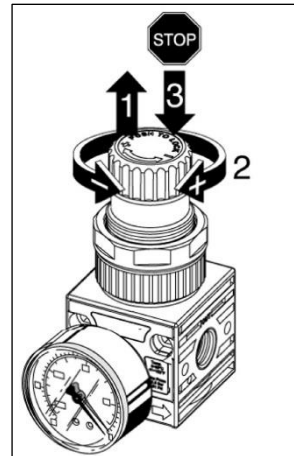


Figure 18 Pressure Regulation

10.5.2 Using standard drainage SS

- When the push button is positioned as in step **A**, drainage is semiautomatic, draining condensate when bowl is depressurized and locking up when bowl is pressurized. Push up the button to drain when bowl is pressurized.
- Then, rotating the button anticlockwise, drainage valve is manually closed, both when bowl is pressurized and depressurized, step **B**.

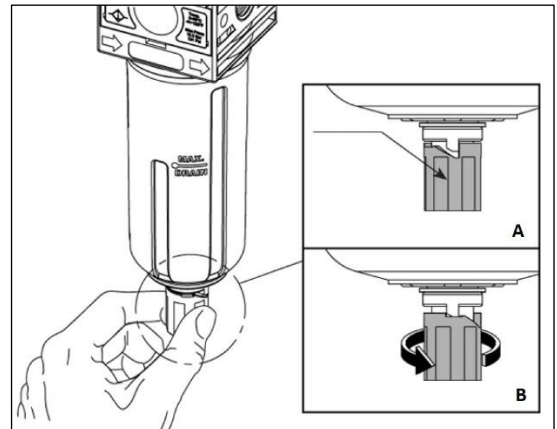


Figure 19 Using standard drainage



Please do not hesitate to contact DECKMA Hamburg GmbH for additional support.

i

Output pressure set at the Air Regulator can be only reduced, if the cleaning sequence is activated repeatedly.

Open the air flow adjuster counterclockwise about typically two revolutions with a screwdriver. Auto Clean should be activated repeatedly, while adjusting the air flow adjuster. The wiper piston should gently run up and downwards. Be careful, if the air pressure is too high, wiper piston will dash.



11. OMD-32 Series Operating instructions

When oily water flows through the instrument the oil content will be measured, and the display will show the actual value of oil content.

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.

Whenever the instrument is switched over to FW, it will be in alarm condition, too.

Additionally, alarms, oil content and separator status will be recorded in data logger every 15 seconds.

11.1 Cleaning Options

It is also recommended to use MCU or the Automatic Cell Cleaning device to clean the Measuring Cell.

Cleaning of the Sample Glass Tube could be simplified with a MCU or an Automatic Cell Cleaning Device.

Using the (MCU):

- Ensure that there is a clean water supply through the cell.
- Activate the Manual Cleaning Unit by gently pressing the handle several times. Each time the handle is pressed, the wiper goes through the Sample Glass Tube once.
- Check, that the reading is between 0 to 2 ppm.
- Additional conventional cleaning with the Cell Cleaning Brush may be necessary.
- The MCU may also be used during operation with sample water. An alarm may occur, because the wiper is passing the light source.

Using the Automatic Cell Cleaning Device:

The Automatic Cell Cleaning Device can be set to cleaning intervals from a minimum of 1 minute to a maximum of 8 hours (See 20.2.2 Functional Button "ON"). This cleaning sequence can be set from the display at all time. Even if the cleaning interval has been set before and is not finished.

i

It is recommended to assist the Automatic Cell Cleaning Device by manually cleaning the Sample Glass Tube at regular maintenance schedule, or as necessary.

If the Measuring Cell is equipped with a Cell Cap, please refer to section 12. Operator Maintenance.



12. Operator Maintenance

→ (See Section 2. Important Notes)

WEEKLY INTERVALS: 12.1 to 12.6 Data Logger Checking

MONTHLY INTERVALS: 12.7 MCU and Automatic Cell Cleaning Device

The Operator Maintenance should be scheduled at least once a week. If needed, prepare the Quick Check List to keep track on maintenance. For more information, see section 22.1 Operator Maintenance Quick Checklist.

12.1 General Test

- a) Visually inspect instrument for obvious leakages or damage.
- b) Visually check condition of cables and connections.
- c) Check the desiccator:
 - Press **"SYS"** button, select Measuring Cell, confirm.
 - Internal data is displayed. Identify Dew Point Temperature [°C] and relative humidity [%rH] data.

The relative humidity [%rH] should be below 10%rH. Dew Point Temperature should be below 0°C. If not, desiccator exchange is recommended. The desiccator also has to be exchanged, if the humidity is higher than 10%rH. For more information, see section 20.2.4 Functional Button **"SYS"**.

12.2 Normal Operation

- d) Let the oil free water flow for a few minutes.
- e) Verify that the display is showing 0 to 2 ppm.

12.3 Cleaning Process



- f) Stop any water flow.
For instruments equipped with Automatic Cell Cleaning Device: Shut off the instrument air.
- g) Unscrew and remove the Cell Cap. Visually check the wiper piston and the O - Rings for wear or damage.
- h) The wiper seal should be clean.
- i) It is recommended to clean the Measuring Cell on a regular schedule manually using the Cell Cleaning Brush with upwards and downwards motion through the entire length of the cell several times.
- j) For oily deposits use a mild detergent on the Cell Cleaning Brush.



- k) Put back the Cell Cap, and the wiper piston. Make sure that the Cell Cap is screwed in completely.
- l) Purge with oil free water for several minutes to get a clean Measuring Cell.
- m) Verify that the display is showing 0 to 2 ppm.
- n) For instruments equipped with Automatic Cell Cleaning Device, restore the air.
- o) Turn on the sample water flow.

12.4 Intensive Cleaning

- p) If there is no improvement, repeat cleaning with the Cell Cleaning Brush and use Sample Tube Cleaner and check contemporary the display, if the "0" point is achieved. The process could take about 5 minutes. Shouldn't the results improve, use Citric Acid and let act on over the night.
 - Cut the upper part of the Cell Cleaning Brush.
 - Insert the wire stem of the Cell Cleaning Brush into a screwdriver and fix it.
 - Slowly rotate the Cell Cleaning Brush for a few minutes in the Sample Glass Tube.
 - Flush with clean water and re-test

For more information, see section 23.1 *Servicing and Cleaning Manual*.

12.5 System Test

- r) Perform a "System Test" for checking the alarms contacts. See section 20.2.1 Functional Button "TEST".
- s) The "System Test" is only useful, if the oil content is under 15 ppm before starting the test.

12.6 Data Logger Checking

- t) Check the data logger:
 - 1. Is the data logger recording the data?
 - 2. Check the clock for time deviation.

For more information, see section 13. Programming Mode.

12.7 MCU and Automatic Cell Cleaning Device

- a) Stop water flow and air supply, respectively.
- b) Check the wiper seal and the O-Rings. Clean if necessary. The wiper piston can be pulled out easily. It is magnetically coupled.
- c) To reinsert just put the wiper back. The magnetic coupling will arrest it.



i

Both MCU and Automatic Cell Cleaning Device may require additional manual cleaning. Check Sample Glass Tube condition and correct working of cleaning systems at regular maintenance schedule.

→ **Remarks:**

The automatic cleaner will not work without sufficient supply of pressurized instrumentation air.

If the wiper is not correctly installed, the wiper piston may proceed to its lower position, thus blocking the measurement region of the Measuring Cell Glass Tube. This can cause false alarms and error conditions.

A worn out or damaged wiper seal may fail to properly clean the Sample Glass Tube. A damaged or missing wiper seal may lead to permanent damage due to scratching the Sample Glass Tube surface.



If the cleaning system operates while the automatic cleaning system is taken out of the Measuring Cell, the wiper may be thrown out by excessive air pressure. Handle with care to avoid loss of wiper and avoid risk of injury.

→ It is recommended to wear safety goggles and safety gloves.



12.8 Maintenance Recommendations

Maintenance recommendations for 200 ppm Oil-in-Water-Monitors OMD-32 Series

IMPORTANT

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

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

In some cases of unexpected high ppm readings with clean water the Measuring Cell has a problem with internal coating of the Sample Glass Tube. Just cleaning with brush and clean water does not always help in this case. Additional cleaning is required.

Please carry out the following instructions to make sure that the Sample Glass Tube is really clean. Then the unit will show 0 to 2 ppm with clean water.

Check Measuring Cell humidity readings and desiccator status. Press **"SYS"** button, select Measuring Cell, confirm. Internal data is displayed. Dew Point Temperature [°C] should be below 0°C, relative Humidity [%rH] should be below 10%rH. If above values are exceeded, renew desiccator and allow new desiccator to absorb the humidity inside the Measuring Cell.

Clean the Sample Glass Tube by using the Cell Cleaning Brush and a mild cleaning agent.

In certain cases, depending on environmental conditions on site, Iron Oxide may be deposited inside the Sample Glass Tube (brownish surface deposit on the Sample Glass Tube). To remove Iron Oxide, it is recommended to use Citric Acid. Drain the instrument, fill Citric Acid into the Sample Glass Tube, add water and let it soak overnight. Flush with clean water. If situation improves, repeat until success. Other deposits may be removed with a mild acidic cleaner.

Additional use of toothpaste 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.

The Measuring Cell is expected to read 0 – 2 ppm, if successfully cleaned.



13. 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.

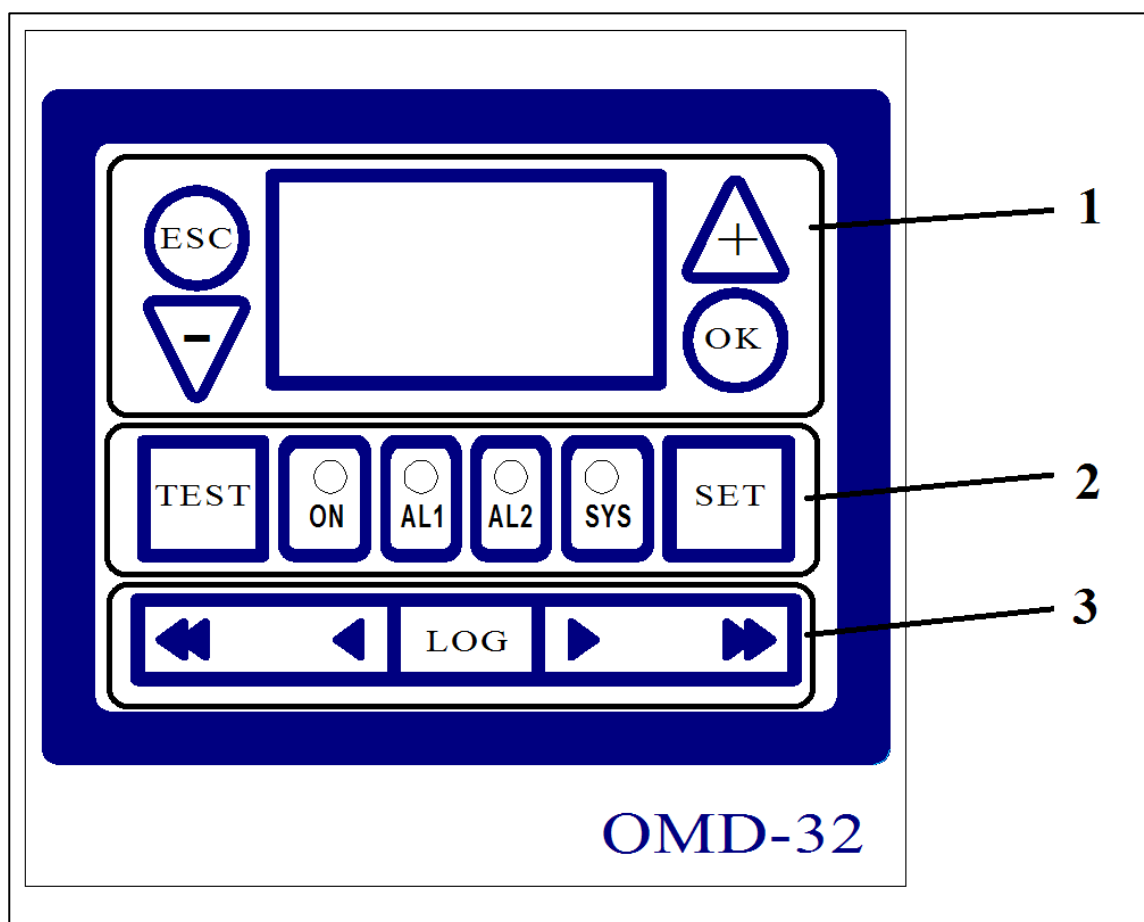


Figure 20. Display Functions

1. Navigation Buttons

With the Navigation Buttons some settings can be adjusted, confirmed or actions can be canceled before they are confirmed. The display shows status Information. (See section 20.1 Navigation Buttons for more details.)

2. Functional Buttons

The Functional Buttons provide a direct access to certain settings. Alarm set points 1 or 2, alarm delays 1 or 2, the Offset, and the Output can be modified. By selecting “set default” all the settings can be reset to the factory default values as well.

Also instrument specific information like type, serial number, and certificate information can be displayed. Additionally, it is also possible to read information about the Measuring Cell, and internal data on temperature, humidity, dew point etc.



With the **“TEST”** button a system test can be performed. Additionally, the Desiccator Status can be checked. (See section 20.2 *Functional Buttons for more details.*)

The cleaning interval at OMD-32 A can be managed from minimum 1 minute and maximum 8 hours. By “0” Autoclean will be off.

3. Data Logger Operation Buttons

The **“Log”** buttons are used to operate the integrated data logger. These buttons show a live display, in which the current data from the alarm status, the external separator, the oil content, the device status, and a reserve are displayed and recorded. That data can be shown as a graphical or a text-based file recording at any particular time. All the information will be recorded every 15 seconds. All recorded data is available for more than 18 months.

With the arrow buttons the data can be navigated.

The internal clock is factory set for GMT (**Greenwich Mean Time**) and cannot be changed or adjusted. The internal clock is adjusted to be within +/- 2 minutes of GMT in production. A few minutes of derivation per year of operation should be expected. (See section 20.3 *Data Logger Operation Buttons for more details.*)

→ See Section 20. Appendix for more details about the buttons.

13.1 Buttons

Buttons	Description
	Pressing this button once, it is possible to return to the previous menu. Pressing this button twice, it is possible to return to the “Normal Operation” display.
	Navigates to the next or previous option.
	Navigates to the next or previous option.
	By pressing this button, it is possible to select and confirm an entry.
	Pressing this button, directly leads into the “SYSTEM TESTS” menu.
	Pressing this button, directly leads into the “SYSTEM-OPTIONS” menu.
	Pressing “AL1/2” buttons, leads into the “SETTING,def.” menu.
	Pressing this button, leads directly into the “SYSTEM info” menu.
	Pressing this button once, leads into the “SETTING,def.” menu. Pressing the button twice leads into “DEFAULT” menu.
	Pressing this button once, leads into the “DATA LOG live” menu, if the memory card is activated. Pressing this button twice, the recorded data display mode will be invoked and graphical recorded data appears. Pressing this button if a non-activated memory card is inserted, leads to the menu to activate the memory card.
	It is possible to press and slide the “Arrow” sliders (right/ left) in the graphical recorded data menu to navigate to the data or time of recorded data.



14. Memory Card

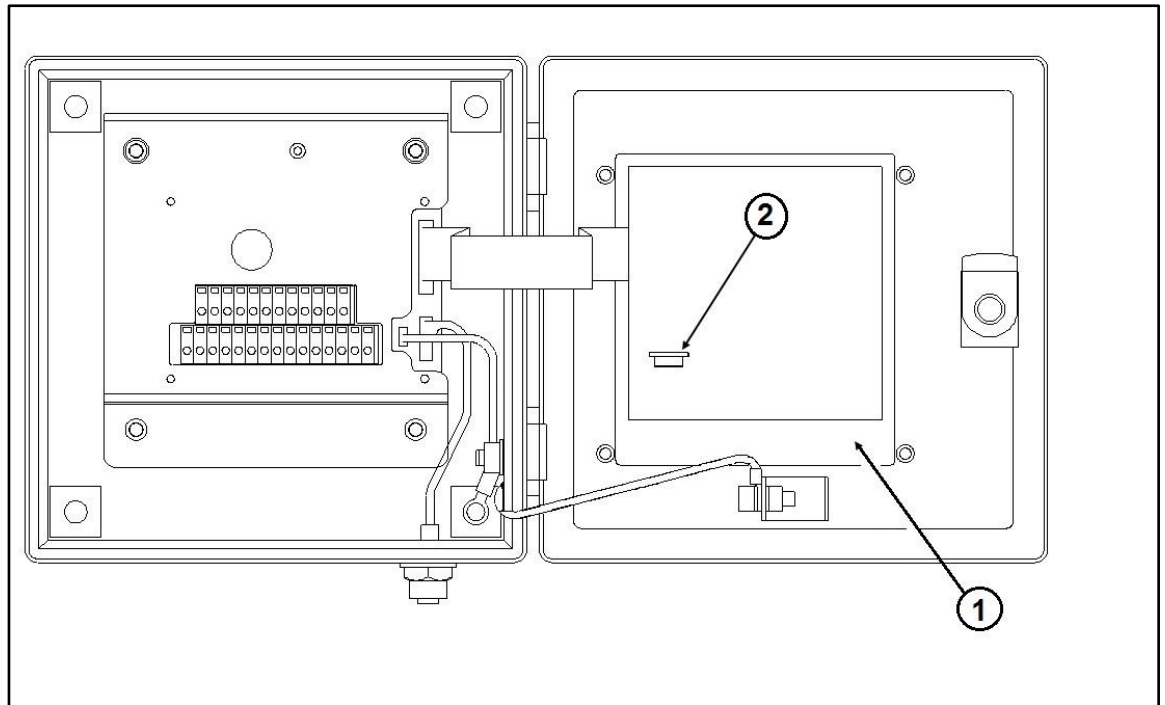


Figure 21. Memory Card Location

1. Display PCB
2. Memory Card

The Memory Card is on the backside of the Display PCB inside the computer housing. It is sufficient for the life of the instrument, and it ensures to the storage time of at least 18 months. 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. The memory card is registered with the specific instrument. The card can be read in other OMD-32/ OMD-32 A Units, but writing is only possible in the related system.

If no memory card is mounted, if the memory card is defective, or a card from another system is inserted, the unit will be in alarm condition **“Status: Datalog”**.



14.1 OMD-CR Memory Card Reader

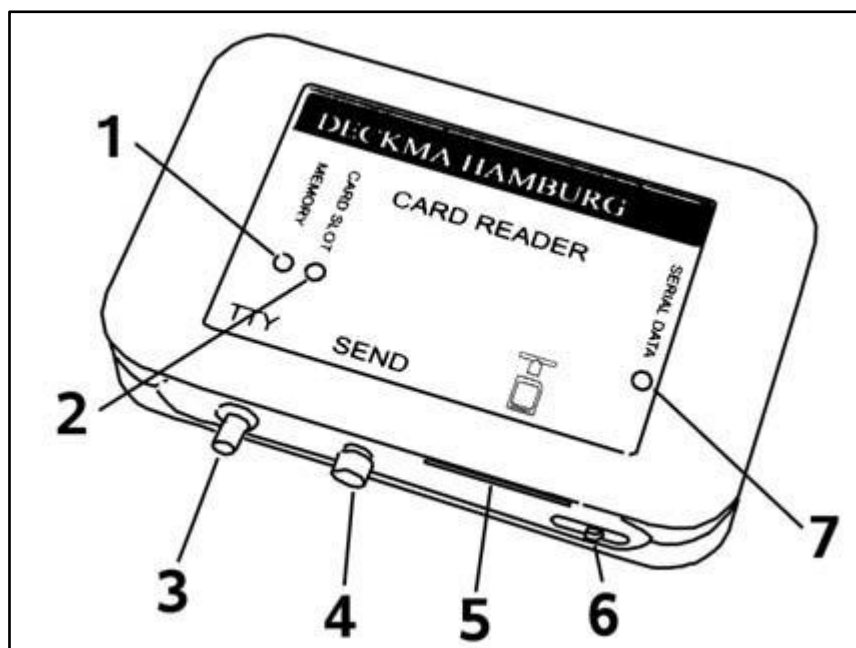


Figure 22. OMD-CR Memory Card Reader

1. Memory LED
2. Card Slot LED
3. Serial Interface Connector
4. SEND – Button
5. Card Slot
6. On-Off Switch
7. Serial Data LED

DECKMA Hamburg oil in water monitors store certain data according to IMO Requirements in a memory card. The data stored by any OMD-32 Unit can be displayed with any other OMD-32 Unit.

Additionally, the data can be accessed with the DECKMA HAMBURG OMD-CR card reader. The OMD-CR card reader allows to copy certain memory card data to a file on a computer, so that it can be processed, browsed, or printed, with only brief interruption of the 15 ppm Bilge Alarm Monitor operation. Please note that only the data requested by MEPC.107(49) (Date, Alarm Status, Separator Status) can be copied to the computer.



15. Fault finding

➔ (See Section 2. Important Notes).

The OMD-32 Series will indicate several malfunctions in the status line of the display. Pressing the **“OK”** button will display additional information.

Status	OK		
Reading	0..200	EE	
System-Alarm-LED	Green/ Blinking		
Alarm Circuit 1,2	No Alarm	Alarm	
Reason	Low oil content. Normal Operation.	Normal Operation.	Sample reading is out of range: Oil content too high. Dirty Sample Glass Tube. Air bubbles in sample stream.
Recommendations	Continue operation. Apply standard maintenance schedule.	Resume normal maintenance schedule.	Wait until oil content is within the range. Clean Sample Glass Tube.

Table 3 Status OK

Status	Flow!
Reading	0..49/ EE
System-Alarm-LED	Green/ Blinking
Alarm Circuit 1,2	Alarm
Reason	Low sample flow rate. Flow input (Terminals 15&16) open. Check sample flow rate and valve position.
Recommendations	

Table 4 Status Flow!



Status	Com?	Sample?	Data log?
Reading	EE		0..200/ EE
System-Alarm-LED	Red/Steady		
Alarm Circuit 1,2	Alarm		
Reason	No communication between Computer Unit and Measuring Cell.	Meter is not able to measure the sample: No water inside. Oil content much too high. No light transmission possible.	Data logging is not possible: No DECKMA memory card inserted. A read only card has been inserted. A Deckma memory card has been inserted, but has not been activated.
Recommendations	Check connection between Computer Unit and Measuring Cell.	Check sample Clean Sample Glass Tube according section 11. OMD-24 Series Operating instructions.	Insert the active memory card. New memory card: Activate the memory card.

Table 5 Status Com? Sample? Data log?

Status	Int.Err	Desicc.	Humid
Reading		0..200/ EE	
System-Alarm-LED	Red/Steady	Green/ Blinking	
Alarm Circuit 1,2	Alarm	Normal Operation	
Reason	Internal error.	Measuring Cell Humidity critically high (>10%rH).	Sample temperature below dew point. Instantaneous condensation possible.
Recommendations	Restart the system.	Check/ Replace desiccator.	Check/ Replace desiccator.

Table 6 Status Int.Err, Desicc, Humid



15.1 Automatic Cell Cleaning Unit Fault Finding

Fault	Explanation	Solution
Pneumatic Cleaner not operating	Air pressure low.	Restore air pressure.
	Air connections missing or wrong.	Sort out air connections. Air connections are Push-In type. Press release ring to release hose.
	Auto Clean interval set to "OFF".	Activate cleaner via menu.
	Auto Clean interval set to long interval, time not yet expired.	Wait for time to expire, or manually trigger cleaning cycle. Refer to section 20.2.2 <i>Functional Button "ON"</i> , "Change of cleaning frequency".
Wiper moving very slowly	Air flow adjuster too stringent.	Turn Adjuster on Auto Clean Control counter-clockwise with a screw driver.
	Wiper or Cylinder not clean.	Clean wiper.
Wiper moving very fast	Air flow adjuster too wide.	Turn Adjuster on Auto Clean Control clockwise with a screw driver.
Cleaning insufficient	Cleaner not operating.	Check wiper and air supply.
	Debris deposits.	Try additional manual cleaning.
	Deposition of material that cannot be removed mechanically (e.g. Iron Oxide).	Try chemical removal of deposit. Apply Cleaning Kit. Iron Oxide can be removed with Citric Acid.
	Cleaner frequency not adjusted to situation on site.	Adjust cleaner frequency.
	Wiper seal worn out or damaged.	Replace wiper seal.
	Wiper piston missing.	Re-install wiper piston.



Please do not hesitate to contact DECKMA Hamburg for additional support.



16. Calibration

16.1 OMD-32 Series

The Measuring Cell of the OMD-32 is calibrated in works. It is always possible to adjust the instrument's offset and gain settings. This affects the display, the alarm settings, and the signal output. If lab samples are taken for adjustment, it is recommended to take the samples after the instrument (downstream) without changing the flow conditions.

16.2 Calibration and Repeatability Check

- a) Switch off the power supply and stop any water flow.
- b) Clean the Sample Glass Tube accurately by using a suitable Cell Cleaning Brush as described under Section 12. *Operator Maintenance.*
- c) Run clean water through the instrument.
- d) Make 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. *OMD-32 Series Operating instructions.*

16.3 Function Test

To provide a simple procedure for instrument check on site, the OMD-32 Series are constructed in that way, that the zero check also confirms the instrument drift within the specifications. The **"Test"** button (see section 20.2.1 Functional Button **"TEST"**) 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 (120 ppm) downwards until the assumed value is equal to the actual measured ppm value.

i

Note that this test will only switch the alarm contacts to non-alarm condition, if the sample contains less than 15 ppm oil content and all other conditions for proper measurement are OK.



17. Spare Parts

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

OMD-32 Series	OMD-32	OMD-32 A
DESCRIPTION	ART-NUMBER	
Alarm Set Point Limitation	10900	10901
Desiccator	79550	79550
Cell Cleaning Brush	77555	77555
O-Ring Set	77775	77775
Measuring Cell	77501	77501
Service Exchange Measuring Cell (incl. new Calibration)	2277501	2277501
T2A Fuse	40107	40107
Wiper Seal	77606	77606
Service Kit	18570	18570
Memory Card	79186	79186
Wiper Piston	77785	77785



17.1 Recommended in Stock spares

OMD-32 Series	OMD-32	OMD-32 A
DESCRIPTION	ART-NUMBER	
Alarm Set Point Limitation	10900	10901
2 off Desiccator	79550	79550
1 off Cell Cleaning Brush	77555	77555
1 off O-Ring Set	77775	77775
T2A Fuse	40107	40107
2 off Wiper Seal	77606	77606
1 off Service Kit	18570	18570
1 off Set of push in connector M5x4	40618	40618
1 off Push-In connector with adjuster	40619	40619
1 off Pneumatic Cylinder	78785	78785
Optional Item		
1 off Manual Cleaning Unit	77780	77780



18. Optional Equipment

Equipment	Art-Number
Manual Cleaning Unit (MCU)	77780
Wiper Seal for MCU	77606
OMD-CR Memory Card Reader	75185
Calibration Check Fluid	18515
Auto Clean Controller Assembly	78790



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

by:

Firm's Name

[illegible]

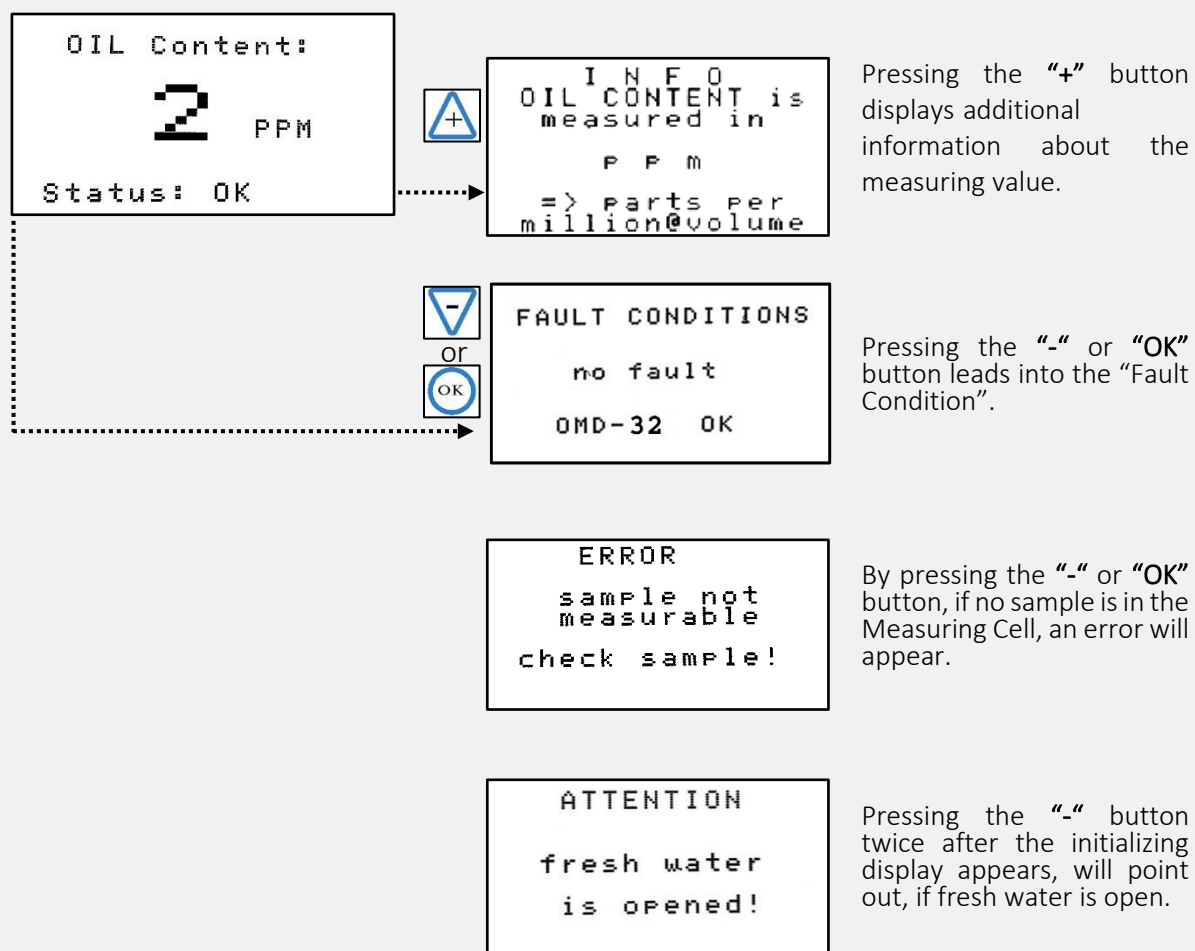


20. Appendix I.

20.1 Navigation Buttons



Pressing one of the tagged buttons, let the “Normal Operation” display appear.

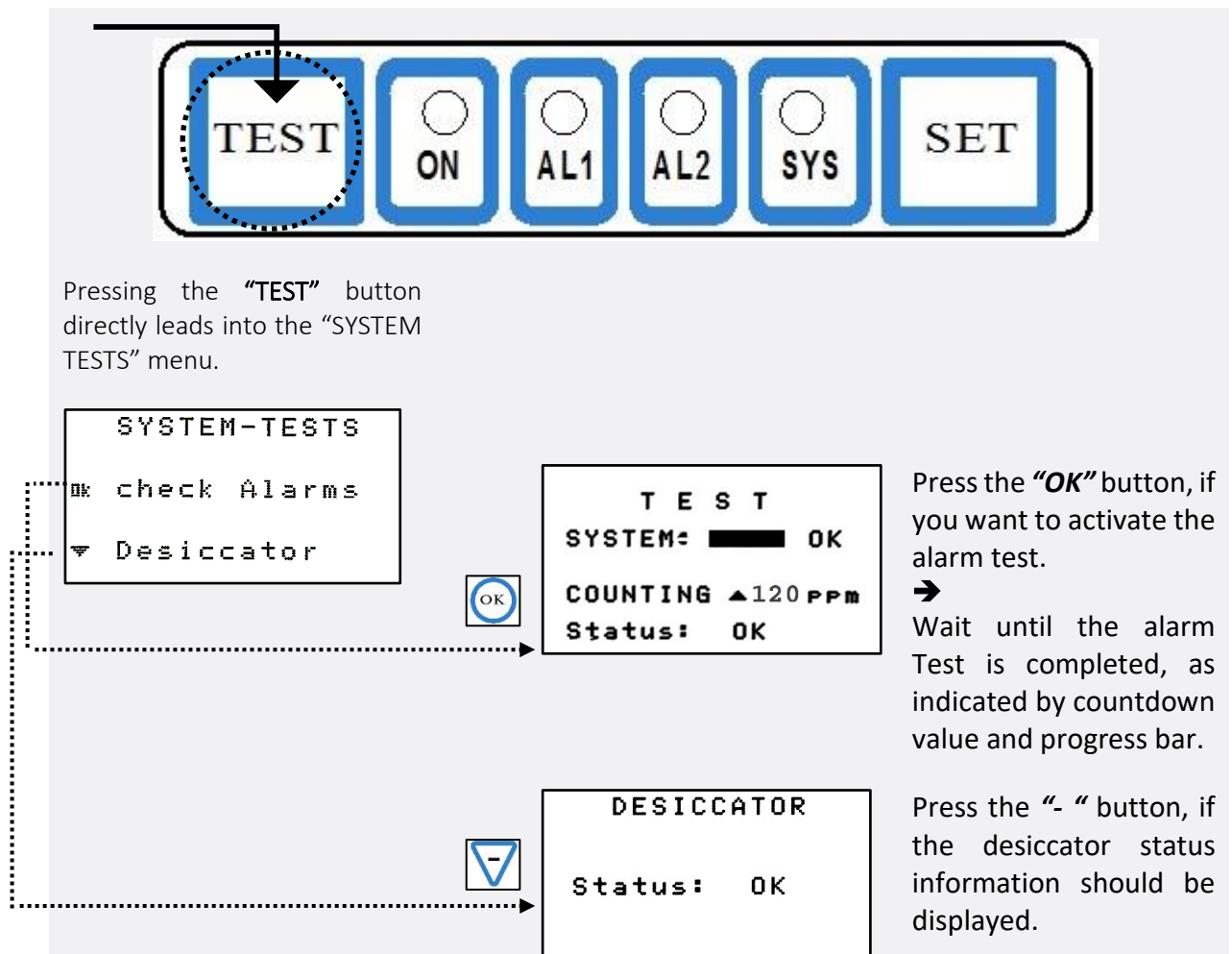


➔ Refer to Fault Finding Table (3 – 6) in manual for explanation of status information.



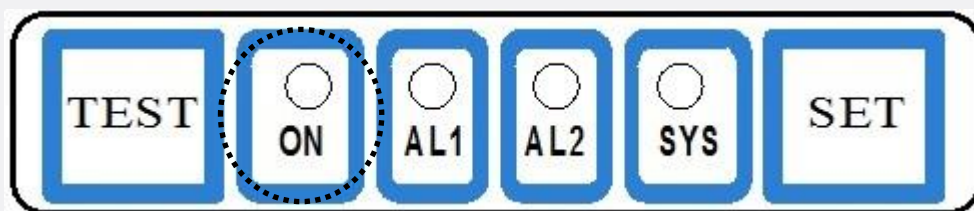
20.2 Functional Buttons

20.2.1 Functional Button "TEST"

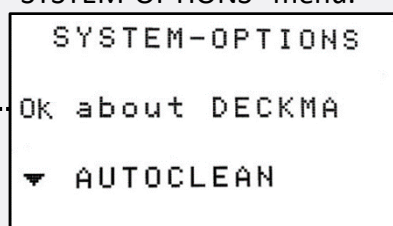




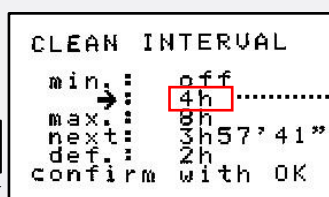
20.2.2 Functional Button "ON"



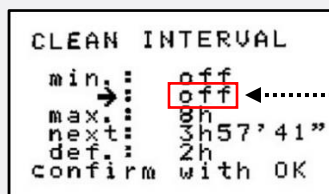
Selecting the "ON" button directly leads into the "SYSTEM-OPTIONS" menu.



The "+" button leads you into the "initializing display".



Pressing the "-" button leads into the "CLEAN INTERVAL" display.



In this display status it is possible to check and set the time delay for Autoclean operation from minimum 1 min. to maximum 8 hours. Alternatively, it is possible to switch off the Autoclean completely.

Line "next" displays the remaining time towards the next cleaning cycle. This is especially useful, if remaining very long (several hours) cleaning intervals.

By selecting "def." the cleaning interval will be set to 2 hours.

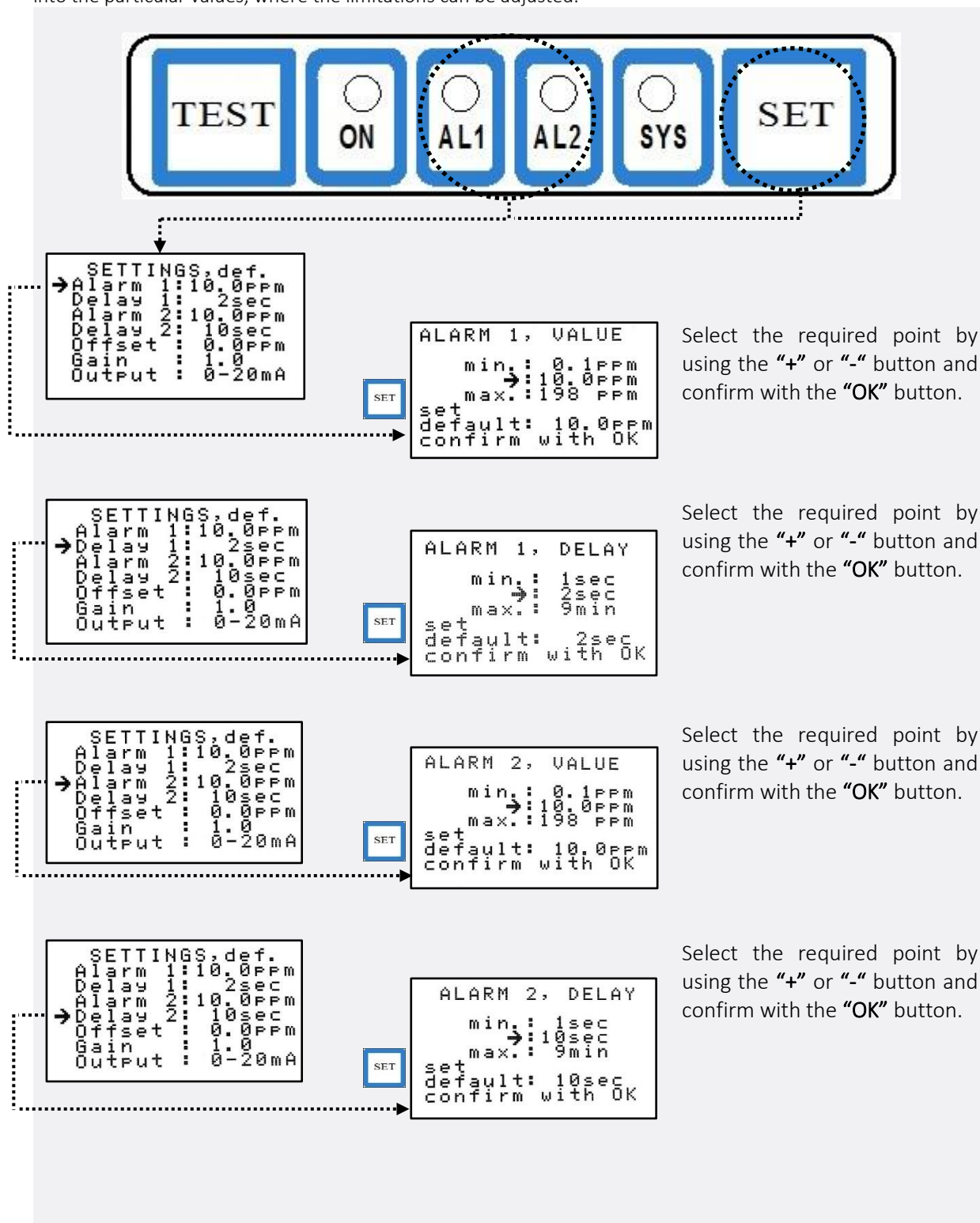
Select the required point by using the "+" or "-" button and confirm with "OK" button.

The Autoclean interval should be off, if it is uncertain, that a sample stream is maintained. If the cleaner operates in a dry Sample Glass Tube, increased wear is to be expected.



20.2.3 Functional Buttons AL1/ AL2/ SET

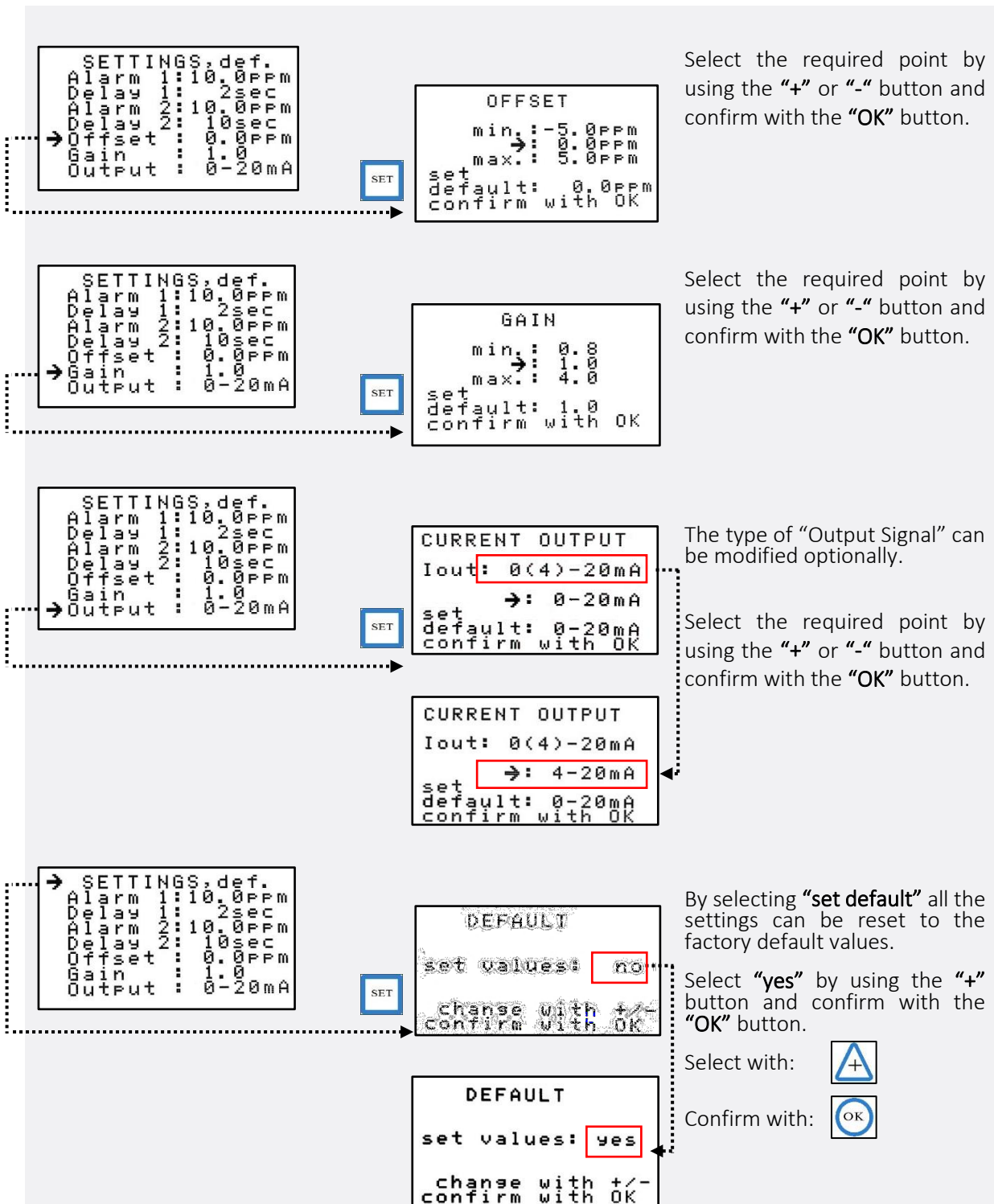
Pressing "AL1", "AL2", or "SET" button leads into the "SETTINGS, def." menu. At the "SETTINGS, def." menu the alarms, time delays, the offset, the gain, and the output signal can be modified within the limitations. And the unit could be also reset to factory default values there. Pressing the "SET" button in the "SETTINGS, def." menu leads into the particular values, where the limitations can be adjusted.





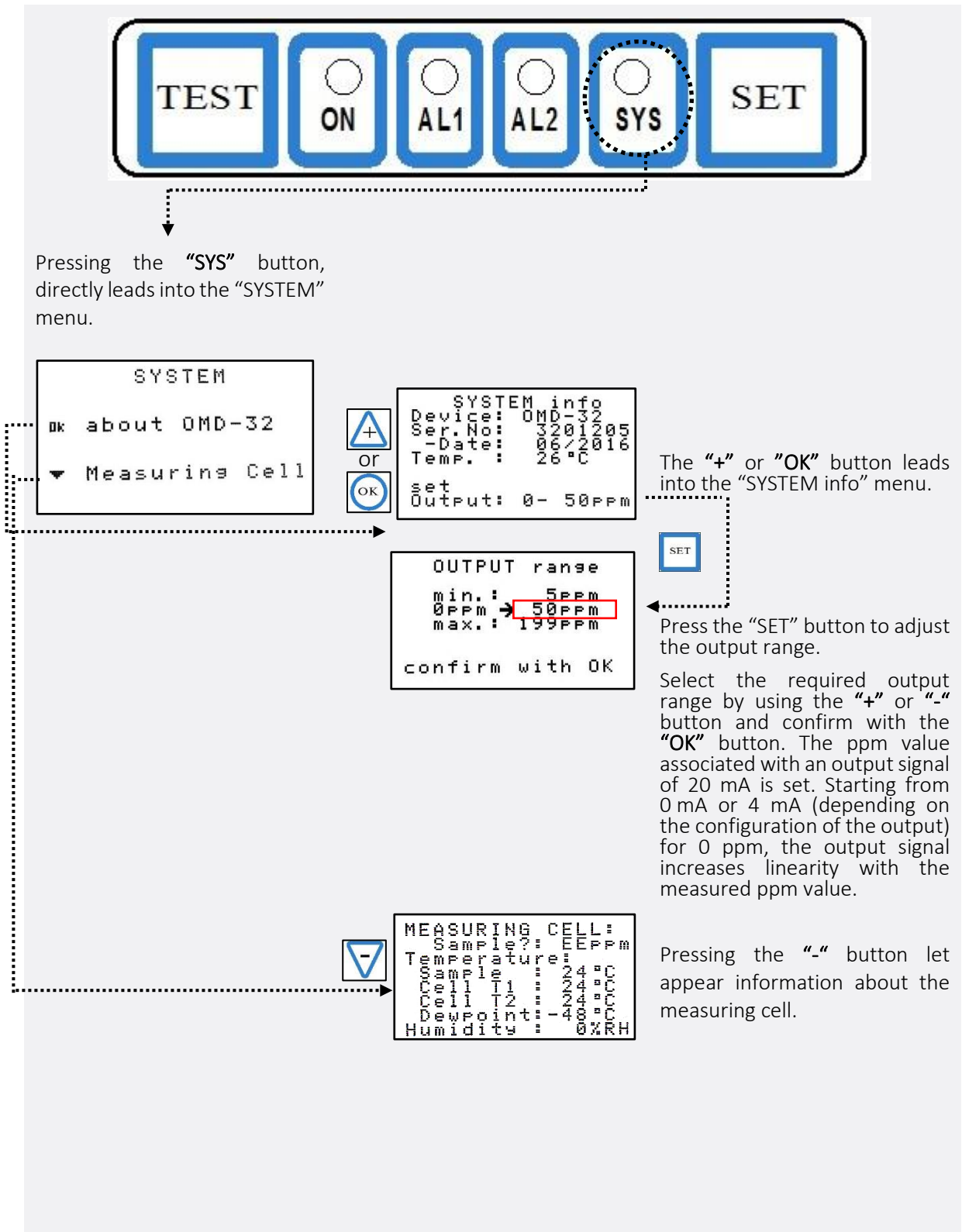
DECKMA

HAMBURG



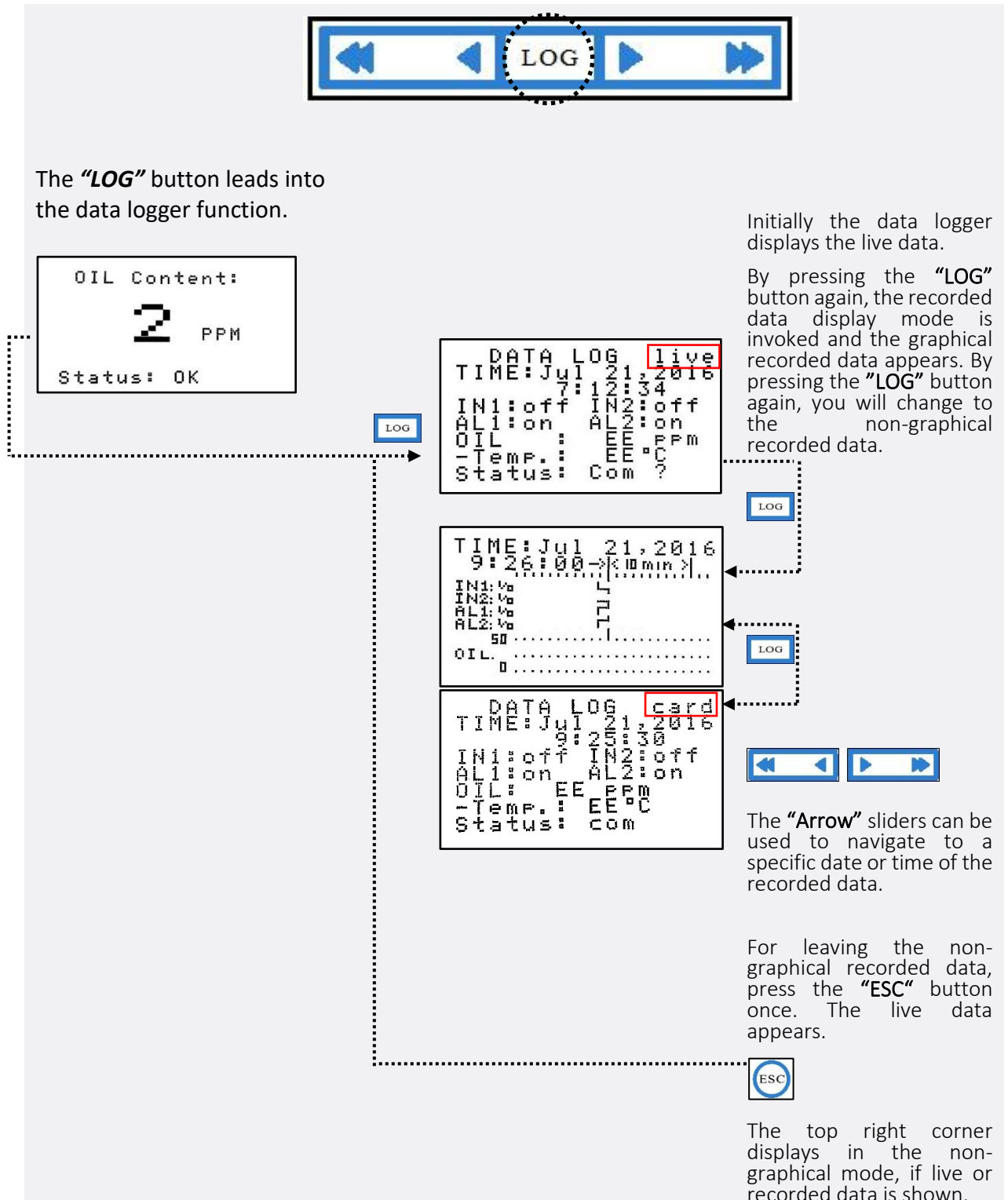


20.2.4 Functional Button "SYS"





20.3 Data Logger Operation Buttons





20.4 Setting TIME / DATE



Press the "LOG" button and "SET" button subsequently to go to the time setting display.

```
SET CLOCK
→year: 2019
month: Feb
day: 19
hour: 11
min: 15
sec: 47
CONFIRM
```



```
SET CLOCK: year
min.: 2011
→: 2019
max.: 2060
set
current: 2019
confirm with OK
```

Select the required point by using the "+" or "-" button and confirm with the "OK" button.

```
SET CLOCK
→year: 2019
month: Feb
day: 19
hour: 11
min: 05
sec: 52
CONFIRM
```



```
SET CLOCK: month
min.: Jan
→: Feb
max.: Dec
set
current: Feb
confirm with OK
```

Select the required point by using the "+" or "-" button and confirm with the "OK" button.

```
SET CLOCK
year: 2019
month: Feb
→day: 19
hour: 11
min: 15
sec: 47
CONFIRM
```



```
SET CLOCK: day
min.: 01
→: 19
max.: 31
set
current: 19
confirm with OK
```

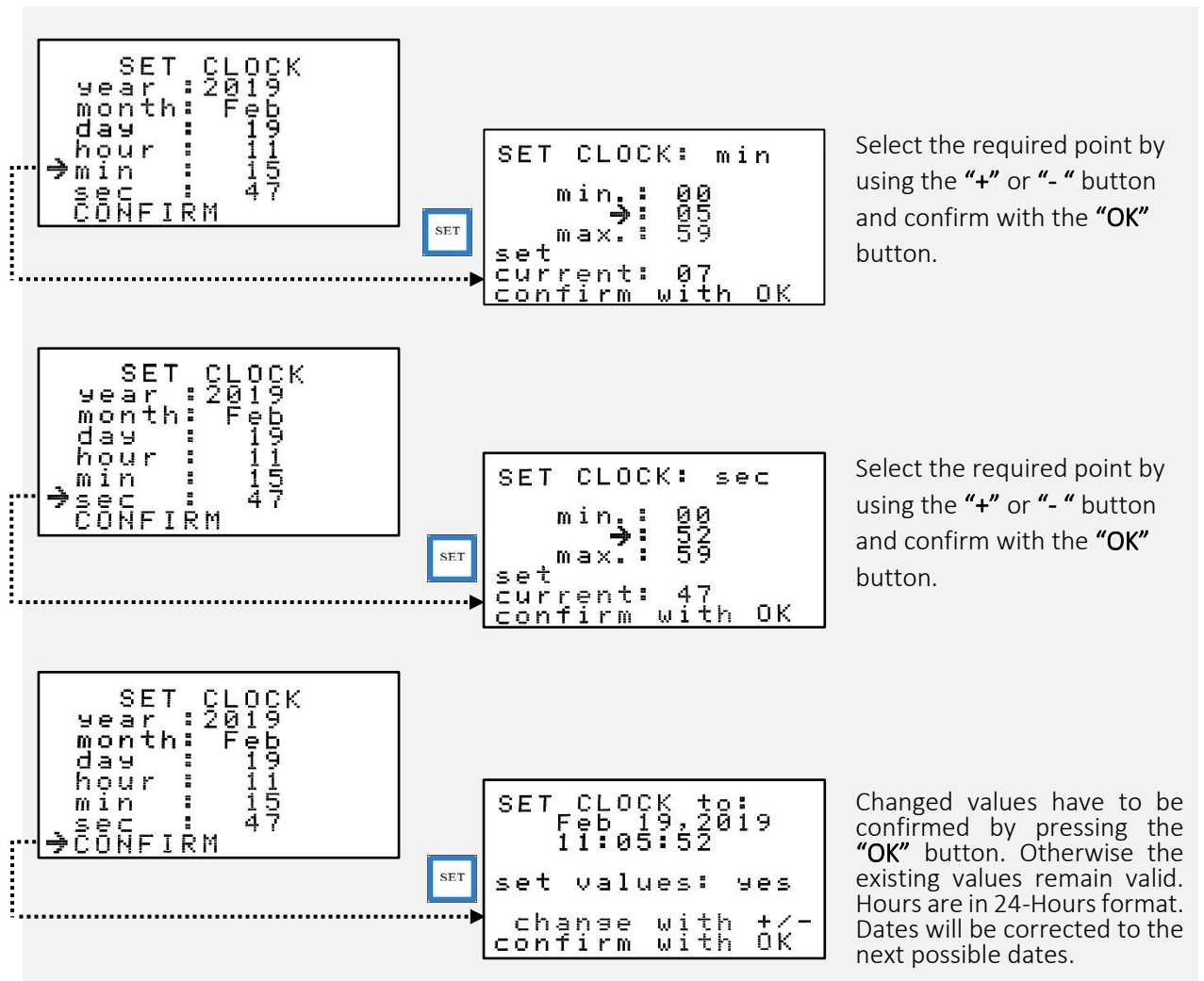
Select the required point by using the "+" or "-" button and confirm with the "OK" button.

```
SET CLOCK
year: 2019
month: Feb
day: 19
→hour: 11
min: 15
sec: 47
CONFIRM
```



```
SET CLOCK: hour
min.: 00
→: 11
max.: 23
set
current: 11
confirm with OK
```

Select the required point by using the "+" or "-" button and confirm with the "OK" button.





20.5 Activating the Memory Card



If you have inserted a new DECKMA memory card, you have to activate the memory card as follows.

OIL Content:
2 PPM
Status: OK

LOG

ATTENTION
new datacard
detected
aktivate: **no**
confirm with OK

ATTENTION
new datacard
detected
aktivate: **yes**
confirm with OK

After pressing the “LOG” button twice, the display will appear with the information, if you want to activate the new DECKMA memory card.

Select “yes” by using the “+” button and confirm with the “OK” button. The data will be recorded now.

Select with: 

Confirm with: 



21. Appendix III.

21.1 ALARMS

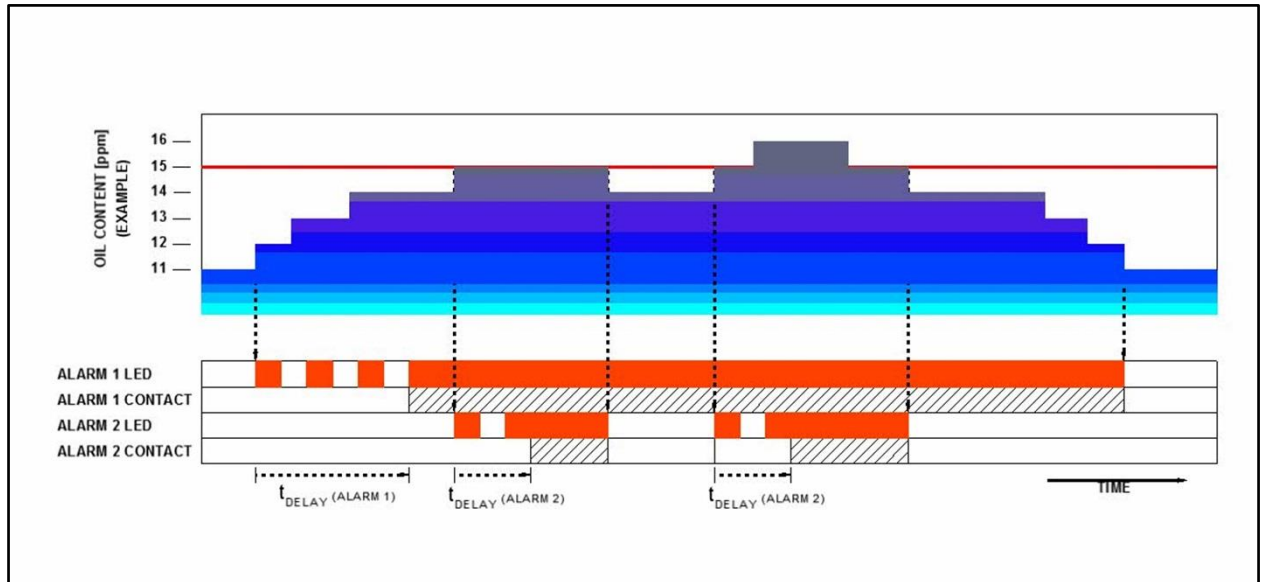


Figure 23. Alarms Example

The figure above reflects how the two independent alarms are working. In this example alarm 1 is set to 12 ppm and alarm 2 is set to 15 ppm. Each alarm is set to an individual delay setting.

Once the oil content is higher than 12 ppm or higher, alarm 1 LED will blink red until the alarm 1 delay is exceeded. Then the alarm 1 contact will be in operation and alarm 1 LED will be continuously red as long as the measurement is higher than 12 ppm. Once the measurement is below 12 ppm, the alarm 1 contact will be out of operation and alarm 1 LED will be off.

Once the oil content is higher than 15 ppm or higher, alarm 2 LED will blink red as long as alarm 2 delay is exceeded. Then alarm 2 contact will be in operation and alarm 2 LED will be continuously red, as long as the measurement is higher than 15 ppm. Once the measurement is below 15 ppm, alarm 2 contact will be out of operation and alarm 2 LED will be off.



22. Appendix IV.

22.1 Operator Maintenance Quick Checklist

Quick Checklist	Done	Intervention needed	Partly	Value
1. Check at first the outward appearance for leakages.				
2. Check out the cables for wear.				
3. The desiccator humidity [%rH].				
4. Switch the stream to FW.				
5. Flush the Measuring Cell with oil free water.				
6. Display shows 0 to 2 ppm. If not, follow up with the steps 7- 13.				
7. Stop any water flow. (Shut off the instrument air.)				
8. Check the O-Rings for wear.				
9. Check the wiper piston.				
10. Clean the Measuring Cell.				
11. Screw back Cell Cap, MCU, or Autoclean tight in.				
12. Flush the Measuring Cell with oil free water.				
13. Display shows 0 to 2 ppm. If not, use the Servicing and Cleaning Appendix.				
14. Check air pipe connection of air supply.				
15. Turn on the sample water flow.				
16. Perform a "System Test" for checking alarms.				
17. Check data logger/ clock.				
Checked by:	Date:		Signature:	



DECKMA
HAMBURG

23. Appendix V

23.1 Servicing and Cleaning Manual

To accomplish the cleaning process, please use the Servicing and Cleaning Manual.



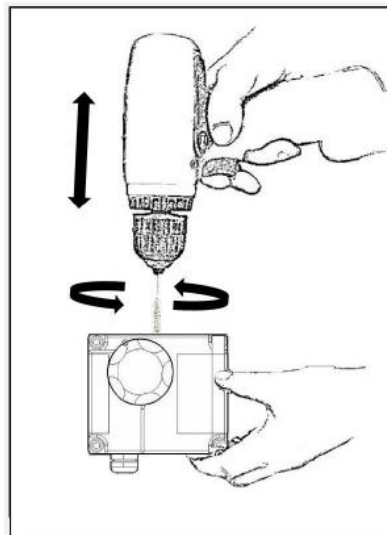
DECKMA
HAMBURG



DECKMA
HAMBURG

SERVICING AND CLEANING MANUAL

OMD-SERIES



Cleaning Procedure of Measuring Cell MZ-09

- Cleaning Manually
- Cleaning Mechanically Assisted
- Cleaning of Iron Oxide and Calcification

We help to protect the Environment



DECKMA
HAMBURG



DECKMA
HAMBURG

Appendix V.

Content

Revision	2
Symbols	3
1. Measuring Cell Cleaning	4
1.1 Cleaning Manually.....	4
1.2 Cleaning with Sample Tube Cleaner	6
1.3 Cleaning Mechanically Assisted	7
1.4 Cleaning of Iron Oxide and Calcification	9
1.5 Outward Appearance.....	10
1.6 Checking the O-Rings	11
1.7 Desiccator Check.....	13
Servicing Worldwide	14
Notes:	15

Revision

Document-Name	Revision No.	Notation	Date
Servicing and Cleaning Manual OMD-Series	R01_20200617		17.06.2020



DECKMA
HAMBURG



DECKMA
HAMBURG

Usage of the Service Manual

This Service Manual will guide you how to clean a Measuring Cell onboard. The instruction manual is split into sections. Every section handles a specific type of cleaning. The first part gives you general information about the outward appearance before cleaning and servicing the Measuring Cell.

The included information should be used only by a technician or a system operator for keeping the units correctly set up and cater for a clean Measuring Cell.

Following this Service Manual ensures clean maintenance and allows a right handling of the instrument.

This instruction manual contains also information about the service support and our contact details. Additionally, the symbols below will support you during the cleaning process.

Appendix V.

Symbols

- ✓ This symbol is used to show the right handling.
- X This symbol is used to show what to avoid.
- ⚙ This symbol is used for giving advices about servicing.
- ➔ This symbol is used for giving general advices.



DECKMA
HAMBURG



DECKMA
HAMBURG

1. Measuring Cell Cleaning

1.1 Cleaning Manually

Step 1.

Stop any water flow.

Step 2.

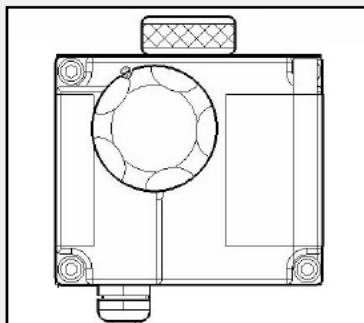


Figure 1

Unscrew Cell Cap, MCU, or Autoclean.

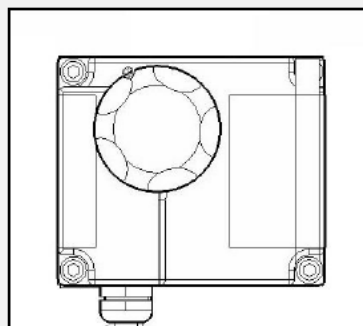


Figure 2

Remove Cell Cap, MCU, or Autoclean.

Step 3.

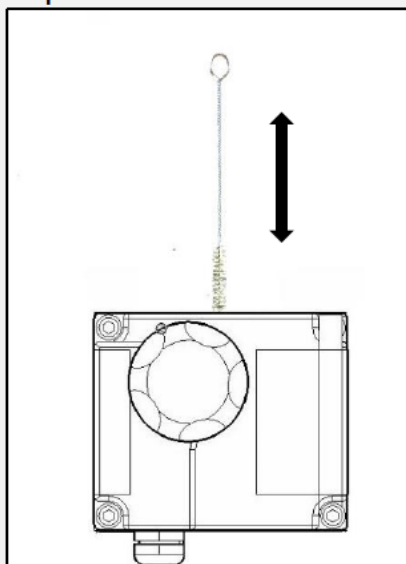


Figure 3

1. For cleaning the Sample Glass Tube, use the Cell Cleaning Brush with upwards and downwards motion through the Measuring Cell several times. Use some water to wet the Cell Cleaning Brush.
2. Remove the Cell Cleaning Brush and replace the Cell Cap.
3. Switch clean water valve to fresh water and allow oil free water to flow through the instrument for few minutes.
4. Avoid air bubbles in the stream.
5. Verify, that the display shows 0 to 2 ppm.
6. Cleaning has been sufficient if display shows 0 to 2 ppm.



DECKMA
HAMBURG



DECKMA
HAMBURG

Step 4.

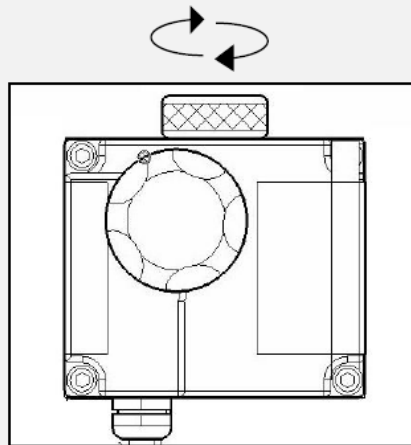


Figure 4

1. Screw in the Cell Cap.
2. Check, that the Measuring Cell Cap is screwed down completely.

Appendix V.



DECKMA
HAMBURG



DECKMA
HAMBURG

1.2 Cleaning with Sample Tube Cleaner

Step 1.



Figure 5

For intensive cleaning use the Sample Tube Cleaner from the Service Kit (Order No.: 18570). Apply clean Sample Tube Cleaner to the Cell Cleaning Brush and add water.

Step 2.

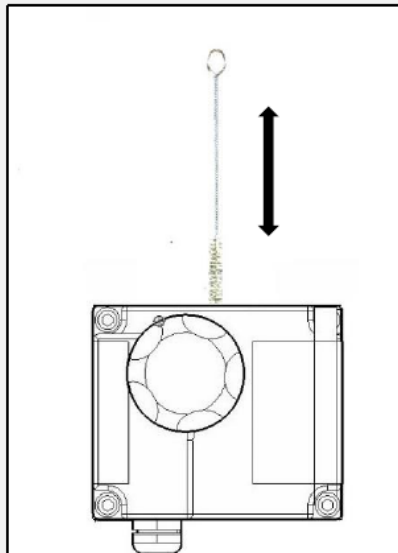


Figure 6

Clean the Sample Glass Tube with the Cell Cleaning Brush by applying the Sample Tube Cleaner.

1. For cleaning the Sample Glass Tube, use the Cell Cleaning Brush with upwards and downwards motion through the Measuring Cell several times. Wet the Cell Cleaning Brush.
2. Remove the Cell Cleaning Brush and replace the Cell Cap.
3. Switch clean water valve to fresh water and allow oil free water to flow through the instrument for few minutes.
4. Observe, that the display shows 0 to 2 ppm.

➔ Check, that the Measuring Cell Cap is screwed down completely.



DECKMA
HAMBURG



DECKMA
HAMBURG

1.3 Cleaning Mechanically Assisted

Step 1.

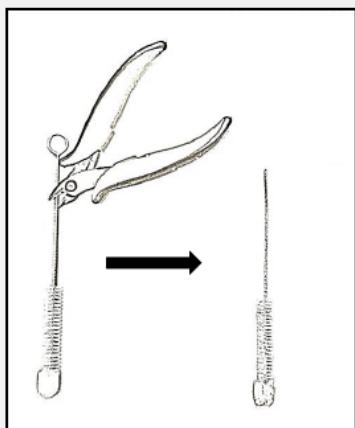


Figure 7

Step 2.

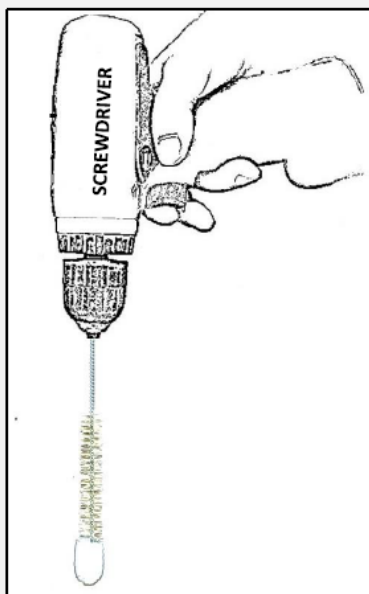


Figure 8

If the manual cleaning was not successful, an additional cleaning is recommended.

1. Cut the upper part of the Cell Cleaning Brush (step 1).
2. Insert the wire stem of the Cell Cleaning Brush into a screwdriver and fix it (step 2).
3. Slowly rotate the Cell Cleaning Brush for a few minutes in the Sample Glass Tube (See Step 3.)
4. Flush with clean water and re-test.



You can also use some Sample Tube Cleaner. It does not damage the surface of the Sample Glass Tube. Please do not use other abrasive cleaners, hard particles contained may damage the Sample Glass Tube within seconds.



DECKMA
HAMBURG



DECKMA
HAMBURG

Step 3.

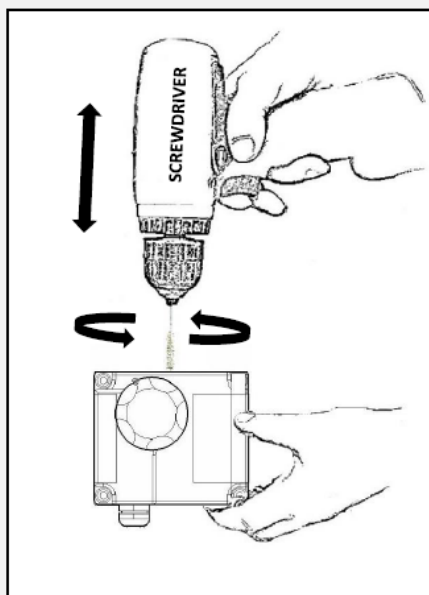


Figure 9

Use a screwdriver for an efficient cleaning. Slowly strike the Cell Cleaning Brush in the Measuring Cell for a few minutes and flush with clean water.

Appendix V.

→ Check, that the Measuring Cell Cap is screwed down completely!



DECKMA
HAMBURG



DECKMA
HAMBURG

1.4 Cleaning of Iron Oxide and Calcification

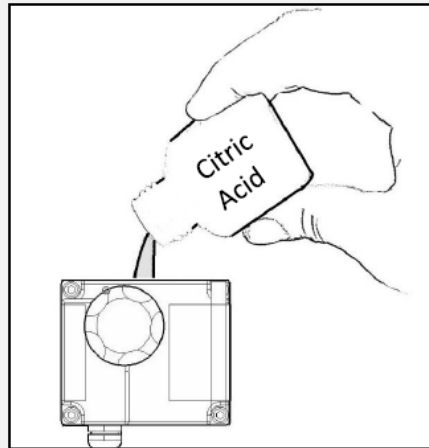


Figure 10

To clean Iron Oxide deposit, calcification, and other stubborn deposit, it is recommended to use the Citric Acid from the Service Kit (Order No.: 18570).

1. Ensure that the valves remain closed.
2. Mix some Citric Acid with 15 ml water.
3. Fill the Sample Glass Tube with the Citric Acid liquid and let it soak over night.
4. Flush with clean water without gas.

Appendix V.



DECKMA
HAMBURG



DECKMA
HAMBURG

1.5 Outward Appearance

Appendix V.

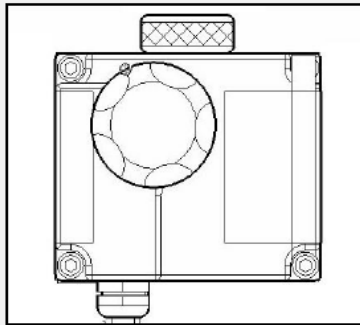


Figure 11

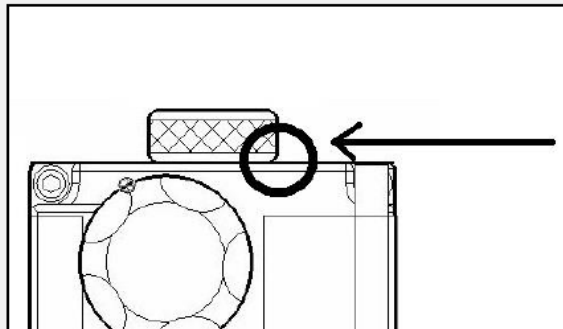


Figure 12

Check, that Cell Cap, MCU, or Autoclean is screwed down completely.

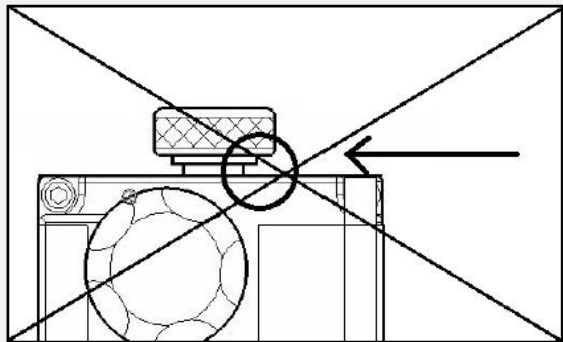


Figure 13

A not completely screwed down Cell Cap may allow formation of air bubbles and may influence the flow rate settings.



DECKMA
HAMBURG



DECKMA
HAMBURG

1.6 Checking the O-Rings

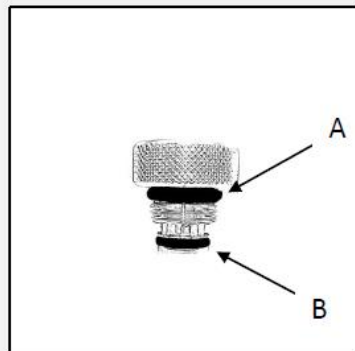


Figure 14

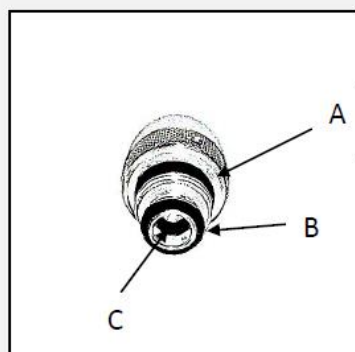


Figure 15

1. Check the condition of the three O-Rings as shown in the figures. If damaged, replace.
2. O-Rings B + C may not be present, depending on flow rate adjustment.
3. O-Ring A is always present.

A= 11.5X3 mm

B= 8.5X2 mm

C= 4.5X2 mm

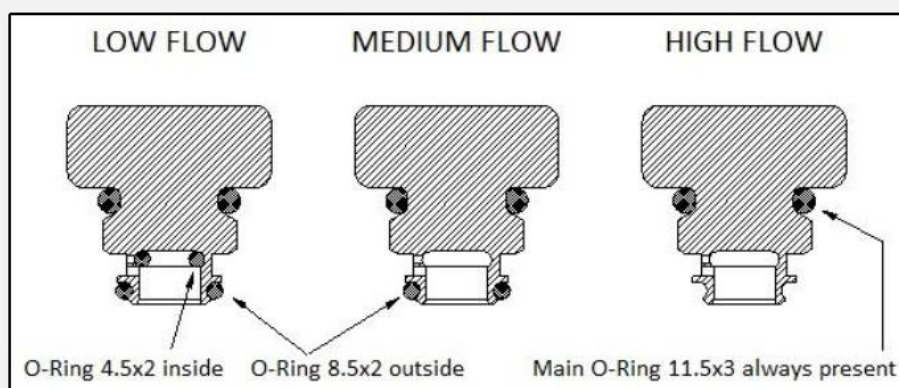


Figure 16



DECKMA
HAMBURG



DECKMA
HAMBURG

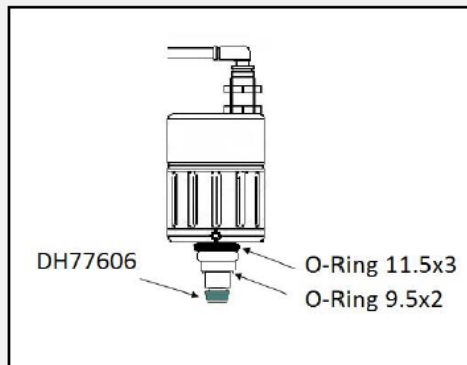


Figure 17

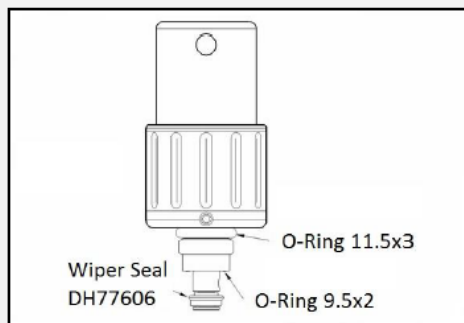


Figure 18

For Units equipped with MCU/ Automatic Cell Cleaning Device, check the two O-Rings and the piston seal.

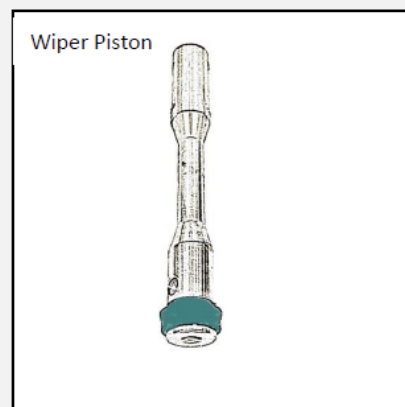


Figure 19



DECKMA
HAMBURG



DECKMA
HAMBURG

1.7 Desiccator Check

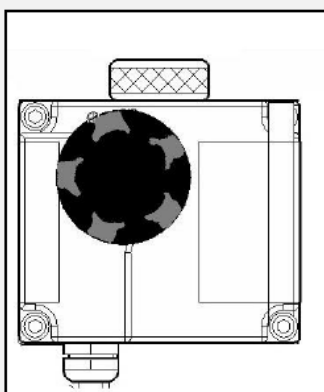


Figure 20

1. Press "SYS" Button, select Measuring Cell, confirm.
2. Internal data will be displayed.
3. The relative humidity [%rH] should be below 10%rH.
4. The dew-point temperature should be below 0°C.
5. If not, exchange desiccator.
6. The desiccator also has to be exchanged, if humidity is higher than 40%rH.

X

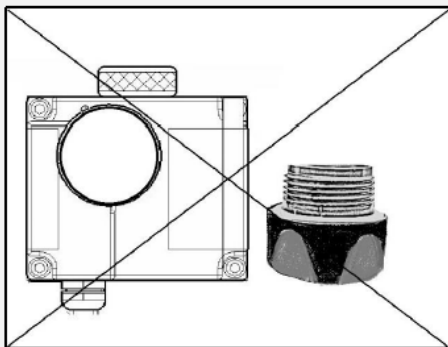


Figure 21



Do not expose the Desiccator to ambient air. Do not leave the Desiccator opening uncovered.



Index:

A

Adjustment9, 10, 14, 15, 36
Air Regulation 11, 24
Alarms.....3, 9, 10, 39, 40, 54
Automatic Cell Cleaning Device..... 11, 16, 34

C

Calibration 9, 10, 40
Card Reader 51
Cell Cap11, 17, 18, 19, 40
Certification 40
Commissioning 31
Computer Unit.....3, 16, 17, 18
Construction 12

D

Data Logger Operation Buttons..42, 59, 60, 62
Desiccator17, 18, 40, 54

F

Flow Sensor..... 51
Function Test Kit 51
Functional Button9, 10, 32, 34, 36, 37, 41, 42,
47, 54, 55, 56, 58

G

Glass Tube..... 11, 39, 40

H

Humidity 40

I

Installation.....3, 8, 12, 29, 31, 34

M

MCU11, 12, 19, 51
Measuring Cell.....8, 16, 49
Memory Card.....3, 43, 51, 62

N

Navigation Buttons41, 53

O

Offset.....10
Oil Content36, 48
Operator Maintenance.....37
Output28

P

Piping23
Power Supply 10, 14, 15, 27, 28, 29, 30, 31, 48

S

Sample 9, 11, 14, 15, 19, 23, 33, 36, 48
Service Exchange Units.....3
Servicing1, 8, 31
Settings.....12, 41
Spare Parts.....49
Specification13, 14, 15

W

Warranty3
Wiring25, 31



List of Figures

Figure 1 Touch Panel	9
Figure 2. Construction OMD-32.....	17
Figure 3. Construction OMD-32 A	18
Figure 4. Automatic Cell Cleaning Device, pneumatically operated	19
Figure 5. MCU DH77780 Manual Cell Cleaning Unit, operated manually.....	19
Figure 6. Installation OMD-32	21
Figure 7. Installation OMD-32 A	22
Figure 8. Piping OMD-32	23
Figure 9. Piping OMD-32 A	24
Figure 10. Cabling OMD-32 Series	25
Figure 11. Bottom View: OMD-32	26
Figure 12. Connection Example	27
Figure 13. Analyzing Display: DECKMA HAMBURG	32
Figure 14. Normal Operation Display	32
Figure 15. Flow Rate Adjustment Cell Cap	33
Figure 16. Flow Rate Adjustment Automatic Cell Cleaning Device/ MCU	33
Figure 17. Auto Clean Control Unit.....	34
Figure 18 Pressure Regulation.....	35
Figure 19 Using standard drainage.....	35
Figure 20. Display Functions.....	41
Figure 21. Memory Card Location	43
Figure 22. OMD-CR Memory Card Reader	44
Figure 22. Alarms Example	63



DECKMA
HAMBURG



Sales & Service Locations

DECKMA HAMBURG GmbH

Kieler Strasse 316
22525 Hamburg
Germany

Tel.: +49 (0)40 548876-0
Fax : +49 (0)40 548876-10
eMail : post@deckma.com
Internet : <http://www.deckma.com/>

General Inquiries: post@deckma.com
Service Inquiries: service@deckma.com

Global Sales & Service Locations & Contacts listed on our Website:
<http://www.deckma.com/agents>

For more information and servicing support , please use our phone number or our website mentioned above and we will give our best to satisfy you.

[illegible]



DECKMA
HAMBURG

DECKMA HAMBURG GmbH Kieler Straße 316, D-22525 Hamburg

Tel.: +49 (0) 40 54 88 76-0
Fax: +49 (0) 40 54 88 76-10
Internet: www.deckma.com
E-Mail: post@deckma.com

