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# INSTRUCTION MANUAL OilGuard 2 W



# Oil trace monitor with free-fall measuring cell

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# **1** General user information

# 1.1 Terms used in this document (glossary)

Please refer to our website for specialist terms: www.photometer.com/en/glossary/

# **1.2** Purpose of the Instruction Manual

This Instruction Manual provides the user with helpful information about the entire life cycle of the OilGuard 2 W and its peripheral devices. Before commissioning the instrument, you should be completely familiar with the Instruction Manual.

# **1.3** Target group of the documentation

The Instruction Manual is intended for all persons who are responsible for the operation and maintenance of the instrument.

# 1.4 Additional documentation

DOC. NO.	TITLE	CONTENT
14808E	Brief Instructions	The most important functions and the servicing schedule.
14811E	Reference Manual	More sophisticated menu functions and worksteps for advanced users.
14790E	Data Sheet	Descriptions and technical data about the instru- ment.
14813E	Service Manual	Repair and conversion instructions for service engineers.
14897DEF	Declaration of Con- formity	Compliance with the underlying directives and standards.
11887DEF	Declaration of Conformi- ty, SP-C039 (power sup- ply)	Compliance with the underlying directives and standards.

# **1.5 Copyright provisions**

This document has been written by SIGRIST-PHOTOMETER AG. Copying or modifying the content or giving this document to third parties is permitted only with the express consent of SIGRIST-PHOTOMETER AG.

# **1.6 Document storage location**

This document is part of the product. It should be stored in a safe place and always be close at hand for the user.

# 1.7 Order document

The most recent version of this document can be downloaded at <u>www.photometer.com</u> (first time registration required).

It can also be ordered from a SIGRIST representative in your country ( $\rightarrow$  Instruction Manual "Customer service information").

## 1.8 Proper use

The OilGuard 2 W is designed for measuring oil traces during water treatment and is optimized for the values that occur in water treatment plants with regard to measuring scope and ambient conditions.

# **1.9** User requirements

The instrument may be operated only by trained technical personnel who have read and understood the content of the Instruction Manual.

# 1.10 Declaration of conformity

Current technological principles were followed in designing and manufacturing the instrument. They comply with the applicable guidelines concerning safety and duty to take due care.



EU: The measuring instrument meets all applicable requirements within the European Union (EU) for carrying the CE mark.



Please refer to the separate declaration of conformity for details. Section 1.4

# 1.11 Use restrictions



#### Operation in an inappropriate environment.

Use in explosive areas can cause explosions, which can lead to the death of persons in the vicinity.

- It is not permitted to operate the instrument in explosion hazardous areas or rooms.
- It is not permitted to use the instrument with explosive sample substances.

# 1.12 Dangers when not used properly



#### Operation when not used properly.

Improper use of the instrument can cause injuries to persons, process-related consequential damage and damage to the instrument and its peripherals.

In the following cases the manufacturer cannot guarantee the protection of persons and the instrument and therefore assumes no legal responsibility:

- The instrument is used in a way not included in the described area of application.
- The instrument is not properly mounted, set up or transported.
- The instrument is not installed and operated in accordance with the Instruction Manual.
- The instrument has been operated with accessory parts which SIGRIST-PHOTOMETER AG has not expressly recommended.
- Improper changes to the instrument have been performed.
- The instrument has not been operated within the specifications, in particular concerning pressure and temperature.
- The instrument is exposed to vibrations, shocks or other mechanical forces.

# 1.13 Meaning of the safety symbols

All **danger symbols** used in this document are explained below:



**Danger due to electrical shock that may result in serious bodily injury or death.** Non-observance of this notice may lead to electrical shocks and death.



**Danger due to explosion that may result in serious bodily injury or death.** Non-observance of this notice may cause explosions resulting in serious property damage and death.

EXPLOSION HAZARD!



Warning about bodily injury or hazards to health with long-term effects. Non-observance of this warning may lead to injuries with possible long-term effects.



Notice about possible material damage.

Non-observance of this notice may cause material damage to the instrument and its peripherals.



Danger due to UV radiation.

Non-observance of this warning can lead to permanent damage to the eyes and skin.



**Danger due to hot surfaces that may result in injuries.** Non-observance of this warning can lead to burns.

# 1.14 Meaning of the pictograms

All **pictograms** used in this document are explained below:



Additional information about the current topic.



Practical procedures when working with the OilGuard 2 W.



Manipulations on the touchscreen.



The screenshot is an example and may differ from current device.

# 2 Instrument overview

# 2.1 Overview of the OilGuard 2 W



Figure 1: Measuring point with optional accessories

1	Photometer with free-fall measur- ing cell	2	Outlet
3	Sample inlet of the level control	4	Sample overflow of the level control
5	Set for wall mounting	6	Inlet pipe on the photometer

# 2.2 Designation of the photometer

The photometer is fitted with the following rating plate:



Figure 2: Rating plate on OilGuard 2 W

1	Manufacturer	2	Country of origin
3	Product name	4	Serial number
(5)	Date of manufacture	6	Service voltage
$\bigcirc$	Frequency range	8	Power
9	Observe the disposal information	1	Observe the Instruction Manual

# 2.3 Scope of supply and accessories

# 2.3.1 Standard scope of supply for the OilGuard 2 W

PCS.	ART. NO.	NAME	VIEW	VARIANT
1	121250	OilGuard 2 W with set for wall mounting and lev- el control		
	121316	OilGuard 2 W A with set for wall mounting and lev- el control		With automatic ad- justment
	121210	OilGuard 2 W		
	121315	OilGuard 2 W A		With automatic ad- justment

Documentation:

PCS.	ART. NO.	NAME	VIEW	VARIANT
1	14809	Instruction Manual	The second se	German French English
1	14811	Reference Manual		German English
1	14808	Brief Instructions		German French English

# 2.3.2 Optional accessories for the OilGuard 2 W

PCS.	ART. NO.	NAME	VIEW	VARIANT
1	121233	Set for wall mounting and lev- el control on the OilGuard 2 W		
1	121255	Checking unit for OilGuard 2 W	0.00	Manual calibration unit
1	119102	Profibus DP, inter- faces print		
1	119103	Modbus RTU, in- terfaces print		
1	121120	Profinet IO, interfaces print		
1	119798	HART, interfaces print		
1	119041	4-way current output module		
1	119082	I/O module		
1	119045	24 VDC power supply, 20 W, IP66, input 100 to 240 VAC		
1	119081	Ethernet cable IP66 (for fixed installa- tion)	C	

# 2.4 Technical data for the OilGuard 2 W

Fluorescence measure- ment	Values
Measuring principle	Fluorescence measurement
Measuring scope	0 50 μg/l (ppb) with 16 EPA-PAH calibration
Wavelength	Excitation: 280 nm (EN 62471 Risk Group 3 – High Risk) Detection: 300 – 400 nm
Radiation class	LED device of Risk Group 3 according to EN 62471
Resolution	0.01 $\mu$ g/l (ppb) with 16 EPA-PAH calibration
Detection limit	< 0.1 µg/l (ppb) with 16 EPA-PAH calibration
Photometer	Values
Reproducibility	± 2 % from measuring range with 16 EPA-PAH
Repeatability	$\pm$ 0.5 % from measuring range with 16 EPA-PAH
Service voltage	18 – 30 VDC
Power consumption	8 W
Dimensions	See detailed dimensional drawing
Weight	3.2 kg
Protection class	IP54 (only electronics)
Maximum operating alti- tude	2,000 m above sea level for instruments that are not operated with low voltage (mains, relays)
Ambient temperature	0 50 °C
Ambient humidity	0 95% rel. humidity, non-condensing
Housing	Plastic (ABS)
Outputs/inputs	<ul> <li>Outputs:</li> <li>2 x 0/4 20 mA, galvanically isolated up to max. 50 V relative to ground, max. 500 Ω burden</li> <li>2 x relay contacts 250 V, 4 A</li> <li>Inputs:</li> <li>2 x 0/4 20 mA, not galvanically isolated</li> <li>1 x digital input (available in OilGuard 2 W A)</li> </ul>
Outputs/inputs	Outputs:
Optional I/O module	<ul> <li>2 x 0/4 20 mA, galvanically isolated up to max. 50 V relative to ground, max. 500 Ω burden</li> <li>4 x digital outputs up to max. 30 VDC, freely configurable inputs:</li> </ul>
	<ul> <li>5 x digital inputs up to max. 30 VDC, freely configurable</li> </ul>

Photometer	Values
Outputs Optional 4-way current output module	<ul> <li>Outputs:</li> <li>4 x 0/4 20 mA, galvanically isolated up to max. 50 V relative to ground, max. 500 Ω burden</li> </ul>
Measuring ranges	8, freely configurable
Interfaces	Ethernet, SD card (for logging, SW update, diagnostics), Mod- bus TCP, optional: Modbus RTU, Profibus DP, Profinet IO or HART
Display	<sup>1</sup> ⁄ <sub>4</sub> VGA with touchscreen Resolution: 320 x 240 pixels with 3.5 " diagonal

Free-fall measuring cell	Values
Material	Inlet pipe: stainless steel 1.4435 or PVC Outlet: PVC
Sample pressure	Pressureless
Medium temperature	0 40 °C (not more than 30 °C over the ambient temperature)
Sample flow	2.5 7 l/min
Connections	Inlet pipe: $\emptyset$ 12 mm Outlet pipe: $\emptyset$ 25 mm

24 VDC power supply	Values
Service voltage	100 240 VAC, 47 63 Hz
Power consumption	Max. 25 W (the power consumption of the connected sensors must not exceed 21 W)
Maximum operating altitude	2000 m above sea level
Protection class	IP66
Weight	0.66 kg
Dimensions	approx. 130 x 155 x 55 mm (W x H x D)
Housing material	PC

## 2.4.1 Typical measuring values and calculation factors

Typical measuring values and calculation factors can be found on our homepage: <u>www.photometer.com</u>

# 3 General safety points

death.

# 3.1 Dangers when properly used



#### Damaged instrument or cabling.

Dangerous voltage inside the instrument.

Touching damaged cables may lead to electrical shocks or death.

- The instrument may be operated only when the cables are undamaged.
- The instrument may be operated only if it has been properly installed or repaired.

Touching live components inside the instrument may lead to electric shocks resulting in

The instrument must not be operated when the housing is removed or opened.





#### Damage to the instrument due to incorrect service voltage.

If the instrument is connected to an incorrect service voltage, the instrument can be damaged.

 The instrument may be connected only to voltage sources as specified on the rating plate.



#### Missing Instruction Manual after the instrument changes hands.

Operating the instrument without knowledge of the Instruction Manual may lead to injuries to persons and damage to the instrument.

- If the instrument changes hands, always include the Instruction Manual.
- If the Instruction Manual is lost, you can request a replacement.
   Registered users can download the current version at <u>www.photometer.com</u>.



#### Escaping water from leaks on the instrument or water connections.

Escaping water can lead to flooding of the room and material damage to the building and fittings.

Check that there are no leaks.

# 





#### Penetration of moisture as well as condensation on the electrical components during servicing duty.

If moisture enters the instrument, the OilGuard 2 W can be damaged.

• Work inside the instrument may be performed only in a dry room and at room temperature. The instrument should be at operating or room temperature (avoid condensation on optical and electrical surfaces).



#### The use of aggressive chemicals when cleaning.

Use of aggressive chemicals can cause damage to instrument components.

- Do not use aggressive chemicals or cleaning agents when cleaning.
- Should the instrument come in contact with aggressive chemicals, clean it thoroughly with a neutral cleaning agent.

#### Danger due to UV radiation 3.2



The OilGuard is equipped with a UV LED with an emission wavelength of 280 nm. According to the standard IEC/EN 62471 (Photobiological safety of lamps and lamp systems), this LED is classified in Risk Group 3 (High Risk).

**UV RADIATION!** 

Exposure of longer than 3 seconds can lead to permanent damage to the eyes and skin.

- The UV LED is only accessible when the housing is open. The OilGuard is equipped with an automatic cut-off device that puts the LED out of operation when the housing is open.
- Switch off the OilGuard when carrying out servicing duties, or wear UV goggles and gloves.

#### **Residual risk** 3.3



According to the risk assessment of the applied safety directive DIN EN 61010-1, there remains the risk of the displayed measuring values being incorrect. This risk can be reduced with the following measures:

- Use an access code to prevent unauthorized persons from changing parameters.
- Perform the specified servicing duties.

#### Warning and danger symbols on the instrument 3.4



#### There are no warning or danger symbols on the instrument.

Users must ensure that they observe the safety measures as specified in the Instruction Manual at all times when working with the instrument and its peripheral equipment, even if no warning or danger symbols are attached to the instrument.

The following sections must be internalized:

- Section 1.11
- Section 1.12
- Section 1.13
- Section 3.1
- Section 3.3
- Observe safety pointers when performing the described procedures.
- Observe local safety pointers.

# 3.5 Preventing undesirable online access attempts





SIGRIST instruments are equipped with an integrated web user interface and Modbus TCP interface, thus offering state-of-the-art administration and control possibilities. However, if these are connected directly to the Internet, then any Internet user can in principle access your instrument and change the configuration.

Please note the following points to prevent this:

- Never connect the instrument directly to the Internet.
- Operate it behind a firewall and block access to the instrument.
- Only connect to branch offices via VPN.
- Change the standard password on commissioning.
- Always keep up to date with the latest changes regarding Internet security so that you can react promptly in the event of alterations.
- Install the latest updates immediately (also for the router and firewall).

# 4 Mounting

# 4.1 Location selection

Note the following points for the operating location:

- Electrical supply must be ensured.
- The water supply must be ensured as described in the technical data.
- The water outlet must be unhindered.
- The system should not be exposed to direct sunlight during measurement; the measurement can be skewed by excessive external light.

# 4.2 Mounting the OilGuard 2 W

1

The dimensional specifications according to the mounting drawings attached in the documentation ring binder of OilGuard 2 W.

Mount the OilGuard 2 W as follows:

	2		١
1×	5	5	
1		C	

		1
	WORKSTEP	ADDITIONAL INFO / IMAGES
1.	Screw on the mounting bracket at the desired position. The mounting bracket must be hori- zontally aligned with a spirit level.	
2.	Align the OilGuard 2 W to the two positioning pins (circles), then screw onto the mounting bracket.	
3.	Remove the optics unit from the OilGuard 2 W according to Section 9.1.1.	



	WORKSTEP	ADDITIONAL INFO / IMAGES
4.	<ul> <li>WORKSTEP</li> <li>Align the OilGuard 2 W as follows: <ol> <li>Loosen the fixing nut (X) of the support (Y).</li> <li>By turning the support (Y, figure right), adjust the instrument using a spirit level until it is straight.</li> <li>Use the measuring cell housing as a support surface for the spirit level (figure below).</li> </ol> </li> <li>Tighten the fixing nut (X) of the support (Y).</li> </ul>	ADDITIONAL INFO / IMAGES

# 4.3 Mounting the docking station

Mount the docking station close to the photometer using two fastening screws.

# 4.4 Mounting the sample connections

### 4.4.1 General information on the sample connections



Flooding of the surrounding area due to improper connection of the sample connections.

Note the following when fastening the hoses:

The outlet hose must be fastened so that the flood protection holes are not covered. Otherwise, flood protection is not guaranteed (see the following figure).



• All hose connections must be secured with hose clamps. The connections should be checked about two weeks after installation to ensure that no air can be pulled in.

In order to ensure an accurate measurement of the oil concentration, observe the following points when mounting the sample connections:

- A continuous water flow rate as specified in the Section 2.4 is required.
- In all cases, a regulator valve or level control is necessary in order to set the water flow rate.
- The use of transparent hoses is not permitted.
- When mounting the inlet hose, ensure in particular that no forces are exerted on the inlet pipe. Use the supplied hose holder as strain relief (see the assembly diagram OILGUARD 2 W-MB)



# 4.4.2 Fastening the sample connections on the OilGuard 2 W

Figure 3: Overview of the measuring cell unit

1	Inlet pipe	2	Conduit gland for inlet pipe
3	Holder for inlet pipe	4	Light trap
(5)	Outlet cone	6	Conduit gland for outlet pipe
$\bigcirc$	Outlet pipe with flood protection		

The following procedure describes how to mount the sample connections on the OilGuard 2 W:

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	WORKSTEP	ADDITIONAL INFO / IMAGES
1.	Remove the optics unit according to Section 9.1.1 and fasten on the docking station.	Warning! UV radiation. Use UV goggles and gloves.
2.	Fasten the inlet hose on the inlet pipe (Figure 3, pos. 1).	
3.	Fasten the outlet hose on the outlet pipe (Figure 3, pos. 7). When doing so, press the outlet cone (Figure 3, pos. 5) downward by hand so that the outlet pipe (Figure 3, pos. 7) is not pressed into the measuring cell space.	Flooding of the measuring cell due to improper mounting of the outlet hose. The outlet hose must be fastened so that the holes on the side are not covered (flood protection). Section 4.4.1
4.	Check to ensure the inlet pipe (Figure 3, pos. 1) projects 5 mm out of the holder.	5 mm
5.	Check to ensure the outlet cone (Figure 3, pos. 5) is in contact with the conduit gland (Figure 3, pos. 6).	
6.	Place the optics unit back on the measuring cell unit and lock with the four mounting clips.	

# 4.5 Mounting the optional accessories

## 4.5.1 General information on the optional accessories



#### Note the following when mounting the optional accessories:

- All hose connections must be secured with hose clamps. The connections should be checked about two weeks after installation to ensure that no air can be pulled in.
- A minimum flow of 1 l/min. must be guaranteed on the overflow of the level control.
  - The dimensions on the dimension sheets must be adhered to (course and radii of the hoses, spacing etc.).

## 4.5.2 Mounting the level control

Mounting of the level control is made according to the dimension sheets **OILGUARD 2 W/1-MB**.

# 5 Electrical installation

# 5.1 Safety pointers for the electrical connection



#### Connecting the service voltage.

Improper connection of the service voltage can be potentially fatal. The system may also be damaged. Local regulations for electrical connection must be observed at all times.

Further, the following basic principles must be observed:

- Because the system has no main switch, a suitable disconnection device (switch, plug) should be installed near the service voltage. It must be designated and easily accessible.
- It is imperative that the protective conductor is connected.
- The system must not be charged with voltage until the installation is completed and all covers are mounted.
- On systems with a service voltage of between 100 and 240 VAC, a back-up fuse with a max. tripping current of 16 A must be present. The cables must be able to withstand this load.
- If faults cannot be remedied, the system must be put out of operation and protected against inadvertent operation.

# 5.2 Removing and reattaching the front cover



#### Life-threatening voltage inside the instrument.

The system has no mains switch, meaning it is charged with voltage immediately after the electrical connections have been established.

The terminals are accessed by removing the front cover. The following describes this process:



	WORKSTEP	ADDITIONAL INFO / IMAGES
1.	<b>Removing the front cover:</b> Loosen the five screws (circles) with a 7 mm key and remove the front cover.	
2.	<ul> <li>Attaching the front cover:</li> <li>Carefully mount the front cover and fasten in place with the five screws (circles).</li> <li>M Damage to the threaded inserts in the housing due to excessive tightening of the screws on the front cover:</li> <li>Use a hex key without a T-handle to tighten the screws of the front cover finger-tight (tightening torque 1 Nm).</li> </ul>	7 mm hex key

# 1

The use of operating signals is described in the Reference Manual.

# **5.3** Connecting the customer connections



#### Life-threatening voltage inside the instrument.

The system has no mains switch, meaning it is charged with voltage immediately after the electrical connections have been established.



Figure 4: Position of the customer terminals



- The cables should be long enough so that there is sufficient freedom of movement for the photometer and its peripherals when carrying out servicing duties (e.g. fastening the photometer onto the docking station).
- The three larger cable glands are designed for cables with an outer diameter of 4 to 8 mm, while the small cable gland is for an outer diameter of 3 to 6.5 mm.



The front cover must first be removed from the OilGuard 2 W according to Section 5.2. Establish the electrical connections in the following sequence:

	TERMINALS	MEANING	REMARKS
1.	1 – 2 – 3	Output 1 (relay contact 1)	The relay contacts can be freely con- figured.
2.	4 – 5 – 6	Output 2 (relay contact 2)	
3.	18, 19	Current output 1 0/4 20 mA	
4.	20, 21	Current output 2 0/4 20 mA	
5.	22, 23	Digital input	Available in OilGuard 2 W A
6.	7 – 8 – 9	18 – 30 VDC power supply	Use the cable gland (Y) in the mid- dle.

# 5.4 Connecting the optional 24 VDC power supply



#### Life-threatening voltage due to accidentally released voltage-carrying wires.

- The wires of the supply connection must be secured with cable ties so that if one wire accidentally becomes loose no other parts can be charged with voltage.
- Cables with an outer diameter of 4 to 8 mm must be used.



Figure 5: Optional power supply with removed cover

	Cable to instrument (24 VDC)	2	Indicator lamp
3	Screw terminals	4	Cable from mains (100 240 VAC)

The terminals are assigned as follows for connecting the power supply:

Terminal designa- tion in the power supply	Cable color	Terminal designation in the photometer	Function
+24 V	Brown	8: 24 V	24 VDC
RTN	Blue	9: GND	Ground
Protective earth	Yellow/green	7: Ground connection	Ground connection
Protective earth			Mains protective ground
Ν			Mains neutral conductor
L			Mains live

# 5.5 Connecting the field bus interfaces (optional)



Information on commissioning the field bus interfaces can be found in the Reference Handbook.

## 5.5.1 Overview of Modbus RTU and Profibus DP



1	Field bus interface (connection printed circuit board) for <b>Profibus DP</b> .	4	Field bus interface (connection printed circuit board) for <b>Modbus RTU</b> .
2	Profibus DP terminals.	(5)	Modbus RTU terminals.
3	DIL switch for matching resistors. Switches (1 and 2) must be <b>ON</b> .	6	DIL switch for matching resistors. Switches (1 and 2) must be <b>ON</b> .

## 5.5.2 Connecting the Modbus RTU or Profibus DP

The terminals on the Profibus DP or Modbus RTU	U module are assigned as follows:
--	-----------------------------------

TERMINALS	MODBUS / PROFIBUS	FUNCTIONAL DESCRIPTION
11 늪	Ground IN	Connection for cable shielding
12 A	RS 485-A IN	Data connection
13 B	RS 485-B IN	Data connection
14 늪	Ground OUT	Connection for cable shielding
15 A	RS 485-A OUT	Data connection
16 B	RS 485-B OUT	Data connection

## 5.5.3 Overview of Profinet IO

- To connect to the Profinet IO, the Profinet IO module must be integrated in the Oil-Guard 2 W.
- The module has an internal switch and provides two Ethernet ports.
- The cable is connected directly to the RJ45 plug of the Profinet IO module inside the instrument or via external M12 connectors.

When connecting directly to the RJ45 plug, please note that only plugs with a short and flat design can be used.

- In the **Digi.interf.\General** menu, the **Modul type** must be set to **Profinet IO**.
- In the Digi.interf.\Profinet menu, the station name, MAC address and connection status are shown. Moreover, it can be defined here whether the data should only be read or be read and written.



Figure 7: Overview of the Profinet IO module

1	Field bus interface for Profinet IO (connection print)	2	Connector to the AQ2Basi print
3	Ethernet port 1	4	Ethernet port 2

## 5.5.4 Overview of HART



Information on commissioning the field bus interfaces can be found in the Reference Handbook.



Figure8: Position of the HART module in the SICON (M)



# 5.5.5 Connecting to HART

The terminals of the HART module are configured as follows:

Terminals	HART	Functional description
1	mA+ In	Must be connected with terminal 13 (mA 1+) of SICON (M).
2	mA- In	Must be connected with terminal 12 (mA 1-) of SICON (M).
3	Shield	Cable shielding.
4	mA+ Out	Current output 1 (+) with HART.
5	mA- Out	Current output 1 (-) with HART.

The loop resistance on current output 1 can be between 230 and 500 Ohm for HART communication.

# 5.6 Connecting the analog modules (optional)

## 5.6.1 Overview of 4-way current output

The configuration of the current outputs is described in the Section 8.2.



*Figure 9: Overview of the 4-way current output module* 



## 5.6.2 Connecting the 4-way current output

The terminals of the 4-way current output are configured as follows:

Terminals	4-way current output	Functional description
1	mA 5 -	Current output 5
2	mA 5 +	
3	mA 6 -	Current output 6
4	mA 6 +	
5	mA 7 -	Current output 7
6	mA 7 +	
7	mA 8 -	Current output 8
8	mA 8 +	

The burden on the current outputs can be a maximum of 500 Ohm.

# 6 Commissioning

The initial start-up of the web user interface via the Ethernet interface is described in the Reference Manual. If malfunctions occur, consult the Section 10.

Proceed with the initial start-up in accordance with the following table:

2	5 C

	WORKSTEP	ADDITIONAL INFO / IMAGES
1.	Remove the optics unit on the photometer ac- cording to Section 9.1.1 and fasten on the dock- ing station.	Warning! UV radiation. Use UV goggles and gloves.
2.	Check the sampling system for the correct sample feed and then open the sample feed. Section 4.4	Flooding of the measur- ing instrument due to im- proper mounting of the out- let hose: The outlet hose must be fas- tened so that the holes on the side are not covered (flood pro- tection).
3.	Check the flow rate and ensure that the light trap and shutter are clean. There must be no pressure surge when turning the water off and on!	Section 9.1.2
4.	Make sure that the OilGuard 2 W is correctly mounted and that the electrical connections are correctly connected.	Section 4/ Section 5
5.	Place the optics unit back on the measuring cell unit and lock with the four mounting clips. Pay attention to the guide pins (see figure).	

	WORKSTEP	ADDITIONAL INFO / IMAGES
6.	<b>Establish the service voltage to the system.</b> 6.1: Establish the service voltage to the instrument. The welcome screen appears on the display. The factory setting language is English. Accordingly, the displayed language during the initial start-up is English.	Welcome
	6.2: The instrument carries out an internal func- tional check.	Function control: Parameter: UserBackupOta: ExpertBackupOta: DisplayBackupOta: RTC: RTC: RTC: Controller: OK Touch-Controller: OK Touch-Controller: OK
	6.3: The instrument is ready for measurement.	16.05.2018 10:52:57 Logar D.227 C1 EPA-PAH ug/I Menu Valu Info Diag
7.	Set the operating language.	Section 8.1
8.	Set the current outputs.	Section 8.2
9.	Set the limits.	Section 8.3
10.	Set outputs 1/2 (relay outputs).	Section 8.4
11.	Set the date and time.	Section 8.5
12.	Enter the access code.	Section 8.6
13.	Copy the configured data to the microSD card.	Section 8.7
# 7 Operation

### 7.1 Operation basics

In this document we describe the practical examples only for the first steps of the menu configuration. All other setting options are described in the Reference Handbook. Operation using the web user interface is described in detail in the Reference Manual.



The instrument has a touchscreen. It is operated by touching with your finger. The navigation elements change color when touched.



#### Sensitive touchscreen.

The touch screen can be damaged through improper handling. Damage can be avoided with the following measures:

- Touch the touchscreen only with your fingers and not with sharp objects.
- Use only slight pressure to perform manipulations on the touchscreen.
- Do not use chemicals or solvents to clean the touchscreen.

### 7.2 Control elements in measuring operation

Ð	16.05.2018 10:52:57	Logge IP 1	r 192.168.3.100
Me	0.27 nu Valu Info Diag	C1 E ug/I	PA-PAH
5		5	) 6)
Figure	10: Control elements in measuring operation		
1	<b>Menu</b> button Calls up the menu structure. Sec- tion 7.3	2	<b>Valu</b> button Numerical representation of the meas- uring values. Section 7.4
3	<b>Info</b> button Displays the information screen. Section 7.5	4	<b>Diag</b> button Graphical representation of the meas- uring values. Section 7.6
5	<b>Up arrow</b> Goes to the previous page.	6	<b>Down arrow</b> Goes to the next page.

#### 7.3 Menu button

Pressing the **Menu** button and entering the access code takes you to the menu structure. Now the instrument is in service operation. Operator prompting in service operation is described in Section 7.11.

### 7.4 Valu button

Pressing the **Valu** button displays the measuring values in numerical form. This is described in detail in Section 7.8.

### 7.5 Info button

When you press the **Info** button, a general overview of the instrument settings appears. These are described below:

#### 7.5.1 Info button, screen 1



#### Page 2, Info button 7.5.2





### 7.6 Diag button

When you press the **Diag** button, a diagram appears which graphically shows the measuring values over a certain period of time.





### 7.7 Functions of the log screen (Log button)

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1
```

The screen logger works independently of the data logger, which is set in the **Logger** menu and writes to the microSD card.

The screen logger records the data of the last 32 days in one-minute intervals. The data can be called up from the Log menu.

If the instrument is out of operation for more than 32 days, the logger data is restarted. An hourglass is shown for about 1.5 minutes in the graphic display. During this time, no logger data is available.

The **Log** button is found only in the main menu in the graphic screen; in the **Valu** screen, the **Diag** button has to be pressed first. When the **Log** button is pressed, the following screen appears:





Figure 14: Functions of the Log display

	The cursor shows the time position which is represented at pos. 4. The cursor position can be changed ei- ther by briefly touching with your fingertip or by pressing the buttons.	2	Represented time period The following time ranges can be set: 3 min./15 min./1 hour/ 3 hours/9 hours/1 day/3 days/10 days/ 32 days
$\odot$	The red bar indicates how much of the total time period is currently represented.	4	Measuring value which was measured at the cursor position.
5	<ul> <li>/&gt;: Moves the cursor position. The cursor moves faster when these buttons a held down longer.</li> <li>&lt;&gt;: Jumps forward or backward by the time period set in point 2.</li> <li>-/+: Increases (+) or decreases (-) the screen section around the cursor position</li> </ul>		time period set in point 2. een section around the cursor position.



In the **Display/General** menu, you can define whether minimum, maximum or mean values are to be displayed.  $\rightarrow$  Reference Manual Pressing the Diag button takes you to the graphical representation.

### 7.8 Displays in measuring operation



Figure 15: Displays in measuring operation

1	Measuring For values the maxim measuring stead, ***	value(s) which are greater than um measuring range, no value is displayed; in- * is displayed.	2	Status line In measuring operation, the status line is green and shows the date and time. If faults should occur, warning and fault messages are shown here and the status line changes to orange or red.
3	Interface in Top le Top rig Profine Below The fo possib - IP no not co - IP DF - IP 16 (exam	nformation ft: Logger status ght: Modbus, HART, et or Profibus status : Ethernet IP status illowing messages are le: ot connected (cable onnected) HCP running i9.254.1.1 ple address)	4	Channel name with unit The channel names shown in the figure are examples and can be adjust- ed individually.
	Color codi	ng:		
	Black	Not active / not present		
	Blue	Activated, in quiescent mode		
	Green	Active		
	Red	Fault		

### 7.9 Lock / unlock the touch screen



	MANIPU	JLATION	
1.	Press the	e lock icon top left.	© 130 7014 15:28:01 0.81 P 192168.3115 0.81 E/n 2.9 H2 400conp Hazen 1.47 C1 254nn E/n 3.6 C2 400nn E/n Menu Valu Info Diag
2.	Within o outside n Dependi changes	ne second press the key bottom at the ight. ng on the initial state, the lock icon as follows: Touch screen unlocked Touch screen locked	<b>13.02.2014</b> 15:24:38 <b>0.81 11.254conp D.81 12.9 H2 400conp H2 400conp H2 400conp H3.02 1.47 C1 254rm 3.6 C2 400nn Menu Valu Info Diag</b>

## 7.10 Switching to service mode

The system is configured in service operation. The measuring procedure is interrupted and the main menus appear on the display. Service operation is accessed as follows:

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	MANIPULATION	ADDITIONAL INFO / IMAGES
1.	Press the <b>Menu</b> button.	
2.	Set the access code and confirm with <b>OK</b> .	<b>I</b> Factory setting is <b>0</b> .
3.	The main menus appear.	The instrument is now in service op- eration.

The following applies in service operation:

- \* The measuring values remain on the last values on the digital interfaces.
- \* Depending on the configuration, the current outputs go to 0/4 mA or remain on the last measuring values.
- The limits are deactivated.
- If an output for service is programmed, it is activated.
- Fault messages are suppressed.

\* This does not apply when the **Current outputs\General\For service** parameter is set to **Measure**.



For measuring operation, press the **Meas** button. When switching from service operation to measuring operation, an hourglass appears in the information bar for about 10 seconds. The measuring values are frozen during this time.

### 7.11 Control components in service mode

### 7.11.1 Input elements in service mode

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L		
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1)(	Menu	<u>1/2</u> - 2
	Recalibration	Configuration
3	Simulation	Meas. channels
3)-	Digi. interf.	Spec. function
	Logger	Meas. info
5	Meas Menu ES	

Figure 16: Input elements in service mode

1	Path specification	2	Page number / total number of pages
3	Main menus Instrument-specific menus of the photometer.	4	Next page
5	Meas button: The instrument changes to measuring Menu button: The display goes back to mean menu ESC button: The display goes back one level in the finally is reached.	g opera is and i ne men	ation. remains in service mode. u hierarchy until the measuring mode

### 7.11.2 Numerical entry

The following screen is for entering numbers and data:





Figure 17: Numerical entry

$\bigcirc$	Parameter name	2	Entered values
3	Prefix: For entering very large or very small values. This can be done as follows: 1. Enter value 2. Select SI prefix Function: $\mathbf{n} = 10^{-9}$ , $\mathbf{u} = 10^{-6}$ , $\mathbf{m} = 10^{-3}$ , $\mathbf{k} = 10^{3}$ , $\mathbf{M} = 10^{6}$ , $\mathbf{G} = 10^{9}$	4	Numerical entry
5	<ul> <li>←: Deletes one digit of the displayed value.</li> <li>C: Clears the displayed value.</li> <li>ESC: Touching the ESC field causes the display to go back one level in the menu hierarchy. The entered value is not saved.</li> <li>OK: Confirm entered value.</li> </ul>	6	If the value entry is too high or too low, a white arrow appears in a red field top right. Arrow points upward: Entry too high Arrow points downward: Entry too low

### 7.11.3 Single selection of functions



The single selection is identifiable by the **ESC** button below right.

The currently selected function is green. Use the Up/Down arrows to navigate the options in long lists. Use the **ESC** button to cancel the entry.

Pressing a selection item saves the configuration and completes the entry.

anguage		
	Deutsch	
	English	
	Francais	
	Espanol	
	Nederlands	ESC

Figure 18: Example of single selection

#### 7.11.4 Multiple selection of functions



The multiple selection is identifiable by the  $\mathbf{OK}$  button bottom right:

The currently selected values are green. Use the Up/Down arrows to navigate the options in long lists. Pressing a selection item changes the active status of the corresponding item. Press the **OK** button to save the configuration and complete the entry.

MenuALogger		
	Active	
	Name	
	Fault	
	Inner temp.	
	LED temp.	ОК

Figure 19: Example of multiple selection

# 8 Settings

## 8.1 Setting the operating language



	MANIPULATION	ADDITIONAL INFO / IMAGES
1.	Press the <b>Menu</b> button.	
2.	Set the access code and confirm with <b>OK</b> .	Factory setting is <b>0</b> .
3.	Press the <b>Configuration</b> button to access language selection.	If the desired menu does not appear, press the arrow bottom right.
4.	Press language field (circle). The list of all lan- guages appears (factory setting is English).	Menu/Configuration     Local 1/3       Language     English       Mandatory oper.     900 s       Access code     0       Disp. contrast     8       Meas     Menu       ESC     V
5.	Apply the desired language by pressing the corresponding field, or press the <b>ESC</b> button to cancel.	Language Deutsch English Francais Espanol Nederlands ESC
6.	Press the <b>Meas</b> button.	The instrument is in measuring op- eration again.

## 8.2 Setting the current outputs



	MANIPULATION	ADDITIONAL INFO / IMAGES
1.	Press the <b>Menu</b> button.	
2.	Set the access code and confirm with <b>OK</b> .	Factory setting is <b>0</b> .
3.	Press the <b>Curr. outputs</b> button.	If the desired menu does not appear, press the arrow at the bottom right.
4.	Select between <b>C1 n</b> .	
5.	Select the <b>source</b> .	<ul> <li>The following selection is available:</li> <li>C1 (measuring channel)</li> <li>A1 n (analog channels)</li> </ul>
6.	Select the <b>Range</b> .	MR1 MR8, In 1, In 2, Auto 1, Auto 2 $\rightarrow$ Reference Manual
7.	Press the <b>Meas</b> button.	The instrument is in measuring op- eration again.

### 8.3 Setting the limits

The limits have to be configured accordingly so that they are not only displayed, but that the outputs are also switched. Section 8.4



	MANIPULATION	ADDITIONAL INFO / IMAGES
1.	Press the <b>Menu</b> button.	
2.	Set the access code and confirm with <b>OK</b> .	Factory setting is <b>0</b> .
3.	Press the <b>Limits</b> button.	If the desired menu does not appear, press the arrow at the bottom right.
4.	Select between <b>L1 n</b> .	
5.	Select the <b>Source</b> .	<ul> <li>The following selection is available (when present):</li> <li>C1 (measuring channel)</li> <li>A1 n (analog channels)</li> </ul>
6.	Define the <b>Mode</b> .	<ul> <li>The following selection is available:</li> <li>Inactive (limit monitoring of this channel is deactivated).</li> <li>Exceeded (limit active when the set threshold value is exceeded).</li> <li>Undershot. (limit active when the set threshold value is undershot).</li> </ul>
7.	Define the upper limit, lower limit, cut-in delay and cut-out delay with the number pad.	Pressing the current number value takes you to the entry mode.
8.	Press the <b>Meas</b> button.	The instrument is in measuring op- eration again.

#### 8.3.1 Upper and lower threshold value of a limit

A mai lower	ximum of eight limits with upper and threshold values can be programmed.	Ð	$\wedge$ .
If the then ceede until t dersh	operating mode is set to <b>Exceeded</b> , while the upper threshold value is ex- ed the limit is active and remains active the lower threshold value is again un- ot.		2
If the then dersh until t ceede	operating mode is set to <b>Undershot</b> , while the lower threshold value is un- ot the limit is active and remains active the upper threshold value is again ex- ed.	Figure .	4 6 5 6 6 20: Diagram of limit exceeded
1	Measuring value	2	Upper threshold value
3	Lower threshold value	4	Time
5	Limit active	6	Limit passive

#### 8.3.2 Reading if limit exceeded or undershot



If a limit event occurs during operation, it has the following effects on measuring operation:

- Threshold value display indicates an unusual state.
- If an output for the corresponding limit channel is programmed, it is switched.

If the message **Limit** appears, the color of the status display changes to **white** and the numbers of the limit channels are listed with their channel numbers in **red** if limits have been exceeded or undershot. Inactive limits are indicated with "\_".



## 8.4 Setting the outputs (digital)

Outputs 1/2 are located on the AQ2Basi print near the customer connection terminals and are designated as relays 1 and 2.

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	MANIPULATION	ADDITIONAL INFO / IMAGES
1.	Press the <b>Menu</b> button.	
2.	Set the access code and confirm with <b>OK</b> .	Factory setting is <b>0</b> .
3.	Press the <b>Inp./outputs</b> button.	If the desired menu does not appear, press the arrow at the bottom right.
4.	Press the <b>Outputs</b> button.	
5.	Select the <b>O1 Inactive O Inactive</b> output.	
6.	Activate the outputs (multiple selection possible).	Activated outputs are highlighted green.  Invert: Inverts the outputs.  Prio fault  Fault  Warning  Service  Adjustment  Limit 1 n  The other buttons named MR- Out are for automatic measuring range switching → Reference Man- ual.
7.	Press the <b>Meas</b> button.	The instrument is back in measuring operation.

## 8.5 Setting the date and time

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L		2		
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				18. s

	MANIPULATION	ADDITIONAL INFO / IMAGES
1.	Press the <b>Menu</b> button.	
2.	Set the access code and confirm with <b>OK</b> .	Factory setting is <b>0</b> .
3.	Press the <b>Configuration</b> button.	If the desired menu does not appear, press the arrow bottom right.
4.	To enter the time, press the currently displayed time at the <b>Time</b> menu item and enter the new time with the number pad. Confirm entry with <b>OK</b> .	The time must be entered in the format hh:mm:ss. Menu/Configuration 2/3 Disp. brightness 64 Date 09/11/2017 Time 13:08:38 Clock corr. week 0.0 s Meas Menu ESC A T
5.	To enter the date, press the currently displayed date at the <b>Date</b> menu item and enter the new date with the number pad. Confirm entry with <b>OK</b> .	The date must be entered in the format selected under the Date format menu item. Menu/Configuration 2/3 Disp. brightness 64 09/11/2017 Time 13:08:38 Clock corr. week 0.0 s Meas Menu ESC
6.	Press the <b>Meas</b> button.	The instrument is in measuring op- eration again.

## 8.6 Setting or changing the access code

You can protect the settings of the instrument against unauthorized manipulations by defining your own access code.

6		1)		
l	C	2		
U			0	
L			62	

	MANIPULATION	<b>ADDITIONAL INFO / IMAGES</b>
1.	Press the <b>Menu</b> button.	
2.	Set the access code and confirm with <b>OK</b> .	Factory setting is <b>0</b> .
3.	Press the <b>Configuration</b> button.	If the desired menu does not appear, press the arrow bottom right.
4.	Press the button to the right of the <b>Access</b> <b>code</b> description text.	
5.	Enter the access code and confirm with <b>OK</b> .	
6.	Press the <b>Meas</b> button.	The instrument is in measuring op- eration again.



A forgotten access code can be cleared only by a SIGRIST service engineer.

Enter your personal access code here:

ere:			

### 8.7 Backup configured data

These measures can be of use to the service engineers for service purposes.

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	C	

	MANIPULATION	ADDITIONAL INFO / IMAGES
1.	Press the <b>Menu</b> button.	
2.	Set the access code and confirm with <b>OK</b> .	Factory setting is <b>0</b> .
З.	Press the <b>System info.</b> button.	If the desired menu does not appear, press the arrow bottom right.
4.	In the <b>User -&gt; SD</b> and <b>Expert -&gt; SD</b> submenus press the <b>Copy</b> function.	The user and expert data are copied to the microSD card. After a suc- cessfully completed procedure, acknowledge with the <b>OK</b> button.
5.	Press the <b>Meas</b> button.	The instrument is in measuring op- eration again.

# 9 Servicing

## 9.1 Servicing schedule for OilGuard 2 W

WHEN	WHO	WHAT	PURPOSE
Monthly or as needed	Operator	Checking the flow rate and cleanliness. Section 9.1.2	Obligatory measure for main- taining measuring accuracy.
Every three months or as needed	Operator	Performing adjustment. Section 9.1.3 / Section 9.1.4	Obligatory measure for main- taining measuring accuracy.
		Cleaning parts which come into contact with water. Section 9.1.5	
Annually or as needed	Operator	Replacing the air filter. Section 9.1.6	Obligatory measure for main- taining functional efficiency.
Every 3 years or as needed	Service technician	Replacing the UV- lightsource	Obligatory measure for main- taining functional efficiency.
Every 10 years or as needed	Operator	Replacing the battery. Section 9.1.7	Obligatory measure for main- taining functional efficiency.

Table 1: Servicing schedule for OilGuard 2 W

#### 9.1.1 Fastening the optics unit to the docking station



#### Danger due to UV radiation

Exposure of longer than 3 seconds can lead to permanent damage to the eyes and skin.

- The UV LED is only accessible when the housing is open. The OilGuard 2 W is equipped with an automatic cut-off device that puts the LED out of operation when the housing is open.
- Switch off the OilGuard 2 W when carrying out servicing duties, or wear UV goggles and gloves.





Figure 21: Optics unit fastened to docking station

1	Measuring cell unit	2	Optics unit
3	Docking station	4	Knurled screw for fastening the op- tics unit

Figure 4

X

Figure 3

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K	5	75	•
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	WORKSTEP	ADDITIONAL IN	FO / IMAGES
1.	Open the mounting clips (circle in figure be- low) as follows:	1/	4
	Use a little force to push the red safety catch in the direction of the arrow (figure 1) and at		
	the same time lift the mounting clip (figure 2). Press the mounting clip in the direction of the	Figure 1	Figure 2
	arrow over the lock plate of the optics unit (figure 3) and then open (figure 4).		

The optics unit is mounted on the docking station as follows:

Position of the mounting clips

area (dark colored area).

Remove the optics unit (Figure 21, pos. 2) from the measuring cell unit (Figure 21, pos. 1) and position it on the docking station (Figure 21, pos. 3). Pay attention to the milled

Fasten the optics unit in place on the docking

station with the knurled screw (X).

2.

#### 9.1.2 Checking the flow rate and cleanliness

The following procedure describes how the flow rate is checked:

		WORKSTEP	ADDITIONAL INFO / IMAGES
PC	1.	Remove the optics unit on the photometer according to Section 9.1.1 and fasten on the docking station.	Danger due to UV radia- tion. Use UV goggles and gloves.
	2.	Check the flow rate of the sample according to the technical data. Section 2.4	
	3.	Check the water jet.	incorrect!Uneven water jet after water stop
	Normal jet, reflections are visible in the water jet.	Normal jet, reflections are visible in the water jet.	incorrect!Too much waterWith large air bubbles
	4.	Check the light trap in the measuring cell for residual water (circle). Remove any residues with a cloth.	

	WORKSTEP	ADDITIONAL INFO / IMAGES
5.	Check the shutter assembly for residual water (circle). Remove any residues with a cloth.	
6.	Place the optics unit back on the measuring cell unit and lock with the four mounting clips. Pay attention to the guide pins (see figu- re).	

### 9.1.3 Manual adjustment

The following procedure describes how manual adjustment is made with an OilGuard 2 W.



	WORKSTEP	ADDITIONAL INFO / IMAGES
1.	Interrupt the sample supply to the photome- ter.	
2.	Loosen the conduit gland (X) and remove the inlet pipe (Y).	AquaScat
3.	Remove the optics unit on the photometer according to Section 9.1.1 and fasten on the docking station.	<b>Danger UV radiation.</b> Use UV goggles and gloves.
4.	Inspect the checking unit to ensure it is clean.	The checking unit must have the same temperature as the in- strument. If the checking unit is stored in another room, let the unit acclimatize to the conditions.
5.	Mount the checking unit and fasten with the knurled screws. Make sure that the pins enter the positioning holes (arrows).	

	WORKSTEP	ADDITIONAL INFO / IMAGES
6.	Place the optics unit back on the measuring cell unit and lock with the four mounting clips. Pay attention to the guide pins (see figu- re).	
7.	Switch the photometer to service operation.	Section 7.10
8.	Press the <b>Recalibration</b> button and then the <b>C1 EPA-PAH</b> menu.	
9.	Check whether the saved nominal value matches the information on the checking unit.	
10.	<ul> <li>Carry out the adjustment as follows:</li> <li>Press the initiate button and wait.</li> <li>If the adjustment was successful, this is confirmed with Adjustment OK. This completes the adjustment.</li> <li>If the adjustment was not successful, it is indicated with Adjust. fault. In this case, check the points in the following list one after the other:</li> <li>Cleanliness of the checking unit?</li> <li>Correct checking unit used?</li> <li>Nominal value corresponds to the value of the checking unit?</li> <li>Large temperature difference between the OilGuard 2 W and the checking unit.</li> <li>Soiled optics in the instrument? In this case, contact customer service.</li> </ul>	If the check could not be successfully completed, contact your country representative. Sec- tion 11
11.	Remove the checking unit from the photome- ter again.	
12.	Reattach the inlet pipe (see step 2) and as- semble the instrument in reverse order.	
13.	The instrument can now be operated again.	



A new recalibration factor is determined during the adjustment. The deviation from the original state is displayed under **Curr. corr.** 

#### 9.1.4 Automatic adjustment with OilGuard 2 W A



Automatic adjustment is only possible with the instrument type OilGuard 2 W A. The automatic adjustment can also be set for time actuation in the **Adjust interval** menu. This is described in the Reference Manual.

The following procedure describes how manual triggering of an adjustment is made with an OilGuard 2 W A:



	WORKSTEP	ADDITIONAL INFO / IMAGES
1.	Switch the photometer to service operation.	Section 7.10
2.	Press the <b>Recalibration</b> button and then <b>C1</b> <b>EPA-PAH</b> .	
3.	Carry out the adjustment as follows: Press the <b>initiate</b> button. This starts the ad- justment. If the adjustment was successful, this is con- firmed with <b>Adjustment OK</b> . This completes the adjustment. If the calibration check was <b>not</b> successful, it is indicated with <b>Adjust. fault</b> . A possible cause of this is soiled optics in the instrument.	If the check could not be successfully completed, contact your country representative (Section 11).



A new recalibration factor is determined during the adjustment. The deviation from the original state is displayed under **Curr. corr.** 

#### 9.1.5 Cleaning parts which come into contact with water

The following describes cleaning the parts of the OilGuard 2 W that come into contact with water:

110	6	
T	5	2
/	-	5

	WORKSTEP	ADDITIONAL INFO / IMAGES
1.	Interrupt the sample supply to the photome- ter.	Section 4.4
2.	Remove the inlet and outlet from the pho- tometer.	
3.	Remove the optics unit on the photometer according to Section 9.1.1 and fasten on the docking station.	Danger UV radiation. Use UV goggles and gloves.
4.	Loosen the conduit gland (A) and remove the inlet pipe (B).	
5.	Remove the outlet cone (C) by pulling it up- wards.	



	WORKSTEP	ADDITIONAL INFO / IMAGES
6.	Loosen the conduit gland (D) and remove the outlet pipe (E) by pulling it downwards.	
7.	Clean the removed parts or replace if neces- sary. When doing so, also inspect the seal in the outlet cone (arrow).	
8.	Insert the outlet pipe into the conduit gland up to the stop and fasten loosely in place. The outlet pipe should protrude approx. 20 mm into the measuring cell unit.	20 mm
9.	Put the outlet cone (C) onto the outlet pipe (E) up to the stop. When doing so, hold the outlet pipe from below. Now press the outlet cone together with the outlet pipe downward up to the stop.	



	WORKSTEP	ADDITIONAL INFO / IMAGES
10.	Fasten this unit by tightening the conduit gland. At position X, there should now be no space between the outlet cone and the conduit gland!	
11.	Insert the inlet pipe (B) from above into the conduit gland (A) up to the stop.	B
12.	Tighten the inlet pipe (B) with the conduit gland (A). The inlet pipe should protrude 5 mm out of the holder.	5 mm
13	Place the optics unit back on the measuring cell unit and lock with the four mounting clips. Pay attention to the guide pins (see figure).	

### 9.1.6 Replacing the air filter

The following describes the replacement of the air filter:



	WORKSTEP	ADDITIONAL INFO / IMAGES
1.	Interrupt the sample feed to the photometer.	Section 4.4
2.	Interrupt the service voltage to the photome- ter.	Section 5
3.	Remove the optics unit on the photometer according to Section 9.1.1 and fasten on the docking station.	<b>Danger UV radiation.</b> Use UV goggles and gloves.
4.	Remove the two screws (arrows), then the fil- ter cover (B) and filter (A).	
5.	Insert the new filter (A) in the housing and fasten the filter cover (B) in place with the two screws (D) and washers (C). A: Filter B: Filter cover C: Washer D: Screw	B B C D C D
6.	Place the optics unit back on the measuring cell unit and lock with the four mounting clips. Pay attention to the guide pins (see figure).	

### 9.1.7 Replacing the battery



#### Danger due to electrical shock that may result in serious bodily injury or death.

External signal lines may carry life threatening voltage even if the voltage supply to the instrument is disconnected. Before opening the instrument, make sure that no connected lines are charged with voltage.

The following describes the replacement of the battery:



	WORKSTEP	ADDITIONAL INFO / IMAGES
1.	Interrupt the service voltage to the photome- ter.	Section 5
2.	Loosen the five screws (circles) with a 7 mm key and remove the cover.	
3.	Remove the old battery and replace with a new one (circle). The battery is built into the cover on the connection print (AQ2Conn).	



	WORKSTEP	<b>ADDITIONAL INFO / IMAGES</b>
4.	Carefully mount the cover and fasten with the five screws.	0
	Damage to the threaded inserts in the housing due to excessive tightening of the screws on the cover:	
	Use a hex key without a T-handle to tighten the screws of the cover finger-tight (tighten- ing torque 1 Nm).	7 mm hex key
5.	Put the instrument into operation again.	
6.	Set the date and time as described in Section 8.5.	

# 10 Troubleshooting

## **10.1 Pinpointing malfunctions**

DETECTABLE MALFUNCTION	ACTION
No reading	<ul> <li>Check whether the supply voltage is present.</li> </ul>
Error message in the display	<ul> <li>Analyze the error message. Section 10.2 to Section 10.4</li> </ul>
The reading is wrong	<ul> <li>Ensure that the sample to be measured corresponds to the operating conditions. Section 2.4</li> </ul>
	<ul> <li>Perform adjustment. Section 9.1.3</li> </ul>
	<ul> <li>Check whether the photometer and the associated peripherals are correctly mounted. Section 4</li> </ul>
	<ul> <li>Ensure that the servicing duties have been performed according to the servicing schedule. Section 9</li> </ul>

Table 2: Pinpointing malfunctions



If the listed measures do not result in the desired results, please consult with customer service. Section  $11\,$ 

### **10.2** Warning messages and effect on operation

Warnings indicate an unusual state.

WARNINGS	
If a warning occurs during operation, it has the follow- ing effects:	WARNING HUMIDITY
<ul> <li>The system continues to operate. However, the measuring results must be evaluated with caution. The cause of the warning message should be rem- edied at the next possible opportunity.</li> </ul>	0.308 C1 Turb
<ul> <li>When the cause of the warning has been reme- died, it is automatically deleted.</li> </ul>	
<ul> <li>When the Warning message occurs, the color of the status display changes to orange and the warning text describes the warning in question.</li> </ul>	Example: WARNING HUMIDITY

The following warning messages can be displayed:

WARNING MESSAGE	DESCRIPTION	POSSIBLE CAUSES
VIN	The input voltage is outside the permitted range (24 VDC ± 10%).	<ul> <li>The service voltage is faulty.</li> </ul>
ADJUST FAULT	Recalibration could not be carried out.	<ul> <li>The instrument is soiled.</li> <li>The nominal value for the adjustment does not match the value of the medium or the checking unit.</li> </ul>
CURRENT 1 8	Current output 1 8 is dis- turbed.	<ul><li>Terminals are open.</li><li>Interruption of the current loop of the measuring value output.</li></ul>
VENTILATOR	The fan does not reach its nominal speed.	Fan is defective.
WATCHDOG	The internal fault monitoring has been actuated. The program has been re- started.	<ul> <li>Program crash.</li> </ul>
SERVICE	Shows when service work is due.	
VERS.SD CARD	The data on the microSD card does not match the current software.	

Table 3: Possible warning messages
# **10.3** Fault messages and effect on operation

#### FAULT If a fault occurs during operation, it has the following FAULT SERIAL 1 192.168.3.111 effects: • A fault is a malfunction which prevents correct measurement value acquisition. 0.00 C1 Turb The measuring values of the concerned photome-ter go to **0**. Assigned current outputs go to the programmed electrical current If fault. Menu Valu Info Diag Assigned limits are deactivated. . Example: FAULT SERIAL 1 When the **Fault** message appears, the color of the status display changes to red and the text de-1 When the cause of the fault scribes the fault in question. has been remedied, it is automati-If an output for faults is programmed, it is . cally deleted. activated.

The following fault messages can be displayed:

FAULT MESSAGE	DESCRIPTION	POSSIBLE CAUSES
V ANALOG	One of the internal analog voltages is outside the permitted range.	<ul> <li>Defect in the electronic system.</li> <li>→ Service technician</li> </ul>
MEASUR.FAULT	Measuring value acquisition is faulty.	<ul> <li>Bubbles in the water.</li> <li>External light in the vicinity of the measuring point (e.g. transparent hoses).</li> <li>Defect in the electronic system. → Service technician</li> </ul>
AN.MEAS.FAULT	The measuring value acquisi- tion of the analog channels is disturbed.	<ul> <li>Defect in the electronic system.</li> <li>→ Service technician</li> </ul>
LIGHTSOURCE 1	The detector for monitoring the light source receives no light from the corresponding light source.	<ul> <li>Defective light source.</li> <li>→ Service technician</li> </ul>
ANALOG IN 1/2	The input signal on analog in- put 1 is less than the fault limit.	<ul> <li>There is no input signal.</li> </ul>
POWER LINK	Actuation of the extended in- puts/outputs via the Powerlink is disturbed.	<ul> <li>Interrupted connection to the extended inputs/outputs.</li> </ul>
IO PORT	The connection between the NG_Haupt and AQ2Basi print has been disturbed.	<ul><li>Cable disconnected.</li><li>Plug connection defective.</li></ul>

Table 4: Possible fault messages

# 10.4 Prioritized fault messages and their effect on operation



When there is a prioritized fault, the cause of the malfunction is serious.



#### **PRIO (PRIORITIZED FAULT)**

If a prioritized fault occurs during operation, it has the PRIO DEFAULT VALUES following effects: The measuring values go to 0. . Prioritized faults can be cleared only by a service engineer.

When the **Prio** message occurs, the color of the status display changes to red and the text describes the prioritized fault in question.



The following prioritized fault messages can be displayed:

PRIO MESSAGE	DESCRIPTION	POSSIBLE CAUSES	
DEFAULT VALUES	The default values were loaded.	<ul> <li>If no parameters were initial- ized or if all parameters were lost, the default values are loaded.</li> </ul>	
CRC EXPERTS	A fault was determined when the expert data was checked.	<ul><li>Electromagnetic malfunctions.</li><li>Defect in the electronic system.</li></ul>	
CRC USER	A fault was determined when the user data was checked.	<ul><li>Electromagnetic malfunctions.</li><li>Defect in the electronic system.</li></ul>	
CRC DISPLAY	A fault was determined when the display data was checked.	<ul><li>Electromagnetic malfunctions.</li><li>Defect in the electronic system.</li></ul>	
EXT RAM	A fault was determined when the RAM in the graphic con- troller was checked.	<ul> <li>Defect in the electronic system.</li> </ul>	
SW VERS	Software which is unsuitable for this instrument type was loaded.	<ul> <li>Faulty software update.</li> <li>→ Service technician</li> </ul>	

Table 5: Possible prioritized fault messages

# 10.5 Replacing the fine-wire fuses

The following describes the replacement of the fine-wire fuse on the AQ2Basi print:

		1	
X	5	1	2
1		-	5

	WORKSTEP	ADDITIONAL INFO / IMAGES
1.	Interrupt the service voltage to the photome- ter.	Section 5
2.	Loosen the five screws (circles) with a 7 mm key and remove the cover.	
3.	Remove the old fine-wire fuse (circle) from the motherboard (AQBasi) and replace with a new one (type T2A).	
4.	Carefully mount the cover and fasten with the five screws.	0
	Damage to the threaded inserts in the housing due to excessive tightening of the screws on the cover: Use a hex key without a T-handle to tighten the screws of the cover finger-tight (tighten- ing torque 1 Nm).	7 mm hex key
5.	Put the instrument into operation again.	

# **11** Customer service information

Should you have any questions, please contact the responsible service center in your country or region. If this is not known, SIGRIST-PHOTOMETER AG customer service in Switzerland would be glad to provide you with a contact address.

A current list of all SIGRIST country representatives is available online at <u>www.photometer.com</u>.

Please have the following information ready when you contact a SIGRIST service point or customer service:

- The serial number of the OilGuard 2 W.
- A description of instrument behavior and the work steps when the problem occurred.
- A description of what you did when trying to solve the problem yourself.
- The documentation of the third-party products you use in conjunction with the OilGuard 2 W.
- Description of operation conditions (place, power supply, measured medium, temperature etc.)
- Application and Instruction Manual.

# 12 Decommissioning/Storage

# 12.1 Decommissioning the OilGuard 2 W

The aim of decommissioning is to prepare the individual components of the system properly for storage.



	WORKSTEP	ADDITIONAL INFO / IMAGES
1.	Interrupt the service voltage to the OilGuard 2 W and remove the electrical connections.	Life-threatening voltage in- side the instrument. Connecting the electrical lines is extremely dangerous. Parts of the system can also be damaged. Lo- cal regulations for electrical instal- lations must be observed at all times.
2.	Interrupt the sample feed to the OilGuard 2 W and remove the inlet and outlet hose.	
3.	All surfaces which come into contact with the sample must be thoroughly cleaned.	
4.	Remove the OilGuard 2 W from the measuring point.	
5.	Make sure that all covers are closed and all locks on the OilGuard 2 W are locked.	

# 12.2 Storing the components

There are no special requirements for storing the instruments. However, please note the following information:

- The system contains electronic components. Storage for such components must fulfill the usual conditions. It is important to note that the storage temperature must be between -20 and +50 °C.
- All components that come into contact with the medium during operation have to be dry and clean for a long time before being put into storage.
- The measuring equipment with all of the accessory parts must be protected against weather factors, condensing humidity and aggressive gases during storage.

# 13 Packaging/Transport/Returning



#### Injuries to persons due to hazardous media residues in the returned instrument.

Instruments that have come into contact with hazardous media may not be sent without the appropriate information on the corresponding repairs or professional decontamination (see RMA form).

• Precise information on the medium must be received by SIGRIST-PHOTOMETER in advance of the instrument to be repaired so that the necessary precautions can be taken when unpacking it.

The original packaging materials should be used for packaging the OilGuard 2 W if possible. If the original packaging is no longer available, note the following information:

- Before packaging, close the openings of the instrument with adhesive tape or plugs so that no packaging materials can enter the instrument.
- The instrument contains optical and electronic components. Make sure that the packaging protects the instrument from being damaged by impacts during transport.
- All peripheral devices and accessory parts must be packaged separately and marked with the serial number of the photometer (Section 2.2). This prevents confusion and mix-ups later while also making it easier to identify parts.
- A RMA form (14711E) must be filled in and enclosed for all returned instruments and spare parts. This can be downloaded at <u>www.photometer.com</u>.

When packaged as described above, the instruments can be transported via all usual shipping methods.

# 14 Disposal



Disposal of the system and its peripheral devices is to be carried out in compliance with regional statutory regulations.

The system has no environmentally damaging sources of radiation. The materials listed below should be disposed of or recycled as described in the following table:

CATEGORY	MATERIALS	DISPOSAL POSSIBILITIES
Packaging	Cardboard, wood, paper	Reuse as packaging material, local disposal center, incinera- tion plants
	Protective foils, polystyrene shells	Reuse as packaging material, recycling
Electronics	Circuit boards, electromechanical components, display, touchscreen, transformer and cables	To be disposed of as electronic waste
Parts which come	PVC	Local disposal center
into contact with water	Stainless steel	Waste metal disposal centers
Optics	Glass, aluminum	Recycling via centers for recy- cling glass and waste metal
Filter and lens hol- der	Aluminum	Waste metal disposal center
Battery	Lithium	Recycling via locally organized collection point
Housing	ABS	Local disposal center

Table 6: Materials and their disposal

# 15 Spare parts list

# **15.1** Spare parts for the OilGuard 2 W

The parts mentioned in this documentation and their article numbers are listed in the following table:

Article number	Name	Remarks
116627	Air filter	Section 9.1.6
116468	Inlet pipe, stainless steel 1.4435	Section 9.1.5
116833	Inlet pipe, PVC	Section 9.1.5
121297	Bent inlet tube for OilGuard 2 W with wall mounting set	Section 9.1.5
117988	Outlet pipe with flood protection, complete	Section 9.1.5
117442	Fuse, microfuse 250 V 2 AT RM5	Section 10.5
111834	Battery 3V CR 2032 (button battery)	Section 9.1.7

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