

Instruction Manual

AquaScat 2 P



Turbidimeter with closed flow cell

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Glossary – terms used in this document

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

1. General notes to the user

1.1. Purpose of the Instruction Manual

This Instruction Manual provides the user with helpful information about the entire life cycle of the photometer and control unit. Please read through it completely before putting the instrument into operation.

1.2. Target group

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

1.3. Additional documentation

DOC. NO.	TITLE	CONTENT
11841E	Brief Instructions	The most important functions and complete menu structure.
11780E	Reference Manual	More sophisticated menu functions and worksteps for advanced users.
11880E	Data sheet	Descriptions and technical data about the photometer.
11840E	Service Manual	Repair and conversion instructions for service engineers.
11888DEF	AquaScat 2 P declaration of conformity	Compliance with the underlying directives and standards.
10718DEF	Declaration of conformity SP-C039 (mains device)	Declaration of conformity SP-C039 (mains device).

1.4. Copyright stipulations

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

1.5. Storage location of the Instruction Manual

The Instruction Manual is a component of the product and should always be close at hand. The most recent version (in color) of the Reference Manual can be downloaded at www.photometer.com (one-time registration). It can also be ordered from our representative in your country. → Section 10

1.6. Meaning of the safety symbols

Below is an explanation of all **danger symbols** that occur in this Instruction Manual.



DANGER!

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

Non-observance of this danger warning may lead to electrical shocks or death.



**EXPLOSION
HAZARD!**

Danger due to explosion that may result in serious bodily injury or death.

Non-observance of this notice may cause explosions resulting in serious material damage and death.



WARNING!

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.



CAUTION!

Notice about possible material damage.

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

1.7. Meaning of the safety pictograms

Below is an explanation of all **pictograms** that occur in this Instruction Manual.



Additional information about the current topic.



Practical procedures when working on the photometer.



Manipulations on the touchscreen.



Work on the PC.

1.8. Proper use

The AquaScat 2 P is designed for measuring turbidity during water treatment and is optimized for the values that occur in water treatment plants with regard to measurement span and environmental conditions.

1.9. User requirements

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

1.10. Conformity

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



The system meets the requirements applicable within the European Union (EU) for electromagnetic compatibility (EMC) and low voltage directives (LVD) and has the CE mark.

Please refer to the separate declaration of conformity for details (document 11888DEF).

1.11. Use restrictions



Explosion hazard during operation in an inappropriate environment.

- 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 can cause injuries to persons, process-related consequential damage and damage to the photometer 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.
- The instrument is not installed 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.

2. Instrument overview

2.1. Measuring station with optional accessory parts

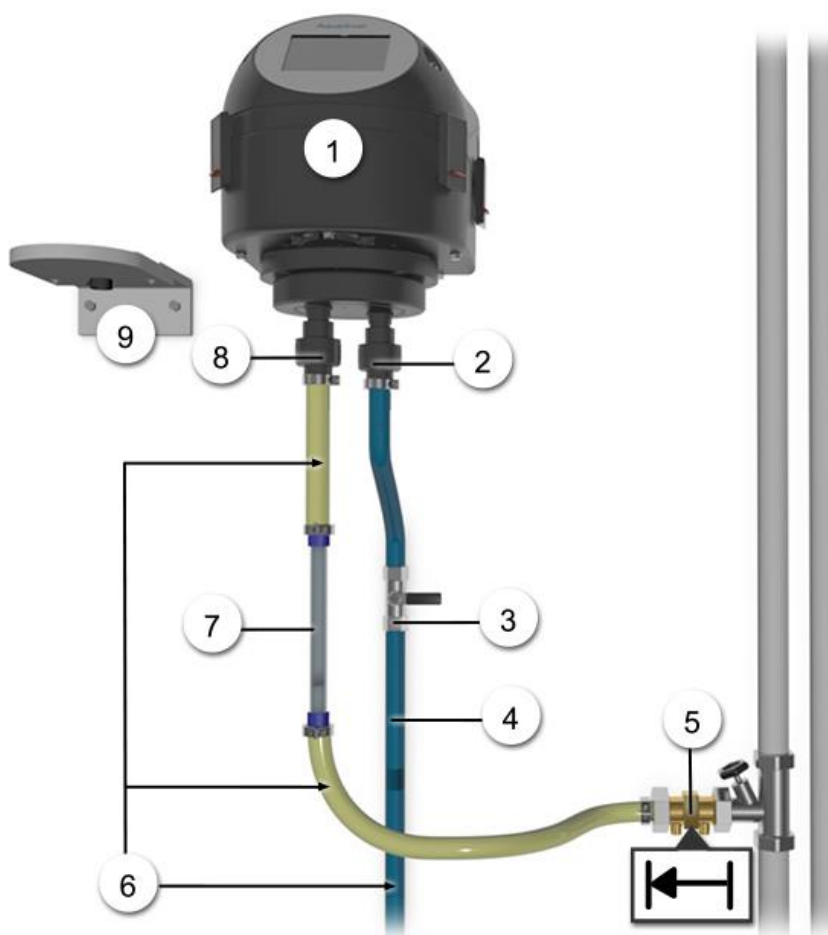



Figure 1: Measuring station with optional accessory parts

①	Photometer with closed measuring cell → Section 2.3 / 2.4	②	Sample outlet → Section 4.4
③	Flow regulator (customer side)	④	Drain hose (customer supply)
⑤	Non-return valve type  (customer supply and according to EN 13959)	⑥	Connection hoses (customer supply and according to EN 13618 or EN 61770)
⑦	Flow meter with/without limit switch (optional)	⑧	Sample inlet → Section 4.4
⑨	Docking station → Section 8.2		

2.2. Designation of the AquaScat 2 P

The photometer is fitted with a rating plate:

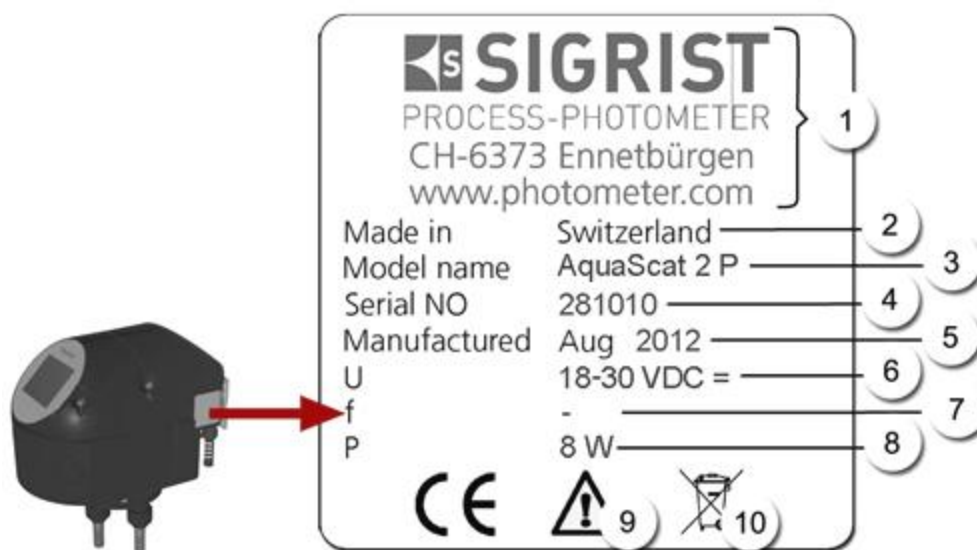



Figure 2: Rating plate on the AquaScat 2 P


①	Manufacturer	②	Country of origin
③	Product name	④	Serial number
⑤	Date of manufacture	⑥	Service voltage
⑦	Frequency range	⑧	Power
⑨	Observe the Instruction Manual	⑩	Disposal information → Section 13

2.3. Scope of supply and accessory parts

Scope of supply



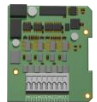

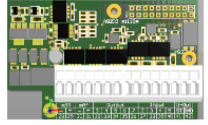

PCS.	ART. NO.	NAME	VIEW	VARIANT
1	118995	AquaScat 2 P 24 VDC		Photometer incl. docking station

Documentation

PCS.	ART. NO.	NAME	VIEW	VARIANT
1		Instruction Manual		German 11838D
				English 11838E
				French 11838F
1		Reference Manual		German 11780D
				English 11780E
1		Brief Instructions		German 11841D
				English 11841E
				French 11841F

Optional accessory parts

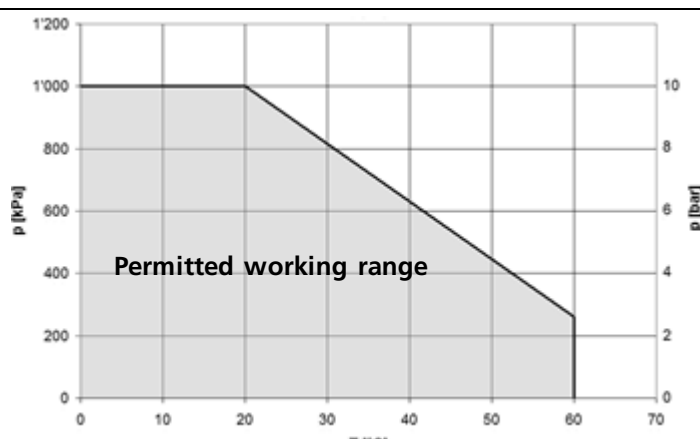
PCS.	ART. NO.	NAME	VIEW	VARIANT
1	120159	Flow meter (with connections D=16 mm)	→ Section 2.1	
1	120161	Flow meter with limit switch (Connections D = 16 mm)	→ Section 2.1	
1	120160	Flow meter with flow regulator (connections D=16mm)	→ Section 2.1	
1	120162	Flow meter with limit switch and flow regulator (connections D=16mm)	→ Section 2.1	
1	119466	Flow regulator with connections D=16mm	→ Section 2.1	
1	116706	Checking unit for AquaScat 2 P	→ Section 8.5	

PCS.	ART. NO.	NAME	VIEW	VARIANT
1	119102	Profibus DP bus coupler → Reference Manual		
1	119103	Modbus RTU bus coupler → Reference Manual		
1	119041	Module for 4 x current outputs		
1	119045	24 VDC mains device 20 W IP66, input 100-240 VAC		
1	119082	I/O module		
1	119081	Ethernet cable for fixed installation IP66		

2.4. Technical data

TURBIDITY MEASUREMENT	VALUES
Measuring principle	Scattered light measurement
Measurement span	0 .. 100 FNU
Sample media	Water
Wavelength	880 nm, compliant with DIN EN ISO 7027
Radiation class	LED device of Class 1 according to EN 60825-1
Measuring angle	90°

AQUASCAT 2 P	VALUES
Resolution	0.001 FNU
Reproducibility	0-10 FNU: ± 0.002 FNU, or $\pm 1\%$ full scale 10-100 FNU: $\pm 1.5\%$
Repeatability	0.001 FNU or $\pm 0.1\%$ full scale
Service voltage	18-30 VDC
Power consumption	8 W
Curr. outputs	2 x 0/4 .. 20 mA, galvanically isolated to max. 50 V relative to ground, max. 600 Ω burden
Digital input	Contact
Analog inputs	2 x 0/4 .. 20 mA
Relay contacts	2 relay contacts 250 V, 4 A
Control unit	Integrated control unit
Measuring ranges	8 ranges between 0 .. 0.1 and 0 .. 100 FNU freely configurable
Housing	Plastic (ABS)
Dimensions	For detailed dimension sheet see Section 15
Weight	Approx. 3.6 kg
Protection degree	IP65
Maximum operating altitude	3,000 m above sea level for instruments which are not operated with low voltage (mains, relays).
Ambient temperature	0 .. 50°C
Ambient humidity	0 .. 95% rel. humidity, non-condensing
Interface	Ethernet, SD card (for logging, SW update, diagnostics) Modbus TCP, optional Modbus RTU, Profibus DP
Terminal size for signal cable	Cable holder for \varnothing of 0.08 mm ² to 1.5 mm ²
Display	¼ VGA with touchscreen Resolution: 320 x 240 pixels with 3.5" diagonal

MEASURING CELL	VALUES
Material	POM/PVC
Sample flow	0.2 .. 2 l/min.
Connections	Hose supports: \varnothing 16 mm GF System: Outer threads G3/4"
Sample pressure / temperature	 <p>The graph illustrates the permitted working range for the measuring cell. The shaded area represents the safe operating region. The pressure is constant at 1000 MPa (10 bar) for temperatures up to 20°C. Beyond 20°C, the pressure must be reduced linearly to 250 MPa (2.5 bar) at 60°C. No operation is permitted above 60°C.</p>

3. General safety pointers

3.1. What to do in an emergency



CAUTION!

What to do in an emergency:

SIGRIST-PHOTOMETER AG instruments have no On/Off switch. This is the responsibility of the customer. Before commissioning, clarify the following points:

- Clarify the position of the On/Off switch and the way it works.
- Where and how the sample supply can be stopped.
- Who the responsible authorities are.

PROCEDURE IN AN EMERGENCY!

	MEASURE	NOTES
1.	Interrupt the service voltage to the measuring station.	
2.	Interrupt sample supply.	
3.	Secure emergency site.	
4.	Notify responsible institution.	

3.2. Dangers when using properly



DANGER!

Electrical shock due to damaged instrument or cabling.

- 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.



DANGER!

Life threatening voltage inside the instrument.

- The instrument must never be operated when the front cover is removed.
- The instrument may be opened only by trained personnel.



WARNING!

Damage due to incorrect service voltage.

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



CAUTION!

Property damage due to escaping sample.

The instrument must never be connected to leaking sample tubes and operated.

**CAUTION!****Damage to the touchscreen due to strong mechanical pressure.**

- Do not apply excessive pressure to the touchscreen (touch lightly with your fingertip).
- Do not use pointed objects for manipulations on the touchscreen.

**CAUTION!****Use of aggressive chemicals.**

- Do not use aggressive chemicals or cleaning agents when cleaning.
- Thoroughly clean the instrument with a neutral cleaning agent if it has come into contact with aggressive chemicals.

**CAUTION!****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 www.photometer.com.



According to the risk assessment of the applied safety directive DIN EN 61010-1, there remains the risk of a faulty measuring value display. This risk can be reduced with the following measures:

- Use a flow meter to monitor the flow rate of the instrument.
- Use an access code to prevent unauthorized persons from changing parameters.
- Perform the specified servicing duties.

3.3. Warning and danger symbols on the instrument

**WARNING!****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.

The following sections must be internalized:

- Section 1.6
- Section 1.8
- Section 3
- Observe local safety pointers when performing the described procedures.

4. Mounting the measuring device

4.1. Location evaluation

A note about selecting the right installation location:

- The sample feed should be as short as possible so that changes in the reading are displayed without delay.
- There should be no vibrations on the mounting surface. Vibrations cause measuring errors and can permanently damage the unit.
- The photometer and peripheral equipment should be easily accessible to facilitate inspection and maintenance work.
- Make sure that the photometer is not exposed to direct sunlight. This may cause significant deviations in the measuring value.

4.2. Mechanical mounting of the photometer

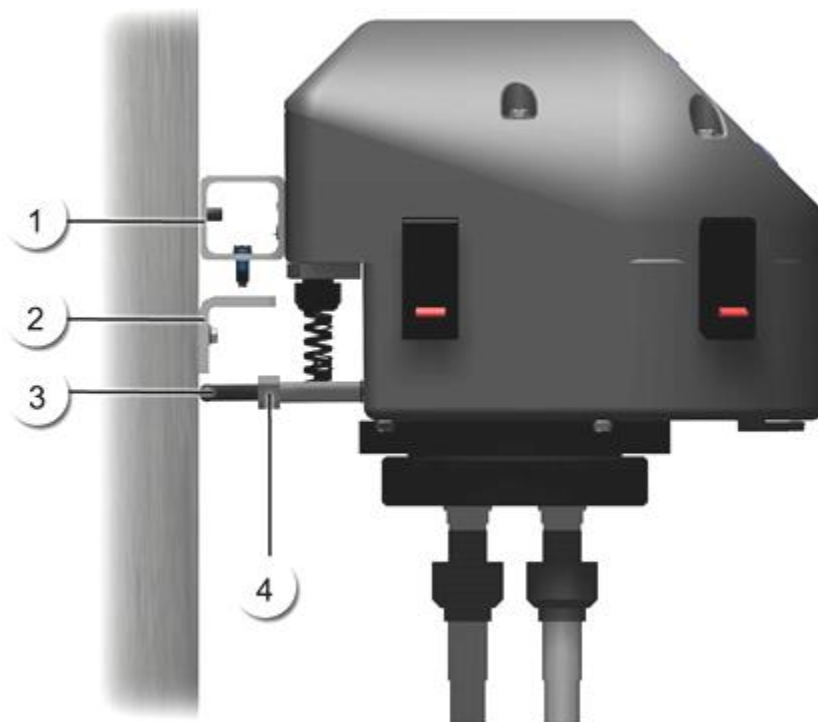



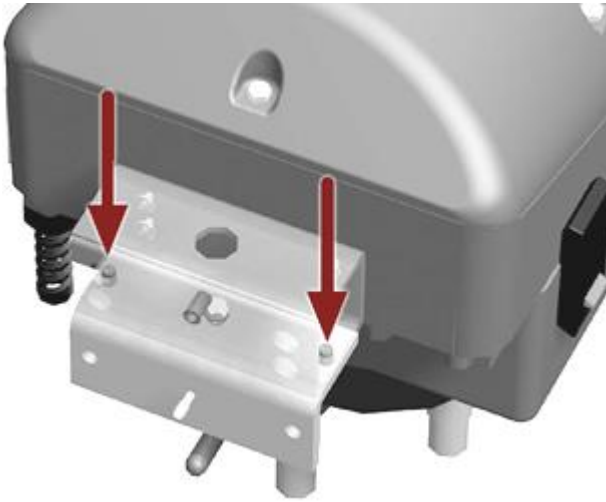
Figure 3: Mounting the AquaScat 2 P

①	Fastening on the photometer	②	Mounting bracket on the wall
③	Support	④	Fixing nut



The dimensional specifications according to the mounting drawings in the Appendix must be observed when mounting the photometer. → Section 15



	WORKSTEP	PROCEDURE
1.	Pre-mounting the mounting bracket.	<p>Screw on the mounting bracket (Figure 3, 2) horizontally at the intended position.</p> 
2.	Fasten the photometer onto the pre-mounted mounting bracket.	<p>2.1: Position the photometer on the pre-mounted mounting bracket (Figure 3, 2) and pay attention to the two positioning pins (arrows, see picture).</p>  <p>2.2: Screw the photometer onto the mounting bracket (Figure 3, 2).</p>
3.	Align the photometer.	<p>3.1: Loosen the fixing nut (Figure 3, 4).</p> <p>3.2: Adjust the support (Figure 3, 3) so that it contacts the wall and relieves the load stress on the instrument (Figure 3, 1).</p> <p>3.3: Tighten the fixing nut (Figure 3, 4).</p>

4.3. Mounting the docking station

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

→ Figure 1, 6

4.4. Mounting the sample connections

4.4.1. Important information when mounting the sample connections



VORSICHT!

Observe the following points when mounting the sample connections:

- Only an non-return valve type EA tested and certified according to EN 13959 must be used.
- Only hoses tested and/or certified according to EN 13618 or EN 61770 must be used.
- All the hoses must be secured with clamping straps. Two weeks after mounting, all the connections must be checked for leakage to avoid any air suction.

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

- A continuous water flow rate as specified in the technical data is required (→ Section 2.4). If the required water flow rate is exceeded or undershot, measuring errors may occur!
- Large drops in the pressure must not occur; if that happens, air bubbles may occur.
- A regulator valve should always be used for adjusting the water flow rate and for generating the counter pressure in the measuring cell on the sample outlet.
- The use of transparent hoses is not permitted.

4.4.2. Attaching the sample connections

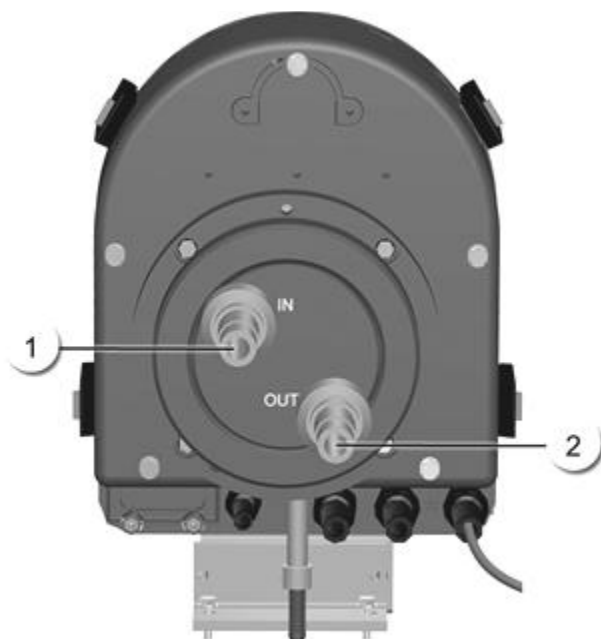


Figure 4: Inlet and outlet of the photometer

①	Sample inlet	②	Sample outlet
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The inlet hose is fastened to the sample inlet (Figure 4, 1) and the drain hose is fastened to the sample outlet (Figure 4, 2).

4.5. Mounting the optional flow meter



Note the following when connecting the optional accessory part:

All hose junctions have to be secured with hose clamps. The sealing of the junctions should be checked about 2 weeks after installation to ensure that no air can be pulled in.

SIGRIST recommends installing a simple flow meter to regularly check the sample flow. → Sections 2.1 and 2.3

Note the following points when mounting the flow meter:

- The flow meter is to be fastened before the sample inlet of the photometer.
- If the required water flow rate is exceeded or undershot, measuring errors may occur! Installing a flow meter with limit contact improves this situation.

5. Electrical installation

5.1. Safety pointers for the installation

**Life threatening voltage inside the instrument:**

Connecting electrical lines is extremely dangerous. Parts of the system can also be damaged. Local regulations must be observed at all times for electrical installations.

Further, the following basic principles must be observed:

- It is imperative that the protective conductor is connected.
- Because the instrument has no main switch, a suitable disconnection device (switch, plug) should be installed near the service voltage. It must be designated and easily accessible.
- The instrument box must not be charged with voltage until the installation is completed and the front cover is mounted.
- On instruments with an optional mains device, 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 unit must be put out of operation and protected against inadvertent operation.






The installation and commissioning of the Modbus RTU and Profibus DP field bus interfaces are described in the Reference Manual.

5.2. Installation procedure

You can access the terminals by removing the front cover. Proceed as follows:



	WORKSTEP	PROCEDURE
1.	Loosen the five screws on the front cover with a size 7 hex key. Remove the front cover.	
2.	Establish the electrical connections as described in Section 5.3.	
3.	<p>When the installation is completed, assemble the photometer in the reverse order. Carefully mount the front cover and fasten with the five screws.</p> <p> Damage to the threaded inserts in the housing due to excessive tightening of the screws when fastening the front cover: Use a hex key without a T-handle to tighten the screws of the front cover finger-tight (approx. tightening torque 1 Nm).</p>	 <i>7 mm hex key</i>



The use of operating signals is described in the Reference Manual. → Section 2

5.3. Connecting the customer connections



DANGER!



Life threatening voltage inside the instrument:

The photometer has no mains switch; hence the instrument is charged with voltage immediately after being connected.

The cable lengths must be selected keeping in mind that the instrument will be mounted on the docking station.

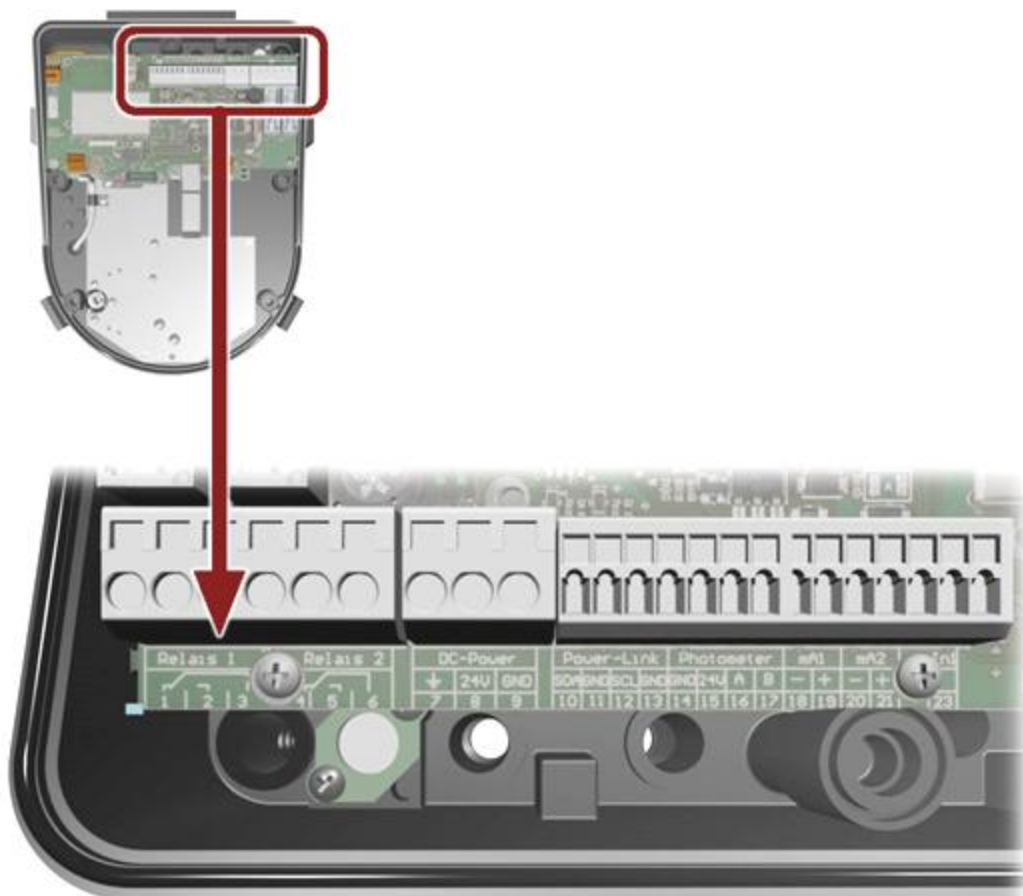



Figure 5: Position of the customer terminals



The three large screwed cable glands are designed for cable with an outer diameter of 4-8 mm, the small screwed cable gland for an outer diameter of 3-6.5 mm.

Establish the electrical connections in the following sequence:



	TERMINALS	MEANING	REMARKS
1.	1 – 2 – 3	Output 1 (relay contact 1)	The relay outputs can be freely configured. → Section 7.11
2.	4 – 5 – 6	Output 2 (relay contact 2)	
3.	18, 19	Current output 1	
4.	20, 21	Current output 2	
5.	22, 23	Connection for optional flow rate monitoring	<p>Use small conduit gland (B).</p>  <p>→ Section 7.10 → Reference Manual</p>
6.	7 – 8 – 9	Power supply 18-30 VDC	Use conduit gland (A) in the middle.

**DANGER!**

5.4. Connection of the optional mains device

Life threatening voltage inside the instrument:

Connecting electrical lines is extremely dangerous. Local regulations for electrical installations must be observed at all times.

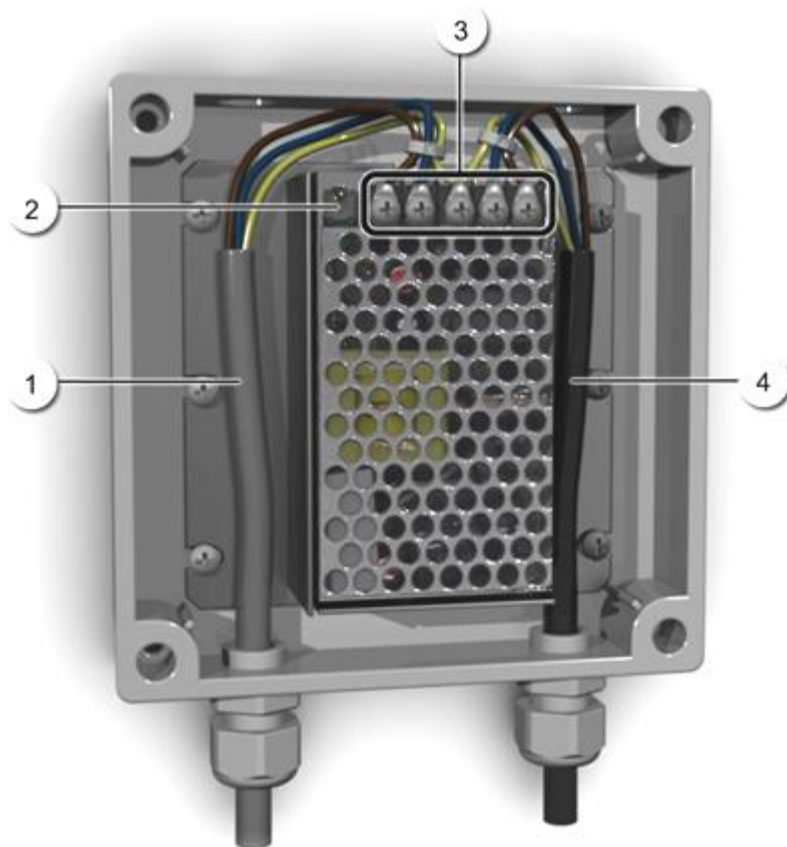


Figure 6: Optional power unit open

①	Cable to photometer (24 VDC)	②	Indicator lamp
③	Terminal screws	④	Cable from mains (100 .. 240 VAC)

**DANGER!**

Life threatening voltage due to released voltage-carrying wires:

The wires of the supply connection must be bound with cable ties so that if one wire becomes loose no other parts can be charged with voltage (Figure 6).



Cable with an outer diameter of 4-8 mm must be used.

Connecting the
mains device:

TERMINAL DESIGNATION IN THE MAINS DEVICE	CABLE COLOR	TERMINAL DESIGNATION IN THE PHOTOMETER	FUNCTION
+24 V	Brown	8: 24V	24 VDC
RTN	Blue	9: GND	Ground
Protective ground	Yellow- green	7: Protective ground	Protective ground
Protective ground			Mains protective ground
N			Mains neutral conductor
L			Mains phase


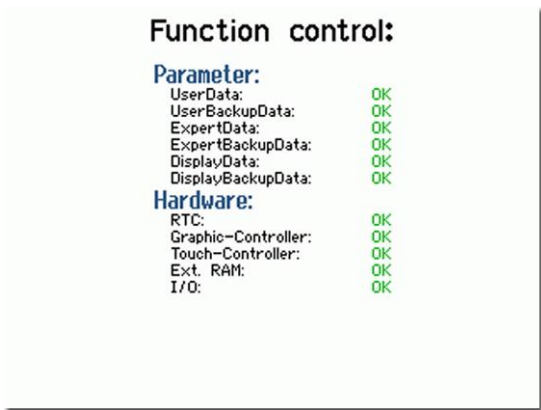
6. Initial start-up




The initial start-up with the web user interface via the Ethernet interface is described in the Reference Manual.

Proceed with the initial start-up in accordance with the following table. If malfunctions occur, please refer to Section 9.



	WORKSTEP	PROCEDURE
1.	Check the sampling system for the correct sample feed and then open the sample feeding.	→ Section 4.4.1
2.	Check the flow rate.	→ Section 2.4
3.	Make sure that the photometer is correctly mounted and that the electrical connections are correctly connected.	→ Section 4.2
4.	Establish service voltage to the photometer.	4.1: Welcome screen appears.
		
		4.2: The instrument carries out an internal functional check.
		

	WORKSTEP	PROCEDURE
		<p>4.3: Measuring operation begins.</p> 
5.	Set language.	→ Section 7.7
6.	Set current outputs.	→ Section 7.8
7.	Set limits.	→ Section 7.9
8.	Configure flow meter if present.	→ Section 7.10
9.	Set outputs 1 & 2 (relay outputs).	→ Section 7.11
10.	Setting the date and time.	→ Section 7.12
11.	Enter access code.	<p>If no access code is required, you can skip this step.</p> <p>→ Section 7.13</p>
12.	Copy the configured data to the microSD card.	→ Section 7.14

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 Manual.
- Operation using the web user interface is described in detail in the Reference Manual.



Damage to the touchscreen caused by incorrect handling:

- 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.



The AquaScat 2 P has a touchscreen. It is operated by touching with your fingers. The navigation elements change color when touched.

7.2. Control components in measuring operation



Figure 7: Control components in measuring operation

①	Menu button Available menu structure. → Section 7.2.1	②	Valu button Numerical representation of the measuring value. → Section 7.2.4
③	Info button General overview of the settings and configurations of the instrument. → Section 7.2.5	④	Diag button Graphic representation of the measuring value. → Section 7.2.2

7.2.1. Menu button

You reach the menu structure by pressing the **Menu** button and entering the access code. Now the instrument is in service operation.

Operator prompting in service operation is described in Section 7.6.

7.2.2. Diag button

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

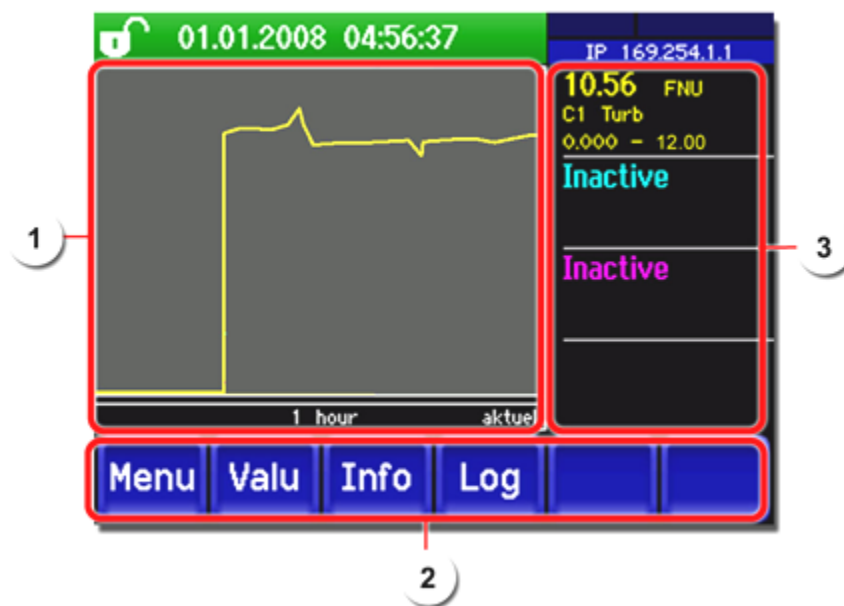


Figure 8: Graphic representation of the measuring values

<p>① Graphic representation of the measuring values</p> <p>The measuring values can be recorded from 3 minutes to 32 days and are graphically represented. The color of the measuring value curves corresponds to the measuring channels on the right side of the reading (position 3).</p>	<p>② Main menu buttons → Section 7.2</p> <p>1 The logger functions (Log button) are described in Section 7.2.3.</p>
<p>③ Measuring channel:</p> <p>Numerical representation of the measuring channel.</p> <ul style="list-style-type: none"> ■ Currently measured measuring value (e.g. 10.56 FNU) ■ Measuring channel with name (e.g. C1 Turb) ■ Scaling of the Y-axis (e.g. 0.000 – 12.00) 	

7.2.3. Functions of the log screen (Log button)



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 hour glass is shown for about 1.5 minutes in the graphic display. During this time no logger data is available.

The **Log** button is in the graphic screen only after the **Diag** button has been pressed. When the **Log** button is pressed, the following screen appears:



Figure 9: Functions of the Log display

①	Cursor shows the time position which is represented at pos. 4. The cursor position can be changed either by briefly touching with your fingertip or by pressing the </> buttons.	②	Represented time period The following time ranges can be set: 3min./15min./1hr./3hr./9hr./1 day/ 3 days/ 10 days/ 32days
③	Indicates how much of the total time period is currently represented.	④	Measuring value which was measured at the cursor position.
⑤	</>: Moves the cursor position. The cursor moves faster when these buttons are held down longer. <</>>: Jumps forward or backward by the time period set in point 2. -/+ : Increases (+) or decreases (-) the screen section around the cursor position.		



In the **Display/General/Values** menu (→ Reference Manual) you can define whether minimum, maximum or average values are to be displayed.
Pressing the **Diag** button takes you to the graphical representation.

7.2.4. Valu button

By touching the **Valu** field, a numerical measuring value appears on the display.
→ Section 7.4

7.2.5. Info button

When you press the **Info** button, a general overview of the settings and configurations of the photometer appears.

Page 1:

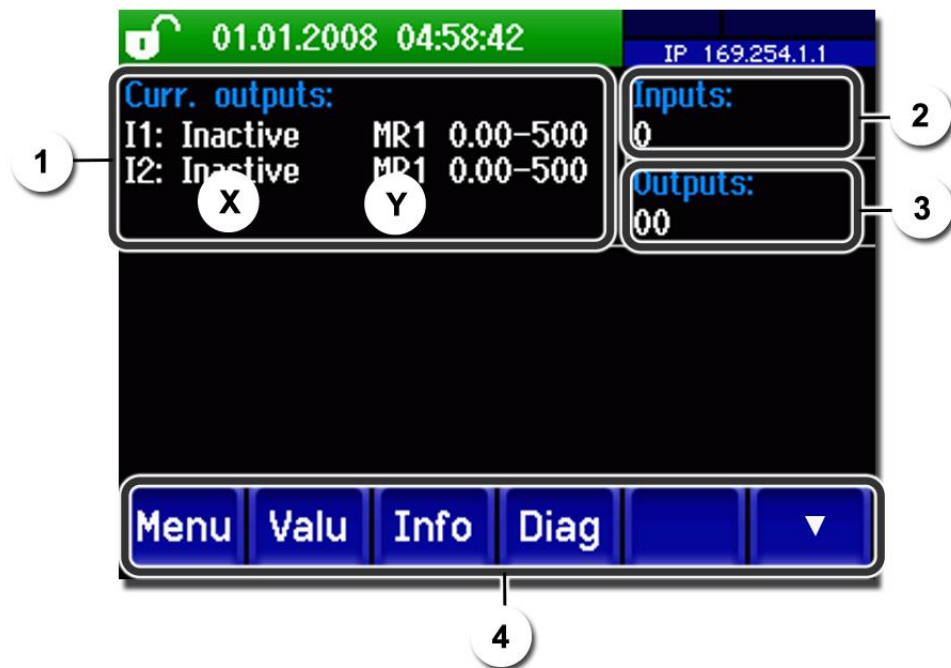


Figure 10: Info menu

①	Information about the current outputs, standard I1 .. I2 X: Source of the current output Y: Measuring range of the current output	②	Status of the inputs → Reference Manual
③	Status of the outputs → Reference Manual	④	Main menu buttons

Page 2:

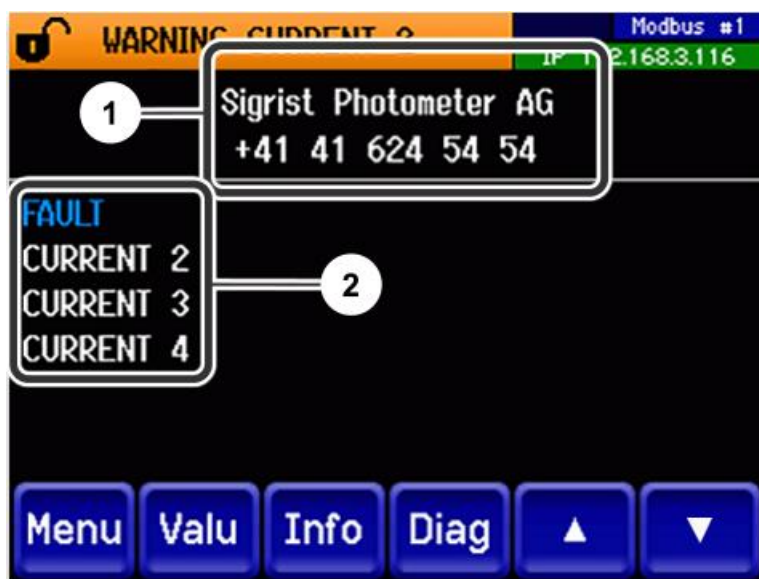


Figure 11: Info screen, page 2

①	Contact information	②	Display of up to 5 pending fault messages
---	---------------------	---	--

7.3. Activating and deactivating the screen lock



1. Press the lock icon top left.



2. Within one second press the button bottom right.



Depending on the initial state, the lock icon changes as follows:



Display unlocked





Display locked

7.4. Display in measuring operation

The instrument is in measuring operation after it is switched on. The current measuring values are continuously displayed.



Figure 12: Displays in measuring operation

①	Measuring value  For values which are greater than the maximum measuring range, no measuring value is displayed but rather **** is displayed.	②	Status line  In measuring operation the status line is green and shows the date and time.
③	Interface information Top left: Logger status Top right: Modbus or Profibus status Below: Ethernet IP status The following messages are possible: <ul style="list-style-type: none"> ■ IP not connected (cable not connected) ■ IP DHCP running... ■ IP 169.254.1.1 (example address) Color coding: Black: Not active / not present Blue: Activated, in quiescent mode Green: Active Red: Fault	④	Channel name with unit

7.5. Switching to service operation

Definition of service operation

The photometer is configured in service operation. The measuring procedure is interrupted and the main menus appear on the display.

Proceed as follows for service operation:



	MANIPULATION	SUPPLEMENTARY INFORMATION
1.	Press the Menu button.	
2.	Set the access code and confirm with OK .	Factory setting is 0 .
3.	The main menus appear.	Now you are in service operation.

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 value.
- The limits are deactivated.
- If an output for service is programmed, it is activated.
- Error messages are suppressed.

* This applies when the **Curr.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 20 seconds. The measuring values are frozen during this time.

7.6. Control components in service operation

7.6.1. Entry element in service operation

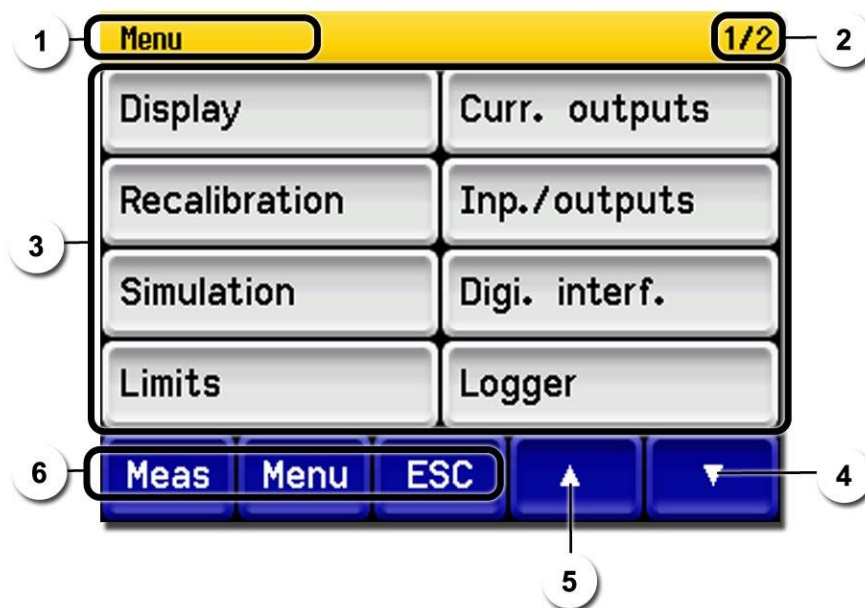


Figure 13: Menu structure

①	Path specification	②	Page number / total number of pages
③	Main menus Instrument-specific menus of the photometer.	④	Next page
⑤	Go to previous page	⑥	Meas button: Touching this button switches the instrument to measuring operation. Menu button: Touching this button displays the topmost level in the menu hierarchy or the instrument goes back one level. ESC button: Touching this button goes back one level in the menu hierarchy until measuring operation will be reached again.

7.6.2. Numerical entry

The following screen is for entering numbers and data:

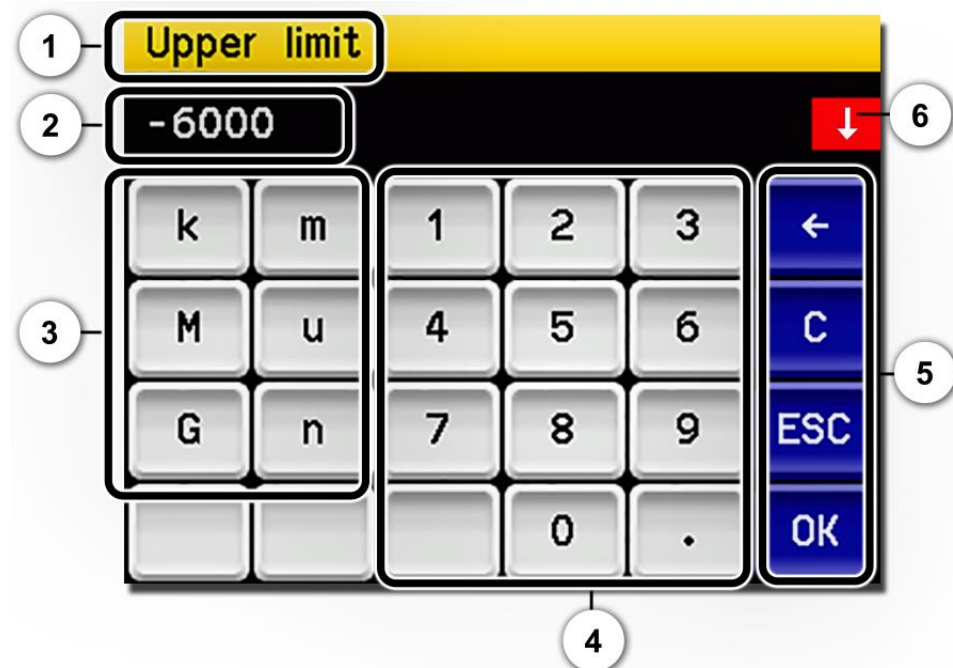


Figure 14: Numerical entry

①	Display of the entered values.	②	SI prefix: For entering very large or very small values. This can be done as follows: 1. Enter value 2. Select SI prefix Function: $n = 10^{-9}$, $u = 10^{-6}$, $m = 10^{-3}$, $k = 10^3$, $M = 10^6$, $G = 10^9$
③	Numerical entry	④	\leftarrow : Deletes one digit of the displayed value. C: Clears the displayed value. ESC: Touching the ESC field causes the display to go back one level in the menu hierarchy. The entered value is not saved. OK: Confirm entered value.
⑤	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		

7.6.3. Single or multiple selection with scroll bar

Single selection

The single selection is identifiable on the **ESC** button below right

The currently selected value 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.



Figure 15: Example of single selection

Multiple selection

The multiple selection is identifiable on the **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 **OK** to save the configuration and complete the entry.





Figure 16: Example of multiple selection

7.7. Setting the operating language

The following describes how to set the language of the menus and messages:



	MANIPULATION	SUPPLEMENTARY INFORMATION
1.	Press the Menu button.	
2.	Set the access code and confirm with OK .	Factory setting is 0 .
3.	Use the down arrow key to select the second page.	
4.	Press the Configuration button to access language selection.	
5.	Press language field (circle). The list of all languages appears (factory setting is English).	
6.	Apply the desired language by pressing the corresponding field. Press ESC to cancel.	
7.	Press the Meas button.	Instrument again in measuring operation.

7.8. Setting the current outputs



	MANIPULATION	SUPPLEMENTARY INFORMATION
1.	Press the Menu button.	
2.	Set the access code and confirm with OK .	Factory setting is 0 .
3.	Press the Curr. outputs button.	
4.	Select current output 1 or 2.	
5.	Select C1 Turb source.	For Inactive the current output is switched off.
6.	Select range.	MR1 .. MR8 (see table below for range definition) In 1, In 2, Auto 1, Auto 2. → Reference Manual
7.	Press the Meas button.	Instrument again in measuring operation.

MEASURING RANGE NO.	MEASURING RANGE DEFAULT	MEASURING RANGE (CUSTOMER SPECIFIC)
1	0 .. 100	
2	0 .. 50.0	
3	0 .. 30.0	
4	0 .. 10.0	
5	0 .. 3.00	
6	0 .. 1.00	
7	0 .. 0.30	
8	0 .. 0.10	

If other measuring ranges are needed, you can re-program the table above as required.
→ Reference Manual

7.9. Setting the limits

So that the limits are not only displayed but also the outputs are switched, they have to be configured accordingly. → Section 7.10



	MANIPULATION	SUPPLEMENTARY INFORMATION
1.	Press the Menu button.	
2.	Set the access code and confirm with OK .	Factory setting is 0 .
3.	Press the Limits button.	
4.	Select limit 1/2.	
5.	Select source.	
6.	Define mode.	<p>The following selection is available:</p> <ul style="list-style-type: none"> ■ Off (limit monitor of this channel is deactivated) ■ Exceeded (limit active when the set threshold value is exceeded) ■ Undershot. (limit active when the set threshold value is under-shot)
7.	<p>Define upper limit, lower limit, cut-in delay and cut-out delay with number pad.</p> <div style="border: 1px solid black; padding: 2px; display: inline-block; text-align: center; width: 20px;">1</div> Pressing the current number value takes you to the entry mode.	
8.	Press the Meas button.	Instrument again in measuring operation.

Upper and lower threshold value of a limit.

A maximum of two limits with upper and lower threshold values can be programmed.

If the operating mode is set to **Exceeded**, then while the upper threshold value is exceeded the limit is active and remains active until the lower threshold value is again undershot.

If the operating mode is set to **Undershot**, then while the lower threshold value is undershot the limit is active and remains active until the upper threshold value is again exceeded.

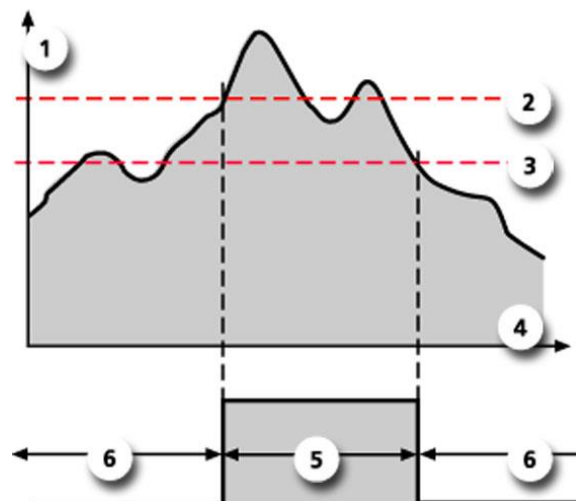


Figure 17: Diagram of exceeded limit

①	Measuring value	②	Upper threshold value
③	Lower threshold value	④	Time
⑤	Limit active	⑥	Limit passive

Reading if limit exceeded or undershot

LIMIT

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 status display changes to **white** and the numbers of the limit channels where a limit has been exceeded or undershot are shown with the corresponding channel numbers in **red**. Inactive limits are indicated by the _ icon.

7.10. Configuring the flow meter

The optional flow meter is connected to terminals 22, 23 (In1). Proceed as follows to activate monitoring:



	MANIPULATION	SUPPLEMENTARY INFORMATION
1.	Press the Menu button.	
2.	Set the access code and confirm with OK .	Factory setting is 0 .
3.	Press the Inp./outputs button.	
4.	Press the Inputs button.	
5.	Select Input 1 .	
6.	Activate input functions External and In-vert.	
7.	Press the OK button.	
8.	Press the General button.	
9.	Under Name ext.in you can enter the text of the error message with a maximum of seven characters (e.g. FLOWRAT).	Prio.ext.in should be on Fault .
10.	Press the Meas button.	Instrument again in measuring operation.

7.11. Setting the outputs (relay outputs 1/2)

Outputs 1/2 are located on the base print of the customer connection terminals and are designated as relays 1/2. → Section 5.3



	MANIPULATION	SUPPLEMENTARY INFORMATION
1.	Press the Menu button.	
2.	Set the access code and confirm with OK .	Factory setting is 0 .
3.	Press the Inp./outputs button.	
4.	Press the Outputs button.	
5.	Select Output 1/2 button.	
6.	Activate output functions (multiple selection possible). When completed press OK .	<p>Activated output functions are highlighted green</p> <ul style="list-style-type: none"> ■ Invert: inverts the outputs ■ Prio fault ■ Fault ■ Warning ■ Service ■ Adjustment ■ Limit 1/2 <p>The functions marked with MR refer to automatic measuring range switching and are described in the Reference Manual.</p>
7.	Press the Meas button.	Instrument again in measuring operation.

7.12. Setting the date and time



	MANIPULATION	SUPPLEMENTARY INFORMATION
1.	Press the Menu button.	
2.	Set the access code and confirm with OK .	Factory setting is 0 .
3.	Use the down arrow key to select the second page.	
4.	Press the Configuration button.	
5.	Press the down arrow key.	
6.	To enter the time, press the currently displayed time at the Time menu item and enter the new time with the number pad. Confirm entry with OK .	The time must be entered in the format hh:mm .
7.	To enter the date, press the currently displayed date at the Date menu item and enter the new date with the number pad. Confirm entry with OK .	The date must be entered in the format DD.MM.YYYY.
8.	Press the Meas button.	Instrument again in measuring operation.

7.13. Setting or changing the access code

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



	MANIPULATION	SUPPLEMENTARY INFORMATION
1.	Press the Menu button.	
2.	Set the access code and confirm with OK .	Factory setting is 0 .
3.	Use the down arrow key to select the second page.	
4.	Press the Configuration button.	
5.	Press button to the right of Access code description text.	
6.	Enter the access code and confirm with OK .	1 .. max. 6 digits
7.	Press the Meas button.	Instrument again in measuring operation.



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

Enter your access code:

--	--	--	--	--	--

7.14. Back up configured data

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



	MANIPULATION	SUPPLEMENTARY INFORMATION
1.	Press the Menu button.	
2.	Set the access code and confirm with OK .	Factory setting is 0 .
3.	Press the down arrow key.	
4.	Press the System info. button.	
5.	In the User -> SD and Expert -> SD submenus, press the copy... function.	The user and expert data are copied to the microSD card. After a successfully completed procedure, the instruments reports with OK .
6.	Press the Meas button.	Instrument again in measuring operation.

8. Servicing



DANGER!

It is absolutely necessary to observe the following instructions when performing servicing duties:

- Observe the safety pointers before performing servicing duties.
- The instrument must never be operated when the housing is removed.
- The instrument may be opened only by trained personnel.
- Perform the worksteps in exactly the order instructed.
- When replacing parts, use only genuine original parts listed in the Spare Parts List.
→ Section 14
- Enter the work in the servicing log. → Section 15
- When returning components, be sure to follow the instructions in the Instruction Manual regarding packaging and transport.
- Do not use aggressive cleaning agents or solvents to remove lime deposits on the instrument.

8.1. Servicing schedule

WHEN	WHO	WHAT	PURPOSE
Annually or if humidity warning.	Operator	Change desiccant → Section 8.4	Obligatory measure for maintaining the measuring accuracy and for protecting the electronics. Interval depends on operating and ambient conditions.
Every three months or as needed	Operator	Manual adjustment → Section 8.5	Measure for maintaining measuring precision.
		Clean the optional accessory parts (e.g. flow meter) → Section 8.6	
As needed	Operator	Clean the closed measuring cell → Section 8.7.	Obligatory measure for maintaining functional efficiency. Interval depends on the sample.
Every 5 years or as needed.	Service technician	Replace gaskets of the measuring cell window.	Maintain sealing. Protect the optics.
Every 10 years or as needed	Service technician	Replace window of the measuring cell.	Maintain measuring accuracy. Protect the optics.
Every 10 years or as needed	Operator	Change battery → Section 8.8	Obligatory measure for maintaining functional efficiency.

Table 1: Servicing schedule.

8.2. Fasten photometer to docking station

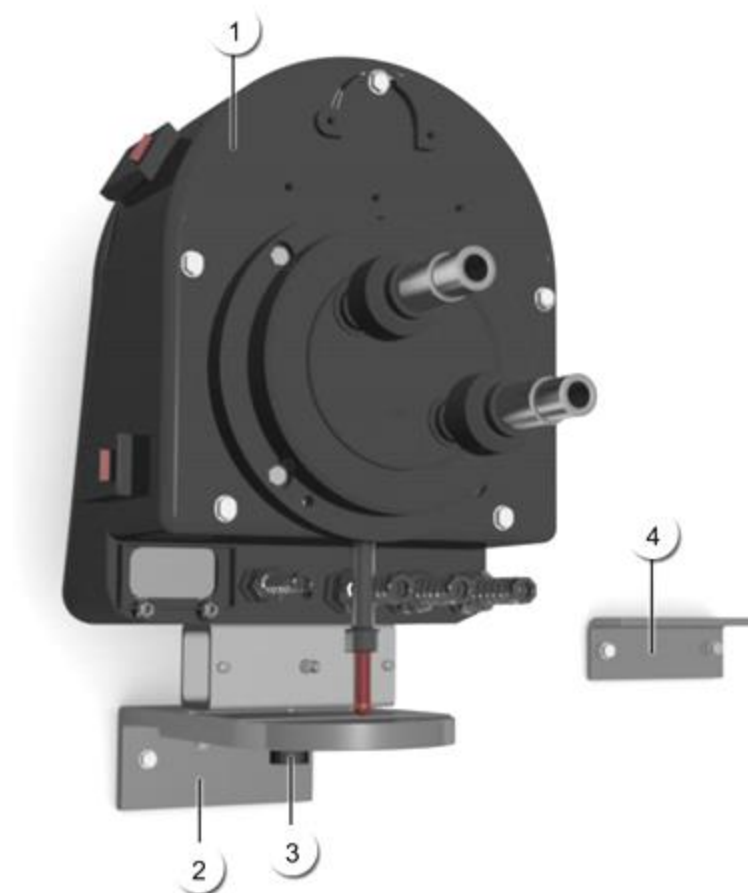



Figure 18: Photometer fastened to docking station



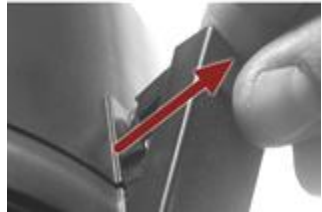


①	Photometer	②	Docking station
③	Knurled screw for fastening the photometer	④	Mounting bracket for photometer in measuring position



	WORKSTEP	PROCEDURE
1.	Interrupt sample supply to the photometer and wait until the measuring cell empties.	
2.	Fasten photometer to the docking station.	<p>2.1: Remove the photometer (Figure 18, 1) from the measuring position and place on the docking station Figure 18, 2). Pay attention to the milled area (dark colored area).</p>  <p>2.2: Fasten the photometer (Figure 18, 1) with knurled screw (Figure 18, 3) to the docking station.</p>

8.3. Remove the measuring cell unit



	WORKSTEP	PROCEDURE
1.	Fasten photometer to the docking station.	→ Section 8.2
2.	Loosen the five fastening screws of the measuring cell unit (circles).	
3.	Loosen mounting clip and remove optics unit	<p>3.1: Use a little force to push the red fuse in the direction of the arrow (picture 1) and at the same time lift the mounting clip (picture 2).</p> <div> <div> <p>Picture 1</p>  </div> <div> <p>Picture 2</p>  </div> </div> <p>3.2: Press mounting clip in the direction of the arrow over the lock plate of the optics unit (picture 3) and then open (picture 4).</p> <div> <div> <p>Picture 3</p>  </div> <div> <p>Picture 4</p>  </div> </div> <p>3.3: Remove optics unit from the measuring cell unit.</p>
4.	Remove measuring cell unit and place on a safe surface.	

8.4. Replace desiccant

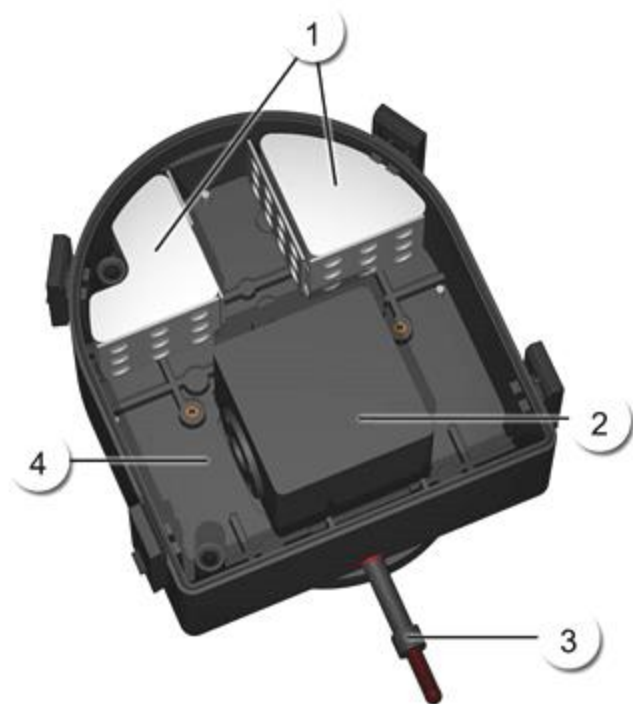
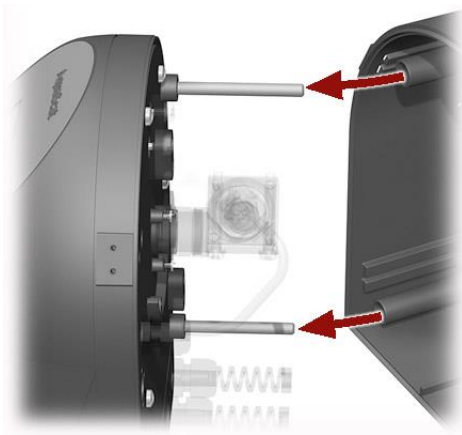



Figure 19: View of the measuring cell element

①	Desiccant (4x)	②	Measuring cell
③	Support	④	Measuring cell plate



	WORKSTEP	PROCEDURE
1.	Interrupt the sample supply to the photometer.	
2.	Remove sample connections and wait until the measuring cell empties.	
3.	Remove measuring cell unit and place on a safe surface.	→ Section 8.3
4.	Remove the old desiccant Figure 19, 1) on both sides and replace with new desiccant. <div>i Two desiccants on each side.</div>	

5.	Re-fasten the measuring cell unit to the optics unit.	<p data-bbox="847 237 1430 338">5.1: Mount the measuring cell unit again on the optics unit and lock with the mounting clips. Pay attention to the guide pins (arrows).</p>  <p data-bbox="847 801 1430 869">5.2: Fasten the measuring cell unit by tightening the five screws (circles).</p> 
6.	The instrument can now be operated again.	

8.5. Manual adjustment




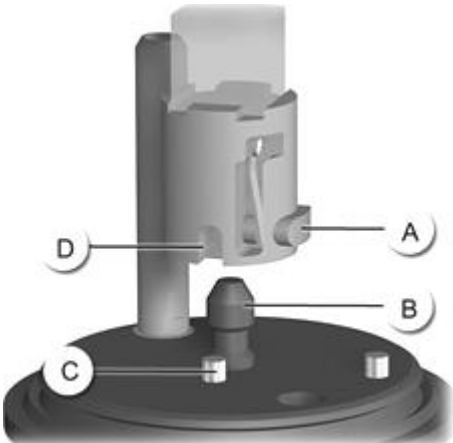
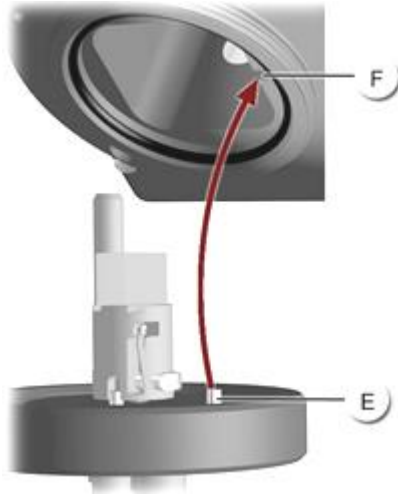
The manual adjustment should be carried out after the measuring cell is cleaned.





The Figure 20 is available in the Appendix to assist you when performing servicing duty.



	WORKSTEP	PROCEDURE
1.	Interrupt the sample supply to the photometer.	
2.	Remove sample connections and wait until the measuring cell empties.	
3.	Insert the checking unit into the measuring cell.	<div>3.1: Loosen the screw cap (Figure 20, 3) and remove the measuring cell plate.</div> <div></div>

	WORKSTEP	PROCEDURE
		<p>3.2: Mount the checking unit (Figure 20, 1) onto the measuring cell plate (Figure 20, 4) as follows.</p> <ol style="list-style-type: none">1. Align the groove (D) to the pin (C).2. Press and hold the release device (A) and guide the checking unit onto the cam (B).3. Release the release device (A). 
		<p>3.3: Re-insert the measuring cell plate (Figure 20, 4) with the mounted checking unit into the measuring cell housing and fasten the with the screw cap (Figure 20, 3).</p> <p>When doing so, ensure that the pin (E) is aligned to the groove (F).</p> 

	WORKSTEP	PROCEDURE
4.	Fill the measuring cell with water.	For turbidity values < 0.5 FNU If the water turbidity is less than 0.5 FNU, establish the sample feed and fill the measuring cell with water.
		For turbidity values > 0.5 FNU If the water turbidity is more than 0.5 FNU, fill the measuring cell with filtered water rather than process water.
5.	Switch photometer to service operation.	→ Section 7.5
6.	Prepare adjustment.	6.1: Press the Recalibration button and then the C1 Turb button.
		6.2: Check whether the saved Nominal value matches the specification on the checking unit.
7.	Perform adjustment.	<p>Press the initiate... button and wait.</p> <p>If the adjustment was successful, the instrument reports with Adjustment OK.</p> <p>If the adjustment was not successful, it is indicated with Adjustment fault. In this case, check the points in the following list one after the other:</p> <ul style="list-style-type: none"> ■ Cleanliness of the checking unit ■ Correct checking unit used. ■ Set point does not correspond to the value of the checking unit. <p> If the check could not be successfully completed, contact your country representative. → Section 10</p>
8.	Remove checking unit.	8.1: Empty the measuring cell.
		8.2: Remove the measuring cell plate (Figure 20, 4) again and disassemble the checking unit (Figure 20, 1) by pressing the release device (A).
		8.3: Insert the measuring cell plate (Figure 20, 4) into the measuring cell and fasten the screw (Figure 20, 3).
		8.4: Clean the checking unit and let it dry.
9.	The instrument can now be operated again.	<p> A new recalibration factor is determined during recalibration. The deviation from the original state is displayed under Curr. corr..</p>

8.6. Check and clean optional accessory parts



CAUTION!

Damage to components due to aggressive cleaning agents.

Do not use aggressive cleaning agents when cleaning optional accessory parts. Commercially available dishwashing liquid can be used if needed.

When checking for cleanliness of the optional accessory parts, the following components must be examined for particle residues:

- Flow meter with regulator valve
- Hoses

If particle residues are found, rinse the concerned components with clean water. Use commercially available dishwashing liquid if needed.

8.7. Clean the closed measuring cell



CAUTION!



Damage to instrument due to aggressive cleaning agents.

Do not use aggressive cleaning agents or solvents to remove lime deposits on the instrument.



The Figure 20 is available in the Appendix to assist you when performing servicing duty.

	MANIPULATION	SUPPLEMENTARY INFORMATION
1.	Interrupt the sample supply to the photometer.	
2.	Remove sample connections and wait until the measuring cell empties.	
3.	Remove the photometer from the measuring position and fasten onto the docking station.	→ Section 8.2

	MANIPULATION	SUPPLEMENTARY INFORMATION
4.	Loosen the screw cap (Figure 20, 3) and remove the measuring cell plate (Figure 20, 4).	
5.	<p>Clean the inside of the measuring cell (arrow) with a cotton cloth.</p> <p>i Clean the measuring cell window with cotton tipped applicators and alcohol.</p>	
6.	Fasten the instrument again (without measuring cell plate) in the measuring position.	
7.	Perform an adjustment as described in Section 8.5.	
8.	The instrument can now be operated again.	

8.8. Change battery








DANGER!



Life threatening voltage inside the instrument:

Connecting the electrical lines is extremely dangerous. Parts of the system can also be damaged. Local regulations must be observed at all times for electrical installations.

	WORKSTEP	PROCEDURE
1.	Interrupt the service voltage to the photometer.	→ Section 5
2.	Loosen the five screws (arrows) and remove the front cover.	
3.	Remove the old battery and replace with a new one (circle).  The battery is built into the front cover on the connection print (AQ2Conn).	
4.	Carefully mount front cover and fasten with the five screws.  Damage to the threaded inserts in the housing due to excessive tightening of the screws when fastening the front cover: Use a hex key without a T-handle to tighten the screws of the front cover finger-tight (approx. tightening torque 1 Nm).	 <i>7 mm hex key</i>
5.	The instrument can now be operated again.	
6.	Set date and time as described in Section 7.12.	

9. Troubleshooting


9.1. Pinpointing the cause of a malfunction




DETECTABLE MALFUNCTION	MEASURES
No reading.	<ul style="list-style-type: none"> ■ Check whether the service voltage is connected. → Section 5 ■ Check whether the fine-wire fuse in the instrument is OK. → Section 9.2
Fault report in the display.	<ul style="list-style-type: none"> ■ Analyze the error message. → Section 9.3
The measuring value appears wrong.	<ul style="list-style-type: none"> ■ Make sure there are no air bubbles in the sample. Counterpressure may help. → Section 4.4.1 ■ Ensure that the sample to be measured corresponds to the operating conditions. → Section 2.4 ■ Perform adjustment. → Section 8.5 ■ Check whether the photometer is correctly mounted. → Section 4 ■ Ensure that the maintenance work has been performed according to the servicing schedule. → Section 8.1 ■ Clean measuring cell. → Section 8.7

If the listed measures do not result in the desired results, please consult with customer service. → Section 10

9.2. Replace fine-wire fuse




	WORKSTEP	PROCEDURE
1.	Interrupt the service voltage to the photometer.	→ Section 5
2.	Loosen the five screws and remove the front cover.	

	WORKSTEP	PROCEDURE
3.	Remove the old fine-wire fuse (circle) from the base print (AQBasi) and replace with a new one (type T2A).	
4.	<p>Carefully mount front cover and fasten with the five screws.</p> <p> Damage to the threaded inserts in the housing due to excessive tightening of the screws when fastening the front cover:</p> <p>Use a hex key without a T-handle to tighten the screws of the front cover finger-tight (approx. tightening torque 1 Nm).</p>	 7 mm hex key
5.	The instrument can now be operated again.	

9.3. Warning and error messages


9.3.1. Warning messages and effect on operation

WARNING:	
<p>If a warning occurs during operation, it has the following effects:</p> <ul style="list-style-type: none"> ■ Warnings indicate an unusual state. ■ The system continues to operate and delivers correct measuring values. The cause of the warning message should be remedied at the next possible opportunity. ■ If an output for warnings is programmed, it is activated. ■ When the cause of the warning has been remedied, it is automatically deleted. 	 <p>When the Warning message occurs, the color of the status display changes to orange and the warning text describes what the warning is about. (Example: HUMIDITY WARNING)</p>

The following warnings can be displayed:

WARNING MESSAGE	DESCRIPTION	POSSIBLE CAUSES
V IN	The input voltage is outside the permitted range (18-30 VDC).	<ul style="list-style-type: none"> The service voltage is faulty.
ADJUSTMENT	The adjustment of the instrument could not be performed.	<ul style="list-style-type: none"> The instrument is soiled. The set point for the adjustment does not match the value of the sample.
CURRENT 1..8	Current output 1..8 is disturbed.	<ul style="list-style-type: none"> Terminals open. Interruption of the current loop of the reading output.
FLOW (Name ext.in.)	A flow rate fault is signaled via the digital input.	<ul style="list-style-type: none"> Flow rate incorrect.
HUMIDITY	The maximum permitted humidity value in the measuring cell housing has been exceeded.	<ul style="list-style-type: none"> Replace desiccant.
WATCHDOG	The internal error monitoring has been actuated. The program has been restarted.	<ul style="list-style-type: none"> Program crash.


9.3.2. Error messages and their effect on operation

FAULT:	
<p>If an error occurs during operation, it has the following effects:</p> <ul style="list-style-type: none"> A fault is a malfunction which prevents correct measurement value acquisition. The measuring values go to 0. The current output goes to the programmed electrical current If fault. The limits are deactivated. If an output for faults is programmed, it is activated. If the cause of the fault has been remedied, it is automatically deleted. 	 <p>When the Fault message appears, the color of the status display changes to red and the error text describes what the fault is about. (Example: FAULT MEASURING FAULT)</p>

The following error messages can be displayed:

ERROR MESSAGE	DESCRIPTION	POSSIBLE CAUSES
V ANALOG	One of the internal analogue voltages is outside the permitted range.	<ul style="list-style-type: none"> ■ Defect in the electronic system. → Service technician
MEASUR.FAULT	Measurement value acquisition is faulty.	<ul style="list-style-type: none"> ■ Air bubbles in the sample tube. ■ External light in the vicinity of the measuring station (e.g. transparent hoses). ■ Defect in the electronic system. → Service technician.
AN.MEAS.FAULT	The measurement value acquisition of the analogue channels is disturbed.	<ul style="list-style-type: none"> ■ Defect in the electronic system. → Service technician.
LED1 FAILURE	The detectors receive no light from the LED for the scattered light measurement.	<ul style="list-style-type: none"> ■ Defective light source. → Service technician.
ANALOG IN 1	The input signal on analog input 1 is less than the fault limit.	<ul style="list-style-type: none"> ■ There is no input signal.
ANALOG IN 2	The input signal on analog input 2 is less than the fault limit.	<ul style="list-style-type: none"> ■ There is no input signal.
POWER LINK	Actuation of the extended inputs/outputs via the Powerlink is disturbed.	<ul style="list-style-type: none"> ■ Interrupted connection to the extended inputs/outputs.
HUMIDITY	The relative humidity in the instrument has risen above 50%.	<ul style="list-style-type: none"> ■ The desiccant is saturated. ■ The seals on the electronic component are defective. ■ The instrument was open for too long.

9.3.3. Prioritized error messages and their effect

PRIO (PRIORITIZED FAULT):	
<p>If a prioritized fault occurs during operation, it has the following effects:</p> <ul style="list-style-type: none"> ■ When there is a prioritized fault, the cause of the malfunction is serious. ■ The measuring values go to 0. ■ The current output goes to the programmed electrical current If fault. ■ The limits are deactivated. ■ If an output for prioritized faults is programmed, it is activated. ■ Prioritized faults can be cleared only by a service engineer. 	 <p>When the Prio message occurs, the color of the status display changes to red and the error text describes what the prioritized fault is about. (Example: PRIO DEFAULT VALUES)</p>

The following faults and prio messages can be displayed:

PRIO MESSAGE	DESCRIPTION	POSSIBLE CAUSES
DEFAULT VALUES	The default values were loaded.	<ul style="list-style-type: none"> ■ If no parameters were initialized or if all parameters were lost, the default values are loaded.
CRC EXPERTS	A fault was determined when the expert data was checked.	<ul style="list-style-type: none"> ■ Electromagnetic malfunctions. ■ Defect in the electronic system.
CRC USER	A fault was determined when the user data was checked.	<ul style="list-style-type: none"> ■ Electromagnetic malfunctions ■ Defect in the electronic system.
CRC DISPLAY	A fault was determined when the display data was checked.	<ul style="list-style-type: none"> ■ Electromagnetic malfunctions. ■ Defect in the electronic system.
EXT RAM	A fault was determined when the RAM in the graphic controller was checked.	<ul style="list-style-type: none"> ■ Defect in the electronic system.

10. 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 in the Internet at www.photometer.com.

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

- The serial number of the photometer. → Section 2.2
- 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 photometer or peripheral devices.

11. Decommissioning & storage




Life threatening voltage inside the instrument:

Connecting the electrical lines is extremely dangerous. Parts of the system can also be damaged. Local regulations must be observed at all times for electrical installations.

The aim of decommissioning is to prepare the instrument properly for storage and to conserve it during storage.



	WORKSTEP	REMARKS
1.	 Life threatening voltage inside the instrument: Connecting the electrical lines is extremely dangerous. Parts of the system can also be damaged. Local regulations must be observed at all times for electrical installations. Interrupt the service voltage to the photometer and remove electrical connections.	
2.	Interrupt the sample feeding and remove the inlet hose and drain hose.	
3.	All surfaces which come into contact with the sample must be thoroughly cleaned.	
4.	Remove the photometer from the measuring station.	
5.	Make sure that all covers are closed and all locks on the instrument are locked.	

Storage

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

- The photometer contains electronic components. Storage for such components must fulfill the usual conditions. It is important to ensure that the storage temperature is between -20 and +50°C.
- All components that come into contact with the sample during operation have to be dry and clean for a longer period of time before being put into storage.
- The photometer and accessory parts must be protected from weather factors, condensing humidity, and aggressive gases.

12. Packaging & transport

The original packaging materials of the photometer should be used for packaging the photometer and its peripheral components if possible. If the original packaging is no longer available, note the following information:

- Before packaging, close the openings of the photometer with adhesive tape or plugs so that no packaging materials can enter the instrument.
- The photometer contains optical and electronic components. Make sure that the packaging protects the instrument from being damaged by impact during transport.
- All peripheral devices and accessory parts must be packaged separately and marked with device numbers (→ Section 2.2). This prevents confusion and mix-ups later while also making it easier to identify parts.
- When sending for repairs, ensure that the complete instrument (checking unit if present) is sent.

When packaged in the way described above, the instruments can be transported by the usual shipping methods and in all positions.

13. Disposal



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

The photometer 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 points, incineration plant
	Protective foils, polystyrene shells	Reuse as packaging material, recycling
Electronics	Print boards, electro-mechanical components	To be disposed of as electronic waste
Measuring cell	POM/PVC	Local disposal center
Optics	Glass, aluminum	Recycling via centers for recycling glass and waste metal
Battery	Lithium	Recycling via locally organized collection center
Housing	Plastic, ABS	Local disposal center

Table 2: Materials and their disposal

14. Spare parts

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

ART.-NO.	ARTICLE NAME	REMARKS
111391	Desiccant bag, 30 g	→ Section 8.4
117442	Fuse, microfuse 250 V 2 AT RM5	→ Section 9.2
111834	Battery 3V CR 2032 (button battery)	→ Section 0

Table 3: Spare parts and article numbers

15. Appendix

The following section contains:

- Required drawings and dimension drawings for mounting
- Diagrams for the servicing section
- Servicing log

15.1. Measuring cell plate with control unit

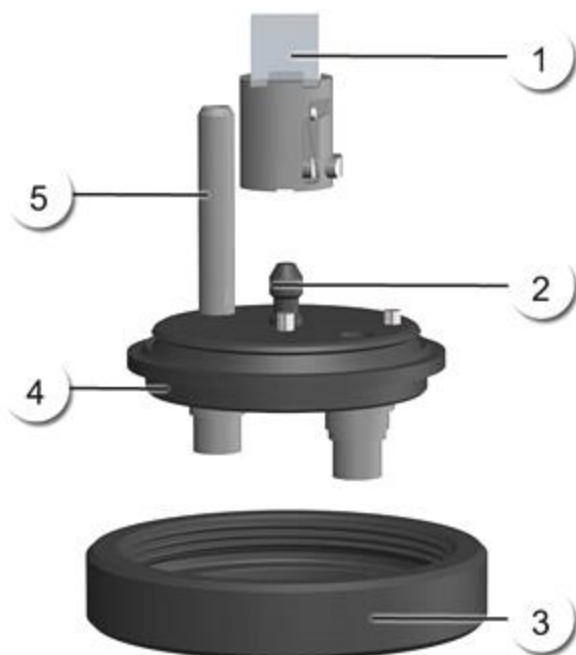


Figure 20: Overview of the closed measuring cell

①	Checking unit	②	Cam for fastening the checking unit.
③	Screw cap for the fastening of the measuring cell plate	④	Measuring cell plate with inlet tube and drain tube
⑤	Outlet tube extension		

15.2. Servicing log

[illegible]

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