

SensoLyt[®] 700 IQ H

IQ SENSORNET - pH/ORP SENSOR
FOR CLASS I DIVISION 2 APPLICATIONS



a xylem brand



For the most recent version of the manual, please visit www.ysi.com.

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1 Overview

1.1 How to use this component operating manual

Structure of the IQ SENSORNET operating manual

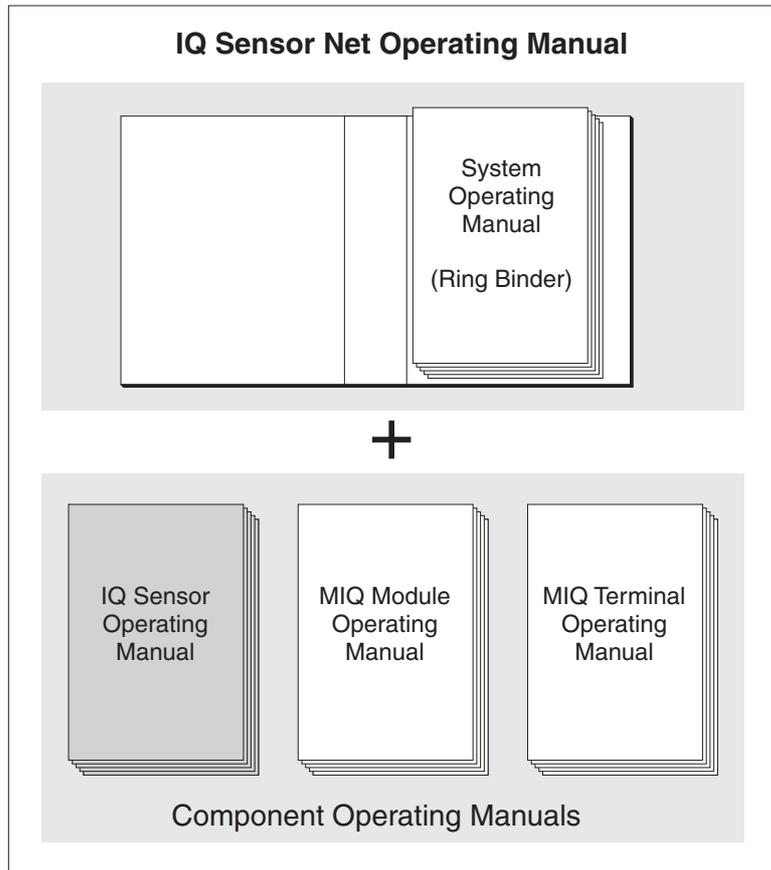


Fig. 1-1 Structure of the IQ SENSORNET operating manual

The IQ SENSORNET operating manual has a modular structure like the IQ SENSORNET itself. It consists of a system operating manual and the operating manuals of all the components used.

Please file this component operating manual into the ring binder of the system operating manual.

1.2 Structure of the SensoLyt[®] 700 IQ H

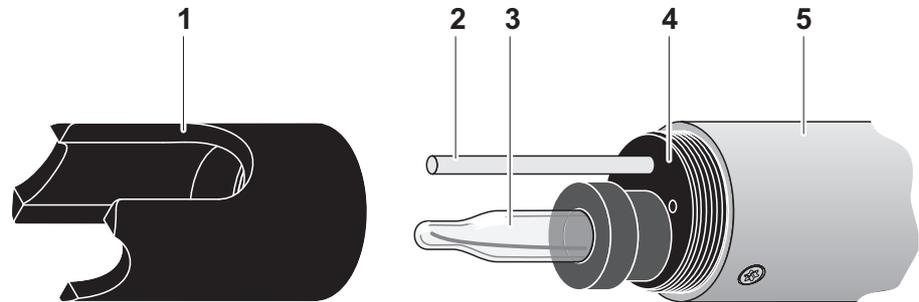


Fig. 1-2 Structure of the pH/ORP sensor (Example SensoLyt[®] 700 IQ H)

1	Protective hood
2	Temperature sensor
3	Combination electrode (not contained in the scope of delivery)
4	Electrode receptacle
5	Sensor shaft



The pH combination electrodes that can be used are available as accessories (see chapter 6 REPLACEMENT PARTS AND ACCESSORIES).

Monitoring glass breakage

The sensor is equipped with a SensCheck function for monitoring glass breakage.

1.3 Recommended fields of application

Stationary measurements in water/wastewater applications in Class I Division 2 hazardous locations.

In conjunction with the SensoLyt[®] SEA(-HP), SensoLyt[®] DWA and SensoLyt[®] ECA pH combination electrodes as well as the SensoLyt[®] PtA ORP combination electrode, the SensoLyt[®] 700 IQ H pH/ORP armature is suitable for stationary pH or ORP measurement in the following fields:

2 Safety

2.1 Safety information

2.1.1 Hazard warnings in this operating manual

This operating manual provides important information on the safe operation of the product. Read this operating manual thoroughly and make yourself familiar with the product before putting it into operation or working with it. The operating manual must be kept in the vicinity of the product so you can always find the information you need.

The hazard warnings are defined for the following levels of danger:

	<p style="text-align: center;">⚠️ GEFAHR</p> <p>GEFAHR indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.</p>
	<p style="text-align: center;">⚠️ WARNUNG</p> <p>WARNUNG indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.</p>
	<p style="text-align: center;">⚠️ VORSICHT</p> <p>VORSICHT indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.</p>
	<p style="text-align: center;">ACHTUNG</p> <p>ACHTUNG is used to address practices not related to personal injury.</p>

2.1.2 Safety information on the product

Note all labels, information signs and safety symbols on the product.

2.1.3 Further documents providing safety information

The following documents provide additional information, which you should observe for your safety when working with the measuring sys-

tem:

- Operating manuals of other components of the measuring system (Power supply units, controllers, accessories)
- Safety datasheets of calibration and maintenance equipment (e.g. cleaning solutions).

2.2 Safe operation

2.2.1 Authorized use

The authorized use of the SensoLyt® 700 IQ H consists of its use as a sensor in the IQ SENSORNET. Only the operation and running of the sensor according to the instructions and technical specifications given in this operating manual is authorized (see chapter 8 TECHNICAL DATA). Any other use is considered unauthorized.

2.2.2 Requirements for safe operation

Note the following points for safe operation:

- The product may only be operated according to the authorized use specified above.
- The product may only be supplied with power by the energy sources mentioned in this operating manual.
- The product may only be operated under the environmental conditions mentioned in this operating manual.
- The product may not be opened.

2.2.3 Unauthorized use

The product must not be put into operation if:

- it is visibly damaged (e.g. after being transported)
- it was stored under adverse conditions for a lengthy period of time (storing conditions, see chapter 8 TECHNICAL DATA).

2.3 Hazardous location use

	 GEFAHR
	<p>Explosion hazard. Only hazardous location rated sensor models ("Hazloc Sensor") must be used in hazardous locations. Read the name plate on the sensor shaft and verify that the sensor is rated for your specific application.</p>

Rated sensor models

The following sensor model is rated for hazardous location use:

SensoLyt® 700 IQ H (YSI-Order No. 207070Y)

Hazardous location rated sensors are identified by the name plate with the rating details engraved on the sensor shaft:

Name plate of a Hazloc sensor (example)

	
<p>SensoLyt® 700 IQ H Hazloc Sensor Rated: Class I Division 2 Groups A, B, C, D, T6 Class I Zone 2 Group IIC T6 0°C ≤ Ta ≤ +60°C = 14...24 V DC/ 0,2 W Control Drawing NO 28123</p>	
<p>Intertek 2001759 CONFORMS TO UL 61010-1 UL 121201 CERTIFIED TO CAN/CSA C22.2 # 61010-1 CAN/CSA C22.2 # 213</p>	

	 GEFAHR
	<p>Explosion hazard. The associated apparatus MIQ/BB1 (YSI part no. 207001Y) has to be used for connection. Refer to the following documents for proper installation:</p> <ul style="list-style-type: none"> ● Control drawing, YSI document no. 28123 (see MIQ/BB1 operating manual) ● MIQ/BB1 operating manual ● All applicable electrical code regulations.

	 GEFAHR
	<p>Explosion hazard. This product does not meet the requirements of the directive 94/9/EC (ATEX).</p>

3 Commissioning

3.1 Scope of delivery

- SensoLyt® 700 IQ H
- The sensor is equipped with a protective hood and protective caps
- Operating manual.

3.2 Installation

Safety guidelines for installation in a hazardous location

	⚠ GEFAHR
	<p>Explosion hazard. Only hazardous location rated sensor models ("Hazloc Sensor") must be used in hazardous locations. Verify the rating on the product name plate on the sensor shaft. The associated apparatus MIQ/BB1 (YSI part no. 207001Y) has to be used for connection. Refer to the following documents for proper installation:</p> <ul style="list-style-type: none"> ● Control drawing, YSI document no. 28123 (see MIQ/BB1 operating manual) ● MIQ/BB1 operating manual ● All applicable electrical code regulations.

Connection cable

A sensor connection cable of the SACIQ type is required to connect the sensor. The cable is available in different lengths.

	⚠ GEFAHR
	<p>Explosion hazard. For hazardous location use only the cable types listed in the control drawing must be used.</p>



How to connect the SACIQ sensor connection cable to the terminal strip of a MIQ module is described in chapter 3 INSTALLATION of the IQ SENSORNET system operating manual.

Are the plug connections dry?

Before connecting the sensor and sensor connection cable, please make sure that the plug connections are dry. If moisture gets into the plug connections, first dry the plug connections (dab them dry or blow

them dry using compressed air).



Do not suspend the sensor on the sensor connection cable. Use an armature or electrode holder.

NOTE

The pH/ORP sensor Sensolyt® 700 IQ H may only be submersed in conjunction with a mounted combination electrode. When changing the electrode, avoid the penetration of moisture into the pH/ORP sensor, as the sensor could otherwise be destroyed. Which electrodes can be used together with the pH/ORP sensor Sensolyt® 700 IQ H is given in section 6.1 COMBINATION ELECTRODES.

Are the plug connections dry?

Before connecting the sensor and sensor connection cable, please make sure the plug connections are dry. If moisture gets into the plug connections, first dry the plug connections (dab them dry or blow them dry using compressed air).



Do not suspend the sensor on the sensor connection cable. Use a sensor holder or armature. Information on this and other IQ SENSORNET accessories is given in the YSI catalog and on the Internet.

Connecting the sensor to the sensor connection cable

- 1 Take the protective caps off the plug connections of the sensor and the SACIQ sensor connection cable and keep them safe.
- 2 Plug the socket of the SACIQ sensor connection cable onto the plug head connector of the sensor. At the same time, rotate the socket so that the pin in the plug head connector (1) clicks into one of the two holes in the jack.
- 3 Then, screw the coupling ring (2) of the sensor connection cable onto the sensor up to the stop.

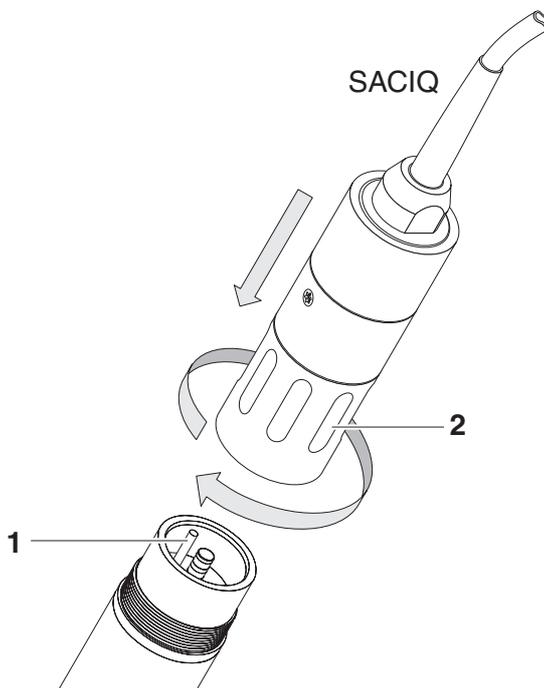


Fig. 3-1 Connecting the sensor

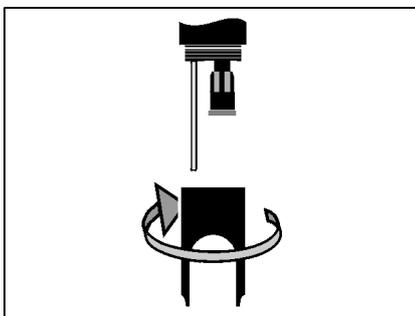
3.3 Commissioning / Getting the sensor ready for measuring



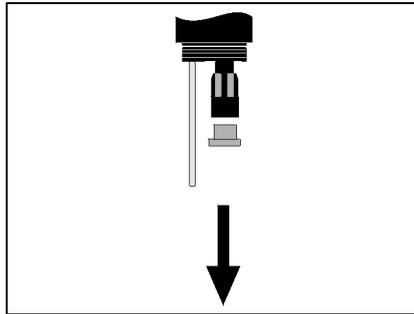
A KCl-filled plastic cap is mounted on the tip of the combination electrode to keep the electrode active during storage (or during longer pauses in measuring). The cap must be removed for measuring.

Mounting the electrode

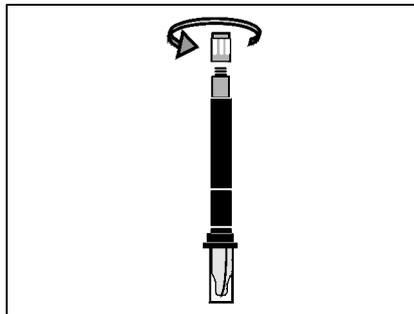
- 1 Unscrew the protective hood from the sensor.



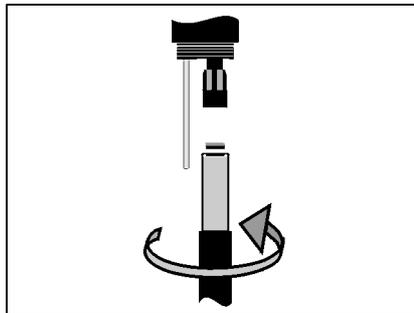
- 2 Pull off the blind plug from the plug head socket of the sensor.



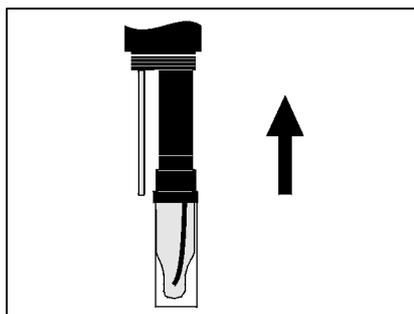
- 3 Screw the protective cap off the plug head connector of the electrode.



- 4 Screw the electrode into the plug head socket of the sensor.

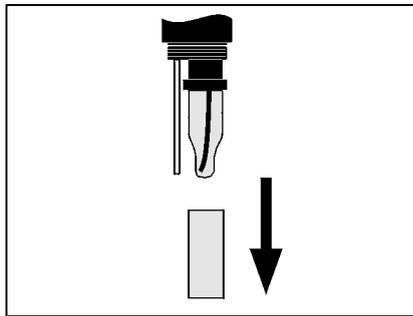


- 5 Push the unit into the sensor up to the stop.

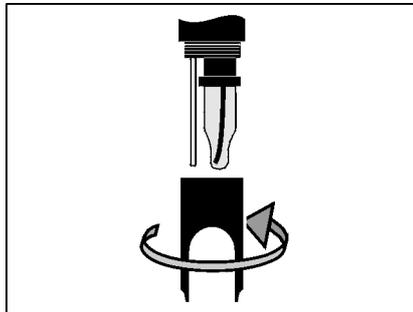


	ACHTUNG
	<p>Push the connected electrode into the sensor right up to the stop so that the connection is watertight. Leakiness can cause the sensor to be destroyed.</p>

- 6 For measuring, pull the KCl-filled plastic cap off the combination electrode.



- 7 Screw the protective hood onto the sensor.



- 8 If required, assign a user-defined name to the sensor (see relevant IQ SENSORNET system operating manual).
- 9 Set up the sensor (see section 3.4).
- 10 Calibrate the sensor (see section 4.2).

3.4 Setting table for the SensoLyt® 700 IQ H

Carrying out settings

Using **<S>**, switch from the measured value display to the main menu of the settings. Then navigate to the setting menu (setting table) of the sensor. The exact procedure is given in the relevant IQ SENSORNET system operating manual.

Setting	Selection/values	Explanation
<i>Measuring mode</i>	<ul style="list-style-type: none"> ● <i>mV</i> ● <i>pH</i> 	Unit of the measured value in the measured value display.
<i>Temperature mode</i>	<ul style="list-style-type: none"> ● °C ● °F 	Unit of the temperature measured value (Celsius, Fahrenheit).
<i>Calibration proced.</i> (only with measuring mode pH)	<ul style="list-style-type: none"> ● <i>CAL TEC AUTO</i> ● <i>CAL CON 2P</i> ● <i>CAL CON 1P</i> 	<ul style="list-style-type: none"> ● Simplified 2-point calibration, with any two different YSI Technical buffer solutions. The nominal values of the buffer solutions are stored in the sensor. The nominal values do not have to be entered manually. ● 2-point calibration with the following buffer solutions: 1) pH 7.0 ± 0.5 2) any pH value The nominal values of the buffer solutions have to be entered ● 1-point calibration with any one buffer solution. The nominal value of the buffer solution has to be entered.
<i>Calibration</i>	<ul style="list-style-type: none"> ● <i>valid</i> ● <i>invalid</i> ● <i>last valid</i> 	<p>Displays and specifies which calibration data the measured value calculation will be based on. The active calibration is displayed in the calibration history (see section 4.2.6).</p> <p><i>valid</i> indicates that a valid calibration is available. The value cannot be changed.</p> <p><i>invalid</i> is displayed if the last calibration is invalid and the sensor is blocked for measurement. In this case you can change the value to <i>last valid</i>, provided there is a valid calibration stored in the sensor.</p> <p>This is used to activate with the next exit from the setting table with <i>Save and quit</i> the last valid calibration stored in the sensor. Next time the setting table is opened, <i>valid</i> is displayed.</p>
<i>ORP shift</i> (only with measuring mode mV)	-100 mV ... +100 mV	Here you can set the ORP zero point.

Setting	Selection/values	Explanation
<i>Temp. adjustment</i>	-1.5 K ... +1.5 K	The temperature compensation enables the adjusting of the temperature sensor to a reference temperature measurement (offsetting the zero point by ± 1.5 K). Notes: <ul style="list-style-type: none">● Please position the sensor in a container with a least 2 l water, because of the thermal capacity of the sensor.● Stirring occasionally, leave the sensor in this container for at least 15 minutes, if the temperature difference between the water and sensor is > 10 K, for at least one hour, then carry out the adjustment.
<i>Save and quit</i>		The settings are stored. The display switches to the next higher level.
<i>Quit</i>		The settings are not stored. The display switches to the next higher level.

4 Measurement / operation

4.1 Measuring

	 WARNUNG
	<p>Chemical or biological hazard. Contact with the sample can be harmful to the user. Depending on the type of sample, suitable protective measures must be taken (protective clothing, goggles, etc.).</p>



Calibrate the combination electrode with the sensor and the measuring system prior to measuring and at regular intervals (depending on the application).



Please pay attention to:

- the minimum immersion depth of the sensor (> 10 cm)
- the measuring range of the electrode used (see operating manual of the electrode).

4.2 Calibration

4.2.1 General information on calibration

Why calibrate?	During the operation of a pH electrode, the slope and asymmetry of the electrode change with time. The calibration procedure determines the current slope and asymmetry of the electrode.
When to calibrate?	Calibrate before measuring and at regular intervals (depending on the application).
Calibration procedures	<p>The calibration procedure <i>CAL TEC AUTO</i> enables the fully automatic calibration with YSI Technical buffer solutions. Order information on YSI Technical buffer solutions is provided in chapter 6 REPLACEMENT PARTS AND ACCESSORIES.</p> <p>The calibration procedure <i>CAL CON 2P</i> enables the conventional 2-point calibration with two different buffers (first buffer solution pH 7.0 ± 0.5; second buffer solution: arbitrary).</p> <p>The calibration procedure <i>CAL CON 1P</i> enables the conventional single-point calibration with any one buffer.</p>
Calibration record / calibration history	The result of a calibration procedure is stored in the calibration record and calibration history and can be viewed afterwards (see relevant IQ SENSORNET system operating manual).

Maintenance condition

During the calibration procedure the sensor is in the so-called maintenance condition. All linked outputs remain in their current status. After the calibration procedure has been finished the maintenance condition has to be switched off manually. For detailed information on the maintenance condition please refer to the relevant IQ SENSORNET system operating manual.

General course of a calibration on the IQ SENSORNET

In general, a calibration procedure is carried out as follows on the IQ SENSORNET. For system-specific details please refer to the relevant IQ SENSORNET system operating manual.



Before starting, make sure that the correct calibration procedure is set (see section 3.4 SETTING TABLE FOR THE SENSOLYT® 700 IQ H).

- 1 Switch to the measured value display with **<M>** and select the sensor Sensolyt® 700 IQ H.
- 2 Call up calibration with **<C>**.
The maintenance condition of the sensor is switched on in the next step. A message on this appears on the display.
- 3 Confirm the message with **<OK>**.
The maintenance condition is active.
The menu-guided calibration routine is started.
Follow the instructions on the display.
After the calibration routine is finished, the measured value display appears again (the measured value flashes because the sensor is still in the maintenance condition).
- 4 If the calibration was successful, bring the sensor into the measuring position.
- 5 Wait for a stable measured value.
- 6 Switch off the maintenance condition.

4.2.2 Calibrating with CAL TEC AUTO

Display indications when calibrating with *CAL TEC AUTO*

Display	Explanation
* Have any two technical buffer solutions ready.	You can use two different YSI Technical buffer solutions for this. Confirm with <OK> .

Display	Explanation
<p>* Rinse the sensor. * Immerse the sensor in the first buffer solution. * Wait for a stable measured value.</p>	Follow the instructions on the display. As soon as the measured value is stable, the next display indication appears.
<p>* Rinse the sensor. * Immerse the sensor in the second buffer solution. * Wait for a stable measured value.</p>	Follow the instructions on the display. As soon as the measured value is stable, the next display indication appears.
<p>Successfully calibrated. End of the CAL_TEC_AUTO calibration.</p>	<p>The values determined for <i>Slope</i> and <i>Asymmetry potential</i> are displayed. Calibration is finished. Confirm with <OK>. The display returns to the measured value display.</p>

4.2.3 Calibrating with CAL CON 2P

Display indications during 2-point calibration with CAL CON 2P

Display	Explanation
<p>* Have buffer pH $7,0 \pm 0,5$ and any second buffer solution ready.</p>	<p>For this calibration procedure, use two buffer solutions whose pH value at the current temperature is known:</p> <ul style="list-style-type: none"> – First buffer solution pH 7.0 ± 0.5 – Second buffer solution: arbitrary
<p>* Rinse the sensor. * Immerse the sensor in the first buffer solution pH $7,0 \pm 0,5$. * Wait for a stable measured value.</p>	Follow the instructions on the display. As soon as the measured value is stable, the next display indication appears.
<p>* Enter the pH value of the first buffer solution.</p>	<p>Confirm with <OK>. Enter the nominal pH value of the first buffer solution according to the displayed temperature with <▲▼◀▶> and confirm with <OK>.</p>

Display	Explanation
<p>* Rinse the sensor. * Immerse the sensor in the second buffer solution. * Wait for a stable measured value.</p>	Follow the instructions on the display. As soon as the measured value is stable, the next display indication appears.
<p>* Enter the pH value of the second buffer solution.</p>	Confirm with <OK> . Enter the nominal pH value of the second buffer solution according to the displayed temperature with <▲▼◀▶ > and confirm with <OK> .
<p>Successfully calibrated. End of the CAL_CON_2P calibration.</p>	The values determined for <i>Slope</i> and <i>Asymmetry potential</i> are displayed. Calibration is finished. Confirm with <OK> . The display returns to the measured value display.

4.2.4 Calibrating with CAL CON 1P

Display indications during 1-point calibration with CAL CON 1P

Display	Explanation
<p>* Have any buffer solution ready.</p>	For this you can use any one buffer solution if its pH value at the current temperature is known. The calibration will be the more exact the nearer the pH value of the buffer solution is to that of the test sample.
<p>* Rinse the sensor. * Immerse the sensor in the buffer solution. * Wait for a stable measured value.</p>	Follow the instructions on the display. As soon as the measured value is stable, the next display indication appears.
<p>* Enter the pH value of the buffer solution.</p>	Confirm with <OK> . Enter the nominal pH value of the buffer solution according to the displayed temperature with <▲▼◀▶ > and confirm with <OK> .

Display	Explanation
<p><i>Successfully calibrated.</i> <i>End of the CAL_CON_1P calibration.</i></p>	<p>The values determined for <i>Slope</i> and <i>Asymmetry potential</i> are displayed. Calibration is finished. Confirm with <OK>. The display returns to the measured value display.</p>

4.2.5 Calibration result

Calibration evaluation

After calibrating, the calibration data and current state of the sensor are evaluated automatically. The asymmetry and slope are evaluated separately. The values must be within the following ranges:

Slope: -50 ... -62 mV/pH

Asymmetry: -45 ... +45 mV

If one of the two values is outside the specified range the calibration is evaluated as not successful, i.e. the sensor could not be calibrated.

A calibration procedure can have the following results:

Possible calibration results

Display after calibrating	Log book entries (meaning/actions)
Measured value display	Sensor was successfully calibrated. Calibration data see calibration history.
"----"	Sensor could not be calibrated. Sensor blocked for measurement. <ul style="list-style-type: none"> – Carry out maintenance activities immediately (see operating manual). – View the calibration history. – Check the calibration conditions and calibration standard.



Information on the contents and structure of the log book, and how to call it up, is given in the Log book chapter of the IQ SENSORNET system operating manual.

4.2.6 Calibration history

Calibration history

HIQ/T2020	15 Aug 2007	14:11			
Calibration history of selected sensor					330
S04 SensoLyt700IQ 99160001					
Date	Slope mV/pH	Asymmetry potential mV			

03.08.2007	-55.75	0.40	o.k.		

15.08.2007	-	-	Error		
03.08.2007	-55.75	0.40	o.k.		
11.07.2007	-59.12	8.07	o.k.		
20.06.2007	-61.46	6.50	o.k.		
Tolerance	-62...-50	-45...+45			
Return ESC					

Currently active calibration

Chronological list of the last calibration procedures

Fig. 4-1 Calibration history SensoLyt® 700 IQ H

The calibration history provides the following information:

- Date of the calibration
- Slope [mV/pH]
- Asymmetry potential [mV]
- Calibration evaluation:
 - o.k.: Successful calibration. The new calibration data are taken over for measurement.
 - Error: Calibration unsuccessful. Sensor blocked for measurement.

4.2.7 Reactivating a valid calibration

The SensoLyt® 700 IQ H provides a feature with which you can reactivate the last valid calibration if necessary. Thus you can immediately continue to measure if a calibration failed.



Reactivating old calibration data is a temporary measure. Take into consideration that the sensor may provide wrong measured values. Ensure the correct functioning of the sensor by checking and/or recalibrating it.

Reactivating the calibration data

- 1 Open the setting table (see section 3.4).
- 2 In the *Calibration* menu, select the setting *last valid* and then exit the setting table with *Save and quit*.

5 Maintenance and changing the electrode

5.1 General maintenance instructions

The Sensolyt® 700 IQ H pH/ORP sensor operates maintenance-free.



Please read the maintenance of the combination electrode in the relevant operating manual.

	WARNUNG
	<p>Chemical or biological hazard. Contact with the sample can be harmful to the user. Depending on the type of sample, suitable protective measures must be taken (protective clothing, goggles, etc.).</p>

	ACHTUNG
	<p>If the glass of the pH electrode breaks, there is a danger of cuts from the splinters of glass!</p>



We do not recommend unscrewing the sensor from the sensor connection cable in order to exchange the electrode. Otherwise, moisture and/or dirt can get into the plug connection where they can cause contact problems.

If you would like to disconnect the sensor from the sensor connection cable, please note the following points:

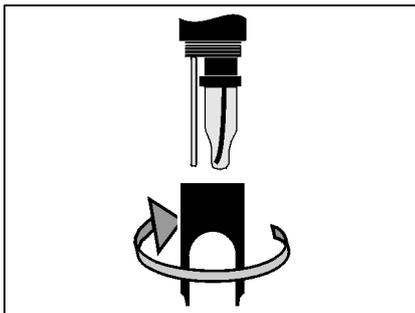
- Before disconnecting the sensor from the SACIQ sensor connection cable, remove any larger pieces of contamination from the sensor, particularly in the area of the plug connection (brush it off in a bucket of tapwater, wash it off with a hose or wipe it off with a cloth).
- Unscrew the sensor from the SACIQ sensor connection cable.
- Always place a protective cap on the plug head of the sensor and on the SACIQ sensor connection cable so that no moisture or dirt can get into the contacting surfaces.
- In a corrosive environment, close the socket of the sensor connection cable (while it is dry) with the screw-on dust cover SACIQ-Plug to protect the electrical contacts against corrosion. The dust cover is available as an accessory (see section 6.2 GENERAL ACCESSORIES). It is included in the scope of delivery of the SACIQ sensor connec-

tion cables.

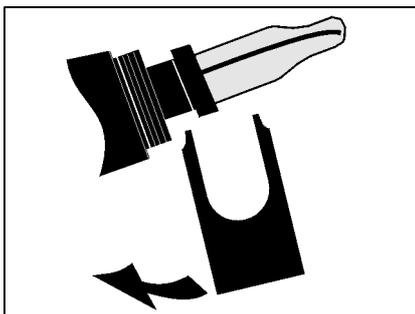
5.2 Replacing the electrode

If it is necessary to replace an electrode, proceed as follows:

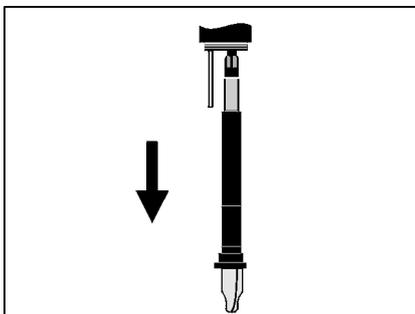
- 1 Unscrew the protective hood from the sensor.



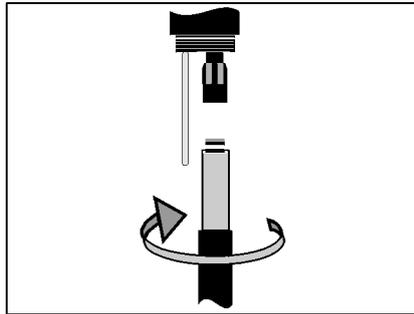
- 2 Use the protective hood as a tool to lever out the electrode.



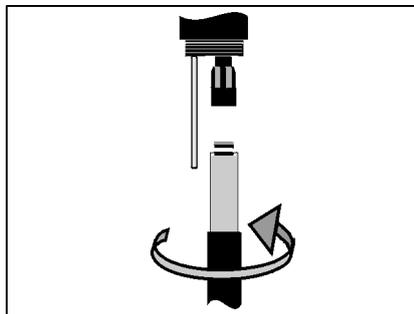
- 3 Carefully pull out the electrode until the plug head screwed fitting can be seen.



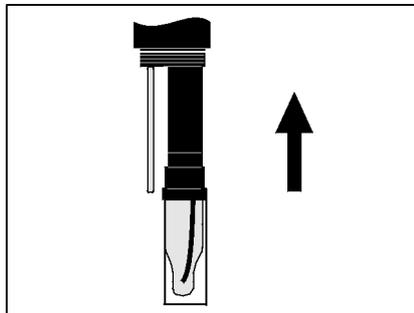
- 4 Unscrew the combination electrode from the plug head socket (for disposal, see section 5.3).



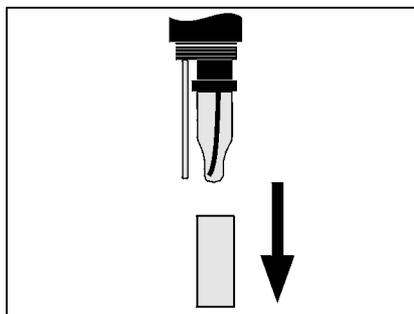
5 Screw in a new combination electrode.



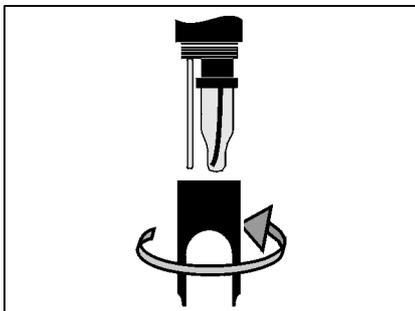
6 Push the unit into the sensor up to the stop.



7 For measuring, pull the KCl-filled plastic cap off the combination electrode.



- 8 Screw the protective hood onto the sensor.



- 9 Calibrate the sensor and the electrode with the measuring system (see section 4.2 CALIBRATION).

5.3 Disposal

Sensor

We recommend disposing of the sensor as electronic refuse.

Combination electrodes

If no official regulations apply to the contrary, used and defective electrodes can be treated as household waste.

6 Replacement parts and accessories

6.1 Combination electrodes

pH combination electrodes	Model	Order no.
	SensoLyt® SEA	109 115Y
	SensoLyt® DWA	109 119Y
	SensoLyt® ECA	109 117Y
	SensoLyt® SEA-HP	109 118Y
ORP combination electrode	SensoLyt® PtA	109 125Y

6.2 General accessories

Technical buffer solutions for pH calibration	Buffer (bottles of 1 liter)	pH value	Order no.
	TEP 4	4.01	108 700Y
	TEP 7	7.0	108 702Y
	TEP 10 Trace	10.01	108 703Y
Protective hood	Model	Order no.	
	SensoLyt® 700 SK	109 194Y	
Screw-on protective dust cover for sensor connection cable	Model	Order no.	
	SACIQ-Plug	480 065	

7 What to do if ...

No measured value

Cause	Remedy
Sensor not connected	Connect the sensor
Unknown	Refer to log book

Measurement does not function

Cause	Remedy
Watering cap still on the electrode	Pull off watering cap and calibrate
Electrode not connected	Connect the electrode
Liquid has penetrated into the sensor	Sensor defective, send it back
Sensor not connected	Connect the sensor
Incorrect instrument setting	Correct the instrument setting

Sensor cannot be calibrated

Cause	Remedy
The slope of the electrode is outside the tolerance (see section 4.2.5)	<ul style="list-style-type: none"> – Condition the electrode – If the slope continues to be outside the tolerance: Replace the electrode
Slope of the electrode too low	Replace the electrode
Asymmetry of the electrode too high	Replace the electrode
Sensor is operated with ORP electrode	Use pH electrode

Measurement provides implausible measured values

Cause	Remedy
Not calibrated	Calibration
Electrode not connected or defective	Check electrode and electrode connection
Electrode contaminated	Clean electrode
Liquid has penetrated into the sensor	Sensor defective, send it back

	Cause	Remedy
	Incorrect instrument setting	Correct the instrument setting (<i>Measuring mode</i> pH or mV)
Measured value flashing	Cause	Remedy
	Maintenance condition is active	<ul style="list-style-type: none">– If the maintenance condition was activated manually (e.g. by pressing the <C> key): Switch off the maintenance condition manually in the menu <i>Display/Options</i> (see IQ SENSORNET system operating manual)– If the maintenance condition was activated automatically (e.g. by the cleaning system): The maintenance condition will be deactivated automatically

8 Technical data

8.1 Measuring characteristics

Measuring principle

Potentiometric measurement using a combination electrode; Integrated microprocessor electronics, shielded 2-wire connection for power and data transmission.

Measuring range

pH	0.00 ... 14.00 pH (depending on the electrode)
ORP	-2000 mV ... +2000 mV (depending on the electrode)

Resolution

pH	0.01 pH
ORP	1 mV

Temperature measurement

Temperature sensor	Integrated NTC
Measuring range	- 5 °C ... + 60 °C (23 ... 140 °F)
Accuracy	± 0.5 K
Resolution	0.1 K
Response time t_{99} of the temperature sensor	< 15 s

Temperature compensation

In the range 0 °C ... 60 °C (32 ... 140 °F)

8.2 Application characteristics

Temperature range

Measuring medium	0 °C ... + 60 °C (32 ... 140 °F)
Storage/transport	- 5 °C ... + 65 °C (23 ... 149 °F)

Allowed pH range of the measuring medium

4 ... 12

Pressure resistance

Sensor with connected SACIQ sensor connection cable:

Max. allowed overpressure with electrode SensoLyt® SEA, DWA, PtA installed	10 ⁶ Pa (10 bar) *
---	-------------------------------

Max. allowed overpressure with electrode SensoLyt® ECA installed	6 x10 ⁵ Pa (6 bar) *
Max. allowed overpressure with electrode SensoLyt® SEA-HP installed	10 ⁶ Pa (10 bar) **

* temperature dependent (see safety instruction below)

** in the entire temperature range

The SensoLyt® 700 IQ H meets the requirements according to article 3(3) of the directive 97/23/EC ("pressure equipment directive").

Depth of immersion

with installed combination electrode, SensoLyt® SEA, DWA, PtA	min. 10 cm; max. 100 m *
with installed combination electrode, SensoLyt® ECA	min. 10 cm; max. 60 m *
with installed combination electrode, SensoLyt® SEA-HP	min. 10 cm; max. 100 m **

* temperature dependent (see safety instruction below)

** in the entire temperature range

	ACHTUNG
	<p>The pressure resistance of the operable pH/ORP armature can be restricted by the pressure resistance of the electrode. When selecting the electrode make sure it is suitable for the intended pressure and temperature range.</p>

Type of protection

Sensor with connected SACIQ sensor connection cable:

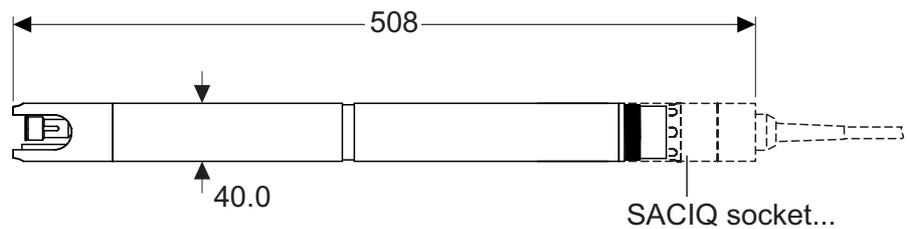
Sensor with an electrode including SACIQ sensor connection cable installed	IP 68, 10 bar (106 Pa)
Sensor plug head connector without sensor connection cable (sensor with the electrode installed)	IP 67

Operating position Any

Fields of application SensoLyt® 700 IQ H | Stationary measurements in water/wastewater applications

8.3 General data

Dimensions (mm)



Weight with electrode (without sensor connection cable) approx. 970 g

Electrodes that can be integrated	pH combination electrodes	SensoLyt® SEA, SEA-HP, DWA, ECA
	ORP electrodes	SensoLyt® PtA

Connection technique Connection via SACIQ sensor connection cable

Material	Shaft:	V4A stainless steel 1.4571 *
	Protective hood	PVC
	Electrode receptacle	POM
	Temperature sensor:	V4A stainless steel 1.4571 *
* Stainless steel can be sensitive to corrosion with chloride concentrations ≥ 500 mg/l.		
	Plug head connector housing:	POM
	Plug, 3-pole	ETFE (blue) Tefzel®

Automatic sensor monitoring (SensCheck function) Function for glass breakage monitoring of the pH electrode

8.4 Instrument safety

8.4.1 General instrument safety

Applicable norms	<ul style="list-style-type: none"> - UL 61010-1 - CAN/CSA C22.2 # 61010.1
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8.4.2 Hazardous location ratings

Applicable directives and standards

In addition to the standards listed in chapter 8.4.1, the SensoLyt® 700 IQ H conforms to the following directives and standards:

- UL 121201
- CAN/CSA C22.2 # 213

The SensoLyt® 700 IQ H is a non-incendive electrical equipment for use in Class I Division 2 hazardous locations.

Hazardous location rating

Class I Division 2
 Groups A, B, C, D T6
 Class I Zone 2
 Groups IIC T6

Associated apparatus	MIQ/BB1, YSI part no. 207001Y
Control Drawing	YSI document no. 28123

8.5 Electrical data

Nominal voltage	max. 24 VDC, via the IQ SENSORNET (Details see IQ SENSORNET system operating manual, chapter TECHNICAL DATA)
Power consumption	0.2 W (with MIQ/BB1: 0.7 W)
Protective class	III

9 Indexes

9.1 Explanation of the messages

This chapter contains a list of all the message codes and related message texts for the SensoLyt® 700 IQ H sensor.



Information on

- the contents and structure of the log book and
- the structure of the message code

See IQ SENSORNET system operating manual, chapter LOG BOOK.

All message codes of the SensoLyt® 700 IQ H end with the number "311".

9.1.1 Error messages

Message code	Message text
EA1311	<i>Meas. range exceeded or undercut</i> * <i>Check process</i> * <i>Select other meas. range</i>
EA2311	<i>Sensor temperature too high!</i> * <i>Check process and application</i>
EA3311	<i>Sensor temperature too low!</i> * <i>Check process and application</i>
EC1311	<i>Sensor could not be calibrated,</i> <i>Sensor blocked for measurement</i> * <i>Check calibration conditions and calibration standard</i> * <i>View calibration history</i> * <i>Service sensor immediately</i> (<i>see operating manual</i>)
EI3311	<i>Operational voltage too low</i> * <i>Check installation and cable lengths, Follow installation instructions</i> * <i>Power supply module overloaded</i> * <i>Check terminal and module connections</i> * <i>Defective component, replace components</i>

Message code	Message text
EI4311	<i>Operational voltage too low, no operation possible</i> <i>* Check installation and cable lengths, Follow installation instructions</i> <i>* Power supply module overloaded</i> <i>* Check terminal and module connections</i> <i>* Defective component,</i> <i>replace components</i>
ES1311	<i>Component hardware defective</i> <i>* Contact service</i>
ESA311	<i>SensCheck: pH electrode defective, glass broken</i> <i>* Replace pH electrode</i>

9.1.2 Informative messages

Message code	Message text
IC1311	<i>Sensor has been successfully calibrated</i> <i>* For calibration data, see calibration history</i>
IC4311	<i>Last valid calibration has been activated. Make sure the sensor operates correctly.</i>

9.2 Status info

The status info is a coded piece of information on the current status of a sensor. Each sensor sends this status info to the controller of the IQ SENSORNET. The status info of sensors consists of 32 bits, each of which can have the value 0 or 1.

Status info, general structure

0 1 2 3 4 5 6 7	8 9 10 11 12 13 14 15	
1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	(general)
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	(internal)
16 17 18 19 20 21 22 23	24 25 26 27 28 29 30 31	

The bits 0 - 15 are reserved for general information.
 The bits 16 - 21 are reserved for internal service information.

You obtain the status info:

- via a manual query in the *Einstellungen/Settings/Serviceinfo/Liste aller Teilnehmer* menu (see system operating manual)
- by an automated query
 - from a superordinate process control (e. g. when connected to the Profibus)
 - from the IQ Data Server (see IQ SENSORNET Software Pack operating manual)



The evaluation of the status info, e.g. in the case of an automated query, has to be made individually for each bit.

Status info SensoLyt® 700 IQ H

Status bit	Explanation
Bit 0	<i>Component hardware defective</i>
Bit 1	<i>SensCheck: pH electrode defective, glass broken</i>
Bits 2-31	-

10 Contact Information

10.1 Ordering & Technical Support

Telephone: (800) 897-4151
(937) 767-7241
Monday through Friday, 8:00 AM to 5:00 PM ET

Fax: (937) 767-1058

Email: info@ysi.com

Mail: YSI Incorporated
1725 Brannum Lane
Yellow Springs, OH 45387
USA

Internet: www.ysi.com

When placing an order please have the following information available:

- YSI account number (if available)
- Model number or brief description
- Quantity
- Name and Phone Number
- Billing and shipping address
- Purchase Order or Credit Card

10.2 Service Information

YSI has authorized service centers throughout the United States and Internationally. For the nearest service center information, please visit www.ysi.com and click 'Support' or contact YSI Technical Support directly at 800-897-4151.

When returning a product for service, include the Product Return form with cleaning certification. The form must be completely filled out for an YSI Service Center to accept the instrument for service. The Product Return form may be downloaded at www.ysi.com and clicking on the 'Support' tab.

Xylem |'zīləm|

- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

We're 12,500 people unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

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