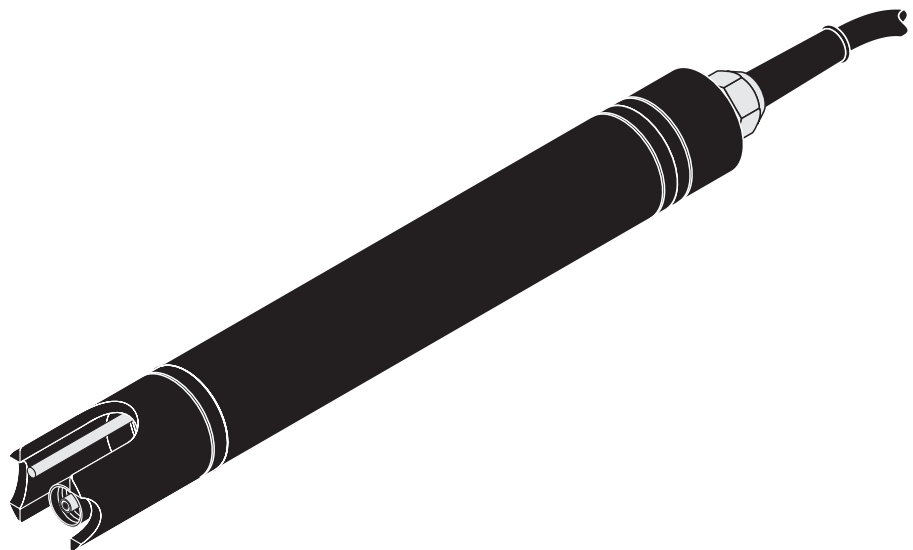


# SensoLyt 650-7



**pH/ORP armature  
without impedance converter,  
with temperature sensor**



**Note**

The latest version of the present operating manual can be found on the Internet under [www.WTW.com](http://www.WTW.com).

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# 1 Overview

## 1.1 Structure of the SensoLyt 650-7 pH/ORP armature

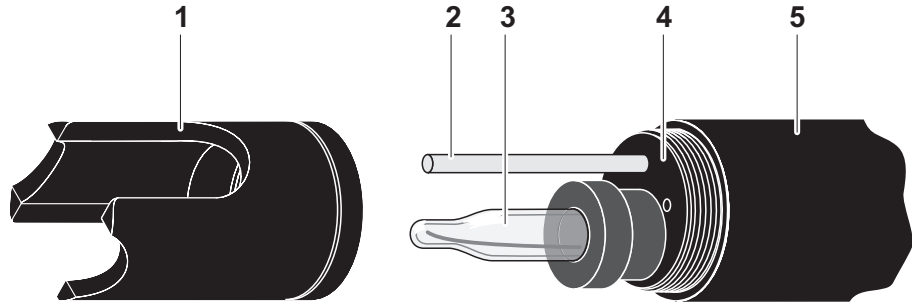


Fig. 1-1 Structure of the SensoLyt® 650 pH/ORP armature

1	Protective hood
2	Temperature sensor
3	Combination electrode (not included in the scope of delivery)
4	Electrode holder
5	Armature shaft



### High-impedance measuring operation

#### Note

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

With the SensoLyt 650-7, the electrode voltage is transmitted to the measuring transmitter without impedance converter. The high-impedance pH/ORP input of the measuring transmitter is used for this.

## 1.2 Recommended fields of application

The SensoLyt 650-7 pH/ORP armature in conjunction with a pH or ORP electrode is suitable for stationary pH or ORP measurements in water and wastewater applications. Suitable electrodes are listed in chapter 6 REPLACEMENT PARTS AND ACCESSORIES).

## 2 Safety instructions

### 2.1 General information on safety

These safety instructions contain all instructions that have to be followed for a safe operation of the Sensolyt 650-7 pH/ORP armature. Before starting any work with the Sensolyt 650-7, carefully read the safety instructions and strictly follow all protective measures mentioned.

Always store and make available these safety instructions together with the operating manual in the vicinity of the place of installation as possible.

#### General safety instructions

Safety instructions in this operating manual can be recognized by the warning symbol (triangle) in the left column. The signal word (e.g. "Caution") indicates the danger level:



#### Warning

indicates instructions that must be followed precisely in order to prevent serious dangers to persons.



#### Caution

indicates instructions that must be followed precisely in order to avoid slight injuries or damage to the instrument or the environment.

#### Other labels



#### Note

indicates notes that draw your attention to special features.



#### Note

indicates cross-references to other documents, e.g. operating manuals.

### 2.2 Authorized use

The authorized use of the Sensolyt 650-7 consists of the stationary measurement of pH or ORP and temperature in conjunction with a pH or ORP electrode in the following areas:

- Water and wastewater
- Environment
- Industry.

Please observe the technical specifications according to chapter 8 TECHNICAL DATA. Only operation according to the instructions given in this operating manual is considered to be authorized.

Any other use is considered to be **unauthorized**. Unauthorized use invalidates any claims with regard to the guarantee.

### 2.3 User qualifications

Calibrating the SensoLyt 650-7 requires the handling of chemicals. Thus, we assume that the relevant personnel are familiar with the necessary precautions to take when dealing with chemicals as a result of their professional training and experience.

### 2.4 General safety instructions

#### Function and operational safety

The armature left the factory in a safe and secure technical condition.

The failure-free function and operational safety of the armature is only guaranteed if the generally applicable safety measures and the special safety instructions in this operating manual are followed during its use.

The smooth functioning and operational safety of the armature can only be guaranteed under the environmental conditions that are specified in chapter 8 TECHNICAL DATA.

The specified temperature (chapter 8 TECHNICAL DATA) must be maintained during the application and transport of the armature. Protect the armature, particularly against frost or overheating.

**Safe operation**

If safe operation is no longer possible, the armature must be taken out of operation and secured against inadvertent operation.

Safe operation is no longer possible if the armature:

- has been damaged in transport
- has been stored under adverse conditions for a lengthy period of time
- is visibly damaged
- no longer operates as described in this manual.

If you are in any doubt, contact the supplier of your armature.

**Obligations of the operator**

The operator of the armature must ensure that the following rules and regulations are followed when dealing with hazardous substances:

- EEC directives for protective labor legislation
- National protective labor legislation
- Safety regulations
- Safety data sheets of the chemical manufacturer.

**Caution**

**All changes of the Sensolyt 650-7 that exceed the work described in this operating manual are not allowed. Repair work may only be carried out by WTW Weilheim.**

### 3 Commissioning

#### 3.1 Scope of delivery

- SensoLyt 650-7 pH/ORP armature  
The armature is equipped with a protective hood and protection caps
- Operating manual.

#### 3.2 Installation

##### Caution

When installing the SensoLyt 650-7 heed the technical data according to chapter 8 TECHNICAL DATA.



**Connection to the measuring transmitter**

The connection cable of the SensoLyt 650-7 is ready to be connected to the terminal strip of a measuring transmitter with high-impedance pH/ORP input. For all further information please refer to the operating manual of the measuring transmitter. The assignment of the cable wires of the SensoLyt 650-7 is given in the chapter 8 TECHNICAL DATA of this operating manual.

#### 3.3 Commissioning / Getting the instrument ready for measuring

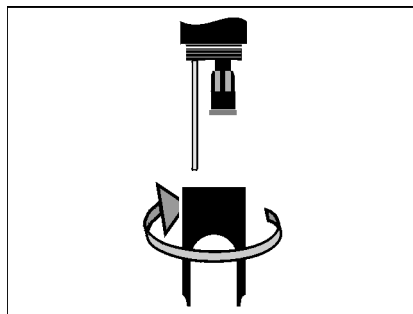
##### Note

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



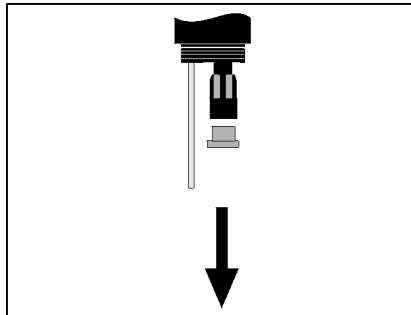
**Mounting the combination electrode**

- 1 | Unscrew the protective hood from the armature.

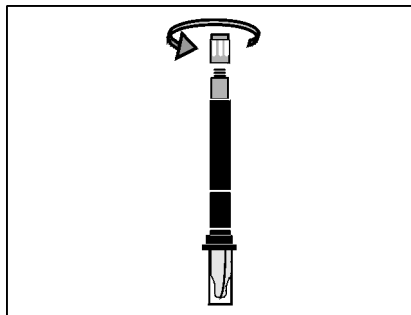




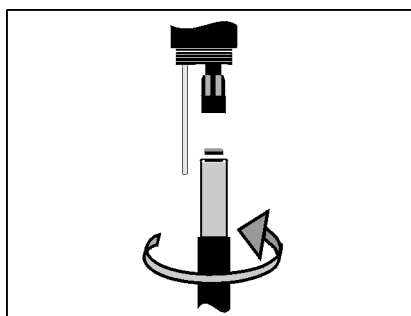
2 Pull off the blind plug from the plug head socket of the armature.



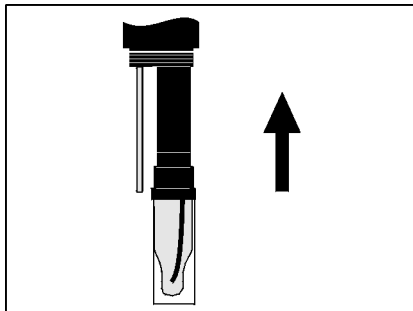
3 Screw off the protective cap of the plug head connector of the electrode.



4 Screw the electrode into the plug head socket of the armature.



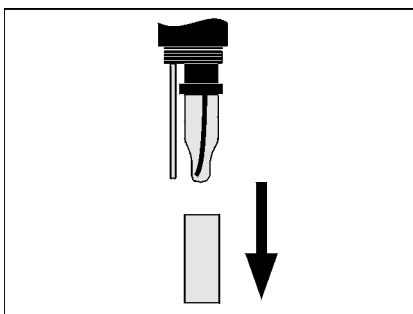
- 5 Push the unit into the armature up to the stop.



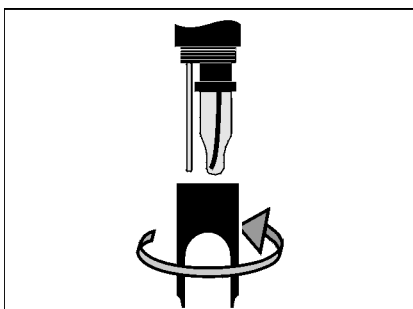
**Caution**

Push the connected electrode into the armature right up to the stop so that the connection is watertight.

- 6 Pull the KCl-filled plastic cap off the electrode for measuring.



- 7 Screw the protective hood onto the armature.



- 8 Make the settings for the electrode on the measuring transmitter. Subsequently, calibrate the measuring system (see section 4.1 CALIBRATION).

## 4 Measuring / Operation



### Note

Calibrate the measuring system after the initial commissioning and at regular intervals (depending on the application).

### 4.1 Calibration

#### Why calibrate?

During the operation of a pH electrode, the slope and asymmetry of the electrode changes 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 procedure

The available calibration procedures depend on the measuring transmitter used. The individual steps for the calibration are comprehensively described in the operating manual of the measuring transmitter.

### 4.2 Measuring



### Warning

**Contact with the sample can lead to danger to the user!  
Depending on the type of sample, suitable protective measures must be taken (protective clothing, protective goggles, etc.).**

Please pay attention to:

- the minimum immersion depth of the armature (> 40 mm)
- the measuring range of the electrode used (see operating manual of the electrode).



## 5 Maintenance and changing the electrode

### 5.1 General maintenance instructions

The Sensolyt 650-7 pH/ORP armature works maintenance-free. Please read the maintenance of the electrode in the relevant operating manual of the electrode.



#### Caution

All changes of the Sensolyt 650-7 that exceed the work described in this operating manual are not allowed. Repair work may only be carried out by WTW Weilheim.

### 5.2 Replacing the combination electrode



#### Warning

Contact with the sample can lead to danger to the user! Depending on the type of sample, suitable protective measures must be taken (protective clothing, protective goggles, etc.).

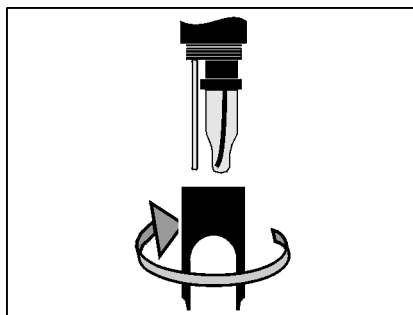


#### Caution

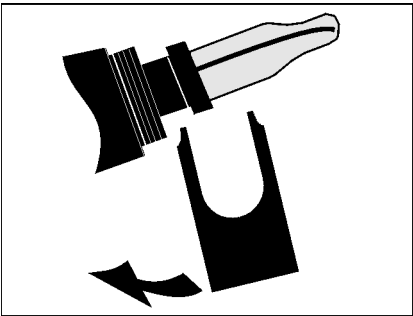
If the glass of the pH electrode breaks, there is a danger of cuts from the splinters of glass!

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

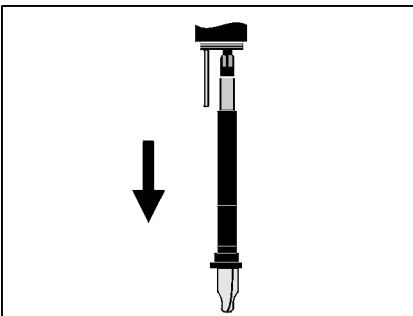
- 1 Unscrew the protective hood from the armature.



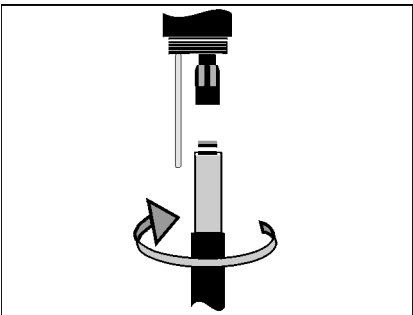
2 Use the protective hood as a tool to lever out the electrode.



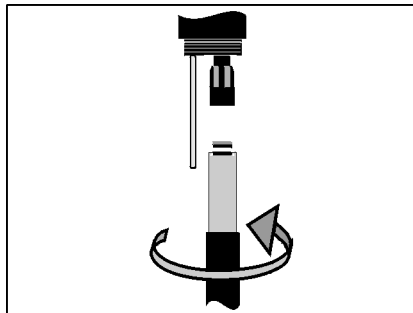
3 Carefully pull out the electrode until the plug head screwed fitting can be seen.



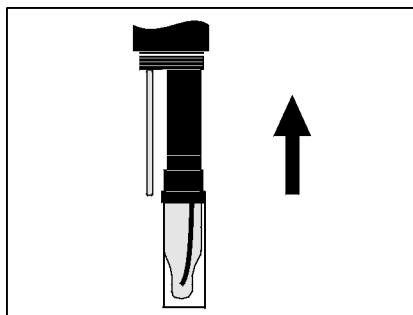
4 Unscrew the combination electrode from the plug head socket (for disposal, see section 5.4).



5 | Screw in a new electrode.

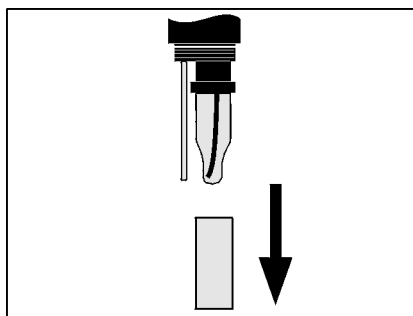


6 | Push the unit into the armature up to the stop.

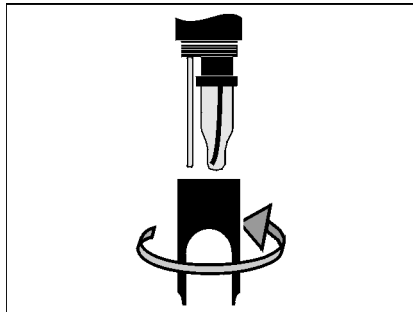


**Caution**  
 Push the connected electrode into the armature right up to the stop so that the connection is watertight.

7 | Pull the KCl-filled plastic cap off the electrode for measuring.



- 8 | Screw the protective hood onto the armature.



- 9 | Calibrate the measuring system (see section 4.1 CALIBRATION).



### 5.3 Cleaning

With normal operation (e.g. municipal wastewater) we strongly recommend to clean the outside of the sensor:

- if there is any pollution (according to visual check)
- if there is a suspicion of erroneous measured values
- if the measured value lies outside the range of precision required by the user during the function check.

#### Exterior cleaning

Contamination	Cleaning agents
Slurry and loosely adhering dirt or biological films	Soft cloth or soft sponge, warm tap water with detergent
Salt and / or lime deposits	Acetic acid (volume percentage = 20 %), soft cloth or soft sponge



#### Note

Please also observe the instructions on cleaning the electrode in the respective operating manual.

### 5.4 Disposal

#### Armature

We recommend disposing of the armature 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



### Caution

The pressure resistance of the operable pH/ORP armature can be restricted by the pressure resistance of the electrode (see chapter 8 TECHNICAL DATA). When selecting the combination electrode make sure it is suitable for the intended pressure and temperature range.

#### pH combination electrodes

Model	Order no.
SensoLyt SEA	109 115
SensoLyt GDA	109 116
SensoLyt ECA	109 117
SensoLyt SEA-HP	109 118

#### ORP combination electrode

Model	Order no.
SensoLyt PtA	109 125

#### Technical buffer solutions for pH calibration

Model (bottles of 1 liter)	pH value	Order no.
TEP 4	4,01	108 700
TEP 7	7,0	108 702
TEP 10	10,0	108 704



### Note

Information on further accessories is given in the WTW catalog and on the Internet.

## 7 What to do if...

### Measurement delivers no or wrong measured values

Cause	Remedy
– Armature not connected	– Check connection to the terminal strip
– Electrode not connected or defective	– Check electrode and electrode connection
– Watering cap still on the electrode	– Pull off watering cap and calibrate
– No or wrong calibration performed	– Calibrate
– Electrode contaminated	– Clean electrode
– Liquid has penetrated the armature	– Armature defective, return to WTW
– Instrument setting incorrect	– Correct instrument setting

### System cannot be calibrated

Cause	Remedy
– Slope of the electrode too low	– Replace the electrode
– Asymmetry of the electrode too high	– Replace the electrode
– Armature is operated with ORP electrode	– Use pH electrode

## 8 Technical data

### 8.1 General features

<b>Electrodes that can be integrated</b>	see chapter 6 REPLACEMENT PARTS AND ACCESSORIES	
<b>Temperature sensor</b>	Integrated NTC 30 (30 kΩ / 25 °C)	
<b>Dimensions</b>	Length	311 mm (length of armoring including protective hood, without screwed cable gland)
	Shaft diameter	40 mm
<b>Weight</b>	approx. 800 g (including 7 m connection cable, without electrode)	
<b>Material</b>	Protective hood	POM, conductive
	Electrode holder	POM
	Enclosure of the temperature sensor	Stainless steel 1.4571
	Protection ring	POM, conductive
	Shaft	POM, conductive
	Screwed cable gland	Brass, nickel-plated
	Cable sheath	PUR
<b>Connection cable</b>	Length	7 m
	Diameter	7 mm
	Smallest allowed bend radius	Permanent bend: 150 mm Short time bend: 70 mm
	Connection	Open wire ends with wire end sleeves to be connected to the measuring transmitter terminal strip
<b>Guidelines and norms used</b>	General safety	<ul style="list-style-type: none"> <li>– EN 61010-1</li> <li>– UL 3111-1</li> <li>– CAN/CSA C22.2 No. 1010.1</li> </ul>
<b>Test certificates</b>	UL, cUL	

## 8.2 Electrical data

Terminal assignment	Connection/wire color	Assignment
	Brown	NTC
	White	NTC
	Transparent	pH/ORP connection of the electrode
	Green + yellow	Reference connection of the electrode

## 8.3 Measurement conditions

Temperature range	Measuring medium	0 °C ... + 60 °C
	Storage/transport	- 5 °C ... + 65 °C

Pressure resistance	Armature with integrated electrode including connection cable	
	Max. allowed overpressure	10 <sup>6</sup> Pa (10 bar)
	Type of protection	IP 68 (106 Pa or 10 bar)

The Sensolyt 650-7 meet the requirements according to article 3(3) of the directive, 97/23/EC ("pressure equipment directive").



### Caution

**The pressure resistance of the operable pH/ORP armature can be reduced by the pressure resistance of the combination electrode. When selecting the combination electrode make sure it is suitable for the intended pressure and temperature range.**

Depth of immersion	min. 40 mm; max. 7 m depth
Operating position	Any
Fields of application	Water and wastewater monitoring

## 8.4 Characteristic data on delivery

Temperature measurement	Sensor accuracy	± 0.3 K
	Response time	t <sub>99</sub> (99 % of the final value display after) < 15 s





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