

<b>PHT 830</b>		<b>CT 830</b>
pH-Messgerät	/	Leitwert-Messgerät
pH-Meter	/	Conductivity Meter
pH-mètre	/	Conductimètre

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## Overview

The meter has been designed for analytical measurements. It is assumed that the user/operator and the maintenance personnel have the proper professional skills and experience to know the specific properties of analytical measuring systems, master the safe handling of chemicals, for example, in the maintenance of electrodes/sensors, and can assess any dangers and risks resulting thereof. The user must ensure that the national legislation and procedures concerning the maintenance of industrial health and safety standards, the accident preventions and the handling of chemicals are observed.



## Safety

This Operating Instructions Manual contains fundamental information that should be observed in connection with the installation, start-up, operation and maintenance of the instrument in connection with the sensor. Therefore, it is absolutely vital for the user to read this manual completely prior to working with it.

The complete meter has been manufactured and tested in accordance with the relevant guidelines and standards for electronic measuring equipment. It has left the factory in technically unobjectionable condition.



The perfect functioning and operational safety of the instrument and the accompanying components will only be ensured if the user observes the normal safety precautions as well as the specific safety guidelines stated in the present manual and in the relevant operating instruction manuals of the components contain replaceable components (exception of the battery) and must be opened for repair by proprietary workshops only. If there is reason to assume that the instrument can no longer be employed without a risk, it must be set aside and appropriately marked to prevent further use.



The safety of the user may be endangered, e. g. if the instrument or one of its components:

- shows visible damage
- no longer operates as specified
- has been stored over a longer period under unsuitable conditions
- has been subjected to difficult conditions during transport

If in doubt, please contact your supplier and sent back the instrument to the manufacturer for repair and maintenance.

## Sockets

### *Sensor*

2 sockets for connecting the sensor and the "Interface HMG USB" are located on the front side of the instrument.

Please use only the delivered original cable for the interface with the PC. For protecting the sockets against moisture and to avoid corrosion, the sensor should always be connected to the instrument and the "Interface HMG USB" socket should be sealed by means of the protection cap if it is not in use. The "Interface HMG USB" is not included in the delivery.

The measuring inputs must be potential-free and must have no connection to mains voltage potentials.



All inputs must be operated with the appropriate sensors only. Connect directly from foreign signals is not allowed.



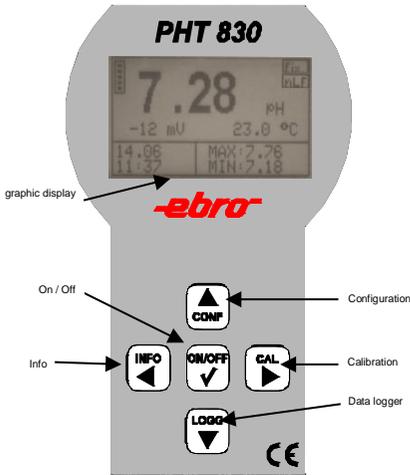
### *Battery*

Please open the battery chamber on the back side of the instrument and insert the battery correctly into the chamber.

Please use only leak proof alkaline manganese batteries from the type **AA, IEC R6, LR6** only.

After connecting and inserting the battery, please close the battery chamber carefully and correctly, to avoid moisture coming inside the device.

If the battery is in low condition, the device shows these with only 1 bar in battery indicator display. A change of the battery is recommended. If there is no bar in the display, the battery must be changed immediately.



## Buttons, Display, Password protection

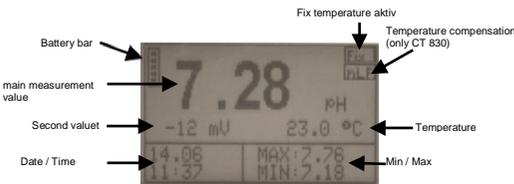
The instrument features easy operation by means of 5 buttons only and a plain text menu structure.

By pressing the button “ON/OFF“ the meter switches on. The meter switches off either automatically after a preset time-out or by long (approximately 3 seconds) pressing the “ON/OFF“ button

Open a menu	Information	Configuration	Data logger	Calibration	On / Off
Navigation in the menu	Cursor left	Cursor up	Cursor down	Cursor right	selection / ENTER
Input / change values	Cursor left	Position value +1	Position value -1	Cursor right	Confirm / save value

The calibration menu (CAL) and the configuration menu (CONF) are password-protected.

The default password for opening these menus is “1“.



### **Configuration pass word**

For configuration of the password do the following steps:

1. Open menu „general“
2. Select “Pass word“ and enter your new pass word
3. Retry the new pass word

Select the position you would like to change by using the buttons  or  and change with  or . Press the -button to accept and save the entry. To cancel the input dialogue without saving the value press  + .

### **Configuration clock**

For configuration of the clock do the following steps:

1. Open menu „general“
2. Select “clock“ and enter the time and date

Select the position you would like to change by using the buttons  or  and change with  or . Press the -button to accept and save the entry. To cancel the input dialogue without saving the value press  + .

### **Configuration language**

For configuration of the language do the following steps:

1. Open menu „general“
2. Select “language“ and enter the language

Select the position you would like to use by using the buttons  or . Press the  -button to accept and save the entry. To cancel the input dialogue without saving the value press  + .

### **Configuration off time**

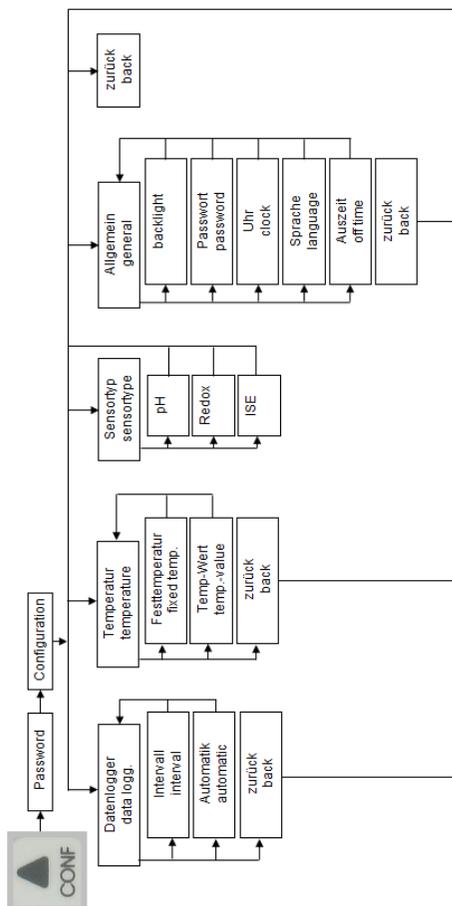
You can set the time when the meter switches off automatically. The data logger will continue to log, if it is set in para 4.6 (Data logger).

To configuration the off time do the following steps:

1. Open menu „general“
2. Select “off time“ and enter the time

Select the position you would like to change by using the buttons  or  and change with  or . Press the  -button to accept and save the entry. To cancel the input dialogue without saving the value press  + .

## Menu structure configuration

**PHT 830***Application field PHT 830*

The pH/Redox/ISE Meter measures pH,/Redox and ISE-potential and combines the features for mobile application in the field with the precision and comfort of a laboratory meter with plain text structure menu, integrated data logging system and a rugged watertight IP 65 enclosure

*Construction PHT 830*

The PHT 830 Set 1 comes completely with the accompanying pH-Sensor AT 830 pH K and accessories in a protective case. This combination operates in accordance with the standardized requirements for determination of pH; electrochemical probe method acc. EN ISO 10523:2012.

The PHT 830 has an automatic temperature compensation for the pH measurement as well as an adjustable reference temperature with measurements without temperature sensor. For calibration the automatic or manual calibration routine can be used.

*pH-Sensor AT 830 pH K*

The Sensor AT 830 pH K has a 1.50 m cable. This electrode features general application for laboratory and field.

*pH-Sensor AT 830 pH G*

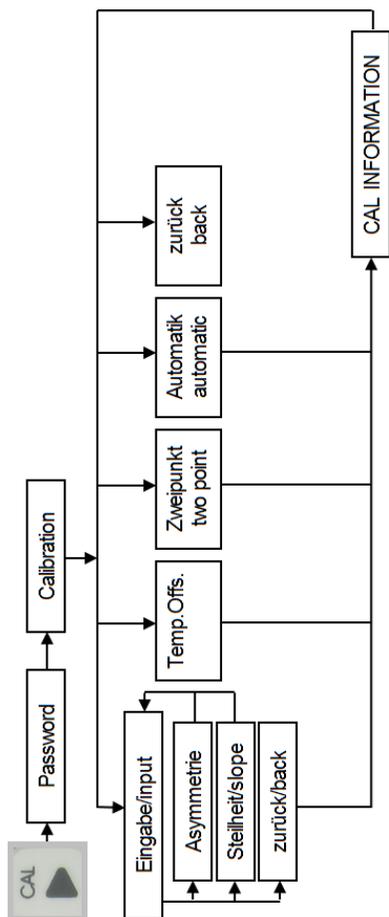
The Sensor AT 830 pH G has a 1.00 m cable. This electrode features general application for laboratory.

*pH-Sensor AT 830 pH E*

The Sensor AT 830 pH E has a 1.50 m cable. This electrode features general application for food.

Its built-in temperature probe Pt 1000 enables simultaneous measurement of pH and temperature as well as automatic temperature compensated pH measurement.

## Menu structure calibration



## Calibration pH

Open with  password the calibration menu.

All kinds of calibration method will be displayed. Choose now your method.

Take note of temperature compensation for all calibration methods. This means, if measured values are compensated by temperature measurement, the associated temperature sensor must also be dipped into the calibration medium to be able to determine the exact temperature.

Carefully rinse electrode with distilled/deionized water after each measurement to avoid carrying off of the measuring medium and sluggish measurement.

The sensor will be dipped in the buffer solution. Wait until the value is stabilized.

### Data input

Data input stands for the input of the specific values of the connected sensor, for example as determined at the laboratory before.

asymmetry / slope / back

Select the corresponding calibration value whose settings you want to change. An input dialogue will now enable you to change the values within corresponding limits. If you exceed these you will get an error message to prompt you to enter a value within the fixed limits.

Select the position you would like to change by using the buttons  or  and change with  or . Press the -button to accept and save the entry. To cancel the input dialogue without saving the value press  + .

### *Settings temperature offset*

This menu item enables you to set a temperature value offset. For this purpose open the menu item “temp. offs.”.

Now, an input dialogue will be displayed which facilitates the setting. The offset can be positive or negative.

Select the position you would like to change by using the buttons  or  and change with  or . Press the -button to accept and save the entry. To cancel the input dialogue without saving the value press  + .

### *Two-point-calibration*

Calibrate the sensor at two separate points using two different defined calibration solutions or known set point values. The calibration points are supposed to include the measuring range or the measured values to be expected, respectively. You can choose any sequence of the calibration solutions or set point values.

At first, you will be prompted to dip the sensor into the first calibration medium. After this step press . to accept the dialogue. Now, the currently measured value will be displayed.

After the measured value has attained a stable state, press  to accept the dialogue. You will now be prompted to enter the associated set point value.

Select the position you would like to change by using the buttons  or . Adjust the corresponding position with  or . Press the -button to accept and save the entry. To cancel the input dialogue without saving the value press  + . The next dialogue field will now prompt you to dip the sensor into the second calibration medium. After you have accepted this, the currently measured value will, again, be displayed. Press  again to accept the stabilized measured value, before you will be prompted to enter the associated set point value.

As a result, you will now be given the new calibration values that will be save in the device.

### *Automatic Calibration*

The automatic calibration of the pH measurement is a two-point type and requires knowledge of what buffer solution group you want to use

You must take a choice in the first dialogue box of the used buffer solutions. For further conditions and tips, please refer to the sensor specifications.

As a result, you will now be given the new calibration values that will be save in the device.

### *Calibration error*

In the PHT 830 predefined ranges for the calibration values are stored. If the determined calibration value is out of the range the message **!Out of limit!** appears in the calibration information. The determined calibration value will be stored nevertheless, so that the measuring and controlling is secured. In this case a new calibration or a replace of the sensor is necessary.

## CT 830

### Application fields CT 830

The CT 830 measures the electrical conductivity, the salinity and the temperature in accordance with the German standard methods for the examination of water, waste water and sludge and combines the features for mobile application in the field with the precision and comfort of a laboratory meter.

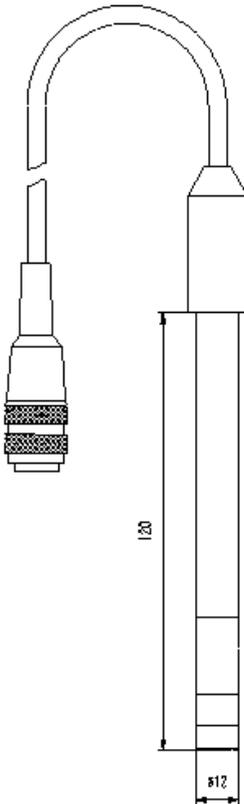
#### *Construction CT 830*

CT 830 Set comes completely with the conductivity sensor AT 830 C and accessories in a protective case.

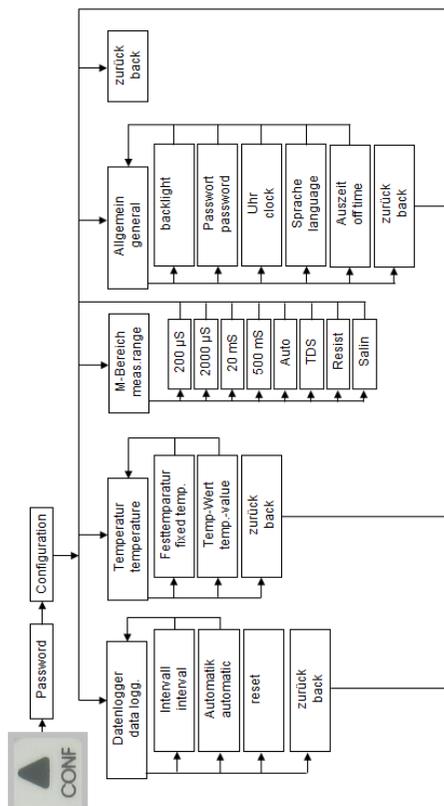
This combination operates in accordance with the standardized requirements for determination of conductivity; electrochemical probe method acc. EN ISO 27888:1993. The instrument in connection with the sensor indicates the conductivity in aqueous solutions in  $\mu\text{S}$  or  $\text{mS}$  as well as the relevant temperature simultaneously.

#### *Conductivity sensor AT 830 C*

The Conductivity Cell AT 830 C has a fixed cable connection to the meter with a length of 1.50 m and is ideal for general applications in laboratory and field. Two special graphite electrodes sealed in epoxy feature high mechanical stability, easy purification and low maintenance. A temperature sensor with low response time is integrated in the cell for automatic temperature compensation and parallel measurement.



## Menu structure configuration



## Calibration Conductivity

Open with  + password the calibration menu.

All kinds of calibration method will be displayed. Choose now your method. Take note of temperature compensation for all calibration methods. This means, if measured values are compensated by temperature measurement, the associated temperature sensor must also be dipped into the calibration medium to be able to determine the exact temperature.

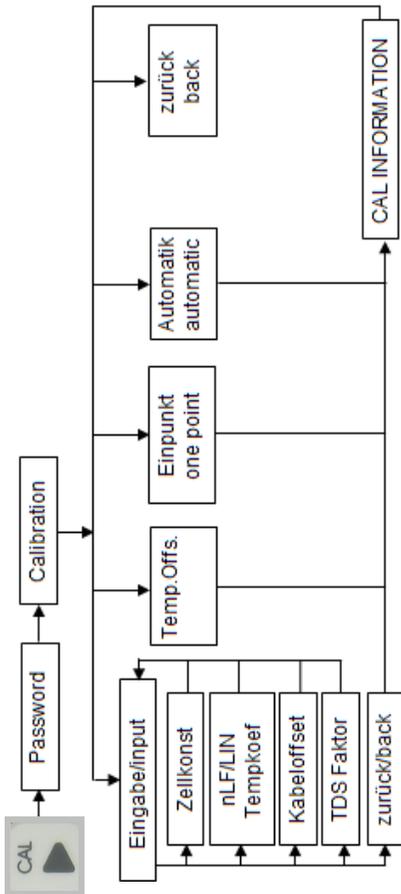
Carefully rinse electrode with distilled/deionized water after each measurement to avoid carrying off of the measuring medium and sluggish measurement. The Sensor will be dipped in the buffer solution. Wait until the value is stabilized.

### Data input

Data input stands for the input of the specific values of the connected sensor, for example as determined at the laboratory before.

Select the corresponding calibration value whose settings you want to change. An input dialogue will now enable you to change the values within corresponding limits. If you exceed these you will get an error message to prompt you to enter a value within the fixed limits.

## Menu structure calibration



cell const. → cell constant  
 nLF/LIN temp coef. → temperature compensation  
 +temperature coefficient  
 cable offset. → cable offset  
 TDS factor → TDS factor  
 back → back

Settings for temperature compensation:

**Lin:** Linear temperature compensation with adjustable temperature coefficient

**nLF:** non-linear temperature compensation for natural water according to DIN EN 27888.

**off:** For measuring without temperature compensation the temperature coefficient in **Lin** **must be set at „0 %/K“**

In Case of measurements with temperature compensation the conductivity value will be **calculated to the reference temperature of 25 °C.**

The **salinity measuring** (second value) will be **calculated** every time regarding a **reference temperature of 15 °C** (according to IOT).

For calculation of **TDS** (second value) the **nonlinear temperature compensation with a reference temperature of 25 °C** will be used every time.

Select the position you would like to change by using the buttons or and change with or . Press the -button to accept and save the entry. To cancel the input dialogue without saving the value press + .

### *Settings Temperature offset*

This menu item enables you to set a temperature value offset. For this purpose open the menu item “temp.off.s.”. Now an input dialogue will be displayed which facilitates the setting. The offset can be positive or negative.

Select the position you would like to change by using the buttons  or  and change with  or . Press the  -button to accept and save the entry. To cancel the input dialogue without saving the value press  + .

### *One-point-calibration*

Calibrate the measuring signal at this one point using a defined calibration solution or a known set point value, e. g. determined by a separate method or by means of another laboratory/field instrument. At first, you will be prompted to dip the sensor into the corresponding calibration medium.

After this step press to accept the dialogue. Now, the currently measured value will be displayed. After the measured value has attained a stable state, accept the dialogue again by pressing . You will now be prompted to enter the set point value. Select the position you would like to change by using the buttons  or  and change with  or . Press the  -button to accept and save the entry. To cancel the input dialogue without saving the value press  + . As a result, you will now be given the new calibration values that will be save in the device.

### *Automatic calibration*

The automatic calibration of the conductivity measurement is a single-point calibration.

The temperature-correction-curves for the following conductivity standard solutions are stored in the CT 830:

C-Solution 0.01 N KCl: 1413  $\mu\text{S}/\text{cm}$  (25 °C)

C-Solution 0.1 N KCl: 12.9  $\text{mS}/\text{cm}$  (25 °C)

At first, you will be prompted to dip the sensor into the corresponding calibration medium.

After this step press  to accept the dialogue. Now, the currently measured value will be displayed. After the measured value has attained a stable state, accept the dialogue again by pressing .

As a result, you will now be given the new calibration values that will be save in the device.

### *Calibration error*

In each device predefined ranges for the calibration values are stored. If the determined calibration value is out of the range the message **!Out of limit!** appears in the calibration information. The determined calibration value will be stored nevertheless, so that the measuring and controlling is secured. As the case a new calibration or a replace of the sensor is necessary.

## Configuration

### *Configurieren of the fix temperature*

The analysis parameter conductivity can be calculated with a temperature compensation. For that the temperature of the measuring and of the calibration fluid must be measured or a fix temperature must be configured. If the fix temperature is activated this will be used for the temperature compensation, in this case the message **Fix** appears in the right upper display corner.

For configuration the fix temperature do the following steps:

1. open the menu „temperature“
2. activate / deactivate the fix temperature in the menu item „fixed temp.“
3. enter the fix temperature value in the menu item „ temp.-value“

Select the position you would like to change by using the buttons  or  and change with  or . Press the -button to accept and save the entry. To cancel the input dialogue without saving the value press  + .

### *Configuration of the measuring range*

For measuring the conductivity in a proper accuracy the actual conductivity measuring range has to be configured. The useful measuring ranges depend on the cell constant and on the measuring cell used.

For configuration of the measuring range do the following steps:

1. open the menu „meas.range“
2. select the actual measuring range
  - 0 ... 200  $\mu$ S
  - 0 ... 2000  $\mu$ S
  - 0 ... 20 mS
  - 0 ... 500 mS

- Auto > automatically selects the correct range
- TDS > shows the calculated value as a by-value
- Resist > shows the calculated value as a by-value
- Salin > shows the calculated value as a by-value

Select the position you would like to change by using the buttons  or . Press the  -button to accept and save the entry. To cancel the input dialogue without saving the value press  + .

## Specification

### Configuration

directly with the device by 5 Keys and Display (plain text menu structure) or by means of the PC interface and corresponding configuration program

### Display

graphic LCD Display, 128 x 64 Pixel, backlight

### Interface

USB with "Interface IF830", isolated

### Power supply

3 Batteries Type AA, LR6, 1,5 V

### Ambient temperature

-10 ... 55 °C

### Relative humidity

max. < 95% (non condensing)

### Connectors

connector BK for Sensor  
4-pole USB Interface socket

### Housing

ABS, IP 65

### Dimensions

200 x 95 x 40 mm (BxWxT)

### Weight

290 g incl. Batteries

### Measurement range PHT 830

pH: 0 ... 14, -1999 ... 1999 mV  
Temperature: -10 ... 100 °C  
Resolution: 0.01 pH; 1 mV; 0.1 °C

### Accuracy PHT 830

pH: ± 0.03  
Temperature: ± 0.1 °C

**Measurement range CT 830**

0 ... 200  $\mu$ S, TDS 0 ... 200 mg/l  
 0 ... 2000  $\mu$ S, TDS 0 ... 2000 mg/l  
 0 ... 20 mS, TDS 0 ... 20 g/l  
 0 ... 500 mS, TDS 0 ... 500 g/l  
 automatic range  
 calculated resistance value  
 calculated salinity value

Temperature: -10 ... 100 °C

**Resolution:**

0.1  $\mu$ S; 1  $\mu$ S; 0.01 mS; 0.1 mS, 0.1 °C

**Accuracy CT 830**

Conductivity:  $\pm$  0,5 % FS  
 Temperature:  $\pm$  0.1 °C

Recommended electrodes / sensors suitable for connection to the device in accordance with the individual detailed technical data sheets.

**Service, disposal**

The device is practically maintenance-free. The unit should occasionally be wiped with a damp, lint-free cloth.

For the maintenance and storage of the sensors, the respective operating instructions must be observed.

**Note:**

This device contains batteries. Batteries must be disposed of only at the collection points for furnished or the point of sale.

**Approvals**

CE



**Service-Adresse / Service Address / Adress du Service**

Xylem Analytics Germany Sales GmbH & Co. KG

ebro

Dr.-Karl-Slevogt-Str. 1

82362 Weilheim

Germany

Phone: +49.(0)841.954.78.0

Fax: +49.(0)841.954.78.80

Internet: [www.ebro.com](http://www.ebro.com)

E-Mail: [ebro@xyleminc.com](mailto:ebro@xyleminc.com)

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**Hersteller / Producer / Fabricant**

Xylem Analytics Germany GmbH

Dr.-Karl-Slevogt-Str. 1

82362 Weilheim

Germany