bürkert
FLUID CONTROL SYSTEMS

Type 8202

pH or redox transmitter

pH- oder Redox-Transmitter

Transmetteur de pH ou de potentiel d'oxydo-réduction

Operating Instructions

Bedienungsanleitung
Manuel utilisateur

bürkert
FLUID CONTROL SYSTEMS

EG-Konformitäts-Erklärung	EC Declaration of Conformity	Déclaration de Conformité CE
Wir erklären in alleiniger Verantwortung, dass die mit CE gekennzeichneten Produkte	We declare under our sole responsibility, that the CE marked products	Nous déclarons sous notre seule responsabilité que les appareils marqués CE
Typ: 8202	**Model: 8202**	**Type : 8202**
Beschreibung: **PH - Transmitter**	**Description:** **PH transmitter**	**Description :** **Transmetteur de PH**
Die grundlegenden Anforderungen der Richtlinien erfüllen	Fulfils the essential requirements of the Directives	Sont conformes aux exigences essentielles des directives
- 2004/108/EG (EMV) - 97/23/EG (Druck) Artikel 3§3 - 2002/95/CE (ROHS)	- 2004/108/EC (EMC) - 97/23/EC (pressure) article 3 §3 - 2002/95/CE (ROHS)	- 2004/108/CE (CEM) - 97/23/CE (pression) : article 3 §3 - 2002/95/CE (ROHS)

Für die Richtlinie 97/23/EG Druck, Das Produkt kann nur in der folgenden Bedingungen verwenden werden (abhängig von dem max Druck , DN der Rohrleitung, der Flüssigkeit und die Elektrode)

Typ Flüssigkeit	Bedingungen
Gruppe 1 §1.3.a	Nur DN25
Gruppe 2 §1.3.a	DN≤32 oder DN>32 +PN*DN≤1000
Gruppe 1 §1.3.b	DN ≤25 oder DN>25 und PN*DN≤2000
Gruppe 2 §1.3.b	DN ≤125

About the pressure directive 97/23/CE, the device can be used only under the following conditions (depending on the max.pressure, the pipe DN ,the type of fluid and the electrode)

Type of fluid	Conditions
Fluid group 1 §1.3.a	DN25 only
Fluid group 2 §1.3.a	DN≤32 or DN>32 + PN*DN≤1000
Fluid group 1 §1.3.b	DN ≤25 or DN>25 and PN*DN≤2000
Fluid group 2 §1.3.b	DN ≤125

Pour la directive pression 97/23/CE, le produit ne peut être utilisé que dans les cas suivants (en fonction de la pression max, du DN de la conduite du type de fluide et du type d'électrode)

Type de fluide	Conditions
Fluide groupe 1 §1.3.a	DN25 uniquement
Fluide groupe 2 §1.3.a	DN≤32 ou DN>32 et PN*DN≤1000
Fluide groupe 1 §1.3.b	DN ≤25 ou DN>25 et PN*DN≤2000
Fluide groupe 2 §1.3.b	DN ≤125

SAS BÜRKERT

BP 21
67220 Triembach au Val
Triembach au Val, le 05/03/2008
Quality Assurance

Bruno Thouvenin

pH or redox transmitter Type 8202

Contents:

1. ABOUT THIS MANUAL

This manual describes the entire life cycle of the device. Please keep this manual in a safe place, accessible to all users and any new owners.

This manual contains important safety information.

Failure to comply with these instructions can lead to hazardous situations.
▪ This manual must be read and understood.

1.1. Symbols used

⚠ **DANGER**

Warns you against an imminent danger.
▪ Failure to observe this warning can result in death or in serious injury.

⚠ **WARNING**

Warns you against a potentially dangerous situation.
▪ Failure to observe this warning can result in serious injury or even death.

⚠ **CAUTION**

Warns you against a possible risk.
▪ Failure to observe this warning can result in substantial or minor injuries.

NOTE

Warns you against material damage.
▪ Failure to observe this warning can result in damage to the device or system.

🛈 indicates additional information, advice or important recommendations for your safety and for the correct operation of the device.

📖 refers to information contained in this manual or in other documents.

→ indicates a procedure to be carried out.

2. INTENDED USE

Use of the pH/Redox transmitter that does not comply with the instructions could present risks to people, nearby installations and the environment.

▪ The 8202 transmitter is intended solely for the measurement of:

  - the pH in clean liquids or liquids containing solids, sulphides or proteins.

  - or the oxidation reduction potential in clean liquids or liquids containing solids, sulphides or proteins which may present low conductivity.

▪ This device must be protected against electromagnetic interference, ultraviolet rays and, when installed outdoors, the effects of the climatic conditions.

▪ This device must be used in compliance with the characteristics and commissioning and use conditions specified in the contractual documents and in the user manual.

▪ Requirements for safe and proper operation are proper transport, storage and installation as well as careful operation and maintenance.

▪ Only use the device as intended.

2.1. Restraints

Observe any existing restraints when the device is exported.

2.2. Foreseeable misuse

▪ The 8202 transmitter must not be used in a potentially explosive atmosphere.

▪ Do not use fluid that is incompatible with the materials of which the transmitter is made.

▪ Do not subject the device to mechanical loads (e.g. by placing objects on top of it or by using it as a step).

▪ Do not make any external modifications to the device. Do not paint or varnish any part of the device.

3. BASIC SAFETY INFORMATION

This safety information does not take into account:

- any contingencies or occurences that may arise during assembly, use and maintenance of the devices.
- the local safety regulations that the operator must ensure the staff in charge of assembly observe.

⚠️

Danger due to high pressure
- Cut off the pressure and depressurize the pipes before loosening the pipes and fittings.

Danger due to electrical voltage
- Before starting work, make sure that you switch off the supply voltage and secure it to prevent restarting.
- Observe all applicable accident protection and safety guidelines for electrical equipment.

Danger due to high temperatures of the fluid
- Use safety gloves to handle the device.
- Stop the circulation of fluid and purge the pipe before loosening the pipes and connections.
- Keep all easily flammable fabrics and fluids away from the device. Do not insulate the device.

Danger due to the nature of the fluid.
- Respect the prevailing rules on accident prevention and safety relating to the use of aggressive fluids.

⚠️

Various dangerous situations

To avoid injury take care to:
- prevent any power supply switch on.
- carry out the installation and maintenance work by qualified and skilled staff with the appropriate tools.
- guarantee a set or controlled restarting of the process, after a power supply interruption.
- use the device only if in perfect working order and in compliance with the instructions provided in the user manual.
- observe the general technical rules during the planning and use of the device.

NOTE

Chemical compatibility of materials in contact with the fluid.
- Systematically check the chemical compatibility of the component materials of the transmitter and the products likely to come into contact with it (for example: alcohols, strong or concentrated acids, aldehydes, alkaline compounds, esters, aliphatic compounds, ketones, halogenated aromatics or hydrocarbons, oxidants and chlorinated agents).

NOTE

Elements / Components sensitive to electrostatic discharges

▪ This device contains electronic components sensitive to electro-static discharges. They can get damaged if they are touched by an electrostatically charged person or object. In the worst case scenario, these components are instantly destroyed or go out of order as soon as they are activated.

▪ To minimise or even avoid all damage due to an electrostatic dis-charge, take all the precautions described in the EN 100 015-1 norm.

▪ Also ensure that you do not touch any of the live electrical com-ponents.

The transmitter type 8202 was developed with due consid-eration given to accepted safety rules and is state-of-the-art. However, risks may arise.

Failure to observe these instructions as well as any unauthorised work on the device excludes us from any liability and also nullifies the warranty which covers the device and its accessories.

4. GENERAL INFORMATION

4.1. Contents of the delivery

When you receive the merchandise, make sure that the contents of the delivery have not been damaged in any way and ensure that they correspond exactly with the delivery note or packing list.

If this is not the case, contact us immediately.

The addresses of our international branches can be found on the last pages of this manual.

Also on the internet, at:

www.burkert.com ➔ Bürkert ➔ Company ➔ Locations

4.2. Warranty conditions

This document does not contain any warranty conditions. To find out this information, please refer to our general sales terms. The condi-tion to benefit from the warranty is the conforming use of the 8202 in observance of the specified conditions of operating.

The warranty only extends to defects in the transmitter type 8202 and its components.

We accept no liability for any kind of consequential damage which may occur due to the failure or the malfunctioning of the device..

4.3. Information on the internet

You can find the user manuals and technical data sheets regarding the type 8202 at:

www.burkert.com ➜ Documentation➜ Datasheets or Manuals/Approvals ➜ Type 8202

The complete manual can be ordered under code: 560329

5. DESCRIPTION

5.1. Area of application

The 8202 transmitter is intended solely for the measurement of:

▪ the pH in clean liquids or liquids containing solids, sulphides or proteins.

▪ or the oxidation reduction potential in clean liquids or liquids containing solids, sulphides or proteins which may present low conductivity.

Thanks to 2 fully programmable transistor outputs, the transmitter can be used to switch a solenoid valve, activate an alarm and, thanks to 1 or 2 4-20 mA current outputs, establish one or two control loops.

5.2. General description

5.2.1. Design

The 8202 transmitter comprises:

▪ a module for measuring physical parameters, comprising:

- a pH or Redox sensor measuring a potential difference (PD) in mV

- a Pt1000 temperature sensor integrated in the armature of the pH or Redox sensor measuring a resistance.

• an acquisition / conversion module for the physical parameters measured:

   - PD acquisition measured in mV

   - conversion of the measured PD into pH units (for a transmitter with pH sensor only)

   - acquisition of the resistance measured and conversion into temperature

• a display module with browse button used to read and/or config-ure the parameters of the device. The display module is available as an accessory.

One version of the 8202 transmitter with 2 transistor outputs and a 4-20 mA outlet operates on a 2-wire system and requires a power supply of 14-36 VDC. For such a version, electrical connection is done via an M12, 5-point, male fixed connector.

One version of the 8202 transmitter with 2 transistor outputs and 2 4-20 mA outlets operates on a 3-wire system and requires a power supply of 12-36 VDC. For such a version, electrical connec-tion is done via an M12, 5-point, male fixed connector and an M12, 5-point, female fixed connector.

5.2.2. pH or Redox sensor

The 8202 transmitter can be fitted with a standard sensor 120 mm long, measuring the pH or the oxidation reduction potential.

It is screwed into an armature with the built-in Pt1000 temperature sensor.

The pH or Redox sensor is a glass membrane with variable selectiv-ity according to the pH or the Redox:

• When the pH sensor is immersed in a solution, a difference in po-tential is formed, due to the hydrogen ions (H^+), between the glass membrane and the solution. This difference in potential, measured in relation to a reference electrode, is directly proportional to the pH value (59.16 mV per pH unit at 25°C).

• When a Redox sensor is immersed in a solution, an exchange of electrons occurs between the oxidised form and the reduced form of an electrolyte. The resulting voltage is the oxidation reduction potential.

5.3. Description of the label
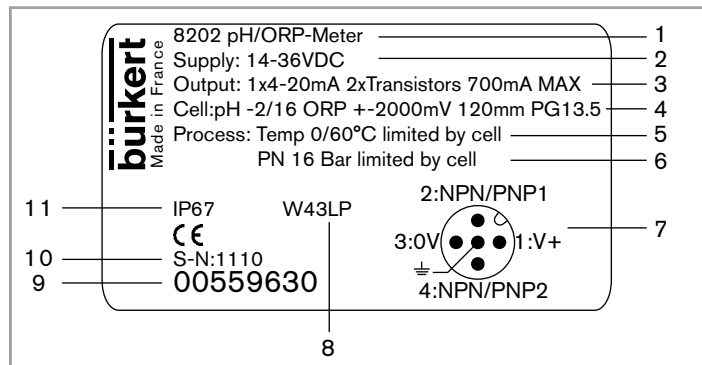
Fig. 5.1 Label on the 8202 transmitter

1. Type of transmitter and parameter measured
2. Electrical power supply
3. Output specifications
4. Sensor specifications
5. Temperature range of the fluid, without sensor
6. Nominal pressure of the fluid, without sensor
7. Allocation of the pins on the M12 fixed connectors
8. Manufacturer code
9. Order reference
10. Serial number
11. Protection rating

5.4. Versions available

The following versions of the 8202 pH transmitter are available. These references include the electronic module and the sensor armature including the Pt1000.

The pH/Redox sensor, the display module and the fitting for connection to the process should be ordered separately. For the pH/Redox sensor and the display module, see the list of accessories in Chapter 12.

Supply voltage	Outputs	Sensor	Electrical connection	Union nut material	Order code
14-36 VDC	2 transistors + 1 x 4-20 mA	without	M12, 5-pin male fixed connector	PVC	559630
				PVDF	559632
12-36 VDC	2 transistors + 2 x 4-20 mA	without	M12, 5-pin male fixed connector and M12, 5-pin female fixed connector	PVC	559631
				PVDF	559633

6. TECHNICAL DATA

6.1. Conditions of use

Ambient temperature: -10 to +60°C (operating and storage without the pH/Redox sensor)

Air humidity: < 85%, non condensated

Protection rating: IP67 with connectors plugged in and tightened and electronic module cover fully screwed down

6.2. Conformity to standards and directives

- EMC: EN 61000-6-2, EN 61000-6-3
- Vibration: EN 60068-2-6
- Shock: EN 60068-2-27

- Pressure: complying with article 3 of §3 from 97/23/CE directive.

  Acc. to the 97/23/CE pressure directive, the device can only be used in the following cases (depending on max. pressure, pipe diameter and fluid):

Type of fluid	Conditions
Fluid group 1, §1.3.a	only DN25
Fluid group 2, § 1.3.a	DN ≤ 32 or DN > 32 and PNxDN ≤ 1000
Fluid group 1, § 1.3.b	DN ≤ 25 or DN > 25 and PNxDN ≤ 2000
Fluid group 2, § 1.3.b	DN ≤ 125

6.3. General technical data

6.3.1. Mechanical data

Component	Material
Box / seals	stainless steel, PPS / EPDM
Cover / seal	PC / EPDM
Display module	PC / PBT
M12 fixed connector	nickel-plated brass
Fixed connector base	stainless steel 1.4404 (316L)
Screw	stainless steel
Tightening nut	PVC or PVDF
Sensor armature / seal	PVDF, stainless steel 1.4571 (316Ti) / EPDM
pH or Redox sensor	refer to the corresponding manual

▪ Materials in contact with the fluid:
PVDF, stainless steel 1.4571 (316Ti). Also refer to the sensor user manual, particularly for sensors other than those manufactured by Bürkert.

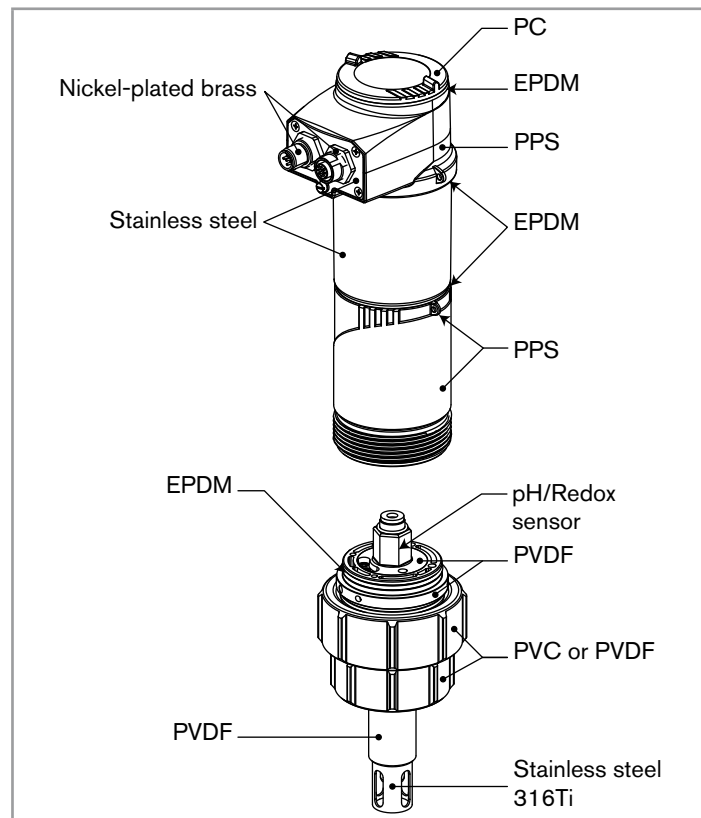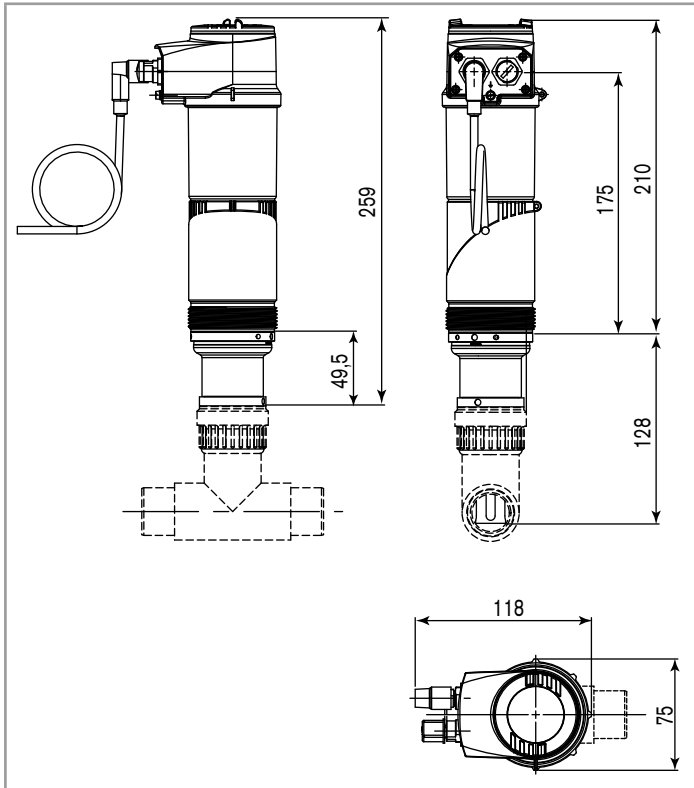*Fig. 6.1 Materials used in the 8202 transmitter*

Fig. 6.2 Dimensions of the 8202 transmitter [mm]
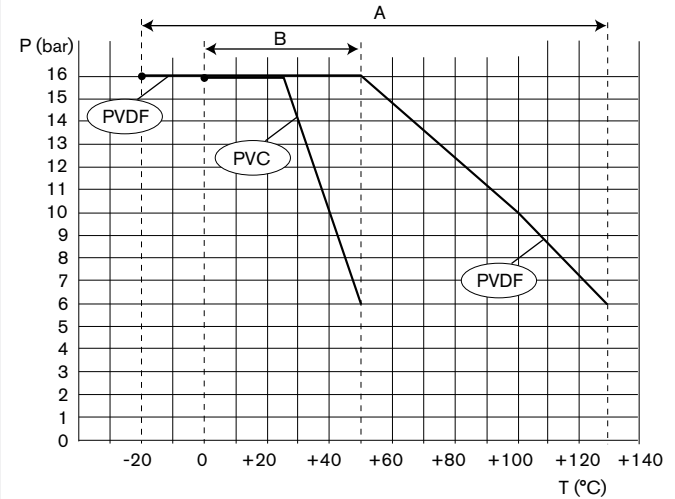
- A: application range of a 8202 with a PVDF nut
- B: application range of a 8202 with a PVC nut

The measures have been made at an ambient temperature of 60 °C

Fig. 6.3 Fluid temperature and pressure dependency (8202, without sensor)

6.3.2. General data

Diameter of the pipes	DN25 to DN125 (DN15 to DN20 depending on conditions)
Type of fitting	PVC or PVDF; ▪ 32 equal 90° Tee (pipe DN25) ▪ d-32-d reducing 90° Tee (pipe ≥ 32) ▪ 25-32-20-25 reducing bushes (pipe DN15) or 32-25 reducing bushes (pipe DN20), mounted on a 32 equal 90° Tee fitting
Union nut for connection to the fitting	G 1 1/2" internal thread
Fluid pressure	PN16 (see fig. 6.3); fluid pressure may be limited by the sensor used: see corresponding instruction manual
Fluid temperature	depends on used sensor (see corresponding instruction manual and fig. 6.3)
pH measurement ▪ Measurement range ▪ Resolution ▪ Measurement error ▪ Recommended min. divergence of the pH range corresponding to the 4-20 mA signal	 ▪ -2 to 16 pH or -580 to +580 mV ▪ 0.001 pH or 0.1 mV ▪ ±0.02 pH or 0.5 mV ▪ 0.5 pH unit or 30 mV (eg: range 6.7 to 7.2 pH or -20 mV to +10 mV corresponds to the 4-20 mA output current)

Redox potential measurement ▪ Measurement range ▪ Resolution ▪ Measurement error ▪ Recommended min. divergence of the redox range corresponding to the 4-20 mA signal	 ▪ -2000 mV to +2000 mV ▪ 1 mV ▪ ±3 mV ▪ 50 mV (eg: range 1550 to 1600 mV corresponds to the 4-20 mA output current)
Temperature sensor	Pt1000 integrated in the sensor armature
Temperature measurement ▪ Measurement range ▪ Resolution ▪ Measurement error ▪ Recommended min. divergence of the temperature range corresponding to the 4-20 mA signal	 ▪ -40 °C to +130 °C ▪ 0.1°C ▪ ±1°C ▪ 10 °C (eg: range 10 to 20 °C corresponds to the 4-20 mA output current)
Temperature compensation	automatic (integrated Pt1000) Reference temperature = 25°C

6.3.3. Electrical data

Power supply	
▪ version with 3 outputs	▪ 14-36 VDC, filtered and regulated
▪ version with 4 outputs	▪ 12-36 VDC, filtered and regulated
Consumption, with charges on transistors	≤ 2 A
Power consumption (without charge):	
▪ version with 3 outputs	▪ ≤ 25 mA (at 14 VDC)
▪ version with 4 outputs	▪ ≤ 5 mA (at 12 VDC)
Protection against polarity reversal	yes
Protection against spike voltages	yes
Protection against short circuits	yes, for the transistor outputs
Transistor output	NPN (/sink) or PNP (/source) (depending on programming), collector open, 700 mA max. NPN output: 0.2-36 VDC PNP outlet: supply voltage

Current output	4-20 mA, sink or source (depending on programming)
▪ Response time (10% - 90%)	▪ 150 ms (by default)
▪ version with 1 current output	▪ max. loop impedance: 1100 Ω at 36 VDC, 610 Ω at 24 VDC, 180 Ω at 14 VDC
▪ version with 2 current outputs	▪ max. loop impedance: 1100 Ω at 36 VDC, 610 Ω at 24 VDC, 100 Ω at 12 VDC

6.3.4. Electrical connections

Number of fixed connectors	Type of cable plug
1 M12 male fixed connector	female M12, 5-pin (not supplied)
1 M12 male fixed connector + 1 M12 female fixed connector	female M12, 5-pin (not supplied) + male M12, 5-pin (not supplied)
Type of cable recommended	shielded

6.3.5.   pH / Redox sensor

Sensor	pH or Redox sensor, combined, 120 mm long with head PG 13.5, without temperature sensor
LOGOTRODE pH	
▪ Type of fluid	▪ clean
▪ Measurement range	▪ 2 to 14 pH
▪ Fluid pressure	▪ 0 to 6 bar
▪ Fluid temperature	▪ -10 to +60°C (see fig. 6.3)
▪ Ambient temperature	▪ 0 to +60°C (when running) +4 to +30°C (storage)
▪ Minimum conductivity	▪ 2 µS/cm
▪ Max. pressure at max. temperature	▪ 6 bar
▪ Number and type of dia-phragms	▪ 1 "single pore™"
▪ Reference electrolyte	▪ polymer

UNITRODE PLUS pH	
▪ Type of fluid	▪ contaminated or containing sul-phides or proteins
▪ Measurement range	▪ 0 to 14 pH
▪ Fluid pressure	▪ 0 to 6 bar
▪ Fluid temperature	▪ 0 to +130°C (see fig. 6.3)
▪ Ambient temperature	▪ 0 to +60°C (when running) +4 to +30°C (storage)
▪ Minimum conductivity	▪ 2 µS/cm
▪ Max. pressure at max. temperature	▪ 6 bar
▪ Number and type of dia-phragms	▪ 2 "single pore™"
▪ Reference electrolyte	▪ polymer

CERATRODE pH	
▪ Type of fluid	▪ at high pressure, a high flow rate
▪ Measurement range	▪ 0 to 14 pH
▪ Fluid pressure	▪ 0 to 16 bar
▪ Fluid temperature	▪ 0 to +130°C (see fig. 6.3)
▪ Ambient temperature	▪ 0 to +60°C (when running) +4 to +30°C (storage)
▪ Minimum conductivity	▪ 50 µS/cm
▪ Max. pressure at max. temperature	▪ 6 bar
▪ Number and type of dia-phragms	▪ 3 in ceramic HP
▪ Reference electrolyte	▪ gel

PLASTRODE pH	
▪ Type of fluid	▪ drinking, aquarium or swimming pool water
▪ Measurement range	▪ 0 to 14 pH
▪ Fluid pressure	▪ 0 to 6 bar
▪ Fluid temperature	▪ -10 to +40°C (see fig. 6.3)
▪ Ambient temperature	▪ 0 to +60°C (when running) +4 to +30°C (storage)
▪ Minimum conductivity	▪ 2 µS/cm
▪ Max. pressure at max. temperature	▪ 6 bar
▪ Number and type of dia-phragms	▪ 1 "single pore™"
▪ Reference electrolyte	▪ polymer

LOGOTRODE redox	
▪ Type of fluid	▪ clean
▪ Measurement range	▪ -2000 to +2000 mV
▪ Fluid pressure	▪ 0 to 6 bar
▪ Fluid temperature	▪ -10 to +50°C (see fig. 6.3)
▪ Ambient temperature	▪ 0 to +60°C (when running) +4 to +30°C (storage)
▪ Minimum conductivity	▪ 2 µS/cm
▪ Max. pressure at max. temperature	▪ 6 bar
▪ Number and type of dia-phragms	▪ 1 "single pore™"
▪ Reference electrolyte	▪ polymer

UNITRODE PLUS redox	
▪ Type of fluid	▪ clean, contaminated, with low conductivity, containing sulphides or proteins
▪ Measurement range	▪ -2000 to +2000 mV
▪ Fluid pressure	▪ 0 to 6 bar
▪ Fluid temperature	▪ 0 to +130°C (see fig. 6.3)
▪ Ambient temperature	▪ 0 to +60°C (when running) +4 to +30°C (storage)
▪ Minimum conductivity	▪ 2 µS/cm
▪ Max. pressure at max. temperature	▪ 6 bar
▪ Number and type of dia-phragms	▪ 2 "single pore™"
▪ Reference electrolyte	▪ polymer

7. ASSEMBLY

7.1. Safety instructions

⚠️ **DANGER**

Risk of injury due to high pressure in the installation.

▪ Cut off the pressure and depressurize the pipes before loosening the pipes and fittings.

Risk of injury due to electrical discharge.

▪ Before starting work, switch off the power supply and secure it to prevent restarting.

▪ Observe all applicable accident protection and safety guidelines for electrical equipment.

Risk of injury due to the nature of the fluid.

▪ Respect the prevailing rules on accident prevention and safety relating to the use of aggressive fluids.

⚠️ **WARNING**

Risk of injury due to non-conforming assembly.

▪ The device must only be assembled by qualified and skilled staff with the appropriate tools.

Risk of injury due to unintentional switch on of power supply or uncontrolled restarting of the installation.

▪ Take appropriate measures to avoid unintentional activation of the installation.

▪ Guarantee a set or controlled restarting of the process subsequent to the assembly of the device.

7.2. Unscrew the cover

NOTE

The tightness of the transmitter is not guaranteed when the cover is removed.

▪ Take any precautions necessary to prevent the projection of fluid inside the box.

The transmitter may be damaged if a metal component comes into contact with the electronics.

▪ Take any precautions necessary to prevent contact of the electronics with a metal component (screwdriver, for example).

	→ To unscrew the cover, use your hand or a tool which can be used as a lever, taking care not to scratch the glass
	→ Turn the cover until fully unscrewed
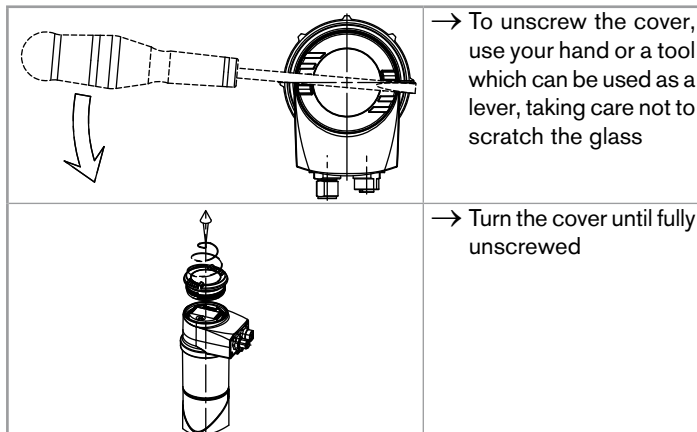
Fig. 7.1 Unscrewing the cover

7.3. Fitting the cover

	→ Check that there is a seal on the cover and that it is not damaged. Replace it if necessary. → Grease the seal if necessary, using a component compatible with the material from which it is made.
	→ Fully tighten by hand to guarantee tightness.
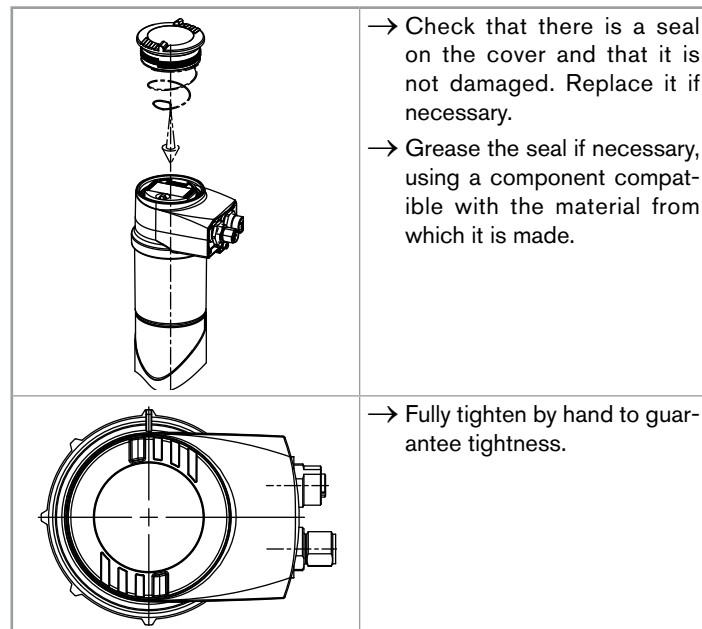
Fig. 7.2 Fitting the cover

7.4. Fitting the display module

20°	→ Unscrew the cover (see § 7.2). → Set the display module at an angle of ca. **20°** in relation to the desired position.
a) c) b) d)	→ The module can be fitted in 4 different positions, at 90° intervals.
LOCK	→ Fully push in the module and, using the palm of your hand, turn to the right to lock it.
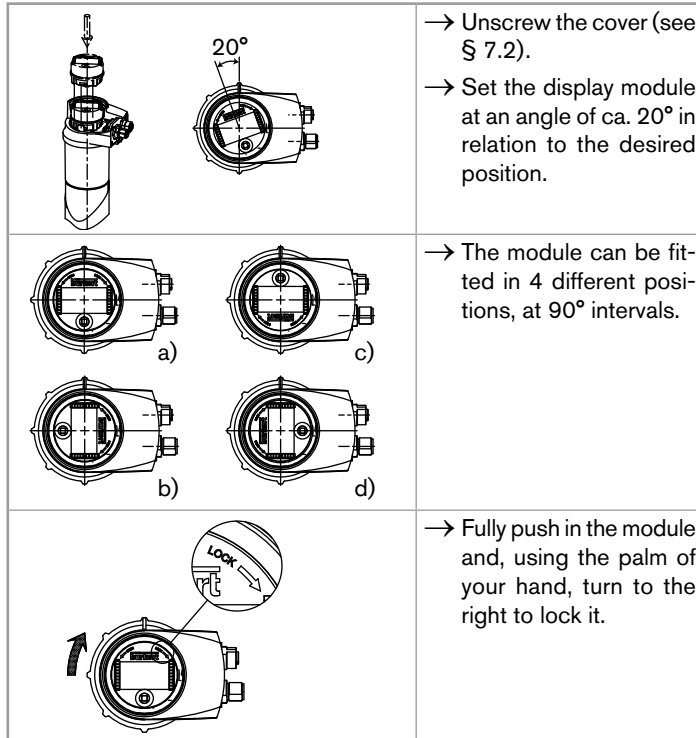
Fig. 7.3 Fitting the display module

7.5. Removing the display module

20° OPEN	→ Unscrew the cover if necessary (see § 7.2). → Place the palm of your hand flat on the module and turn by ca. **20°** to the left. Once unlocked, the module is raised slightly by the spring action.
	→ Remove the module from its housing.
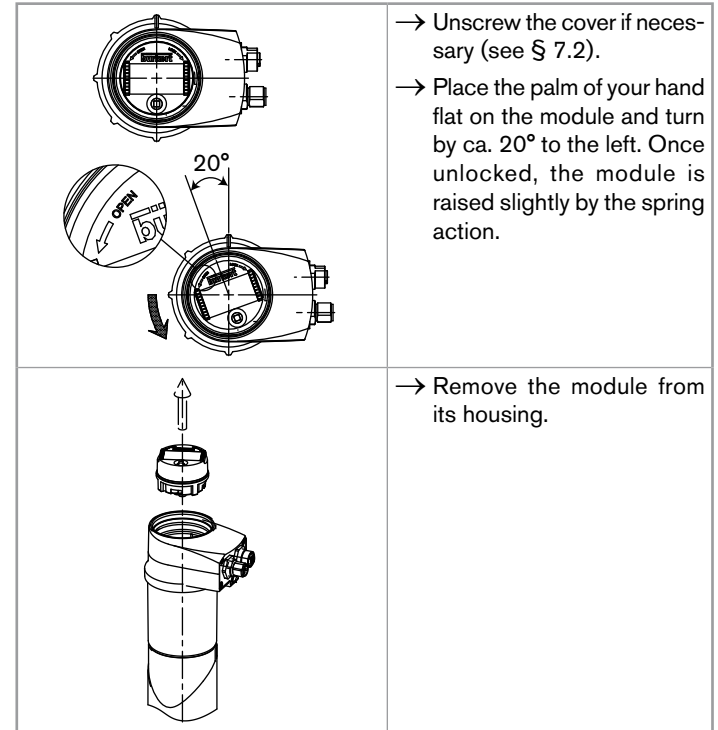
Fig. 7.4 Removing the display module

7.6. Fitting the sensor into the armature (without fluid)

H Sensor head Compression washer Seal ring	→ Check that dimension H on the sensor is between 34 and 46mm. If necessary, adjust the height of the compression washer. → Remove the protective plug
A	→ At first use, apply water or soapy water on the "A" gasket. → Insert the tightness seal supplied into the groove on the armature. → Insert the sensor fitted with its seal into the armature from above.
	→ Tighten the sensor head using a suitable wrench.

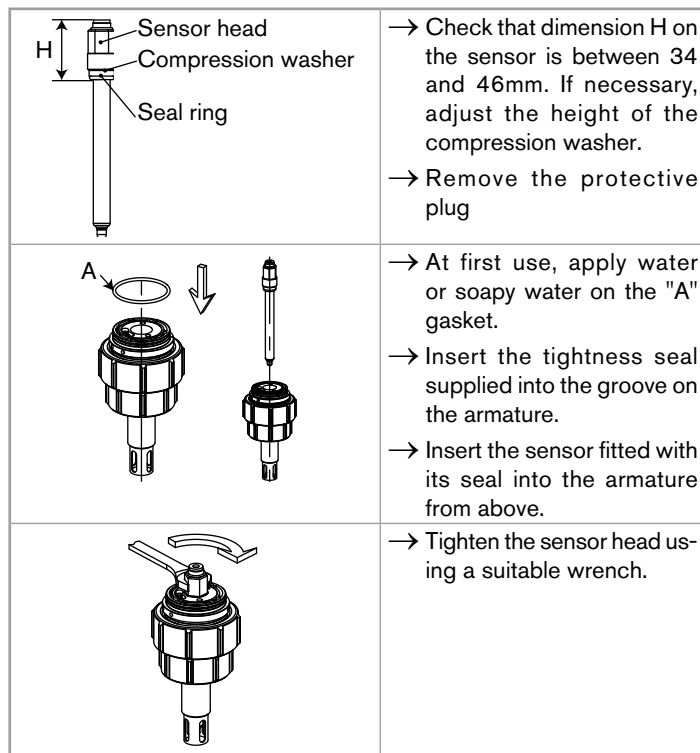*Fig. 7.5 Fitting the sensor into the armature (without fluid)*

7.7. Fitting the electronic module to the armature

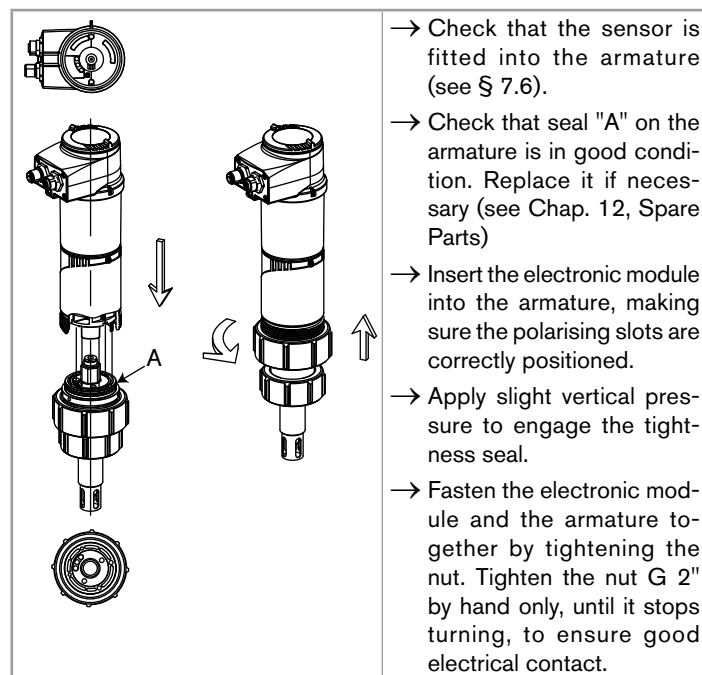|	
A	→ Check that the sensor is fitted into the armature (see § 7.6). → Check that seal "A" on the armature is in good condition. Replace it if necessary (see Chap. 12, Spare Parts) → Insert the electronic module into the armature, making sure the polarising slots are correctly positioned. → Apply slight vertical pressure to engage the tightness seal. → Fasten the electronic module and the armature together by tightening the nut. Tighten the nut G 2" by hand only, until it stops turning, to ensure good electrical contact.

Fig. 7.6 Fitting the electronic module to the armature

8. INSTALLATION AND WIRING

8.1. Safety instructions

⚠ DANGER

Risk of injury due to high pressure in the installation.
▪ Cut off the pressure and depressurize the pipes before loosening the pipes and fittings.

Risk of injury due to electrical discharge.
▪ Before starting work, switch off the power supply and secure it to prevent restarting.
▪ Observe all applicable accident protection and safety guidelines for electrical equipment.

Risk of injury due to the nature of the fluid.
▪ Respect the prevailing rules on accident prevention and safety relating to the use of aggressive fluids.

⚠ WARNING

Risk of injury due to non-conforming installation.
▪ The electrical and fluid installation can only be carried out by qualified and skilled staff with the appropriate tools.
▪ Install appropriate safety devices (correctly rated fuse and/or circuit-breaker).
▪ Respect the assembly instructions for the fitting used.

Risk of injury due to unintentional switch on of power supply or uncontrolled restarting of the installation.
▪ Take appropriate measures to avoid unintentional activation of the installation.
▪ Guarantee a set or controlled restarting of the process subsequent to the assembly of the device.

8.2. Installation onto the pipe

⚠️ **DANGER**

Risk of injury due to high pressure in the installation.

▪ Cut off the pressure and depressurize the pipes before loosening the pipes and fittings.

Risk of injury due to the nature of the fluid.

▪ Respect the prevailing rules on accident prevention and safety relating to the use of aggressive fluids.

The 8202 transmitter is inserted into a fitting fitted to the pipe.

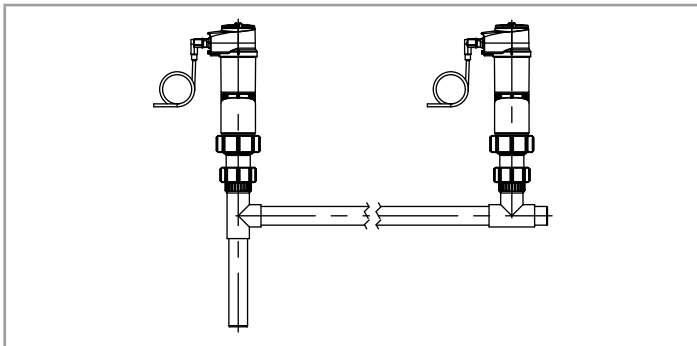→ Select an appropriate position on the piping

Fig. 8.1 Assembly positions in the piping

→ Fit the fitting at an angle of ±75° max. to the vertical
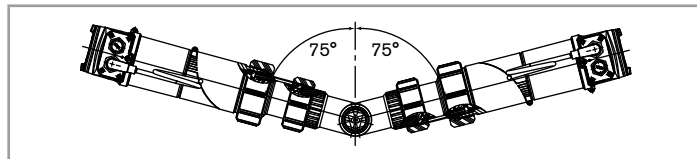

Fig. 8.2 Angle to the vertical

→ Fit the display module (see § 7.4) to be able to calibrate and programme the transmitter

→ Fit the transmitter (see § 7.6 and 7.7)

→ Calibrate the transmitter (see 10.8.3)

⚠️ The sensor must always be immersed in the fluid to prevent it drying out.

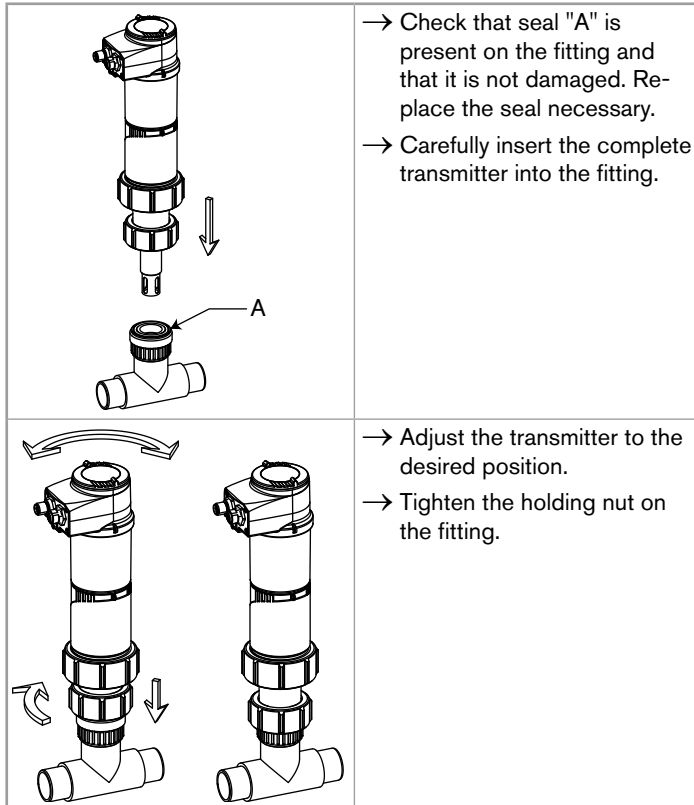→ Fit the transmitter into the fitting, as shown in figure 8.3:

	→ Check that seal "A" is present on the fitting and that it is not damaged. Replace the seal necessary. → Carefully insert the complete transmitter into the fitting.
	→ Adjust the transmitter to the desired position. → Tighten the holding nut on the fitting.

Fig. 8.3 Installation into a fitting

8.3. Electrical wiring

⚠ **DANGER**

Risk of injury due to electrical discharge.

▪ Before starting work, switch off the power supply and secure it to prevent restarting.

▪ Observe all applicable accident protection and safety guidelines for electrical equipment.

🛇 **Use a high quality electrical power supply (filtered and regulated).**

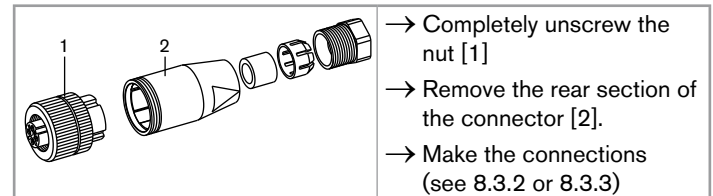## 8.3.1. Assembling the male or female connector (accessories: see Chap. 12)

	→ Completely unscrew the nut [1] → Remove the rear section of the connector [2]. → Make the connections (see 8.3.2 or 8.3.3)

Fig. 8.4 M12 multi-pin connector (not supplied)

8.3.2. Wiring a version with one M12 fixed connector

Transistor output 1

2

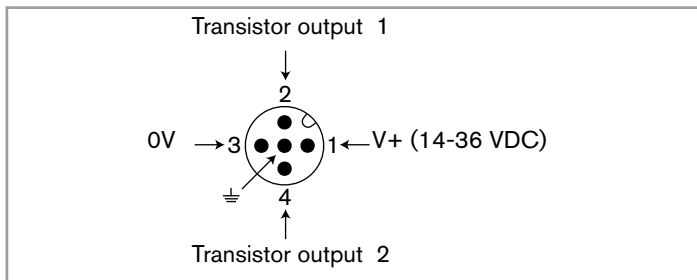0V → 3 ● 1 ← V+ (14-36 VDC)

4

Transistor output 2

Fig. 8.5 Wiring of the male fixed connector on a version with 1 M12 fixed connector

Pin for the M12 female cable available as op-tional equipment (order ref. 438680)	Colour of the conductor
1	brown
2	white
3	blue
4	black
5	grey

white

Charge 1
(solenoid valve,
for example)

2
brown
black 3 1
4 grey

blue

Charge 2
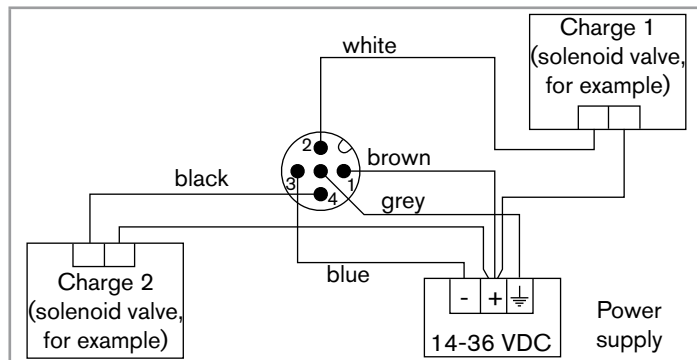(solenoid valve,
for example)

- + ⏚

14-36 VDC

Power
supply

Fig. 8.6 Connection of the 2 transistor outputs, in NPN mode (software pro-gramming "NPN/sink", see § 10.7.3), on a version with 1 fixed connector

white

Charge 1
(solenoid valve,
for example)

2
brown
black 3 1
4 grey

blue

Charge 2
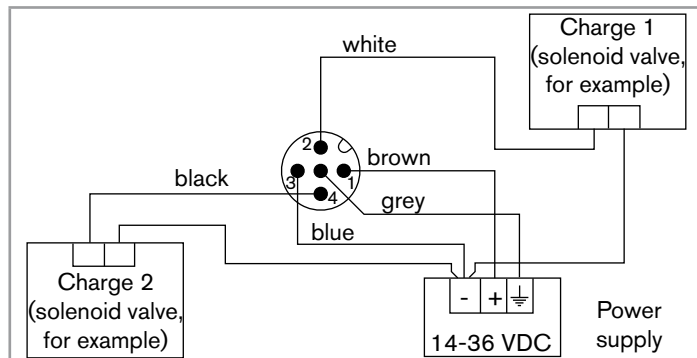(solenoid valve,
for example)

- + ⏚

14-36 VDC

Power
supply

Fig. 8.7 Connection of the 2 transistor outputs, in PNP mode (software pro-gramming "PNP/sink", see § 10.7.3), on a version with 1 fixed connector
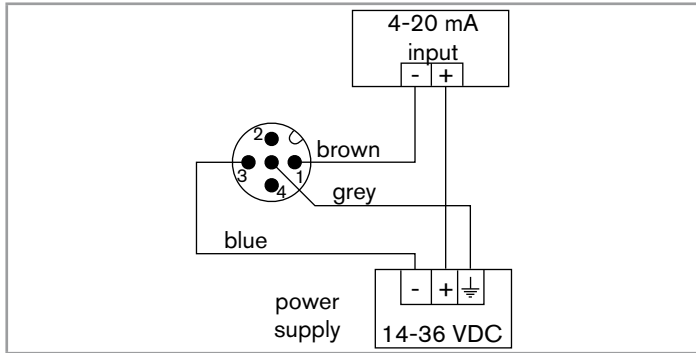
Fig. 8.8 Connection of the current output, in sink mode (software program-ming "NPN/sink", see § 10.7.3), on a version with 1 fixed connector
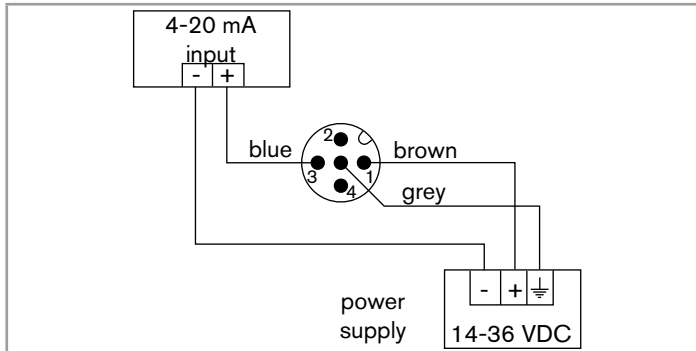

Fig. 8.9 Connection of the current output, in source mode (software pro-gramming "PNP/source", see § 10.7.3), on a version with 1 fixed connector
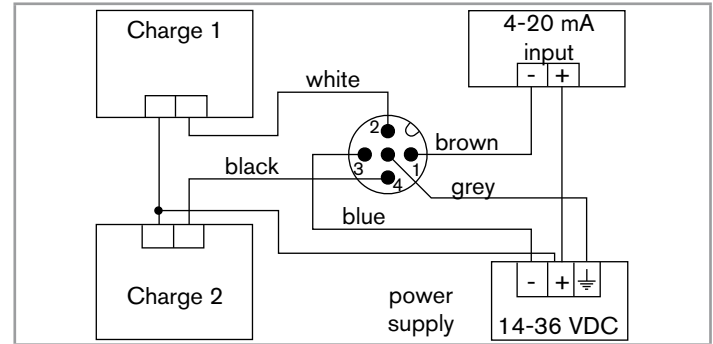

Fig. 8.10 Connection of the 2 transistor outputs and the current output, in NPN/sink mode (software programming "NPN/sink", see § 10.7.3), on a version with 1 fixed connector
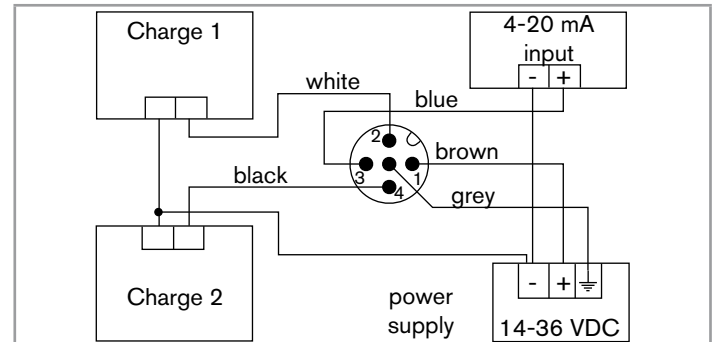

Fig. 8.11 Connection of the 2 transistor outputs and the current output, in PNP/source mode (software programming "PNP/source", see § 10.7.3), on a version with 1 fixed connector

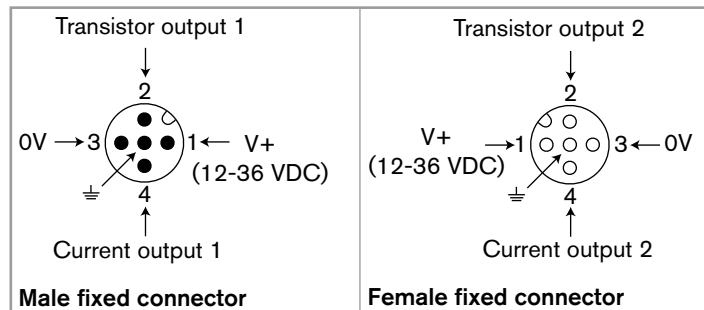### 8.3.3. Wiring a version with two M12 fixed connectors

Fig. 8.12 Wiring on the M12 male fixed connector and the M12 female fixed connector

Pin for the M12 female cable available as optional equipment (order ref. 438680)	Colour of the conductor
1	brown
2	white
3	blue
4	black
5	grey

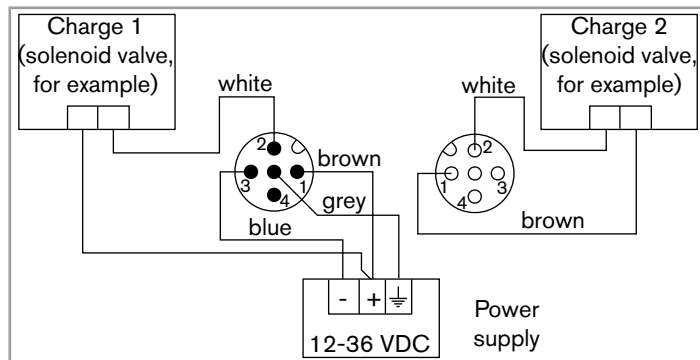| Pin for the M12 male cable available as optional equipment (order ref. 559177)	Colour of the conductor
1	brown
2	white
3	blue
4	black
5	grey

Fig. 8.13 Connection of the 2 transistor outputs, in NPN mode, on a version with 2 fixed connectors (software programming "NPN/sink", see § 10.7.3)

Fig. 8.14 Connection of the 2 transistor outputs, in PNP mode, on a version with 2 fixed connectors (software programming "PNP/source", see § 10.7.3)

Fig. 8.15 Connection of the 2 current outputs, in sink mode, on a version with 2 fixed connectors (software programming "NPN/sink", see § 10.7.3)
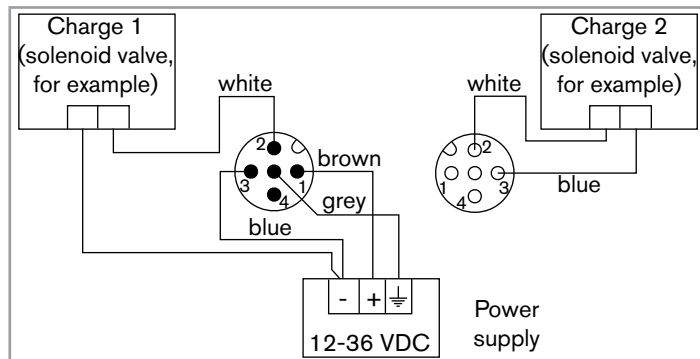

Fig. 8.16 Connection of the 2 current outputs, in source mode, on a version with 2 fixed connectors (software programming "PNP/source", see § 10.7.3)
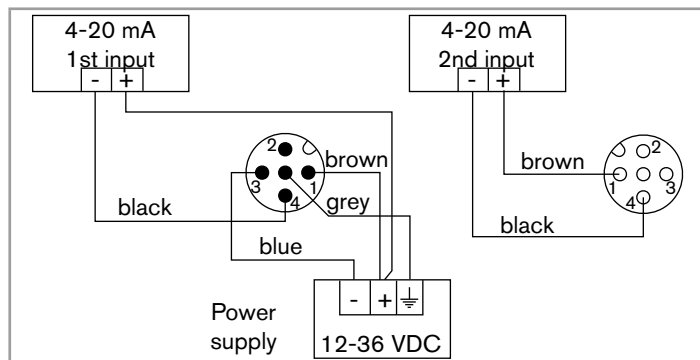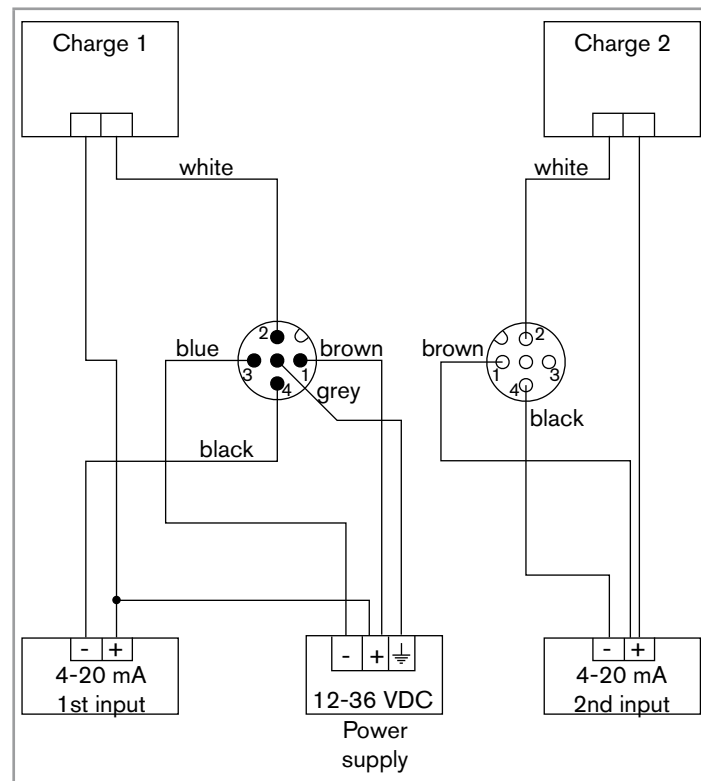

Fig. 8.17 Connection of the 2 transistor outputs and the 2 current outputs, in NPN/sink mode, on a version with 2 fixed connectors (software programming "NPN/sink", see § 10.7.3)

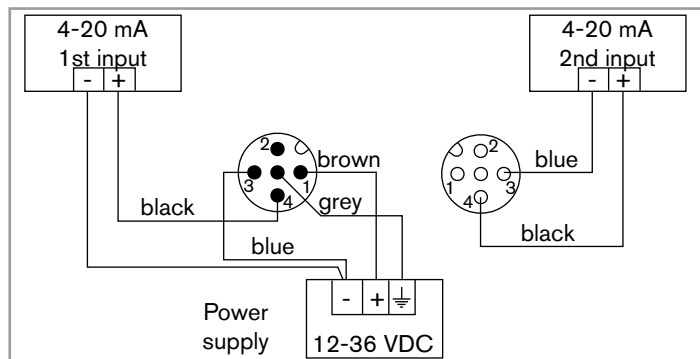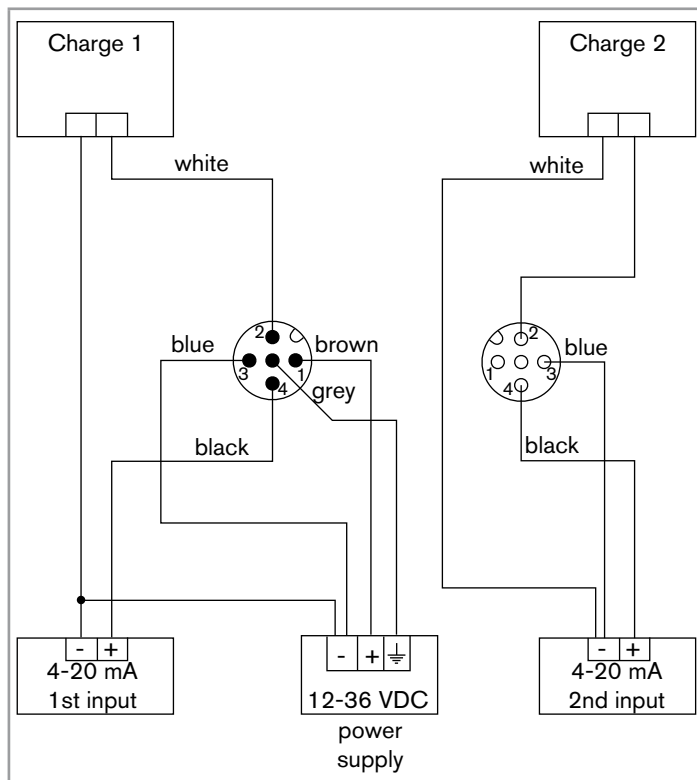*Fig. 8.18 Connection of the 2 transistor outputs and the 2 current outputs, in PNP/source mode, on a version with 2 fixed connectors (software program-ming "PNP/source", see § 10.7.3)*

9. COMMISSIONING

9.1. Safety instructions

⚠️ **WARNING**

Danger due to non-conforming commissioning.

Non-conforming commissioning could lead to injuries and damage the device and its surroundings.

▪ Before commissioning, make sure that the staff in charge have read and fully understood the contents of the manual.

▪ In particular, observe the safety recommendations and intended use.

▪ The device/installation must only be commissioned by suitably trained staff.

▪ Protect this device against electromagnetic interference, ultraviolet rays and, when installed outdoors, the effects of the climatic conditions.

10. ADJUSTMENT AND FUNCTIONS

10.1. Safety instructions

⚠️ **WARNING**

Risk of injury due to non-conforming adjustment.

Non-conforming adjustment could lead to injuries and damage the device and its surroundings.

▪ The operators in charge of adjustment must have read and understood the contents of this manual

▪ In particular, observe the safety recommendations and intended use.

▪ The device/installation must only be adjusted by suitably trained staff.

10.2. Functions

The device has 2 modes of use:

Read mode

This mode is used to read:

▪ the measured values of 2 physical parameters selected in the Parameters menu

▪ the current values emitted on the 4-20 mA outputs

Menus mode

This mode comprises 5 menus:

▪ **the Parameters menu (§ 10.7) to:**

  - set the parameters for the transmitter data, independent of the measurements (date, time, Parameters menu access code...)

  - restore the default data of the Read mode and the outputs

  - programme the information to be displayed in Read mode, independently of the parameters programmed for the current and transistor outputs

  - define the display contrast and, on a version with 2 fixed connectors only, the brightness of the backlighting

  - set the parameters for each current and transistor output, independently of each other and independently of the parameters selected for the Read mode

  - define the behaviour of each 4-20 mA output in the event of diagnostic error

  - define the electrical connection mode for the outputs (sink/NPN or source/PNP)

  - define the measurement parameters for the pH or oxidation reduction potential sensor

▪ **the Calibration menu (§ 10.8) to:**

  - activate the Hold mode

  - programme the Calibration menu access code

  - adjust each 4-20 mA output

  - calibrate the sensor

  - input an offset to measure the temperature

▪ **the Diagnostic menu (§ 10.9) to:**

- programme the Diagnostic menu access code

- configure the device's behaviour if problems are detected on the pH/redox sensor electrodes

- activate or deactivate the use of "error" and "warning" messages for the pH/redox sensor if the defined impedance thresholds are exceeded

- configure the 2 impedance ranges outside of which "error" and "warning" messages are used

- read the measured values of the impedances on the pH/redox sensor

- activate or deactivate the use of "error" and "warning" messages if the defined fluid temperature thresholds are exceeded

- configure the 2 temperature ranges outside of which "error" and "warning" messages are used

- read the measured value of the fluid temperature

▪ **the Test menu (§ 10.10) to:**

- programme the Test menu access code

- check that the outputs are working and behaving correctly

▪ **the Information menu (§ 10.11) to:**

- read the meaning of certain icons, when they are displayed

- read the software version of the acquisition / conversion module for the physical parameters

10.3. Using the browse button

Symbolised by in this manual

Symbolised by in this manual

Symbolised by in this manual

Symbolised by in this manual

Symbolised by in this manual
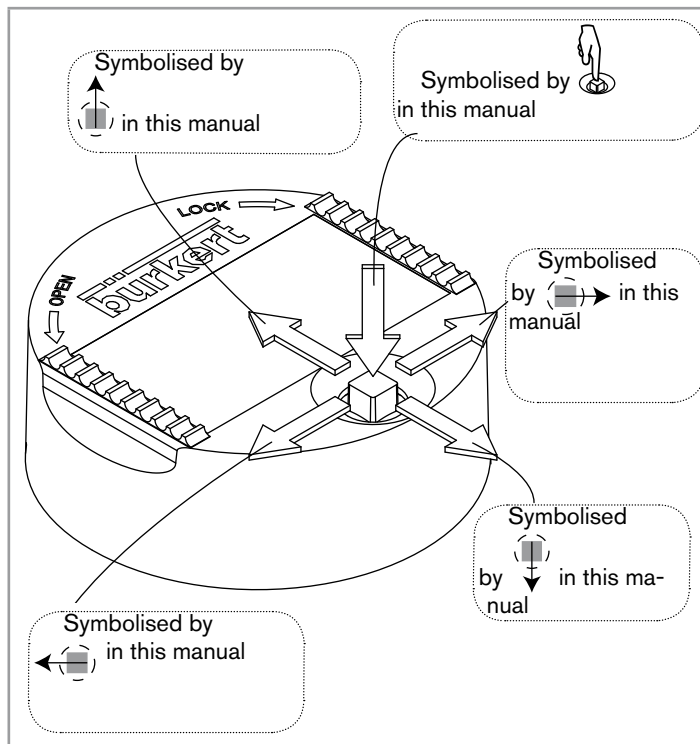
Fig. 10.1 Using the browse button

You want to…	Press…
…browse in Read mode	▪ Next screen: ▪ Previous screen:
▪ …access the Programming mode ▪ …display the Parameters menu	for at least 2 sec. from any screen in Read mode
…browse in the Programming mode menus	▪ Next menu: ▪ Previous menu:
…select the menu displayed	
…browse in the menu functions	▪ Next function: ▪ Previous function:
…select the highlighted function	

You want to...	Press...
...browse in the dynamic functions bar (MEAS, BACK, ABORT, OK, YES, NO)	▪ Next function: ▪ Previous function:
...confirm the highlighted dynamic function	
...modify a numerical value - increment the figure selected	-
- decrement the figure selected	-
- select the previous figure	-
- select the next figure	-
- allocate the "+" or "-" sign to the numerical value	- to the extreme left of the numerical value then until the desired sign is displayed
- move the decimal point	- to the extreme right of the numerical value then until the decimal point is in the desired place

10.4. Description of the display

10.4.1. Description of the icons and leds

Red led: indi-cates an error; see § 11.14

Not used

Yellow led: indicates that tran-sistor 1 has been switched

Yellow led: indicates that tran-sistor 2 has been switched
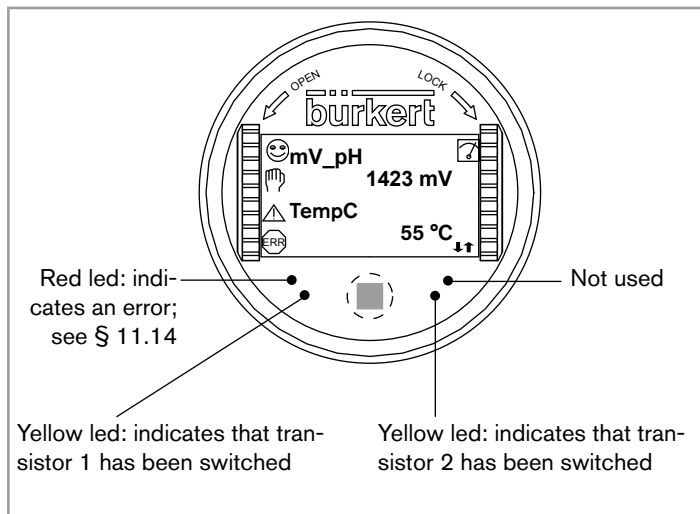
Fig. 10.2 Position of the icons and description of the leds

⚠ The leds of the display module are duplicated on the elec-tronic board that is located under the display module: these leds become visible when the transmitter is not equipped with the display module.

Icon	Meaning and alternatives
😊	Sensor in good order and fluid temperature within the pro-grammed range.
	If the monitoring of the impedance on the electrodes and/or the fluid temperature has been activated, the alternatives in this position are:
	▪ 😊, associated with ⚠ : see § 10.9.2, 10.9.3 and 11.4
	▪ 😕, associated with ERR : see § 10.9.2, 10.9.3 and 11.4
⚟	Device currently measuring.
	The alternatives in this position are:
	▪ ⚠HOLD flashing: HOLD mode activated (see § 10.8.1)
	▪ T : running check that the outputs are working and be-having correctly (see § 10.10.2 and 10.10.3)
⚒	"Maintenance" event; see § 10.8.3 and 11.4
⚠	"Warning" event; see § 10.8.3, 10.9.2, 10.9.3 and 11.4
ERR	"Error" event; see § 10.9.2, 10.9.3 and 11.4

10.4.2. When switching on the device

When the device is switched on, the display indicates the software version of the display.

The display then shows the first screen in READ mode:
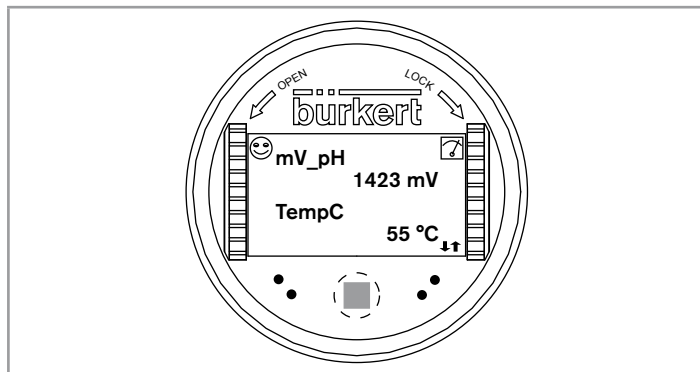
Fig. 10.3 Display when the device is switched on

See paragraph 10.7.2 to choose the data displayed in Read mode

10.4.3. When browsing in the menus

Title of the menu, the sub-menu or the function which you are currently browsing.

The arrow indicates the presence of the previous functions, accessible via

This icon identifies the menu in which you will find it.

Dynamic functions (accessible via and) :

- MEAS: to go back to the READ mode
- BACK: to go back to the parent menu
- ABORT (appears in place of "BACK"): to go back to the parent menu without validating the input
- OK: to validate the value or input selected and return automatically to the parent menu
- YES and NO: to answer the question asked

The arrow indicates the presence of the next functions, accessible via

10.5. Read mode and access to the Menus mode

Read mode

A

☺ mV_pH
1243 mV
TempC
55 °C

☺ mV_pH
1243 mV

☺ TempC
55 °C

☺ AC1
18.3 mA
AC2
7.5 mA

☺ AC1
18.3 mA

☺ AC2
7.5 mA

A

> 2s

Menus mode

B

This is when the device is being parametered............
Param

Calib

Diagnostic

Test

Info

B

→ See § 10.6 for details of the functions per menu
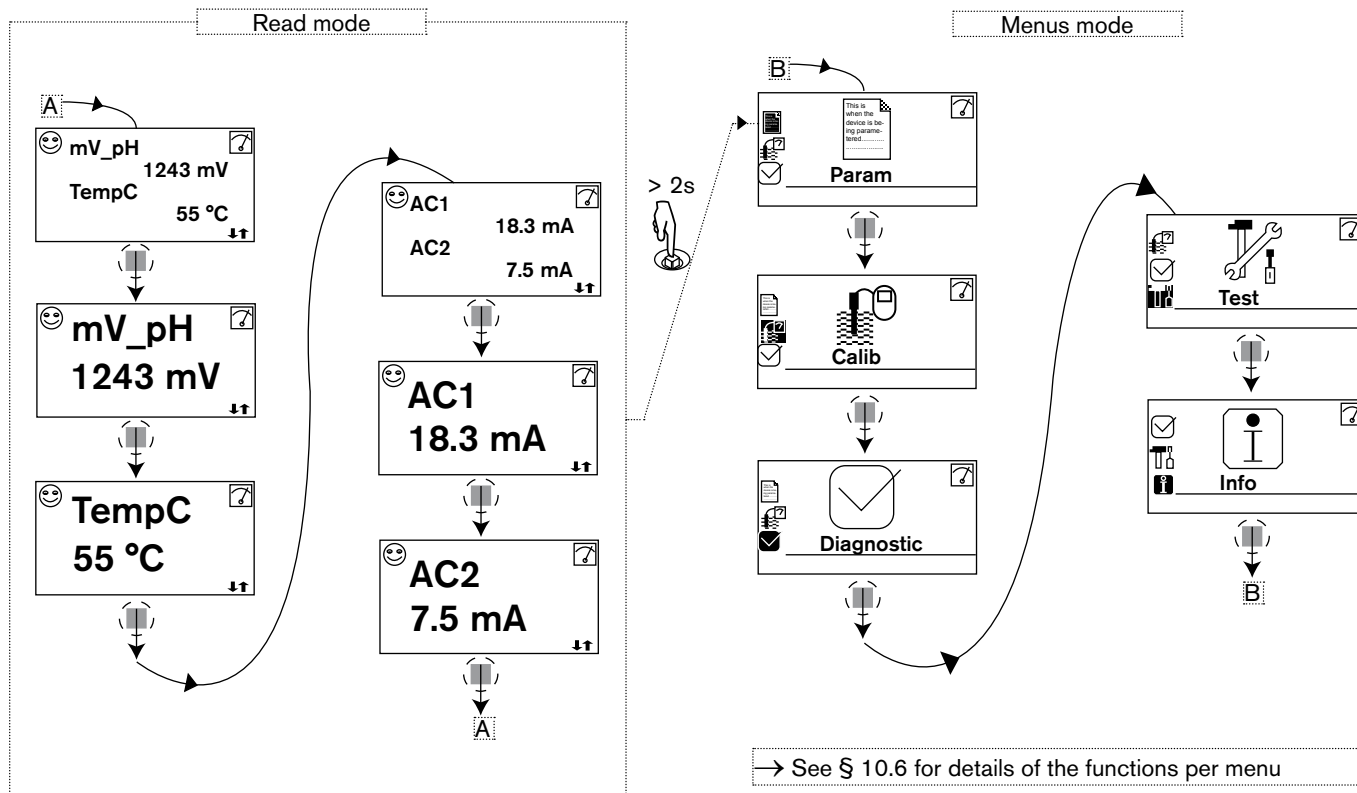
10.6. Functions available per menu

Param

Code incorrect [1]

Code "Param" correct

Param
System
Display
Outputs
MEAS BACK

Param
Display
Outputs
Sensor
MEAS BACK
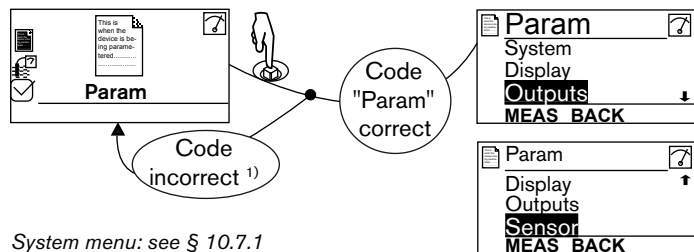
System menu: see § 10.7.1

Display menu: see § 10.7.2

Outputs menu: see § 10.7.3, 10.7.4 and 10.7.5

Sensor menu: see § 10.7.6

Calib

Code incorrect [1]

Code "Calib" correct

Calibration
System
Outputs
Sensor
MEAS BACK
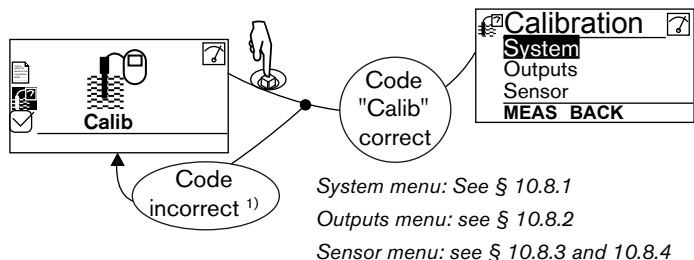
System menu: See § 10.8.1

Outputs menu: see § 10.8.2

Sensor menu: see § 10.8.3 and 10.8.4

Diagnostic

Code incorrect [1]

Code "Diagnostic" correct

Diagnostic
System
Sensor
MEAS BACK
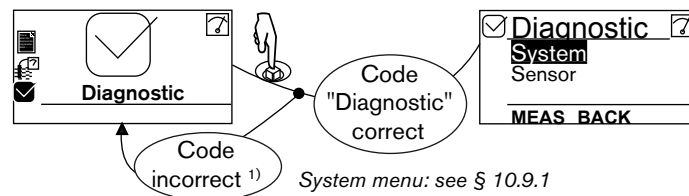
System menu: see § 10.9.1

Sensor menu: see § 10.9.2 and 10.9.3

Test

Code incorrect [1]

Code "Test" correct

Test
System
Outputs
Sensor
MEAS BACK
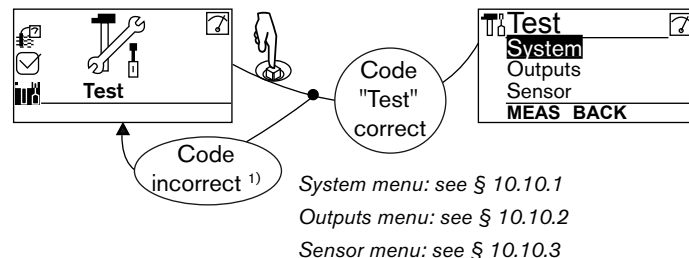
System menu: see § 10.10.1

Outputs menu: see § 10.10.2

Sensor menu: see § 10.10.3

Info

Info
Error
Warning
Maintenance
MEAS BACK

Info
Maintenance
Smiley
Software
MEAS BACK
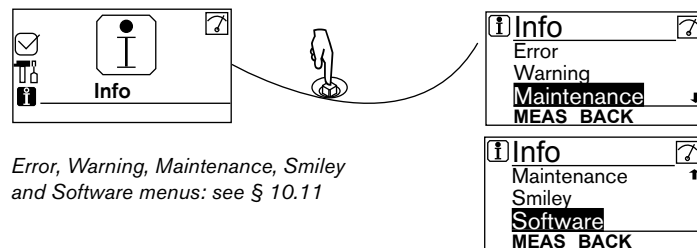
Error, Warning, Maintenance, Smiley and Software menus: see § 10.11

[1] If the code has been lost, use the "9100" universal code.

10.7.   Parameters menu ("Param")

10.7.1.   Set the data parameters independently of the measurements ("System" menu)

Refer to paragraphs 10.5 and 10.6 to access the Param menu.

System
Date
Time
Code
MEAS BACK

System
Time
Code
Factory Set
MEAS BACK
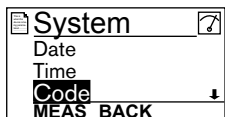
DATE: Set the date (input format: year/month/day in the form YYYY/MM/DD)

TIME: Set the time (input format: hours:minutes^{seconds})

CODE: Modify the PARAM menu access code (4 figures; 0000 by default).
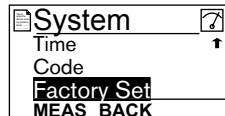
FACTORY SET: Restore the default data of the Read mode and the outputs.

10.7.2. Set the display parameters ("Display" menu)

⚠️ **WARNING**

Risk of injury due to non-conforming adjustment.
▪ Choose the type of sensor (see 10.7.6) fitting the transmitter before setting the display parameters.

Refer to paragraphs 10.5 and 10.6 to access the Param menu.

📄 **Line 1** ¹)
  PVar:
  Unit:
  Filter:
  MEAS BACK

¹) or "Line2"

📄 **Display**
  Line1
  Line2
  Contrast
  MEAS BACK

📄 **Display**
  Line2
  Contrast
  Backlight
  MEAS BACK

Set the parameters for the data displayed in Read mode:

PVAR: Choose the physical parameter to be displayed on line 1 or line 2 of the display respectively. The possible choices depend on the selected sensor type, whether pH or ORP.

UNIT: Choose the unit in which the physical parameter selected in the PVAR function above is displayed

FILTER: Choose the attenuation level for the measurement variations of the physical parameter displayed on line 1 or line 2. See details next page

Set the parameters for the reading comfort level of the data displayed:

CONTRAST: Choose the display contrast level (as a %)

BACKLIGHT: On a version with 2 fixed connectors only, choose the light intensity of the display (as a %)

Attenuate the measurement variations on the display ("Filter" function in "Line1" or "Line2" menu)

Three levels of attenuation are proposed: "slow", "fast" or "none"

"Slow" filtration
30 s

"Fast" filtration
6 s

"None" filtration
150 ms
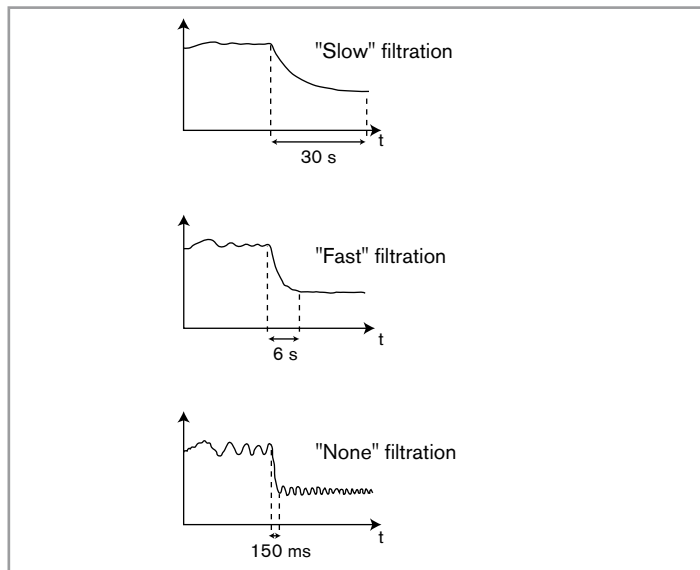
Fig. 10.4 Filtration graphs

10.7.3. Output connection mode (menu "Outputs" - Function "HWMode")

Refer to paragraphs 10.5 and 10.6 to access the Param menu.

Outputs
HWMode
AC1
AC2
MEAS BACK
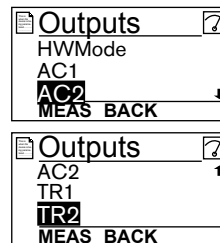
HWMODE: Choose the connection mode for all outputs (current and transistor)

Outputs
AC2
TR1
TR2
MEAS BACK

Outputs menu, functions AC1 and AC2: see 10.7.4
Outputs menu, functions TR1 and TR2: see 10.7.5

The connection mode is the same for all outputs.

If you choose "sink NPN", the current outputs must be connected in sink mode and the transistor outputs in NPN mode.

If you choose "source PNP", the current outputs must be connected in source mode and the transistor outputs in PNP mode.

See the wiring for the outputs in paragraph 8.3.

10.7.4. Set the parameters for the current outputs (menu "Outputs" - Functions "AC1" and "AC2")

⚠️ **WARNING**

Risk of injury due to non-conforming adjustment.

- Choose the type of sensor (see 10.7.6) fitting the transmitter before setting the output parameters.

Refer to paragraphs 10.5 and 10.6 to access the Param menu. The 2nd current output "AC2" is only available on a version with 2 fixed connectors.

Outputs menu - "HWMode" function: see 10.7.3

Outputs
HWMode
AC1
AC2
MEAS BACK

Outputs
AC2
TR1
TR2
MEAS BACK

Outputs menu - Functions TR1 and TR2: see 10.7.5

Output.AC1[1]
PVar:
4mA:
20mA:
MEAS BACK

Output.AC1[1]
20mA:
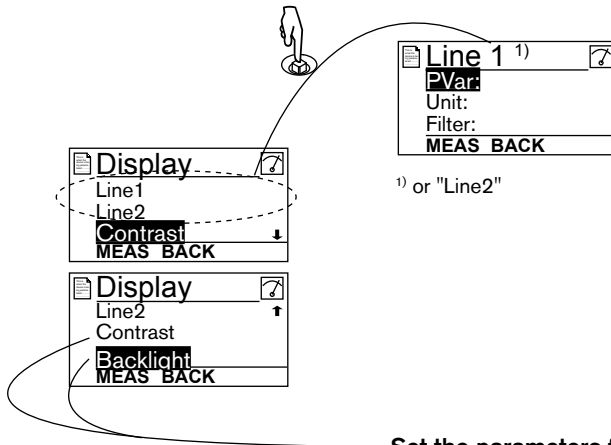Filter:
Diag. mode:
MEAS BACK

[1] or "Output.AC2"

PVAR: Choose a physical parameter associated with current output 1 or current output 2 respectively. The possible choices depend on the selected sensor type, whether pH or ORP.

4mA: Choose the value of the physical parameter (previously selected), associated with a current of 4 mA, for each current output. See "Current output parameters", next page.

20mA: Choose the value of the physical parameter (previously selected), associated with a current of 20 mA, for each current output. See "Current output parameters", next page.

FILTER: Choose the level of attenuation for the current variations for each current output. See next page and fig. 10.4.

DIAG. MODE: Choose to emit a current of 22 mA on current output 1 or current output 2 respectively when an "error" event related to the diagnostic (see § 10.9.2 and 10.9.3) is generated by the transmitter or leave current output 1 or current output 2 respectively to operate normally (select "none").

📖 See also "If you encounter problems" at § 11.4.

Attenuate the measurement variations on the current output ("Filter" function in "Output.AC1" or "Output.AC2" menu)

Three levels of attenuation are proposed: slow, fast or none

The behaviour of the filters for the current outputs is identical to that of the filters for display. Refer to figure 10.4.

Set the parameters of a current output (functions "4mA" and "20mA" in the "Outputs" menu)

Functions "4mA" and "20mA" are used to define the measurement range for the physical parameter associated with the current on the 4-20 mA output.

We should note P_1 respectively P_2 the values associated with a 4 mA or 20 mA current respectively
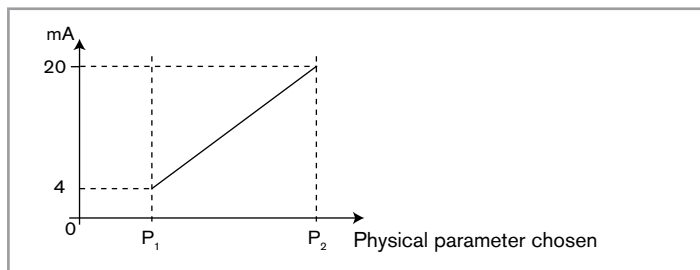
Fig. 10.5 Current 4-20 mA according to the chosen physical parameter

Please note:

P_1 may be greater than P_2: if this is the case, the signal is inverted and range P_1-P_2 corresponds to the range for the 20-4 mA current.

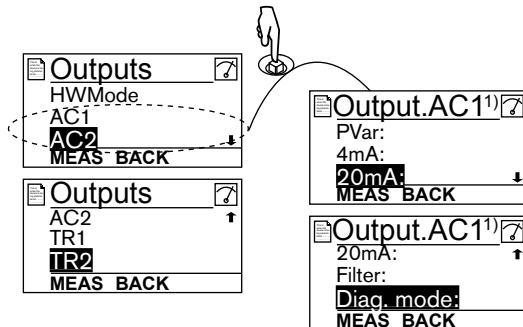## 10.7.5. Set the parameters for the transistor outputs (menu "Outputs" - functions "TR1" and "TR2")

⚠️ **WARNING**

Risk of injury due to non-conforming adjustment.

▪ Choose the type of sensor (see 10.7.6) fitting the transmitter before setting the output parameters.

Refer to paragraphs 10.5 and 10.6 to access the Param menu.

Outputs menu - HWMode function: see 10.7.3

Outputs menu - Functions AC1 and AC2: see 10.7.4

```
┌─────────────────┐
│ ⌕ Outputs      📷│
│   HWMode         │
│   AC1            │
│   AC2            ↓│
│ MEAS  BACK       │
└─────────────────┘
┌─────────────────┐
│ ⌕ Outputs      📷│
│   AC2            │
│   TR1            ↑│
│   TR2            │
│ MEAS  BACK       │
└─────────────────┘
```

```
┌─────────────────┐
│ ⌕ Output.TR1¹⁾ 📷│
│   PVar:          │
│   Mode:          │
│   Low:          ↓│
│ MEAS  BACK       │
└─────────────────┘
┌─────────────────┐
│ ⌕ Output.TR1¹⁾ 📷│
│   High:          │
│   Contact:       ↑│
│   Delay:         │
│ MEAS  BACK       │
└─────────────────┘
```

¹⁾ or "Output.TR2"

²⁾ Are not available if the generation of a "warning" event has been linked to the selected transistor output.

PVAR: Choose a physical parameter associated with transistor output 1 or transistor output 2 respectively or link the generation of a "warning" event (see § 10.8.3, 10.9.2 and 10.9.3) to transistor output 1 or transistor output 2 respectively. The possible choices depend on the selected sensor type, whether pH or ORP.
If the selected transistor output is linked to the "warning" event, the transistor switches as soon as such an event is generated by the transmitter. See also "If you encounter problems", at § 11.4.

MODE ²⁾: Choose the switching mode for transistor output 1 or transistor output 2. See details next page.

LOW ²⁾: Choose the low switching threshold value for transistor output 1 or transistor output 2. See details next page.

HIGH ²⁾: Choose the high switching threshold value for transistor output 1 or transistor output 2. See details next page.

CONTACT: Choose the type of contact on standby (normally open, NO, or normally closed, NC) for transistor output 1 or transistor output 2. See details next page.

DELAY: Choose the value of the delay prior to switching for each transistor output. See details next page.

Possible switching modes and switching thresholds on a transistor output (functions "Mode", "Low", "High" and "Delay" in the menu "Output.TR1" or "Output.TR2")

Hysteresis mode

The change of status is done when a threshold is detected (increasing flow rate: threshold high (function High) to be detected; decreasing flow rate: threshold low (function Low) to be detected).
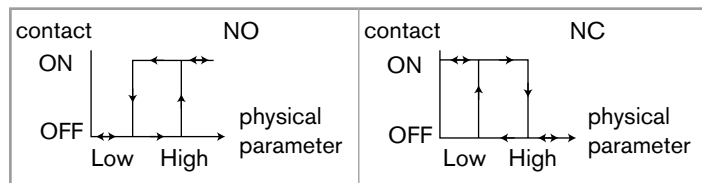
Fig. 10.6 Hysteresis mode

Window mode

The change of status is done whenever one of the thresholds is detected.
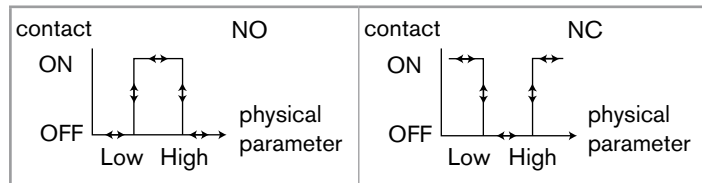
Fig. 10.7 Window mode

NO = Normally open; NC = Normally closed

The "**Delay**" **function** is used to programme the timing prior to switching and is valid for both output thresholds.

Switching is only done if one of the thresholds, high or low (functions "High" or "Low"), is exceeded for a duration longer than this timing.

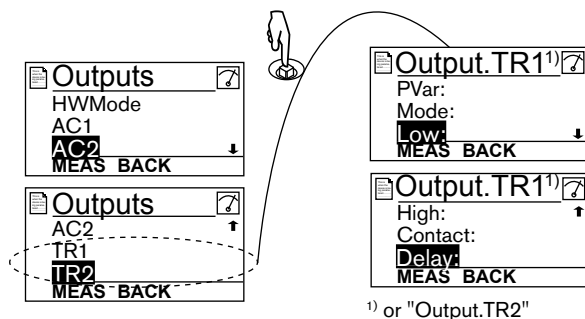### 10.7.6. Set the sensor parameters ("Sensor" menu)

⚠️ **WARNING**

Risk of injury due to non-conforming adjustment.
▪ Choose the type of sensor mounted on the transmitter before setting the display and output parameters

🛈 The monitoring (see § 10.9.2) of the redox ("ORP") sensor is impossible if the measurement mode is set to "asymmetrical".

Refer to paragraphs 10.5 and 10.6 to access the Param menu.

```
📄 Sensor        📋
  Type:
  Mode:
  Mains Fcy:
  MEAS  BACK
```
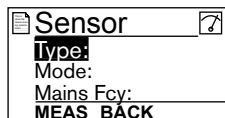
TYPE: Choose the type of sensor used, pH or Redox ("ORP" choice).

MODE: Choose the type of measurement, symmetrical (differential) or asymmetrical.

MAINS FCY: Choose the frequency of your mains electricity, 50 or 60 Hz. This frequency is filtered by the transmitter to ensure stable measurements.

Symmetrical or asymmetrical measurement ("Mode" function in the "Sensor" menu)

Symmetrical measurement

The symmetrical measurement is a differential measurement: in this type of measurement, the stainless steel ring on the sensor armature is used as a reference.

(1): Measurement electrode
(2): Reference electrode
(3): Stainless steel ring
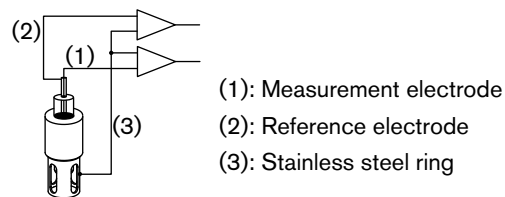
Fig. 10.8 Schematic diagram of symmetrical measurement

Asymmetrical measurement

In the asymmetrical measurement, the measurement is done in relation to the reference electrode.

(1): Measurement electrode
(2): Reference electrode
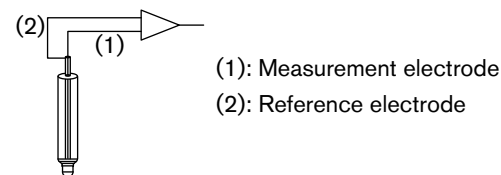
Fig. 10.9 Schematic diagram of asymmetrical measurement

10.8. Calibration menu ("Calib")

10.8.1. Activate/deactivate the Hold function and modify the access code to the Calibration menu ("System" menu)

Refer to paragraphs 10.5 and 10.6 to access the Calib menu.

```
System
 Hold
 Code

MEAS  BACK
```
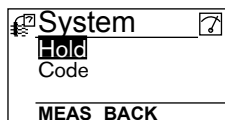
HOLD: Choose whether the HOLD function is enabled or disabled.

CODE: Modify the Calibration menu access code (4 figures; 0000 by default)

"Hold" function in the "System" menu

⚠ The Hold mode si automatically deactivated when the transmitter restarts after a power interruption, if the Hold mode was activated at the moment of the power cut-off.

The Hold mode is used to carry out maintenance work without interrupting the process.

To activate the HOLD mode:
→ enter the "HOLD" function
→ choose "enabled"
→ validate by "OK"

In practice, when the device is in Hold mode:

▪ the ⚠HOLD icon is displayed in place of the 🗠 icon

▪ the current emitted on each 4-20 mA output is fixed at the value of the last measurement of the physical parameter associated with each output

▪ each transistor output is fixed at the status acquired at the moment the Hold function is activated.

▪ the device is in Hold mode until the HOLD function is deactivated.

To deactivate the HOLD mode:
→ enter the "HOLD" function
→ choose "disabled"
→ validate by "OK"

10.8.2. Adjust the current outputs ("Outputs" menu)

⚠️ **WARNING**

Risk of injury due to non-conforming adjustment.
▪ Make sure the Hold mode is disabled (see 10.8.1).

Refer to paragraphs 10.5 and 10.6 to access the Calib menu.

```
AC1 ¹⁾
4mA
20mA
MEAS BACK
```

¹⁾ or "AC2"

```
Outputs
AC1
AC2
MEAS BACK
```
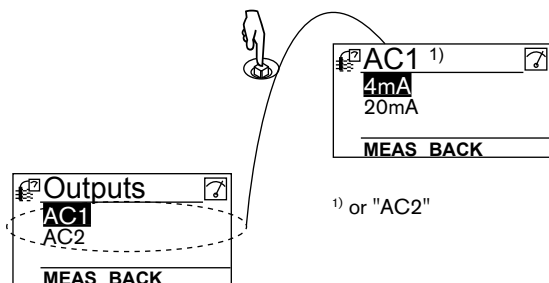
4mA: Adjust the offset on current output 1 or current output 2.

When the "4mA" function is selected, the transmitter generates a current of 4 mA: measure the current emitted by the 4-20 mA output using a multimeter and input the value given by the multimeter in the function "AC1.4mA" or "AC2.4mA".

20mA: Adjust the span on current output 1 or current output 2.

When the "20mA" function is selected, the transmitter generates a current of 20 mA: measure the current emitted by the 4-20 mA output using a multimeter and input the value given by the multimeter in the function "AC1.20mA" or "AC2.20mA".

10.8.3. Calibrate the sensor (menu Sensor - function "Probe")

🛈 Choose the type of sensor (§ 10.7.6) the transmitter is fitted with before calibrating the sensor.

Refer to paragraphs 10.5 and 10.6 to access the Calib menu.

Sensor
Probe
Temperature
MEAS BACK

Probe
Calib temperat.
Calibration
Probe constants
MEAS BACK

Probe
Calibration
Probe constants
Calib interval
MEAS BACK
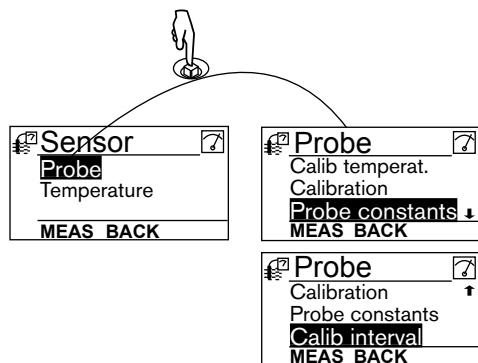
CALIB TEMPERAT.: Choose the type of temperature compensation for the calibration process: either the temperature measured (select "Auto") or a fixed value (select "constant" then input reference temperature).

CALIBRATION: Calibrate the pH sensor in 1 or 2 points or the Redox sensor in 1 point. See details following pages. A calibration process updates the last calibration date ("Last cal. date" function of the CALIB INTERVAL sub-menu hereafter).

This calibration can be replaced by the input in the "Probe constants" function below, of the offset and/or span values indicated on the sensor certificate, if supplied. Entering the probe constants does not update the last calibration date ("Last cal. date" function of the CALIB INTERVAL sub-menu hereafter).

PROBE CONSTANTS: Input the offset and/or span values indicated on the pH / Redox sensor certificate, if supplied. This input replaces a calibration made by the "Calibration" function above but does not update the last calibration date ("Last cal. date" function of the CALIB INTERVAL sub-menu hereafter).

CALIB INTERVAL: Read the date of the last calibration (function "Last cal. date") and programme the periodicity of calibrations, in days (function "Interval"): the transmitter generates a "maintenance" event by displaying the ⟨icon⟩ icon and a "warning" event, each time a calibration is due. Set function "Interval" to "0000 days" to ignore the function.

▪ The "warning" event may be associated with one or other or both transistor outputs (see § 10.7.5).
▪ See also "If you encounter problems" at § 11.4.

Calibrate the pH / Redox sensor ("Calibration" function in the "Probe" menu)

▪ The pH sensor can be calibrated according to a 1-point or a 2-point procedure.

▪ The Redox sensor can be calibrated according to a 1-point procedure.

> ⚠ ▪ In order not to interrupt the process, activate the HOLD function (see § 10.8.1).
>
> ▪ Before each calibration, correctly clean the electrode with a suitable product.
>
> ▪ In a 2-point calibration, the buffer solutions used must be at the same temperature.
>
> ▪ Programme the periodicity of calibrations in the "Interval" function in the sub-menu "Calib interval" (see previous page): each time a calibration is due, the transmitter generates a "maintenance" event and a "warning" event.

1-point calibration

The 1-point calibration procedure is used for rapid calibration by adjusting the offset of the measurement graph with a buffer solution with a known pH (to calibrate a pH sensor: see p. 55) or a known oxidation reduction potential
(to calibrate a Redox sensor: see p. 54).

2-point calibration

The 2-point calibration procedure for a pH sensor is used for the precise calibration of the offset and the gradient ("span") of the sensor measurement graph.

This operation requires 2 buffer solutions: in general a first solution with a pH of 7 and a second solution with a pH very close to that of the process value to be measured. See p. 55.

Errors in pH sensor calibration

At the end of calibration of the pH sensor, two types of messages may be displayed:

▪ the "Warning: span/offset out of range" message signals either an error in the buffer solution or the ageing of the sensor (it has reached halfway in its lifespan). Ageing of the sensor is confirmed by a "span" value of between 50 mV/pH and 53 mV/pH or between 63 mV/pH and 65 mV/pH and an offset value of between -60 mV and -35 mV or between 35 mV and 60 mV.
These values can nevertheless be saved.

▪ the "Error: span/offset out of range" message indicates that the sensor must be replaced. This is confirmed by a "span" value < 50 mV/pH or > 65 mV/pH or an offset value < -60 mV or > 60 mV.
In this case, the calibration is not taken into account.
Recalibrate the transmitter when the new sensor is in place.

Detailed procedure for the 1-point calibration of the oxidation reduction potential sensor

1st point

465.0 mV

475.0 mV

MEAS ABORT OK

OK

Cal.Result

Offset:

MEAS BACK

Input the DDP of the buffer solution (indicated on the bottle).

The transmitter displays the calibration result.

BACK

Immerse the clean sensor in the buffer solution; if the Hold mode is deactivated, the transmitter alternately displays:

▪ the solution DDP measured

▪ the solution temperature measured

You are requested to save the calculated value or not.

See below for errors in the calibration of an oxidation reduction potential sensor.

Errors in the calibration of an oxidation reduction potential sensor

At the end of calibration of the oxidation reduction potential sensor, two types of message may be displayed:

▪ the "Warning: span/offset out of range" message signals either an error in the buffer solution or the ageing of the sensor (it has reached halfway in its lifespan). Ageing of the sensor is confirmed by an offset value of between -60 mV and -35 mV or between 35 mV and 60 mV. These values can nevertheless be saved.

▪ the "Error: span/offset out of range" message indicates that the sensor must be replaced. This is confirmed by an offset value < -60 mV or > 60 mV. In this case, the calibration is not taken into account.
Recalibrate the transmitter when the new sensor is in place.

Detailed procedure for the 1- or 2-point calibration of the pH sensor

```
1st point
  7.100 pH
  7.000 pH
MEAS  ABORT  OK
```

```
1st point
  Do you want to cali-
  brate a 2nd point?
YES    NO
```

```
Cal.Result
  Offset:
  Span:
MEAS  BACK
```

OK

YES   NO   BACK

Input the pH of the buffer solution (indi-cated on the bottle).

The transmitter displays the calibration result.

You are requested to save the calcu-lated values or not.

See p.53 for errors in the calibration of a pH sensor.

Immerse the clean sensor in the first buffer solution; if the Hold mode is de-activated, the transmitter alternately displays:
▪ the solution pH meas-ured
▪ the solution tempera-ture measured

```
Rinse
  6.153 pH
  25.00 °C
MEAS  ABORT  OK
```

Rinse the sensor. When the pH reaches the desired value, validate rinsing with OK

OK

```
2nd point
  23.6 °C
  10.00pH
MEAS  ABORT  OK
```

OK

Immerse the clean sensor in the second buffer solution; if the Hold mode is deactivated, the transmitter alternately displays:
▪ the solution pH measured
▪ the solution temperature measured

Input the pH of the second buffer solu-tion (indicated on the bottle).

10.8.4. Input an offset for the temperature measurement (menu "Sensor" - function "Temperature")

Refer to paragraphs 10.5 and 10.6 to access the Calib menu.

The temperature transmitted by the Pt1000 sensor may be corrected.

This correction factor is the temperature offset.

Input the tempera-ture offset
(±5 °C)
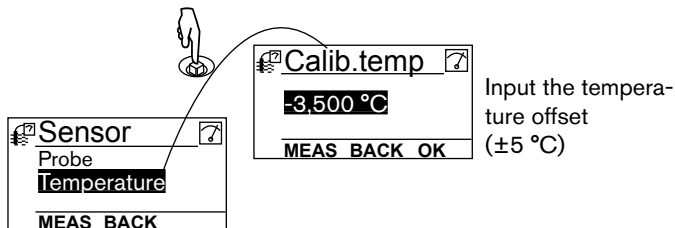
10.9. Diagnostic menu ("Diagnostic")

10.9.1. Modify the Diagnostic menu access code ("System" menu)

Refer to paragraphs 10.5 and 10.6 to access the Dagnostic menu.

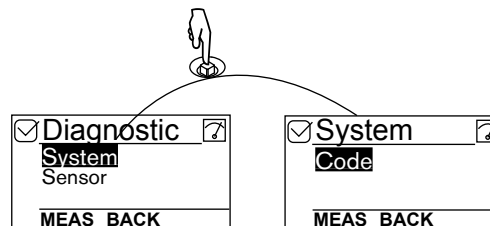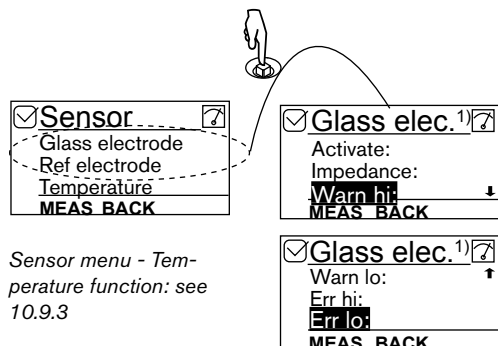CODE: Modify the Diagnostic menu access code (4 figures; 0000 by default).

10.9.2. Monitor the sensor (menu "Sensor" - Functions "Glass electrode" and "Ref electrode")

Refer to paragraphs 10.5 and 10.6 to access the Dagnostic menu.

Sensor menu - Temperature function: see 10.9.3

¹⁾ or "Ref. elec."

Configure the device's behaviour in case of electrode consumption or if there are problems on the pH sensor (glass electrode, function "Glass elec" and/or reference electrode, function "Ref.elec.") or on the Redox sensor (reference electrode, function "Ref.elec.")

ACTIVATE: Choose whether or not to activate monitoring of the impedance on the selected electrode.

This monitoring is done by the generation of a "warning" event if the impedance range defined in the "Warn hi/lo" functions below is exceeded and an "error" event if the impedance range defined in the "Err hi/lo" functions below is exceeded.

See also "If you encounter problems" at § 11.4.

IMPEDANCE: Read the impedance measured in real time on the pH electrode and the reference electrode respectively of the pH/Redox sensor.

WARN HI: Input the impedance value above which a "warning" event is generated. See details next page.

WARN LO: Input the impedance value below which a "warning" event is generated. See details next page.

ERR HI: Input the impedance value above which an "error" event is generated. See details next page.

ERR LO: Input the impedance value below which an "error" event is generated. See details next page.

"Warning" and "error" events (functions "Activate", "Warn hi", "Warn lo", "Err hi" and "Err lo" in the menus "Glass elec." and "Ref.elec.")

A malfunction in your process or simply in the measurement sensor may be revealed by too low or too high an impedance on one and/or other electrode on the measurement sensor.

To be warned when an electrode has too low or too high an impedance:

→ activate monitoring on this electrode in the function "activate", then

→ programme an impedance range (in MΩ for the pH electrode and in kΩ for the reference electrode on the pH/Redox sensor) outside of which the transmitter generates a "warning" event and displays the ☺ and ⚠ icons.

→ programme an impedance range (in MΩ for the pH electrode and in kΩ for the reference electrode on the pH/Redox sensor) outside of which the transmitter generates an "error" event and displays the ☹ and ᴱᴿᴿ icons.

When a "warning" or "error" event is generated by the transmitter:

→ go into the "Info" menu to read the cause of the event generation

→ and/or go into the "Sensor" function of the Diagnostic menu to read the impedance values for each electrode in order to identify the cause of an out of range impedance.

→ if necessary, clean then recalibrate the measurement sensor or replace it

▪ The "warning" event may also be associated with one or other or both transistor outputs. See § 10.7.5, function "Output.TR1" or "Output.TR2".

▪ The "error" event may also be associated with one or other or both current outputs. See § 10.7.4, function "Output.AC1" or "Output.AC2".

▪ See also "If you encounter problems" at § 11.4.

10.9.3. Monitor the fluid temperature (menu "Sensor" - Function "Temperature")

Refer to paragraphs 10.5 and 10.6 to access the Dagnostic menu.

Sensor menu - Functions Glass electrode and Ref electrode: see 10.9.2
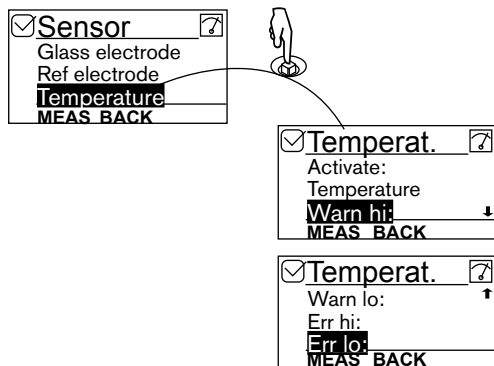
Monitor the fluid temperature and configure the device's behaviour if the ranges defined are exceeded ("Temperat.")

ACTIVATE: Choose whether or not to activate monitoring of the fluid temperature.

This monitoring is done by the generation of a "warning" event if the fluid temperature range defined in the "Warn hi/lo" functions below is exceeded and an "error" event if the fluid temperature range defined in the "Err hi/lo" functions below is exceeded.

See also "If you encounter problems" at § 11.4.

TEMPERATURE: Read the fluid temperature measured in real time by the built-in Pt1000 sensor.

WARN HI: Input the fluid temperature value above which a "warning" event is generated. See details next page.

WARN LO: Input the fluid temperature value below which a "warning" event is generated. See details next page.

ERR HI: Input the fluid temperature value above which an "error" event is generated. See details next page.

ERR LO: Input the fluid temperature value below which an "error" event is generated. See details next page.

"Warning" and "error" events (functions "Activate", "Warn hi", "Warn lo", "Err hi" and "Err lo" in the menu "Temperature")

A malfunction in your process or the built-in temperature sensor may be revealed either by too low or too high a fluid temperature or by an incorrect temperature measurement.

To be warned when the temperature measurement is out of range:

→ activate monitoring on the fluid temperature in the function "activate", then

→ programme a temperature range (in **°C**) outside of which the transmitter generates a "warning" event and displays the ☺ and ⚠ icons.

→ programme a temperature range (in **°C**) outside of which the transmitter generates an "error" event and displays the ☹ and ⓔᴿᴿ icons.

When a "warning" or "error" event is generated by the transmitter:

→ go into the "Info" menu to read the cause of the event generation

→ and/or go into the "Sensor" function of the Diagnostic menu to read the measured fluid temperature value.

→ if necessary, check whether the built-in Pt1000 is working correctly by measuring a fluid with a known temperature. If the Pt1000 is faulty, return the device to Bürkert.

→ if the Pt1000 is not the cause of the problem, check the process.

▪ The "warning" event may also be associated with one or other or both transistor outputs. See § 10.7.5, function "Output.TR1" or "Output.TR2".

▪ The "error" event may also be associated with one or other or both current outputs. See § 10.7.4, function "Output.AC1" or "Output.AC2".

▪ See also "If you encounter problems" at § 11.4.

10.10. Test menu ("Test")

### 10.10.1. Modify the Test menu access code ("System" menu)

Refer to paragraphs 10.5 and 10.6 to access the Test menu.

Test	System
System	Code
Outputs	
Sensor	
MEAS BACK	MEAS BACK
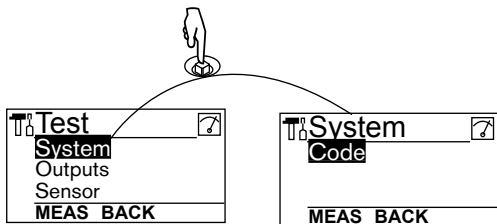
CODE: Modify the Test menu access code (4 figures; 0000 by default).

10.10.2. Check that the outputs are working correctly ("Outputs" menu)

Refer to paragraphs 10.5 and 10.6 to access the Test menu.

Test	Outputs
System	AC1
Outputs	AC2
Sensor	Tr1
MEAS BACK	MEAS BACK

Outputs
AC2
Tr1
Tr2
MEAS BACK
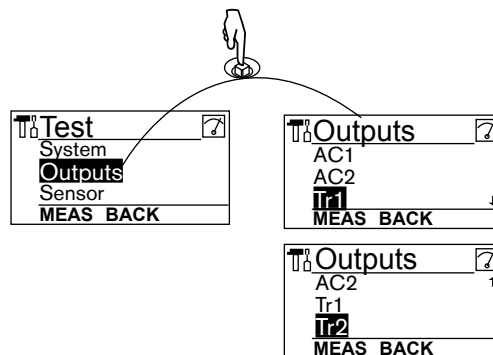
AC1: Check that current output 1 is working correctly by inputting a current value and then selecting "OK".

*AC2*: Check that current output 2 is working correctly by inputting a current value and then selecting "OK".

TR1: Check that transistor output 1 is working correctly by selecting the status of the transistor ("ON" or "OFF") then "OK".

TR2: Check that transistor output 2 is working correctly by selecting the status of the transistor ("ON" or "OFF") then "OK".

10.10.3. Check that the outputs are behaving correctly ("Sensor" menu)

Refer to paragraphs 10.5 and 10.6 to access the Test menu.

The feature makes it possible to simulate the measurement of the physical parameter to check if the outputs are correctly programmed.
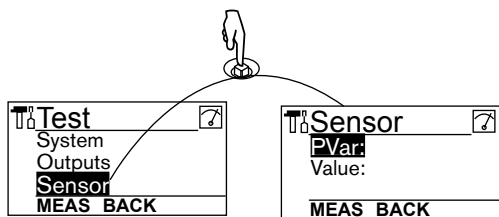
PVAR: Choose the physical parameter to be tested.

VALUE: Input a physical parameter selected from the "PVAR" function above to check output behaviour.

10.11. Information menu ("Info")

Refer to paragraphs 10.5 and 10.6 to access the Info menu.
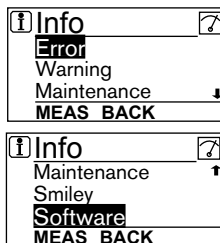
This menu makes it possible to read:

▪ a short description of the reason why the following icons are displayed by the transmitter, on one hand:

- ERROR: ⊗ᴱᴿᴿ

- WARNING: ⚠

- MAINTENANCE: ✋

- SMILEY: ☺ or ☹

> 🛈 See also "If you encounter problems" at § 11.4.

▪ the software version (function "Software") of the acquisition / conversion module for the physical parameters measured, on the other hand.

11. MAINTENANCE AND TROUBLESHOOTING

11.1. Safety instructions

⚠️ **DANGER**

Risk of injury due to high pressure in the installation.
▪ Cut off the pressure and depressurize the pipes before loosening the pipes.

Risk of injury due to electrical discharge.
▪ Before starting work, switch off the power supply and secure it to prevent restarting.
▪ Observe all applicable accident protection and safety guidelines for electrical equipment.

Risk of injury due to the nature of the fluid.
▪ Respect the prevailing rules on accident prevention and safety relating to the use of aggressive fluids.

⚠️ **WARNING**

Risk of injury due to non-conforming maintenance.
▪ Maintenance must only be carried out by qualified and skilled staff with the appropriate tools.
▪ Guarantee a set or controlled restarting of the process, after a power supply interruption.

11.2. Cleaning of the transmitter

The 8202 transmitter can be cleaned with water or using a detergent compatible with the materials it is made of.

Please feel free to contact your Bürkert supplier for any additional information.

11.2.1. Maintenance of the pH/redox sensor

⚠️ **DANGER**

Risk of injury due to the nature of the cleaning or regeneration solution.
▪ Respect the prevailing rules on accident prevention and safety relating to the use of aggressive fluids.

NOTE

The process may be polluted by the cleaning solution.
▪ After each cleaning operation, rinse the sensor with distilled water and immerse it in a KCl 3M solution or running water for 10 minutes.

Lifespan of the sensor

The lifespan of a pH/redox sensor depends on the fluid to be measured and the conditions in which measurements are taken.

When the fluid to be measured is aggressive, for example, and/or the fluid temperature reaches high values, the lifespan of the sensor may be shortened.

When the measuring conditions are favourable and the fluid temper-
ature remains in the region of 25°C, the sensor has a lifespan of 1
to 3 years; it drops to 3 months when the fluid temperature reaches
90°C.

Storing the sensor

▪ To store the sensor:

→ put KCl 3M solution, available as an accessory, in the protective
cap

→ place the protective cap on the sensor

▪ If the sensor has dried out during storage:

→ let it soak in a KCl solution for one full night if dehydration is
major to obviate incorrect measurements and drift

Cleaning the sensor

▪ When the sensor is dirty, clean it according to the type of dirt:

- clogging by greases or oils: use a tensioactive-based cleaner

- limescale or metal hydroxide desposit: use diluted hydrochloric
acid (10%)

- sulphurous precipitate (e.g. in purification stations): use a mix-
ture of diluted hydrochloric acid (10%) and pepsin (saturated)

▪ Particular case of a sensor with a ceramic diaphragm:

- egg white colour pollution: soak the sensor in a solution com-
posed of 0.4% HCl and 5g/l of pepsin for several hours

- black colouration of the diaphragm (silver precipitate): immerse
the sensor in a solution composed of 0.4% HCl and 76 g/l of
thiourea

▪ when the redox sensor is polluted by ions:

→ use aqua regia, a solution composed of 25% nitric acid and
75% hydrochloric acid

→ immerse the sensor in the solution obtained for a maximum of
1 minute to prevent this aqua regia solution dissolving the plate

→ rinse thoroughly

Regenerating the sensor

▪ To regenerate a pH sensor:

→ soak the sensor in an NaOH solution (0.1 - 1M) for 10 minutes

→ soak the sensor in an HCl solution (0.1 - 1M) for 10 minutes

→ rinse the sensor by soaking it in a KCl 3M solution (see Chap.
12) for at least 15 minutes

▪ To regenerate a redox sensor:

→ clean the metal surface with a slightly abrasive material such as
toothpaste or very fine scouring powder.

11.3. Replacing the sensor

NOTE

The transmitter loses the IP67 protection rating when dis-mounted.
▪ Take any precautions necessary to protect the inside of the dis-mounted transmitter.

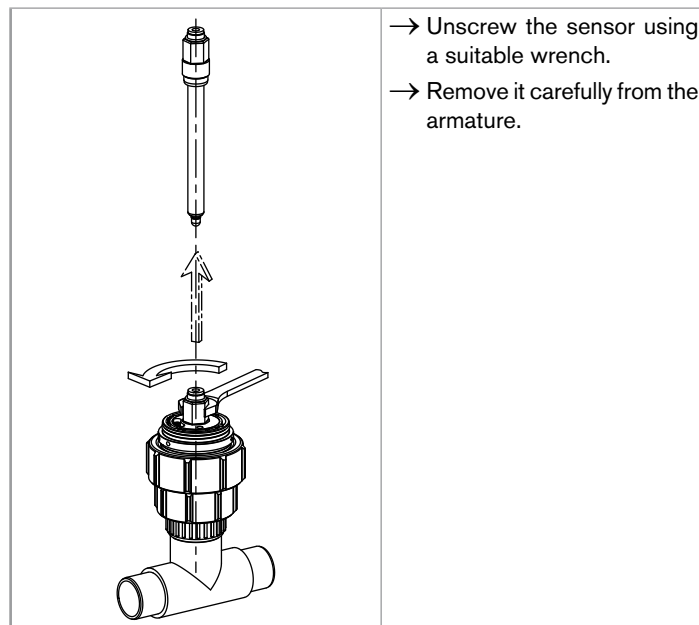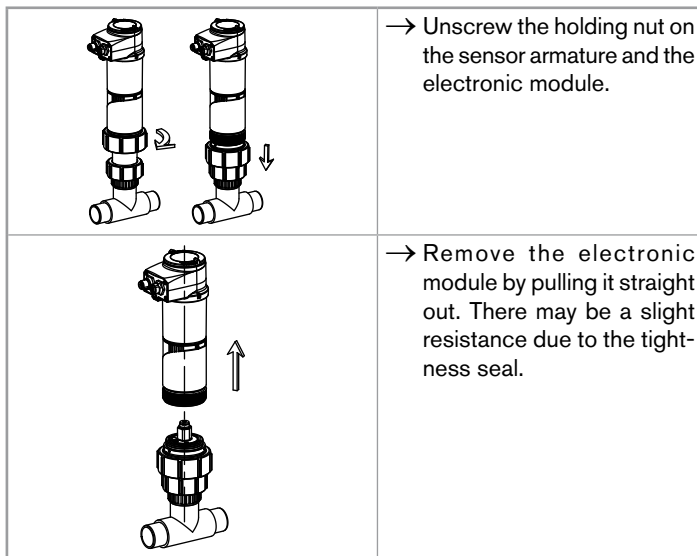→ Remove the sensor as shown below.

	→ Unscrew the holding nut on the sensor armature and the electronic module.
	→ Remove the electronic module by pulling it straight out. There may be a slight resistance due to the tight-ness seal.

	→ Unscrew the sensor using a suitable wrench. → Remove it carefully from the armature.

Fig. 11.1 Removing the sensor from the armature

→ Fit a new sensor into the armature as shown in § 7.6.
→ Refit the electronic module to the armature as shown in § 7.7.

11.4. If you encounter problems

| Red LED	Current output	Transistor output	Icon	Message displayed within the Info menu	Meaning	What to do
ON	22 mA	depending on thresholds	⊗ERR + ☺	"E:Sat. ORP Stage" "E:Sat. pH Stage"	The pH or redox value is not being correctly measured due to the saturation of the input stage of the measuring board	→ Check the correct wiring of the earth points → check the equipotential surfaces of the installation
ON	22 mA	depending on thresholds	⊗ERR + ☺	"No sensor board"	The link to the measurement module is interrupted	→ Switch the power supply off then on again → if the error persists, return the device to Bürkert
ON	22 mA	depending on thresholds	⊗ERR + ☺	"S EE FactI Read" "S EE Fact Read"	Factory data is lost. The process continues but the accuracy of the device is modified	→ Switch the power supply off then on again → if the error persists, return the device to Bürkert
ON	22 mA	depending on thresholds	⊗ERR + ☺	"S EE User Read" "S EE User Write"	User data for the sensor is lost (eg. type of sensor)	→ Switch the power supply off then on again → check the sensor parameters in all the "Sensor" menus then save them again → if the error persists, return the device to Bürkert
ON	22 mA	depending on thresholds	⊗ERR + ☺	"S PT Missing"	The connection to the Pt1000 sensor is lost	→ Check that the fastening nut between the pH sensor and the electronic module is correctly screwed → if the error persists, return the device to Bürkert

Red LED	Current output	Transistor output	Icon	Message displayed within the Info menu	Meaning	What to do
ON	22 mA	depending on thresholds	ERR + ☺	"S PT Regulation"	The fluid temperature is not being correctly measured. The process is stopped.	→ Switch the power supply off then on again → if the error persists, return the device to Bürkert
ON	22 mA	depending on thresholds	ERR + ☺	"S RTC Clock"	The clock is faulty. The process continues.	→ Return the device to Bürkert if the clock is essential.
ON	22 mA	depending on thresholds	ERR + ☺	"TR COM Measure"	The acquisition/conversion module of the physical parameters is faulty. The process is stopped.	→ Switch the power supply off then on again → if the error persists, return the device to Bürkert
ON	22 mA	depending on thresholds	ERR + ☺	"TR EE Fact Read" "TR EE User Read"	Parameter reading error	→ Switch the power supply off then on again → if the error persists, set the device back to the default settings (§ 10.7.1) → if the error persists, return the device to Bürkert
ON	22 mA	depending on thresholds	ERR + ☺	"TR EE UserWrite"	Parameter saving error	→ Switch the power supply off then on again, → save the parameters again → if the error persists, set the device back to the default settings (§ 10.7.1) → if the error persists, return the device to Bürkert

Red LED	Current output	Transistor output	Icon	Message displayed within the Info menu	Meaning	What to do
OFF	4-20 mA	depending on thresholds	⚠ + ☺	"S Buff Diff ORP" "S Buff Diff pH" "S Buff pH ORP"	The pH or redox value is not being correctly measured due to the saturation of the input stage of the measuring board (common mode).	→ Check the wiring → check the equipotential surfaces of the installation
				"S RTC Reinit"	The date and time are lost because the device has not been powered up for at least 5 days. The message is only displayed at the first powering up.	→ Program the date and time (see § 10.7.1). → power up the transmitter at least 4 hours so that the date and time are battery powered for 5 days.
ON	22 mA [1]	depending on thresholds	ERR + ☹	"E:Impedance Ref"	The impedance of the reference electrode is out of range. The message is displayed if the monitoring of the impedance of the reference electrode has been activated, depending on the programmed thresholds ERR LO and ERR HI (see § 10.9.2).	→ Go into the "Sensor" function of the Diagnostic menu to read the impedance value of the reference electrode (§ 10.9.2) → if necessary, clean then recalibrate the measurement sensor or replace it

[1] if the DIAG MODE function of the "Output.AC1" or "Output.AC2" menu is set to "22 mA" (see § 10.7.4); else, the current output delivers a standard current between 4 and 20 mA

Red LED	Current output	Transistor output	Icon	Message displayed within the Info menu	Meaning	What to do
ON	22 mA[1]	depending on thresholds	ERR + ☹	"E:Imped. Glass"	The impedance of the pH electrode is out of range. The message is displayed if the monitoring of the impedance of the pH electrode has been activated, depending on the programmed thresholds ERR LO and ERR HI (see § 10.9.2).	→ Go into the "Sensor" function of the Diagnostic menu to read the impedance value of the pH electrode (§ 10.9.2) → if necessary, clean then recalibrate the measurement sensor or replace it
ON	22 mA[1]	depending on thresholds	ERR + ☹	"E:Temperature"	The fluid temperature is out of range. The message is displayed if the monitoring of the fluid temperature has been activated, depending on the programmed thresholds ERR LO and ERR HI (see § 10.9.3).	→ Go into the "Sensor" function of the Diagnostic menu to read the measured fluid temperature (§ 10.9.3). → if necessary, check whether the built-in Pt1000 is working correctly by measuring a fluid with a known temperature. → If the Pt1000 is faulty, return the device to Bürkert. → if the Pt1000 is not the cause of the problem, check the process.

[1] if the DIAG MODE function of the "Output.AC1" or "Output.AC2" menu is set to "22 mA" (see § 10.7.4); else, the current output delivers a standard current between 4 and 20 mA

Red LED	Current output	Transistor output	Icon	Message displayed within the Info menu	Meaning	What to do
OFF	4-20 mA	Switched [2]	⚠ + ☺	"W:Impedance Ref"	The impedance of the reference electrode is out of range. The message is displayed if the monitoring of the impedance of the reference electrode has been activated, depending on the programmed thresholds WARN LO and WARN HI (see § 10.9.2).	→ Go into the "Sensor" function of the Diagnostic menu to read the impedance value of the reference electrode (§ 10.9.2) → if necessary, clean then recalibrate the measurement sensor or replace it
OFF	4-20 mA	Switched [2]	⚠ + ☺	"W:Imped. Glass"	The impedance of the pH electrode is out of range. The message is displayed if the monitoring of the impedance of the pH electrode has been activated, depending on the programmed thresholds WARN LO and WARN HI (see § 10.9.2).	→ Go into the "Sensor" function of the Diagnostic menu to read the impedance value of the pH electrode (§ 10.9.2) → if necessary, clean then recalibrate the measurement sensor or replace it

[2] If the "PVAR" function of the "Output.TR1" and/or "Output.TR2" menus is set to "warning" (see § 10.7.5); else, the transistor outputs are operating depending on the programmed thresholds.

Red LED	Current output	Transistor output	Icon	Message displayed within the Info menu	Meaning	What to do
OFF	4-20 mA	Switched [2)]	⚠ + ☺	"W:Temperature"	The fluid temperature is out of range. The message is displayed if the monitoring of the fluid temperature has been activated, depending on the programmed thresholds WARN LO and WARN HI (see § 10.9.3).	→ Go into the "Sensor" function of the Diagnostic menu to read the measured fluid temperature (§ 10.9.3). → if necessary, check whether the built-in Pt1000 is working correctly by measuring a fluid with a known temperature. → If the Pt1000 is faulty, return the device to Bürkert. → if the Pt1000 is not the cause of the problem, check the process.
OFF	4-20 mA	Switched [2)]	☞	"M:Calib. Date"	A calibration is due. The periodicity of the calibrations is set within the "INTERVAL" function of the "CALIB INTERVAL" menu (see § 10.8.3)	→ Calibrate the sensor (§ 10.8.3)

[2)] If the "PVAR" function of the "Output.TR1" and/or "Output.TR2" menus is set to "warning" (see § 10.7.5); else, the transistor outputs are operating depending on the programmed thresholds.

12. SPARE PARTS AND ACCESSORIES

⚠️ **CAUTION**

Risk of injury and/or damage by the use of incorrect parts.

Incorrect accessories and unsuitable replacement parts maycause injuries and damage the device and the surrounding area.

▪ Use only original accessories and original replacement parts from Bürkert.

Spare part	Order code
Seal in EPDM, Ø 46x2 mm, for the sensor armature	559169

Accessory	Order code
Display module	559168
pH sensor, LOGOTRODE pH 120 mm	427114
pH sensor, CERATRODE pH 120 mm	418319
pH sensor, UNITRODE PLUS pH 120 mm	560376
pH sensor, PLASTRODE pH 120 mm	560377
Redox sensor, UNITRODE PLUS Redox 120 mm	560378
Redox sensor, LOGOTRODE Redox 120 mm	560379
Storage solution for pH/Redox sensor (KCl 3M), 500 ml	418557

Accessory	Order code
Buffer solution, 500 ml, pH = 4	418540
Buffer solution, 500 ml, pH = 7	418541
Buffer solution, 500 ml, pH = 10	418543
Buffer solution, 500 ml, redox potential = 475 mV	418555
M12, 5-pin female connector, to be wired	917116
M12, 5-pin female connector, moulded on shielded cable (2 m)	438680
M12, 5-pin male connector, moulded on shielded cable (2 m)	559177

13. PACKAGING, TRANSPORT

NOTE

Damage due to transport

Transport may damage an insufficiently protected device.

▪ Transport the device in shock-resistant packaging and away from humidity and dirt.

▪ Avoid the effects of heat and cold which could cause the storage temperature range to be exceeded.

▪ Protect the electrical interfaces by using protection caps.

14. STORAGE

NOTE

Poor storage can damage the device.

▪ Store the device in a dry place away from dust.

▪ Storage temperature of the 8202: -10 to +60°C.

▪ Storage temperature of the sensor: see § 6.3.5 or corresponding instruction manual.

15. DISPOSAL OF THE PRODUCT

→ Dispose of the device and its packaging in an environmentally-friendly way.

NOTE

Damage to the environment caused by products contaminated by fluids.
▪ Keep to the existing provisions on the subject of waste disposal and environmental protection.

Please note
Comply with the national and/or local regulations which concern the area of waste disposal.

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