Type 8203

pH probes or Redox potential probes

We reserve the right to make technical changes without notice.

Technische Änderungen vorbehalten.

Sous réserve de modifications techniques.

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Operating Instructions 1906/06_EU-ml_00560756 REF 624192/04

Operating Instructions

Bedienungsanleitung
Manuel d'utilisation

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ABOUT THIS MANUAL

This manual describes the entire life cycle of the product. 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.

SYMBOLS USED

The following symbols are used in this manual:

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.

advice or important recommendations for your safety and for the correct operation of the product.

→ indicates a procedure to be carried out.

INTENDED USE

Use of the pH/Redox probe type 8203 that does not comply with the instructions could present risks to people, nearby installations and the environment.

- The probe is used to measure:
  - 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 product 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 product as intended.

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Restraints

Observe any existing restraints when the product is exported.

Foreseeable misuse

- Do not use the pH / Redox probes in an explosive atmosphere.
- Do not use fluid that is incompatible with the materials of which the probe is made.

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 in the installation.

Danger due to high temperatures of the fluid.

Danger due to the nature of the fluid.

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.
- 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 probe and the fluids 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).

GENERAL INFORMATION

Contact

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

Also on the internet, at:

www.burkert.com

Warranty conditions

The condition to benefit from the warranty is the conforming use of the pH/Redox probe in observance of the specified conditions of operating.

Information on the internet

You can find the user manual and technical data sheet regarding type 8203 at:

www.burkert.com

DESCRIPTION

Sphere of application

The pH/Redox probe is used to measure:

- 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.

General description

- The pH probe is a glass membrane with variable selectivity according to the pH. When the pH probe is immersed in a solution, a difference in potential 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 probe 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.

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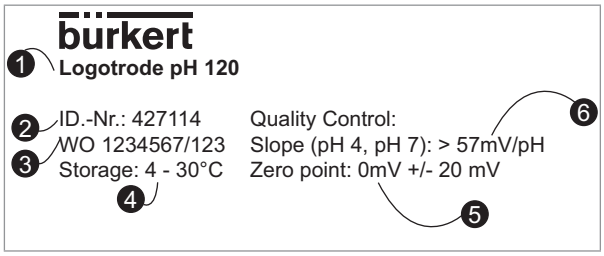
Data marked on the probe



1	Probe name, physical parameter measured and length in mm
2	Ordering code
3	Internal code
4	Ambient temperature for storage
5	Value of the zero point
6	Value of the slope

Versions available

Probe	Order code
pH probe, FLATRODE pH, 120 mm	561025
pH probe, LOGOTRODE pH, 120 mm	427114
pH probe, UNITRODE PLUS pH, 120 mm	560376
pH probe, CERATRODE pH, 120 mm	418319
pH probe, PLASTRODE pH, 120 mm	560377
pH probe, FERMTRODE VP pH, 120 mm	561727
Redox probe, FLATRODE Redox, 120 mm	561027
Redox probe, LOGOTRODE Redox, 120 mm	560379
Redox probe, UNITRODE Redox, 120 mm	560378

TECHNICAL DATA

Conformity to the pressure equipment directive

→ Make sure that the product materials are compatible with the fluid.

→ Make sure that the pipe DN is adapted for the probe.

The probe conforms to Article 4, Paragraph 1 of the Pressure Equipment Directive 2014/68/EU under the following conditions:

- Probe used on a pipe (PS = maximum admissible pressure; DN = nominal dimension of the pipe)

Type of fluid	Conditions
Fluid group 1, Article 4, Paragraph 1.c.i	DN ≤ 25
Fluid group 2,Article 4, Paragraph 1.c.i	DN ≤ 32 or PSxDN ≤ 1000 bar
Fluid group 1, Article 4, Paragraph 1.c.ii	DN ≤ 25 or PSxDN ≤ 2000 bar
Fluid group 2, Article 4, Paragraph 1.c.ii	DN ≤ 200 or PS ≤ 10 bar or PSxDN ≤ 5000 bar

- Probe used on a vessel (PS = maximum admissible pressure; V = vessel volume)

Type of fluid	Conditions
Fluid group 1, Article 4, Paragraph 1.a.i	V >1 L and PSxV ≤ 25 bar.L OR PS ≤ 200 bar
Fluid group 2,Article 4, Paragraph 1.a.i	V >1 L and PSxV ≤ 50 bar.L OR PS ≤ 1000 bar
Fluid group 1, Article 4, Paragraph 1.a.ii	V >1 L and PSxV ≤ 200 bar.L OR PS ≤ 500 bar
Fluid group 2, Article 4, Paragraph 1.a.ii	PS >10 bar and PSxV ≤ 10000 bar.L OR PS ≤ 1000 bar

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Common probe-data

- pH or Redox probe, combined
- 120 mm long with head PG 13.5
- without temperature probe

Individual probe-data

FLATRODE pH	
▪ Type of fluid	▪ contaminated
▪ Measurement range	▪ 0...14 pH
▪ Fluid pressure	▪ 0...6 bar
▪ Fluid temperature	▪ 0...+80 °C
▪ Ambient temperature	▪ 0...+60 °C (operation), +4...+30 °C (storage)
▪ Minimum conductivity	▪ 50 µS/cm
▪ Max. pressure at max. temperature	▪ 4 bar
▪ Number and type of diaphragms	▪ 1, annular and centered, in High Density Polyethylen
▪ Reference electrolyte	▪ acrylamide gel
▪ Electrical connection	▪ S7/S8

LOGOTRODE pH	
▪ Type of fluid	▪ clean
▪ Measurement range	▪ 0...14 pH
▪ Fluid pressure	▪ 0...6 bar
▪ Fluid temperature	▪ -10...+60 °C
▪ Ambient temperature	▪ 0...+60 °C (operation), +4...+30 °C (storage)
▪ Minimum conductivity	▪ 2 µS/cm
▪ Max. pressure at max. temperature	▪ 6 bar
▪ Number and type of diaphragms	▪ 1 "single pore™"
▪ Reference electrolyte	▪ polymer
▪ Electrical connection	▪ S7/S8

UNITRODE PLUS pH	
▪ Type of fluid	▪ contaminated or containing sulphides or proteins
▪ Measurement range	▪ 0...14 pH
▪ Fluid pressure	▪ 0...16 bar if fluid temperature < 100 °C, 0...10 bar if fluid temperature between 100 and 130 °C
▪ Fluid temperature	▪ 0...+130 °C
▪ Ambient temperature	▪ 0...+60 °C (operation), +4...+30 °C (storage)
▪ Minimum conductivity	▪ 2 µS/cm
▪ Max. pressure at max. temperature	▪ 6 bar
▪ Number and type of diaphragms	▪ 2 "single pore™"
▪ Reference electrolyte	▪ polymer
▪ Electrical connection	▪ S7/S8

CERATRODE pH	
▪ Type of fluid	▪ at high pressure, at high flow rate
▪ Measurement range	▪ 0...14 pH
▪ Fluid pressure	▪ 0...16 bar (max. 6 bar at +130°C, max. 16 bar at +25°C)
▪ Fluid temperature	▪ 0...+130 °C
▪ Ambient temperature	▪ 0...+60 °C (operation), +4...+30 °C (storage)
▪ Minimum conductivity	▪ 50 µS/cm
▪ Max. pressure at max. temperature	▪ 6 bar
▪ Number and type of diaphragms	▪ 3 in High Performance ceramic
▪ Reference electrolyte	▪ gel
▪ Electrical connection	▪ S7/S8

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FERMTRODE pH VP	
▪ Type of fluid	▪ Fluids containing proteins, cells culture or injection solutions
▪ Measurement range	▪ 0...14 pH
▪ Fluid pressure	▪ 0...6 bar
▪ Fluid temperature	▪ 0...+135 °C
▪ Ambient temperature	▪ 0...+60 °C (operation), +4...+30 °C (storage)
▪ Minimum conductivity	▪ 100 µS/cm
▪ Max. pressure at max. temperature	▪ 6 bar
▪ Number and type of diaphragms	▪ 1 in HP-COATRAMIC™
▪ Reference electrolyte	▪ Pressurized FOODLYTE™
▪ Electrical connection	▪ Variopin 6.0

PLASTRODE pH	
▪ Type of fluid	▪ drinking, aquarium or swimming pool water
▪ Measurement range	▪ 0...14 pH
▪ Fluid pressure	▪ 0...6 bar
▪ Fluid temperature	▪ -10...+40 °C
▪ Ambient temperature	▪ 0...+60 °C (operation), +4...+30 °C (storage)
▪ Minimum conductivity	▪ 50 µS/cm
▪ Max. pressure at max. temperature	▪ 6 bar
▪ Number and type of diaphragms	▪ 1 "single pore™"
▪ Reference electrolyte	▪ polymer
▪ Electrical connection	▪ S7/S8

FLATRODE redox	
▪ Type of fluid	▪ contaminated
▪ Measurement range	▪ -2000...+2000 mV
▪ Fluid pressure	▪ 0...6 bar
▪ Fluid temperature	▪ 0...+80 °C
▪ Ambient temperature	▪ 0...+60 °C (operation), +4...+30 °C (storage)
▪ Minimum conductivity	▪ 50 µS/cm
▪ Max. pressure at max. temperature	▪ 4 bar
▪ Number and type of diaphragms	▪ 1 double junction
▪ Reference electrolyte	▪ acrylamide gel
▪ Electrical connection	▪ S7/S8

LOGOTRODE redox	
▪ Type of fluid	▪ clean, with a low conductivity
▪ Measurement range	▪ -2000...+2000 mV
▪ Fluid pressure	▪ 0...6 bar
▪ Fluid temperature	▪ -10...+60 °C
▪ Ambient temperature	▪ 0...+60 °C (operation), +4...+30 °C (storage)
▪ Minimum conductivity	▪ 2 µS/cm
▪ Max. pressure at max. temperature	▪ 6 bar
▪ Number and type of diaphragms	▪ 1 "single pore™"
▪ Reference electrolyte	▪ polymer
▪ Electrical connection	▪ S7/S8

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UNITRODE PLUS redox	
▪ Type of fluid	▪ clean, contaminated, with low conductivity, containing sulphides or proteins
▪ Measurement range	▪ -2000...+2000 mV
▪ Fluid pressure	▪ 0...6 bar
▪ Fluid temperature	▪ 0...+130 °C
▪ Ambient temperature	▪ 0...+60 °C (operation), +4...+30 °C (storage)
▪ Minimum conductivity	▪ 2 µS/cm
▪ Max. pressure at max. temperature	▪ 6 bar
▪ Number and type of diaphragms	▪ 2 "single pore™"
▪ Reference electrolyte	▪ polymer
▪ Electrical connection	▪ S7/S8

ASSEMBLY

Safety instructions

DANGER

Risk of injury due to high pressure in the installation

- Stop the circulation of fluid and depressurize the pipes before loosening the fittings.

Risk of injury 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.

Risk of injury due to the nature of the fluid.

- Respect the regulations on accident prevention and safety relating to the use of aggressive fluids.

Risk of injury due to high fluid temperatures.

- Use safety gloves to handle the device.

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.

Fit the probe to a Bürkert transmitter or a probe armature

→ Refer to the user manual for the transmitter or the armature.

MAINTENANCE

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 device may be damaged.

- Dry the probe head with a duster before connecting the probe to the transmitter.

NOTE

The process may be polluted by the cleaning solution.

- After each cleaning operation, rinse the probe with distilled water and immerse it in a KCl 3M solution or running water for 10 minutes.

Lifespan of the probe

The lifespan of a pH/Redox probe 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

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lifespan of the probe may be shortened.

When the measuring conditions are favourable (e.g. clean water) and the fluid temperature remains in the region of 25°C, the probe has a lifespan of 1 to 3 years; the higher the fluid temperature the lower the lifespan of teh probe.

Storing the probe

- To store the probe:

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

→ place the protective cap on the probe

- If the probe has dried out during storage:

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

Cleaning the probe

- When the probe is dirty, clean it according to the type of dirt:
  - clogging by greases or oils: use a tensioactive-based cleaner
  - limescale or metal hydroxide deposit: use diluted hydrochloric acid (10%)
  - sulphurous precipitate (e.g. in purification stations): use a mixture of diluted hydrochloric acid (10%) and pepsin (saturated)

- Particular case of a probe with a ceramic diaphragm:
  - egg white colour pollution: soak the probe in a solution composed of 0.4% HCl and 5g/l of pepsin for several hours
  - black colouration of the diaphragm (silver precipitate): immerse the probe in a solution composed of 0.4% HCl and 76 g/l of thiourea

Regenerating the probe

- To regenerate a pH probe:

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

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

→ rinse the probe by soaking it in a solution of KCl 3M for at least 15 minutes

- To regenerate a Redox probe:

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

Accessories

Accessory	Order reference
Storage solution for pH/Redox probe (KCl 3M), 500 ml	418557
Buffer solution, 500 ml, pH = 4.01	418540
Buffer solution, 500 ml, pH = 7	418541
Buffer solution, 500 ml, pH = 10.01	418543
Calibration solution, 500 ml, Redox potential = 475 mV	418555
Cleaning solution kit for pH/redox probes, 3x500 ml	560949

PACKAGING, TRANSPORT, STORAGE

NOTE

Damage due to transport

Transport may damage an insufficiently protected product.

- Transport the product 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 probe endings by using protection caps.

Poor storage can damage the device.

- Store the probe in a dry place away from dust.
- Storage temperature +4...+30°C.

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DISPOSAL OF THE PRODUCT

→ Dispose of the product 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.

Note

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