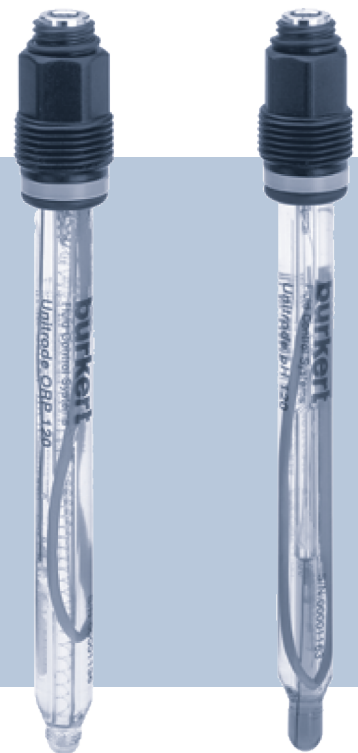


Type 8203

pH probes or Redox potential probes



Operating Instructions

We reserve the right to make technical changes without notice.

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1 About this document

The document is an important part of the product and guides the user to safe installation and operation. The information and instructions in this document are binding for the use of the product.

- ▶ Before using the product for the first time, read and observe the whole safety chapter.
- ▶ Before starting any work on the product, read and observe the respective sections of the document.
- ▶ Keep the document available for reference and give it to the next user.
- ▶ Contact the Bürkert sales office for any questions.



Further information concerning the product at [Products](#).

- ▶ Enter the article number from the type label in the search bar.

The illustrations in these instructions may vary depending on the product variant.

1.1 Symbols



DANGER!

Warns of a danger that leads to death or serious injuries.



WARNING!

Warns of a danger that can lead to death or serious injuries.



CAUTION!

Warns of a danger that can lead to minor injuries.

NOTICE!

Warns of property damage on the product or the installation.



Indicates important additional information, tips and recommendations.



Refers to information in this document or in other documents.

- ▶ Indicates a step to be carried out.

✓ Indicates a result.

Menu Indicates a software user-interface text.

1.2 Terms and abbreviations

The terms and abbreviations are used in this document to refer to following definitions.

Product	Type 8203 pH/Redox probe
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1.3 Manufacturer

Bürkert SAS

20, rue du Giessen

67220 TRIEMBACH-AU VAL

FRANCE

The contact addresses are available at [Contact](#).



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- ▶ Explore the full range of products on our [eShop](#).

2 Safety

2.1 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.

Restrictions

- ▶ Observe any existing restrictions 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.

2.2 Safety instructions

This safety information does not take into account:

- any contingencies or occurrences 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:

- ▶ 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.

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).

3 Product description

3.1 Sphere of application

The pH/Redox probe is used to measure:

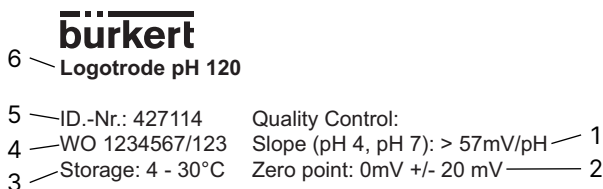
- the pH in clean liquids or liquids containing solids, sulphides or proteins.
- or the oxidation reduction potential in clean liquids or liquids containing solids, sulphides or proteins which may present low conductivity.

3.2 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.

3.3 Data marked on the probe



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

3.4 Versions available

Probe	Article number
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

4 Technical data

4.1 Standards and directives

This product complies with the legal requirements applicable at the time of placing on the market and has been developed and tested in accordance with the relevant European directives/regulations and harmonized standards. The conformity is documented and, if necessary, supported by evidence. The EU Declaration of Conformity can be found behind the respective type on the home page country.burkert.com

4.2 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 PNxDN ≤ 1000
Fluid group 1, Article 4, Paragraph 1.c.ii	DN ≤ 25 or PNxDN ≤ 2000
Fluid group 2, Article 4, Paragraph 1.c.ii	DN ≤ 200 or PN ≤ 10 bar or PNxDN ≤ 5000

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

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

4.3 Data

Common probe-data

- pH or Redox probe, combined
- 120 mm long with head PG 13.5
- without temperature probe
- Storage temperature: +4...+30 °C.

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 TM "
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 TM "
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

FERMTRODE pH

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-COATRAMICTM
Reference electrolyte	Pressurized FOODLYTETM
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 poreTM"
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 poreTM"
Reference electrolyte	polymer
Electrical connection	S7/S8

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 poreTM"
Reference electrolyte	polymer
Electrical connection	S7/S8

5 Assembly

5.1 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.



DANGER!

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.



DANGER!

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.



DANGER!

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.



WARNING!

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.

5.2 Fit the probe to a Bürkert transmitter or a probe armature

- ▶ Refer to the user manual for the transmitter or the armature.
- ▶ Ensure the process tightness by compressing the seal appropriately. After careful insertion to avoid mechanical damage to the glass, the probe should be screwed into its holder with a maximum torque of 2 Nm.

6 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.

NOTICE!

The device may be damaged.

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

NOTICE!

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.

6.1 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 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 the probe.

6.2 Shelf-life of glass-based probes upon storage

Manufacturing dates are indicated on individual probe labels. A slow ageing can occur, which can affect the slopes, response times and asymmetry potentials, but simple sitting in storage does not “kill” sensors. Slight variations against time should be compensated by the calibration upon installation. For non-pressurized glassbased probes (i.e. excluding the Flatrode and Fermtrode models), a shelf-life of at least 18 months can be warranted (6 months for the Flatrode and 12 months for the Fermtrode), if the probes are properly stored (i.e. by respecting the specified temperature ranges, and not allowing for drying out or mechanical damage of the pHsensitive bulb, respectively of the Redox bulb).

Beyond this period of time, the slope can be checked in pH 4 and pH 7 buffer solutions, similarly to a 2-point calibration: if the sensor slope still is 97 % (or better) of its nominal value, then the shelf life can be extended another 6 months.

This process can be repeated for up to 3 years from the date of manufacture.



The Redox glass bulb is not as sensitive to ageing as the pH glass bulb.

6.3 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

6.4 Cleaning the probe

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

- ▶ clogging by greases or oils: use a tensioactivebased 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 5 g/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

6.5 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.

7 Accessories

Accessory	Article number
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	418540
Buffer solution, 500 ml, pH = 10.01	418543
Buffer solution, 500 ml, pH = 10.01	418555
Cleaning solution kit for pH/redox probes, 3x500 ml	560949

8 Logistics

8.1 Transport and storage

- ▶ Protect the device against moisture and dirt in the original packaging during transportation and storage.
- ▶ Avoid UV radiation and direct sunlight.
- ▶ Protect connections, if present, from damage with protective caps.
- ▶ Observe the permitted storage temperature.

8.2 Return



No work or tests will be carried out on the device until a valid Contamination Declaration has been received.

- ▶ To return a used device to Bürkert, contact the Bürkert sales office. A return number is required.

8.3 Disposal

Environmentally friendly disposal



- ▶ Follow national regulations regarding disposal and the environment.
- ▶ Collect electrical and electronic devices separately and dispose of them as special waste.

Further information at country.burkert.com