pH- and ORP-probes

- For many different types of installations and applications
- Large selection of probe for a wide range of holder
- Useable for pipe DN 15...DN 200

Product variants described in the data sheet may differ from the product presentation and description.

Can be combined with

Type 8200
Armatures for analytical sensors

Type 8202
pH or redox potential transmitter, ELEMENT design

Type 8619
multiCELL – multi-channel/ multi-function transmitter/ controller

Type description

A Type 8203 probe is inserted either into a Bürkert pH meter or ORP meter. These modular devices are designed for the measurement of the pH or the ORP respectively in clean or contaminated liquids, containing sulfides or proteins, or liquids which may present low conductivity.

The Type 8203 probes are proposed in several models, depending on the application.
For pH measurement, the product line includes PLASTRODE pH 120 mm, FLATRODE pH 120 mm, LOGOTRODE pH 120 mm, UNITRODE PLUS pH 120 mm, CERATRODE pH 120 mm and FERMTRODE VP pH 120 mm
For the measurement of oxidation-reduction potential (ORP), the available models are FLATRODE ORP 120 mm, LOGOTRODE ORP 120 mm, and UNITRODE PLUS ORP 120 mm.

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Visit product website

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1. General technical data

1.1. About the probe

For general or hygienic purposes the probes, available in several models, are
- used in combination with one of the many holders offered in Type 8200,
- or inserted in a pH or ORP meter Type 8202 in the standard or neutrino variant

See **data sheet Type 8200** ▶ or **data sheet Type 8202** ▶ for more information.

1.2. All variants

The following data applies to all variants mentioned above.

Product properties	
Dimensions	Further information can be found in chapter "4. Dimensions" on page 8.
Temperature compensation	• Automatic – if the measurement system is equipped with Pt1000. Further information on the Pt1000 can be found in chapter "9.5. Ordering chart accessories" on page 14. – if the probe has an integrated Pt100 sensor. • Manual compensation reference temperature 25 °C (77 °F)
Electrical data	
Output	Analog signal, to be connected to ELEMENT or ELEMENT neutrino pH/ORP meter Type 8202 or multiCELL transmitter/controller Type 8619. See **data sheet Type 8202** ▶ or **data sheet Type 8619** ▶ for more information.
Product connections	
Process connection	PG 13.5
Approvals and conformities	
Directives	
CE directive	Further information on the CE directive can be found in chapter "2.3. Standards" on page 7.
Pressure equipment directive	Complying with article 4, paragraph 1 of 2014/68/EU directive Further information on the pressure equipment directive can be found in chapter "2.4. Pressure Equipment Directive (PED)" on page 7.
Environment and installation	
Ambient temperature	• Operation: 0...+ 60 °C (+ 32...+ 140 °F) • Storage: + 4...+ 30 °C (+ 39.2...+ 86 °F)

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1.3. pH probes

Note:

- The pH probe Type 8203 is available in 6 models.
- These probes can be used in a measuring range of 0...14 pH.

Technical data for PLASTRODE pH 120, FLATRODE pH 120 and LOGOTRODE pH 120 models

Product properties			
Probe model	**PLASTRODE pH 120**	**FLATRODE pH 120**	**LOGOTRODE pH 120**
Material			
Armature	Glass	Cast epoxy resin, black	Glass
Diaphragm	"Single pore"	Annular and centered, in high density Polyethylen	"Single pore"
Seal	EPDM	FKM	EPDM
Number of diaphragms	1	1	1
Temperature sensor	Not integrated	Not integrated	Not integrated
Reference electrolyte	Polymer	Acrylamide gel KNO3/3.5M KCl-AgCl	Polymer
Medium data			
Fluid	Drinking water, aquarium, swimming-pool...	Contaminated (viscous, suspended solids, small sized solids, paints, cosmetics, foodstuffs)	Clean (drinking water, cooling-water, aquarium, swimming-pool...)
Fluid conductivity	Min. 50 µS/cm	Min. 50 µS/cm	Min. 2 µS/cm
Fluid temperature	-10...+40 °C (+14...+104 °F)	0...+80 °C (+32...+176 °F)	-10...+60 °C (+14...+140 °F)
	If the temperature ranges given for the holder and the inserted probe are different, use the most restrictive range.		
Fluid pressure	0...6 bar (0...87 PSI)	0...6 bar (0...87 PSI)	0...6 bar (0...87 PSI)
	If the pressure ranges given for the holder and the inserted probe are different, use the most restrictive range.		
Maximum pressure at max. temperature	6 bar (87 PSI)	4 bar (58 PSI)	6 bar (87 PSI)
Product connections			
Electrical connection	S7/S8 connector	S7/S8 connector	S7/S8 connector
	(Coaxial shielded cables with S7/S8 connector and 4-wire cable for Pt1000/Liquid earth rod (if needed), see chapter "9.5. Ordering chart accessories" on page 14.)		

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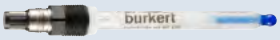
Technical data for UNITRODE PLUS pH 120, CERATRODE pH 120 and FERMTRODE pH 120 models

Product properties			
Probe model	**UNITRODE PLUS pH 120**	**CERATRODE pH 120**	**FERMTRODE pH 120** 
Material			
Armature	Glass	Glass	Glass
Diaphragm	"Single pore"	HP ceramics	HP-COATRAMIC
Seal	FPM	EPDM (conform to FDA - 21CFR 177.2600 and to USP class VI)	Silicone (conform to FDA - 21CFR 177.2600 and to USP class VI)
Number of diaphragms	2	3	1
Temperature sensor	Not integrated	Not integrated	Integrated Pt100
Reference electrolyte	Polymer	Gel	Pressurized FOODLYTE (conform USP 31)
Medium data			
Fluid	• Contaminated (waste water, cooling water, electro-plating, paints, cosmetics...) • Containing sulfides/proteins (tannery, animal breeding, waste water, foodstuffs, cosmetics, biotechnology)	High pressure, high flow rate applications	Biotechnology, pharma, food industry • containing proteins, cell cultures, injectable • applications requiring biocompatibility or suitability for food contact guarantee
Fluid conductivity	Min. 2 µS/cm	Min. 50 µS/cm	Min. 100 µS/cm
Fluid temperature	0...+ 130 °C (+ 32...+ 266 °F) If the temperature ranges given for the holder and the inserted probe are different, use the most restrictive range.	0...+ 130 °C (+ 32...+ 266 °F)	0...+ 140 °C (+ 32...+ 284 °F)
Fluid pressure	• 0...16 bar if fluid temperature < + 100 °C (0...232 PSI if fluid temperature < + 212 °F) • 0...10 bar if fluid temperature between + 100...+ 130 °C (0...145 PSI if fluid temperature between + 212...+ 266 °F) If the pressure ranges given for the holder and the inserted probe are different, use the most restrictive range.	• 0...16 bar if fluid temperature ≤ + 25 °C (0...232 PSI if fluid temperature ≤ + 77 °F) • 0...6 bar if fluid temperature > + 25 and ≤ + 130 °C (0...145 PSI if fluid temperature > + 77 and ≤ + 266 °F)	0...6 bar (0...87 PSI)
Maximum pressure at max. temperature	10 bar (145 PSI)	6 bar (87 PSI)	6 bar (87 PSI)
Product connections			
Electrical connection	S7/S8 connector (Coaxial shielded cables with S7/S8 connector and 4-wire cable for Pt1000/Liquid earth rod (if needed), see chapter "9.5. Ordering chart accessories" on page 14.)	S7/S8 connector	Variopin 6.0

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1.4. ORP probes

Note:

- The ORP probe Type 8203 is available in 3 models.
- These probes can be used in a measuring range of - 2000...+ 2000 mV.

Technical data for FLATRODE ORP 120, LOGOTRODE ORP 120, UNITRODE PLUS ORP 120 models

Product properties			
Probe model	**FLATRODE ORP 120**	**LOGOTRODE ORP 120**	**UNITRODE PLUS ORP 120**
Material			
Armature	Cast epoxy resin, black	Glass	Glass
Diaphragm	Annular and centered, in high density Polyethylen	"Single pore"	"Single pore"
Seal	FKM	EPDM	FPM
Number of diaphragms	1	1	2
Temperature sensor	Not integrated	Not integrated	Not integrated
Reference electrolyte	Acrylamide gel KNO_3/3.5M KCl-AgCl	Polymer	Polymer
Medium data			
Fluid	Contaminated (viscous, suspended solids, small sized solids, paints, cosmetics, foodstuffs)	• Clean liquids (cooling-water, waste water or slightly contaminated) • With low conductivity (pure or rainwater...> 2 µS/cm)	• Clean liquids (drinking water, aquarium, swimming-pool...) • Contaminated (waste water, cooling water, electro-plating, paints...) • With low conductivity (pure or rainwater...> 2 µS/cm) • Containing sulfides/proteins (tannery, animal breeding, waste water, foodstuffs, cosmetics, biotechnology...)
Fluid conductivity	Min. 50 µS/cm	Min. 2 µS/cm	Min. 2 µS/cm
Fluid temperature	0...+ 80 °C (+ 32...+ 176 °F) If the temperature ranges given for the holder and the inserted probe are different, use the most restrictive range.	- 10...+ 60 °C (+ 14...+ 140 °F)	0...+ 130 °C (+ 32...+ 266 °F)
Fluid pressure	0...6 bar (0...87 PSI) If the pressure ranges given for the holder and the inserted probe are different, use the most restrictive range.	0...6 bar (0...87 PSI)	• 0...16 bar if medium temperature < + 100 °C (0...232 PSI if medium temperature < 212 °F) • 0...10 bar if medium temperature between + 100...+ 130 °C (0...145 PSI if medium temperature between 212...266 °F)
Maximum pressure at max. temperature	4 bar (58 PSI)	6 bar (87 PSI)	10 bar (145 PSI)
Product connections			
Electrical connection	S7/S8 connector (Coaxial shielded cables with S7/S8 connector and 4-wire cable for Pt1000/Liquid earth rod (if needed), see chapter "9.5. Ordering chart accessories" on page 14.)	S7/S8 connector	S7/S8 connector

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2. Approvals and conformities

2.1. General notes

- The approvals and conformities listed below must be stated when making enquiries. This is the only way to ensure that the product complies with all required specifications.
- Not all available variants of the device can be supplied with the below mentioned approvals or conformities.

2.2. Conformity

In accordance with the Declaration of Conformity, the product is compliant with the EU Directives.

2.3. Standards

The applied standards which are used to demonstrate compliance with the EU Directives are listed in the EU-Type Examination Certificate and/or the EU Declaration of Conformity.

2.4. Pressure Equipment Directive (PED)

The device conforms to article 4, paragraph 1 of the Pressure Equipment Directive (PED) 2014/68/EU under the following conditions:

Device used in a pipe

Note:

- The data in the table is independent of the chemical compatibility of the material and the fluid.
- PS = maximum admissible pressure (in bar), DN = nominal diameter 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 PS*DN ≤ 1000
Fluid group 1, article 4, paragraph 1.c.ii	DN ≤ 25 or PS*DN ≤ 2000
Fluid group 2, article 4, paragraph 1.c.ii	DN ≤ 200 or PS ≤ 10 or PS*DN ≤ 5000

Device used in a vessel

Note:

- The data in the table is independent of the chemical compatibility of the material and the fluid.
- PS = maximum admissible pressure (in bar), V = vessel volume

Type of fluid	Conditions
Fluid group 1, article 4, paragraph 1.a.i	V > 1 L and PS*V ≤ 25 bar.L or PS ≤ 200 bar
Fluid group 2, article 4, paragraph 1.a.i	V > 1 L and PS*V ≤ 50 bar.L or PS ≤ 1000 bar
Fluid group 1, article 4, paragraph 1.a.ii	V > 1 L and PS*V ≤ 200 bar.L or PS ≤ 500 bar
Fluid group 2, article 4, paragraph 1.a.ii	PS > 10 bar and PS*V ≤ 10000 bar.L or PS ≤ 1000 bar

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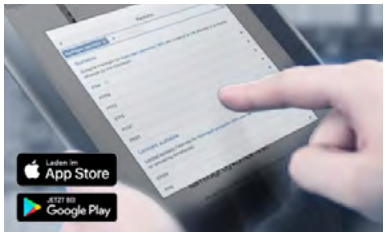
3. Materials

3.1. Bürkert resistApp



Bürkert resistApp – Chemical resistance chart

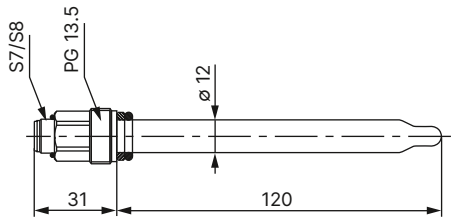
You want to ensure the reliability and durability of the materials in your individual application case? Verify your combination of media and materials on our website or in our resistApp.

Start chemical resistance check

4. Dimensions

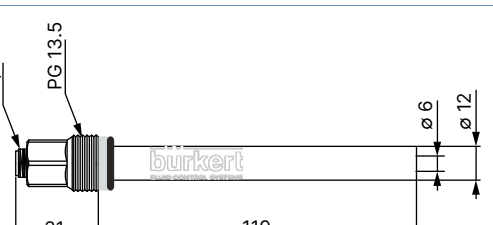
4.1. pH/ORP probes in glass with S7/S8 connector

Note:
Dimensions in mm, unless otherwise stated



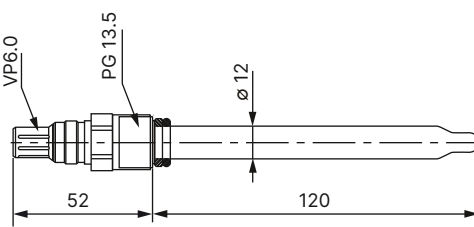
4.2. pH/ORP probes in cast epoxy resin with S7/S8 connector

Note:
Dimensions in mm, unless otherwise stated



4.3. pH probe with VP 6.0 multipin connector

Note:
Dimensions in mm, unless otherwise stated



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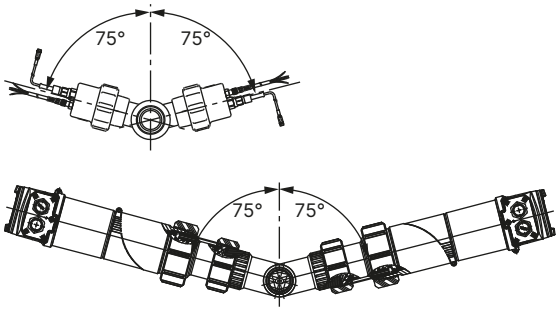
5. Product installation

5.1. Installation notes

Note:

- The pH or ORP probe is either installed in a holder Type 8200 or inserted into the pH or ORP transmitter Type 8202.
- The probe must continuously be immersed into the measurement fluid in order to protect it from drying out.
- The device must be protected from heat, direct sunlight and other environmental influences.

See **data sheet Type 8200** ▶ or **data sheet Type 8202** ▶ for more information.

Installation example	Description
	The device has to be installed with a maximum angle of 75 degrees against the vertical onto an horizontal pipe. Select and install the required fitting onto the pipe, according to specific requirements of the device and fitting material (temperature and pressure). After having connected the probe to the Type 8619 (pH/ORP) multiCELL transmitter/controller and having calibrated the unit, cautiously install the complete pH/ORP meter on the fitting. See **data sheet Type 8619** ▶ for more information. In order to get reliable measurement air bubbles must be avoided. **Please ensure that the mounting location provides a continuous and complete immersion of the probe in the flow stream**.

6. Product operation

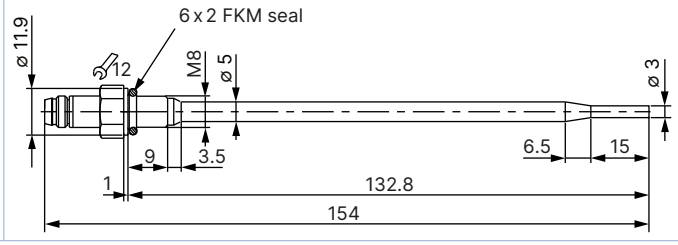
6.1. Measurement principle

The pH or redox probe built up on a glass membrane with variable sensitivity according to the pH or the redox, which must be screwed into the selected probe holder Type 8200 or inserted into the pH or redox meter (standard variant or neutrino) Type 8202, connected to the e.g. transmitter/controller Type 8619. Only the probe with S7/S8 electrical connector can be screwed into the pH/redox ELEMENT meter Type 8202 (standard or neutrino variant). The probe must be calibrated with buffer solution before the installation of the sensor into the pipe.

See **data sheet Type 8200** ▶, **data sheet Type 8619** ▶, **data sheet Type 8202** ▶ for more information.

- When a pH probe is immersed into the solution a difference in potential is formed due to 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).
  The pH meter can be calibrated in 1-point (Offset at pH 7) or in 2-points (Offset at pH 7 and Span at pH 4 or pH 10).
- When a redox probe is immersed into the solution an ion exchange occurs between the oxidised and the reduced state of an electrolyte. The generated cell voltage is the oxidation-reduction potential value. The redox meter can only be calibrated in 1-point (Offset).

7. Product accessories

Description	Dimensions
For an automatic temperature compensation a Pt1000 temperature probe/liquid earth rod will be needed if the probe does not integrate a temperature sensor. Further information on Pt1000 ordering can be found in chapter "9.5. Ordering chart accessories" on page 14).	

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8. Networking and combination with other Bürkert products

Example:

Type 8203
and Pt1000 (option)

Type 8200 ▸
Armatures for analytical probes

Type 8202 ▸
pH or redox potential measuring device, standard or neutrino variant

Complete pH/ORP sensor

Complete pH/ORP meter

Type 8619 ▸
multiCELL - transmitter/controller

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9. Ordering information

9.1. Bürkert eShop

Bürkert eShop – Easy ordering and quick delivery

You want to find your desired Bürkert product or spare part quickly and order directly? Our online shop is available for you 24/7. Sign up and enjoy all the benefits.

Order online now

9.2. Recommendation regarding product selection

Complete pH/ORP sensor

A complete pH/ORP sensor consists of a pH or ORP probe Type 8203, a Pt1000/liquid earth rod (option, if not integrated in the pH probe), a probes holder Type 8200 with seals, a pH/ORP shielded cable, a Pt1000/liquid earth rod shielded cable (option, if needed).

See **data sheet Type 8200** ▶ for more information.

Different components must be ordered to obtain a complete device. The following information is required:

- **Article no.** of the selected pH or ORP probe **Type 8203** (see chapter "9.4. Ordering chart" on page 13)
- **Article no.** of the desired probes holder **Type 8200** (see **data sheet Type 8200** ▶)
- **Article no.** of the Pt1000/liquid earth rod, if needed (see chapter "9.5. Ordering chart accessories" on page 14)
- **Article no.** of the pH/ORP shielded cable (see chapter "9.5. Ordering chart accessories" on page 14)
- **Article no.** of the Pt1000/liquid earth rod shielded cable, if needed (see chapter "9.5. Ordering chart accessories" on page 14)

pH or ORP probes

Pt1000/ liquid earth rod

Probe holder Type 8200
(example: with G 2"process connection)

Cable for pH or ORP probe

Cable for Pt1000/ liquid earth rod

For connection to Type 8619

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Complete pH/ORP meter

A complete ph/ORP meter consists of a replaceable standard 120 mm pH or ORP probe with S7/S8 connector Type 8203 and a pH or ORP meter Type 8202.

See **data sheet Type 8202** ▸ for more information.

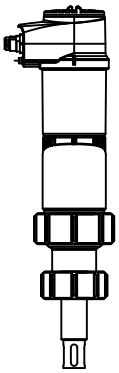
Two different components must be ordered to obtain a complete device. The following information is required:

The following information is necessary for the selection of a complete device:

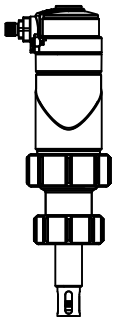
- **Article no.** of the selected pH or ORP probe with S7/S8 connector **Type 8203** (see chapter "9.4. Ordering chart" on page 13)
- **Article no.** of the selected pH/ORP meter **Type 8202** (see **data sheet Type 8202** ▸)

pH or ORP probes

pH or ORP meter standard variant



pH or ORP meter neutrino variant



9.3. Bürkert product filter

Bürkert product filter – Get quickly to the right product

You want to select products comfortably based on your technical requirements?
Use the Bürkert product filter and find suitable articles for your application quickly and easily.

Try out our product filter

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9.4. Ordering chart

pH probes

Probe model	Measuring range	Fluid temperature	Fluid pressure	Fluid minimum conductivity	Electrical connection	Article no.
	[pH]	[°C]	[bar]	[µS/cm]		
PLASTRODE pH 120 mm	0...14	-10...+40	0...6	50	S7/S8 connector	560377
FLATRODE pH 120 mm		0...+80	0...6	50		561025
LOGOTRODE pH 120 mm		-10...+60	0...6	2		427114
UNITRODE PLUS pH 120 mm		0...+130	0...16	2		560376
CERATRODE pH 120 mm		0...+130	0...16	50		418319
FERMTRODE pH 120 mm		0...140	0...6	100	Variopin 6.0	561727

ORP probes

Probe model	Measuring range	Fluid temperature	Fluid pressure	Fluid minimum conductivity	Electrical connection	Article no.
	[mV]	[°C]	[bar]	[µS/cm]		
FLATRODE ORP 120 mm	-2000...+2000	0...+80	0...6	50	S7/S8 connector	561027
LOGOTRODE ORP 120 mm		-10...+60	0...6	2		560379
UNITRODE PLUS ORP 120 mm		0...+130	0...16	2		560378

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9.5. Ordering chart accessories

Temperature probes

Description	Article no.
Pt1000/liquid earth rod made of stainless steel 1.4571	427023
Pt1000/liquid earth rod made of titanium	560317

Cables for probes

Description		Article no.
For connection between pH/ORP probe mounting into Type 8200 armatures and Type 8619 Transmitter		
Coaxial cable with S7/S8 probe connector and open strand ends, cable length:	3 m	561904
	5 m	561905
	10 m	561906
Connection cable with VarioPin female connector (VP 6.0) and open strand ends with wire end sleeves, cable length:	3 m	554855
	5 m	554856
	10 m	554857
For connection between pH/ORP probe mounting into Type 8200 immersion fitting and Type 8619 Transmitter		
Coaxial cable with S7/S8 probe connector and open strand ends, cable length:	5 m	561905
	10 m	561906
For connection between Pt1000/liquid earth rod mounting into Type 8200 armatures and Type 8619 Transmitter		
4-conductor cable with M8 connector and open strand ends, cable length:	2 m	427110
	3 m	561907
	5 m	427113
	10 m	554822
For connection between Pt1000/liquid earth rod mounting into Type 8200 immersion fitting and Type 8619 Transmitter		
4-conductor cable with plug-in coupling and open strand ends with wire end sleeves, cable length:	5 m	562627
	10 m	562628

Other accessories

Description	Article no.
Storage solution (KCl 3M), 500 ml	418557
Buffer solution, 500 ml, pH value: 4.01 [1.] (+ 25 °C)	418540
Buffer solution, 500 ml, pH value: 7.00 [1.] (+ 25 °C)	418541
Buffer solution, 500 ml, pH value: 10.01 [1.] (+ 25 °C)	418543
Buffer solution, 500 ml, ORP value: 475 mV	418555
Factory certificate of 2-point pH calibration	550673
Factory certificate of 1-point ORP calibration	550674

1.) At 25 °C certified and traceable to NIST and PTB

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