

pH or ORP meter



- Integral compact measurement device for direct connection to control level (PLC).
- Thanks to the modular HMI, parameterization, calibration, transferring of parameterization data easily possible.
- Usage of 120 mm standard PG13,5 pH/ORP-probes with S8 connector (Type 8203 recommended)
- Simulation of process value and diagnostic function

Type 8202 can be combined with...



Type 8203
pH or ORP probes



Type 8611
eCONTROL
universal controller



Type 8619
multiCELL
Transmitter/Controller



Type 8693
Digital electropneumatic
Process Controller



Type 8802
Continuous Control
Valve Systems



Type S022
Fitting

The Type 8202 is a compact measuring device designed for the measurement of:

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

The meter consists of a replaceable 120 mm standard PG13,5 pH or ORP probe Type 8203 with S8 Connector, screwed in a probe holder with integrated Pt1000 temperature sensor. This ensemble is plugged-in and screwed with a nut to an enclosure with cover containing the electronic module and a removable display. Thus the Bürkert meter facilitates short installation and maintenance effort.

The pH/ORP meter can operate independent of the display, but it will be required for configuring the device (i.e. selection of pH or ORP probe type, measuring range, engineering units, calibration, limits...) and also for visualizing continuously the measured and processed data.

The device Type 8202 is available

- with three fully adjustable outputs : two digital and one analogue outputs
- with four fully adjustable outputs: two digital and two analogue outputs

The device Type 8202 converts the measured signal, displays different values in different physical units (if display mounted) and computes the output signals, which are provided via one or two M12 fixed connectors.

Technical data (Pipe + meter)	
Pipe diameter	DN25...DN110 (DN < 25 with reduction)
pH measurement	
Measuring range	-2...16 pH or -580...+580 mV
Resolution	0.001 pH or 0.1 mV
Measurement deviation	±0.02 pH or 0.5 mV
Minimal pH scale	0.5 pH or 30 mV (i.e 6.7...7.2 pH or -20...+10 mV corresponding to 4...20 mA)
ORP measurement	
Measuring range	-2000...+2000 mV
Resolution	1 mV
Measurement deviation	±3 mV
Minimal ORP scale	50 mV (i.e 1550...1600 mV corresponding to 4...20 mA)
Temperature measurement	
Measuring range	-20...+130°C (-40...+266°F)
Resolution	0.1°C (0.18°F)
Measurement deviation	±1°C (1.8°F)
Temperature compensation	automatic (integrated Pt1000) - reference temperature 25°C (77°F)
Minimal temperature scale	10°C (18°F) (i.e 10...20°C (50 to 68°F) corresponding to 4...20 mA)
Medium temperature*	
With PVC nut connection	0...+50°C (+32...+122°F) restricted by the used probe
With PVDF nut connection	-20...+130°C (-4...+266°F) restricted by the used adaptor or probe restriction with adaptor S022 in:
	- PVC: 0...+50°C (+32...+122°F)
	- PP: 0...+80°C (+32...+176°F)
	- Metal: -20...+130°C (-4...+266°F)
Fluid pressure max	PN16 (232 PSI) (see pressure / temperature chart - depends on selected probe)
* If the specific temperature limits for the used probe and the temperature limits given in the above technical data chart are different, please use the more restrictive range.	
Environment	
Ambient temperature	-10...+60°C (+14...+140°F) (operating and storage without probe)
Relative humidity	≤ 85%, without condensation

8202 ELEMENT

Electrical data	
Power supply	
3 outputs meter (2-wire)	14...36 V DC, filtered and regulated
4 outputs meter (3-wire)	12...36 V DC, filtered and regulated
Current consumption with sensor	
3 outputs meter (2-wire)	≤ 1 A (with transistor loads)
4 outputs meter (3-wire)	≤ 25 mA (at 14 V DC without transistor loads, with current loop)
	≤ 5 mA (at 12 V DC without transistor loads, without current loop)
Reversed polarity of DC	Protected
Voltage peak	Protected
Short circuit	Protected for transistor outputs
Output	
Transistor	adjustable as sourcing or sinking (respectively both as PNP or NPN), open collector max. 700 mA, 0.5 A max. per transistor if the 2 transistor outputs are wired output NPN: 0.2...36 VDC output PNP: V+ power supply
Current	
3 outputs meter (2-wire)	4...20 mA adjustable as sourcing or sinking, max. loop impedance: 1100 Ω at 36 V DC; 610 Ω at 24 V DC; 180 Ω at 14 V DC
4 outputs meter (3-wire)	adjustable in the same mode as transistor: sourcing or sinking, max. loop impedance: 1100 Ω at 36 V DC; 610 Ω at 24 V DC; 100 Ω at 12 V DC
Response time (10%...90%)	150 ms (standard)

General data	
Compatibility	Any pipe which are fitted out with Bürkert adaptor S022 (see separate data sheet)
Materials	See exploded view, opposite
Housing / cover / seals	Stainless steel 1.4404, PPS / PC / EPDM, silicone
Screws / Display / navigation key	Stainless steel / PC / PBT
Fixed connector mounting plate	Stainless steel 1.4404 (316L)
Fixed connector / Nut	Brass nickel plated / PVC or PVDF
Wetted part materials	
Probe holder	PVDF, Stainless steel 1.4571 (316Ti)
Probe	See probe specific technical data
Probe	Bürkert pH or ORP probe Type 8203 (recommended) or any other combined 120 mm pH or ORP probe, without temperature sensor, with PG13.5 head, S7/S8 connector
Temperature sensor	Pt1000 integrated within the holder
Display (accessories)	Grey dot matrix 128 x 64 with backlighting
Electrical connections	
3 outputs meter (2-wire)	1 x 5-pin M12 male fixed connector,
4 outputs meter (3-wire)	1 x 5-pin M12 male and 1 x 5-pin M12 female fixed connectors
Connection cable	Shielded cable

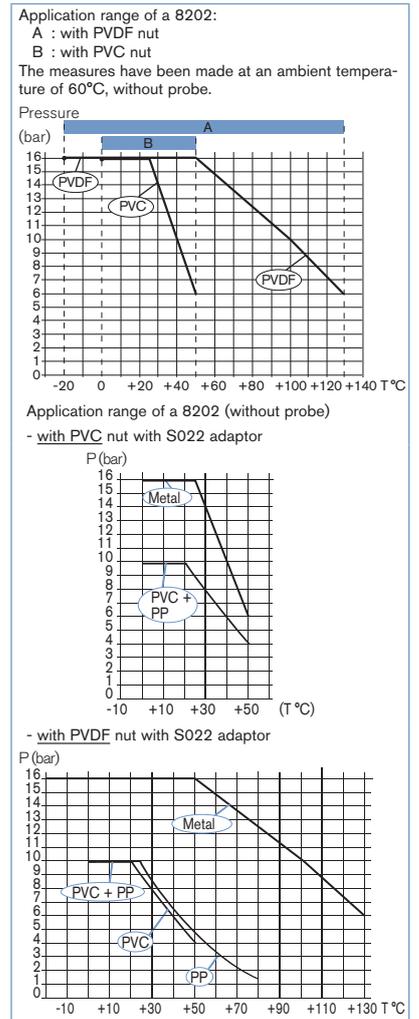
Standards, directives and certifications	
Protection class	IP65 and IP67 with device wired and with M12 cable plug mounted and tightened and cover fully screwed down
Standard and directives 	The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and/or the EU Declaration of conformity (if applicable) Complying with article 4, §1 of 2014/68/EU directive*
Pressure	
Certificate	FDA declaration of conformity
Certification	
UL-Recognized for US and Canada 	UL61010-1 + CAN/CSA-C22.2 No.61010-1

* For the 2014/68/EU pressure directive, the device can only be used under following conditions (depend on max. pressure, pipe diameter and fluid).

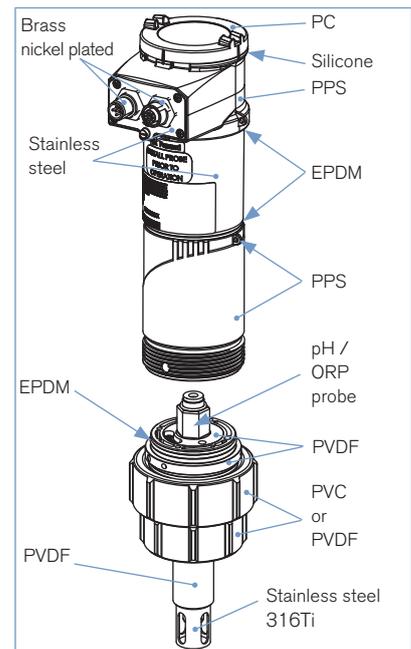
Type of fluid	Conditions
Fluid group 1, article 4, §1.c.i	DN ≤ 25
Fluid group 2, article 4, §1.c.i	DN ≤ 32 or PN*DN ≤ 1000
Fluid group 1, article 4, §1.c.ii	DN ≤ 25 or PN*DN ≤ 2000
Fluid group 2, article 4, §1.c.ii	DN ≤ 200 or PN ≤ 10 or PN*DN ≤ 5000

 If the device is mounted in a humid environment or outside the maximum allowed voltages are **35 V DC** instead of 36 V DC.

Pressure/temperature chart



Materials view



Principle of operation

The 8202 device can be used as a pH or a ORP meter according to the Type 8203 probe version mounted into the holder. The probes Type 8203 are electrode-systems consisting of a reference and a glass electrode in case of a pH-probe or consisting of a reference and a platinum-electrode in case of an ORP-probe. The device must be calibrated with buffer solution before the installation of the meter into the pipe.

- ▶ 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 sensor 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 electron exchange occurs between the oxidised and the reduced state of an electrolyte. The generated cell voltage is the oxidation-reduction potential that is directly proportional to the redox value. The ORP sensor can only be calibrated in 1-point (Offset).

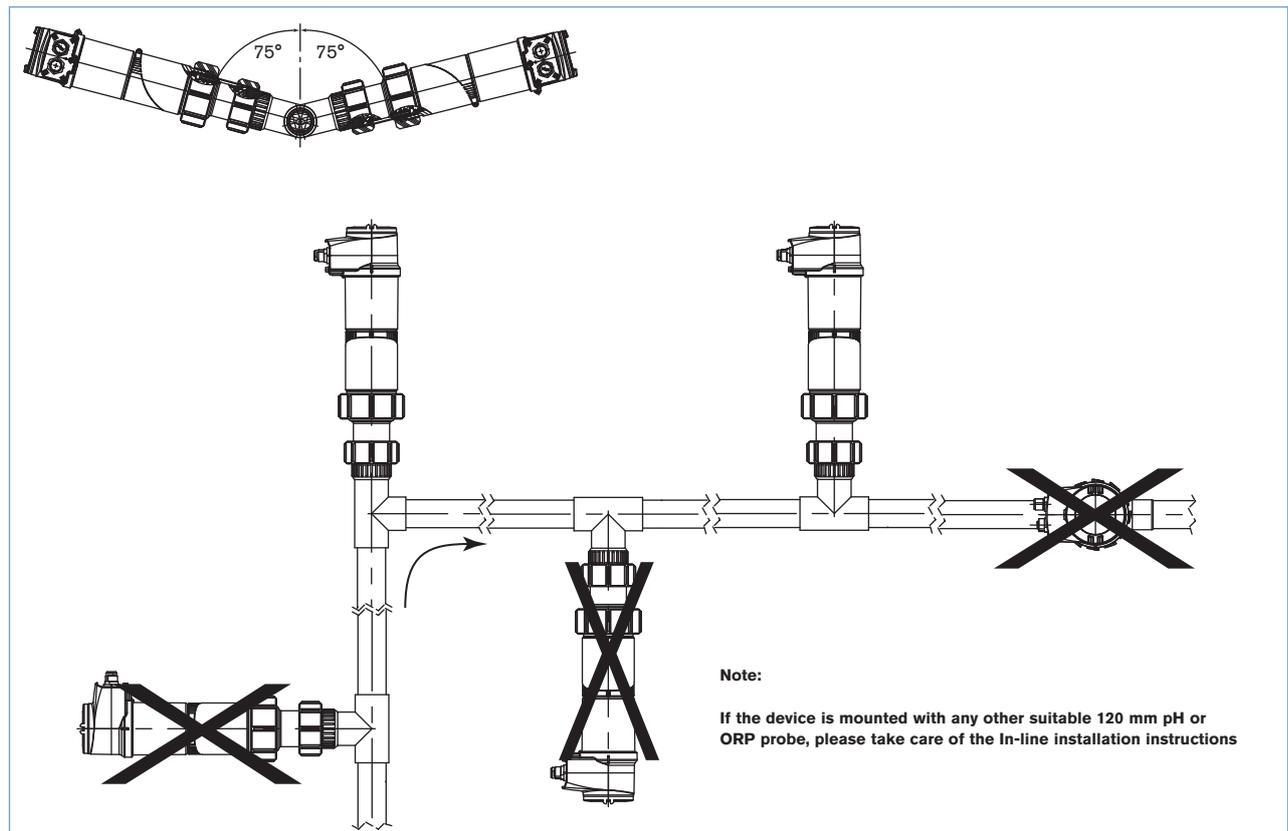
The meter is a two wire device (3 outputs meter) or a three wire device (4 outputs meter) which requires a power supply of 14 V DC (3 outputs meter) or 12 V DC (4 outputs meter) up to 36 V DC and delivers a 4...20 mA standard signal proportional to the pH or to the redox potential as output signal.

Installation

The 8202 pH/ORP meter can be installed into any adaptor with G1 1/2" external threaded sensor connection by just fixing the main nut. Select the required adaptor according to specific requirements of the sensor and material (temperature and pressure), and install it in a vertical position with an angle of $\pm 75^\circ$ max. against the vertical onto an horizontal pipe. For mounting on a tank or direct mounting on a pipe (DN100 and DN110), an adaptor with a G1 1/2" external threaded sensor connection must be used.

After having connected the pH or redox sensor to the meter and having calibrated the unit, cautiously install the complete meter on the fitting. In order to get reliable measurement air bubbles must be avoided.

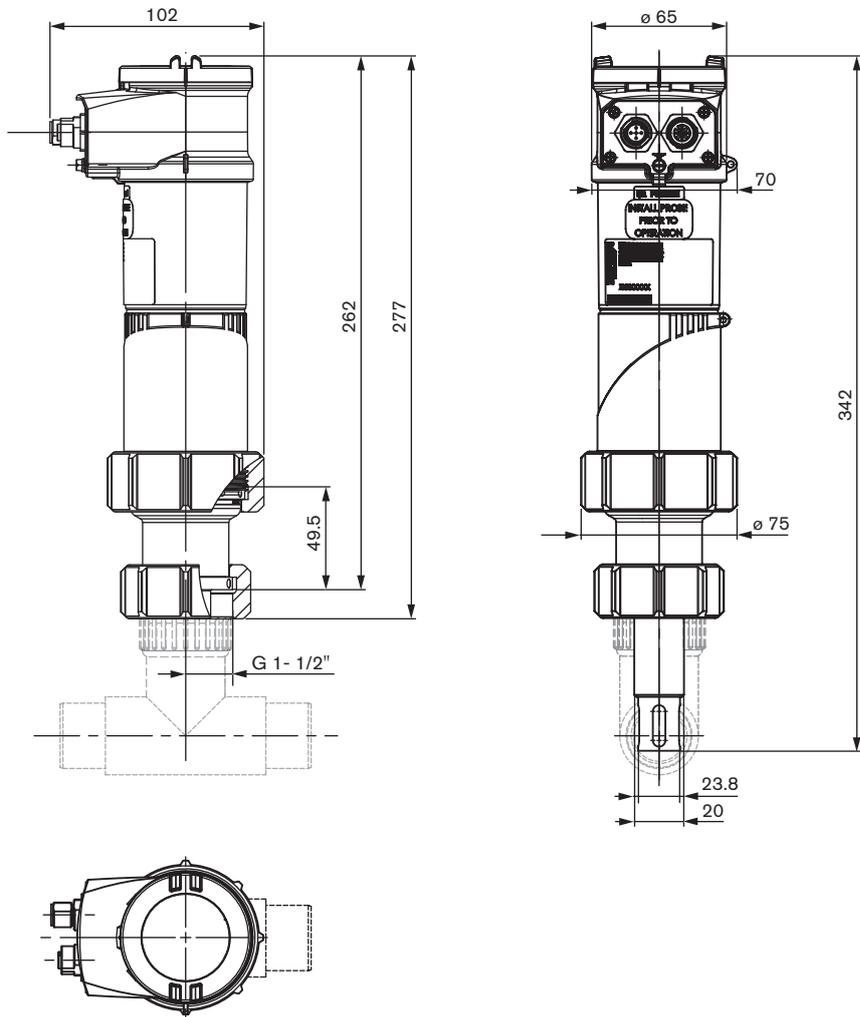
Please ensure that the mounting location provides a continuous and complete immersion of the probe in the flow stream.



The probe must continuously be immersed into the measuring fluid in order to protect it from drying out.

The meter must be protected from constant heat radiation and other environmental influences, such as direct exposure to sunlight.

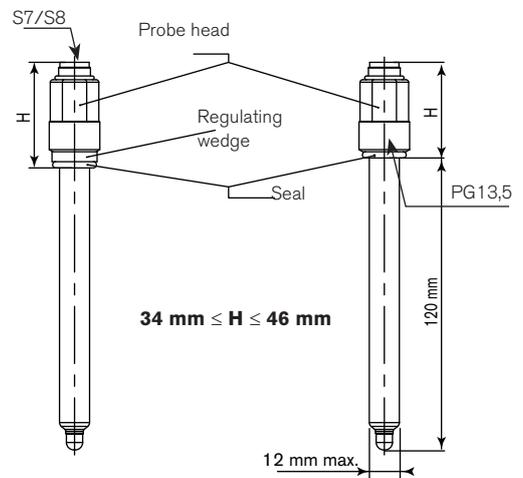
Dimensions [mm] of meter Type 8202



Probe

When you click on the orange box "More info," you will come to our website for the Type 8203 product where you can download the data sheet.

More info.



$34 \text{ mm} \leq H \leq 46 \text{ mm}$

Ordering information for compact meter Type 8202

A complete compact pH/ORP ELEMENT meter Type 8202 consists of a compact pH/ORP ELEMENT meter Type 8202, a pH/ORP probe Type 8203, a removable display/configuration module and a Bürkert INSERTION adaptor Type S022 (with G 1-1/2" external threaded sensor connection)

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

- **Item no.** of the desired pH/ORP ELEMENT meter **Type 8202** (see ordering chart on p. 6)
- **Item no.** of the selected pH/ORP probe **Type 8203** (see separate data sheet) [More info.](#)
- **Item no.** of the a removable display/configuration module (see accessories ordering chart on p. 6)
- **Item no.** of the selected INSERTION adaptor **Type S022 with G1½" external threaded sensor connection** (see separate data sheet) [More info.](#)

When you click on the orange box "More info," you will come to our website for the resp. product where you can download the data sheet.



You have to order three or four components.

Attention!

When you order devices without display, please take care that you also order at least one display module for the operation.
Order no. of the removable display/configuration module (see ordering chart on p. 6)

Example

Compact meter Type 8202 without display

Removable display/configuration module

Complete ELEMENT meter for pH or ORP measurement Type 8202



pH or ORP probes Type 8203



[More info.](#)

INSERTION adaptor Type S022



[More info.](#)



Fitting (example only)

Ordering chart for compact meter Type 8202

pH/ORP meter Type 8202

Specifications	Voltage supply	Output	Sensor version	Nut material	Electrical connection	UL Certifications	Item no.
Compact meter: probe holder with integrated Pt1000 + electronic module with cover, without display	14...36 V DC	2 x transistors + 1 x 4...20 mA	None	PVC	5-pin M12 male fixed connector	No	559 630
						 UL-Recognized	559 634
				PVDF	5-pin M12 male fixed connector	No	559 632
						 UL-Recognized	559 636
	12...36 V DC	2 x transistors + 2 x 4...20 mA	None	PVC	5-pin M12 male and 5-pin M12 female fixed connectors	No	559 631
						 UL-Recognized	559 635
				PVDF	5-pin M12 male and 5-pin M12 female fixed connectors	No	559 633
						 UL-Recognized	559 637

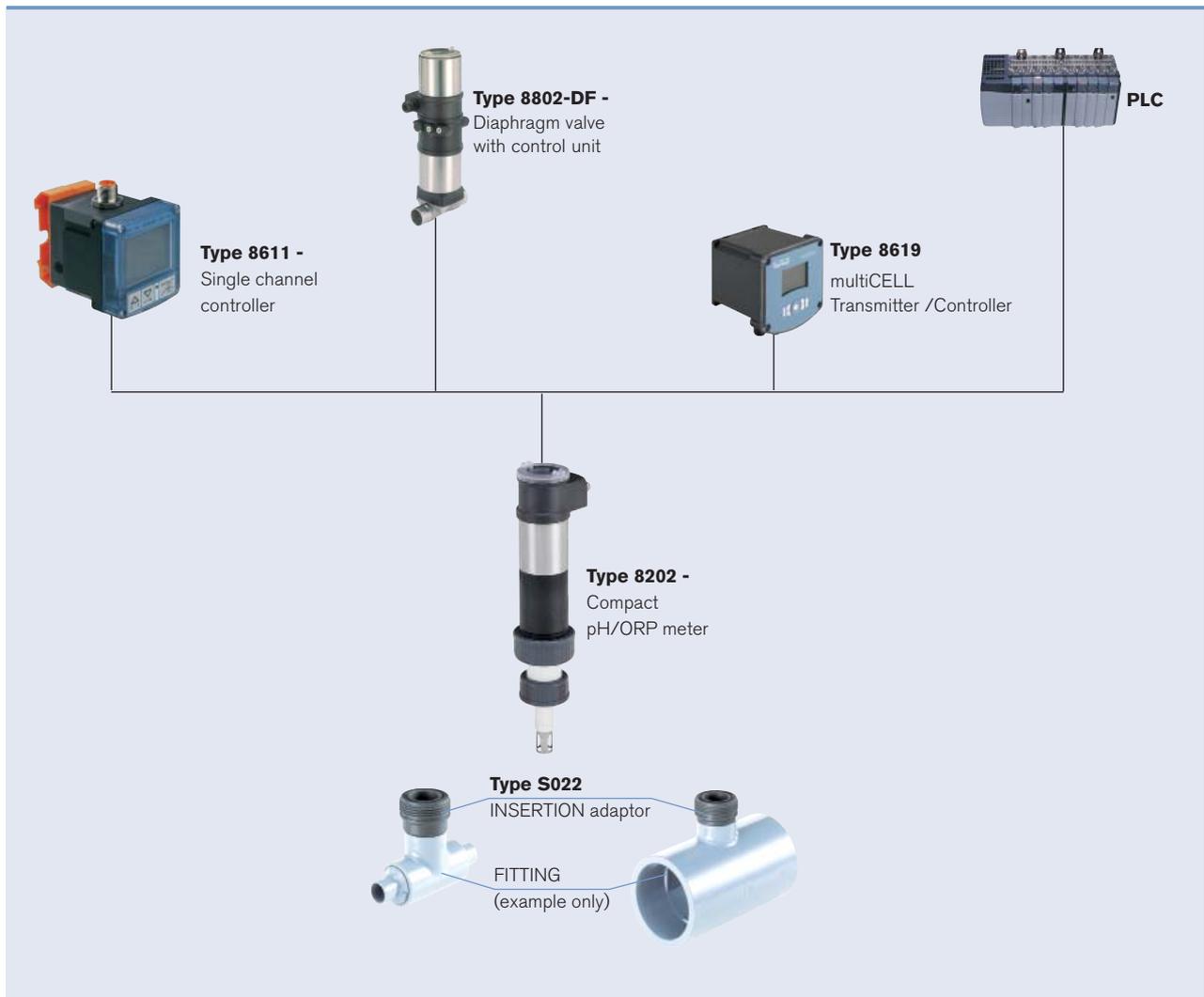
Note: Order separately (see accessories)

- pH or ORP probe Type 8203
- display/configuration module
- M12 cable plugs (only female for single 4...20 mA, 1 male + 1 female for dual 4...20 mA meter)
- Reference, cleaning and storage liquids for the pH/ORP probes

Ordering chart for accessories

Specifications	Item no.
Removable display/configuration module (with instruction sheet)	559 168
Blind cover with EPDM seal	560 948
Transparent cover with EPDM seal	561 843
One \varnothing 46x2 mm EPDM seal for 120 mm probe holder (with instruction sheet)	559 169
Probe holder with PVC nut	560 947
Probe holder with PVDF nut	561 476
 5 pin M12 female straight cable plug with plastic threaded locking ring, to be wired	917 116
 5 pin M12 male straight cable plug with plastic threaded locking ring, to be wired	560 946
 5 pin M12 female straight cable plug moulded on cable (2 m, shielded)	438 680
 5 pin M12 male straight cable plug moulded on cable (2 m, shielded)	559 177

Interconnection possibilities with other Bürkert devices



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