

pH/ORP meter



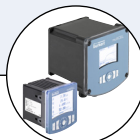
Type 8202 can be combined with...



Type 8203
pH or ORP probes



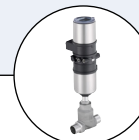
Type 8611
eControl Universal
controller



Type 8619
multiCELL
transmitter/controller



Type 8693
electropneumatic
process controller



Type 8802
ELEMENT
control valve system



Type S022
Insertion adaptor

The 8202 pH/ORP meter 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.

Thus, due to the design of the measuring device, Bürkert simplifies installation and maintenance work.

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 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.

- 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 PG 13.5 pH/ORP-probes with S8 connector (Type 8203 recommended)
- Simulation of process value and diagnostic function

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...600 mV corresponding to 4...20 mA)
Temperature measurement	
Measuring range	-20...+130 °C (-4...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)
Fluid temperature**	
With PVC nut connection	0...+50 °C (+32...+122 °F) restricted by the used probe
With PVDF nut connection (on request)	-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)
4...20 mA output uncertainty	± 1 % of range

* ("measurement bias" as defined in the standard JCGM 200:2012)

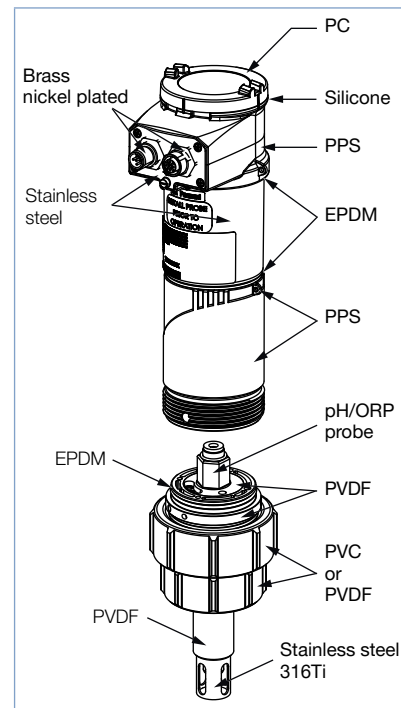
** If the specific temperature limits for the probe used and the temperature limits given in the above technical data chart are different, please use the more restrictive range (see separate datasheet)

8202 ELEMENT

General data	
Compatibility	Any pipe which are fitted out with Bürkert adaptor S022 (see separate datasheet)
Materials	See exploded view, opposite
Housing / Cover	Stainless steel 1.4404 (316L), PPS / PC
Seals / Screws / Display	EPDM, silicone / Stainless steel / PC
Navigation key	PBT
Fixed connector mounting plate	Stainless steel 1.4404 (316L)
Fixed connector / Nut	Brass nickel plated / PVC or PVDF
Wetted part materials	PVDF, Stainless steel 1.4571 (316Ti)
Probe holder	See specific technical data of the used probe
Probe	120 mm Bürkert pH or ORP probe, Type 8203 (recommended) or any combined 120 mm pH or ORP probe, without temperature sensor, with PG 13.5 head, S7/S8 connector
Temperature sensor	Pt1000 integrated within the holder
Display (accessories)	Grey dot matrix 128x64 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 + 1 x 5 pin M12 female fixed connectors
Connection cable	Shielded cable
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
Characteristics of the power source (not provided) of UL recognized devices	Limited power source (according to § 9.4 of the UL61010-1 standard, second edition) or low power source (according to UL60950-1 standard) or Class 2 type power source (according to the UL1310/UL1585 standards)
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)
Protection	- 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)	4...20 mA 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)
Environment	
Ambient temperature	-10...+60 °C (+14...+140 °F) (operating and storage without probe)
Relative humidity	≤ 85 %, without condensation
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
Standards and directives CE	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)
Pressure	Complying with article 4, §1 of 2014/68/EU directive*
Certificates	FDA declaration of conformity
Certification	
UL-Recognized for US and Canada	UL61010-1 + CAN/CSA-C22.2 No. 61010-1

bürkert

Materials view



⚠ If the device is mounted in a humid environment or outside, then the maximum voltage allowed is **35 V DC** instead of 36 V DC.

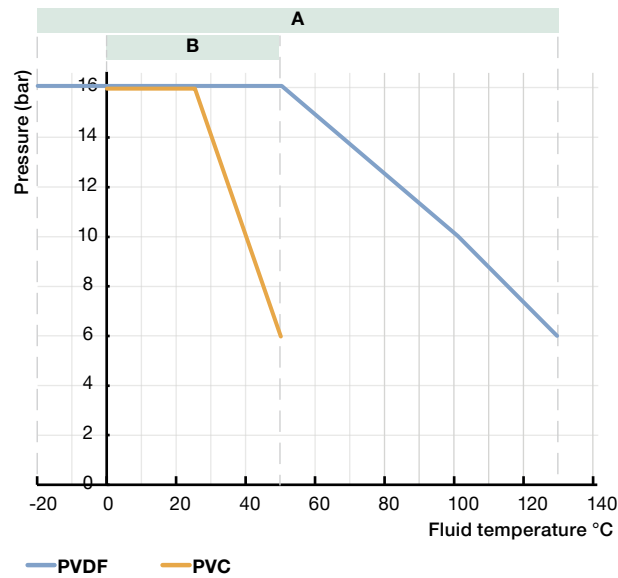
* For the 2014/68/EU pressure directive, the device can only be used under the following conditions (depends on max. pressure, pipe diameter and fluid).

Type of Fluid	Conditions
Fluid group 1, article 4, §1.c.i	DN25 only
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

Specific technical data of UL-Recognized products for US and Canada	
Intended for an inner pollution	Pollution degree 2 according to EN 61010-1
Installation category	Category I according to UL61010-1 – indoor use

Pressure/temperature charts

Application range of a 8202 ELEMENT meter:



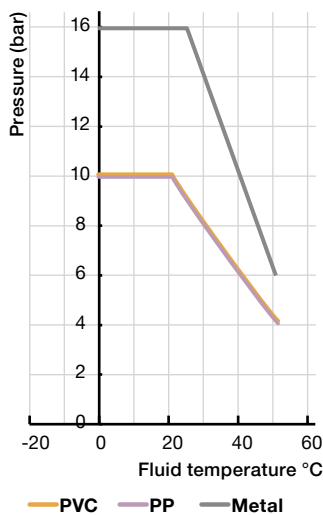
A: application range with PVDF nut (on request)

B: application range with PVC nut

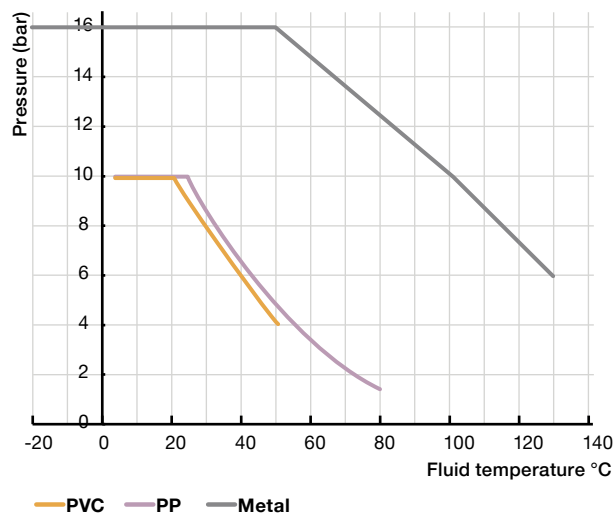
The measures have been made at an ambient temperature of 60 °C, without probe.

Application range of a 8202 ELEMENT meter (without probe):

• with PVC nut with S022 adaptor



• with PVDF nut with S022 adaptor



Design and principle of operation

The pH/ORP meter consists of a replaceable 120 mm pH or ORP probe, Type 8203, which is screwed in a probe holder with integrated Pt1000 temperature sensor. This ensemble is plugged-in and screwed with a nut to an enclosure with a cover containing the electronic module and a removable display. So it can be used as a pH or a ORP meter according to the 8203 probe version mounted into the holder. The 8203 pH or redox probe is a glass membrane with variable selectivity according to the pH or the redox, which must be calibrated with buffer solution before the installation of the device 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 in a solution, an exchange of electrons occurs based on the oxidizing and reducing effects of an electrolyte. The resulting voltage is the oxidation reduction potential. The ORP sensor can only be calibrated in 1-point (Offset).

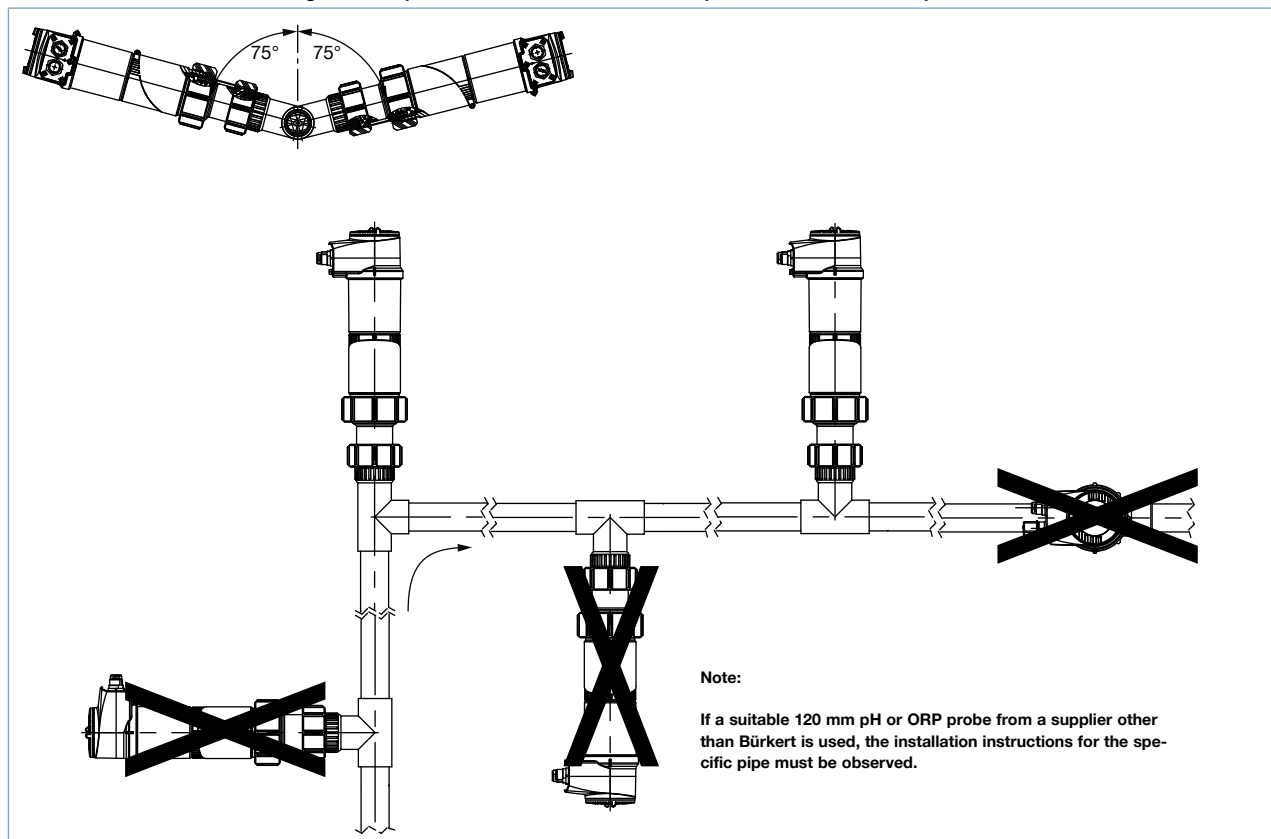
The meter is a two wire device (3 outputs meter) or a three wire device (4 outputs meter) which requires a power supply of 14 V DC (3 outputs meter) or 12 V DC (4 outputs meter) up to 36 V DC and delivers a 4...20 mA standard signal proportional to the pH or to the redox potential as output signal.

Installation

The 8202 ELEMENT pH/ORP meter can be installed into any adaptor with G 1½" external threaded sensor connection by just fixing the main nut. Select the required adaptor, taking in account the specific requirements of the sensor and adapter material (temperature and pressure), and install it in a vertical position or with an angle of $\pm 75^\circ$ max. relative to the vertical on a horizontal pipe. For mounting on a tank or direct mounting on a pipe (DN100 or DN110), an adaptor with a G 1½" external threaded sensor connection must be used.

After having connected the pH or redox sensor to the 8202 neutrino meter and having calibrated the unit, carefully install the complete unit on the fitting. In order obtain reliable measurements air bubbles must be avoided.

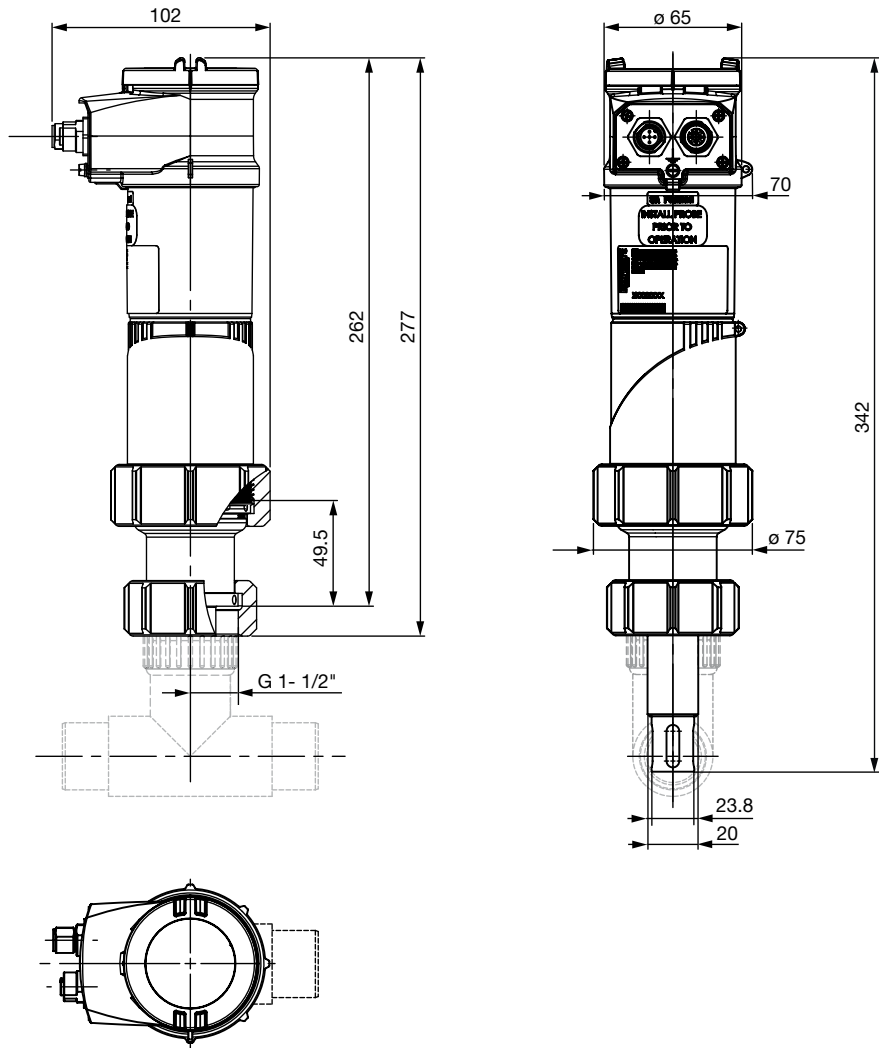
Please ensure that the mounting location provides a continuous and complete immersion of the probe in the flow stream.



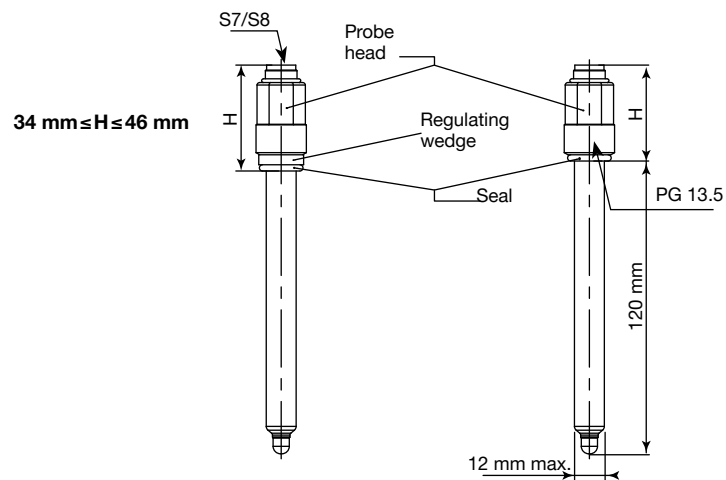
The probe must be continuously immersed into the measuring fluid in order to protect it from drying out.

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

Dimensions [mm]



Probe



Ordering information for compact pH/ORP meter, Type 8202

A complete 8202 ELEMENT pH or ORP meter consists of a compact 8202 ELEMENT pH or ORP meter, a 8203 pH or ORP probe, a removable display/configuration module and a Bürkert S022 Insertion adaptor (with G 1½" external threaded sensor connection)

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

- **Article no.** of the desired **8202 ELEMENT** pH or ORP meter (see ordering chart on next page)
- **Article no.** of the desired **8203** pH or ORP probe (see separate datasheet)
- **Article no.** of the the removable display/configuration module (see accessories ordering chart on next page)
- **Article no.** of the selected **S022** Insertion adaptor with G 1½" external threaded sensor connection (see separate datasheet)

→ You have to order the three or four components separately.



Attention!

When you order devices without display, please take care that you also order at least one display module for the operation.

Article no. of the removable display/configuration module (see ordering chart on next page)

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

Example

**Compact meter Type 8202
without display**

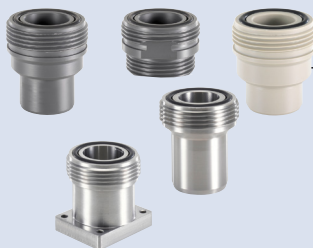
**Removable display/configuration
module**



**pH or ORP probes
Type 8203**



Insertion adaptor Type S022



**Complete 8202 ELEMENT meter
for pH or ORP measurement**



Fitting (example only)

Ordering chart for ELEMENT pH/ORP meter, Type 8202

Specifications	Voltage supply	Output	Sensor version	Nut material	Electrical connection	UL Certification	Article no.
Compact meter: sensor 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	559630 
						 UL-Recognized	559634 
				PVDF	5 pin M12 male fixed connector	No	559632 
						 UL-Recognized	559636 
	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	559631 
				PVDF	5 pin M12 male and 5 pin M12 female fixed connectors	No	559633 
						 UL-Recognized	559637 

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)
- Reference, cleaning and storage liquids for the pH/ORP probes

Ordering chart for accessories (to be ordered separately)

Description	Article no.
Removable display/configuration module (with instruction sheet)	559168 
Blind cover with seal	560948 
Transparent cover with seal	561843 
One Ø 46 x 2 mm EPDM seal for 120 mm probe holder (with instruction sheet)	559169 
Probe holder with PVC nut	560947 
Probe holder with PVDF nut	561476 
 5 pin M12 female straight cable plug with plastic threaded locking ring, to be wired	917116 
 5 pin M12 male straight cable plug with plastic threaded locking ring, to be wired	560946 
 5 pin M12 female straight cable plug moulded on cable (2 m, shielded)	438680 
 5 pin M12 male straight cable plug moulded on cable (2 m, shielded)	559177 

Interconnection possibilities with other Bürkert flowmeters

