

## pH or ORP Transmitter



Type 8202 can be combined with...



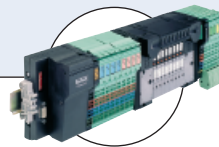
**Type 6642**  
Solenoid valve



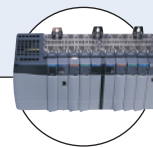
**Type 8620**  
Cooling Tower or boiler  
chemistry controller



**Type 2030**  
On/Off Diaphragm  
valve



**Type 8644**  
Valve islands



**PLC**

- Programmable outputs: two transistor and single or dual analog 4-20 mA (Process + Temp)
- Removable backlighted display
- Universal process connection
- Compatible with 120 mm pH/ ORP probes Type 8203
- Diagnostic function

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

- 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.

The transmitter consists of a replaceable standard pH or ORP probe Type 8203, 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 Transmitter facilitates short installation and maintenance effort.

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

The device Type 8202 is available :

- with three fully programmable outputs : two transistor and one 2-wire 4-20 mA current outputs
- with four fully programmable outputs: two transistor and two 3-wire 4-20 mA current 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 + transmitter)



<b>Pipe diameter</b>	DN25 to DN110 (DN<25 with reduction)
<b>pH measurement</b>	
Measuring range	-2...16 pH or -580... +580 mV
Resolution	0.001 pH or 0.1 mV
Accuracy	±0.02 pH or 0.5 mV
<b>Minimal pH scale</b>	0.5 pH or 30 mV (i.e 6.7 to 7.2 pH or -20 to +10 mV corresponding to 4-20 mA)
<b>ORP measurement</b>	
Measuring range	-2000 ...+2000 mV
Resolution	1 mV
Accuracy	± 3 mV
<b>Minimal ORP scale</b>	50 mV (i.e 1550 to 1600 mV corresponding to 4-20 mA)
<b>Temperature measurement</b>	
Measuring range	-40 to +130°C (-40 to 266°F)
Resolution	0.1°C (0.18°F)
Accuracy	± 1°C (1.8°F)
<b>Temperature compensation</b>	automatic (integrated Pt1000) - reference temperature 25°C (77°F)
<b>Minimal temperature scale</b>	10°C (18°F) (i.e 10 to 20°C (50 to 68°F) corresponding to 4-20 mA)
<b>Medium temperature*</b>	
With PVC nut connection	0 up to 50°C (32 to 122°F) restricted by the used probe
With PVDF nut connection	-20 up to 130°C (-4 to 266°F) restricted by the used adaptor or probe
	restriction with adaptor S022 in:
	- PVC: 0 up to 50°C (32 to 122°F)
	- PP: 0 up to 80°C (32 to 176°F)
	- Metal: -20 up to 130°C (-4 to 266°F)
<b>Fluid pressure max</b>	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

<b>Ambient temperature</b>	-10 to +60°C (14 to 140°F) (operating and storage without probe)
<b>Relative humidity</b>	≤ 85%, without condensation

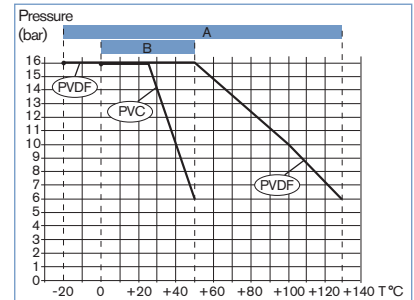
## 8202 ELEMENT

Electrical data	
<b>Power supply</b>	
3 outputs transmitter (2-wire)	14-36 V DC, filtered and regulated
4 outputs transmitter (3-wire)	12-36 V DC, filtered and regulated
<b>Current consumption</b> with sensor	≤ 1 A (with transistor loads)
3 outputs transmitter (2-wire)	≤ 25 mA (at 14 V DC without transistor loads, with current loop)
4 outputs transmitter (3-wire)	≤ 5 mA (at 12 V DC without transistor loads, without current loop)
<b>Reversed polarity of DC</b>	Protected
<b>Voltage peak</b>	Protected
<b>Short circuit</b>	Protected for transistor outputs
<b>Output</b>	
Transistor	configurable 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
<b>Current</b>	
3 outputs transmitter (2-wire)	4-20 mA programmable 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 transmitter (3-wire)	configurable 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
<b>Response time</b> (10% - 90%)	150 ms (standard)
General data	
<b>Compatibility</b>	Any pipe which are fitted out with Bürkert adaptor S022 (see separate data sheet)
<b>Materials</b>	See exploded view, opposite
Housing / cover / seals	Stainless steel 1.4561, PPS / PC / EPDM
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
<b>Probe</b>	120 mm Bürkert pH or ORP probe Type 8203 or any combined 120 mm pH or ORP probe, without temperature sensor, with PG13.5 head, S7/S8 connector
<b>Temperature sensor</b>	Pt1000 integrated within the holder
<b>Display (accessories)</b>	Grey dot matrix 128x64 with backlighting
<b>Electrical connections</b>	
3 outputs transmitter (2-wire)	1x 5-pin M12 male fixed connector,
4 outputs transmitter (3-wire)	1x 5-pin M12 male and 1x 5-pin M12 female fixed connectors
<b>Connection cable</b>	Shielded cable
Standards, directives and approvals	
<b>Protection class</b>	IP65 and IP67 with M12 cable plug mounted and tightened and cover fully screwed down
<b>Standard and directives</b> 	EN 61000-6-2, EN 61000-6-3
EMC	Complying with article 3 of §3 from 97/23/CE directive.*
Pressure	EN 60068-2-6 / EN 60068-2-27
Vibration / Shock	
<b>Approvals</b>	
UL-Recognized for US and Canada 	61010-1 + CAN/CSA-C22 No.61010-1
<b>Type of fluid</b>	<b>Conditions</b>
Fluid group 1, §1.3.a	Only DN25
Fluid group 2, §1.3.a	DN ≤ 32, or DN > 32 and PN*DN ≤ 1000
Fluid group 1, §1.3.b	DN ≤ 25, or DN > 25 and PN*DN ≤ 2000
Fluid group 2, §1.3.b	DN ≤ 125

\* For the 97/23/CE pressure directive, the device can only be used under following conditions (depend on max. pressure, pipe diameter, type of probe and fluid).

bürkert

## Pressure / temperature chart



Application range of a 8202:

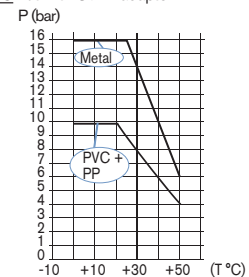
A: with PVDF nut

B: with PVC nut

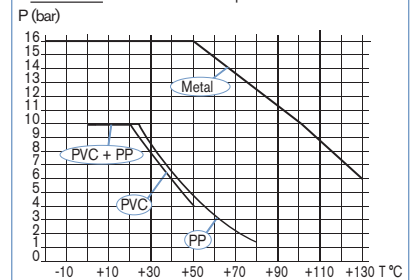
The measures have been made at an ambient temperature of 60°C, without probe.

Application range of a 8202 (without probe)

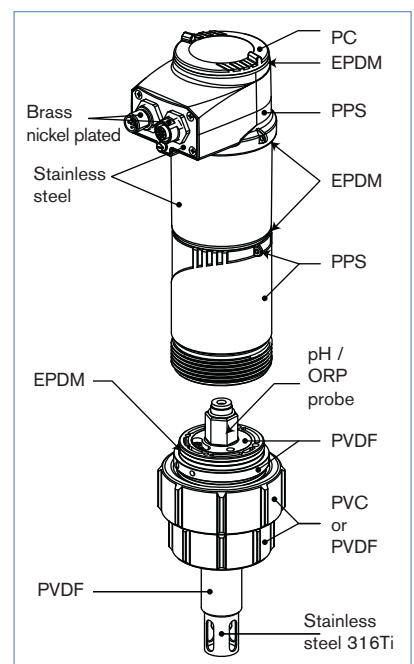
- with PVC nut with S022 adaptor



- with PVDF nut with S022 adaptor



## Materials view



## Principle of operation

The 8202 device can be used as a pH or a ORP transmitter according to the Type 8203 probe version mounted into the holder. The pH or redox probe Type 8203 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 transmitter 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).

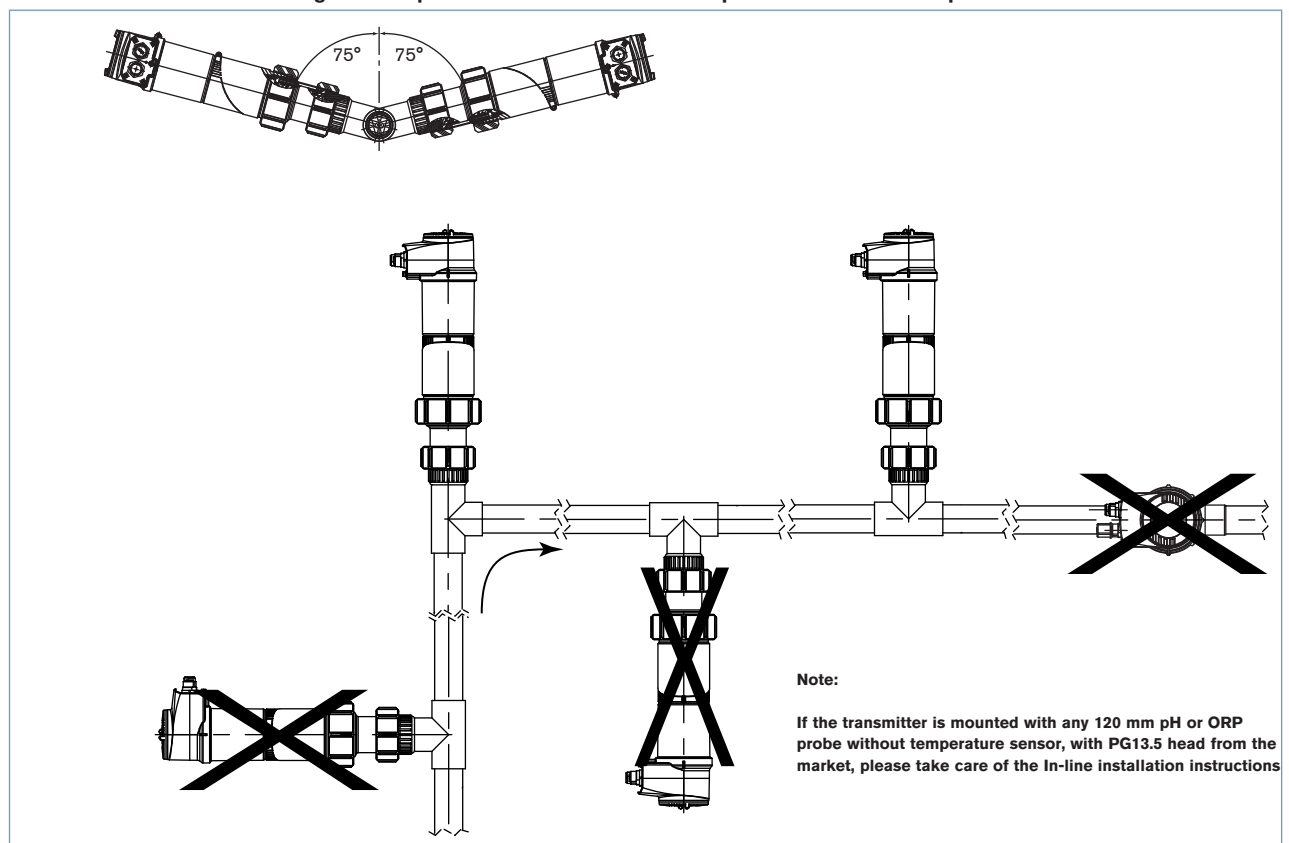
The transmitter is a two wire device (3 outputs transmitter) or a three wire device (4 outputs transmitter) which requires a power supply of 14 V DC (3 outputs transmitter) or 12 V DC (4 outputs transmitter) up to 36 V DC and delivers a 4... 20 mA standard signal proportional to the pH or to the redox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

## Installation

The 8202 pH/ORP transmitter can be installed into any adaptor with G1½" 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 G1½" external threaded sensor connection must be used.

After having connected the pH or redox sensor to the Type 8202 transmitter and having calibrated the unit, cautiously install the complete unit on the fitting. In order to get reliable measurement air bubbles must be avoided.

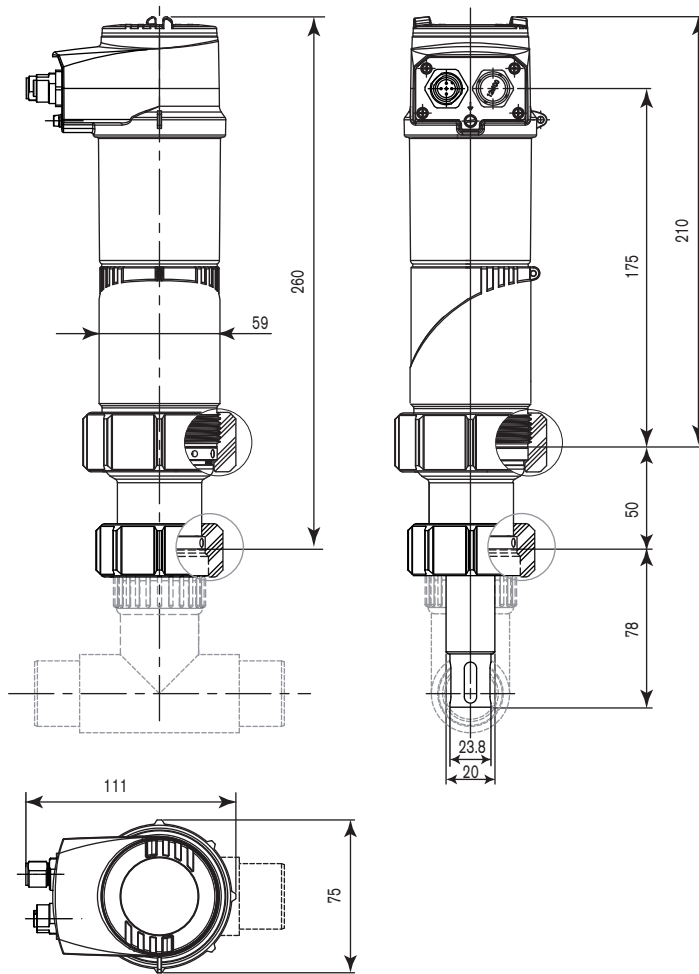
**Please ensure that the mounting location provides a continuous and complete immersion of the probe in the flow stream.**



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

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

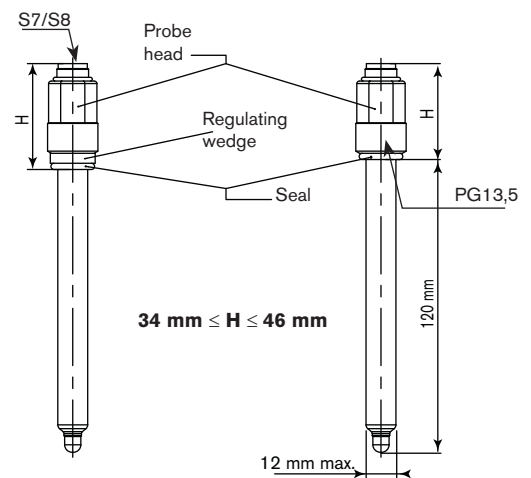
Dimensions [mm] of transmitter Type 8202



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.



## Ordering information for compact transmitter Type 8202

A complete compact pH/ORP ELEMENT transmitter Type 8202 consists of a compact pH/ORP ELEMENT transmitter Type 8202, a pH/ORP probe Type 8203, a removable display/programmer 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 transmitter **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/programmer (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 / programming module (see ordering chart on p. 6)

### Example

#### Compact transmitter Type 8202 without display

#### Removable display/programmer







#### Complete ELEMENT transmitter for pH or ORP measurement Type 8202



## Ordering chart for compact transmitter Type 8202





## pH/ORP transmitter Type 8202

Specifications	Voltage supply	Output	Sensor version	Nut material	Electrical connection	UL Approvals	Item no.
Compact transmitter: probe holder with integrated Pt1000 + electronic module with cover, without display	14-36 V DC	2 x transistors + 1x 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 + 2x 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

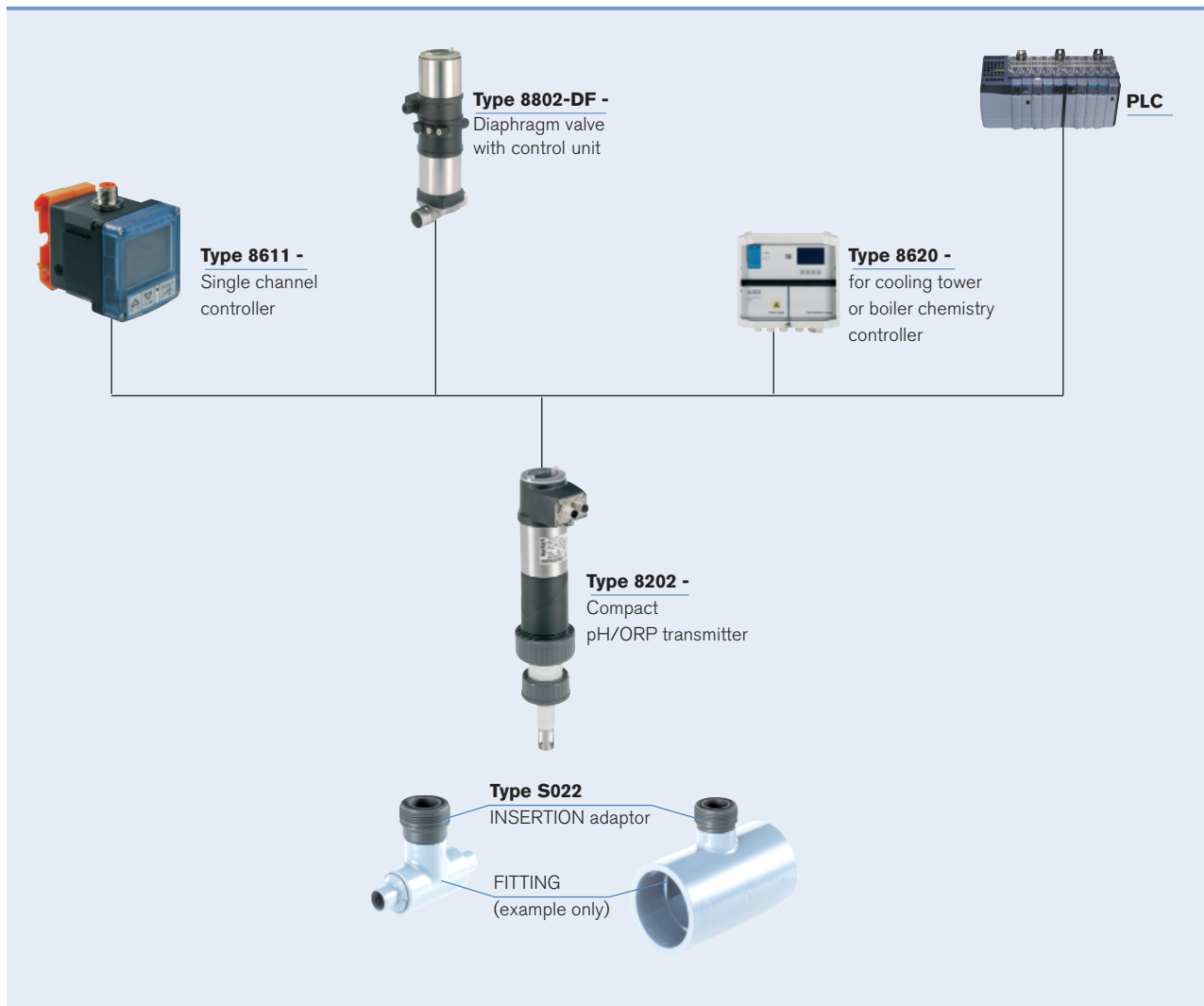
**Note: Order separately (see accessories)**

- pH or ORP probe Type 8203
- display/programmer module
- M12 cable plugs (only female for single 4-20 mA, 1 male + 1 female for dual 4-20 mA transmitter)

## Ordering chart for accessories

Specifications	Item no.
Removable display/programmer module (with instruction sheet)	559 168
Black blank cover with EPDM seal	560 948
Transparent cover with EPDM seal	561 843
One ø 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



To find your nearest Bürkert facility, click on the orange box →

[www.burkert.com](http://www.burkert.com)

In case of special application conditions,  
please consult for advice.

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