

Digital pH controller



- Compact, remote versions for DN15 to DN200
- Fully configurable pH controller for all kinds of pH-measurement tasks
- PID controller with pulse or pulse width modulation signal for acid and base control
- Multi language, menu-guided operation

Type 8205 can be combined with...



Type S020
INSERTION fitting



Type 6642
Solenoid valve



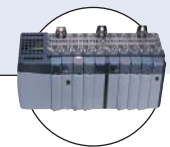
Type 7800
Dosing pump



Type 2030
On/Off Diaphragm
valve



Type 8644
Valve islands



PLC

The pH controller is available in different models:

- Compact pH controller with integrated pH probe.
It can be installed into pipes by using INSERTION Type S020 fittings or other suitable installation materials. It can also be installed in tanks or containers by using an industrial immersion fitting.
- Remote pH controller, for panel or wall mounting, to connect to a pH probe mounted into a Bürkert probe holder Type 8200 (max. 10 m) which can be installed into pipes by using INSERTION Type S020 fittings or using its own particular connection. It can also be installed in tanks or containers by using an industrial immersion fitting.

Technical data (common to the various versions)

General data

Display	15x60 mm, 8-digit LCD, alphanumeric, 15 segments, 9 mm high
Electrical connections	shielded cable with 1.5 mm ² max. cross-section

Environment

Relative humidity	≤ 95%, without condensation
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Standards, directives and approvals

Standard and directives	
EMC	EN 61000-6-3, EN 61000-6-2
Security	EN 61010-1
Pressure	Complying with article 3 of §3 from 97/23/CE directive.*
Vibration	EN 60068-2-6
Shock	EN 60068-2-27

* 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).

Type of fluid	Conditions
Fluid group 1, §1.3.a	DN25 only
Fluid group 2, §1.3.a	DN ≤ 100
Fluid group 1, §1.3.b	DN ≤ 100
Fluid group 2, §1.3.b	DN ≤ 100

System versions

The compact version



combines a pH sensor and an electronic module (PID controller) with a display in an IP65 enclosure.

The access to the output terminals are provided via two cable glands.

Bürkert designed fitting ensures simple direct installation into pipes from DN15 to DN200.

The panel-mounted version



consists of an electronic module (PID controller) 8205 integrated in a front-cover. The associated separate pH sensor consists of a pH probe mounted into a Bürkert probe holder Type 8200.

The output signals are provided on a terminal strip.

The wall-mounted version



consists of an electronic module (PID controller) 8205 in an IP65 enclosure. The associated separate pH sensor consists of a pH probe mounted into a Bürkert probe holder Type 8200.

The output signals are provided on a terminal strip via cable gland.

Operation and display

Customized adjustments, such as measuring range, engineering units and alarms, setpoints can be carried out menu-supported on site via a multilingual display.

The operation is classified according to three levels.

▶ **Main Menu**

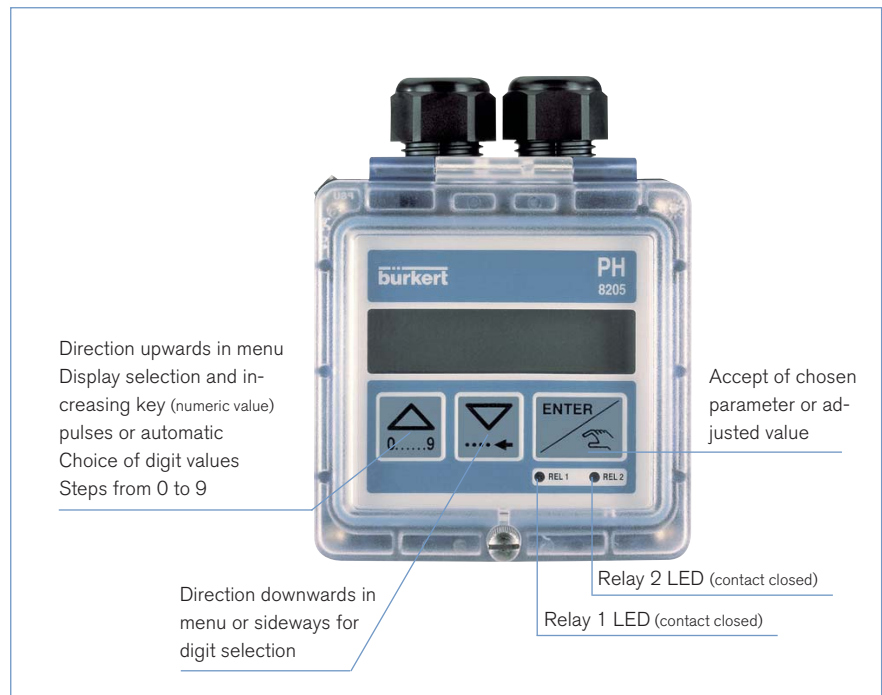
- pH, setpoints, working rates
- temperature
- output current
- HOLD function
- pH probe calibration

▶ **Calibration Menu**

- language
- temperature unit
- measuring range 4-20 mA
- output 1 (lye) settings
- output 2 (acid) settings
- setpoint definition
- pH adjustment
- regulation principle (P, PI or PID)
- alarm threshold
- manual mode activation
- temperature compensation selection
- filter selection

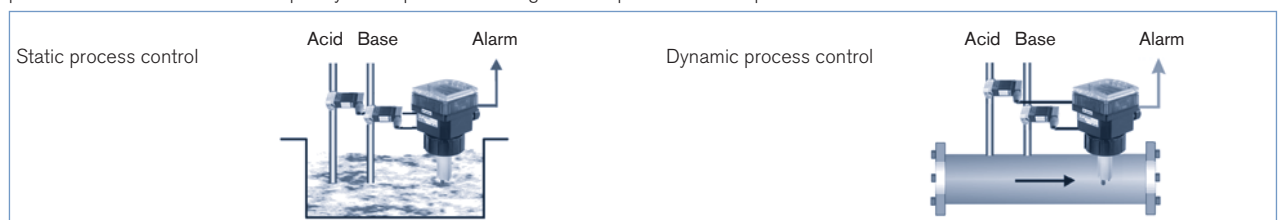
▶ **Test Menu**

- Offset
- Span
- temperature adjustment
- simulation of pH or temperature value
- display of instantaneous electrode voltage



Control principle

The pH controller Type 8205 is designed for use in static or dynamic process of pH-control. The output signals control a valve or a pump, by means of pulses which time duration or frequency is computed according to users parameters and pH-value of the fluid.



Compact pH controller Type 8205

The sensor component consists of a replaceable combination pH-probe, screwed into the sensor holder.

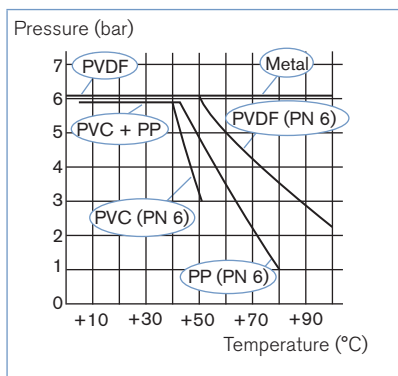
The measured signal is conveyed to the controller via a coax plug.

The Pt1000 for automatic temperature compensation is a standard feature in the sensor holder.

The controller electronics converts the measured signal, displays the actual value and computes the output signals.



Pressure / temperature chart



Principle of operation

The most important part of the pH controller is the pH probe with its pH selective glass membrane. When the probe is immersed into the solution, an electrical charge caused by ions (H+) generates a cell voltage between the glass membrane and the solution. This electrical voltage is measured with reference to a reference electrode, located around the pH glass electrode. The cell voltage of the electrode is directly proportional to the pH value.

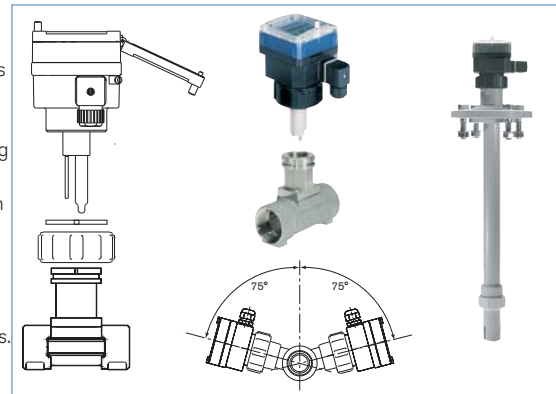
The controller functions in a three wire circuit and requires a power supply of 15...30 V DC.

A relay alarm and a 4...20 mA standard signal proportional to the pH or to the temperature (°C) are available as output signals. The pulse output signals are provided by relay or transistors.

General data	
Compatibility	with fittings S020 (see corresponding data sheet)
Materials	
Housing, cover, lid, nut / Screws	PC / Stainless steel
Front panel foil / Cable plug	Polyester / PA
Wetted parts materials	
Fitting	Brass, stainless steel 1.4404/316L, PVC, PP or PVDF
Sensor holder / Pt1000	PVDF / Stainless steel 1.4571 (316Ti)
Seal	FKM (EPDM included in delivery)
Probe	UNITRODE PLUS pH
Electrical connection	Cable glands M20x1.5
Complete device data (fitting + transmitter)	
Pipe diameter	DN15 to DN200
pH measurement	
Measuring range	0...14 pH
Resolution / Accuracy	0.01 pH / ±0.02 pH, after proper probe calibration
Minimal range	0.5 pH unit (i.e. 6.7 to 7.2 corresponding to 4-20 mA)
Temperature measurement	
Measuring range	-30°C to +140°C (-22°F to 266°F)
Resolution / Accuracy	0.1°C (0.18°F) / ±1°C (1.8°F)
For temperature compensation	automatic (integrated Pt1000) or manual (user programmed) - reference temperature 25°C (77°F)
Medium temperature	with fitting in PVC: 0°C...+50°C (32°F to 122°F) - PP: 0°C...+80°C (32°F to 176°F) - PVDF, stainless steel, brass: 0°C...+100°C (32°F to 212°F)
Medium pressure max.	PN6 (87PSI) (see pressure / temperature chart)
Electrical data	
Power supply	15...30 V DC, filtered and regulated
Current consumption with sensor	≤ 60 mA at 30 V DC; 110 mA at 15 V DC (with relays) ≤ 40 mA at 30 V DC; 70 mA at 15 V DC (without relay)
Output	4...20 mA programmable, proportional to pH or T °C max. loop impedance: 1200 Ω at 30 V DC; 900 Ω at 24 V DC; 450 Ω at 15 V DC
Relay alarm	1 relay, freely configurable, 3 A, 230 V AC
Pulse	2 frequency and time duration adjustable outputs
Relay pulse	2 relays, freely configurable, 3 A, 230 V AC; F < 1 Hz
Transistor pulse	2 Polarized, potential free, 5...30 V DC; 100 mA, protected, line drop at 100 mA: 1.5 V DC - for status and alarm message; F < 17 Hz
Environment	
Ambient temperature	
Operation	0°C to +60°C (32°F to 140°F)
Storage	4°C to 30°C (39.2°F to 86°F) (limited through the probe)
Standard	
Protection class	IP65 with cable gland mounted and tightened or with obturator locked if not used.
Specific technical data: UNITRODE PLUS pH probe	
Fluid	- Clean (drinking water, aquarium, swimming pool...) - Contaminated (effluent rinse water, cooling tower water, brackish water, RO pretreatment, electroplating, cosmetics...) - with low conductivity (pure and rainwater...) - containing sulphides/proteins (tannery, animal breeding, effluent, foodstuffs, cosmetics, biotechnology...)
Measuring range	0...14 pH
Minimal conductivity	2 μS/cm (200 kΩ.cm)
Housing	glass shaft
Medium temperature	with fitting in PVC: 0°C...+50°C (32°F to 122°F) - PP: 0°C...+80°C (32°F to 176°F) - PVDF: 0°C...+100°C (32°F to 212°F) - stainless steel, brass: 0°C...+130°C (32°F to 266°F)
Medium pressure	0...6 bar (0...87PSI)
Max. pressure at max. temperature	6 bar at 130°C (87PSI at 266°F)
Diaphragm	Two clogging free "Single pores™"
Reference electrolyte	polymer

Installation

The 8205 pH controller has to be installed with a maximum angle of ± 75 degrees from vertical into any Bürkert INSERTION fitting (S020).
 Select and install the required fitting onto the pipe, according to specific requirements of the sensor and fitting material (temperature and pressure). Then, cautiously install the unit on the fitting, and tighten with the nut.
 In order to get a reliable measurement, air bubbles must be avoided, and the mounting location must ensure that the probe is continuously and completely immersed in the flow stream. When kept in inventory or the system is not in use, ensure the probe is in fluid and wet at all times; this prevents the probe from drying out which will result in probe failure.
 The controller must be protected from constant heat radiation and other environmental influences, such as direct exposure to sunlight.
 An industrial immersion kit allows installation of this controller into tanks or containers. The following lengths are available: 500, 1000, 1500, 2000 mm. Special lengths on request.



Dimensions [mm]

Compact version

Orifice	H		
	T-Fitting	Plastic spigot*	St. St. spigot
15	187		
20	185		
25	185		
32	188		
40	192		
50	198		193
65	198	206	199
80		212	204
100		219	214
125			225
150			236
200			257

* using fusion spigot (Item no. 418652, 418660 or 418644 in PP, PVDF or PE) for orifice DN65-DN100

Immersion kit

L
500
1000
1500
2000

Remote pH controller Type 8205

The remote pH controller Type 8205 is available in 2 versions:

- Panel-mounted



- Wall-mounted



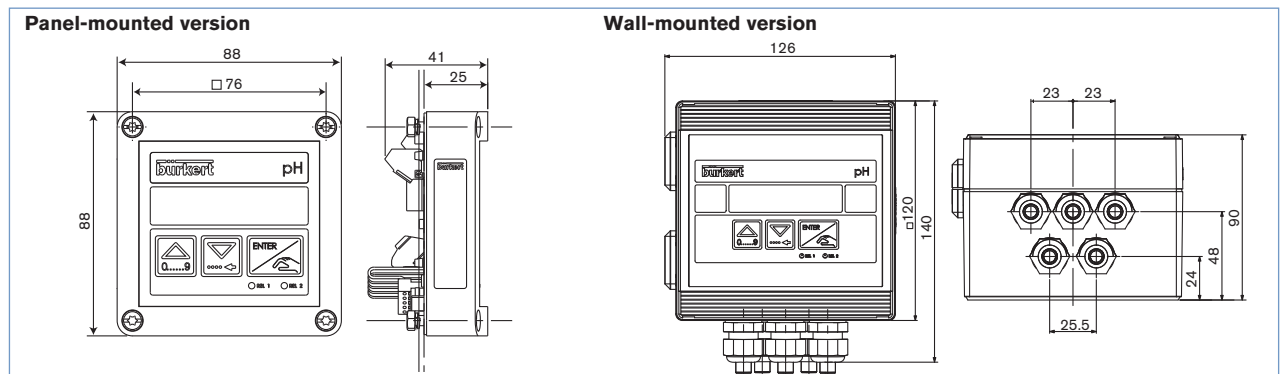
A separate pH sensor from Bürkert must be associated with this remote pH controller. This sensor consisting of a pH probe and a probe holder Type 8200 must be ordered separately.

General data	
Compatibility	Bürkert pH sensor
Materials Housing, cover Front panel foil / Screws Cable glands	PC (panel-mounted version); ABS (wall-mounted version) Polyester / Stainless steel PA
Electrical connection	Terminals (panel-mounted version) Or terminals via 5 cable glands M16x1.5 (wall-mounted version)
Electrical data	
Power supply Panel-mounted version Wall-mounted version	15...30 V DC, filtered and regulated 15...30 V DC, filtered and regulated or 115/230 V AC - 50/60 Hz (see technical specifications 115/230 V AC)
Current consumption with sensor	≤ 60 mA at 30 V DC; 110 mA at 15 V DC (with relays) ≤ 40 mA at 30 V DC; 70 mA at 15 V DC (without relay)
Sensor input	Analog signal from pH probe and Pt1000
Cable length	max. 10 m (distance between sensor and controller)
Output Relay alarm Pulse Relay pulse Transistor pulse	4...20 mA programmable, proportional to pH or T°C max. loop impedance: 1200 Ω at 30 V DC; 900 Ω at 24 V DC; 450 Ω at 15 V DC 1 relay, freely configurable, 3 A, 230 V AC 2 frequency and time duration adjustable outputs 2 relays, freely configurable, 3 A, 230 V AC; F < 1 Hz 2 Polarized, potential free, 5...30 V DC; 100 mA, protected, line drop at 100 mA: 1.5 V DC - for status and alarm message; F < 17 Hz
Control mode	P, PI or PID programmable
Environment	
Ambient temperature	0°C to +60°C (32°F to 140°F) (Operation and storage)
Standard	
Protection class	IP65 (panel-mounted and wall-mounted version) IP20 (panel-mounted version, inside the cabinet)
Technical specifications 115/230 VAC	
Voltage available in the device	27 V DC regulated, max. current: 250 mA integrated protection: fuse 250 mA temporised power: 6 VA



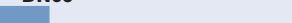

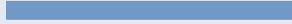
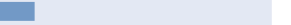

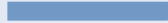
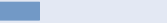
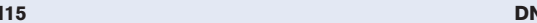
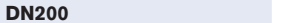
Installation

The remote 8205 pH controller has to be installed into a cabinet or on a wall. A pH sensor from Bürkert must be associated with this remote pH controller. The pH sensor in its extended version can also be associated with an industrial immersion kit, which allows pH measurement into tanks or containers. The following lengths are available: 500, 1000, 1500, 2000 mm. Special lengths on request. The sensor consisting of a pH probe and a probe holder Type 8200 must be ordered separately (see separate data sheet Type 8200).

Dimensions [mm]




Combining the compact pH controller Type 8205 with fittings Type S020

Available fitting DN	T-fitting S020 	DN15 	DN65 	
	Welding tab S020 		DN50 	DN200 
	Fusion spigot S020 		DN65 	DN100 
pH measurement 8205 compact		DN15 	DN200 	

Ordering chart for compact controller Type 8205

A complete compact pH controller Type 8205 consists of a compact pH controller Type 8205 and a Bürkert INSERTION fitting Type S020.

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

- **Item no.** of the desired pH controller **Type 8205** (see ordering chart, below)
 - **Item no.** of the selected INSERTION fitting **Type S020** (DN15 - DN200 - see separate data sheet)  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 two components.

Compact pH controller Type 8205

Specifications	Voltage supply	Output	Control outputs	Sensor version	Electrical connection	Item no.
Compact controller	15...30 V DC	4...20 mA 1 alarm relay	2 relays	UNITRODE PLUS pH	2 cable glands	426 430
			2 transistors	UNITRODE PLUS pH	2 cable glands	426 450

FKM seal in standard; 1 Kit including a black EPDM seal for the sensor, an obturator for an M20x1.5 cable gland, a 2x6 mm multiway seal and a mounting instruction sheet is supplied with each controller.

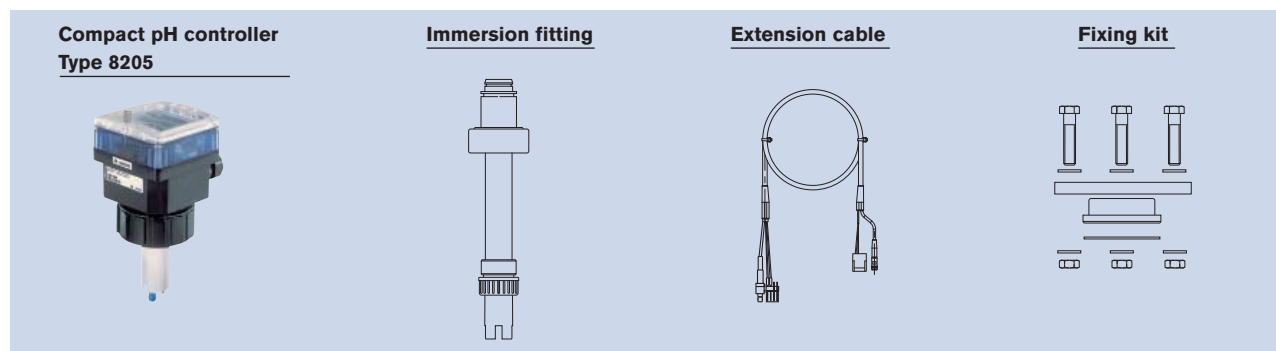
Tank installation with a compact pH controller Type 8205.

A compact pH controller Type 8205 for tank installation is made up of a compact pH controller Type 8205 and an immersion kit which is consisting of an immersion fitting, an extension cable for immersion fitting and a fixing kit (flange DN65 with stainless steel screws).

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

- **Item no.** of the desired compact pH controller **Type 8205** (see ordering chart on p. 6)
- **Item no.** of the immersion fitting (see accessories ordering chart on p. 8)
- **Item no.** of the extension cable for the immersion fitting (see accessories ordering chart on p. 8)
- **Item no.** of the fixing kit (flange DN65 with stainless steel screws - see accessories ordering chart on p. 8)

→ You have to order four components.



Ordering chart for remote controller Type 8205

A complete remote pH controller Type 8205 consists of a remote pH controller Type 8205, a Bürkert pH sensor and a Bürkert INSERTION fitting Type S020.

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

- **Item no.** of the desired pH controller **Type 8205** (wall-mounted or panel-mounted version - see ordering chart, below)
- **Item no.** of the desired pH sensor made of pH probe and probe holder **Type 8200** (see separate data sheet) More info.
- **Item no.** of the selected INSERTION fitting **Type S020** (DN15 - DN200 - see separate data sheet) More info.

→ You have to order three components.

pH controller Type 8205 panel or wall-mounted version

Specifications	Voltage supply	Output	Control outputs	Sensor version	Electrical connection	Item no.
Panel-mounted	15...30 V DC	4...20 mA 1 alarm relay	2 relays	Type 8200	Terminal strip	427 939
			2 transistors	Type 8200	Terminal strip	427 941
Wall-mounted	15...30 V DC	4...20 mA 1 alarm relay	2 relays	Type 8200	Cable glands	427 946
			2 transistors	Type 8200	Cable glands	427 948
	115/230 V AC	4...20 mA 1 alarm relay	2 relays	Type 8200	Cable glands	427 951
			2 transistors	Type 8200	Cable glands	427 953

Tank installation with a remote pH controller Type 8205.

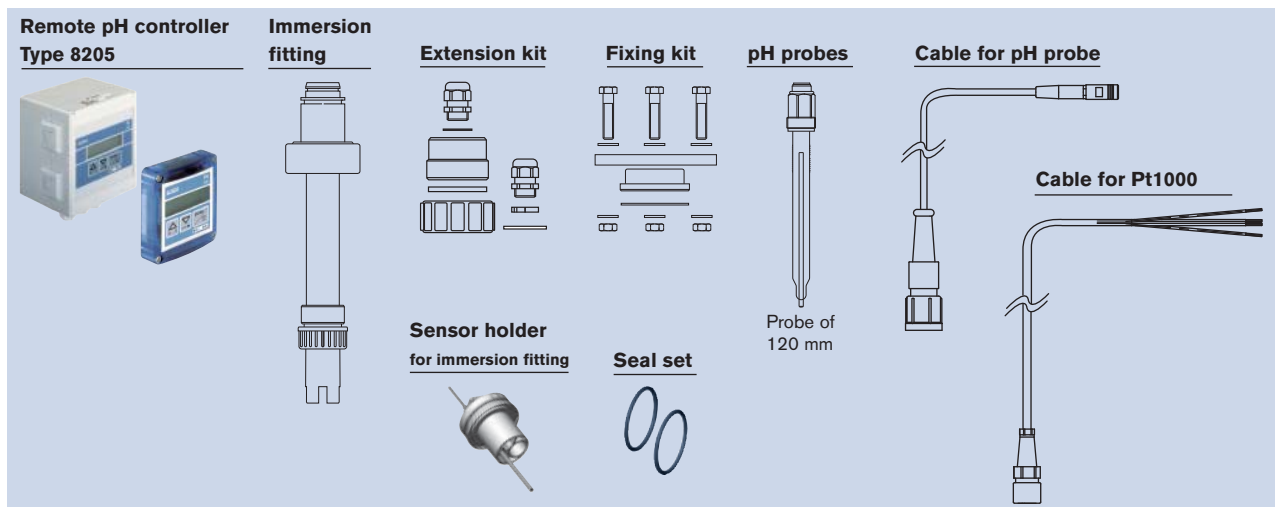
A remote pH controller Type 8205 for tank installation is made up of a remote pH controller Type 8205, an immersion kit which is consisting of an immersion fitting, an extension kit for immersion fitting, a fixing kit (flange DN65 with stainless steel screws), a sensor holder with Pt1000, a pH probe, a shielded cable for pH, a shielded cable for Pt1000 and a seal

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

- **Item no.** of the desired remote pH controller **Type 8205** (wall-mounted or panel-mounted version - see ordering chart on p. 7)
- **Item no.** of the immersion fitting (see separate data sheet Type 8200)
- **Item no.** of the extension kit for the immersion fitting (see separate data sheet Type 8200)
- **Item no.** of the fixing kit (flange DN65 with stainless steel screws - see separate data sheet Type 8200)
- **Item no.** of the sensor holder with Pt1000 (see separate data sheet Type 8200)
- **Item no.** of the 120 mm pH probe (see separate data sheet Type 8200)
- **Item no.** of the seal set if EPDM desired (see separate data sheet Type 8200)
- **Item no.** of the pH shielded cable (see separate data sheet Type 8200)
- **Item no.** of the Pt1000 shielded cable (see separate data sheet Type 8200)

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 Type 8200 data sheet.

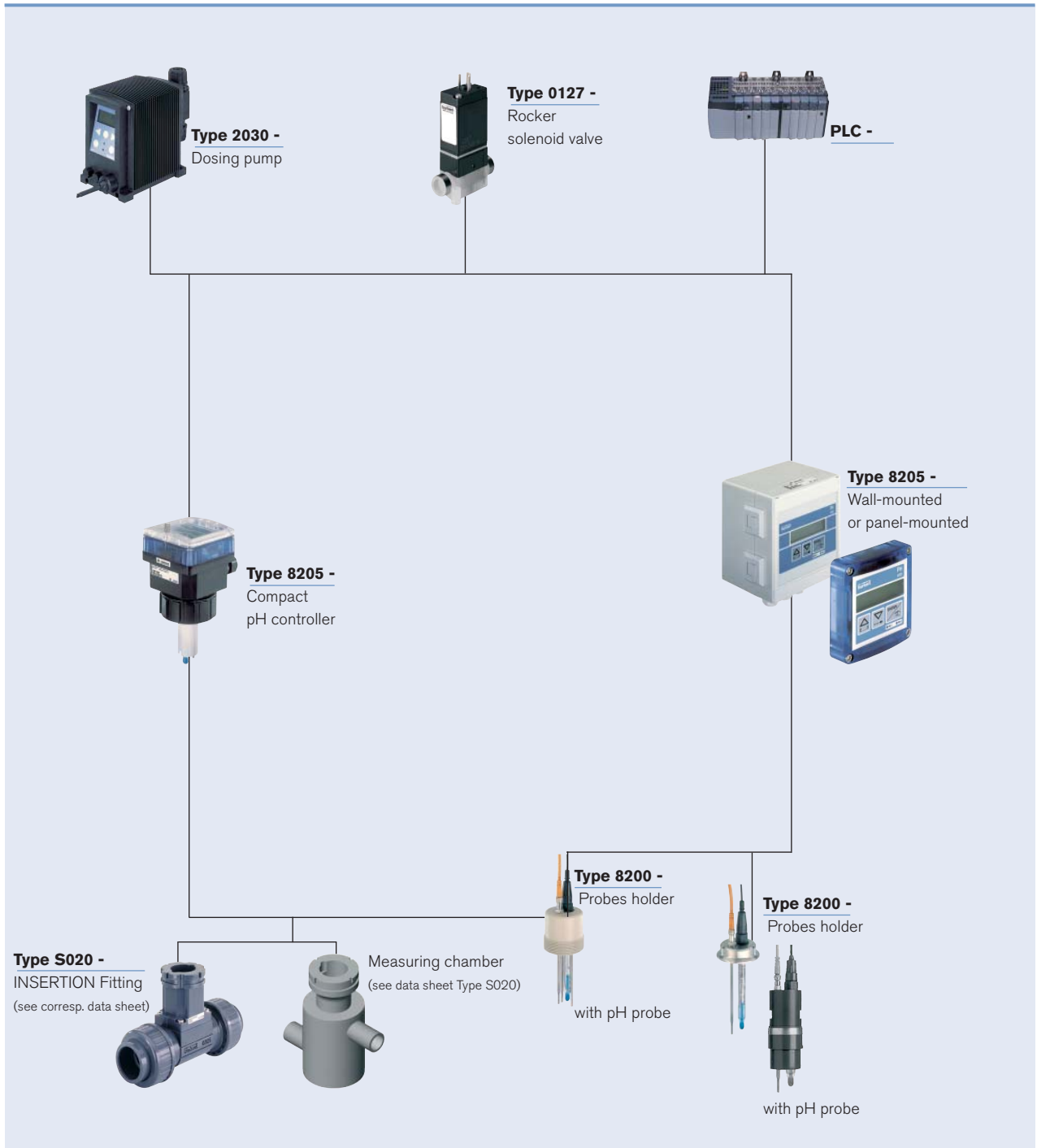
→ You have to order nine components.



Ordering chart for accessories for pH controller Type 8205

Description	Item no.
Set with 2 cable glands M20x1.5 + 2 neoprene flat seals for cable gland or plug + 2 screw-plugs M20x1.5 + 2 multiway seals 2x6 mm	449 755
Set with 2 reductions M20x1.5 /NPT1/2" + 2 neoprene flat seals for cable gland or plug + 2 screw-plugs M20x1.5	551 782
Set with 1 stopper for unused cable gland M20x1.5 + 1 multiway seal 2x6 mm for cable gland + 1 black EPDM seal for the sensor + 1 mounting instruction sheet	551 775
Ring	619 205
PC - nut	619 204
Set with 1 green FKM + 1 black EPDM seal	552 111
Sensor holder with stainless steel Pt1000	418 889
Sensor holder with titanium Pt1000	418 890
pH probe 0...130°C, 0...6 bar - UNITRODE PLUS pH 80 mm	552 041
Immersion fitting in PP, L=0.5 m	419 567
Immersion fitting in PP, L=1.0 m	419 568
Immersion fitting in PP, L=1.5 m	419 569
Immersion fitting in PP, L=2.0 m	419 570
Extension cable, long of 0.7 m (for immersion fitting, L=0.5 m)	416 632
Extension cable, long of 1.2 m (for immersion fitting, L=1.0 m)	416 633
Extension cable, long of 1.7 m (for immersion fitting, L=1.5 m)	416 634
Extension cable, long of 2.2 m (for immersion fitting, L=2.0 m)	416 635
Fixing kit - flange DN65 with stainless steel screws	413 615
Storage solution for electrodes (KCl 3M), 500 ml	418 557
Cleaning solution set for electrodes, 3 x 500 ml	560 949
Buffer solution, 500 ml, pH = 4.01	418 540
Buffer solution, 500 ml, pH = 7	418 541
Buffer solution, 500 ml, pH = 10.01	418 543
Factory 2-point pH calibration certificate	550 673

Interconnection possibilities with other Bürkert devices



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please consult for advice.

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