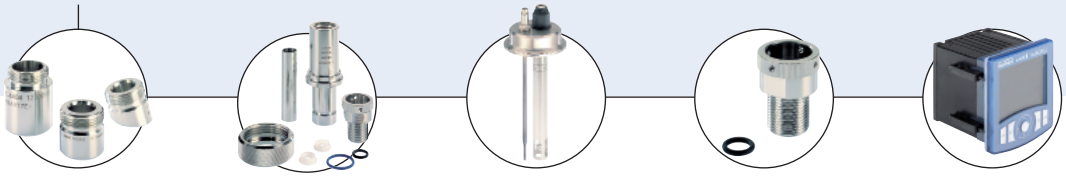
burkert
FLUID CONTROL SYSTEMS

pH measuring system for hygienic process applications

- Sterile design, CIP-compatible, in-line sterilizable
- Extremely robust and unbreakable construction
- Extremely long service life
- Long calibration intervals
- Especially suitable when preparing foods and drinks

Type 8201 can be combined with...



Type 8201
DN25, DN30

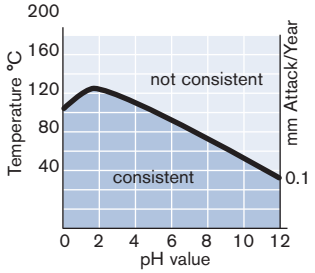
Type 8201
Adaptation sets for fittings Type 8201

Type 8200
pH armature

Type 8201
Adaptation set for armature Type 8200

Type 8619
multiCELL transmitter/Controller

The 8201 pH measuring system is suitable for measuring absolute pH values in liquids between pH 0 and pH 12 at medium temperatures of up to 140°C and process pressures of max. 6 bar. Due to its hygienic design and the robust glass-free layout, this model is particularly suitable for use in hygienic processes. An example would be the production of foods and active ingredients, during which the pH value of liquid mediums - including those which are viscous or contain solids - is measured.
The pH probe's extremely smooth enamel surface inhibits the medium from sticking and is very easy to clean inline. Due to its robust design and high temperature and chemical tolerance, the probe stays in the process even during a CIP purification. This means that expensive retractable fittings can be dispensed with.



Technical data - Probe	
Measuring value	Absolute pH
Reference system	Machined diaphragm (ceramic enamelled), reference electrode Ag/AgCl, KCl electrolyte 3-molar sterile
Measuring range	0 to 10 pH (for up to 12 pH see diagram)
Measuring error	Depending on calibration max. 0.01 pH
Measuring chain zero point	8.65 ±1 pH*
Measuring chain isotherm point	1.0 ±1 pH; Uis= 440 mV*
Slope	56-59 mV/pH* at 25°C *(77°F)*
Ambient temperature	0 to +50°C *(32 to 122°F)*
Medium temperature	0 to +140°C *(32 to 284°F)*
Minimal conductivity	1 µS
Thermoshock resistance	ΔT = 120°C *(248°F)*
Medium pressure	-1 to 6 bar rel. *(-14 to 87 PSI)*
Temperature compensation	Pt1000
Materials Wetted part	Probe head PVDF Enamelled steel pipe, ceramic enamelled ground diaphragm, 1.4404 process connection and EPDM seal
Signal outputs	Pt1000 2-wire, pH value in mV
Electrical connection	6-pin gold-plated
Protection type	IP68
Adaptation set	For pH armatures Type 8200 or Type 8201 For flange connection adapted for GEA Tuchenhagen VARINLINE process connection (DN50-DN125; EHEDG) or for Clamp 2"
Suitable transmitters	Devices with isotherm option
Hygienic connection fittings 8201	
	Weld connection DN25 (Ingold welding nozzle), Weld connection DN30 (EHEDG), other on request Stainless steel connecting pieces 1.4404
pH armature Type 8200	
	Only stainless steel versions possible. For dimensions see data sheet Type 8200

* For exact values see probe test report

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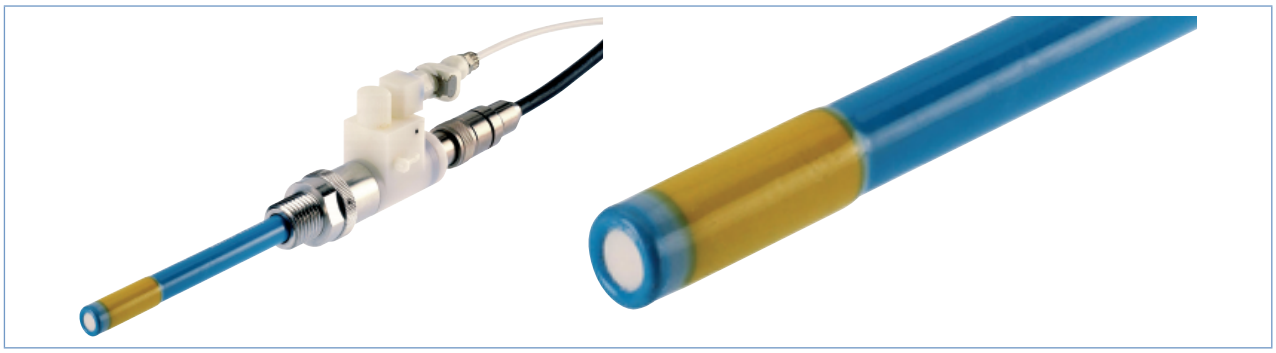
Measuring principle



The pH sensor works as a single-rod measuring cell. The measuring electrode and reference electrode are combined in one element. An enamelled steel pipe is used as the basic carrier. The measuring electrode is created by additionally attaching an ion-sensitive enamel layer (yellow) with metallic voltage conductor (positioned in the non-conductive blue enamel carrier layer). An ion exchange of H+ions and alkali ions takes place on the surface (gel layer) of this enamel layer. The Ag/AgCl reference electrode is located in the interior of the enamel pipe filled with electrolyte. A ceramic machined diaphragm is pressed into the lower end of the pipe. Voltage transfer takes place when the electrolyte makes contact with the measuring solution via the annular gap of the diaphragm. A Pt1000 for temperature compensation is also integrated in the sensor. The electrolyte used is 3-molar KCl, stored in a separate electrolyte vessel and permanently connected to the probe via a hose.

The pressure of the electrolyte vessel is maintained slightly above process pressure by means of an attached pressure controller. For non-pressurised processes the static overpressure of the pressure vessel mounted approx. 0.5 m above the probe is generally sufficient. Due to the very slight permanent electrolyte flow that flows through the extremely small annular gap, contamination of the reference electrode is practically eliminated. Accidental operation without electrolyte is prevented by optional inductive level monitoring of the pressure container. When a minimum level has been reached, the electrolyte supply bottle in the pressure container is simply changed.

Bürkert Type 8285 provides the analysis of the measured value. The maximum length of cable between probe and converter (transmitter) should not exceed 5 m.

pH probe 8201 is supplied without adaptation. The appropriate set is selected according to the fitting/armature chosen. Different hygienic variations of Model 8201 are available. Various standard armatures Type 8200 can be used as well.

Structure

The complete measuring system consists of the pH probe, an adaptation set, an attachment fitting, the reservoir with hose for the electrolyte solution, the electrolyte solution and the electric cable for connecting to a suitable transmitter.
The pH probe 8201 is supplied without adaptation. According to the chosen fitting/armature the appropriate adaptation set has to be selected. Different hygienic fittings (Type 8201) or for general purpose applications pH armatures of Type 8200 can be selected.

Installation

Intended performance is limited to proper installation of the fitting (by weld), integrating the probe into the process using the appropriate adaptation kit, proper mounting of the electrolyte vessel – electrolyte attachment perpendicularly downwards – close to the measuring point and connecting the pH sensor and electrolyte vessel using the hose connection supplied.

The electrolyte supply bottle is inserted into the electrolyte vessel and the pH sensor filled with electrolyte by opening the ventilation screw.

You are free to choose the assembly position of the pH sensor. During operation care must be taken that the active surface (length approx. 45 mm from probes lower edge) is completely surrounded by medium. The flow velocity should not exceed 3 to 4 m/s.
Dry-storage of the pH sensor is unrestricted.

The probe is connected to the transmitter by means of the attachment cable.
Inductive level switch is attached to a suitable analyzing device.

pH-Sensor	transparent
Reference electrode	red
Solution ground	blue
Probe body ground	grey
Cable protection	green/yellow
Pt1000	white
Pt1000	green

Cable allocation, connection cable for transmitter

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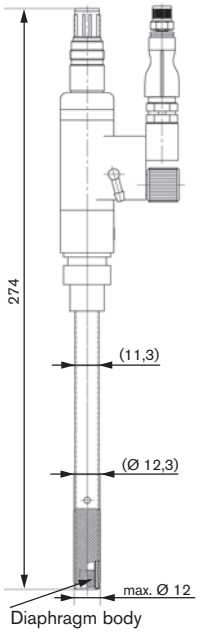
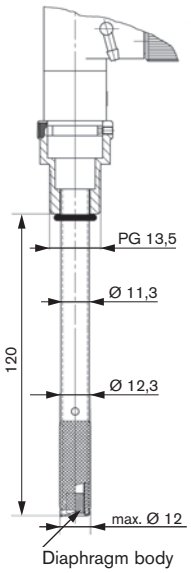
Dimensions [mm]

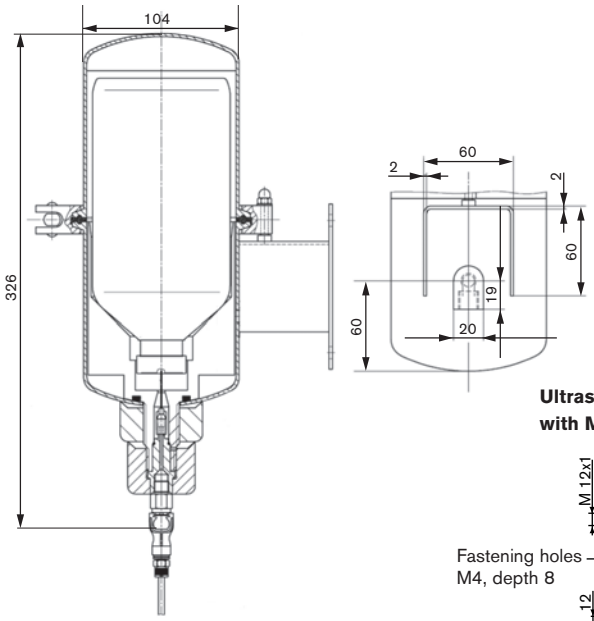
pH probe enamel without adaptation



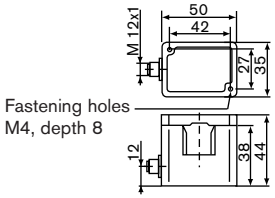
pH probe with adaptation set PG13.5 for pH armature Type 8200



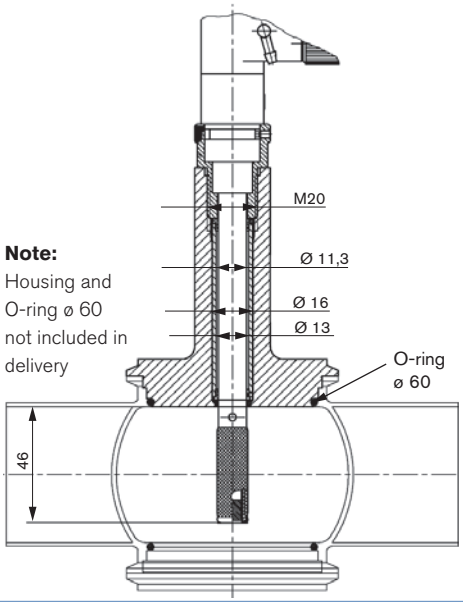
Electrolyte vessel with built-in electrolyte supply bottle



Ultrasonic level switch with M12 connector

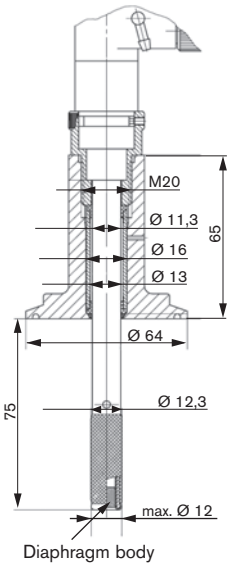


pH probe with adaptation set for flange connection adapted for GEA Tuchenhagen VARINLINE process connection (DN50-DN125; EHEDG)

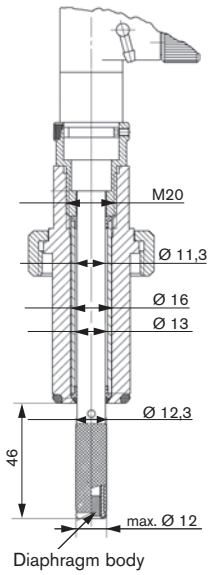


Note:
Housing and O-ring ø 60 not included in delivery

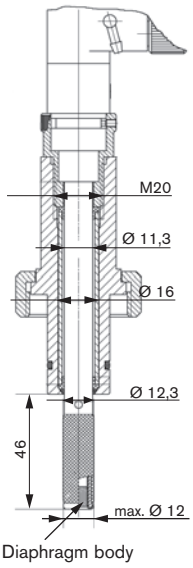
pH probe with adaptation set Clamp 2" external ø64 mm



pH probe with adaptation set DN30 (EHEDG)

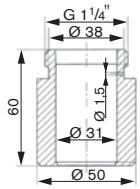


pH probe with adaptation set DN25

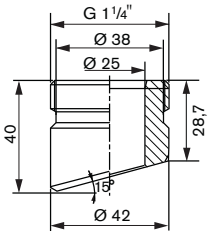


Fittings Type 8201

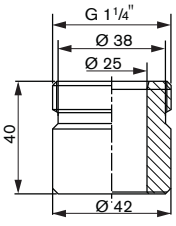
Welding tab DN30 EHEDG



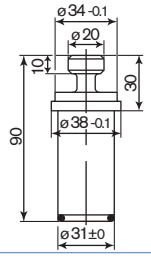
Welding tab DN25 sloped



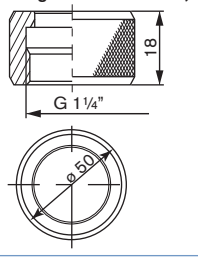
Welding tab DN25 straight



Blind plug for welding tab DN30 EHEDG



nut for blind plug (welding tab DN30 EHEDG)



Ordering chart

A complete Model 8201 pH measuring system contains the following components:

- pH probe enamel
- Suitable adaptation set for fitting/armature
- Fitting/armature
- Electrolyte vessel (electrolyte hose included)
- Supply bottle with 1 litre electrolyte KCl
- Connection cable for transmitter
- Transmitter Type 8285 (see data sheet Type 8285)

Note: The cable between probe and transmitter must categorically be selected as short as possible – particularly at low process temperatures – in order to guarantee measurement signal dynamics that are as high as possible. A cable length of 10 m should only be used in exceptional cases.

If required, to disinfect and rinse the system you will need:

- Demineralized water, 1 Litre plastic bottle
- Plastic bottle with septum for alcohol filling

All necessary parts have to be ordered separately

Description	pH measuring range	Medium temp.	Pressure (rel.)	Electrical connection	Item no.
Probe					
pH probe-enamel without adaptation	0 to 10 (12)	0 to +140°C	-1 to 6 bar	6-pin gold-plated	554 849

Description	Comment	Item no.
Adaptation sets		
Adaptation set for welding tab DN25 Type 8201	Union nut G 1¼" / DN25	554 866
Adaptation set for welding tab DN30 (EHEDG) Type 8201	Union nut G 1¼" / DN30	554 873
Adaptation set PG13.5 for pH armature Type 8200	PG13.5 with O-ring	554 862
Adaptation set for flange connection adapted for GEA Tuchenhagen VARINLINE process connection (DN50-DN125; EHEDG)	Flange adapted for GEA Tuchenhagen VARINLINE process connection	558 617
Adaptation set Clamp 2" external ø64 mm	Clamp 2"	559 744
Electrolyte vessel		
Electrolyte vessel, stainless steel	incl. electrolyte hose set 5 m, compressed air attachment, pipe / wall-mounting unit 1	554 850
Electrolyte vessel, stainless steel, with level switch		554 851
Operating liquids		
Electrolyte KCl, sterilised, 1 litre plastic bottle	Electrolyte reference system	554 852
Water demineralised, 1 litre plastic bottle	For rinsing the system	554 853
Plastic bottle with septum	For self-filling with alcohol 70% vol.	554 854
Connection cables		
Connection cable for pH probe enamel, 3 m long	6-pole Variopin coupling on pH probe, flexes on transmitter	554 855
Connection cable for pH probe enamel, 5 m long		554 856
Connection cable for pH probe enamel, 10 m long *		554 857
Fittings Type 8201 attachment cables		
Welding tab DN25, 40 mm, straight, 1.4404	DN25/weld attachment straight	554 858
Welding tab DN25, 40 mm, sloped, 1.4404	DN25/weld attachment diagonal	554 859
Welding tab EHEDG, DN30, 60 mm, straight, 1.4404	DN30/weld attachment straight	554 860
Blind plug for welding tab EHEDG, DN30, 1.4404 **	Union nut G 1¼" / DN30	554 861
Nut for blind plug for welding tab EHEDG, DN30, 1.4404 **	G 1¼" / DN30	554 872

* Only to be used in exceptional cases, please consult your Bürkert application specialist for application advice.

** Absolutely necessary in order to prevent warping when welding EHEDG DN30 connecting pieces.

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Ordering chart, inspection and retrofit sets

The maintenance sets contain small parts such as O-rings, seals, stainless steel canulas, flexible tubing, couplings etc.
The retrofit sets contain all parts needed for mounting / dismantling a level switch.

Description	Contents	Item no.
Maintenance sets		
Inspection set for pH probe enamel	2 O-rings 10 x 2.5 mm EPDM, 2 O-rings 20 x 2.5 mm silicon, 2 O-rings 23.39 x 3.53 mm EPDM, 4 items adaptor reinforcement ring PTFE	554 876
Flexible tube set	1 hose connection, 1 hose connector, PTFE hose 4 x 1 length 5 m	554 883
Retrofit sets		
Level switch cplg.	Ultrasonic level switch with M12 fixed connector	561 533
Locking screw M12 x 1 cplg.	Locking screw PVDF with O-ring FKM	554 887

Please use the attached application questionnaire to describe your process and send it to your Bürkert office to check the suitability. Please complete all three pages.

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Questionnaire applications with the enamel pH probe Type 8201

Please fill in and send to your local Bürkert Sales Centre*.

Company:	Contact person:
Customer No.:	Department:
Address:	Tel. / Fax.:
Postcode / Town:	E-mail:

Our process

Process description: .....

.....

☐ continuously pH regulation

☐ continuously pH control

Temperature range * from ..... to ..... [°C]

Pressure range * from ..... to ..... [bar]

pH range * from ..... to ..... [bar]

Concentration of dissolved substances Molarity ..... [mol]

or proportion ..... [%]

which substances .....

variable concentration ☐ no ☐ yes

if yes, please quotate the variation ..... [mol]

Cleaning process **	Conc. mol	Temp. °C	Time minutes	pH value pH
Cleaning with base	.....	.....	.....	
Cleaning with acid	.....	.....	.....	
Sterilisation with steam		.....	.....	
Sterilisation with product		.....	.....	.....
Sterilisation with aseptic solutions		.....	.....	.....

Other cleaning .....

.....

* Please chart this data into the diagram time lapse of the process at page 7.

** Please chart this data into the diagram time lapse of the cleaning process at page 8.

Currently used measuring

Used type of pH measuring system:

Following issues are existing:

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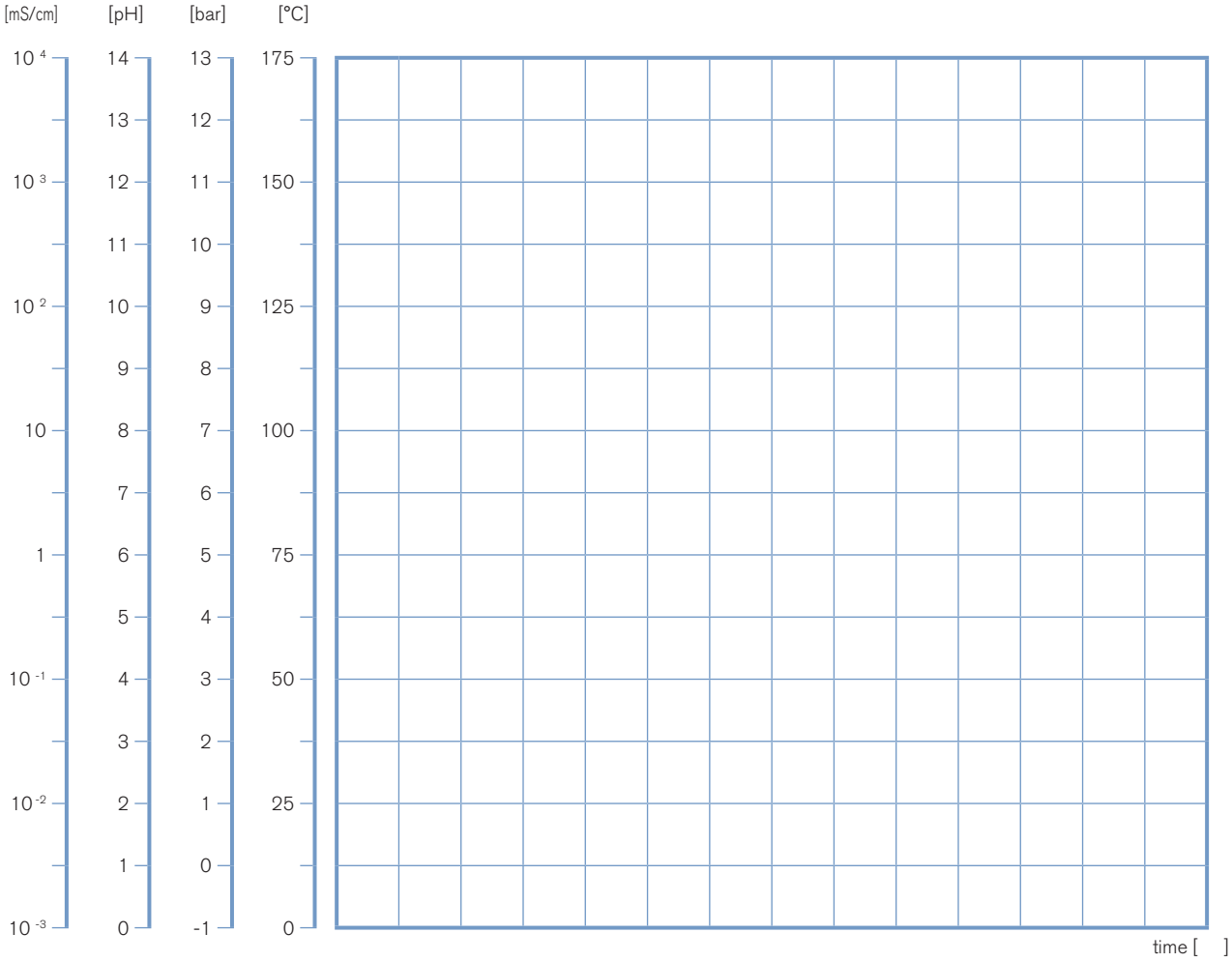
Process time lapse



Remarks:

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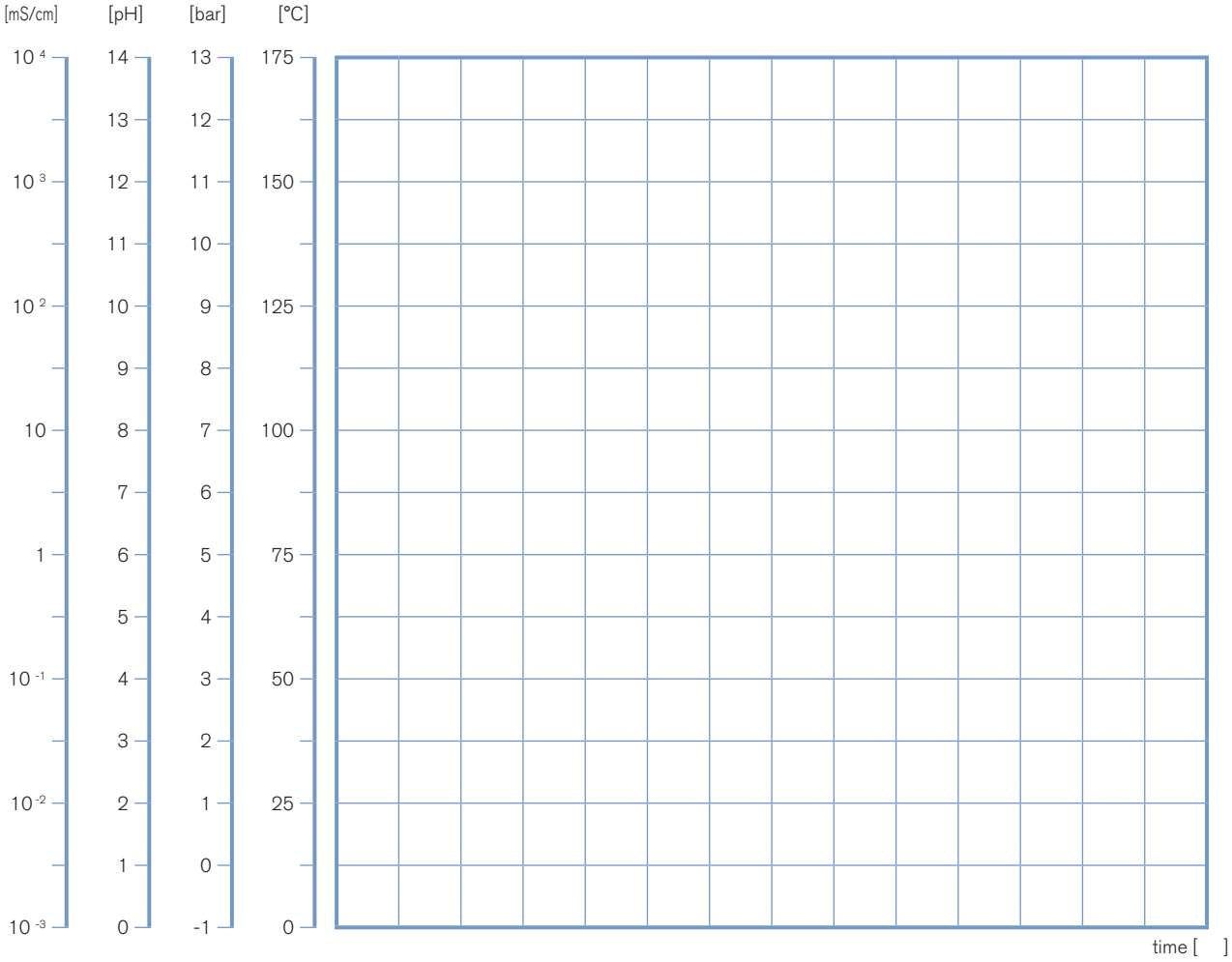
Cleaning time lapse



Remarks: