

JUMO GmbH & Co. KG

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JUMO Instrument Co. Ltd.

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JUMO Process Control, Inc.

8 Technology Boulevard
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JUMO tecLine pH JUMO tecLine Rd pH and redox combination electrodes

in glass or plastic shaft versions

201020 series - pH electrodes

201025 series - redox electrodes

Brief description

JUMO tecLine electrodes are high-quality sensors for professional applications in process and industrial measurement technology. These electrodes are known for their use of top-quality materials and components. They are designed as combined electrodes (the glass or metal electrode and the reference electrode are combined in one shaft). A temperature probe can also be integrated as an option, depending on the type.

Suitable versions are available to meet a wide variety of requirements:

JUMO tecLine

- for industrial and communal water and wastewater engineering
- for measurements in suspensions and varnishes
- for measurements in low-ion media
- for high-alkaline, high-temperature and sterilization processes
- for media containing fluorides and low-temperature applications
- PRO version for the toughest operating conditions

JUMO tecLine sensors are state-of-the-art for modern pH and redox electrodes. Each electrode is a quality product and is individually tested as a matter of routine. Modern production facilities ensure consistent characteristics.

General information about the construction of the JUMO tecLine series

All standard electrodes are made from physiologically safe and FDA-listed materials.



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Active element of pH and redox electrodes:

Membrane glass or active component	Designation	pH or redox range	Temperature range	Typical application
U glass	universal glass	pH 0 - 12 (briefly pH 14)	-5 to +80°C	Water and wastewater engineering, process measurement technology, low-ion media
HA glass	high-alkaline glass	pH 0 - 14	-5 to +80°C	For heavily alkaline media (above pH 12)
HT glass	high-temperature glass	pH 0 - 14	0 to 135°C	For temperatures above 80°C or for heavily alkaline media
DS glass	steam-sterilizable glass	pH 0 - 12	-5 to +80°C briefly up to 130°C (20 min)	Biotechnology, pharmaceutical and food technology, sterilization processes
C glass	fluoride-resistant glass	pH 0 - 11	-5 to +50°C	Media containing fluorides (hydrofluoric acid) (c(HF) ≤ 1000mg/l)
Platinum tip	redox measurement	±2000mV	-10 to +135°C	Chromate reduction, nitrite oxidation, swimming pool and drinking water disinfection
Gold tip	redox measurement	±2000mV	-10 to +135°C	Cyanide oxidation, water disinfection

Reference system design variations (reference electrode):

The only reference electrolytes used for JUMO tecLine electrodes are those that have no silver ions. A cartridge-style conduction system contains the silver / silver chloride (Ag / AgCl). Various forms of diaphragm are used.

Diaphragm type	Explanation	Possible electrolytes	Typical application / limitations
1 x ceramic diaphragm	High-quality zirconium dioxide diaphragm ¹	Highly viscous KCl gel or liquid KCl	General water or wastewater engineering, industrial processes, etc.
3 x ceramic diaphragm	As above, but the increased number means more KCl escapes	Highly viscous KCl gel or liquid KCl.	For polluted or low-ion media (LF < 100µS/cm); low-temperature applications
Glass fiber diaphragm	Glass fiber bundle instead of a ceramic diaphragm for electrodes with a plastic shaft	Highly viscous KCl gel	General water or wastewater engineering (lightly polluted media)
PTFE ring diaphragm	Large surface area ring diaphragm	Highly viscous KCl gel	Only for very heavily polluted media or adherent media containing oil, for example
Annular-gap or perforated diaphragm	Open transition between the solid electrolyte and the medium, implemented in annular or punctate form	Polymerized solid electrolyte	Suspensions, varnishes, media containing solids, heavily polluted media; not suitable for very pure drinking water or low-ion media
Doka types (two-chamber system)	The extended diffusion path and double diaphragm separation prevent electrode poisoning	Highly viscous gel KCl/KCl bridge Solid electrolyte	For when electrode poisons are present (e.g. sulphides)

Other pH and redox electrodes can be found in the following data sheets:

Data sheet 201005 JUMO ecoLine pH / Rd

Data sheet 201030 JUMO labLine or data sheet 201080 JUMO single sensors

¹ Zirconium dioxide diaphragm: high-quality ceramic material of consistent porosity. This means optimum diffusion properties.

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JUMO tecLine pH / Rd with ceramic or glass fiber diaphragm for water and process measurement technology

Typical areas of application

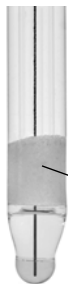
- Industrial and communal, as well as general water and wastewater engineering
- Process measurements, electroplating plants, final inspections, neutralization plants
- Drinking and well water, boiler feed water
- Lightly polluted wastewater
- Two-chamber system for when electrode poisons (e.g. sulphides, cyanides) are present
- Low-temperature applications (-30 to +30°C), e.g. measurement in cooling systems
- Media containing fluorides (hydrofluoric acid) up to 1000mg/l HF
- High-alkaline applications (reduced alkaline error at pH values > pH 12)

Key features

- High-quality zirconium dioxide diaphragms (glass fiber diaphragm for plastic shaft)
- Cartridge-style conduction system with a reference electrolyte with no silver ions
- Pressure-resistant versions up to 10bar (50°C)
- Temperature range: up to -5 to +80°C (90°C for redox) or -30 to +30°C (for TT version)
- Temperature probe integration options
- Salt reserve option for increasing service life in media with lower conductivity or in drinking water
- JUMO HA glass for continuous measurements in the up to pH 14 range
- Redox versions with a platinum or gold tip up to ±2000mV

Extra code

Salt reserve, extra code 837



The option is available to equip the electrode with a salt reserve, in the form of four salt rings (see illustration). This is recommended when using the electrode in media with fewer ions or at high flow rates.

The salt reserve helps to increase the service life of the electrode. The rings are not a manufacturing defect (crystallization).

salt reserve

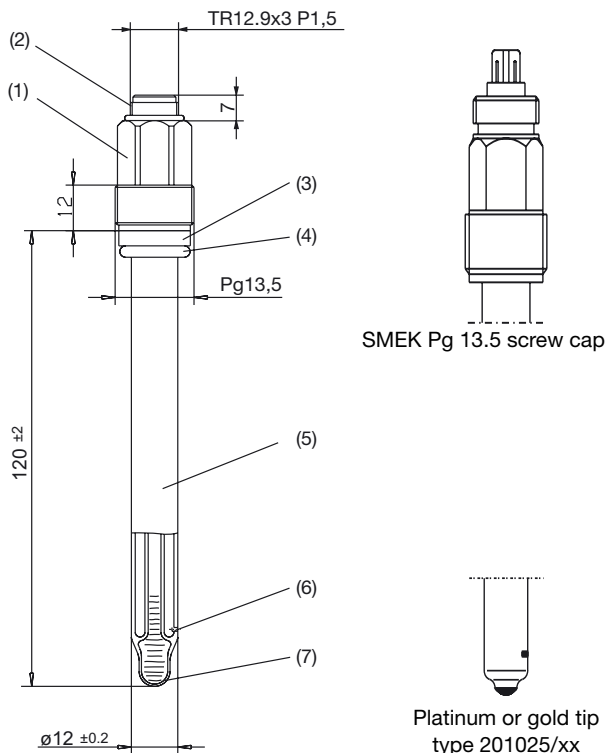
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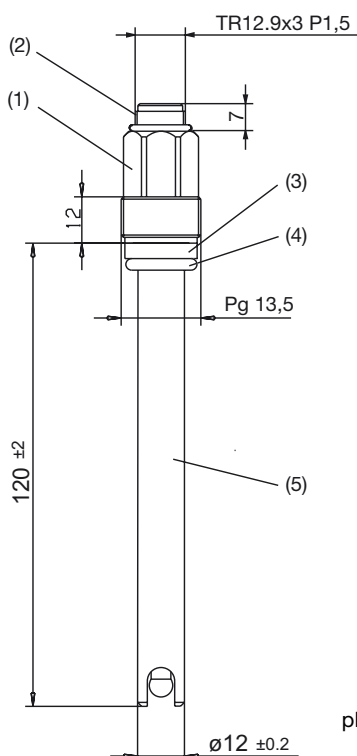


Dimensions



Type 20102x/51

- | | |
|-----------------------------|--|
| (1) Pg 13.5 screw cap | (5) Electrode shaft (DIN19 263 glass) |
| (2) TR12.9x 3 P1.5 thread | (6) 1 to 3 diaphragms (zirconium dioxide ø 1 mm) |
| (3) Ring (PSU) | (7) Rounded membrane |
| (4) O-ring 10 x 3.5 (FPM70) | |



pH, no protection

Platinum or gold tip
 type 201025/74

Type 20102x/74

- | |
|-----------------------------------|
| (1) Pg 13.5 screw cap |
| (2) TR12.9x 3 P1.5 thread |
| (3) Ring (PSU) |
| (4) O-ring 10 x 3.5 (FPM70) |
| (5) Electrode shaft (PSU plastic) |

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JUMO tecLine pH / Rd

pH / redox combination electrodes

for water and process measurement technology

Order details

	(1) Basic type	
	201020	pH combination electrode JUMO tecLine pH
	201025	redox combination electrode JUMO tecLine Rd
	(2) Basic type extension	
x x	51	glass shaft, gel-sealed / cartridge-style conduction system
o o	72	PEI plastic shaft with protection basket, gel-sealed, glass filament diaphragm, cartridge-style conduction system
o o	73	PSU plastic shaft without protection basket, gel-sealed, glass filament diaphragm, cartridge-style conduction system ¹
o o	74	PSU plastic shaft with protection basket, gel-sealed, glass filament diaphragm, cartridge-style conduction system ¹
	(3) Active component	
x	10	U glass, pH 0 - 12 (briefly 14), -5 to +80 °C
o	11	C glass, pH 0 - 12, -5 to +50 °C, fluoride-resistant up to 1000 mg HF/l
o	17	HA glass, pH 0 - 14, -5 to +80 °C, high-alkaline use
x	22	Platinum tip, redox range ±2000mV, -5 to +90 °C
o	32	Gold tip, redox range ±2000mV, -5 to +90 °C
	(4) Diaphragm	
o o	05	1 x glass filament diaphragm ²
x x	07	1 x zirconium dioxide diaphragm (special ceramic)
o o	09	3 x zirconium dioxide diaphragm (special ceramic)
	(5) Connection	
o	17	SMEK Pg 13.5 screw cap ³
x x	22	Pg 13.5 screw cap
	(6) Fitting length	
x x	120	120 mm (standard)
o o	225	225 mm other lengths on request
	(7) Extra codes	
o o	000	none
x x	837	salt reserve
o o	838	Two-chamber system (DOKA) with KCl/KCl bridge
o	840	Pt 100 temperature probe
o	841	Pt 1000 temperature probe

x = as standard
 o = option

	(1)	(2)	(3)	(4)	(5)	(6)	(7)							
Order code	<input type="text"/>	/	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	/	<input type="text"/>	, ... ⁴
Order example	201020	/	51	-	10	-	07	-	22	-	120	/	837	

Note:

The type code is not a modular system.
 If possible, choose items listed under "**stock versions**" or "**production versions**" for your orders.
 We will have to technically inspect and approve a free combination of individual key features.

¹ Only available in fitting length 225.
² Only for basic type extension 72, 73 or 74.
³ For electrodes with extra code 840 or 841.
⁴ List extra codes in sequence, separated by commas.

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pH stock versions (delivery 3 working days after receipt of order)

Type	Brief description	Sales No.
201020/51-10-07-22-120/837	Glass shaft, gel-sealed, zirconium dioxide diaphragm, screw cap, 120mm, salt reserve	20/00300151
201020/51-10-07-22-120/000	Glass shaft, gel-sealed, zirconium dioxide diaphragm, screw cap, 120mm,	20/00300148
201020/51-10-07-17-120/837, 840	Glass shaft, gel-sealed, zirconium dioxide diaphragm, SMEK screw cap, 120mm, salt reserve, integrated Pt 100	20/00351265
201020/51-17-07-22-120/837	Glass shaft, gel-sealed, zirconium dioxide diaphragm, screw cap, 120mm (high-alkaline applications)	20/00408953
201020/74-10-05-22-225/000	PSU plastic shaft with protection basket, gel-sealed, glass filament diaphragm, screw cap, 225mm	20/00354295
201020/73-10-05-22-225/000	PSU plastic shaft without protection basket, gel-sealed, glass filament diaphragm, screw cap, 225mm	20/00330857
201020/72-10-05-22-120/837, 838	PEI plastic shaft with protection basket, gel-sealed, glass filament diaphragm, screw cap, 120mm, salt reserve, two-chamber system	20/00303398

pH production versions (delivery 10 working days after receipt of order)

Type	Brief description	Sales No.
201020/51-10-07-22-225/000	Glass shaft, gel-sealed, zirconium dioxide diaphragm, screw cap, 225mm,	20/00399535
201020/51-11-07-22-120/000	Glass shaft, gel-sealed, zirconium dioxide diaphragm, screw cap, 120mm	20/00375623

Redox stock versions (delivery 3 working days after receipt of order)

Type	Brief description	Sales No.
201025/51-22-07-22-120/837	Glass shaft, gel-sealed, platinum tip, zirconium dioxide diaphragm, screw cap, 120mm, salt reserve	20/00300397
201025/51-32-07-22-120/837	Glass shaft, gel-sealed, gold tip, zirconium dioxide diaphragm, screw cap, 120mm, salt reserve	20/00300396
201025/72-22-05-22-120/837, 838	PEI plastic shaft without protection basket, gel-sealed, platinum tip, glass filament diaphragm, screw cap, 120mm, salt reserve, two-chamber system	20/00084011

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JUMO tecLine pH / Rd for wastewater, heavily polluted media, suspensions, varnishes

Typical areas of application

- Industrial wastewater engineering
- Process measurements, electroplating plants, paper industry, drinks industry
- Wastewater containing oil
- Suspensions, varnishes, media containing solid particles
- Two-chamber system for when electrode poisons are present
- Media containing fluorides (hydrofluoric acid) up to 1000mg/l HF

Key features

- A dirt-repellent PTFE ring diaphragm with a highly viscous KCl solution (gel) or a perforated or annular-gap diaphragm with a polymerized solid electrolyte - virtually blockage-free
- Cartridge-style conduction system with a reference electrolyte with no silver ions
- Pressure-resistant versions up to 10 bar (50°C)
- Temperature range: see order details
- Temperature probe integration options
- Salt reserve option for increasing service life in media with lower conductivity

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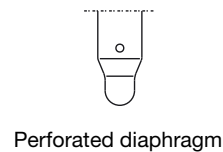
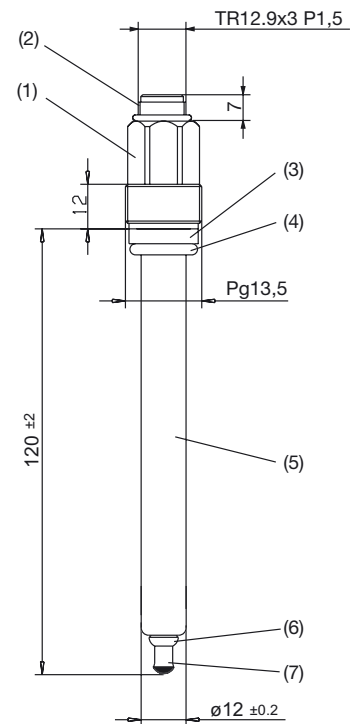
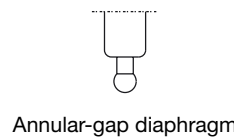
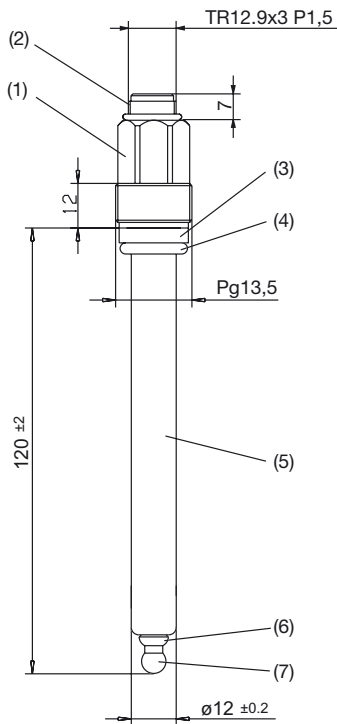
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**Dimensions****Type 201020/51**

- (1) Pg 13.5 screw cap
- (2) TR12.9x3 P1.5 thread
- (3) Ring (PSU)
- (4) O-ring 10 x 3.5 (FPM70)
- (5) Electrode shaft (DIN19 263 glass)
- (6) Ring diaphragm (PTFE)
- (7) Rounded membrane

Type 201025/51

- (1) Pg 13.5 screw cap
- (2) TR12.9x3 P1.5 thread
- (3) Ring (PSU)
- (4) O-ring 10 x 3.5 (FPM70)
- (5) Electrode shaft (DIN19 263 glass)
- (6) Ring diaphragm (PTFE)
- (7) Platinum or gold tip

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JUMO tecLine pH / Rd pH / redox combination electrodes for wastewater,

Order details

	(1) Basic type
	201020 pH combination electrode JUMO tecLine pH
	201025 redox combination electrode JUMO tecLine Rd
	(2) Basic type extension
x x	51 glass shaft, gel-sealed, cartridge-style conduction system
	(3) Active component
x	10 U glass, pH 0 - 12 (briefly 14), -5 to +80°C
o	11 C glass, pH 0 - 12, -5 to +50°C, fluoride-resistant up to 1000 mg HF/l
o	17 HA glass, pH 0 - 14, -5 to +80°C, high-alkaline use
x	22 platinum tip, redox range ±2000mV, -5 to +90°C
o	32 gold tip, redox range ±2000mV, -5 to +90°C
	(4) Diaphragm
x x	04 PTFE ring diaphragm
o o	10 annular-gap diaphragm, gel of polymerized solid electrolyte ("diaphragm-free")
o o	11 perforated diaphragm, gel of polymerized solid electrolyte ("diaphragm-free")
	(5) Connection
o	17 SMEK Pg 13.5 screw cap ¹
x x	22 Pg 13.5 screw cap
	(6) Fitting length
x x	120 120 mm (standard)
o o	225 225 mm
	other lengths on request
	(7) Extra codes
o o	000 none
x x	837 salt reserve
o o	838 Two-chamber system (DOKA) with KCl/KCl bridge ²
o	840 Pt 100 temperature probe ³
o	841 Pt 1000 temperature probe ³

x = as standard
 o = option

Order code (1) (2) (3) (4) (5) (6) (7)
Order example 201020 / 51 - 10 - 04 - 22 - 120 / 837, ...⁴

Note:

The type code is not a modular system.
 If possible, choose items listed under "**stock versions**" or "**production versions**" for your orders.
 We will have to technically inspect and approve a free combination of individual key features.

¹ For electrodes with extra code 840 or 841.
² Not in conjunction with diaphragm 10 or 11.
³ With connection 17 only.
⁴ List extra codes in sequence, separated by commas.

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**pH stock versions** (delivery 3 working days after receipt of order)

Type	Brief description	Sales No.
201020/51-10-04-22-120/000	Glass shaft, gel-sealed, PTFE diaphragm, Pg 13.5 screw cap, 120mm	20/00327907
201020/51-10-04-22-120/837	Glass shaft, gel-sealed, PTFE diaphragm, Pg 13.5 screw cap, 120mm, salt reserve	20/00321035
201020/51-10-04-22-225/837	Glass shaft, gel-sealed, PTFE diaphragm, Pg 13.5 screw cap, 225mm, salt reserve	20/00327142
201020/51-17-04-22-120/837	Glass shaft, gel-sealed, PTFE diaphragm, Pg 13.5 screw cap, 120mm (high-alkaline applications)	20/00332794
201020/51-10-04-17-120/837,840	Glass shaft, gel-sealed, PTFE diaphragm, Pg 13.5 SMEK screw cap, 120mm, salt reserve, integrated Pt 100	20/00470246

pH production versions (delivery 10 working days after receipt of order)

Type	Brief description	Sales No.
201020/51-10-04-17-120/840	Glass shaft, gel-sealed, PTFE diaphragm, SMEK Pg 13.5 screw cap, 120mm, integrated Pt 100	20/00383865
201020/51-10-04-22-225/000	Glass shaft, gel-sealed, PTFE diaphragm, Pg 13.5 screw cap, 225mm,	20/00372505
201020/51-10-11-22-120/837	Glass shaft, gel-sealed, perforated diaphragm and solid electrolyte, screw cap, 120mm, salt reserve	20/00445428
201020/51-10-11-17-120/837, 840	Glass shaft, gel-sealed, perforated diaphragm and solid electrolyte, SMEK screw cap, 120mm, salt reserve, integrated Pt 100	20/00468525
201020/51-11-04-17-120/837, 840	Glass shaft, gel-sealed, PTFE diaphragm, Pg 13.5 screw cap, 120mm, salt reserve, integrated Pt 100	20/00478086

Redox stock versions (delivery 3 working days after receipt of order)

Type	Brief description	Sales No.
201025/51-22-04-22-120/837	Glass shaft, gel-sealed, platinum tip, PTFE diaphragm, Pg 13.5 screw cap, 120mm, salt reserve	20/00321746

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Internet: www.jumo.us



JUMO tecLine pH / Rd for high-temperature and sterilization applications

Typical areas of application

- Processes with permanently elevated temperatures (max. 135°C)
- Sterilization applications
- Two-chamber system for when electrode poisons are present
- Media containing fluorides (hydrofluoric acid) up to 1000mg HF/l

Key features

- Proven JUMO HT glass (pH high-temperature membrane glass) 0 - 14 pH
- JUMO DS membrane glass for sterilization applications
- Cartridge-style conduction system with a (gel) reference electrolyte with no silver ions
- Pressure-resistant versions up to 10 bar (50°C)
- Temperature range: 0 to 135°C¹
- Temperature probe integration options
- Redox versions with a platinum or gold tip up to ±2000mV

¹ Sterilizable version:
sterilization at max. 135°C for up to 20 minutes.
Continuous electrode operation after sterilization up to max. 80°C.

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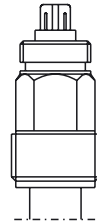
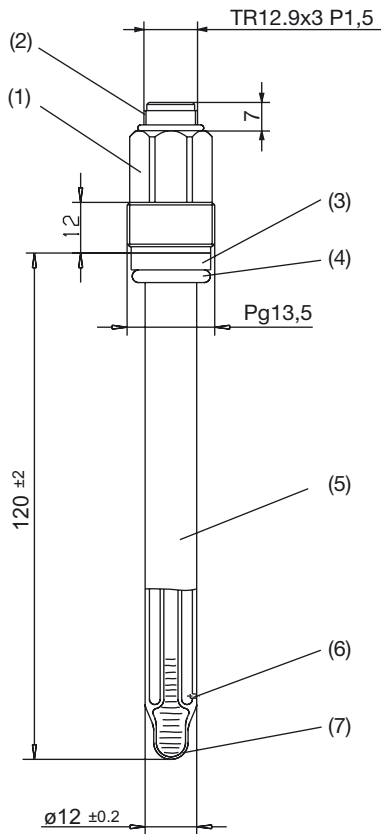
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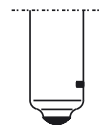
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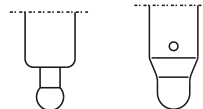
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**Dimensions**

SMEK screw cap
Pg 13.5



Platinum or gold tip
type 201025/xx



Annular-gap / perforated
diaphragm

Type 20102x/75

- (1) Pg 13.5 screw cap
- (2) TR12.9x3 P1.5 thread
- (3) Ring (PSU)
- (4) O-ring 10 x 3.5 (FPM70)
- (5) Electrode shaft (DIN19 263 glass)
- (6) 1 to 3 diaphragms
(zirconium dioxide ∅ 1 mm)
- (7) Rounded membrane

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JUMO tecLine pH / Rd pH / redox combination electrodes for high-temperature and sterilization applications

Order details

	(1) Basic type
	201020 pH combination electrode JUMO tecLine pH
	201025 redox combination electrode JUMO tecLine Rd
	(2) Basic type extension
x x	75 glass shaft, high-temperature gel, sealed, cartridge-style conduction system
	(3) Active component
	12 HT glass, pH 0 - 14, -5 to +135°C
	14 DS glass, pH 0 - 14, -5 to +80°C, can be sterilized for 20 minutes at 135°C
x	22 platinum tip, redox range ±2000mV, -5 to +135°C
o	32 gold tip, redox range ±2000mV, -5 to +135°C
	(4) Diaphragm
x x	07 1 x zirconium dioxide diaphragm (special ceramic)
o o	09 3 x zirconium dioxide diaphragm (special ceramic)
o o	10 annular-gap diaphragm, gel of polymerized solid electrolyte ("diaphragm-free") ¹
o o	11 perforated diaphragm, gel of polymerized solid electrolyte ("diaphragm-free") ¹
	(5) Connection
o	17 SMEK Pg 13.5 screw cap ¹
x x	22 Pg 13.5 screw cap
	(6) Fitting length
x x	120 120 mm (standard)
o o	225 225 mm
	other lengths on request
	(7) Extra codes
o o	000 none
x x	837 salt reserve ³
o	840 Pt 100 temperature probe ²
o	841 Pt 1000 temperature probe ²

x = as standard
 o = option

Order code	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Order example	201020	/ 75	- 12	- 07	- 22	- 120	/ 000

Note:

The type code is not a modular system.

If possible, choose items listed under "**stock versions**" or "**production versions**" for your orders.

We will have to technically inspect and approve a free combination of individual key features.

pH stock versions (delivery 3 working days after receipt of order)

Type	Brief description	Sales No.
201020/75-12-07-22-120/000	Glass shaft, gel-sealed, HT gel, zirconium dioxide diaphragm, Pg 13.5 screw cap, 120mm (high-temperature applications)	20/00304030

pH production versions (delivery 10 working days after receipt of order)

Type	Brief description	Sales No.
201020/75-12-11-17-120/837, 840	Glass shaft, gel-sealed, solid electrolyte, perforated diaphragm, SMEK Pg 13.5 screw cap, 120mm (high-temperature applications)	20/00449510

¹ For electrodes with extra code 840 or 841.

² With connection 17 only.

³ Only in conjunction with diaphragm 10 and 11.

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JUMO tecLine pH / Rd with liquid KCl filling, refillable

Typical areas of application

- Low-ion media with conductivity <100µS/cm (recommended)
- Ultra-pure water applications
- Electroplating processes, PCB production
- Fermenters
- Heavily polluted, adherent media
- Suspensions, varnishes
- Boiler feed water

Key features

- Can be combined with all JUMO membrane glasses
- Zirconium dioxide diaphragm
- Cartridge-style conduction system Refillable, KCl solution with no silver ions
- Temperature range: -10 to +135°C¹
- Redox versions with platinum or gold tip ±2000mV

Construction of an electrolyte bridge

In the case of pH and redox measurement, there are several disruptive factors that can reduce the accuracy or the service life of the measurement electrode. If the medium disrupts, pollutes or chemically attacks the measurement electrode, the only possible remedies are to use selected measurement electrodes, to treat the samples, or to use an electrolyte bridge.

Disruptive factors can include:

- Getting oiled-up, blocked-up Diaphragm is blocked because of precipitation or coating buildup, for example
- Poisoning Chemical reaction of reference system with medium
- Pressure fluctuations Medium penetrates the electrode

When using an electrolyte bridge, the reference electrode is removed from the medium and installed in a separate vessel somewhere safe. The use of an electrolyte bridge in tubing (flow-through) and in a container, is shown on the next page.

¹ Depending on the type of glass

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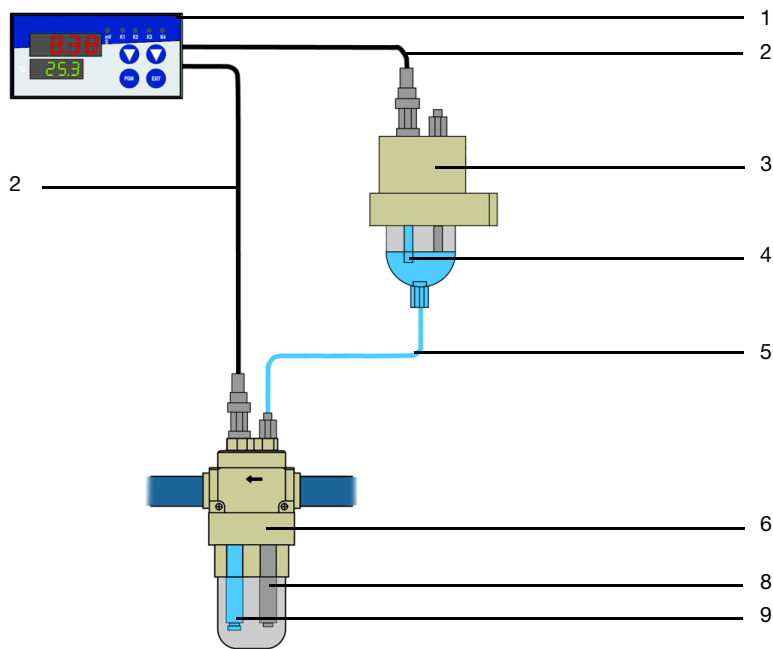
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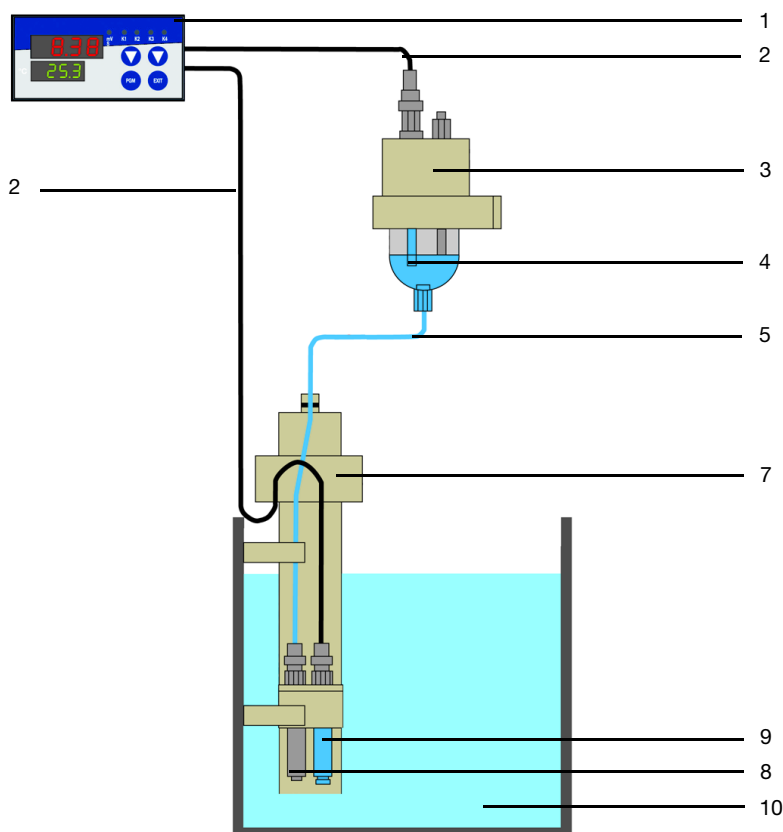


Construction of an electrolyte bridge

Flow-through example



Container example



- 1 pH transmitter
JUMO dTRANS pH 01,
e.g. 202530/10-888,000-23-00/000
- 2 Electrode connecting cable,
e.g. 2992-2(10)-0
- 3 KCl storage vessel,
e.g. item no. 20/00060254
- 4 Reference electrode,
e.g. 201082/89-04-07-22-120
- 5 Hose coupling
from diaphragm tube to KCl
storage vessel
- 6 Flow-through fitting,
e.g. 202810/03-104-87-80/000
- 7 Immersion fitting,
e.g. 202820/63-0500-87/000
- 8 Diaphragm tubing
- 9 pH glass electrode,
e.g. 201081/89-10-22-120
- 10 Tank/container

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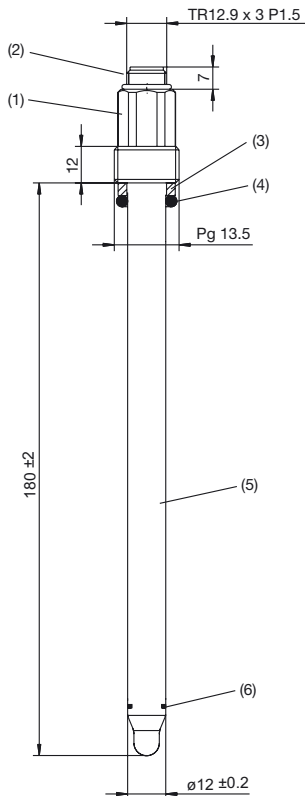
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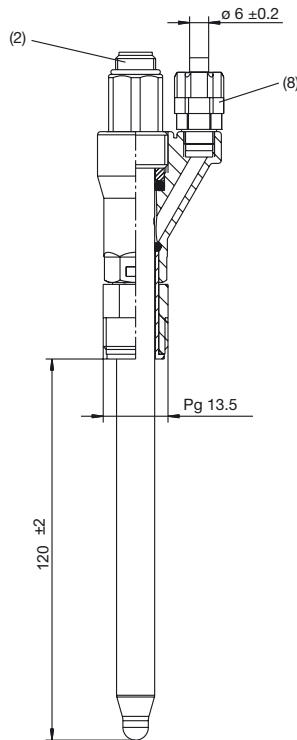
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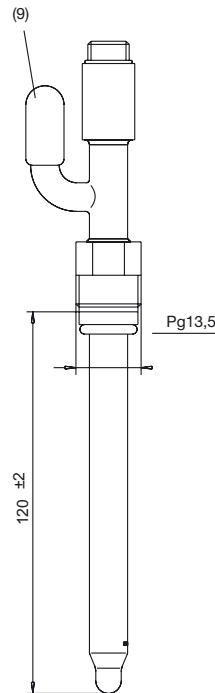
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**Dimensions**

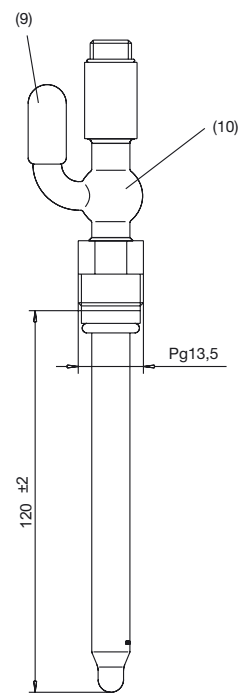
Electrode type 201020/76-...
Diaphragm 09
Fitting length 180



Electrode type 201020/76-...
Fitting length 180
Extra code 833



Electrode type 201020/76-...
Connection 20



Electrode type 201020/76-...
Connection 19



Type 201025/xx
Platinum or gold tip

Type 201020/xx

- (1) Pg 13.5 screw cap
- (2) TR12.9x3 P1.5 thread
- (3) Ring (PSU)
- (4) O-ring 10 x 3.5 (FPM70)
- (5) Electrode shaft (DIN 19 263 glass)
- (6) 1 to 3 diaphragms
- (7) Rounded membrane (universal glass 40 - 60 MΩ)
- (8) Connection for overpressure attachment
- (9) Hose olive
- (10) Spherical, extended shaft

Extra code 833 (KCl connection)

- Material: PPO (polyphenylene oxide)
Temperature range: 0 - 105°C, briefly +130°C
Pressure range: max. 10bar (25°C)

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JUMO tecLine pH / Rd pH / redox combination electrodes with liquid KCl filling, refillable

Order details

	(1) Basic type	
	201020	pH combination electrode JUMO tecLine pH
	201025	redox combination electrode JUMO tecLine Rd
	(2) Basic type extension	
x x	76	glass shaft, KCl liquid electrolyte, cartridge-style conduction system
	(3) Active component	
x	10	U glass, pH 0 - 12 (briefly 14), -5 to +80°C
o	11	C glass, pH 0 - 12, -5 to +50°C
o	12	HT glass, pH 0 - 14, 0 to 135°C (also for high-alkaline use)
o	14	DS glass, pH 0 - 12, 0 to 80°C (can be sterilized for 20 minutes at 135°C)
x	22	platinum tip, redox range ±2000mV, -5 to +90°C
o	32	gold tip, redox range ±2000mV, -5 to +90°C
	(4) Diaphragm	
x x	07	1 x zirconium dioxide diaphragm (special ceramic)
o o	09	3 x zirconium dioxide diaphragm (special ceramic)
	(5) Connection	
o o	19	hose olive, spherical extended shaft, Pg 13.5 threaded coupling cemented with putty
o o	20	hose olive and Pg 13.5 threaded coupling cemented with putty
x x	22	Pg 13.5 screw cap
	(6) Fitting length	
o o	120	120mm (standard)
x x	180	effective fitting length 120mm, but glass length 180mm ¹
	(7) Extra codes	
o o	000	none
x	833	Applicable for KCl connection ²

x = as standard
 o = option

	(1)	(2)	(3)	(4)	(5)	(6)	(7)						
Order code	<input type="text"/>	/	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	/	<input type="text"/>
Order example	201020	/	76	-	10	-	07	-	22	-	120	/	000

Note:

The type code is not a modular system.

If possible, choose items listed under "**stock versions**" or "**production versions**" for your orders.

We will have to technically inspect and approve a free combination of individual key features.

¹ Only in conjunction with extra code 833.

² Only in conjunction with fitting length 180.

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pH production versions (delivery 10 working days after receipt of order)

Type	Brief description	Sales No.
201020/76-10-09-22-180/833	Glass shaft, KCl liquid electrolyte, 3 x zirconium dioxide diaphragm, fitting length 180 mm	20/00373964
201020/76-12-07-20-120/000	Glass shaft, KCl liquid electrolyte, zirconium dioxide diaphragm, hose olive with Pg13.5 threaded coupling cemented with putty, 120mm	20/00300160

Redox production versions (delivery 10 working days after receipt of order)

Type	Brief description	Sales No.
201025/76-22-07-22-180/833	Glass shaft, KCl liquid electrolyte, 1 x zirconium dioxide diaphragm, fitting length 180 mm	20/00303849

Accessories

Type		Sales No.
KCl connection		20/00475617
KCl storage vessel, pressure-resistant, for wall mounting		20/00060254
For constructing an electrolyte bridge or when using electrodes filled with KCl. 3-molar KCl solution, 5 x 250ml pack unit (also see data sheet 201090)		20/00306215

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JUMO tecLine PRO pH / Rd pH and redox combination electrodes

201020 series - pH electrodes

201025 series - redox electrodes

(previous designation 2 GE-20-...)

General description

The electrodes of the 201020(25)/79 series are known for their high mechanical and chemical resistance. Thanks to their sturdy PVDF body, there is hardly any risk of the sensor breaking. The electrolyte of these combination electrodes guarantees a stable measurement value, even in critical media containing sulphides.

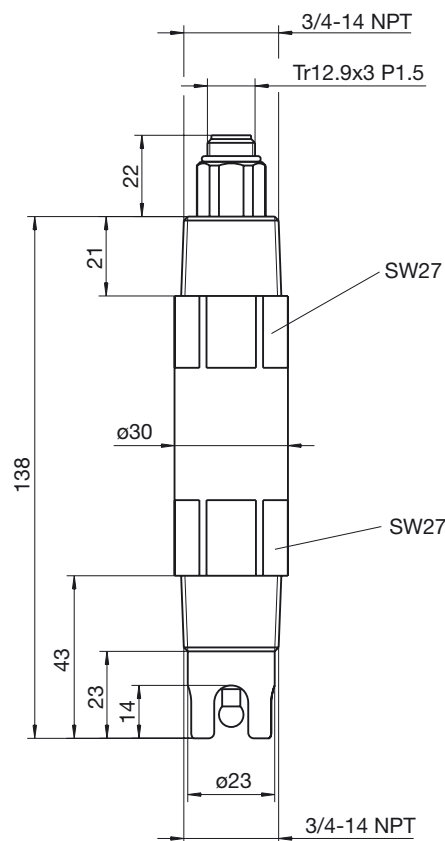
There is an integrated Pt 1000 temperature probe. The electrodes can be manufactured as pH or redox electrodes, subject to the application. An open annular-gap diaphragm is the type of diaphragm used.

Areas of operation

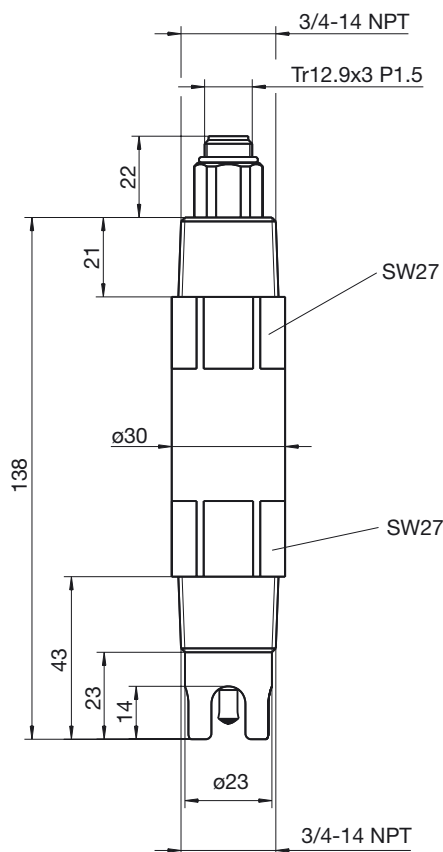
- Chemical industry
- Wastewater treatment
- Sewage treatment works
- Paper industry



Dimensions



Type 201020/xx



Type 201025/xx

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Order details

	(1) Basic type
	201020 JUMO tecLine PRO pH
	201025 JUMO tecLine PRO Redox
x x	(2) Basic type extension 79 process electrode
x	(3) Active component 10 U glass, -5 to +80°C; pH 0 - 12 (briefly pH 14)
o	12 C glass, 0 to 110°C; pH 0 - 14
x	22 platinum tip, 0 to 110°C; ±2000mV
o	32 gold tip, 0 to 110°C; ±2000mV
x x	(4) Diaphragm 10 annular-gap diaphragm; gel of polymerized solid electrolyte ("diaphragm-free")
o o	(5) Electrical connection 17 SMEK cap
x x	22 screw cap
x x	(6) Extra codes 837 salt reserve
o	841 integrated Pt 1000

x = as standard
 o = option

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Order code	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Order example	201020	/ 79	- 12	- 10	- 22	- 43	/ 841

Note:

The type code is not a modular system.
 If possible, choose items listed under "**stock versions**" or "**production versions**" for your orders.
 We will have to technically inspect and approve a free combination of individual key features.

pH production versions (delivery 10 working days after receipt of order)

Type	Brief description	Sales No.
201020/79-10-10-17/837, 841	SMEK cap, solid electrolyte, annular-gap diaphragm, salt reserve, Pt 1000, U glass	20/00468776
201020/79-10-10-22/837	Screw cap, solid electrolyte, annular-gap diaphragm, salt reserve, U glass	20/00468999
201020/79-12-10-17/837, 841	SMEK cap, solid electrolyte, annular-gap diaphragm, salt reserve, Pt 1000, HT glass	20/00470258
201020/79-12-10-22/837	Screw cap, solid electrolyte, annular-gap diaphragm, salt reserve, HT glass	20/00469853

Accessories

Type	Sales No.
SMEK connecting cable, 5 m, type 2994-10(5)-0	20/00347843
SMEK connecting cable, 10 m, type 2994-10(10)-0	20/00346442