

**JUMO GmbH & Co. KG**  
Delivery address: Mackenrodtstraße 14,  
36039 Fulda, Germany  
Postal address: 36035 Fulda, Germany  
Phone: +49 661 6003-0  
Fax: +49 661 6003-607  
e-mail: mail@jumo.net  
Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
JUMO House  
Temple Bank, Riverway  
Harlow, Essex CM 20 2TT, UK  
Phone: +44 1279 635533  
Fax: +44 1279 635262  
e-mail: sales@jumo.co.uk  
Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
8 Technology Boulevard  
Canastota, NY 13031, USA  
Phone: 315-697-JUMO  
1-800-554-JUMO  
Fax: 315-697-5867  
e-mail: info@jumo.us  
Internet: www.jumo.us



# pH and Redox Combination Electrodes

## JUMO tecLine pH

## JUMO tecLine Rd

with glass or plastic shaft

### 201020 Series - pH electrodes

(former type code: 2GE-2-...)

### 201025 Series - redox electrodes

(former type code: 2ME-2-...)

#### Brief description

JUMO tecLine electrodes are high-quality sensors for professional application in process and industrial measurement technology. The use of materials and components that meet the highest standards is the distinguishing feature of these electrodes. They are designed as combined electrodes (the glass or metal electrode and the reference electrode are combined in a single shaft). Depending on the type, a temperature probe can additionally be integrated (option). Suitable models are available for the most diverse requirements:

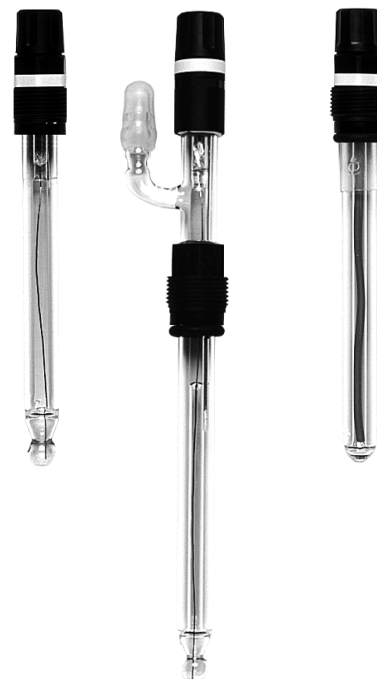
#### JUMO tecLine

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

JUMO tecLine sensors incorporate state-of-the-art technology for modern pH or redox electrodes. Each electrode is a quality product and individually tested. Modern production facilities ensure constant characteristics.

#### General notes on the construction of the JUMO tecLine series

All standard electrodes have been manufactured from physiologically safe, FDA-listed materials: glass, the noble metals platinum or gold, PSU plastic, O-rings from FPM; EPDM on request.



**Active elements of the pH or redox electrode**

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 highly alkaline media (above pH 12)
HT glass	high-temperature glass	pH 0 — 14	0 to +135°C	for temperatures above 80°C or with highly 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 fluoride (hydrofluoric acid) C(HF) up to 1000 mg/l
TT glass	low-temperature glass	pH 0 — 12	-30 to +30°C	cooling cycles, low-temperature applications
Platinum tip	redox measurement	+/- 2000 mV	-10 to +135°C	chromate reduction, nitrite oxidation, swimming pool and drinking water disinfection
Gold tip	redox measurement	+/- 2000 mV	-10 to +135°C	cyanide oxidation, water disinfection

**Constructional variations of the reference system (reference electrode)**

Only reference electrolytes that are free from silver ions are used for the JUMO tecLine electrodes. A cartridge-style conductive 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 <sup>1</sup> .	highly viscous KCl gel or liquid KCl	general water or wastewater engineering, industrial processes etc.
2 x ceramic diaphragm or 3 x ceramic diaphragm	as above but, due to increased number, more KCl escapes	highly viscous KCl gel or liquid KCl TT glass: low-temperature gel	for polluted or low-ion media; low-temperature applications
Glass fiber diaphragm	glass fiber bundle instead of ceramic diaphragm for electrodes with plastic shaft	highly viscous KCl gel	general water or wastewater engineering (slightly polluted media)
PTFE ring diaphragm	large-area ring diaphragm	highly viscous KCl gel	only with heavily polluted media or e.g. adherent media containing oil
Annular-gap or perforated diaphragm	open transition between solid electrolyte and medium implemented in annular or point form	polymerized solid electrolyte	suspensions, varnishes, media containing solids, heavily polluted media. Not suitable for very pure drinking water and low-ion media
Ground diaphragm	fixed or movable ground element. open transition between electrolyte and medium	liquid KCl	low-ion media (e.g. pure or high-purity water)
Doka types (2-chamber system)	longer diffusion path and double diaphragm separation prevents electrode poisoning	highly viscous gel KCl/KCl bridge	low-ion media (e.g. pure or high-purity water)
		KCl/KNO <sub>3</sub> bridge	in the presence of electrode poisons, cyanides
		solid electrolyte	in the presence of electrode poisons, sulfides

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

Data Sheet 20.1005 JUMO ecoLine pH / Rd

Data Sheet 20.2900 JUMO pH / Rd single sensors, diaphragm tubes, compensation thermometers, multitrode

<sup>1</sup> zirconium dioxide diaphragm: high-quality ceramic material of constant porosity. This means optimum diffusion properties.

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

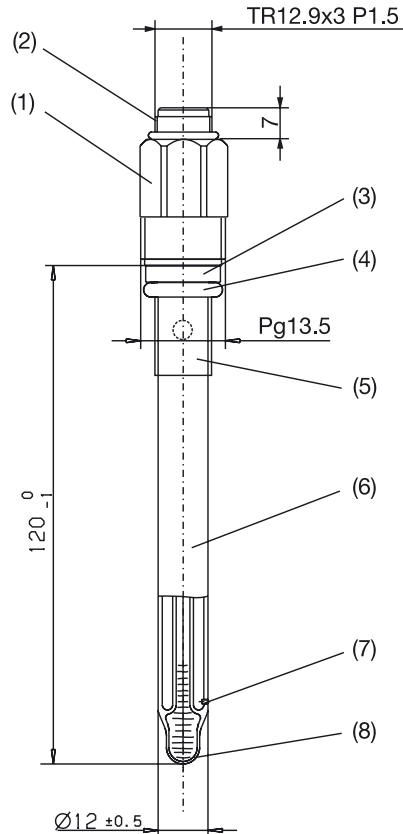
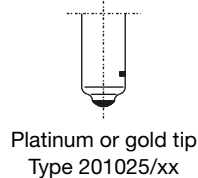
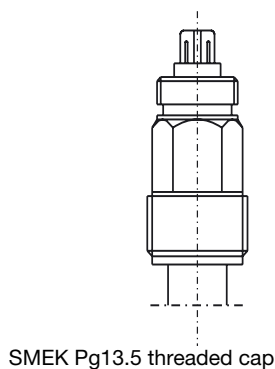
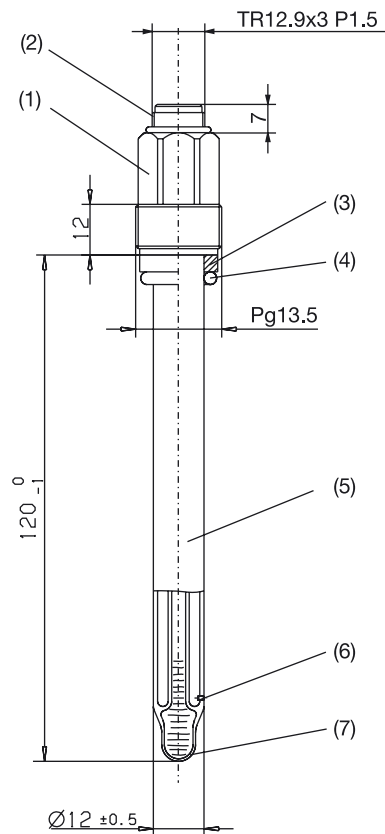
## Typical applications

- Industrial and municipal as well as general water and wastewater engineering
- Process measurements, electroplating plant, final checks, neutralization plant
- Drinking and well water, boiler feed water
- Mildly polluted wastewater
- 2-chamber system in the presence of electrode poisons (e.g. sulfides, cyanides, etc.)
- Low-temperature applications (-30 to +30°C), e.g. measurement in cooling plant
- Media containing fluoride (hydrofluoric acid) up to 1000mg/l HF
- High-alkaline applications (reduced alkaline error at pH values > pH 12)

## Key features

- High-quality zirconium dioxide diaphragm (glass fiber diaphragm for plastic shaft)
- Cartridge-style conductive system with reference electrolyte (free from silver ions)
- Pressure-resistant versions up to 10 bar (50°C)
- Temperature range: up to -5 to +80°C (+90°C with redox) or -30 to +30°C (with TT version)
- Temperature probes can optionally be integrated
- Optional salt reservoir for extending the operational life in media with low conductivity or in drinking water
- JUMO-HA glass for continuous measurement in the range up to pH 14
- Redox versions with platinum or gold tip up to +/-2000mV

## Dimensions

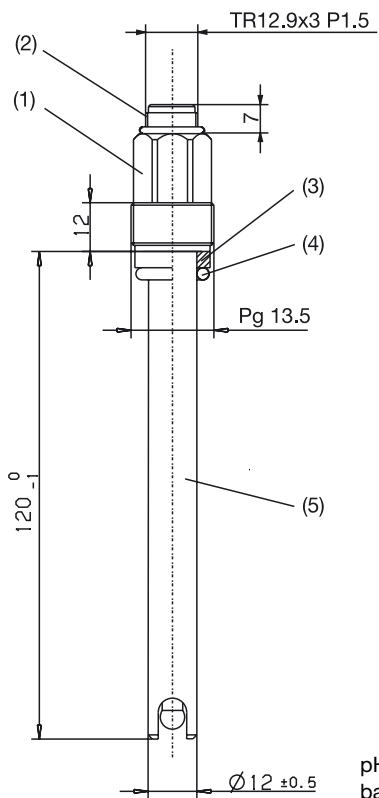


### Type 20102x/51

- (1) Pg13.5 threaded cap
- (2) TR12.9x 3 P1.5 thread
- (3) Ring (PSU)
- (4) O-ring 10 x 3.5 (FPM70)
- (5) Electrode shaft (glass DIN 19 263)
- (6) 1 to 3 diaphragm(s) (ceramic / zirconium dioxide 1 mm dia. )
- (7) Rounded membrane

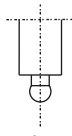
### Type 20102x/52

- (1) Pg13.5 threaded cap
- (2) TR12.9x 3 P1.5 thread
- (3) Ring (PSU)
- (4) O-ring 10 x 3.5 (FPM70)
- (5) Tubular seal
- (6) Electrode shaft (glass DIN 19 263)
- (7) Diaphragm (ceramic / zirconium dioxide 1 mm dia. )
- (8) Rounded membrane

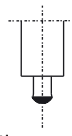


### Type 20102x/74

- (1) Pg13.5 threaded cap
- (2) TR12.9x 3 P1.5 thread
- (3) Ring (PSU)
- (4) O-ring 10 x 3.5 (FPM70)
- (5) Electrode shaft (PSU plastic)



pH, without protection  
basket



Platinum or gold tip  
Type 201025/74

## 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 conductive system
o	o	72 plastic shaft PEI with protection basket / gel-sealed / glass silk diaphragm / cartridge-style conductive system
o	o	73 PSU plastic shaft, no protection basket / gel-sealed / glass silk diaphragm / cartridge-style conductive system <sup>1</sup>
o	o	74 PSU plastic shaft with protection basket / gel-sealed / glass silk diaphragm / cartridge-style conductive system <sup>1</sup>
		(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
o	-	13 TT glass / pH 0 — 12 / -30 to +30°C / low-temperature <sup>2</sup>
o	-	17 HA glass / pH 0 — 14 / -5 to +80°C / high-alkaline application
-	x	22 platinum tip / redox range +/-2000 mV / -5 to +90°C
-	o	32 gold tip / redox range +/-2000 mV / -5 to +90°C
		(4) Diaphragm
o	o	05 1 x glass silk diaphragm <sup>3</sup>
x	x	07 1 x zirconium dioxide diaphragm (special ceramic)
o	o	08 2 x zirconium dioxide diaphragm (special ceramic)
o	o	09 3 x zirconium dioxide diaphragm (special ceramic)
		(5) Connection
o	-	17 SMEK Pg13.5 threaded cap <sup>4</sup>
x	x	22 Pg 13.5 threaded cap (S8 / SN6)
		(6) Fitting length
x	x	120 fitting length 120 mm (standard)
o	o	225 fitting length 225 mm
		(7) Extra codes
o	o	000 none
x	x	837 salt reservoir
o	o	838 2-chamber system (DOKA) with KCl/KCl bridge <sup>5</sup>
o	o	839 2-chamber system (DOKA) with KCl/KNO <sub>3</sub> bridge <sup>5, 6</sup>
o	-	840 with Pt100 temperature probe <sup>5</sup>
o	-	841 with Pt1000 temperature probe <sup>5</sup>

<sup>1</sup> available in fitting length 225 only

<sup>2</sup> only in conjunction with diaphragm 09

<sup>3</sup> only with basic type extension 73 or 74

<sup>4</sup> for electrodes with extra code 840 or 841

<sup>5</sup> not in conjunction with active component 17

<sup>6</sup> not in conjunction with active component 11, 13 or 17

X = combination is standard

o = combination is optional

- = combination cannot be supplied

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

### Note:

Versions 20102x/51 or /52 are identical for application purposes.

Version /52, features a silicone tubular seal below the electrode head on the glass shaft, which increases the shaft diameter to about 14mm.

The version without tubing should be given preference.

## Stock items for pH

Sales No.	Type	Brief description
20/00300151	201020/51-10-07-21-120/837 (2GE-2-GV-U-1)	gel-sealed, zirconium dioxide diaphragm, threaded cap (S8), 120 mm, salt reservoir
20/00300148	201020/51-10-07-22-120/000 (2GE-2-GV-U-1)	gel-sealed, zirconium dioxide diaphragm, threaded cap (S8), 120 mm,
20/00351265	201020/52-10-07-17-120/837, 840 (2GE-9-GV-U-1)	gel-sealed, zirconium dioxide diaphragm, SMEK threaded cap, 120 mm, salt reservoir, integrated Pt100
20/00382270	201020/51-10-07-17-120/840 (2GE-9-GV-U-1)	gel-sealed, zirconium dioxide diaphragm, SMEK threaded cap (S8), 120 mm, integrated Pt100
20/00408953	201020/51-17-07-22-120/837 (2GE-2-GV-HA-1)	gel-sealed, zirconium dioxide diaphragm, threaded cap (S8), 120 mm (highly alkaline applications)
20/00354295	201020/74-10-05-22-225/000 (2GEP-2-GV-U-S)	plastic shaft PSU with protection basket, gel-sealed, glass silk diaphragm, threaded cap (S8), 225 mm
20/00330857	201020/73-10-05-22-225/000 (2GEP-2-GV-U-O)	plastic shaft PSU, no protection basket, gel-sealed, glass silk diaphragm, threaded cap (S8), 225 mm
20/00303398	201020/72-10-05-22-120/837, 838 (2GEP-2-GV-Doka-U-S)	plastic shaft PEI with protection basket, gel-sealed, glass silk diaphragm, threaded cap (S8), 120 mm, salt reservoir, 2-chamber system

## Non-stock items for pH

Sales No.	Type	Brief description
20/00399535	201020/51-10-07-22-225/000 (2GE-2-GV-U-1)	gel-sealed, zirconium dioxide diaphragm, threaded cap (S8), 225 mm,
20/00375623	201020/51-11-07-22-120/000 (2GE-2-GV-C-1)	gel-sealed, zirconium dioxide diaphragm, threaded cap (S8), 120 mm
20/00387720	201020/52-13-09-22-120/000 (2GE-2-GV-TT-3)	gel-sealed, 3 x diaphragm, threaded cap (S8), 120mm, no salt reservoir
20/003364282	201020/72-10-05-17-120/840 (2GE-9-GV-TT-3)	gel-sealed, 3 x diaphragm, SMEK threaded cap (S8), 120mm, integrated Pt100

## Stock items for redox

Sales No.	Type	Brief description
20/00300397	201025/52-22-07-22-120/837 (2ME-2-GV-PtK-1)	gel-sealed, platinum tip, zirconium dioxide diaphragm, threaded cap (S8), 120 mm, salt reservoir
20/00300396	201025/52-32-07-22-120/837 (2ME-2-GV-AuK-1)	gel-sealed, gold tip, zirconium dioxide diaphragm, threaded cap (S8), 120 mm, salt reservoir
20/00084011	201025/74-22-07-22-120/837, 838 (2MEP-2-GV-Doka-PtK-0)	gel-sealed, platinum tip, zirconium dioxide diaphragm, threaded cap (S8), 120 mm, salt reservoir, 2-chamber version

**Note:** Former type code in brackets

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

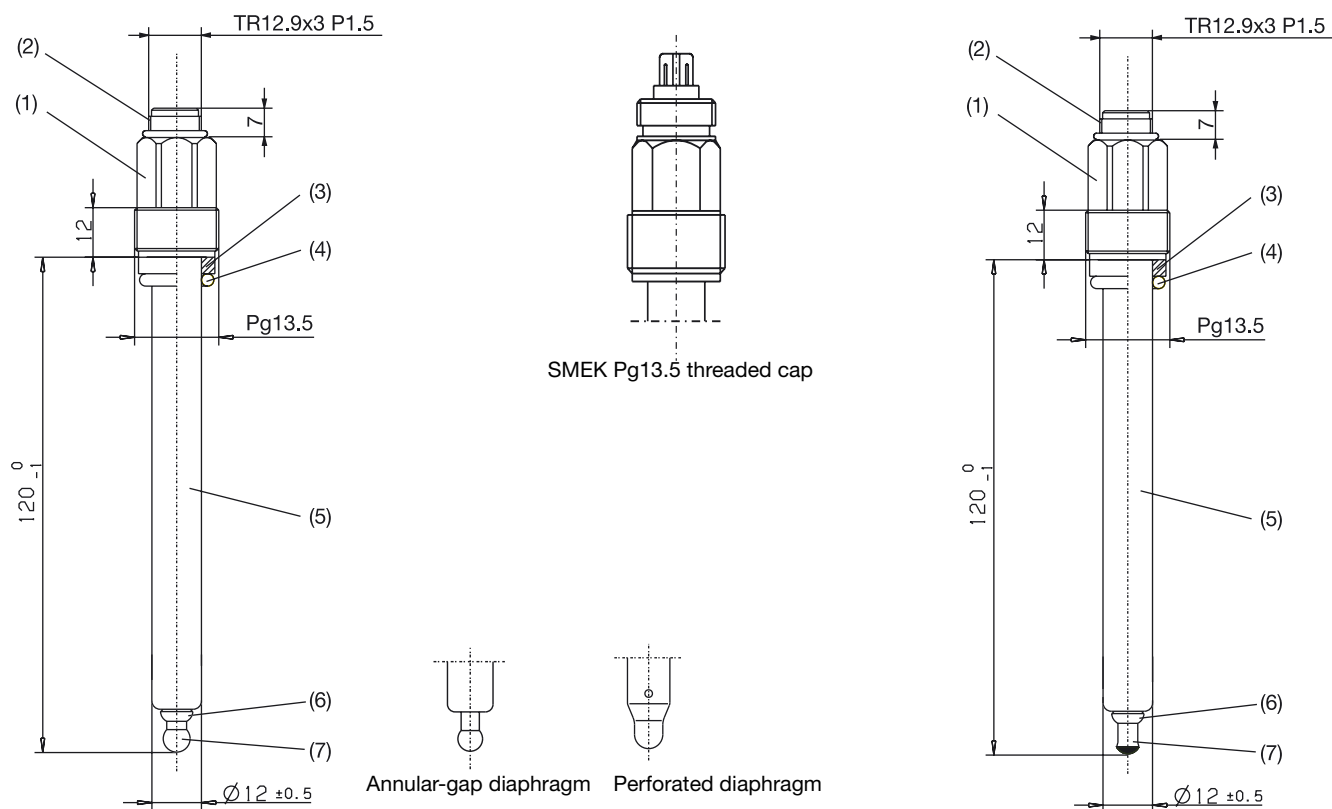
## Typical applications

- Industrial wastewater engineering
- Process measurements, electroplating plant, paper industry, drinks industry
- Wastewater containing oil
- Suspensions, varnishes, media containing solid particles
- 2-chamber system in the presence of electrode poisons
- Media containing fluoride (hydrofluoric acid) up to 1000mg/l HF

## Key features

- Dirt-repellent PTFE ring diaphragm with highly viscous KCl solution (gel) or perforated or annular-gap diaphragm with polymerized solid electrolyte - effectively blockage-free
- Cartridge-style conductive system with reference electrolyte (free from silver ions)
- Pressure-resistant versions up to 10 bar (50°C)
- Temperature range: see order details
- Temperature probes can optionally be integrated
- Optional salt reservoir for extending the operational life in low-conductivity media

## Dimensions



### Type 201020/51

- (1) Pg13.5 threaded cap
- (2) TR12.9x3 P1.5 thread
- (3) Ring (PSU)
- (4) O-ring 10 x 3.5 (FPM70)
- (5) Electrode shaft (glass DIN 19 263)
- (6) Ring diaphragm (PTFE)
- (7) Rounded membrane

### Type 201025/51

- (1) Pg13.5 threaded cap
- (2) TR12.9x3 P1.5 thread
- (3) Ring (PSU)
- (4) O-ring 10 x 3.5 (FPM70)
- (5) Electrode shaft (glass DIN 19 263)
- (6) Ring diaphragm (PTFE)
- (7) Platinum or gold tip



## Order details

		<b>(1) Basic type</b>	
		201020	pH combination electrode JUMO tecLine pH
		201025	redox combination electrode JUMO tecLine Rd
		<b>(2) Basic type extension</b>	
x	x	51	glass shaft / gel-sealed / cartridge-style conductive system
		<b>(3) Active component</b>	
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
o	-	13	TT glass / pH 0 — 12 / -30 to +30°C
o	-	17	HA glass / pH 0 — 14 / -5 to +80°C / high-alkaline application
-	x	22	platinum tip / redox range +/-2000 mV / -5 to +90°C
-	o	32	gold tip / redox range +/-2000 mV / -5 to +90°C
		<b>(4) Diaphragm</b>	
x	x	04	PTFE ring diaphragm
o	o	10	annular-gap diaphragm / gel from polymerized solid electrolyte ("no diaphragm") <sup>1</sup>
o	o	11	perforated diaphragm / gel from polymerized solid electrolyte ("no diaphragm") <sup>1</sup>
		<b>(5) Connection</b>	
o	-	17	SMEK Pg13.5 threaded cap <sup>2</sup>
x	x	22	Pg 13.5 threaded cap (S8 / SN6)
		<b>(6) Fitting length</b>	
x	x	120	fitting length 120 mm (standard)
o	o	225	fitting length 225 mm <sup>3</sup>
		<b>(7) Extra codes</b>	
o	o	000	none
x	x	837	salt reservoir <sup>3</sup>
o	o	838	2-chamber system (DOKA) with KCl/KCl bridge <sup>3, 4</sup>
o	o	839	2-chamber system (DOKA) with KCl/KNO <sub>3</sub> bridge <sup>3, 5</sup>
o	-	840	with Pt100 temperature probe <sup>6</sup>
o	-	841	with Pt1000 temperature probe <sup>6</sup>
o	-	842	flat membrane

<sup>1</sup> not in conjunction with connection 17

<sup>2</sup> for electrodes with extra code 840 or 841

<sup>3</sup> not in conjunction with diaphragm 10 or 11

<sup>4</sup> not in conjunction with active component 17

<sup>5</sup> not in conjunction with active component 11, 13 or 17

<sup>6</sup> only with connection 17

X = combination is standard

o = combination is optional

- = combination cannot be supplied

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(7)
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Order example	201020	/ 51	- 10	- 04	- 22	- 120	/ 837	. <input type="text"/>

### Note

Versions 20102x/51 or /52 are identical for application purposes.

Version /52 features a silicone tubular seal below the electrode head on the glass shaft, which increases the shaft diameter to about 14mm.

The version without tubing should be given preference.

## Stock items for pH

Sales No.	Type	Brief description
20/00327907	201020/51-10-04-22-120/000 (2GE-2-GV-U-T)	gel-sealed, PTFE diaphragm, threaded cap (S8), 120 mm,
20/00321035	201020/51-10-04-22-120/837 (2GE-2-GV-U-T)	gel-sealed, PTFE diaphragm, threaded cap (S8), 120 mm, salt reservoir
20/00327142	201020/51-10-04-22-225/837 (2GE-2-GV-U-T)	gel-sealed, PTFE diaphragm, threaded cap (S8), 225 mm, salt reservoir
20/00332794	201020/51-17-04-22-120/837 (2GE-2-GV-HA-T)	gel-sealed, PTFE diaphragm, threaded cap (S8), 120 mm (highly alkaline applications)
20/00364282	201020/72-10-05-17-120/840 (2GEP-9-GV-U-S)	plastic shaft PEI with protection basket, gel-sealed, glass silk diaphragm, SMEK threaded cap, 120 mm, integrated Pt100

## Non-stock items for pH

Sales No.	Type	Brief description
20/00383865	201020/51-10-04-17-120/840 (2GE-9-GV-U-T)	gel-sealed, PTFE diaphragm, SMEK threaded cap, 120 mm, integrated Pt100
20/00372505	201020/51-10-04-22-225/000 (2GE-2-GV-U-T)	gel-sealed, PTFE diaphragm, threaded cap (S8), 225 mm
20/00446112	201020/51-10-10-22-120/837 (2GE-2-GV-U-R)	gel-sealed, annular-gap diaphragm and solid electrolyte, threaded cap (S8), 120 mm, salt reservoir
20/00460412	201020/51-10-04-22-120/837, 842 (2GE-2-GV-U-T)	gel-sealed, PTFE diaphragm, threaded cap, 120 mm, salt reservoir, flat membrane
20/00410112	201020/51-11-04-17-120/840 (2GE-9-GV-C-T)	gel-sealed, PTFE diaphragm, SMEK threaded cap, 120 mm, integrated Pt100
20/00376194	201020/51-11-04-22-120/000 (2GE-2-GV-C-T)	gel-sealed, PTFE diaphragm, threaded cap (S8), 120 mm
20/00419366	201020/51-13-04-22-120/837 (2GE-2-GV-TT-T)	gel-sealed, PTFE diaphragm, threaded cap (S8), 120mm, with salt reservoir

## Stock items for redox

Sales No.	Type	Brief description
20/00321746	201025/52-22-04-22-120/837 (2ME-2-GV-PtK-T)	gel-sealed, platinum tip, PTFE diaphragm, threaded cap (S8), 120 mm, salt reservoir

**Note:** Former type code in brackets

# JUMO tecLine pH / Rd

## for high-temperature and sterilization applications

### Typical applications

- Processes with permanently elevated temperatures (up to 135°C max.)
- Sterilization applications
- 2-chamber system in the presence of electrode poisons
- Media containing fluoride (hydrofluoric acid) up to 1000mg/l HF

### Key features

- Proven JUMO HT glass (pH high-temperature membrane glass) 0 — 14 pH
- JUMO DS membrane glass for sterilization applications
- Cartridge-style conductive system with reference electrolyte (gel) free from silver ions
- Pressure-resistant versions up to 10 bar (50°C)
- Temperature range: 0 to 135°C <sup>1</sup>
- Temperature probes can optionally be integrated
- Redox versions with platinum or gold tip up to +/-2000 mV

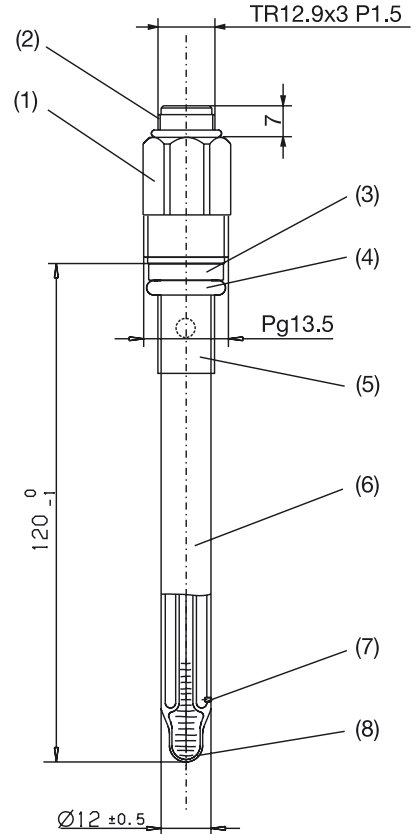
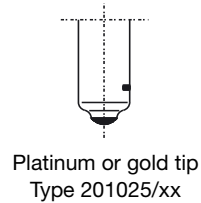
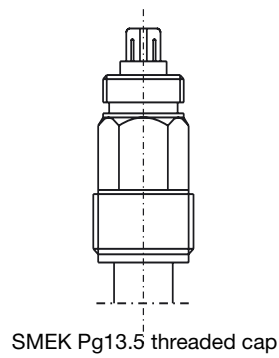
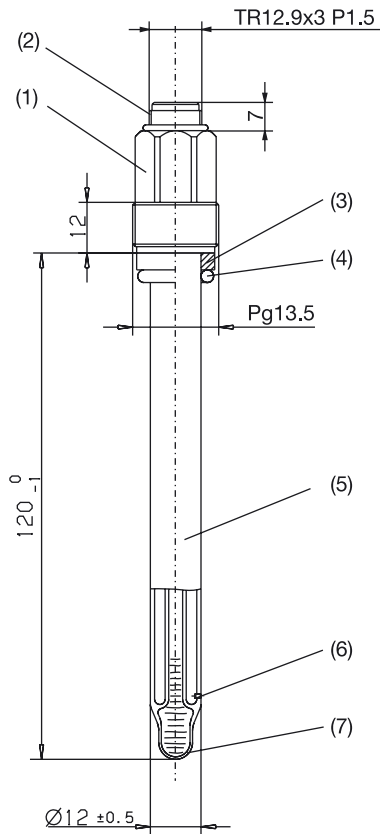
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<sup>1</sup> Sterilizable version:

Sterilization at 135°C max. for up to 20 minutes.

Continuous electrode operation after sterilization up to 80°C max.

## Dimensions



### Type 20102x/51

- (1) Pg13.5 threaded cap
- (2) TR12.9x3 P1.5 thread
- (3) Ring (PSU)
- (4) O-ring 10 x 3.5 (FPM70)
- (5) Electrode shaft (glass DIN 19 263)
- (6) 1 to 3 diaphragm(s) (ceramic / zirconium dioxide 1 mm dia. )
- (7) Rounded membrane

### Type 20102x/52

- (1) Pg13.5 threaded cap
- (2) TR12.9x3 P1.5 thread
- (3) Ring (PSU)
- (4) O-ring 10 x 3.5 (FPM70)
- (5) Tubular seal
- (6) Electrode shaft (glass DIN 19 263)
- (7) Diaphragm (ceramic / zirconium dioxide 1 mm dia. )
- (8) Rounded membrane

## Order details

<b>(1) Basic type</b>		
	201020	pH combination electrode JUMO tecLine pH
	201025	redox combination electrode JUMO tecLine Rd
<b>(2) Basic type extension</b>		
x	x	75 glass shaft / HT gel (high-temperature) / sealed / cartridge-style conductive system
<b>(3) Active component</b>		
x	-	12 HT glass / pH 0 — 14 / -5 to +135°C
o	-	14 DS glass / pH 0 — 14 / -5 to +80°C / can be sterilized for 20 min at 135°C
-	x	22 platinum tip / redox range +/-2000 mV / -5 to +135°C
-	o	32 gold tip / redox range +/-2000 mV / -5 to +135°C
<b>(4) Diaphragm</b>		
x	x	07 1 x zirconium dioxide diaphragm (special ceramic)
o	o	08 2 x zirconium dioxide diaphragm (special ceramic)
o	o	09 3 x zirconium dioxide diaphragm (special ceramic)
<b>(5) Connection</b>		
o	-	17 SMEK Pg13.5 threaded cap <sup>1</sup>
x	x	22 Pg 13.5 threaded cap (S8 / SN6)
<b>(6) Fitting length</b>		
x	x	120 fitting length 120 mm (standard)
o	o	225 fitting length 225 mm
<b>(7) Extra codes</b>		
o	o	000 none
o	-	840 with Pt100 temperature probe <sup>2</sup>
o	-	841 with Pt1000 temperature probe <sup>2</sup>

<sup>1</sup> for electrodes with extra code 840 or 841

<sup>2</sup> only with connection 17

Other versions on request!

X = combination is standard

o = combination is optional

- = combination cannot be supplied

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(7)
<b>Order code</b>	<input type="text"/>	/ <input type="text"/>	- <input type="text"/>	- <input type="text"/>	- <input type="text"/>	- <input type="text"/>	/ <input type="text"/>	. <input type="text"/>
<b>Order example</b>	201020	/ 75	- 12	- 07	- 22	- 120	/ 000	. <input type="text"/>

## Stock items for pH

Sales No.	Type	Brief description
20/00304030	201020/75-12-07-22-120/000 (2GE-2-GHV-HT-1)	gel-sealed, HT gel, zirconium dioxide diaphragm, threaded cap (S8), 120 mm (high-temperature applications)

## Non-stock items for pH

Sales No.	Type	Brief description
20/00410027	201020/75-14-07-17-120/840 (2GE-9-GHV-DS-1)	gel-sealed, HT gel, zirconium dioxide diaphragm, SMEK threaded cap, 120 mm (for sterilization processes)
20/00430366	201020/75-14-07-22-120/000 (2GE-2-GHV-DS-1)	gel-sealed, HT gel, zirconium dioxide diaphragm, threaded cap (S8), 120 mm (for sterilization processes)

# JUMO tecLine pH / Rd with liquid KCl filling, refillable

## Typical applications

- Low-ion media (including high-purity water)
- Electroplating processes, PCB production
- Fermenters
- Heavily polluted, adherent media
- Suspensions, varnishes
- Boiler feed water

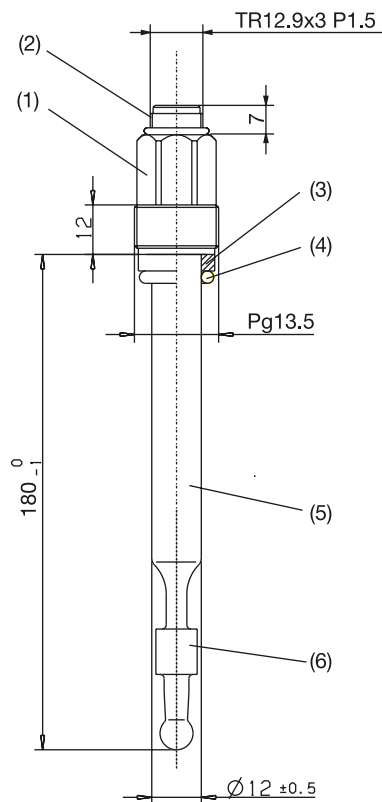
## Key features

- Can be combined with all JUMO membrane glasses
- Zirconium dioxide diaphragm or ground diaphragm
- Cartridge-style conductive system. Refillable KCl solution (free from silver ions)
- Temperature range: up to -10 to +135°C <sup>1</sup>
- Redox versions with platinum or gold tip up to +/-2000mV
- Versions with a spherically enlarged shaft as an additional KCl reservoir
- Tube connection implemented as a glass nipple or with a re-usable plastic pressure head

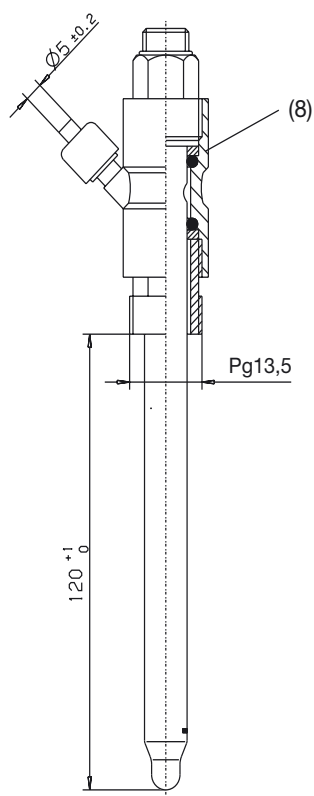
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<sup>1</sup> Depending on the type of glass

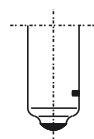
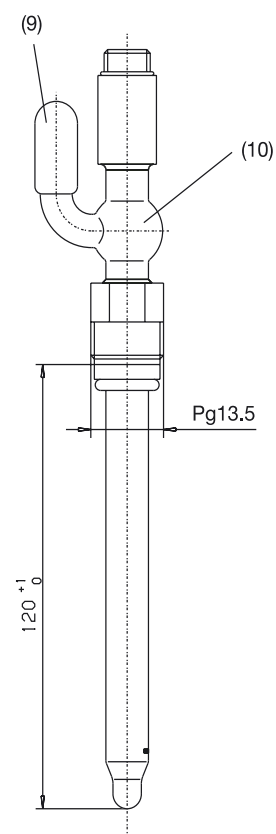
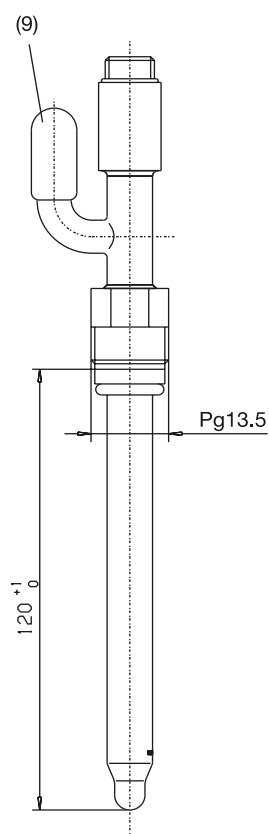
## Dimensions



Electrode prepared  
for pressure head



Electrode with  
pressure head



Platinum or gold tip  
Type 201025/xx

### Type 201020/xx

- (1) Pg13.5 threaded cap
- (2) TR12.9x3 P1.5 thread
- (3) Ring (PSU)
- (4) O-ring 10 x 3.5 (FPM70)
- (5) Electrode shaft (glass DIN 19 263)
- (6) 1 to 3 diaphragm(s) (ceramic / zirconium dioxide 1 mm dia. )
- (7) Rounded membrane (universal glass 40 — 60 MΩ)
- (8) Pressure head
- (9) Tube nipple
- (10) Spherically enlarged shaft

## Order details

		<b>(1) Basic type</b>	
		201020	pH combination electrode JUMO tecLine pH
		201025	redox combination electrode JUMO tecLine Rd
		<b>(2) Basic type extension</b>	
x	x	76	glass shaft / KCl liquid electrolyte / cartridge-style conductive system
		<b>(3) Active component</b>	
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 highly alkaline applications)
o	-	14	DS glass / pH 0 – 12 / 0 to +80°C (up to 135°C for 20 minutes max.)
-	x	22	platinum tip / redox range +/-2000 mV / -5 to +90°C
-	o	32	gold tip / redox range +/-2000 mV / -5 to +90°C
		<b>(4) Diaphragm</b>	
x	x	07	1 x zirconium dioxide diaphragm (special ceramic)
o	o	08	2 x zirconium dioxide diaphragm (special ceramic)
o	o	09	3 x zirconium dioxide diaphragm (special ceramic)
o	-	13	ground diaphragm (movable)
		<b>(5) Connection</b>	
x	x	19	tube nipple, spherically enlarged shaft and Pg 13.5 thread (S8 / SN6) cemented on
x	x	20	tube nipple and Pg 13.5 thread (S8 / SN6) cemented on
x	x	22	Pg 13.5 threaded cap (S8 / SN6)
		<b>(6) Fitting length</b>	
x	x	120	fitting length 120 mm (standard)
o	o	180	effective fitting length 120 mm, but glass length 180 mm for use with pressure head (extra code 833)
o	o	225	fitting length 225 mm
		<b>(7) Extra codes</b>	
o	o	000	none
o	-	833	prepared for pressure head (select fitting length 180 mm)

Other versions on request!

X = combination is standard

o = combination is optional

- = combination cannot be supplied

<b>Order code</b>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(7)
<b>Order example</b>	201020	/	76	-	10	-	07	-

## Non-stock items for pH

Sales No.	Type	Brief description
20/00373781	201020/76-10-13-22-180/833 (2GE-2-D-KCl-U-Schliff)	KCl liquid electrolyte, ground diaphragm, threaded cap (S8), 180 mm, for use with pressure head

**Note:** Former type code in brackets

## Accessories

Sales No.	Type
20/00390360	pressure head
20/00060254	KCl reservoir, pressure-resistant, for wall mounting. For setting up an electrolyte bridge or when using KCl-filled electrodes.
20/00306215	250 ml 3-molar KCl solution, packed in units of 5 (see also Data Sheet 20.2900)