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pH and Redox Combination Electrodes JUMO labLine pH JUMO labLine Rd

with glass or plastic shaft

201030 Series - pH electrodes

(former type code 2GE-1-...)

201035 Series - redox electrodes

(former type code 2ME-1-...)

Type 201030/51-xx-07-40-...

Type 201035/51-xx-07-21-...

Brief description

JUMO labLine electrodes are high-quality sensors for pH and redox potential (ORP) measurements in the laboratory. The sensors can be supplied with either a glass shaft or a sturdy plastic shaft.
JUMO labLine electrodes are suitable for all measurements in liquid media. They offer a high degree of measurement accuracy and reliability for all applications.

A special electrode is available for the ion-selective measurement of ammonia, see page 11.

Suitable models are available for the most diverse requirements:

Active component for pH: There is a choice of different membrane glasses for the pH versions.

Active component for redox: A sturdy platinum or gold tip can be supplied.

Reference system: The tried and tested JUMO silver/silver chloride conductive system (Ag/AgCl) and the acrylamide-free KCl gel together constitute the reference system. The conductive system is designed in cartridge style. As a result, the reference electrolyte remains free from sliver ions over the entire life span of the sensor, which makes it less susceptible to electrode poisons.

Diaphragm: In the standard version, JUMO labLine electrodes feature a sturdy ceramic diaphragm in zirconium dioxide. On the models with a plastic shaft, a glass fiber diaphragm forms the connection between the substance being measured and the reference system. PTFE and ground diaphragms are available for special applications.

Electrical connection: The electrical connection of the sensors is made through:

- S6 plug cap
- plug cap with attached cable
- SMEK plug cap for electrodes with integrated temperature probe

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

General notes on the JUMO labLine sensors

All standard electrodes are manufactured from physiologically harmless, FDA-listed materials.

Area of application

- surface measurements on paper and textiles
- insertion measurements in food
- pharmaceutical and cosmetic applications
- measurements in small sample volumes
- measurements in low-ion media

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	General liquid media
HA glass	high-alkaline glass	pH 0 — 14	-5 to +80°C	for highly alkaline media (above pH 12)
C glass	fluoride-resistant glass	pH 0 — 11	-5 to +50°C	media containing fluoride (hydrofluoric acid) media c(HF) up to 1000 mg/l
Platinum tip	redox measurement	+/- 2000 mV	-10 to +135°C	general redox measurements
Gold tip	redox measurement	+/- 2000 mV	-10 to +135°C	highly oxidizing redox applications

Constructional variations of the reference system (reference electrode)

Only reference electrolytes that are free from silver ions are used for the JUMO labLine 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[1].	highly viscous KCl gel or liquid KCl	general liquid media
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 with 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 liquid 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_3 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:

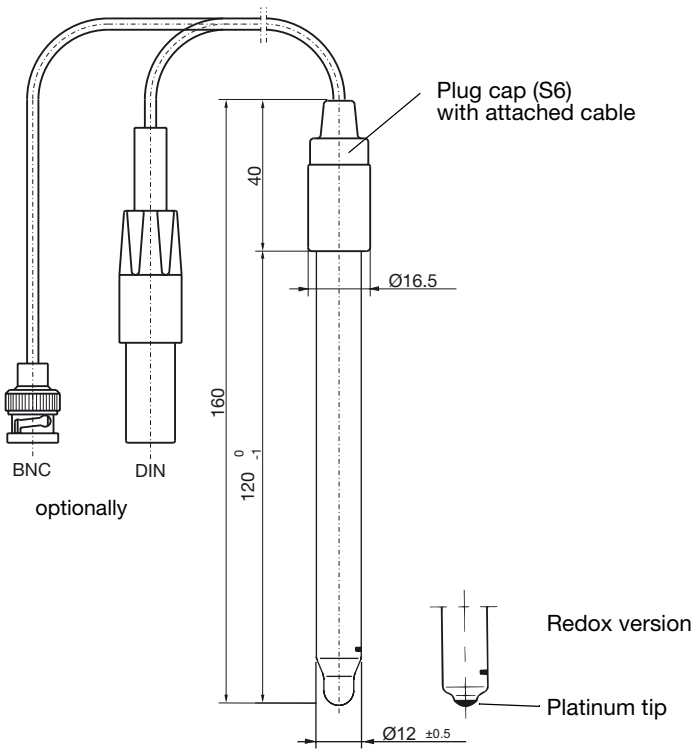
data sheet 20.1005 JUMO ecoLine pH / Rd
data sheet 20.1080 JUMO pH / Rd single sensors, diaphragm tubes, compensation thermometers, multitrode
1 zirconium dioxide diaphragm: high-quality ceramic material of constant porosity. This means optimum diffusion properties.

JUMO labLine pH / Rd with glass or plastic shaft PEI / PSU

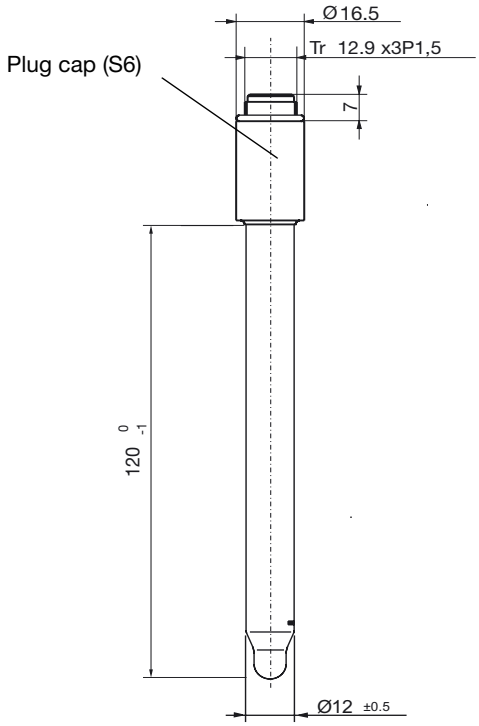
Key features

- High-quality zirconium dioxide diaphragm; glass fiber diaphragm for plastic shaft
- Cartridge-style conductive system with reference electrolyte (free from silver ions)
- pH range: 0 — 12 pH, briefly up to 14 pH
- Temperature range: up to -5 to +80°C
- Temperature probes can optionally be integrated
- Optional salt reservoir for extending the operational life in low-conductivity media
- Redox versions with platinum or gold tip up to +/-2000 mV

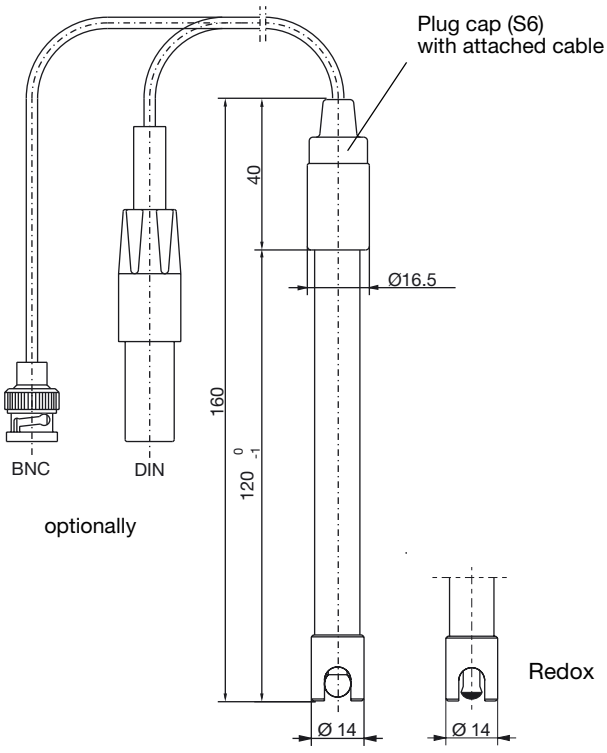
Dimensions



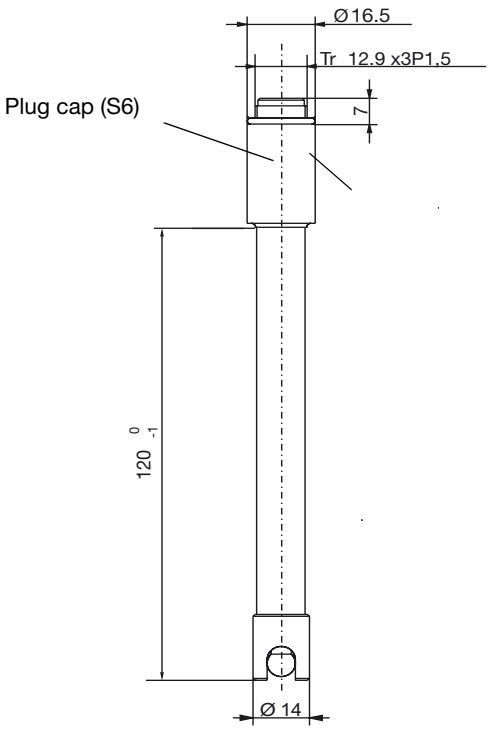
Type 201030/51-10-07-40-xxxx-76-120/000(pH)
Type 201030/51-10-07-40-xxxx-78-120/000(pH)
Type 201035/51-22-07-40-xxxx-76-120/000(redox)
Type 201035/51-22-07-40-xxxx-78-120/000(redox)



Type 201030/51-10-07-21-0000-00-120/000(pH)
Type 201035/51-22-07-21-0000-00-120/000(redox)



Type 201030/53-10-05-40-xxxx-76-120/000(pH)
Type 201030/53-10-05-40-xxxx-78-120/000(pH)
Type 201035/53-22-05-40-xxxx-76-120/000(redox)
Type 201035/53-22-05-40-xxxx-78-120/000(redox)



Type 201030/53-10-05-21-0000-00-120/000(pH)
Type 201035/53-22-05-21-0000-00-120/000(redox)

Order details

			(1)	**Basic type**
		201030		pH combination electrode JUMO labLine pH
		201035		redox combination electrode JUMO labLine Rd
			(2)	**Basic type extensions**
x	x	51		glass shaft / gel-sealed / cartridge-style conductive system
o	o	53		plastic shaft PEI / gel-sealed / cartridge-style conductive system
			(3)	**Active component**
x		10		U glass / pH 0 — 12 (briefly 14) / -5 to +80°C
x		11		C glass / pH 0 — 11 / -5 to +50°C
o		17		HA glass / pH 0 — 14 / -5 to +80°C
	x	22		platinum tip / +/- 2000 mV
			(4)	**Diaphragm**
o	o	04		PTFE diaphragm[1]
o	o	05		1 x glass silk diaphragm[2]
x	x	07		1 x zirconium dioxide diaphragm (special ceramic)[1]
			(5)	**Connection**
x	x	21		plug cap (S6)
o	o	40		plug cap (S6) with attached cable
			(6)	**Cable length**
x	x	0000		no attached cable
o	o	xxxx		length in mm / only full meters / up to 10 m / standard length 1000 mm = 1 m
			(7)	**Instrument connector**
x	x	00		no connector
o	o	76		BNC connector
o	o	78		DIN connector
			(8)	**Fitting length**
x	x	120		fitting length 120 mm (standard)
o		150		fitting length 150 mm [1]
o		225		fitting length 225 mm [1]
			(9)	**Extra codes**
x	x	000		none
o	o	052		KCl reservoir (holder)
o	o	837		salt reservoir[1]
o	o	838		2-chamber system (DOKA) with KCl/KCl bridge [3]

[1] only available with basic type extension /51 (glass shaft...)
[2] only available with basic type extension /53 (plastic shaft...)
[3] not available with basic type extension /53 (plastic shaft...)

X = combination is standard
o = combination is optional

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)	
Order code		/		-		-		-		-		-		-		/		, ...
Order example	201030	/	51	-	10	-	07	-	21	-	0000	-	00	-	120	/	000	

Note:

The type code is a type designation, not a modular system.
If at all possible, please choose the items listed under “Stock versions” or “Production versions” when placing your order.
Any free combination of individual code features must be technically checked and approved by us.
Please ask us in case of doubt.

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

Sales No.	Type	Brief description
20/00303347	201030/51-10-07-21-0000-00-120/000	plastic shaft PEI, gel-sealed, U glass, plug cap (S6), 120 mm, 2-chamber system
20/00303348	201030/51-10-07-21-0000-00-120/837	plastic shaft PEI, gel-sealed, U glass, plug cap (S6), 120 mm, 2-chamber system, salt reservoir
20/00303399	201030/53-10-05-21-0000-00-120/837,838 (2GEP-1-GV-Doka-U-S)	plastic shaft PEI, gel-sealed, U glass, plug cap (S6), 120 mm, 2-chamber system, compatible with Mettler Toledo InLab417 / Schott BlueLine 22pH
20/00345114	201030/53-11-05-21-0000-00-120/837,838 (2GEP-1-GV-Doka-C-S)	plastic shaft PEI, gel-sealed, C glass, plug cap (S6), 120 mm, 2-chamber system

Production versions (delivery: 10 working days after receipt of order)
Redox (ORP)

Sales No.	Type	Brief description
20/00300395	201035/51-22-07-21-0000-00-120/837 (2ME-1-GV-AuK-1)	glass shaft, gel-sealed, gold tip, zirconium dioxide diaphragm, plug cap (S6), 120 mm
20/00416919	201035/51-22-07-40-1000-76-120/837 (2ME-4-GV-PtK-1-1-BNC)	glass shaft, gel-sealed, platinum tip, zirconium dioxide diaphragm, attached cable, BNC connector, 120 mm

Note: Former type designations in brackets

JUMO labLine pH for measurements in solids

Typical applications

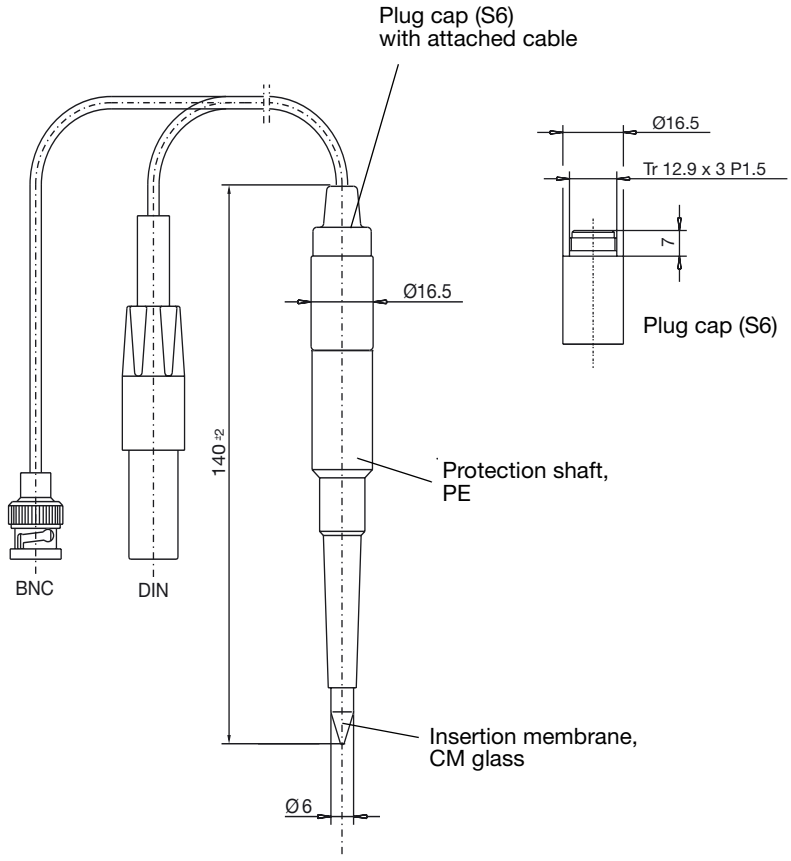
- Food checks (measurements in meat, cheese, vegetables, etc.)
- Soil samples

Key features

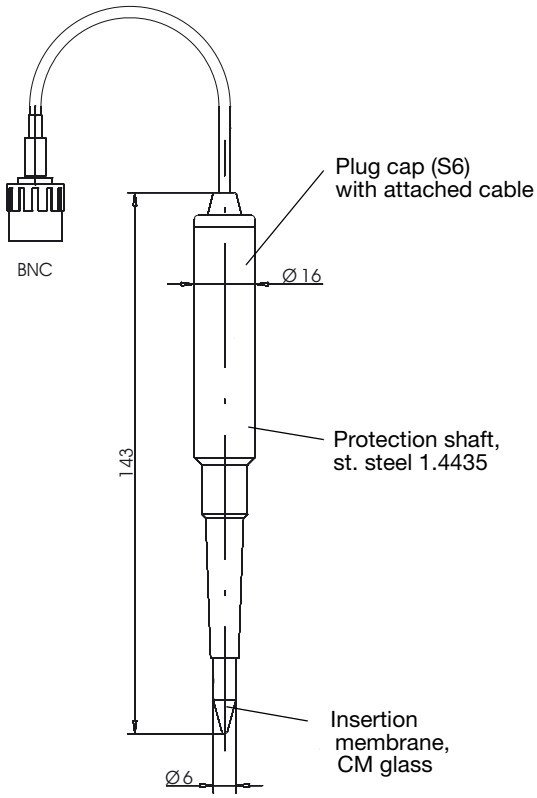
- Insertion probe 6 mm
- Highly viscous KCl solution (gel), double zirconium dioxide diaphragm
- Cartridge-style conductive system with reference electrolyte (free from silver ions)
- pH range: 0 — 11 pH, briefly up to 14 pH
- Temperature range: -5 to +50°C (please refer to the order details)
- Optional salt reservoir for extending the operational life in low-conductivity media
- Protection reinforcement in stainless steel 1.4435, for high stability

Type 201030/60-15-08-21-...

Dimensions



Type 201030/60-15-08-40-xxxx-76-120/000(pH)
Type 201030/60-15-08-40-xxxx-78-120/000(pH)



Type 201030/61-15-08-40-xxxx-76-120/000(pH)

Order details

				(1)	**Basic type**
			201030		pH combination electrode JUMO labLine pH
				(2)	**Basic type extensions**
			60		plastic shaft PE / gel-sealed / cartridge-style conductive system / insertion probe
			61		reinforcement in stainless steel 1.4435 / gel-sealed / cartridge-style conductive system / insertion probe
			62		glass shaft / KCl filling / wire conduction / insertion probe
				(3)	**Active component**
x	x	x	15		CM glass / pH 0 — 11 / -5 to +50°C
				(4)	**Diaphragm**
x	x	x	08		2 x zirconium dioxide diaphragm (special ceramic)
				(5)	**Connection**
x	x	x	21		plug cap (S6)
o	o	o	40		plug cap (S6) with attached cable
				(6)	**Cable length**
o	o	o	0000		no attached cable
x	x	x	xxxx		length in mm / only full meters / up to 10 m / standard length: 1000 mm = 1 m
				(7)	**Instrument connector**
o	o	o	00		no connector
x	x	x	76		BNC connector
o	o	o	78		DIN connector
				(8)	**Fitting length**
x	x	x	120		fitting length 120 mm (standard)
				(9)	**Extra codes**
x	x	x	052		KCl reservoir (holder)

X = combination is standard
o = combination is optional

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)
Order code	201030	/		-	15	-	08	-		-		-		-	120	/	052
Order example	201030	/	60	-	15	-	08	-	21	-	0000	-	00	-	120	/	052

Note:

The type code is a type designation, not a modular system.
If at all possible, please choose the items listed under “Stock versions” or “Production versions” when placing your order.
Any free combination of individual code features must be technically checked and approved by us.
Please ask us in case of doubt.

Production versions (delivery: 15 working days after receipt of order)

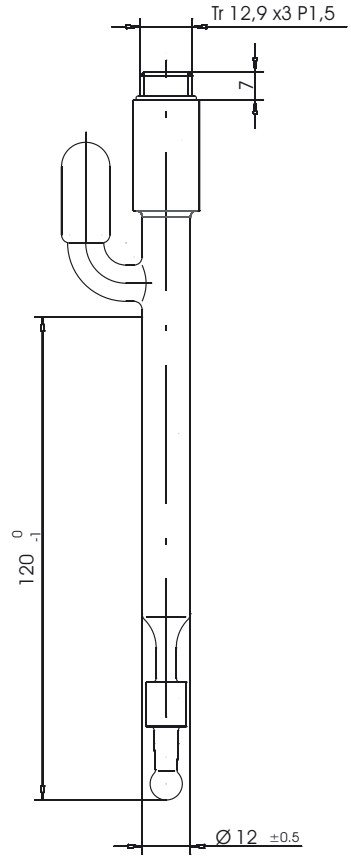
Sales No.	Type	Brief description
20/00432926	201030/60-15-08-21-0000-00-120/052 (2GE-1-GV-CM-2)	gel-sealed, zirconium dioxide diaphragm, plug cap (S6), 120 mm, compatible with Mettler Toledo InLab412 / Schott L7780
20/00448527	201030/60-15-08-40-1000-76-120/052 (2GE-4-GV-CM-2-1-BNC)	gel-sealed, zirconium dioxide diaphragm, plug cap (S6) with attached cable, 120 mm

JUMO labLine pH / Rd
with KCl liquid electrolyte, refillable

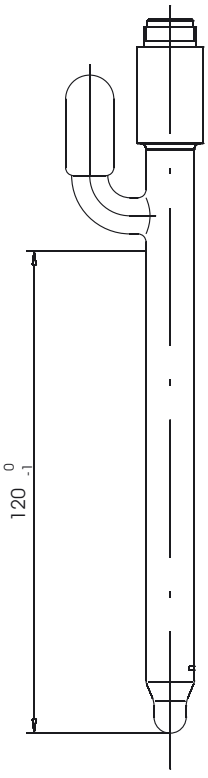
Key features

- High-quality zirconium dioxide diaphragm
- Cartridge-style conductive system with reference electrolyte (free from silver chloride)
- pH range: 0 — 12 pH, briefly up to 14 pH
- Temperature range: -5 to +130°C (depending on the membrane glass selected)
- Temperature probes can optionally be integrated
- Redox versions with platinum or gold tip up to +/-2000 m

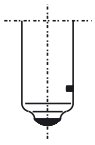
Dimensions



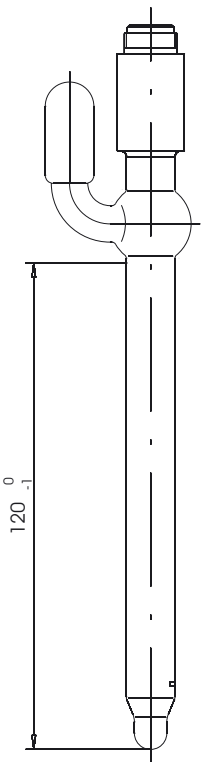
Type 201030/12-10-13-21-0000-00-120/000 (pH)



Type 201030/12-10-07-21-0000-00-120/000 (pH)



Platinum or gold tip
Type 201035/...



Type 201030/13-17-07-21-0000-00-120/000 (pH)

Order details

			(1)	**Basic type**
		201030		pH combination electrode JUMO labLine pH
		201035		redox combination electrode JUMO labLine Rd
			(2)	**Basic type extensions**
o	o	12		glass shaft / KCl/ tube nipple
o	o	13		glass shaft / KCl/ tube nipple / spherically enlarged shaft
x	x	76		glass shaft / KCl liquid electrolyte / cartridge-style conductive system
			(3)	**Active component**
x		10		U glass / pH 0 — 12, briefly pH 14) / -5 to +80°C
x		11		C glass / pH 0 — 12 / -5 to +50°C / fluoride-resistant
o		17		HT glass / pH 0 — 14 / -5 to +130°C / high-alkaline or high-temperature 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**
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) [1]
			(5)	**Connection**
x	x	21		plug cap (S6)
o	o	40		plug cap (S6) with attached cable
			(6)	**Cable length**
x	x	0000		no attached cable
o	o	xxxx		length in mm / only full meters / up to 10 m / standard length: 1000 mm = 1 m
			(7)	**Instrument connector**
x	x	00		no connector
o	o	76		BNC connector
o	o	78		DIN connector
			(8)	**Fitting length**
x	x	120		fitting length 120 mm (standard)
			(9)	**Extra codes**
x	x	000		none
o	o	052		KCl reservoir (holder)

[1] only available with extra code /052 (KCl reservoir...)
Other versions on request!

X = combination is standard
o = combination is optional

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)
Order code		/		-		-		-		-		-		-	120	/	
Order example	201030	/	76	-	10	-	07	-	21	-	0000	-	00	-	120	/	000

Note:

The type code is a type designation, not a modular system.
If at all possible, please choose the items listed under “Stock versions” or “Production versions” when placing your order.
Any free combination of individual code features must be technically checked and approved by us.
Please ask us in case of doubt.

Production versions (pH) (delivery: 15 working days after receipt of order)

Sales No.	Type	Brief description
20/00300196	201030/76-10-07-40-1000-76-120/000 (2GE-4-KCl-U-1-1-BNC)	pH electrode, zirconium dioxide diaphragm, 1 m attached cable, BNC connector, 120 mm, compatible with: Mettler Toledo InLab409
20/00300165	201030/76-10-13-21-0000-00-120/052 (2GE-1-KCl-U-Schliff)	pH electrode, ground diaphragm, plug cap (S6), 120 mm, compatible with: Mettler Toledo InLab420 / Schott BlueLine 13pH

Gas-sensitive sensor

for measuring ammonia

Brief description

This sensor can be used to measure ammonia (NH_3) in aqueous solutions. The ammonia sensor consists of a pH glass electrode and a reference electrode. Both electrodes are in an electrolyte. The electrolyte is separated from the sample medium by means of a hydrophobic, gas-permeable membrane. The pH of the electrolyte changes if NH_3 gas diffuses through the membrane. This local change in pH is measured by the pH electrode as a high-resistance value.

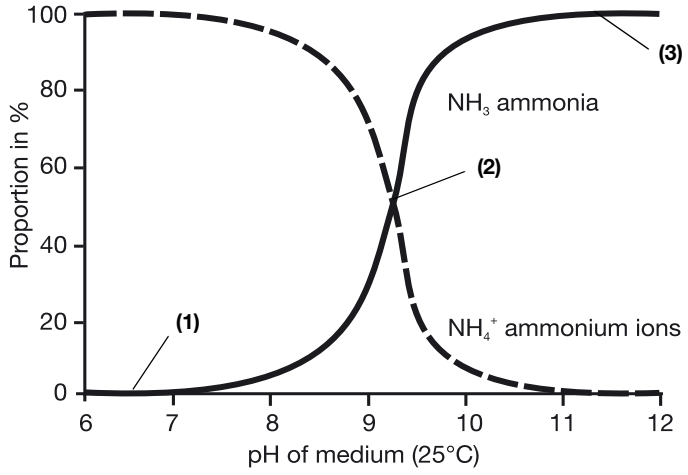
Area of application

- leakage monitoring in cooling systems
- ammonia determination
  in freshwater/seawater
  in coating baths
  in the wastewater of gas scrubbers
  in wastewater checks
  in laboratories

Technical data

Range: 0.01 — 20,000 ppm (= mg/l) NH_3
Temperature range: 0 to 50°C
Accuracy: +/- 2%
Length:120 mm
Diameter: 12 mm
Connection:threaded cap (S8)

Application range

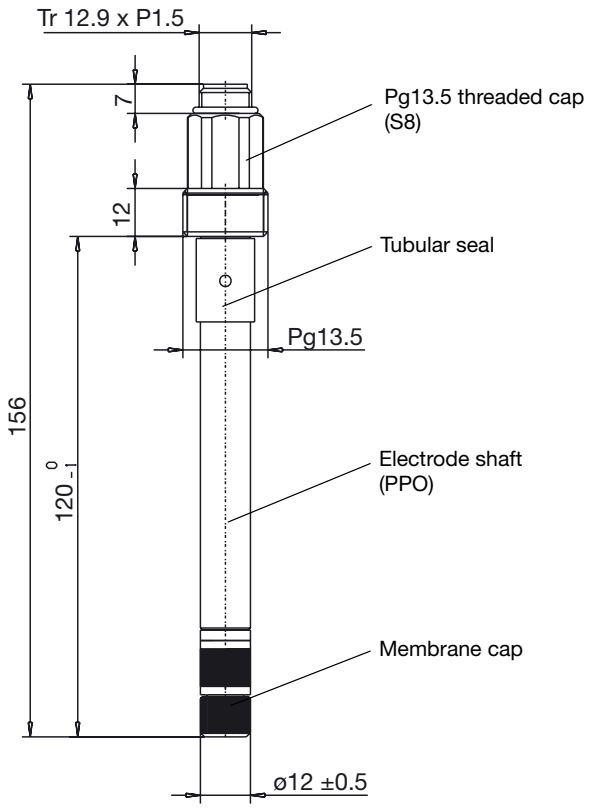


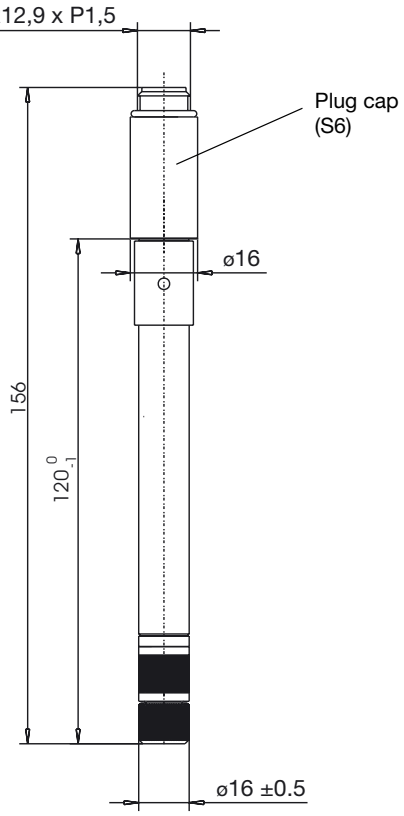
(1) only NH_4^+ ions (ammonium) present
(2) The ratio of NH_4^+ ions (ammonium) and NH_3 (ammonia) is 1:1.
(3) only NH_3 (ammonia) present

Note

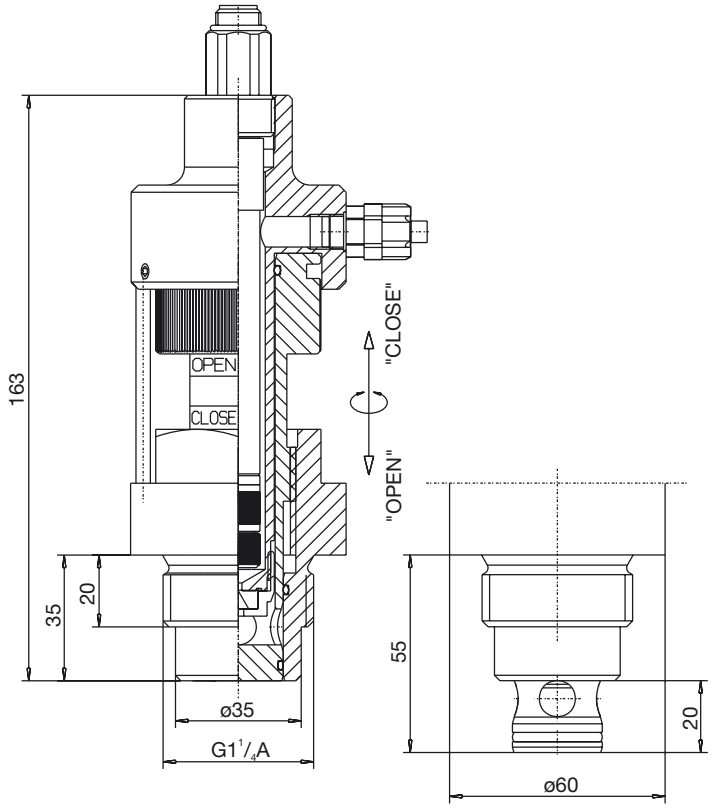
The presence of ammonia in the sample medium is strongly dependent on the pH value of the latter (see graph shown above).
In the acidic range, there will be a predominance of NH_4^+ ions (ammonium) that are **not** detected by the sensor.
With approx. 9.3 pH, the concentration ratio between ammonia (NH_3) and ammonium (NH_4^+) is about 1:1.
Ammonia will dominate the reaction in the strongly alkaline range only.

Dimensions



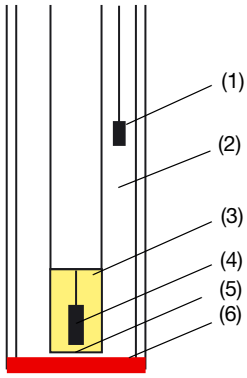


Accessories



Quick-change fitting
Sales No. 20/00379583
optimum operating pressure: 2 – 3 bar
maximum operating pressure: 6 bar
operating temperature range: -5 to 50°C

Design of the gas-sensitive electrode



(1) Conduction of the reference system (Ag/AgCl)
(2) Electrolyte
(3) Internal buffer
(4) Internal conduction (Ag/AgCl)
(5) Glass membrane
(6) Gas-permeable PTFE membrane

The ammonia electrode consists of a reference electrode and a pH glass electrode. Both electrodes are in an electrolyte which is separated from the sample medium by means of a PTFE membrane. The electrolyte has a specific chloride-ion concentration which defines a reference potential for the conduction of the reference electrode (Ag/AgCl) when immersed.

The measuring electrode is a pH glass electrode. If NH_3 diffuses through the PTFE membrane into the thin electrolyte layer between PTFE membrane and pH glass membrane, the pH value of the electrolyte changes according to the NH_3 concentration. The ammonia concentration of the sample liquid can be determined by measuring the pH.

Additional fittings

Type of fitting	Data Sheet
Flow-through fittings	20.2810
Immersion fittings	20.2820

Order details

		(1)	**Basic type**
	201030		JUMO labLine
		(2)	**Basic type extension**
o	65		ammonia sensor
		(3)	**Connection**
o	21		plug cap (S6)
x	22		threaded cap Pg13.5 (S8)
		(4)	**Fitting length**
x	120		fitting length 120 mm (standard)
		(5)	**Extra codes**
x	000		none

X = combination is standard
o = combination is optional

	(1)		(2)		(3)		(4)		(5)
Order code	201030	/	65	-		-	120	/	000
Order example	201030	/	65	-	22	-	120	/	000

Production versions (delivery: 10 working days after receipt of order)

Sales No.	Type	Brief description
20/00440655	201030/65-22-120/000	Ammonia electrode, threaded cap Pg13.5 (S8), 120 mm

Accessories

Sales No.	Type	Brief description
20/00449637		Maintenance kit for ammonia sensor
20/00379538	202822/107-55/87	Quick-change fitting in PP
20/00442445	202535/10-888-000-23-00/000	Redox transmitter JUMO dTRANS Rd01

JUMO Multitrode

for acquisition of the parameters: pH value, redox potential (ORP) and temperature

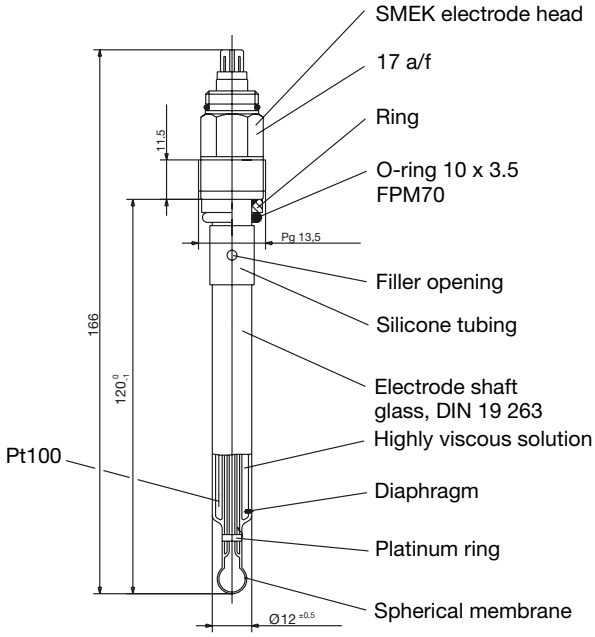
Brief description

Thanks to the JUMO Multitrode, several process parameters can now be obtained from one measurement point. Integrating individual sensors in one electrode means less maintenance effort. Furthermore, the compact design also ensures that the installation costs are kept to a minimum, since there is no need for installing further fittings for additional sensors. In conjunction with suitable transmitters, the individual values for pH, redox potential and temperature can all be acquired at the same time, and indicated. The JUMO Multitrode operates fast and reliably, also under process conditions.

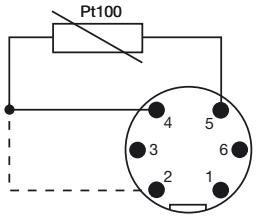
Technical data

Meas. range	pH: U glass 0 — 12 pH (briefly up to 14 pH) DS glass 0 — 12 pH (suitable for steam sterilization) Redox: Platinum ring ± 2000 mV Gold ring ± 2000 mV Temperature: Pt100 -5 to +80°C
Temperature range	U glass -5 to +80°C DS glass 0 to +80°C (briefly up to +120°C during sterilization)
Pressure range	up to 10 bar at 25°C up to 1 bar at 80°C

Dimensions



Pin assignment



Pin	Assignment
1	pH core
2	
3	redox
4	Pt100
5	Pt100
6	screen

Order details

Type designation

(1) Basic type
201030 JUMO labLine Rd electrode

(2) Basic type extensions
80 Multitrode (multi-parameter sensor)

(3) Version
85 glass shaft, gel-sealed, cartridge-style conductive system
86 glass shaft, high-temperature gel, gel-sealed, cartridge-style conductive system

(4) Active component
50 U glass, 0 — 12 pH (briefly 14), -5 to +80°C
platinum ring, ± 2000 mV, -5 to +80°C
51 U glass, 0 — 12 pH (briefly 14), -5 to +80°C
gold ring, ± 2000 mV, -5 to +80°C
52 DS glass, 0 — 12 pH, -5 to +80°C (briefly up to +130°C)
platinum ring, ± 2000 mV, -5 to +80°C

(5) Diaphragm
07 1 x zirconium dioxide diaphragm (special ceramic)
09 3 x zirconium dioxide diaphragm (special ceramic)

(6) Connection
17 SMEK screw cap, Pg13.5

(7) Fitting length
120 120 mm

(8) Extra codes
000 none
840 Pt100 temperature probe
841 Pt1000 temperature probe

	(1)		(2)		(3)	(4)	(5)	(6)		(7)		(8)
Order code		/		-					-		/	
Order example	201030	/	80	-	85	50	07	17	-	-120	/	840

Note:
The type code is a type designation, not a modular system.
If at all possible, please choose the items listed under “Stock versions” or “Production versions” when placing your order.
Any free combination of individual code features must be technically checked and approved by us.
Please ask us in case of doubt.

Stock versions (delivery: 3 days after receipt of order)

Sales No.	Type	Description
20/00431380	201030/80-85-50-07-17-120/840	JUMO Multitrode, gel-sealed, U glass, Pt ring, zirconium dioxide diaphragm, 120 mm, Pt100 temperature probe

Production versions (delivery: 10 days after receipt of order)

Sales No.	Type	Description
20/00438431	201030/80-85-50-09-17-120/840	JUMO Multitrode, gel-sealed, U glass, Pt ring, 3 x zirconium dioxide diaphragm, 120 mm, Pt100 temperature probe
20/00438432	201030/80-85-51-09-17-120/840	JUMO Multitrode, gel-sealed, U glass, Au ring, 3 x zirconium dioxide diaphragm, 120 mm, Pt100 temperature probe
20/00438433	201030/80-86-52-09-17-120/840	JUMO Multitrode, gel-sealed, DS glass, Pt ring, 3 x zirconium dioxide diaphragm, 120 mm, Pt100 temperature probe

Accessories

Sales No.	Type
20/00412117	SMEK connecting cable, 5 m, for Multitrode