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## Accessories

### pH, redox potential and conductivity measurement

#### Connection cables

#### for pH, redox, conductivity and temperature sensors

#### Connection cables

Screened coaxial cables must be used for connecting pH and redox electrodes, compensation thermometers and glass conductivity cells. On the sensor side, the cables are equipped with a rotatable cable socket.

No plug or socket is attached on the instrument side, in order to allow the cable to be passed through a cable gland.

The conductivity cells are connected via a 4-core screened control cable that is available in 25 and 50 m rolls.

#### Order details

##### (1) Cable end 1 (on sensor side)

- 2990 no plug connection
- 2992 N cable socket, rotating
- 2994 SMEK cable socket

##### (2) Cable type

- |    |  |  |                           |
|----|--|--|---------------------------|
| 2  | low-noise coaxial cable                            | diameter: 5 mm, black  | temperature: -25 to +70°C |
| 9  | special cable, 4-core, screened (for conductivity) | diameter: 5 mm, gray   | temperature: -5 to +80°C  |
| 10 | coaxial cable (SMEK) + 3 stranded wires and screen | diameter: 5.5 mm, black (for electrodes with integrated Pt100) | temperature: -25 to +70°C |

##### (3) Cable length

- xx length in meters (e.g. 1 = 1 m cable)

##### (4) Cable end 2 (on device side)

- 0 no plug connection



Type 201090-2992-2....

	(1)	(2)	(3)	(4)
<b>Order code</b>				
<b>Order example</b>	2990	-	9	( 25 ) 0

<sup>†</sup> suitable e.g. for plug cap (S6) or threaded cap Pg13.5 (S8)

**Stock items**

(shipment: 3 working days from receipt of order)

**Standard cables for pH and redox electrodes, compensation thermometers and glass conductivity cells**

Sales No.	Type
20/00082672	2992-2(3)-0
20/00082673	2992-2(5)-0
20/00085976	2990-2(100)-0
20/00082659	2992-2(10)-0
20/00082660	2992-2(25)-0
20/00303525	2992-2(50)-0

**Assembled connection cables for pH electrodes and glass conductivity cells with integral temperature probe.****Preassembled with SMEK cable socket at one end.**

Sales No.	Type
20/00347843	2994-10(5)-0 length 5 m (SMEK universal cable)
20/00346442	2994-10(10)-0 length 10 m (SMEK universal cable)

**Special connection cables (in rolls) for conductivity cells to Data Sheet 20.2923-20.2926**

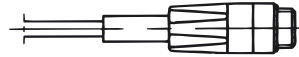
Sales No.	Type
20/00303681	2990-9(25)-0 length 25 m, 4-pole with screen
20/00304181	2990-9(50)-0 length 50 m, 4-pole with screen

**Connection plugs and sockets for coaxial cables**

Sales No.	Type		
20/00061202	2990-00-4	N plug	minimum ordering quantity: 5 units
20/00057350	2991-00-0	N cable socket	minimum ordering quantity: 5 units
20/00311905		cable socket wrench	
20/00064222	2990-00-23	BNC angled plug	minimum ordering quantity: 5 units
20/00048842	2990-00-22	BNC straight plug	minimum ordering quantity: 5 units

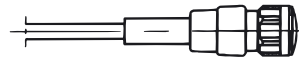
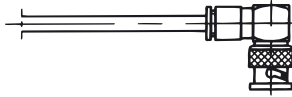
# Connection cables and plugs for electrodes

No plug connection



Plug / coupling S6 for 5 mm cable dia.

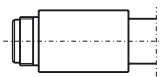
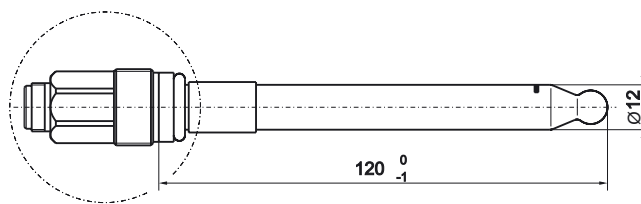
BNC angled plug for 5 mm cable dia.



N cable socket, rotatable, suitable for cap (S6) or threaded cap Pg13.5 (S8) (can only be fitted at the factory)

# Electrode connection heads

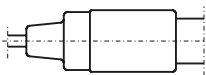
Type of electrode head



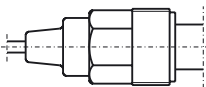
- Cap (S6)



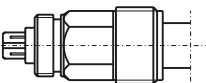
- Threaded cap Pg13.5 (S8)



- Cap (S6) with attached cable



- Threaded cap Pg13,5 with attached cable



- SMEK threaded cap Pg13.5 (multi-pole connector)



- Variopin (VP) threaded cap (multipole connector, metal) with Pg13.5 thread **available on request**

## Technical buffer solutions to DIN 19267

- are used for calibrating pH electrodes and have proved successful – particularly for use in industry and industrial laboratories – because they are relatively unaffected by dilution (high buffering capacity).
- The effect of the temperature on the pH values of the buffer solutions is shown in the table on the bottle label.  
The uncertainty is 0.02 pH units.
- The batch no. and the recommended use-by date are shown on the bottles.
- The bottle tops are color-coded, for identification.

Sales No.	Designation
20/00309747	250 ml buffer solution pH 3.07 to DIN 19267 at 20°C
20/00344977	250 ml buffer solution pH 4.00 to DIN 19267 at 20°C
20/00301070	250 ml buffer solution pH 4.65 to DIN 19267 at 20°C
20/00301071	250 ml buffer solution pH 6.80 to DIN 19267 at 20°C
20/00338371	250 ml buffer solution pH 7.00 to DIN 19267 at 20°C
20/00301072	250 ml buffer solution pH 9.27 to DIN 19267 at 20°C
20/00345027	250 ml buffer solution pH 10.00 to DIN 19267 at 20°C
20/00301073	250 ml redox-potential test solution +468mV (at 25°C)

Packed in units of 5



## Cleaners (for pH /redox electrodes)

Sales No.	Designation
20/00307586	250 ml diaphragm cleaner (thiourea solution)
20/00307114	250 ml electrode cleaner (pepsin hydrochloric acid solution, protein remover)

Packed in units of 5<sup>1</sup>

## Auxiliary electrolytes

Sales No.	Designation
20/00306215	250 ml 3-molar KCl solution without AgCl (free from silver ions)
20/00307585	250 ml 3-molar KCl solution with AgCl (for electrodes with wire conductor in reference system)

Packed in units of 5<sup>1</sup>

## Conductivity test solutions

Sales No.	Designation
20/00346056	250 ml KCl 0.01 mol/l 1.41 mS/cm
20/00346058	250 ml KCl 0.1 mol/l 12.88 mS/cm
20/00346060	250 ml KCl 1.0 mol/l 111.80 mS/cm

Packed in units of 5<sup>1</sup>  
can be supplied within 3 working days after receipt of order

<sup>1</sup> Please state number of units when ordering (5, 10 or 15...)

# Simulators

- Simulators are connected to the transmitter in place of an electrode or measuring cell, to test connecting cables and/or transmitters/controllers (installation test, commissioning etc.).
- Simulation of conductive 2-electrode measuring cells (2H-SLF-1).
- 2 temperatures, switchable to check the temperature compensation (2H-SLF-1).

## pH simulator

### Type 2H-SpH-1

#### Range

0 – 14pH,  
with selector switch in 1pH steps

#### Output signal

+414mV to 0 to -414mV,  
in 59mV steps,  
corresponding to 0 – 14pH

#### Calibration error

±1% of selected pH value

#### Reference temperature

25 °C

#### Output resistance

1kΩ (direct) or 1000MΩ (1000M),  
depending on switch position

#### Supply voltage

9V block battery (included in delivery)

#### integrated battery test

#### 1000MΩ circuit

to check installed pH connection cables for faults

#### Connection

BNC socket and socket

for separate reference electrode

#### Permissible ambient temperature

0 to 50 °C

#### Housing

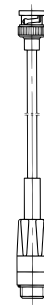
aluminium

#### Dimensions

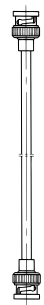
70 x 120 x 45 mm

#### Available connection cables

Sales No.	Designation
20/00082906	22-2(1,1)-22, adapter cable (Fig. 2) BNC/BNC, length 1.1 m
20/00082908	22-2(1,1)-4, adapter cable (Fig. 1) BNC/N plug, length 1.1 m



(Fig. 1)



(Fig. 2)

## Conductivity simulator (conductive)

### Type 2H-SLF-1

#### Simulation range

with cell constant K = 0.01 to 10.0:  
conductivity in steps from 2μS/cm to  
800mS/cm, (switchable, see table)

#### Possible simulations

R / K	0.01	0.1	1.0	3.0	10.0
12.5 Ω	800 μS	8 mS	80 mS	240 mS	800 mS
25 Ω	400 μS	4 mS	40 mS	120 mS	400 mS
50 Ω	200 μS	2 mS	20 mS	60 mS	200 mS
125 Ω	80 μS	800 μS	8 mS	24 mS	80 mS
250 Ω	40 μS	400 μS	4 mS	12 mS	40 mS
500 Ω	20 μS	200 μS	2 mS	6 mS	20 mS
1200 Ω	8 μS	80 μS	800 μS	2,4 mS	8 mS
2500 Ω	4 μS	40 μS	400 μS	1,2 mS	4 mS
5000 Ω	2 μS	20 μS	200 μS	600 μS	2 mS
12.5 kΩ	800 nS	8 μS	80 μS	240 μS	800 μS
25 kΩ	400 nS	4 μS	40 μS	120 μS	400 μS
50 kΩ	200 nS	2 μS	20 μS	60 μS	200 μS
125 kΩ	80 nS	800 nS	8 μS	24 μS	80 μS
250 kΩ	40 nS	400 nS	4 μS	12 μS	40 μS
• Ω	0	0	0	0	0

#### Calibration error

±1% of selected resistance

Pt100 simulation:

25 °C and 75 °C ±1 °C

in 2- and 3-wire circuit

#### Permissible ambient temperature

0 to 50 °C

#### Housing

aluminium

#### Dimensions

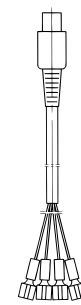
70 x 120 x 45 mm

#### Connection

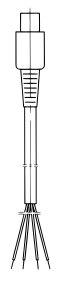
5-pole diode socket

#### Available connection cables

Sales No.	Designation
20/00082901	7-9(1,1)-0 adapter cable (Fig. 4) diode plug/bare wire ends length 1.10 m
20/00082902	7-9(1,1)-6 adapter cable (Fig. 3) diode plug/AMP plug 6.3 mm, length 1.10 m



(Fig. 3)



(Fig. 4)