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Lines, plugs and sockets for pH, redox, conductivity and temperature sensors

Brief description

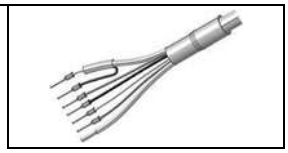
The use of electrochemical sensors for liquid analysis requires special connection lines and connectors. JUMO offers a selection of tried and tested versions for this application. They are available either as a finished preassembled connection line, as loose material by the roll or as individual plugs/sockets for self-assembly.

As a general rule:
The measuring lead selected between an electrochemical sensor and the transmitter/indicator/controller should be as short as possible. Typical line lengths in this case are 5 to 10 m with high functional reliability. If longer line lengths must be selected in some cases, the technical documentation of the sensors and measuring instruments must be observed. The line between the sensor and evaluation instrument must be laid directly and without interruption (for example terminal strips) or cable extensions.

pH and redox measurement
Specially designed coaxial lines are used for pH and redox measurements. In these measurements direct voltages of a lower level are generated by the sensor and transferred to the evaluation instrument. These measurements, some of which are high-resistive measurements (potentiostatic measurement principle, internal resistors up to several gigaohms) are sensitive to electrical faults and radiation. Even a movement of the line can falsify measurement values in unfavorable conditions. An additional layer of insulation in JUMO coaxial line increases the insulation resistance of the line, thereby ensuring a reliable connection from the sensor to the transmitter. Other coaxial lines of the type used for antennas and computers are not suitable and could damage the sensors. This could also result in immediate failure of the sensor or reduced service life. For multiple sensors, for example with integrated temperature sensors, coax lines with individual core wires are available (Variopin, etc.).

Conductive conductivity measurement
Connecting cables for conductive conductivity probes as per data sheets 202922 to 202930 are also specially optimized and selected for the application. Alternating voltages of low amplitude in the range of a few Hertz to several Kilohertz are transferred. Accordingly these measuring leads are normally equipped with shielding. The shielding itself must be designed according to applicable technical rules and the relevant application. The individual core wires must be twisted for increased "twisted pair" signal reliability.





Type 202990/xx-xx-xx-11
Ferrules



Type 202990/xx-xx-xx-04
N connector



Type 202990/xx-xx-xx-13
Shield-Kon® connector



Type 202990/xx-xx-xx-22
BNC connector, straight



Type 202990/xx-xx-xx-23
BNC connector, angled



Type 202990/xx-xx-xx-90
N line socket

Type 202990/11-95-xx-xx-xx
with VP line socket

Key features

- High-quality preassembled connection lines
- Highest possible protection type with factory assembly
- Wide range of connectors/sockets and special selection
- Customer-specific versions on request

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Order details

	(1)	**Basic type**
202990		Lines, plugs and sockets for pH, redox, conductivity and temperature sensors
	(2)	**Type of line**
00		Without
02		Line for pH and redox, Ø 5 mm, 75 °C
09		Line for conductive conductivity probes, 4-core
11		VP coaxial line
	(3)	**Connection end 1 (sensor side)**
00		Without
92		N line socket, rotating
95		VP line socket, 6-pin, for lines Ø 5 mm
	(4)	**Line length**
		for line type 02
1,5		1.5 m
3		3 m
5		5 m
10		10 m
25		25 m
50		50 m
100		100 m
		for line type 09
25		25 m
50		50 m
		for line type 11
5		5 m
10		10 m
15		15 m
20		20 m
	(5)	**Connection end 2 (device side)**
00		Without
04		N connector
11		Ferrules
13		Shield-Kon® connector
22		BNC connector, straight, for lines Ø 5 mm
23		BNC connector, angled, for lines Ø 5 mm
90		N line socket, for lines Ø 5 mm

	(1)		(2)		(3)		(4)		(5)
Order code		/		-		-		-	
Order example	202990	/	02	-	92	-	10	-	00

Minimum order quantity: Plugs and sockets, 5 pieces per type, deviating and preassembled line 10 pieces per type

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Stock versions (delivery 3 days after receipt of order)

Preassembled lines

Coaxial lines, Ø 5 mm for pH and redox electrodes, compensation thermometer and glass conductivity cells

Line end 1 (sensor side)	Type of line	Type	Old type	Line end 2 (device side)	Part no.
92	02			0	
N-line socket, rotating	Low-noise coaxial line, temperature: -25 to +75, PVC, black			Without plug, without socket	
	Length 3 m:	202990/02-92-3-00	2992-2(3)-0		00082672
	Length 5 m:	202990/02-92-5-00	2992-2(5)-0		00082673
	Length 10 m:	202990/02-92-10-00	2992-2(10)-0		00082659
	Length 25 m:	202990/02-92-25-00	2992-2(25)-0		00082660
	Length 50 m:	202990/02-92-50-00	2992-2(50)-0		00303525



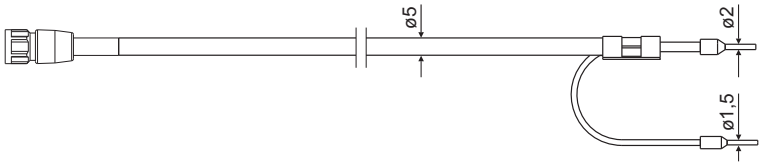
Coaxial lines, Ø 5 mm for pH and redox electrodes, compensation thermometer and glass conductivity cells

Line end 1 (sensor side)	Type of line	Type	Old type	Line end 2 (device side)	Part no.
92	02			22	
N line socket, rotating	Low-noise coaxial line, temperature: -25 to +75, PVC, black			BNC connector, straight	
	Length 1 m:	202990/02-92-1-22	-		00328997



Coaxial lines, Ø 5 mm for pH and redox electrodes, compensation thermometer and glass conductivity cells

Line end 1 (sensor side)	Leitungsart	Type	Old type	Line end 2 (device side)	Part no.
92	02			13	
N line socket, rotating	Low-noise coaxial line, temperature: -25 to +75, PVC, black			Shield-Kon® connector	
	Length 1,5 m:	202990/02-92-1,5-13	-		00085154
	Length 5 m:	202990/02-92-5-13	-		00307298
	Length 10 m:	202990/02-92-10-13	-		00082649



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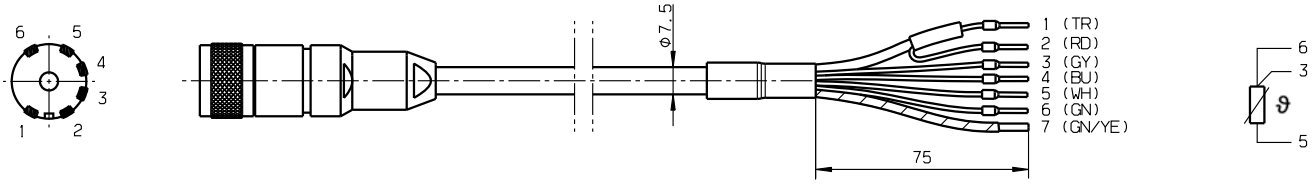
Connecting cables for pH and redox electrodes and glass conductivity cells and multisensors with integrated temperature sensor; VP terminal head

Line end 1 (sensor side)	Type of line	Type	Old type	Line end 2 (device side)	Part no.
95	11			11	
VP (Variopin)-line socket, 6-pin	VP (Variopin) coaxial line with shield +4 stranded wire and cable shield, temperature: -30 to +70, PVC, black			Ferrules	
	Length 5 m:	202990/11-95-5-11	-		00372919
	Length 10 m:	202990/11-95-10-11	-		00373029
	Length 15 m:	202990/11-95-15-11	-		00451481



Contact assignment:	(1) pH glas	(2) pH reference	(3) Pt100/1000 (3-wire)	(4) free
	(5) Pt100/1000	(6) Pt100/1000	(7) Shield	

Lines (by the roll without plugs or sockets)

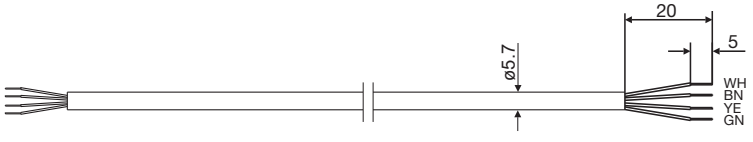
Coaxial lines, Ø 5 mm for pH and redox measurements

Line end 1 (sensor side)	Type of line	Type	Old type	Line end 2 (device side)	Part no.
0	02			0	
Without plug, without socket	Low-noise coaxial line, temperature: -25 to +75, PVC, black			Without plug, without socket	
	Length 100 m:	202990/02-00-100-00	2990-2(100)-0		00085976



Connecting cables, Ø 5.7 mm for conductive conductivity probes (2-electrode system)

Line end 1 (sensor side)	Type of line	Type	Old type	Line end 2 (device side)	Part no.
0	09			0	
Without plug, without socket	4 stranded wire and shield temperature: -5 to +80 PVC, grey			Without plug, without socket	
	Length 25 m:	202990/09-00-25-00	2990-9(25)-0		00303681
	Length 50 m:	202990/09-00-50-00	2990-9(50)-0		00304181



Color coding to DIN IEC 757:

BU = Blue GN = Green GN/YE = Green/Yellow GY = Grey RD = Red TR = Transparent WH = White YE = Yellow

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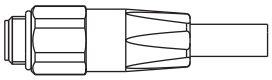
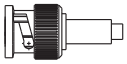
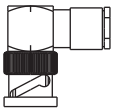
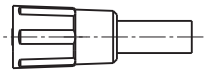
Plugs[1] (for self-assembly on coaxial line)

Designation/illustration	Type	Old type	for line type	Part no.
N connector for line diameter Ø 5 mm: 	202990/00-00-000-04	2990-00-4	02	00061202
BNC connector, straight for line diameter Ø 5 mm: 	202990/00-00-000-22	2990-00-22	02	00068842
BNC connector, angled for line diameter Ø 5 mm: 	202990/00-00-000-23	2990-00-23	02	00064222

Sockets[1] (for self-assembly on coaxial line)

Designation/illustration	Type	Old type	for line type	Part no.
N line socket for line diameter Ø 5 mm: 	202990/00-00-000-90	2991-00-0	02	00057350

[1] **Minimum order quantity:** Plugs and sockets, 5 pieces per type, deviating and preassembled line 10 pieces per type