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
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM 20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

JUMO BlackLine CR-GT/-EC/-GS
Conductive 2-Electrode Conductivity Sensor

Cell constants K = 0.01 – 1.0

202922 Series

- for universal application, e.g. drinking and surface water monitoring, ion exchangers and reverse osmosis plant, construction of air conditioning and cooling systems, horticultural technology, sea water and fresh water aquaculture, mildly contaminated industrial rinse and process water, high-purity water monitoring, etc.
- compact style for universal application
- manufactured from physiologically safe materials

JUMO BlackLine CR-GT
with the cell constants K = 1.0

The GT version features a special graphite as the electrode material. The graphite has been especially treated to achieve - in conjunction with suitable evaluation devices - measuring ranges up to 100 mS/cm and above.
A temperature probe can optionally be integrated. The conductivity sensor with 120 mm fitting length and a shaft diameter of 12 mm can be used in combination with standard pH or redox electrodes in suitable built-in fittings. The sensor is also ideally suited for linking with handheld or laboratory measuring equipment. When used as an online sensor, suitable flow-through fittings must be employed (see JUMO data sheets 202810, 202820, 202822).

JUMO BlackLine CR-EC
with the cell constants K = 0.01, K = 0.1 and K = 1.0

The principal features of the EC version are its very compact construction and the Pt100 that is integrated as standard. With a fitting length of just 40 mm (or 63 mm), the sensors can also be screwed into pipelines with a small nominal diameter. To this end, the conductivity sensors either have a G 1/2A or 1/2"-14 thread.
The version with K = 1.0 achieves a measuring range of 0.1 to about 5000 µS/cm (5mS/cm). Titanium pins function as the measuring electrodes here. The version with K=1.0 has been implemented as a coaxial cell and can be used to about 1000 µS/cm. Sensors with K = 0.01 cover ranges from 0.05 to 20 µS/cm. They are therefore extremely suitable for pure and high-purity water applications. The electrode material for these sensors is stainless steel 1.4571.

JUMO BlackLine CR-GS glass conductivity sensors K = 1.0

Glass conductivity sensors are used to conductively determine the electrolytic conductivity of aqueous solutions. The cell constant of the sensor is K = 1.0 $^{1}/_{cm}$. These sensor can be supplied with an integrated Pt100 masuring insert, as an option.
Versions with a Pg13.5 threaded cap can be incorporated in suitable fittings (sse data sheets 202810, 202820, 20,2822 and 202825).



**JUMO BlackLine CR-GT (left),
JUMO BlackLine CR-EC (middle),
JUMO BlackLine CR-GS (right)**

Operating principle

The sensors in the 202922 series are 2-electrode conductivity sensors. A transmitter applies an AC voltage to the sensors. The current flowing through the liquid and the electrodes is determined by the conductivity of the liquid.

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Technical data

JUMO BlackLine CR-GT

Cell constant[a]	K=1.0
Typical measuring range[b]	0.1 to approx. 10 mS/cm (with the appropriate evaluation equipment: up to 100 mS/cm)
Temperature compensation	none/Pt100/Pt1000
Process connection	Pg13.5 screw-in thread
Electrode material	special graphite
Body material	PPE, PS
Operating temperature	-5 to +80 °C
Maximum pressure	6 bar (at 25 °C)
Electrical connection	attached cable (free cable ends) or M12 connector

[a] Depending on the production conditions, the cell constant can deviate by ±10 % from the nominal value. This deviation can be compensated at the transmitter.
[b] The measuring ranges also depend on the transmitter used. When used for wider ranges than the “typical” ones, measurement errors may be caused by polarization.

JUMO BlackLine CR-EC

Cell constant[a]	K = 0.01	K = 0.1	K = 1.0
Typical measuring range[b]	0.05 to approx. 20 µS/cm	0.1 to approx. 1000 µS/cm	0.1 to approx. 5000 µS/cm
Temperature compensation	Pt100	Pt100	Pt100
Process connection	G 1/2A or 1/2"-14 NPT screw-in thread	G 1/2A or 1/2"-14 NPT screw-in thread	G 1/2A or 1/2"-14 NPT screw-in thread
Electrode material	stainless steel 1.4571	stainless steel 1.4571	titanium
Body material	PEI	PEI	PEI
Operating temperature	-5 to +90 °C	-5 to +90 °C	-5 to +90 °C
Maximum pressure	6 bar (at 25 °C)	6 bar (at 25 °C)	6 bar (at 25 °C)
Electrical connection	attached cable (free cable ends) or M12 connector	attached cable (free cable ends) or M12 connector	attached cable (free cable ends) or M12 connector

[a] Depending on the production conditions, the cell constant can deviate by ±10 % from the nominal value. This deviation can be compensated at the transmitter.
[b] The measuring ranges also depend on the transmitter used. When used for wider ranges than the “typical” ones, measurement errors may be caused by polarization.

JUMO BlackLine CR-GS

Cell constant[a]	K = 1.0
Typical measuring range[b]	0 to 1 mS/cm (platinum raw) 0 to 100 mS/cm (platinum platinized)
Temperature compensation[c]	Pt100
Process connection	threaded cap Pg13,5 or plug cap
Electrode material	platinum
Body material	glass
Operating temperature	-10 to +160 °C
Maximum pressure	0 to 6 bar with threaded cap Pg13,5 unpressurized with plug cap
Electrical connection	N-connector or M12 connector

[a] Depending on the production conditions, the cell constant can deviate by ±10% from the nominal value. This deviation can be compensated at the transmitter.
[b] The measuring ranges also depend on the transmitter used. When used for wider ranges than the “typical” ones, measurement errors may be caused by polarization.
[c] Option.

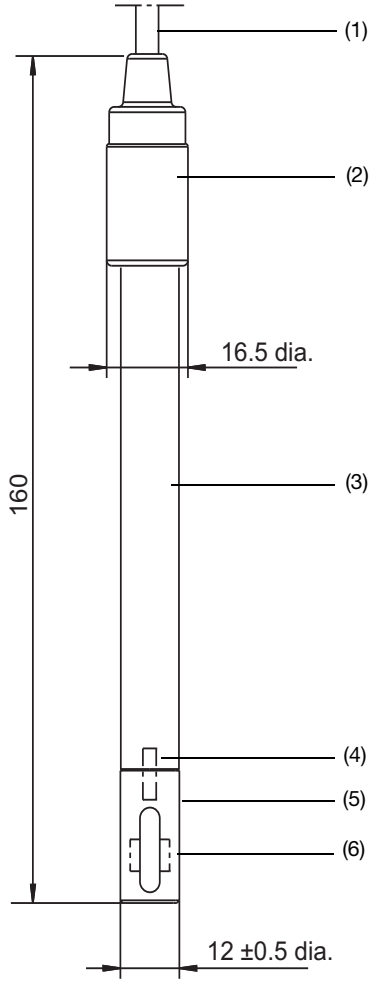
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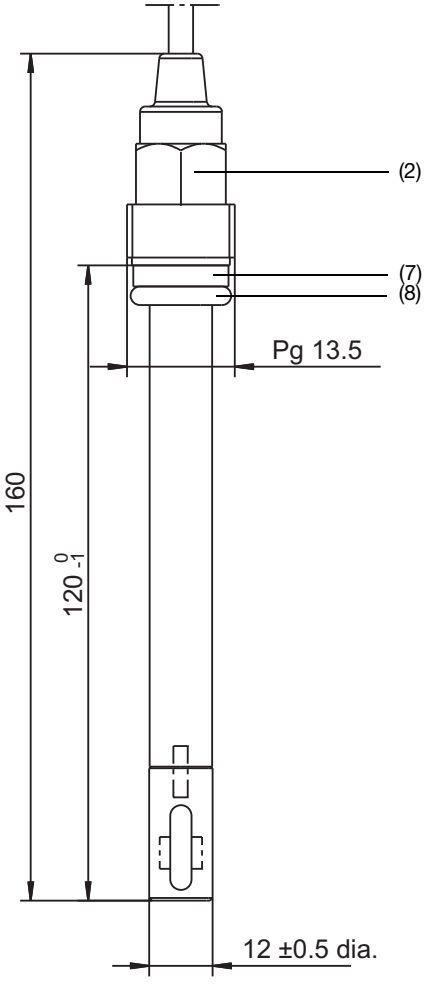
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East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
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Dimensions

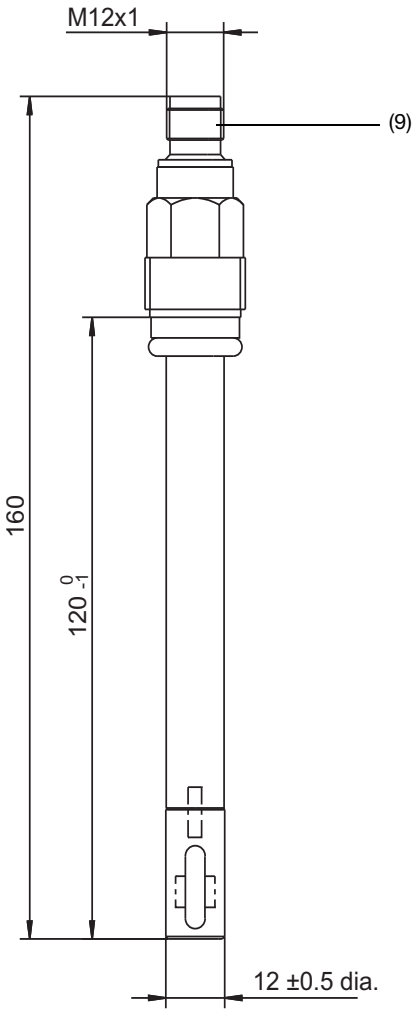
JUMO BlackLine CR-GT



Type 202922/10-...
plug cap with attached cable



Type 202922/10-...
threaded cap with attached cable



Type 202922/10-...
threaded cap with M12 connector

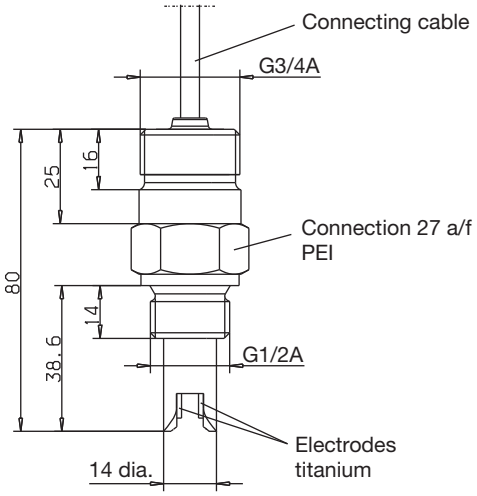
1 Connecting cable 5 mm dia.
2 Electrode head, PC
3 Electrode shaft, PPO
4 Measuring insert (Temperature sensor)
5 Electrode holder, PPO
6 Graphite electrodes
7 Ring, PSU
8 O-ring 10 × 3,5, FPM
9 Built-in connector M12 × 1, 4-pole, 713 series

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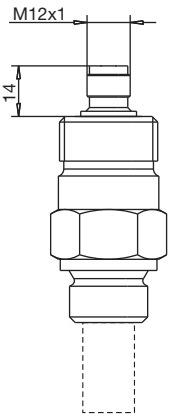
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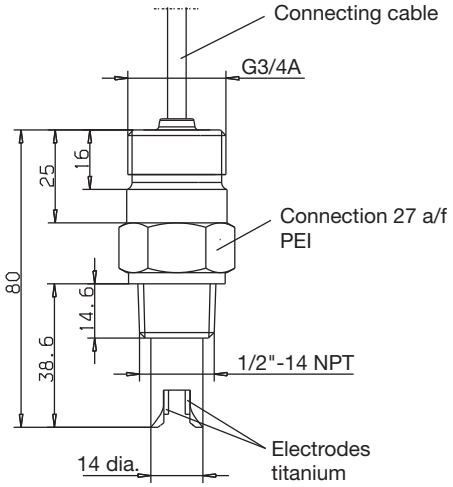
JUMO BlackLine CR-EC



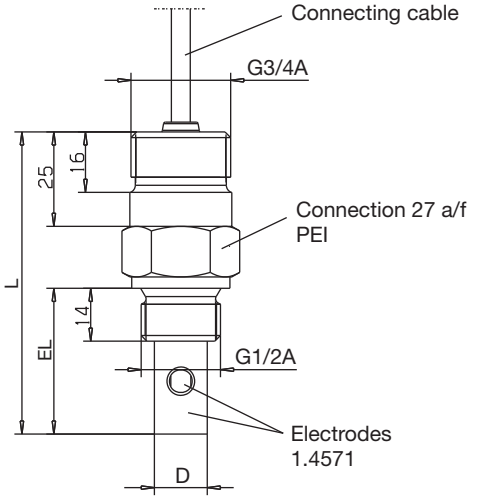
Type 202922/20-0100-1003-60-104-20-5000-040
Cell constant K = 1.0



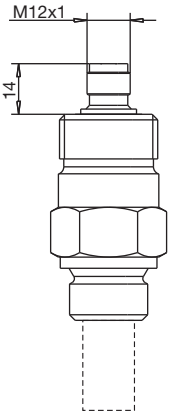
Type 202922/20-...
with M12 connector



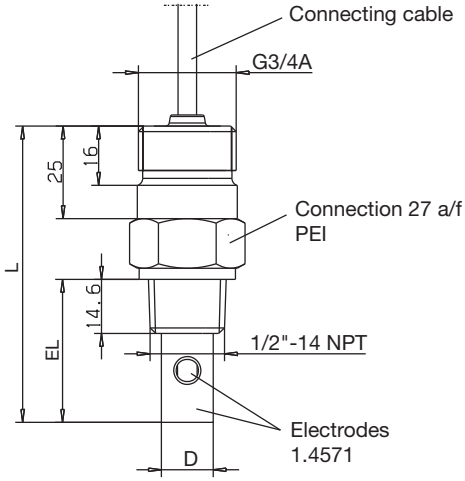
Type 202922/20-0100-1003-60-144-20-5000-040
Cell constant K = 1.0



Type 202922/20-0010-1003-26-104-20-5000-040
Cell constant K = 0.1
Type 202922/20-0001-1003-26-104-20-5000-063
Cell constant K = 0.01



Type 202922/20-...
with M12 connector



Type 202922/20-0010-1003-60-144-20-5000-040
Cell constant K = 0.1
Type 202922/20-0001-1003-26-144-20-5000-063
Cell constant K = 0.01

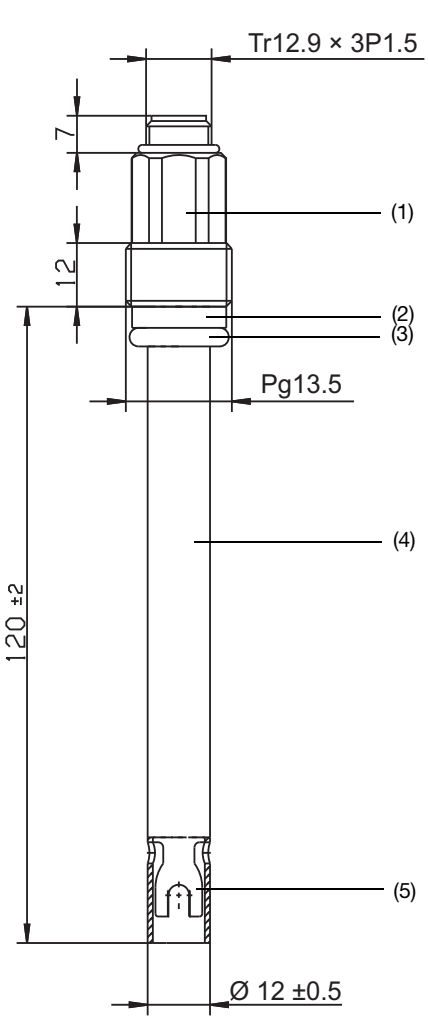
Type	Fitting length EL mm	L mm	D mm
202922/20-0010-...	38.6	80	Ø 14
202922/20-0001-...	63	105	Ø 16

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
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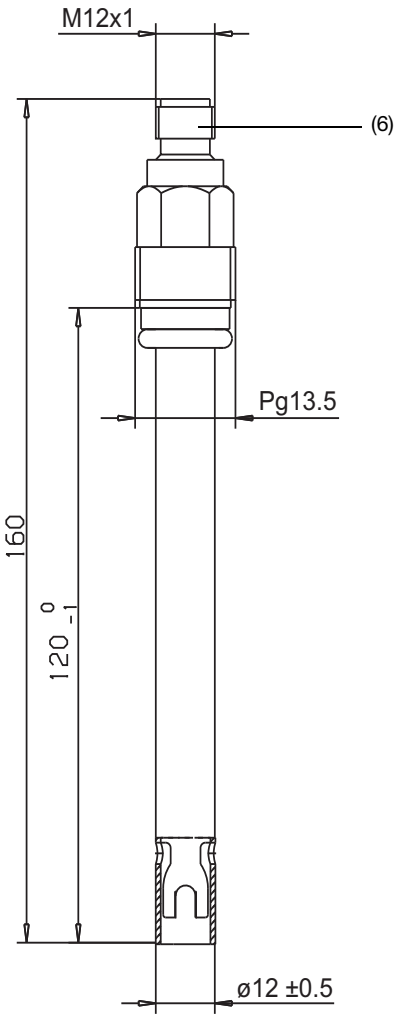
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Harlow, Essex CM 20 2DY, UK
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JUMO BlackLine CR-GS



Type 202922/30-...
threaded cap Pg13.5



Type 202922/30-...
threaded cap with M12 connector

1 Electrode head, PC Ø 5 mm
2 Ring, PSU
3 O-Ring 10 × 3.5, FPM
4 Electrode shat, glass
5 Measuring surface, platinum
6 Built-in connector M12 × 1, 4-pole, 713 series

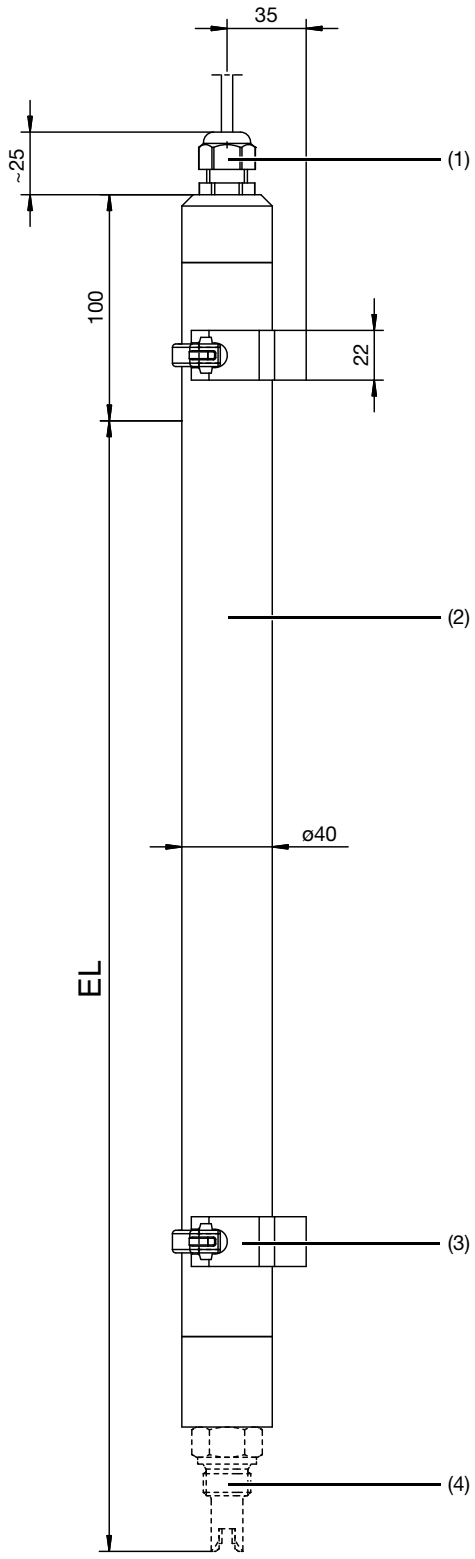
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Accessories for JUMO BlackLine CR-EC

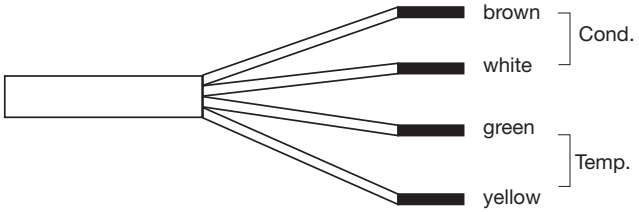
Immersion fitting[1]



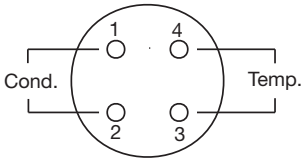
[1] Only suitable for process connection 104 (screw-in thread G1/2“).

Electrical connection

Connection for cable



Connection for M12 connector



EL Immersion length 500 mm or 1000 mm
1 Cable gland, protection class IP68 (up to 0.2 bar)
2 Protection tube
3 Pipe clip
4 Conductivity sensor JUMO BlackLine CR-EC

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Order details

				(1)	**Basic type**
			202922/10		Style: JUMO BlackLine CR-GT
			202922/20		Style: JUMO BlackLine CR-EC
			202922/30		Style: JUMO BlackLine CR-GS
				(2	**Cell constant**
-	o	-	0001		K = 0.01[a]
-	o	-	0010		K = 0.1
o	o	x	0100		K = 1.0
				(3)	**Measuring insert**
x	x	x	0000		none
x	x	o	1003		Pt100
o	o	o	1005		Pt1000
				(4)	**Electrode material**
-	o	-	26		stainless steel 1.4571[b]
-	o	-	60		titanium[c]
-	-	x	61		platinum (platinized)
x	-	-	84		special graphite
				(5)	**Process connection**
-	o	-	104		G1/2" screw-in thread
-	o	-	144		1/2" NPT screw-in thread
x	-	x	413		Pg13.5 thread
				(6)	**Electrical connection**
o	o	-	20		attached cable
-	-	x	22		threaded cap Pg13.5
o	o	o	83		M12 connector
				(7)	**Cable length**
x	o	x	0		no cable (with electrical connection 83 and 22)
x	x	-	5000		length in mm (other lengths on request)
				(8)	**Fitting length**
-	x	-	40		40 mm
-	x	-	63		63 mm (for cell constant K = 0.01 only)
x	-	x	120		120 mm

x = standard

o = optional

- = not available

[a] Only in conjunction with fitting length 063.
[b] Only in conjunction with cell constant 0001 or 0010.
[c] Only in conjunction with cell constant 0100.

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)
Order code		-		-		-		-		-		-		-	
Order example	202922/10	-	0100	-	0000	-	84	-	104	-	83	-	0	-	120

Note:
The type code is a type designation, not a modular system.
If at all possible, choose the articles listed under “Stock items” or “Non-stock items”.
Any free combination of individual code features must be technically checked by us and released.
Please ask us in case of doubt!

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Stock items

Type	Brief description	Part No.
202922/10-0100-0000-84-413-20-5000-120	K = 1.0, without Pt100, attached cable, Pg13.5, 120 mm	00430769
202922/10-0100-1003-84-413-20-5000-120	K = 1.0, with Pt100, attached cable, Pg13.5, 120 mm	00430770
202922/10-0100-1003-84-413-83-0-120	K = 1,0, with Pt100, M12 connector, Pg13.5, 120 mm	00439265
202922/20-0100-1003-60-104-20-5000-40	K = 1.0, with Pt100, attached cable, G 1/2A, 40 mm	00437646
202922/20-0100-1003-60-144-20-5000-40	K = 1.0, with Pt100, attached cable, 1/2"-14 NPT, 40 mm	00437647
202922/20-0010-1003-26-104-20-5000-40	K = 0.1, with Pt100, attached cable, G 1/2A, 40 mm	00418069
202922/20-0010-1003-26-144-20-5000-40	K = 0.1, with Pt100, attached cable, 1/2"-14 NPT, 40 mm	00441398
202922/20-0010-1003-26-104-83-0-40	K = 0.1, with Pt100, M12 connector, G 1/2A, 40 mm	00457199
202922/20-0001-1003-26-104-20-5000-63	K = 0.01, with Pt100, attached cable, G 1/2A, 63 mm	00448986
202922/20-0001-1003-26-104-83-0-63	K = 0.01, with Pt100, G 1/2", M12 connector, 63 mm	00457197
202922/20-0100-1003-60-104-83-0-40	K = 1.0, with Pt100, G 1/2", M12 connector, 40 mm	00459296
202922/30-0100-0000-61-413-22-0-120	K = 1.0, Pg13.5, 120 mm	00303396

Accessories for version with M12 connector

Brief description	Part No.
4-pole cable connector M12 × 1, 713 series, angled (supplied without cable), gold-plated contacts	00318906
25 m connecting cable, for self-assembly, 4-pole + screen	00303681
Connecting cable incl. (straight) M12 cable socket, length 10 m, 4-pole + screen	00458513
Connecting cable incl. (straight) M12 cable socket, length 25 m, 4-pole + screen	00458514

Accessories for JUMO BlackLine CR-EC

Brief description	Part No.
Immersion fitting, EL = 500 mm[a]	00452567
Immersion fitting, EL = 1000 mm[a]	00452571
Retainer for immersion fitting with 40 mm diameter	00453191

[a] Only suitable for process connection 104 (screw-in thread G1/2“).