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 UK LTD
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: info.uk@jumo.net
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6724 Joy 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 tecLine CR-4P
Conductive 4-Electrode Conductivity Sensor

Brief description

The JUMO tecLine CR-4P fills the gap between conductive conductivity measurement with two-electrode conductivity sensors, and inductive conductivity measurement.
Four-pin technology makes it possible to cover a very wide measuring range from about 1 µS/cm to 600 mS/cm, with just one conductivity sensor.
The hygienic design of both the sensor and the system for process connection (JUMO PEKA) makes it easy to use in pharmaceutical and food technology. JUMO PEKA is an adapter system that combines the conductivity sensor with the process connection. All the materials are physiologically safe, and meet FDA standards.
Stainless steel electrodes are inserted into a circular, plastic body. The process seal provided as standard is an EPDM O-ring. A fast-response temperature probe delivers information about the process temperature to the measurement amplifier. Electrical connection is made via an M12 connector.
The conductivity sensor is available in three fitting lengths, for optimum installation in different pipe diameters. The conductivity sensor can also be installed in container walls. No incident flow is required to make it work, but is recommended for fast, stable measurement values and to prevent the accumulation of deposits.
A certificate of quality is included among the items supplied (exact cell constant, FDA approval for the material, typical surface roughness, etc.).

Operative range:
Their vast measuring range allows the sensors to be used in washing processes in food and drink applications, pharmaceuticals and biotechnology, where the different conductivities have to be safely recorded by a measuring system (e.g. CIP/SIP applications, reverse processes in ion exchangers, phase separation, bottle cleaning plants, process water).

Note:
Compatible with JUMO transmitters/controllers AQUIS 500 CR, dTRANS CR 02, AQUIS touch S/P, digiLine CR ST10, as well as JUMO PEKA process connection adapters..

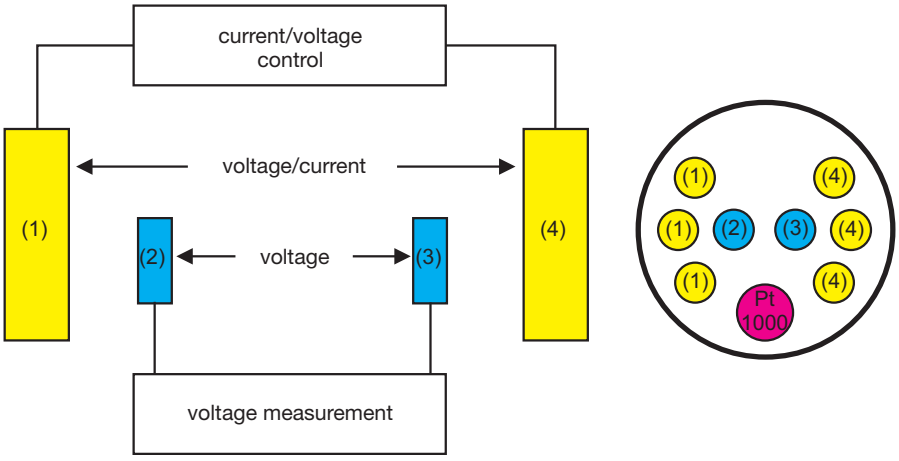


Typ 202930
with JUMO PEKA adapters

Key features

- Vast measuring range
- Hygienic process connections (clamp, Varivent®, aseptic NKS)
- CIP/SIP capability
- Design complies with EHEDG and FDA standards
- Certificate of quality included

Block diagram



Function

The conductivity sensors have two pairs of electrodes. The transmitter applies alternating current at the outer pair of electrodes.
A voltage is released at the inner electrodes, subject to the conductivity of the measuring material. The transmitter acquires the voltage and uses it, in conjunction with the given current, to calculate the electrolytic conductivity value. Functionally, excitation and measurement are kept separate. This has some advantages compared to 2-electrode conductivity sensors, as the effects of polarization recede into the background.
To a large extent, incoming resistances are automatically compensated. Measurement errors as a result of contamination or deposits, are reduced.

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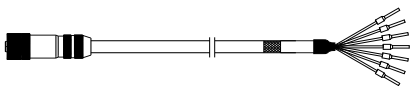
Technical data

Typical measuring range[a]	1 µS/cm to approx. 600 mS/cm
Accuracy	≤ 5 % of measured value
Cell constant[b]	typically, K = 0.3 - 0.4 cm^{-1}
Operating temperature	-10 to +120 °C, briefly 140 °C (sterilization)
Maximum pressure	16 bar at 25 °C 6 bar at -10 °C and +140 °C
Temperature measurement	With Pt1000, DIN EN 60751 Class A
Electrical connection[c]	M12 connector
Enclosure protection	IP65 when connected
Fitting length	18 mm 38 mm 48 mm (see "Dimensions")
Materials in contact with the measuring medium • Cell housing • Electrodes • Probe pocket • Seal	 FDA compliant PEEK Stainless steel 1.4435 (316L) Stainless steel 1.4435 (316L) EPDM (other material on request)
Process connection	JUMO PEKA[d] (hygienic process connection) Available process connection adapters: • Varivent DN 40-125, stainless steel 1.4435 (316L) • Clamp DN 25/32/40 and DN50, stainless steel 1.4435 (316L) • Aseptic DN 40 and DN50, stainless steel 1.4435 (316L) • Aseptic NKS DN 40, stainless steel 1.4435 (316L)
Sensor installation	Only possible in conjunction with JUMO PEKA process connection adapters![e]
Surface quality (roughness)	Stainless steel components ≤ 0.6 µm Plastic components ≤ 0.8 µm

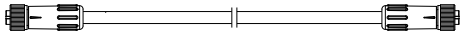
[a] Measuring ranges are also dependent on the transmitter being used.
[b] See the namplate for a measured cell constant. A cell constant deviation can be adjusted at the transmitter.
[c] The CR-4P cable is required for connection (see Accessories)!
[d] See chapters “Dimensions” and “Accessories”. Further information is provided in data sheet 409711.

Connecting cables (accessory)

for JUMO AQUIS 500 CR, JUMO dTRANS CR 02, and JUMO AQUIS touch S/P

M12 female connector	Metal, 8-pin	for JUMO AQUIS 500 CR and dTRANS CR 02 
Cable diameter	7 ±0.3 mm	
Stranded wire cross section	0.25 mm^2 each	
Cable material	PU, blue	
Ambient temperature	-30 to +80 °C	for JUMO AQUIS touch S/P 
Cable length	5 m or 10 m	

for JUMO digiLine CR ST10

M12 female connectors	Plastic, 8-pin[a]	
Cable diameter	7 ±0.3 mm	
Cable material	PUR, blue	
Ambient temperature	-30 to +80 °C	
Cable length	1.5 m, 5 m or 10 m	

[a] Connection side of transmitter colored blue.

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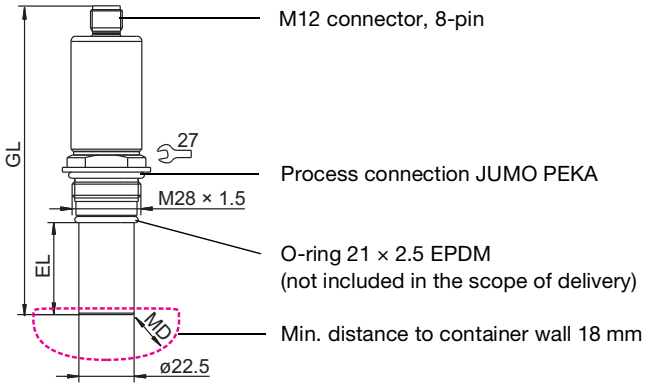
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Dimensions

Choose the immersion length (EL) according to the installation situation.

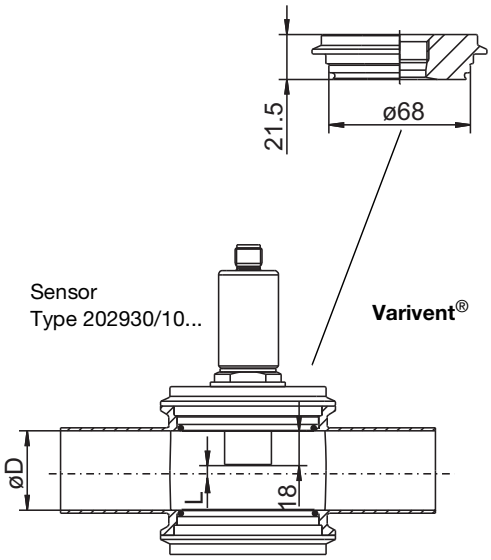
Immersion length EL	Total length GL	Type
18	126	202930/10
38	146	202930/20
48	156	202930/30



Mounting suggestions

The customer must provide the T-pieces!

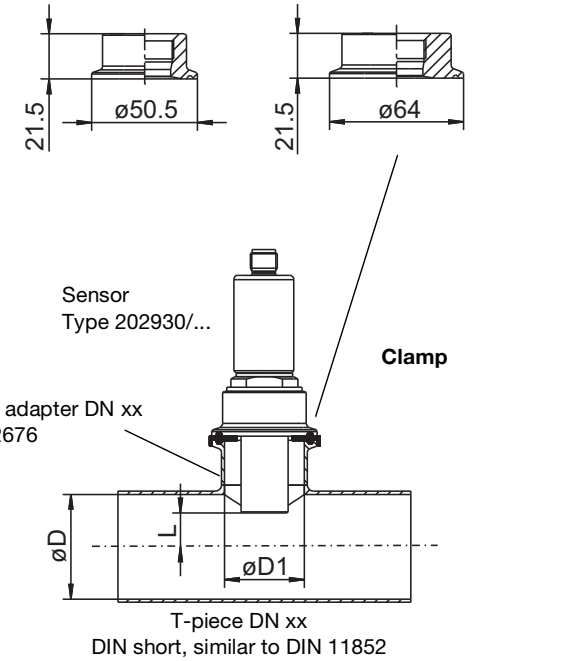
Process connection adapter JUMO PEKA
Varivent DN 40-125
Part no.: 00577961; Ra < 0.8 µm



Varivent housing DN xx

Process connection adapter JUMO PEKA
Clamp DN 25/32/40
Part no.: 00577998; Ra < 0.8 µm

Clamp DN 50
Part no.: 00577997; Ra < 0.8 µm



T-piece DN xx
DIN short, similar to DIN 11852

Varivent housing DN	Ø D	L	Sensor Type
40	38	3	202930/10
50	50	9	
65	66	18	
80	81	24,5	
100	100	34	

Clamp adapter DN	T-piece DN	Ø D	Ø D1	L	Sensor Type
25	32-25	32[a]	26	5	202930/20
	40-25	38[a]		0	202930/30
	50-25	50		7	
	65-25	66		15	
	80-25	81		20	
	100-25	100		30	
50	65-50	66	50	15	
	80-50	81		20	
	100-50	100		30	

[a] It is recommended to control the cell constant with the calibration procedure of the transmitter.

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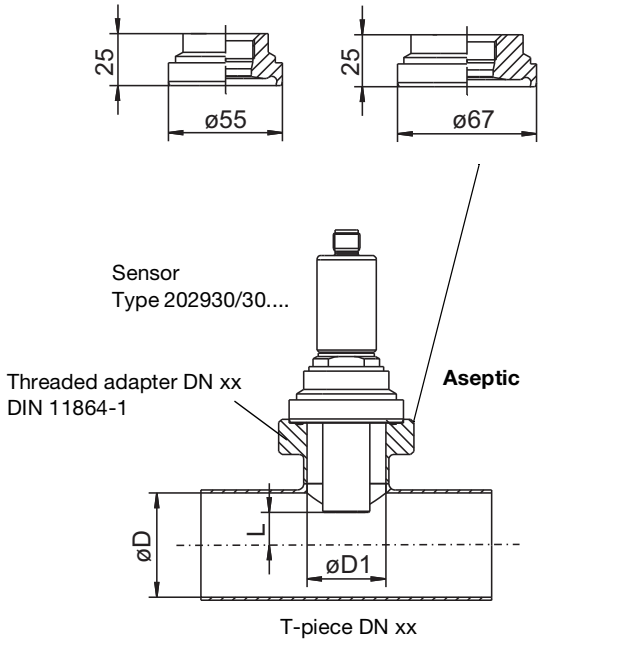
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Mounting suggestions

The customer must provide the T-pieces!

Process connection adapter JUMO PEKA
Aseptic DN 40
Part no.: 00577995; R < 0.8 µm

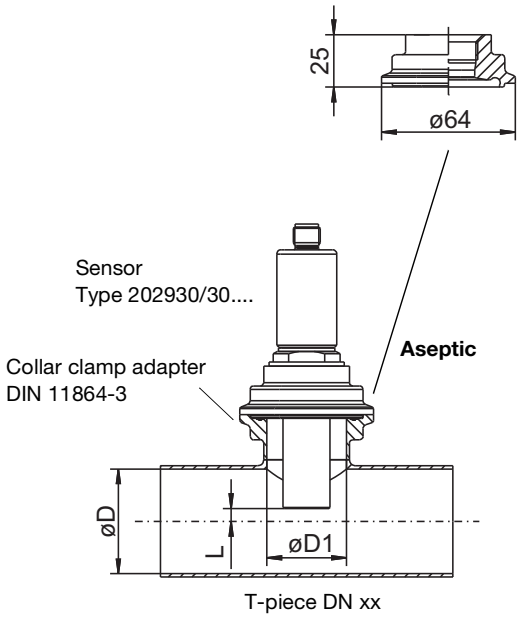
Aseptic DN 50
Part no.: 00577979; Ra < 0.8 µm



T-piece DN xx

Threaded adapter DN	T-piece DN	Ø D	Ø D1	L	Sensor Type
40	50-40	50	38	10	202930/30
	65-40	66		18	
	80-40	81		27	
	100-40	100		37	
50	65-50	66	50	18	
	80-50	81		27	
	100-50	100		37	

Process connection adapter JUMO PEKA
Aseptic NKS DN 40
Part no.: 00577999; Ra < 0.8 µm



T-piece DN xx

Collar clamp adapter DN	T-piece DN	Ø D	Ø D1	L	Sensor Type
NKS DN 40 Form A	50-40	50	38	3	202930/30
	65-40	66		13	
	80-40	81		25	
	100-40	100		35	

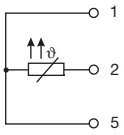
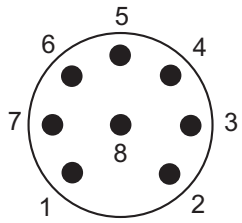
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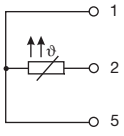
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Terminal assignment

Sensor

Connection for	**M12 connector of the sensor**	
	Pin	**Assignment**
Pt1000 temperature probe for temperature compensation 	1 2 5	
Voltage tap inner electrode 2	3	
Current entry outer electrode 2	4	
Current entry outer electrode 1	6	
Voltage tap inner electrode 1	7	
NC	8	

Connecting cable with wire ends (accessories)

Connection for	**M12 connector**	**Bare wire ends**
	Pin	**Color**
Pt1000 temperature probe for temperature compensation 	1 2 5	GN YE BN
Voltage tap inner electrode 2	3	PK
Current entry outer electrode 2	4	BU
Current entry outer electrode 1	6	RD
Voltage tap inner electrode 1	7	GR
NC	8	-
CAUTION! The shielding of the cable has to be connected to the transmitter **only** – not to the sensor!		

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Order Details

	(1)	**Basic type**
202930		JUMO tecLine CR-4P - Conductive 4-Electrode Conductivity Sensor
	(2)	**Basic type extension**
10		Short design
20		Medium design
30		Long design
	(3)	**Temperature compensation**
1005		Pt1000
	(4)	**Electrode material**
31		Stainless steel 1.4435 (316L)
	(5)	**Process connection**[a]
997		JUMO PEKA
	(6)	**Electrical connection**[b]
83		M12 connector
	(7)	**Extra code**
000		none

[a] Process connection adapters (see "Accessories") must be ordered separately!
[b] The CR-4P cable is required for electrical connection (see "Accessories")!

	(1)		(2)		(3)		(4)		(5)		(6)		(7)
Oder code		/		-		-		-		-		-	
Samlpe order	202930	/	10	-	1005	-	31	-	997	-	83	-	000

Other versions on request!

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Stock versions

Type	Brief description	Part no.
202930/10-1005-31-997-83/000	4-Electrode Conductivity Sensor; short design	00531113
202930/20-1005-31-997-83/000	4-Electrode Conductivity Sensor; medium design	00531048
202930/30-1005-31-997-83/000	4-Electrode Conductivity Sensor; long design	00531114

Accessories

Designation	Part no.
Connecting cable for 4-electrode conductivity sensors M12 female connector, 8-pin (metal), to ferrules Length 5 m	00528699
Connecting cable for 4-electrode conductivity sensors M12 female connector, 8-pin (metal), to ferrules Length 10 m	00528700
Connecting cable for 4-electrode conductivity sensors to JUMO AQUIS touch S/P M12 female connector, 8-pin (metal), to ferrules, extended connection lines for Pt1000 Length 5 m	00502027
Connecting cable for 4-electrode conductivity sensors to JUMO AQUIS touch S/P M12 female connector, 8-pin (metal), to ferrules, extended connection lines for Pt1000 Length 10 m	00502029
Connecting cable for 4-electrode conductivity sensors to JUMO digiLine CR ST10, M12 female connector, 8-pin (plastic) to M12 female connector, 8-pin (plastic), Length 1.5 m	00759427
Connecting cable for 4-electrode conductivity sensors to JUMO digiLine CR ST10, M12 female connector, 8-pin (plastic) to M12 female connector, 8-pin (plastic), Length 5 m	00759428
Connecting cable for 4-electrode conductivity sensors to JUMO digiLine CR ST10, M12 female connector, 8-pin (plastic) to M12 female connector, 8-pin (plastic), Length 10 m	00759431

Process connection adapter JUMO PEKA for	Material	Part no.
Varivent DN 40-125	Stainless steel 1.4435/316L; Ra < 0.8 µm with certificate EN 10204-3.1	00577961
Clamp DN25/32/40	Stainless steel 1.4435/316L; Ra < 0.8 µm with certificate EN 10204-3.1	00577998
Clamp DN 50	Stainless steel 1.4435/316L; Ra < 0.8 µm with certificate EN 10204-3.1	00577997
Aseptic DN 40	Stainless steel 1.4435/316L; Ra < 0.8 µm with certificate EN 10204-3.1	00577995
Aseptic DN 50	Stainless steel 1.4435/316L; Ra < 0.8 µm with certificate EN 10204-3.1	00577979
Aseptic NKS DN 40	Stainless steel 1.4435/316L; Ra < 0.8 µm with certificate EN 10204-3.1	00577999

O-Ring 21 × 2.5	EPDM	00446162