

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, CM20 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 tecLine CR S01

Conductive 2-electrode conductivity sensor

Brief description

The JUMO tecLine CR S01 sensors acquire the electrolytic conductivity of a measuring liquid according to the conductive 2-electrode measuring principle. A transmitter supplies the electrodes with an alternating voltage. The current flowing through the measurement medium depends on the medium's conductivity. An integrated temperature probe (either Pt100 or Pt1000) simultaneously acquires the temperature of the measuring liquid.

The sensors are available in two design types, which differ in terms of their geometry and the cell constant K. The version with $K = 1.0$ covers a wide measuring range of 1.0 to 5000 $\mu\text{S}/\text{cm}$ (5 mS/cm). The version with $K = 0.1$ can be used in a range of 0.1 to 1000 $\mu\text{S}/\text{cm}$. The electrodes of these sensors are made from stainless steel 1.4404 and are set in a PEEK (polyether ether ketone) body, which offers a high level of chemical resistance. Another feature of these sensors is their resistance to heat and cold, with an area of application between -40 and $+100$ °C.

The sensor housing is based on a cable fitting according to DIN EN 62444 and ensures that the sensor has a compact size. As a result, the sensor can also be installed in hard-to-reach areas. With immersion lengths between 22.5 and 44.5 mm, the sensors can also be installed in pipes with small nominal widths.

Process connections featuring a globally standardized metric thread (M20 \times 1.5) or standardized self-sealing NPT thread (1/2") ensure that the sensor can be mounted easily and reliably.

Application

The sensor is suitable for universal use, for example:

- Drinking water, service water, and wastewater applications
- Refrigeration, air-conditioning, and cooling system construction
- Reverse osmosis plants
- Industrial rinsing processes involving a low level of pollutants
- Horticultural technology
- Industrial water applications
- Chemical industry
- Food and beverage industry

It is possible to select different materials for the process connection, such as nickel-plated brass or corrosion-resistant stainless steel, meaning the user can select the ideal sensor for their particular application.

The "Sensor selection guide" table on the next page is intended to help users make their selection.



Type 202928/10-0010-...

Special features

- Robust, compact process sensor, also suitable for small nominal pipe widths
- Wide measuring range (0.1 to 5000 $\mu\text{S}/\text{cm}$)
- Resistant to heat and cold at temperatures between -40 and $+100$ °C
- Simple installation
- Protection type IP68
- Provides good chemical resistance to aggressive media
- Easy to clean

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Sensor selection guide

The information in this table has been compiled from relevant references and guidelines. The table is intended as an overview to make it easier for the user to select their sensor. The table is not exhaustive. The user must verify the suitability of the sensors themselves.

Process connection material	Resistance	Common applications	Notes on suitability
Brass, nickel-plated	Resistant to <ul style="list-style-type: none"> • Aqueous and alkaline solutions • Non-oxidizing acids (e.g. hydrochloric acid) • Neutral salt solutions • Organic substances Not resistant to <ul style="list-style-type: none"> • Oxidant • Oxidizing acids • Ammonia compounds • Hydrogen sulfide • Seawater 	<ul style="list-style-type: none"> • Drinking water • Service water • Refrigeration, air-conditioning, and cooling systems • General water and wastewater applications 	Not suitable for <ul style="list-style-type: none"> • Swimming pools • Seawater und brackish water • Soft water with a high chloride content
Stainless steel 1.4404	Resistant to <ul style="list-style-type: none"> • Organic and inorganic acids • Solutions with moderate chlorine^a and salt concentrations Not resistant to <ul style="list-style-type: none"> • Solutions with a high hydrogen sulfide content 	<ul style="list-style-type: none"> • Drinking water • Service water • General water and wastewater applications • Sewage treatment plants • Industrial water • Swimming pools • Chemical industry • Apparatus engineering • Paper industry • Automotive industry • Food industry • Beverage industry, breweries • Dairies 	Suitable for <ul style="list-style-type: none"> • Salt solutions^b Not suitable for <ul style="list-style-type: none"> • Hygienic applications • Seawater^b

^a Limited resistance to chlorine (up to 4 mg/l).

^b Due to the material that the electrode is made from (stainless steel 1.4404), the content of chloride ions must not exceed 1000 mg/l in cold water and 500 mg/l in heated indoor and open-air swimming pools.

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Technical data

Measuring principle for conductivity	Conductive
Cell constant ^a	K = 0.1 or K = 1.0
Typical measuring range ^b with K = 0.1 with K = 1.0	0.1 to 1000 µS/cm 1 to 5000 µS/cm
Temperature sensor	Either Pt100 or Pt1000 (at least Class A in each case), optionally without a temperature sensor
t ₉₀ temperature ^c	< 81 s
Process connection	Thread 1/2" NPT or thread M20 × 1.5
Materials ^d Process connection Sensor base Electrodes	Stainless steel 1.4404 or nickel-plated brass PEEK Stainless steel 1.4404
Admissible storage temperature	-20 to +80 °C
Admissible medium temperature	-40 to +100 °C
Admissible process pressure	6 bar at 100 °C
	<p>The graph shows a constant process pressure of 6 bar across the entire temperature range from 0 °C to 100 °C. The y-axis is labeled 'p/bar' and ranges from 0 to 6. The x-axis is labeled 'T/°C' and ranges from 0 to 100.</p>
Protection type ^e	IP68
Electrical connection On the sensor On the transmitter	Securely connected cable, 5 m long 4 lines with ferrules + shield

- ^a The cell constant can differ by ±10 % of the nominal value depending on manufacturing. This deviation can be equalized on the transmitter.
- ^b The measuring ranges also depend on the transmitter being used. When used in measuring ranges other than the "typical" one, incorrect measured values may occur due to polarization.
- ^c DIN EN 60751.
- ^d Please also refer to the dimensional drawings for the sensors.
- ^e DIN EN 60529.

Suitable transmitters

The sensors are suitable for being connected to the following transmitters:

Type	Features	Data sheet
JUMO ecoTRANS Lf 01/02	Transmitter and switching device for conductive conductivity sensors, DIN-rail mounting, 1 galvanically isolated analog output (Lf 01) or 1 relay output (Lf 02)	202731
JUMO ecoTRANS Lf 03	Transmitter and switching device with LCD display for conductive conductivity sensors, DIN-rail mounting, 2 analog outputs (conductivity and temperature); 1 relay output/2 open-collector outputs	202732
JUMO ecoTRANS Lf 04	Transmitter and switching device for conductive conductivity sensors, DIN-rail mounting, output: RS485 serial interface with Modbus-RTU	202733
JUMO dTRANS CR 02	Modular, compact multichannel transmitter and controller with backlit graphic display for conductivity in the panel housing or surface-mounted housing, 1 main input, 1 analog input, 2 digital inputs, other inputs via optional boards; up to 3 analog outputs, up to 7 relays	202552
JUMO AQUIS 500 CR	Transmitter and controller with backlit graphic display for conductivity, 2 analog outputs, 2 relays with changeover contacts, comprehensive controller and switching functions	202565
JUMO AQUIS touch P/S	Modular multichannel measuring devices for liquid analysis with integrated controller and paperless recorder, USB host, USB device, Modbus, PROFIBUS-DP, and Ethernet using optional boards	202580 and 202581

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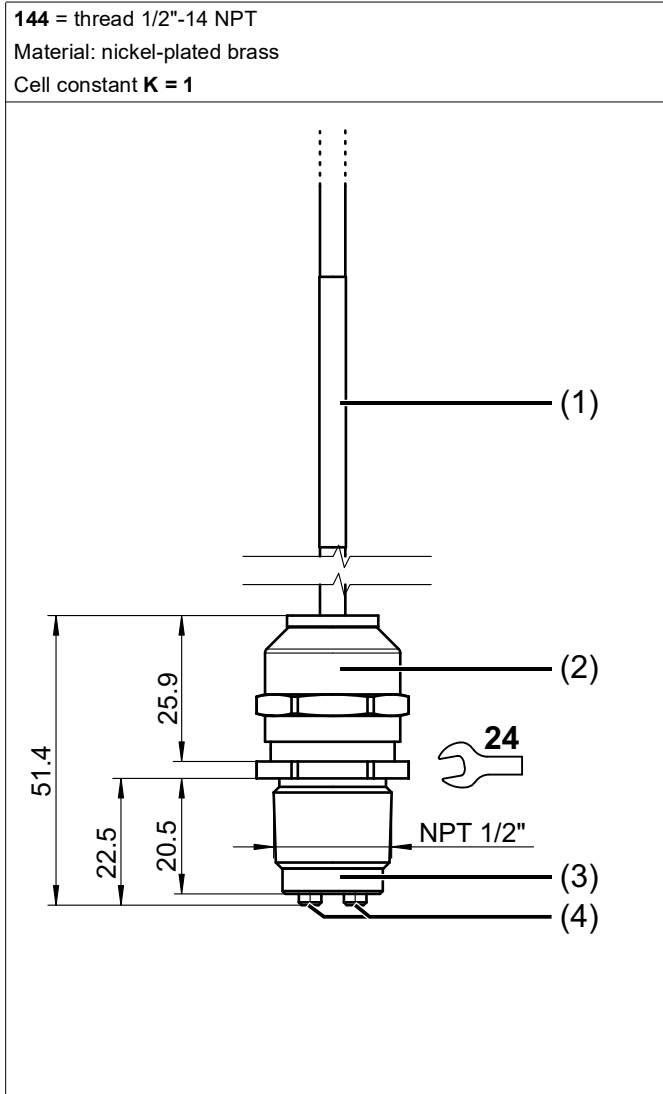
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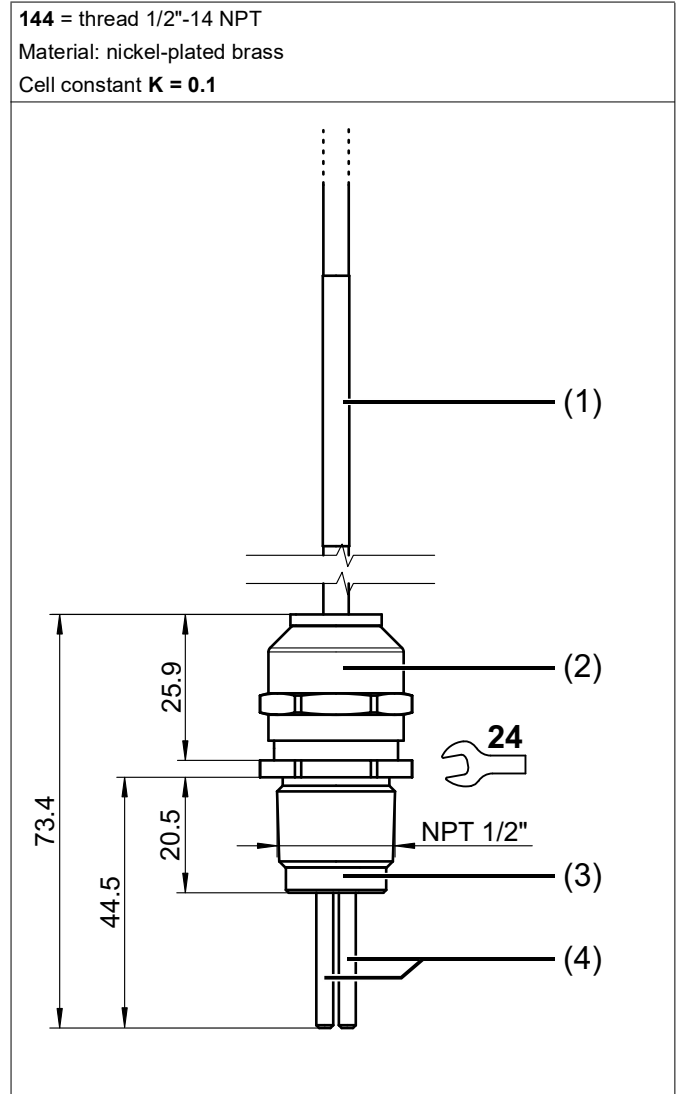


Dimensions

Process connections



- 1 Nameplate
- 2 Cable fitting, nickel-plated brass

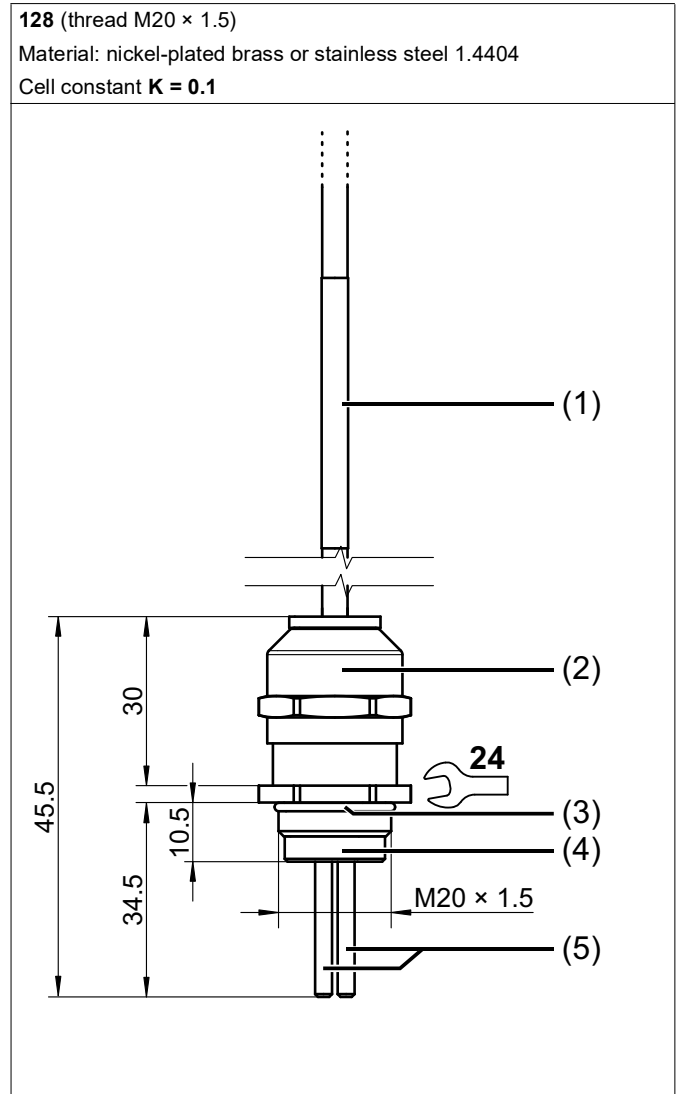
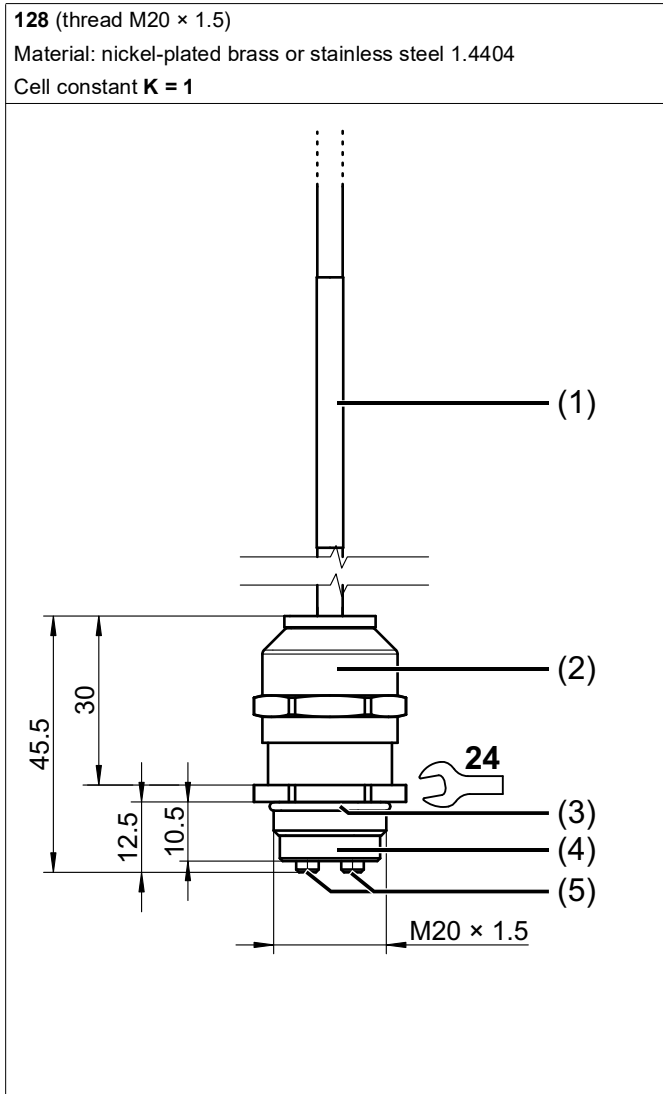


- 3 Sensor base, PEEK
- 4 Electrodes, stainless steel 1.4404

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- | | | | |
|---|--|---|------------------------------------|
| 1 | Nameplate | 4 | Sensor base, PEEK |
| 2 | Cable fitting, nickel-plated brass or stainless steel 1.4404 | 5 | Electrodes, stainless steel 1.4404 |
| 3 | O-ring, NBR | | |

Electrical connection

Figure	Wire color	Function
	White	Electrode
	Brown	Electrode
	Yellow	Pt100/Pt1000
	Green	Pt100/Pt1000
	Black	Shield

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Order details

(1) Basic type	
202928	JUMO tecLine CR-S01 – Conductive 2-electrode conductivity sensor
(2) Basic type extension	
10	Standard version
(3) Cell constant	
0010	K = 0.1
0100	K = 1.0
(4) Measuring insert	
0000	None
1003	1 × Pt100 in two-wire circuit
1005	1 × Pt1000 in two-wire circuit
(5) Process connection	
128	Thread M20 × 1.5
144	Thread 1/2-14 NPT
(6) Process connection material	
24	Stainless steel 1.4404 (CrNi 1.4404) ^a
46	Nickel-plated brass (CuZn)
(7) Electrical connection	
20	Fixed cable connection
(8) Length of permanent cable	
5000	5000 mm
(9) Extra codes	
0	None

^a Only in combination with process connection 128.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)						
Order code	<input type="text"/>	/	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	/	<input type="text"/>
Order example	202928	/	10	-	0100	-	1005	-	128	-	24	-	20	-	5000 / 0