

JUMO GmbH & Co. KG

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JUMO Instrument Co. Ltd.

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JUMO Process Control, Inc.

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JUMO tecLine Ci

Inductive conductivity and temperature sensor for hygienic applications

Application

- Dairies
- Breweries
- Soft drinks manufacturing/bottling
- Mineral springs
- Drinking water
- Liquid food production
- CIP/SIP systems
- Other rinsing and cleaning processes
- Measuring the concentration of acids, lyes and cleaning chemicals, etc.

Brief description

The sensor detects the electrolytic conductivity of a process liquid. The sensor uses the inductive principle of measurement. An integrated, fast-response (Pt1000) temperature probe detects the process temperature at the same time.

The overall construction of the sensor conforms to EHEDG standards. The joint and gap-free design and the high quality of the finish meet the highest standards for hygienic processes. The quality of the PEEK(polyetheretherketone) body material is approved for food use. Certain versions can be supplied with an EHEDG certificate.

A vast number of process connections are available to ensure flexibility in systems, and can even be used as spare equipment for older devices.

The sensor is primarily designed for use in food and drink installations. But where the body material is suitable, it can also be used in other industries. Customized variants (OEM versions) are available on request.

Because it measures inductively, the sensor is practically maintenance-free, compared with the conductive method; deposits and grease or oil film on the surface of the sensor have virtually no effect on measuring accuracy.

The JUMO tecLine Ci sensor is designed for connection to the JUMO AQUIS 500 Ci (as per data sheet 202566), JUMO CTI-750 (as per data sheet 202756) and JUMO AQUIS touch (as per data sheets 202580 and 202581) transmitters.

Product advantages

- EHEDG-compliant sensor design enhances hygiene safety
- Materials are FDA/food-use approved
- A variety of process connection variants
- A fast-response, internal temperature sensor
- Constructed without seals (parts coming into contact with the medium)



Type 202941/10-607-...



Type 202941/10-686-...

Approvals and approval marks



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Technical data

Conductivity measurement principle	Inductive
Conductivity measuring range ^a	0 - 500 µS/cm to 0 - 2000 mS/cm (depending on connected transmitter)
Conductivity accuracy for measuring range	
0 to 500 µS/cm	≤ 1 %
0 to 1000 µS/cm	≤ 1 %
0 to 2000 µS/cm	≤ 0,5 %
0 to 10 mS/cm	≤ 0,5 %
0 to 20 mS/cm	≤ 0,5 %
0 to 50 mS/cm	≤ 0,5 %
0 to 100 mS/cm	≤ 0,5 %
0 to 200 mS/cm	≤ 0,5 %
0 to 500 mS/cm	≤ 0,5 %
0 to 1000 mS/cm	≤ 1 %
0 to 2000 mS/cm	≤ 1 %
Cell constant	dependent on design: 5.0 cm ⁻¹ or 5.15 cm ⁻¹
Temperature sensor	Pt1000, Class A
t ₉₀ temperature ^b	≤ 26 s
Permissible ambient temperature	-10 to +60 °C
Permissible storage temperature	-20 to +75 °C
Enclosure protection ^c	IP67
Permissible medium temperature ^d	
In operation	-10 to +125 °C
For short periods (sterilization)	≤ 150 °C (≤ 60 min, ≤ 5 bar)
Permissible process pressure	
at +20 °C	max. 12 bar
at +80 °C	max. 10 bar
at +125 °C	max. 8 bar
at +150 °C	max. 5 bar (≤ 60 min)
at -10 to +150 °C	min. -0,1 bar
Sensor material	
in contact with medium	dependent on design: PEEK, 1.4301 stainless steel, AISI 304, EPDM
not in contact with medium	dependent on design: 1.4301 stainless steel, AISI 304, PA6.6 GF30, PUR, FPM, CuZn
Process connection	see order details / dimensions
Electrical connection	JUMO tecLine Ci type conductivity sensors are suitable for connection to the transmitters JUMO AQUIS 500 Ci, JUMO CTI-750, and JUMO AQUIS touch!
Connection type	fixed connection cable
Socket	M12 socket
Socket material	CuZn, PA6.6 GF30, PUR
Cable material	outer sleeve: PUR
Cable lengths	5 m; 10 m (standard); 15 m; 20 m; 25 m; 30 m (no other lengths available)
Permissible temperature	--20 to +75 °C
Approvals/marks of conformity	EHEDG (for type 202941/10-686-...)

^a Usual application range from approx. 100 µS/cm.

^b DIN EN 60751.

^c DIN EN 60529.

^d **Note:** Temperature, pressure and sample medium affect the life of the sensor!

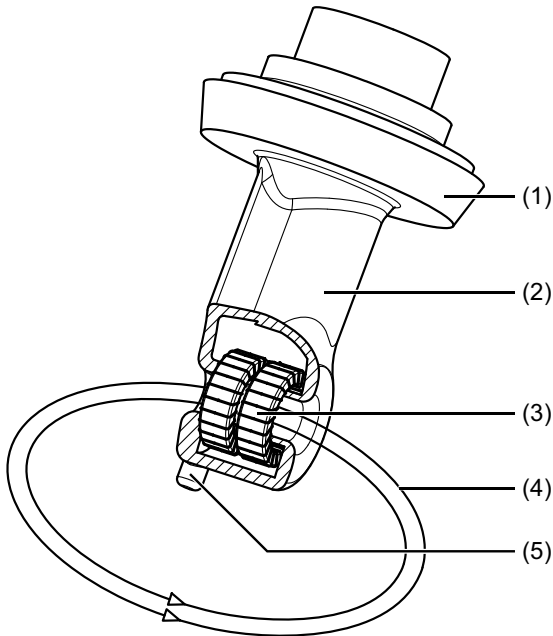
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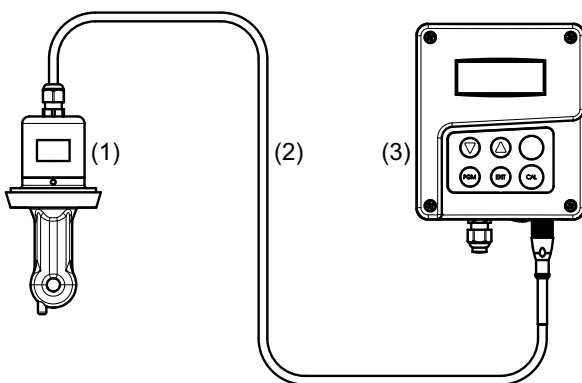
Measuring principle



Conductivity is measured by an inductive probe. Sinusoidal AC voltage supplies the transmitter coil. Current is induced in the receiver coil, subject to the conductivity of the liquid to be measured. The current is proportional to the conductivity of the medium. The cell constant of the inductive probe depends on the geometry. The cell constant can also be affected by the parts in close proximity to it. Use the "installation factor" parameter on the transmitter to correct this effect.

- (1) Process connection
- (2) PEEK material
- (3) Induction coils
- (4) Liquid loop
- (5) Temperature sensor

Setting up a measuring path



- (1) JUMO tecLine Ci, hygienic inductive conductivity and temperature sensor
- (2) Cable (JUMO tecLine Ci component)
- (3) JUMO AQUIS 500 Ci, transmitter/controller for conductivity, concentration and temperature

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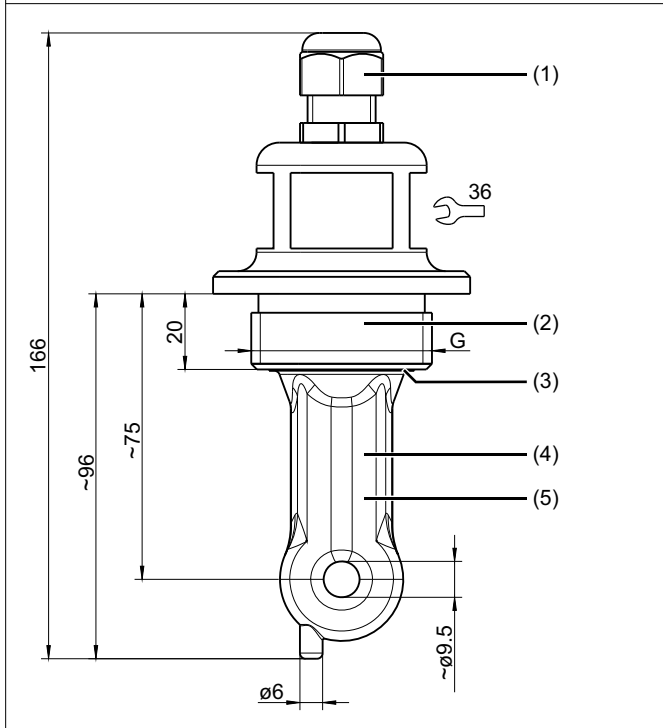
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Dimensions

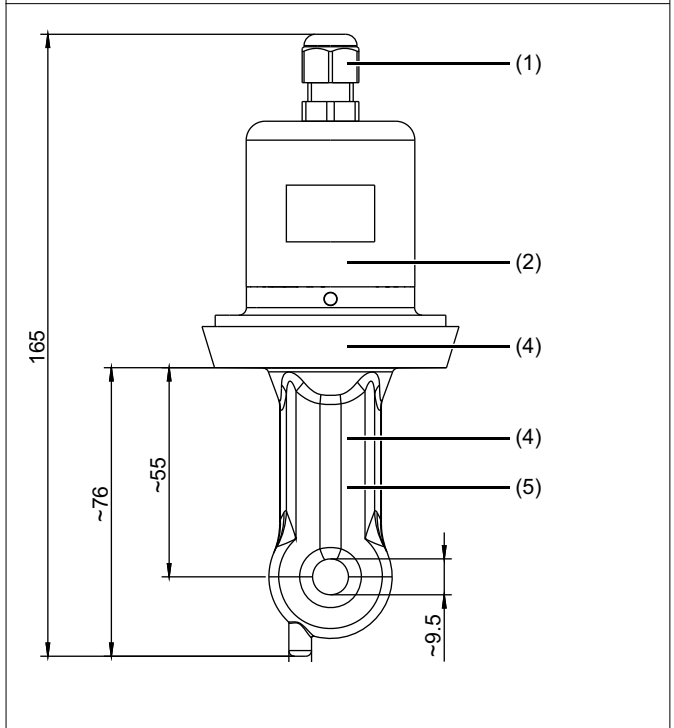
Process connections

108 = Screw connection G 1 1/2"
 110 = Screw connection G 2"



- 1 PA6, CR, NBR
- 3 EPDM
- 5 Cell constant $k = 5,0 \text{ cm}^{-1}$

607 = Taper socket DN 50 DIN 11851
 (Union nut not included in scope of delivery)



- 2 Stainless steel 1.4301, AISI 304
- 4 PEEK

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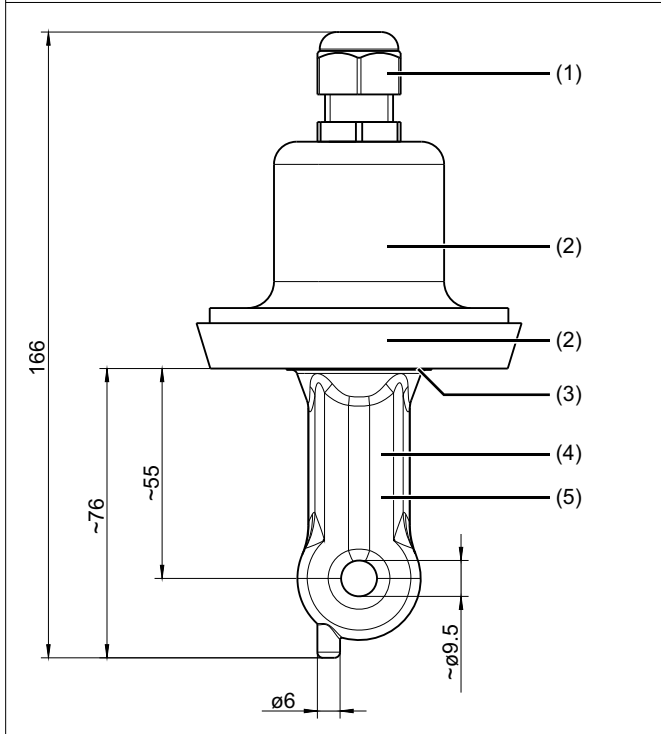
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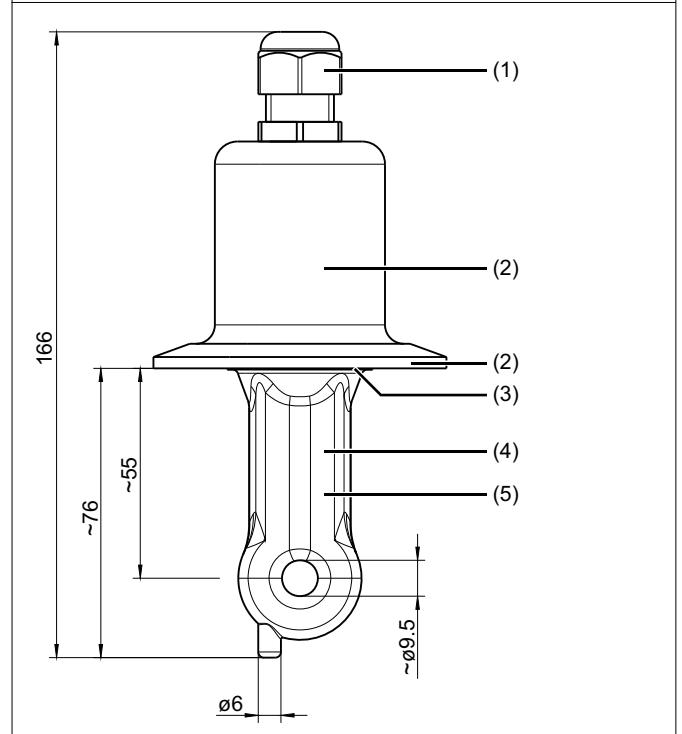


608 = Taper socket DN 65 DIN 11851
609 = Taper socket DN 80 DIN 11851
(Union nut not included in scope of delivery)



- 1 PA6, CR, NBR
- 3 EPDM
- 5 Cell constant $k = 5,0 \text{ cm}^{-1}$

617 = Clamping socket (Clamp) 2 1/2"
(Retaining clamp not included in scope of delivery)



- 2 Stainless steel 1.4301, AISI 304
- 4 PEEK

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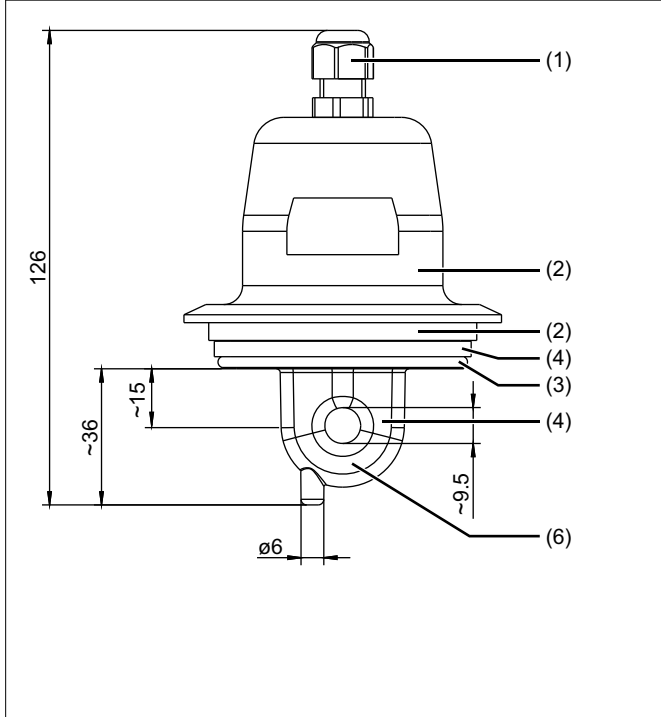
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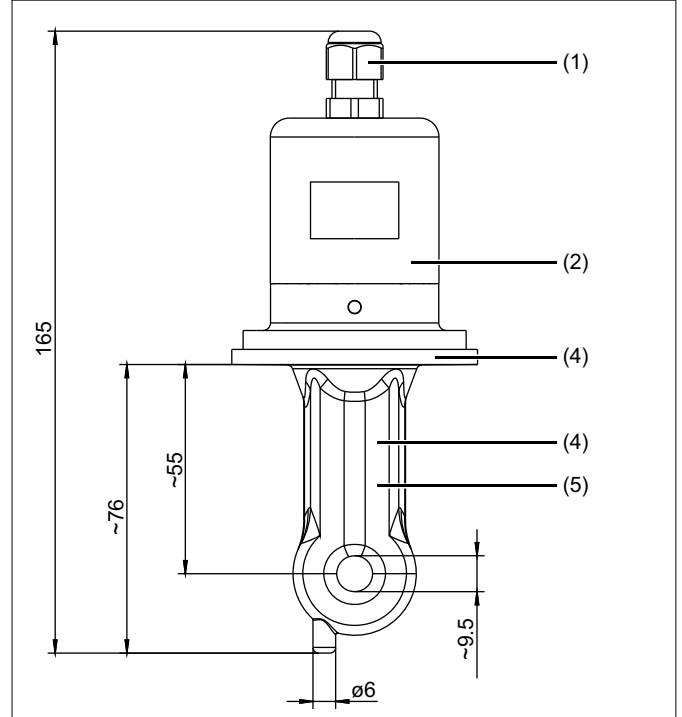
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**686 = Varivent® DN 50/40**

(Retaining clamp not included in scope of delivery)

^a Tightening torque for union nut ≤ 200 Nm.

- 1 PA6, CR, NBR
- 3 EPDM
- 5 Cell constant $k = 5,0 \text{ cm}^{-1}$

690 = SMS DN 2"(Union nut^a not included in scope of delivery)

- 2 Stainless steel 1.4301, AISI 304
- 4 PEEK
- 6 Cell constant $k = 5,15 \text{ cm}^{-1}$

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Order details

(1) Basic type	
202941	JUMO tecLINE Ci – inductive conductivity and temperature sensor for hygienic applications
(2) Basic type extension	
10	Standard version
(3) Process connection	
108	Screw connection G 1 1/2"
110	Screw connection G 2"
607	Taper socket for union nut DN 50 DIN 11851 (dairy compression fitting) ^a
608	Taper socket for union nut DN 65 DIN 11851 (dairy compression fitting) ^a
609	Taper socket for union nut DN 80 DIN 11851 (dairy compression fitting) ^a
617	Clamping socket (clamp) 2 1/2", similar to DIN 32676 ^b
686	Varivent® connection DN 50/40 ^b
690	SMS DN 2" ^a
(4) Immersion length	
0,0	without
(5) Electrical connection	
21	Fixed cable with M12 connector
(6) Length of fixed cable	
10	10 m
15	15 m
20	20 m
30	30 m

^a Union nut not included in delivery.

^b Retaining clamp not included in delivery.

Order code	(1)	/	(2)	-	(3)	-	(4)	-	(5)	-	(6)
Order example	202941	/	10	-	607	-	0	-	21	-	10

Stock versions

Item	Part no.
202941/10-607-0-21-10/000	JUMO tecLine Ci, taper socket for union nut DN 50 DIN 11851 (dairy compression fitting), 10 m fixed cable
	00543048

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Accessories

Item	Part no.
Weld-on threaded adapter DN 50, DIN 11851 (mating component for process connection 607) with PTFE sealing ring	00085020
Union nut DN 50, DIN 11851	00343368
Union nut DN 65, DIN 11851	00362956
Union nut SMS DN 2"	00345162
Calibration adapter for inductive conductivity measurement, type 202711/21	00543395

NOTE!

The following are required for initial startup of the sensor and transmitter/controller, or when replacing components:

- Transmitter/controller e.g. JUMO AQUIS 500 Ci, data sheet 202566
- JUMO tecLine Ci-S inductive conductivity and temperature sensor
- Calibration adapter for inductive conductivity measurement, type 202711/21, data sheet 202711