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JUMO tecLine Cl2
Sensor for free chlorine

Type 202630/40
Type 202630/41

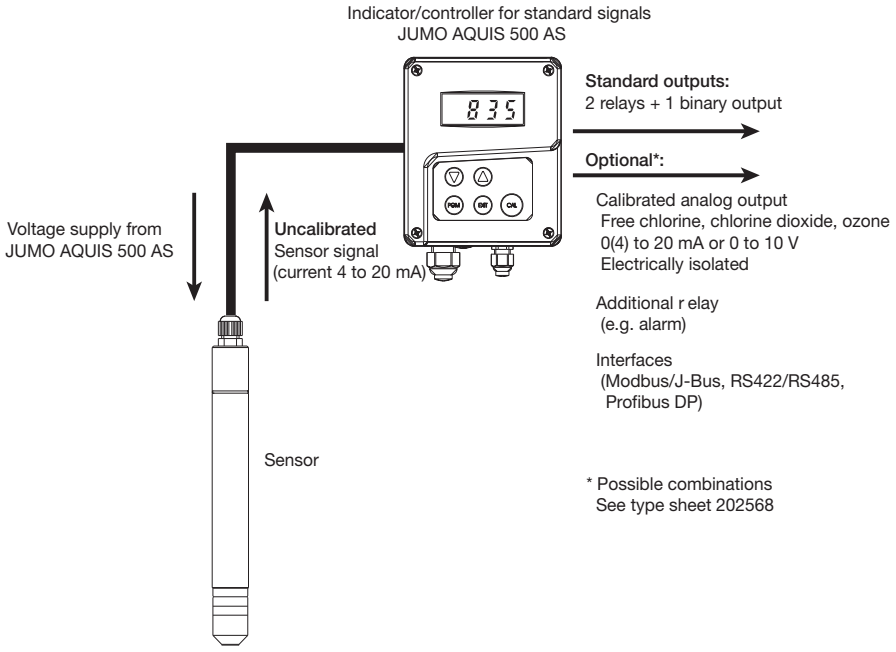
- 2- or 3-electrode principle
- Easy calibration
- Integrated temperature compensation
- Proven measuring system

Type 202630/40- ...

Brief description

These membrane-covered, amperometric sensors are used to measure the concentration of free chlorine (for example in drinking and swimming water, industrial, process and cooling water).
The following inorganic chlorinating agents can be measured with the sensor for free chlorine: chlorine gas (Cl_2), electrolytically generated chlorine, sodium hypochlorite (NaOCl, chlorine bleach lye), calcium hypochlorite ($Ca(OCl)_2$) or chlorinated lime (Ca(OCl)Cl).
The sensors are not suitable for detecting the absence of free chlorine.
The integrated electronics of the sensors provides a temperature-compensated current signal of 4 to 20 mA. A downstream device (indicator, controller, recorder, PLC, etc.) is used for calibration.
The sensors can be connected directly to a suitable indicator and controller. Two indicators / controllers, the JUMO dTRANS AS 02 (type sheet 202553) and the JUMO AQUIS 500 AS (type sheet 202568) are especially suitable for combining with these sensors. They provide the voltage required for the power supply of the sensor and makes for an easy way to calibrate the measuring system.

Function



Note

All types

- This measurement is only possible in a suitable flow-through fitting (see accessories).
- For proper operation, the incident flow of the process medium on the sensor must be at least 15 cm / s (0.5 l / min). The minimum inflow can be ensured with JUMO flow monitoring (see accessories), which consists of a flow monitor and the matching fitting.
- A test set is required for calibration to determine the free chlorine content using the DPD method. Suitable photometric or colorimetric test sets can be obtained commercially.
- To ensure fault-free sensor functionality, only one disinfectant should be used.
- Sensors for free chlorine are **not** suitable for determining organic chlorinating agents (for example products based on cyanuric acid).
- For further information about how to set up and use amperometric sensors, refer to our brochure "Information on Amperometric Measurement of Free Chlorine, Chlorine Dioxide and Ozone in Water".

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Type 202630/40

- The measurement water for the sensor with a hydrophobic membrane must not contain any surfactants (ingredients of cleaning agents, detergents and disinfectants).
- The pH value for the sensor for free chlorine (type 202630/40) must be kept constant (ΔpH <0.05) after calibration. If that is not possible, the sensor for free chlorine with reduced pH dependency (type 202630/41) must be used.

Type 202630/41 (reduced pH dependency)

- If the sensor with a hydrophilic membrane is used, a test is required in this special case to determine whether the presence of surfactants results in a significantly reduced service life. In this case as well, however, the water quality should be similar to drinking or swimming pool water.
- The output signal of the sensor for free chlorine with reduced pH dependency (type 202630/41) is independent in the pH value range from pH 5 to 7. Outside this range the pH dependency is reduced (see technical data).
- To ensure proper functionality of the sensor for free chlorine with reduced pH dependency (type 202630/41), the conductivity of the process medium must be least 50µS / cm.

Technical data

Analyte	**Free chlorine**	
Membrane type	Hydrophobic PTFE membrane	Hydrophilic membrane
	Type 202630/40	Type 202630/41
Measuring cable connection	2-pin terminal, polyamide PG7 screw connection; conductor cross section 2x 0.25 mm^2, cable diameter approx. 4 mm	
Voltage supply	U_B 12 to 30V DC (electrical isolation recommended)	
Electromagnetic compatibility	According to EN 61326-1 Interference emission: Class B Interference immunity: To industrial requirements	
Output signal	4 to 20mA	
Burden	$\leq \frac{U_B - 7.5\ V}{0.02\ A}$	
Settling time	1 h	2 h
Incident flow velocity	approx. 15cm / s If the sensor is installed in the JUMO flow-through fitting (part no: 00392611), this is equivalent to a flow rate of approx. 30l / h.	
Measurement ranges[1]	0 to 0.5 / 0 to 2.0 / 0 to 5 / 0 to 10mg / l (ppm)	
Resolution	0.001mg / l, for measurement range 0 to 0.5mg/l; 0.01mg / l, for measurement range 0 to 2.0mg / l	
Response time t_{90}	approx. 30 s	approx. 2 min
Operating temperatures / temperature compensation	+5 to +45 °C	
Zero point adjustment	Not required	
pH value operating range	6.0 to 8 pH Note the effect of the pH value on disinfecting properties, corrosion or the dissociation curve.	4 to 9 pH
pH dependency (loss of slope)	At pH 8 about 65%, at pH 9 about 95%, (starting from pH 7)	In the range from pH 5 to 7: No loss of slope, at pH 8 about 10%, at pH 9 about 20% (starting from pH 7)
Disruptive substances / cross sensitivity	Chlorine dioxide not permitted Ozone not permitted	Chlorine dioxide not permitted Ozone not permitted combined chlorine disruptive
Pressure resistance	p_{abs} max. 2 bar p_{rel} max. 1 bar No pressure fluctuations are admissible when operating under pressure. We recommend unpressurized operation (atmospheric pressure).	
Material	Shaft, cover, cap: PVC	Shaft, cover, cap: PVC Membrane disk holder: stainless steel
Dimensions	Diameter: 25 mm, length: 220 mm	
Weight	approx 125 g	
Maintenance	Check the measurement signal: regularly, at least once a week Replace the membrane cap: once a year (subject to water quality) Change the electrolyte: every 3 to 6 months	
Storage	Sensor: frost-free, dry, without electrolyte and at +5 to +45 °C can be stored for an unlimited time Membrane cap: used membrane caps cannot be stored! Electrolyte: in the original bottle, protected against sunlight and at +5 to +25 °C	

[1] Other measuring ranges on request.

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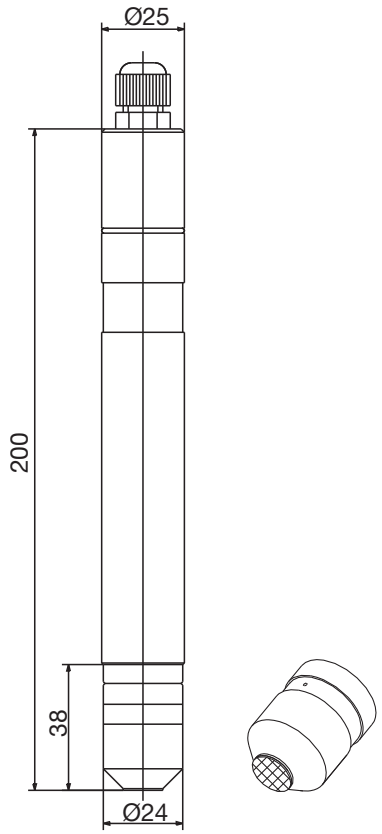
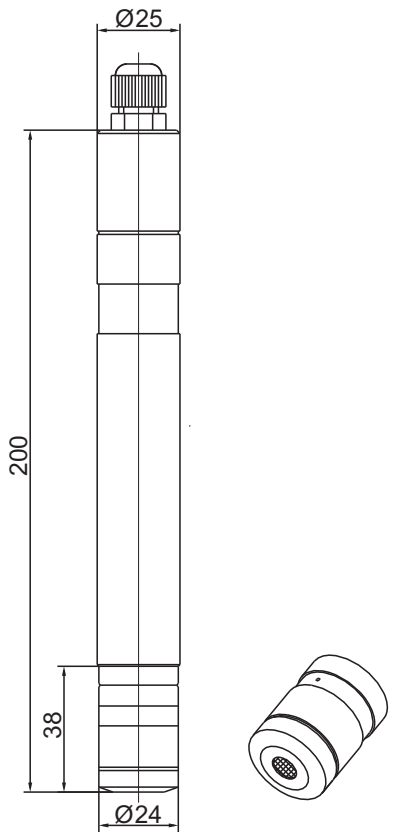
Dimensions

Type 202630/40



Type 202630/41

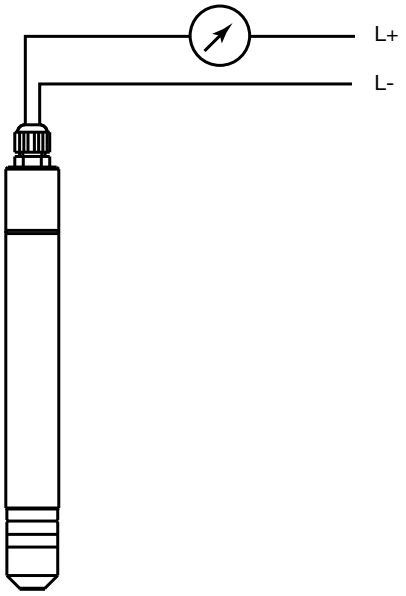


Scope of delivery

Type 202630/40:
Two-wire sensor including membrane cap, electrolyte and special abrasive paper for cathode cleaning

Type 202630/41:
Two-wire sensor including membrane cap and device holder, electrolyte and special abrasive paper for cathode cleaning

Electrical connection



Connection		Screw terminals
Voltage supply DC 12 to 30V		1 L+ 2 L-
Output 4 to 20mA, two wires Impressed current 4 to 20mA in voltage supply		1 L+ 2 L-

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Accessories

Flow-through fitting for sensors according to type sheets 202630, 202631, 202634, 202636

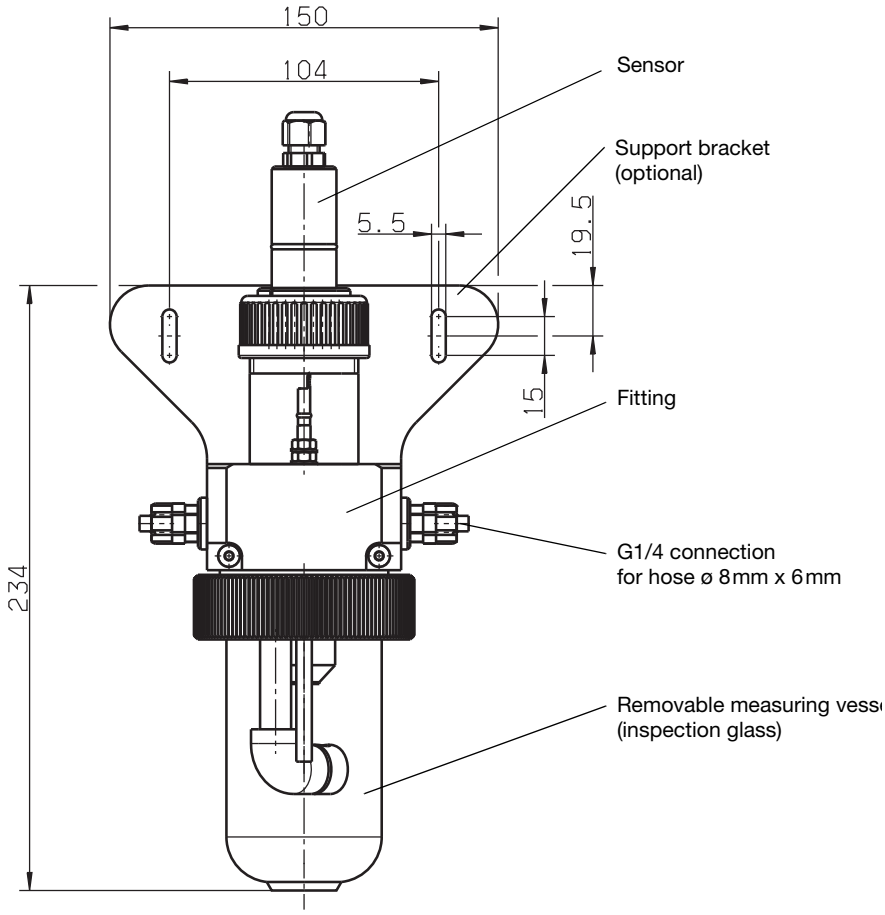
Part no.: 00392611

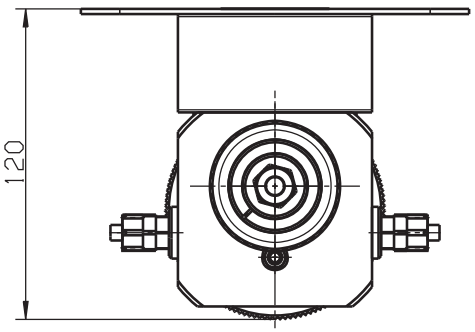
Materials
Case: PVC
Measuring vessel: PC

Admissible temperature / pressure
0 to +50 °C; at 1 bar

Connection
Hose screw connection G 1/4

Mounting
Optional: stainless steel support bracket,
Mat. no. 1.4571
Part no.: 00455706





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Flow monitoring device

Consisting of:

Flow monitor
Part no.: 00396471

and

Fitting for flow monitor
Part no.: 00396470

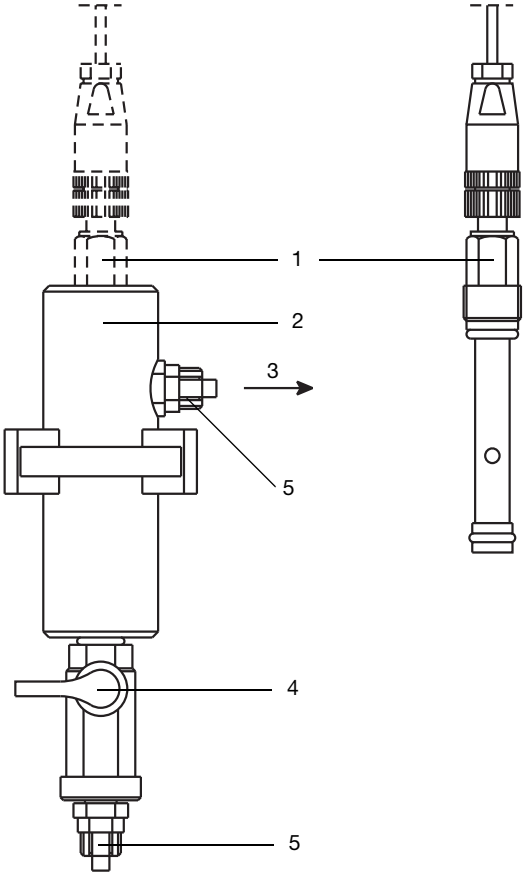
Function

For proper operation, the incident flow of the process medium on the sensors must be at least 15cm / s.

Below this minimum incident flow velocity, the sensors will indicate values that are too low. This could result in dangerous overdosing or underdosing in a connected control system. Above the minimum incident flow velocity, the measurement signal is only slightly affected by the incident flow velocity.

The flow monitoring device can be used to monitor the minimum incident flow velocity of 15cm / s.

The flow monitoring device consists of a flow monitor and the corresponding fitting. The flow monitoring device is installed in series with the flow-through fitting. If the minimum flow speed is not reached or is exceeded, a contact in the terminal head of the flow monitor switches. The contact can be used, for example, to control a binary input of the indicator/controller for JUMO AQUIS 500 AS standard signals. If the incident flow is too low, the JUMO AQUIS 500 AS is placed in "HOLD". This can prevent imprecise dosing.

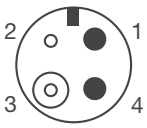


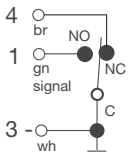
1 Flow monitor part no.: 00396471
2 Fitting for flow monitor part no.: 00396470
3 Flow direction
4 Shut-off valve
5 G1/4 connection (for hose diameter 8mm x 6mm)

Electrical connection

of the flow monitor

4-pin plug





Function
Contact (3 + 4) of the flow monitor is opened at a flow velocity of 15cm/s or greater.

Options

JUMO AQUIS 500 AS

Indicator/controller for standard signals and temperature
(for detailed information, see type sheet 202568)

JUMO dTRANS AS 02

Transmitter/controller for standard signals and temperature
(for detailed information, see type sheet 202553)

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Order details

		(1)	**Basic type**
	202630		Sensor
		(2)	**Basic type extension**
	40		for free chlorine
	41		for free chlorine (reduced pH-dependency)
		(3)	**Measuring range**
x	10		0.00 to 0.500 mg / l (ppm)
x o	20		0.00 to 2.00 mg / l (ppm)
o o	25		0.00 to 5.00 mg / l (ppm)
o o	35		0.00 to 10.00 mg / l (ppm)

x: Standard
o: Option

	(1)		(2)		(3)
Order code		/		-	
Order example	202630	/	40	-	20

Note:
The type code is an order detail, not a modular system.
If possible, choose items listed under "stock versions" for your orders.
We will have to technically inspect and approve a free combination of individual key features. In case of doubt, please ask.

Stock versions (delivery 3 working days after receipt of order)

Type	**Part no.**
Sensor for free chlorine, type 202630/40-10	00391395
Sensor for free chlorine, type 202630/40-20	00391396

Accessories

Designation	**Part no.**
Flow-through fitting for sensors according to type sheets 202630, 202631, 202634, 202636	00392611
Support bracket for flow-through fitting	00455706
Flow monitor	00396471
Fitting for flow monitor	00396470
Spare parts set for 202630/40 (1x membrane cap, fine abrasive paper)	00392331
Spare parts set for 202630/41 (1x membrane cap, device holder, fine abrasive paper)	00402292
Special electrolyte for 202630/42, 100 ml	00438122
Special electrolyte for 202630/41, 100 ml	00438123
Matching indicator / controller: JUMO AQUIS 500 AS, type: 202568/20-888-888-888-310-310-23/000 (for other versions see type and price sheet 202568)	00528718
Matching transmitter / controller: JUMO dTRANS AS 02, type: 202553/01-8-01-4-0-00-23/000 (for other versions see type and price sheet 202553)	00550842