

# JUMO tecLine Br

## Sensor for bromine

Type 202637/61 Output signal 4 to 20 mA  
 Type 202637/71 Output signal digital interface

### Brief description

The disinfectant bromine offers a greater disinfectant effect and higher pH value compared with chlorine compounds, while having a low corrosive effect. Abreacted bromine solutions irritate the mucous membranes to a lesser extent and have a neutral odor.

The membrane-covered, amperometric sensor works on the 3-electrode principle; it is used for online measurement hypobromous acid (HOBr). Suitable bromination methods include free bromine (HOBr) as well as 1-bromine-3-chlorine-5.5-dimethyl-hydantoin (BCDMH).

Depending on the type, the electronics integrated in the sensors provide a temperature-compensated current signal (4 to 20 mA) or a Modbus RTU output signal. A downstream device (indicator, controller, recorder, PLC, etc.) is used for calibration.

The sensor can be connected directly to indicating devices/transmitters/controllers (see "Transmitters/controllers for sensors with an output signal of 4 to 20 mA (type 202637/61)", page 7). They supply the sensor with voltage and allow for easy calibration of the measuring system.

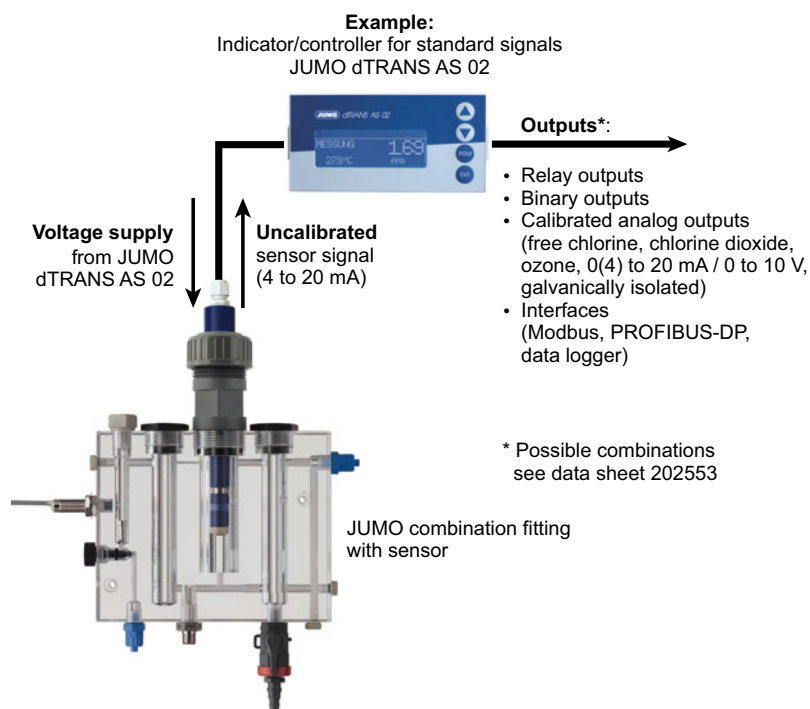
The sensor is not suitable for detecting the absence of bromine.

**Application areas:** measurements in cooling water, swimming pool water, service water, process water, seawater.



Type 202637/71...

### Application example



### Special features

- 3-electrode principle
- Easy calibration
- Integrated temperature compensation
- Proven measuring system
- Electrical connection analog or digital
- Connection to JUMO digiLine system optional

Additional indicating devices/controllers: "Transmitters/controllers for sensors with an output signal of 4 to 20 mA (type 202637/61)", page 7

## Important information

### Notes for all types

- Measuring is only possible in a suitable flow fitting (see accessories).
- The flow rate from the measurement medium must be at least 15 cm/s (0.5 l/min) in order for the sensor to work correctly. The minimum inflow can be guaranteed using the JUMO combination fitting or the JUMO individual fitting in connection with the JUMO flow monitor for disinfectant measurands (see accessories).
- For calibration, a test set is required to determine the bromine content. Determination methods that can potentially be used include DPD-1 (for free bromine) or DPD-4 (for bromine from BCDMH).
- To make sure the sensor works correctly, only one disinfectant should be used at a time.
- In particular cases, it must be checked if the presence of surfactants will cause a significant reduction in the service life of sensors with hydrophilic membranes; however, in these cases the measurement medium must also have qualities similar to drinking or swimming pool water.
- The output signal from this sensor is independent of the pH value to a great extent in a range between pH 6.5 and 9.5.
- To ensure that the sensor functions correctly, the measurement medium must have a conductivity of at least 10  $\mu\text{S}/\text{cm}$ .
- For more details on the structure and uses of the amperometric sensors, please refer to our technical literature "Analysis Measuring Technology in Liquid Media".

### Notes for type 202637/61 (output signal 4 to 20 mA)

- The slope of these sensors can vary depending on the manufacture and application by between 65 % and 150 % of the nominal slope. To determine the appropriate measuring range or appropriate sensor, it is therefore recommended that the concentration to be measured be multiplied by a factor of 1.5.

**Example:** concentration to be measured 1.6 ppm  $\times$  factor 1.5 = 2.4 ppm  $\Rightarrow$  recommended sensor with measuring range 5 ppm

### Required components for a measuring point

The following components are required to set up a measuring point for measuring bromine:

- amperometric sensor, membrane-covered
- transmitter /controller
- flow monitor (optional extra, recommended)
- fitting for membrane-covered sensors

## Technical data

Sensor type	202637/61 (output signal 4 to 20 mA)	202637/71 (digital interface output signal)
Measurand	Hypobromous acid (HOBr)	
Area of application Suitable bromination methods	Disinfection of drinking water, swimming pool water, service water, process water and seawater free bromine (HOBr) 1-bromine-3-chlorine-5.5-dimethyl-hydantoin (BCDMH)	
Measuring principle	Membrane-covered, amperometric, potentiostatic three-electrode system with integrated electronics	
Measuring cable connection	2-pin terminal connection (2 × 1 mm <sup>2</sup> )	5-pin flange connector, M12
Voltage supply	U <sub>B</sub> DC 12 to 30 V (galvanic isolation required)	U <sub>B</sub> DC 22.5 to 26 V (galvanically isolated from the sensor)
Electromagnetic compatibility <sup>a</sup>	Interference emission: class B <sup>b</sup> Interference immunity: to industrial requirements	
Output signal	4 to 20 mA	Modbus RTU
Burden/current consumption	≤ (U <sub>B</sub> - 7.5 V) ÷ 0.02 A	approx. 20 mA
Settling time	Approx. 2 h for initial startup	
Inflow speed	Approx. 15 cm/s (corresponds to a flow of approx. 30 l/h when installed in the JUMO flow fitting (part no.: 00392611))	
Measuring ranges <sup>c</sup>	0.005 to 2 mg/l (ppm) 0.05 to 20 mg/l (ppm)	
Resolution	0.001 mg/l with measuring range 2 mg/l 0.01 mg/l with measuring range 20 mg/l	
Response time t <sub>90</sub>	approx. 2 minutes	
Operating temperature Measurement water ambience	0 to 45 °C <sup>d</sup> 0 to 55 °C	
Temperature compensation	Automatic, using integrated temperature probe <sup>e</sup>	
pH value area of application	pH 6.5 to pH 9.5	
Zero point adjustment	Not required	
Slope adjustment	On evaluation unit/controller using analytical determination	
Disturbances	Cl <sub>2</sub> : is also measured ClO <sub>2</sub> : is also measured O <sub>3</sub> : is also measured Corrosion inhibitors and water hardness stabilizers can lead to measuring errors	
Absence of the disinfectant	max. 24 h	
Pressure resistance <sup>f</sup>	pabs max. 1.5 bar prel max. 0.5 bar	
Materials	PVC-U, PEEK, stainless steel 1.4571	
Dimensions	Dia. 25 mm, length 220 mm	Dia. 25 mm, length 205 mm
Weight	Approx. 125 g	

<sup>a</sup> EN 61326-1, EN 61326-2-3

<sup>b</sup> The product is suitable for industrial use as well as for households and small businesses.

<sup>c</sup> Other measuring ranges upon request.

<sup>d</sup> Prerequisite: no ice crystals in the measurement medium.

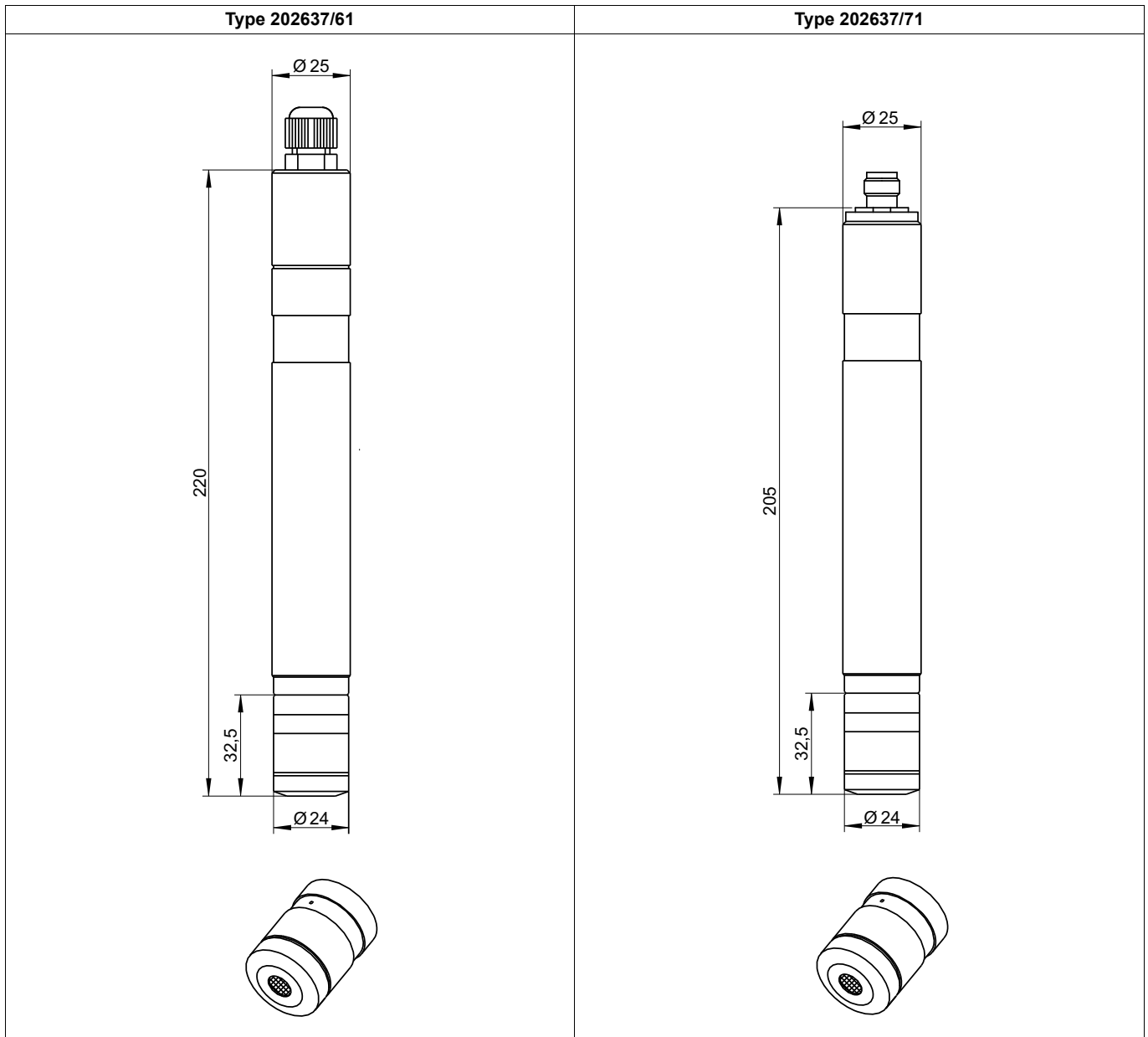
<sup>e</sup> Prerequisite: no temperature jumps in the measurement medium.

<sup>f</sup> No pressure fluctuations admissible. Pressure-free operation (atmospheric pressure) recommended.

## Maintenance and storage

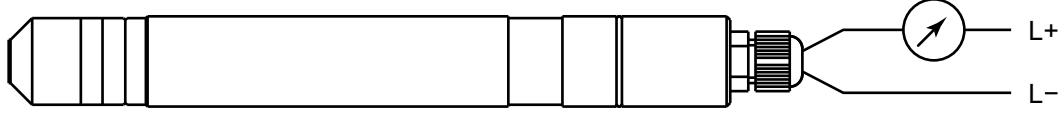
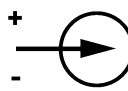

Sensor type	202637/61 (output signal 4 to 20 mA)	202637/71 (digital interface output signal)
<b>Maintenance</b>		
Inspection of the measuring signal	Regularly, at least once a week	
Replacement of membrane cap	Once a year (depending on the quality of the water)	
Replacement of electrolyte	Every 3 to 6 months	
<b>Storage</b>		
Sensor	Can be stored indefinitely in a dry place, without electrolyte, between +5 and 40 °C	
Membrane cap	Can be stored indefinitely in the original packaging at +5 to 40 °C.	
Electrolyte	In original bottle, away from sunlight, for at least one year (or up to minimum best by date) at +5 to 35 °C.C	

## Dimensions

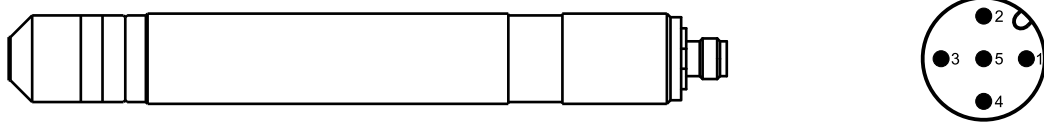


## Electrical connection

### Type 202637/61

		
<b>Function</b>		<b>Screw terminals</b>
Voltage supply DC 12 to 30 V		1 L+ 2 L-
Two-wire output of 4 to 20 mA, load-independent current of 4 to 20 mA in voltage supply		1 L+ 2 L-

### Type 202637/71

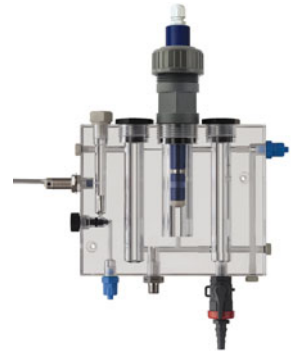
	
<b>Function</b>	<b>Pin on M12 flange connector</b>
not connected	1
+24 V voltage supply from transmitter/controller	2
GND	3
RS 485 B (RxD/TxD-)	4
RS 485 A (RxD/TxD+)	5

## Accessories

### Combination fitting type 202811/10

The combination fitting is intended to hold several electrochemical sensors. It is typically used for disinfection monitoring of drinking and swimming pool water as well as slightly polluted process and cooling water. Thanks to its compact design, the fitting allows for the space-saving consolidation of several sensors and is usually operated in a bypass or downstream of a tap in the main line. The sensors are easily visible through the fitting's crystal-clear design and can be visually inspected for pollutants.

In the maximum version, 2 sensors with Pg13.5 thread (for example for pH value and redox), 1 membrane-covered sensor Ø 25 mm for disinfectant monitoring and one temperature probe with thread M14 x 1.5 can be installed. Furthermore, the inflow of the measuring water contains flow monitoring with an inductive proximity switch for monitoring the inflow of the membrane-covered sensor. A ground pin can also be installed to discharge any electrostatic charges.



### Flow monitor type 202811/20

The flow monitor is integrated in the measuring water supply, in line with the disinfection sensor, and monitors the required minimum flow speed to the sensor.

It consists of a flow unit, a needle valve insert for flow control, and an inductive proximity sensor, the contact of which can control a binary input of a controller (for example JUMO AQUIS 500 AS/RS). If the inflow is too low, the controller is moved to the "HOLD" status. This helps to avoid incorrect dosages.



### Flow fitting type 202811/30

The flow fitting is intended to hold an individual membrane-covered sensor. The fitting is generally mounted in the bypass and, thanks to its special design type, provides the correct inflow for the sensor.

The flow monitor type 202811/20 is recommended as an extension for monitoring the minimum inflow speed of a sensor.

The standard ground rod of the fitting enables the discharge of undesired electrical and electrostatic voltage potentials, which occur in complex plants and can distort the measured values.



### Transmitters/controllers for sensors with an output signal of 4 to 20 mA (type 202637/61)

Type	Features
JUMO AQUIS 500 AS	Single-channel indicating device/controller, additional temperature input, binary input, up to two analog and switching outputs each
JUMO dTRANS AS 02	Modular multichannel transmitter/controller for standard signals, PROFIBUS-DP, RS422/485, data logger using optional boards
JUMO AQUIS touch S/P	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

### Transmitters/controllers for sensors with a digital interface (type 202637/71)

Type	Features
JUMO AQUIS 500 RS	Single-channel (Modbus RTU) indicating device/controller, additional temperature input, binary input, up to two analog and switching outputs
JUMO AQUIS touch S/P	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

## Order details

<b>(1) Basic type</b>	
202637	JUMO tecLine Br Sensor for bromine
<b>(2) Basic type extension</b>	
61	Sensor for bromine, output signal 4 to 20 mA
71	Sensor for bromine, output signal digital interface
<b>(3) Measuring range</b>	
20	0 to 2 mg/l (ppm)
37	0 to 20 mg/l (ppm)

<b>Order code</b>	(1)	/	(2)	-	(3)
<b>Order example</b>	202637	/	61	-	37

### Important information:

The order code is not modular. When placing orders, if possible please select the items listed under "**Stock versions**". We must check the technical feasibility of and approve freely chosen combinations of individual code parts.

## Scope of delivery

Type 202637/61	Two-wire sensor, incl. membrane cap, electrolyte, special abrasive paper for cathode cleaning and operating manual
Type 202637/71	Modbus RTU sensor, incl. membrane cap, electrolyte, special abrasive paper for cathode cleaning and operating manual

## Manufacturing versions

(Delivery within 10 working days after receipt of order)

Type	Part no.
202637/61-20 (bromine, 4 to 20 mA, 0 to 2 mg/l)	00673874
202637/61-37 (bromine, 4 to 20 mA, 0 to 20 mg/l)	00673875
202637/71-20 (bromine, digital, 0 to 2 mg/l)	00673822
202637/71-37 (bromine, digital, 0 to 20 mg/l)	00673868



## Accessories

### Fittings

Description	Part no.
Combination fitting for mounting several electrochemical sensors <sup>a</sup>	00607325
Individual fitting for mounting a membrane-covered sensor	00392611
Mounting bracket for individual fitting	00455706
Flow monitor for monitoring the minimum inflow <sup>b</sup>	00605507

<sup>a</sup> With integrated flow monitor, mini ball valve included.

<sup>b</sup> For flow monitoring in connection with the individual fitting.

### Spare parts set and electrolyte

Description	Part no.
Spare parts set (1 x membrane cap, fine abrasive paper)	00673877
Special electrolyte (100 ml)	00673876

### Accessories for sensors with a digital interface (type 202637/71)

Description	Part no.
JUMO digiLine hub <sup>a</sup>	00646871
JUMO power supply unit for JUMO digiLine hub <sup>a</sup>	00661597

<sup>a</sup> When connecting multiple sensors with a digital interface (type 20263x) to the JUMO AQUIS touch S/P, the JUMO digiLine hub and an external power supply (e.g. part no. 00661597) are required. For further accessories see data sheet 202705.

### Transmitters/controllers for sensors with an output signal of 4 to 20 mA (type 202637/61)

Description	Part no.
JUMO AQUIS 500 AS, type 202568/20-888-888-310-310-23/000 (for further versions, please refer to data sheet 202568)	00528718
JUMO dTRANS AS 02, type: 202553/01-8-01-4-0-00-23/000 (for further versions, please refer to data sheet 202553)	00550842
JUMO AQUIS touch S/P	Refer to data sheet 202580/81

### Transmitters/controllers for sensors with a digital interface (type 202637/71)

Description	Part no.
JUMO AQUIS 500 RS, type 202569/20-654-888-888-310-310-23/000 (for further versions, please refer to data sheet 202569)	00602275
JUMO AQUIS touch S/P	Refer to data sheet 202580/81