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JUMO ecoLine NTU

Optical Sensor for Turbidity Measurements

Brief description

The turbidity measurement according to DIN EN ISO 7027 is a tried and tested method for monitoring waters with low to strong turbidity.

The measuring principle of the JUMO ecoLine NTU turbidity sensor is based on an infrared light measurement according to the 90 ° scattered light method. Thanks to the light measurement at a wavelength of 880 nm and the wide measuring range of 0 to 4,000 NTU, the sensor can be used in an array of water and wastewater treatment applications, e.g. for monitoring the water quality, detecting filter leaks, and for wastewater final inspection.

The JUMO ecoLine NTU stores its calibration data and history directly in the sensor electronics, meaning that it can be used quickly anywhere without the need for constant recalibration.

The sensor is characterized by its slim and robust design.

Suitable fittings are required for the installation of the sensor, e.g. in order to prevent the influence of extraneous light and the resulting measurement errors. For the corresponding immersion, suspended, and flow fittings that are available, see Chapter "Accessories", page 5.

The robust, simple sensor is particularly well-suited to the following areas of application:

- Drinking water treatment
- Water protection
- Fish farming companies
- Municipal and industrial sewage treatment plants
- Process plants
- Paper industry



Type 202670/...

Technical data

Specifications

Measuring principle	Optical, nephelometric turbidity measurement with 90 ° scattered light according to DIN EN ISO 7027
Measurands	Turbidity Temperature
Measuring ranges	0 to 4,000 NTU in a choice of 4 measuring ranges as well as automatic measuring range detection: <ul style="list-style-type: none"> • 0.00 to 50.00 NTU • 0.0 to 200.0 NTU • 0 to 1,000 NTU • 0 to 4,000 NTU
Resolution	0.01 to 1, depending on measuring range
Accuracy	< 5 % from NTU measured value
Max. sampling rate for measured values	1 Hz
Temperature range	0 to +50 °C
Pressure range	Up to 5 bar
Storage temperature	-10 to +60 °C

Interfaces

Signal interface	RS485 interface with Modbus RTU protocol ^a
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^a Only in connection with suitable Modbus master devices, see "Display unit / controller" on page 2.

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**Electrical data**

Voltage supply	DC 5 to 12 V
Current consumption	Standby: 40 µA RS485 on average: 820 µA (at 1 measurement per second) Current pulse (starting current peak): 500 mA, heat-up time: 100 ms
Connection	4-conductor shielded cable, open conductor ends with ferrules
Electromagnetic compatibility	Acc. to EN 61326-1
Interference emission	Class A
Interference immunity	Industrial requirements

Case

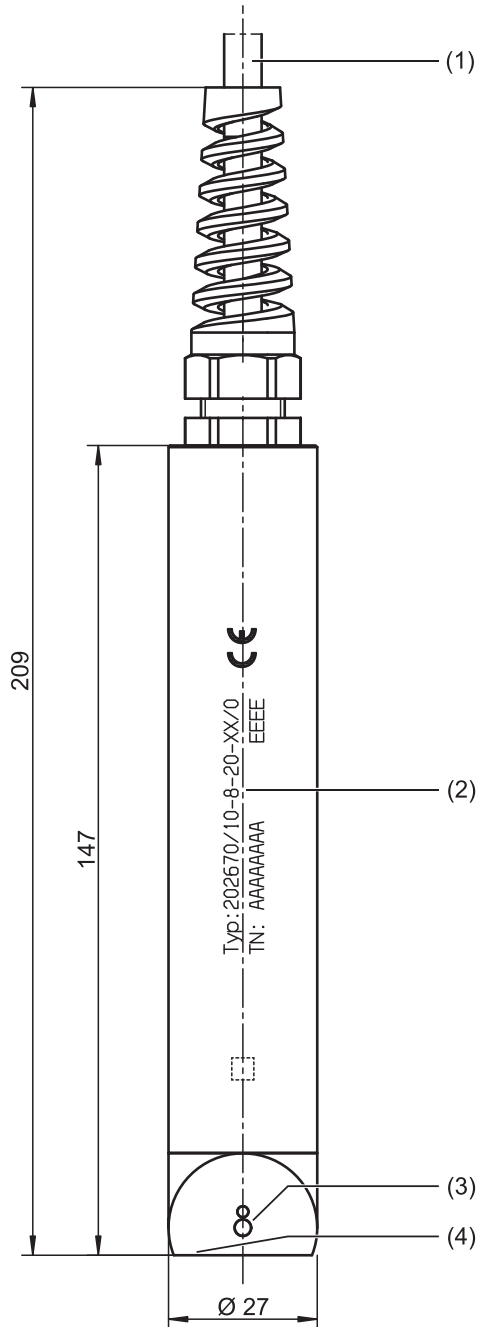
Dimensions	Ø 27 mm × 147 mm (sensor case without cable)
Weight	720 g (sensor including 10 m cable) 1,850 g (sensor including 30 m cable)
Length of permanent cable	10 m, 30 m
Materials	Sensor case: PVC, POM-C Optical window: PMMA Connection cable: polyamide
Protection type	IP68

Display unit / controller

	<p>JUMO AQUIS 500 RS display unit / controller, type 202569/... See data sheet 202569</p>
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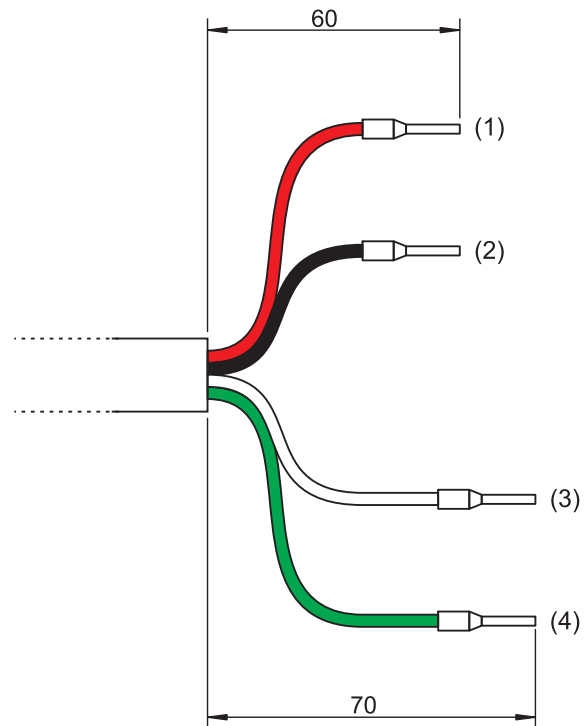


Dimensions



Electrical connection

The cables with conductor end sleeves are connected without tension or soldering, using screw-type plug-in terminals on the JUMO AQUIS 500 RS (type 202569/...) display unit / controller.



- (1) RS485 connection cable
- (2) Laser engraving indicating the sensor type and part no.
- (3) Infrared transmitter and receiver
- (4) Temperature sensor

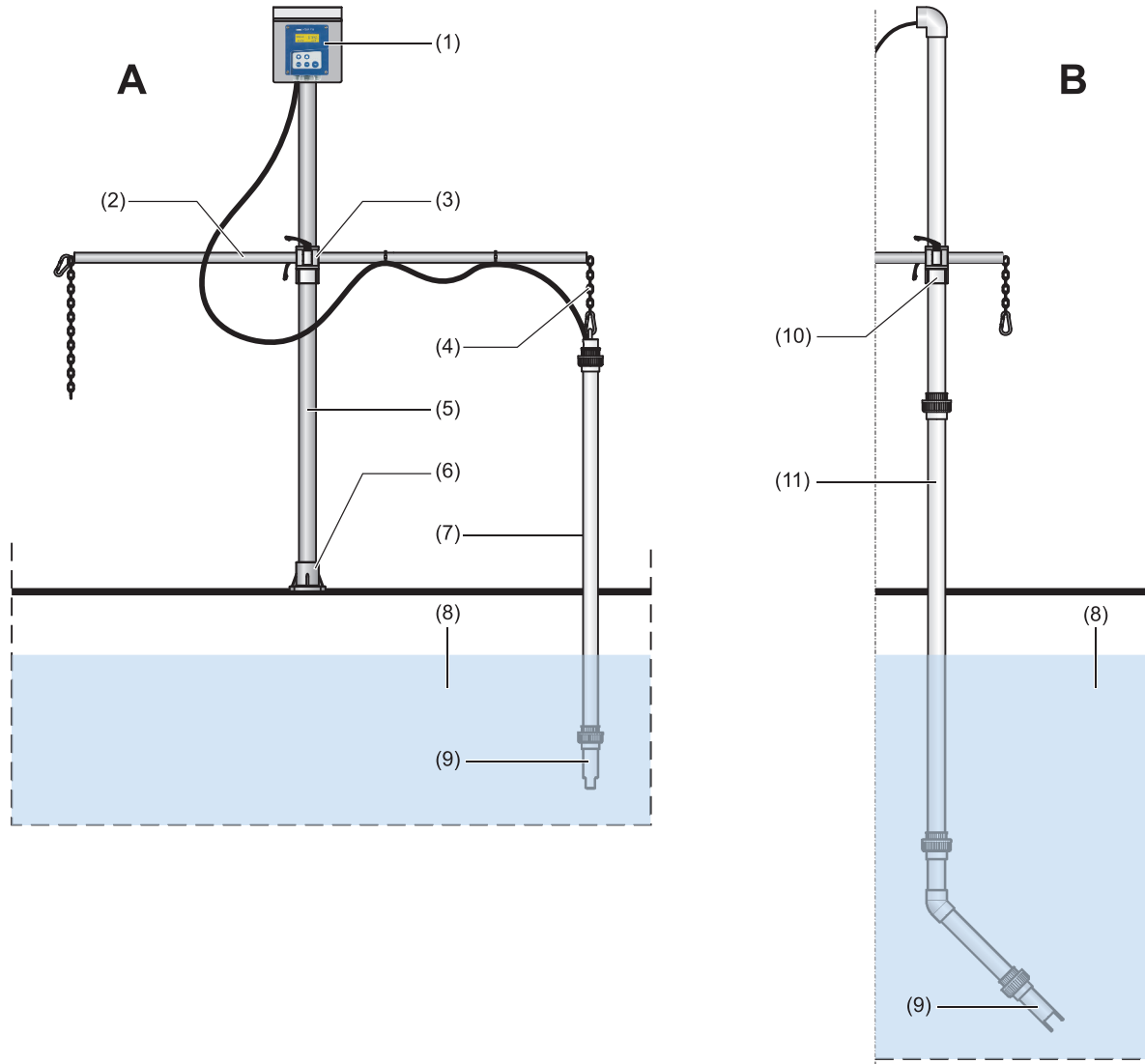
- (1) Red Voltage supply +
- (2) Black Voltage supply -
- (3) White RS485 +
- (4) Green RS485 -



Measuring point set-up

The set-up of a complete measuring system for turbidity measurements is shown below. The figure shows a support pillar with pedestal base, cantilever arm, and chain. A JUMO AQUIS 500 RS is used as a display unit / controller, which is mounted on the support pillar and protected by a weather protection canopy (see Chapter "Accessories", page 9).

The suspended fitting in image A is attached to the cantilever arm by a chain. Alternatively, an immersion fitting can also be attached to the cantilever arm using a cross clamp, see image B.



- (1) JUMO AQUIS 500 RS display unit / controller, type 202569/...
 - (2) Cantilever arm, adjustable
 - (3) Cross clamp with 2 clamping levers
 - (4) Chain
 - (5) Support pillar
 - (6) Pedestal base
 - (7) Suspended fitting including sensor mounting (9), part no.: 00616716
 - (8) Basin/tank/container
 - (9) Immersion fitting including sensor mounting (9), part no.: 00616717
 - (10) Cross clamp for support pillar (part no. 00605468), required to attach the immersion fitting
 - (11) Angled immersion fitting including sensor mounting (9), part no.: 00616717
- } Support pillar with pedestal base, cantilever arm, and chain; part no. 00398163

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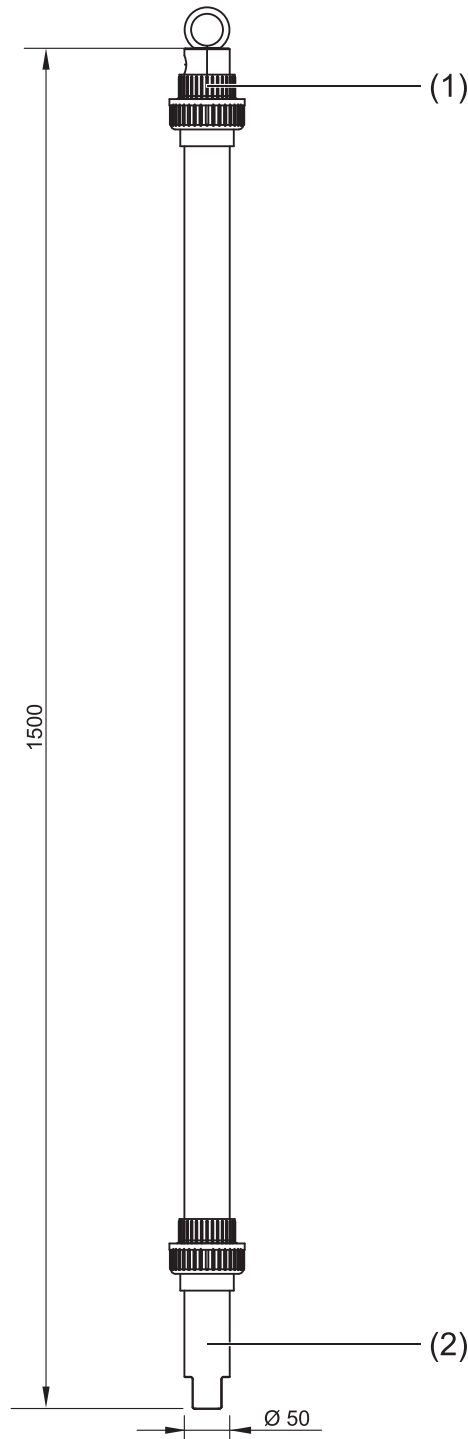
Accessories

Suspended fitting

The suspended fitting is used to hold the JUMO ecoLine NTU turbidity sensor and position it at a suitable point in the measurement medium. It is designed to provide the greatest possible protection for the sensor against extraneous light and damage through mechanical influences. The fitting is suspended on a chain, enabling it to follow the movement of the medium in various directions as the water level fluctuates. The fitting is primarily used to take measurements from open channels or basins. Please note the following when planning your set-up:

- The fitting must be easily accessible to allow the sensor and the fitting itself to be maintained and cleaned regularly.
- Do not allow the fitting (and thus also the sensor) to swing against and hit the basin edge.
- When working with systems involving pressure and/or temperature, ensure that the fitting and sensor meet all relevant requirements.
- The system designer must check that the materials in the fitting and sensor are suitable for the measurement (chemical compatibility, for instance).

Suspended fitting		
Materials	Pipe:	PVC
	Sensor mounting:	PVC
Temperature range	0 to 60 °C	
Pressure range	Up to 5 bar	
Total length	1,500 mm	
Part no.	00616716	



- (1) Fastener with chain holder
 (2) Sensor mounting

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Immersion fitting

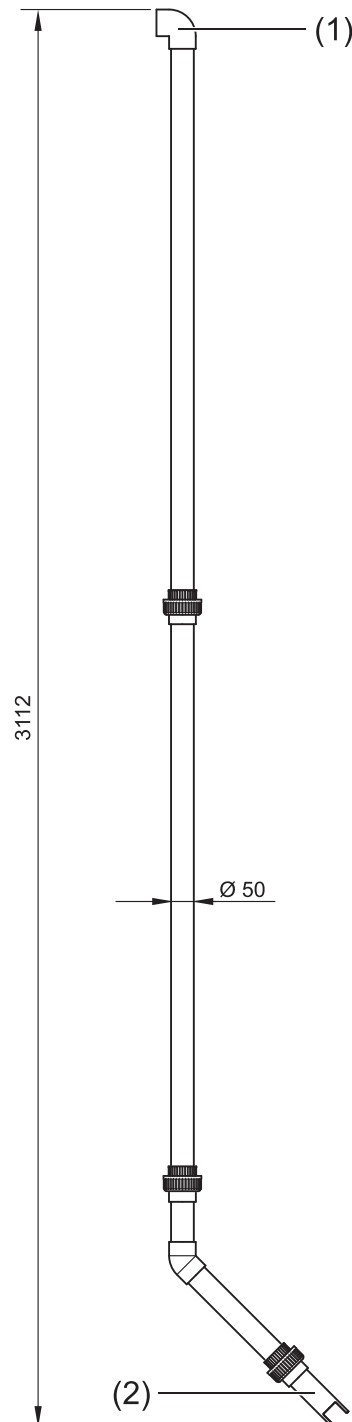
The immersion fitting is used to hold the JUMO ecoLine NTU turbidity sensor and position it at different immersion depths. The fitting is angled at the lower end, thus keeping rising gas bubbles as far away as possible from the sensor. It also protects the sensor against extraneous light and mechanical influences. The fitting is attached to the support pillar using a cross clamp, see Chapter "Measuring point set-up", page 4.

Alongside the standard version with a total length of 3,112 mm, shorter versions are also available on request.

Please note the following when planning your set-up:

- The fitting must be easily accessible to allow the sensor and the fitting itself to be maintained and cleaned regularly.
- Do not allow the fitting (and thus also the sensor) to swing against and hit the basin edge.
- When working with systems involving pressure and/or temperature, ensure that the fitting and sensor meet all relevant requirements.
- The system designer must check that the materials in the fitting and sensor are suitable for the measurement (chemical compatibility, for instance).

Immersion fitting		
Materials	Pipe: PVC Sensor mounting: PVC	
Temperature range	0 to 60 °C	
Pressure range	Up to 5 bar	
Total length	3,112 mm	Other lengths on request
Part no.	00616717	



- (1) Angled end piece
(2) Sensor mounting

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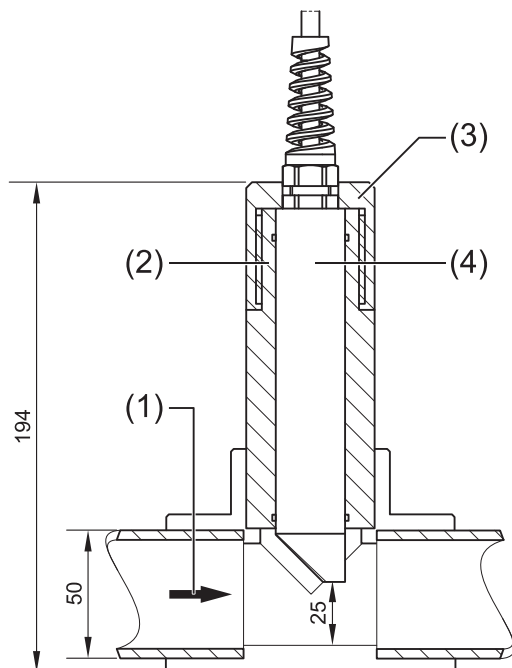


Flow fitting

The flow fitting is used to hold the JUMO ecoLine NTU turbidity sensor. The fitting is mounted directly in the supply line for the medium being measured or in the bypass. Its special design type ensures the correct inflow to the sensor, thus preventing incorrect measurements. Please note the following when planning your piping set-up:

- The fitting must be easily accessible to allow the sensor and the fitting itself to be maintained and cleaned regularly
- It is recommended that the fitting be installed in a bypass with gate valves. This variant allows the sensor to be removed without interference in the process.
- When working with systems involving pressure and/or temperature, ensure that the fitting and sensor meet all relevant requirements.
- The system designer must check that the materials in the fitting and sensor are suitable for the measurement (chemical compatibility, for instance).

PVC flow fitting	
Material	PVC
Temperature range	0 to 60 °C
Pressure range	Up to 5 bar
Connection	Bonded sockets
Process connection	90° T-piece, DN 40
Part no.	00616715



- (1) Flow direction
(2) Sensor mounting
(3) Union nut
(4) JUMO ecoLine NTU sensor

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Order details

(1) Basic type	
202670	JUMO ecoLine NTU
	Optical turbidity sensor
(2) Basic type extension	
10	Standard, 0 to 4000 NTU
(3) Version	
8	Standard with factory settings
(4) Electrical connection	
20	Permanent cable
(5) Length of permanent cable	
10	10 m
30	30 m
(6) Extra code	
0	Without

	(1)		(2)		(3)		(4)		(5)		(6)
Order code	<input type="text"/>	/	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	/	<input type="text"/>
Order example	202670	/	20	-	8	-	20	-	10	/	0

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Scope of delivery

Turbidity sensor with the ordered cable version
Operating manual B 202670.0
Calibration certificate

Stock versions

(Delivery within 3 working days after receipt of order)

Type	Part no.
202670/20-8-20-10/000	00614965
202670/20-8-20-30/000	00614966

Accessories

(Delivery within 10 working days after receipt of order)

Fittings

Description	Part no.
Suspended fitting for type 202670/..., PVC, total length 1,500 mm	00616716
Immersion fitting for type 202670/..., PVC, total length 3,112 mm ^a	00616717
Flow fitting for type 202670/..., PVC	00616715

^a Other lengths on request.

Display unit / controller

Description	Part no.
JUMO AQUIS 500 RS, type 202569/...	See data sheet 202569

Accessories for JUMO AQUIS 500RS

Description	Part no.
Support pillar with pedestal base, cantilever arm, and chain	00398163
Additional cross clamp for support pillar, required to attach the immersion fitting	00605468
Pipe-mounted kit for JUMO AQUIS 500 RS	00398162
Weather protection canopy for JUMO AQUIS 500 RS	00398161
Setup program for JUMO AQUIS 500 on CD-ROM	00483602
PC interface with USB/TTL converter, for connecting the PC/laptop to the JUMO AQUIS 500 RS	00456352