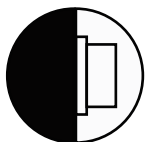
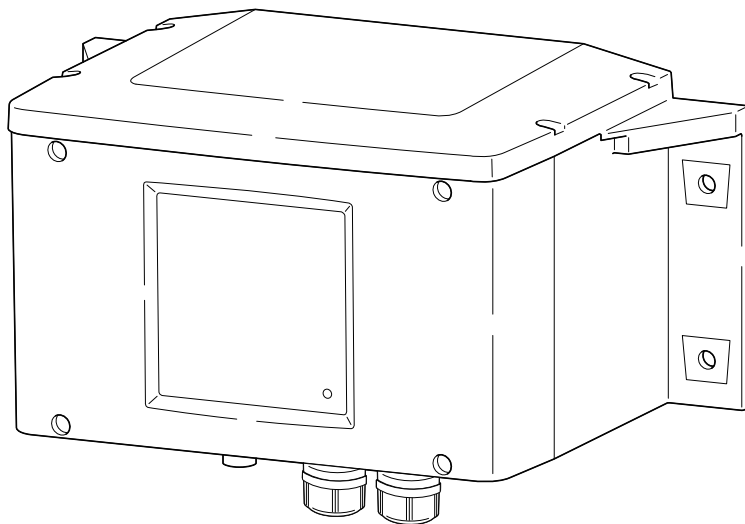


innoSens 850T

Turbidity Sensor

Operation Manual



WALL MOUNTING

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Maintenance	8
Technical Parameters	10
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Safety

Be sure to read this instruction manual in order to use the Turbidity sensor innoSens 850T properly.



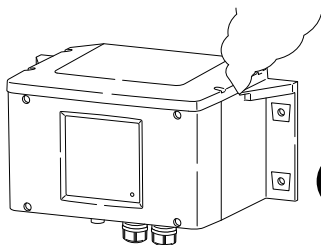
- ✓ Please thoroughly read the “For safe use” before using the innoSens 850T properly.
- ✓ Because these precautions are related to failure or malfunction, observe the precautions for use without fail.

Use the Turbidity Sensor only for measurement of water quality.
In order to use the innoSens 850T properly, observe the following precautions.

Qualifications of operator

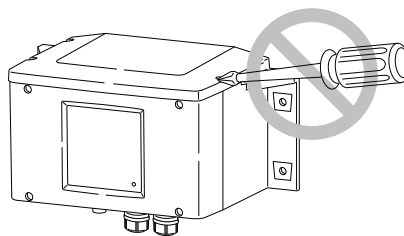
Precautions which are the cause of failure:

“⊘” denotes “Prohibited action”, and “! ” denotes “Required action”.



Power supply OFF

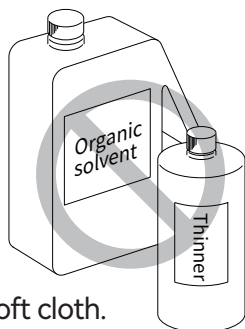
Turn off the Power immediately in the unlikely event that there occur any abnormalities such as smoke or abnormal noise. Otherwise it may cause fire or an electric shock.



Do not disassemble or modify the product.

Do not wipe the product with solvent. It may cause failure.

To clean the product, first wipe away lightly with a clean soft cloth damped by diluted mild detergent solution and then wipe off moisture with a dry clean soft cloth.



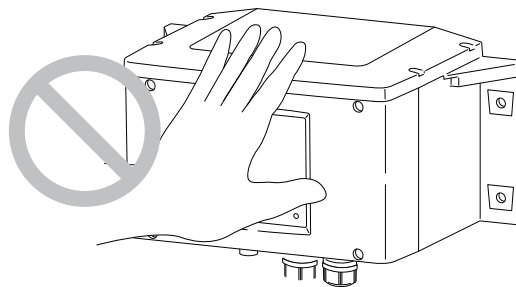
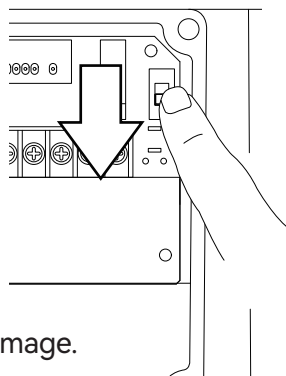
DC24V

Be sure to use the power supply of DC24V. Otherwise it may cause fire or electric shock.

Keep the Power off during installation and wiring operations.

During installation and wiring, turn OFF the power switch and disconnect the power cable from the outlet.

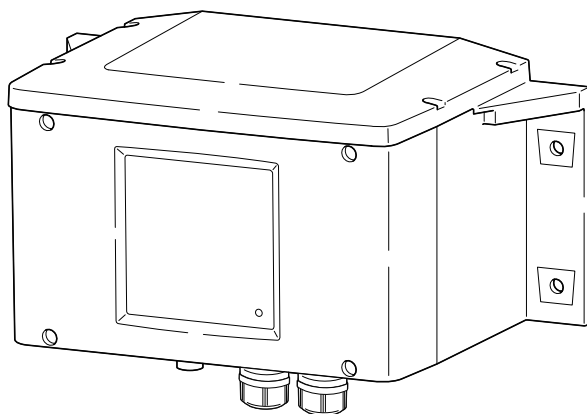
Otherwise, it could result in fire, electric shock, and damage.



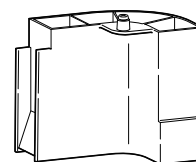
Do not apply strong impact or excessive force to the innoSens 850T.

Supply

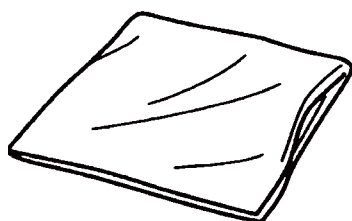
Thank you very much for purchasing JENSPRIMA innoSens 850T Turbidity Sensor. All of this instruction manual must be read before operation of the Turbidity Sensor innoSens 850T for safe and proper operation. This instruction manual should be kept for future reference such as maintenance.



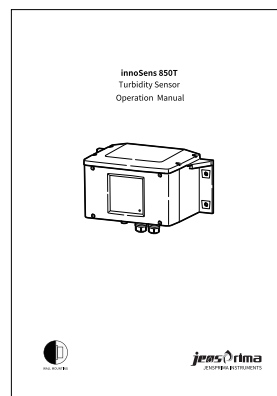
innoSens 850T
Turbidity Sensor



Deaerator

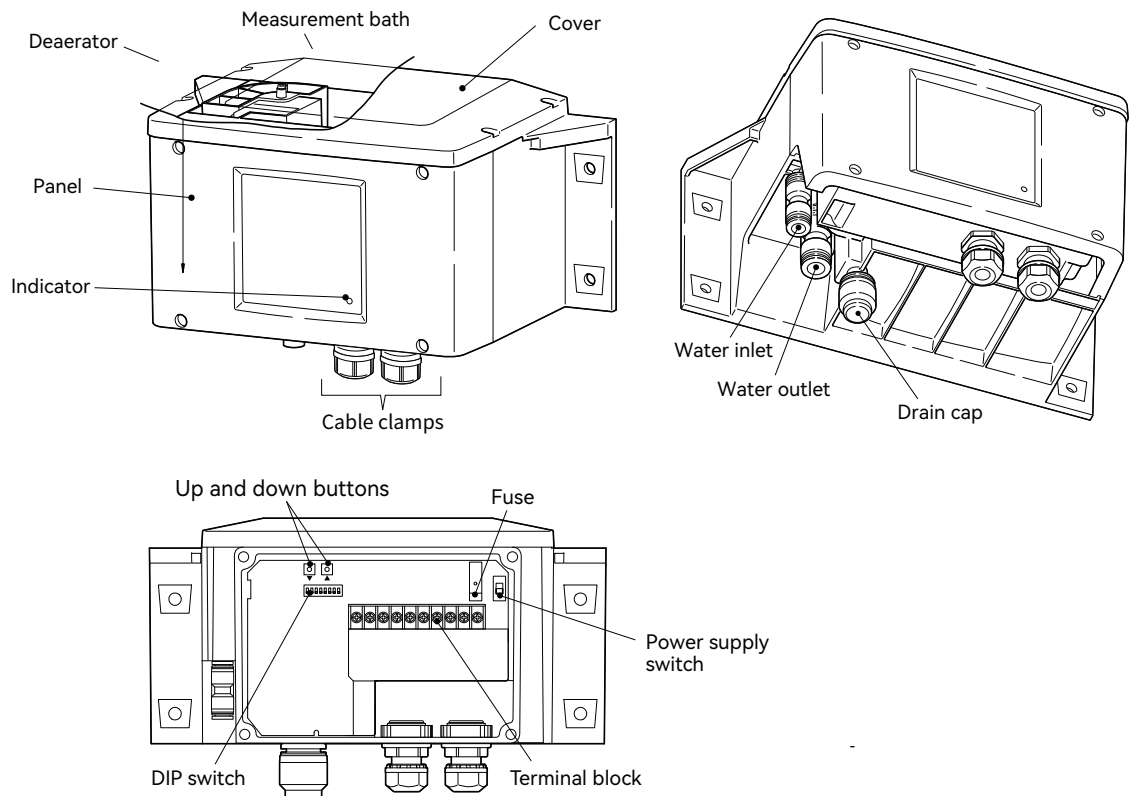


Cleaning paper



Operation Manual

Sensor Names of the parts

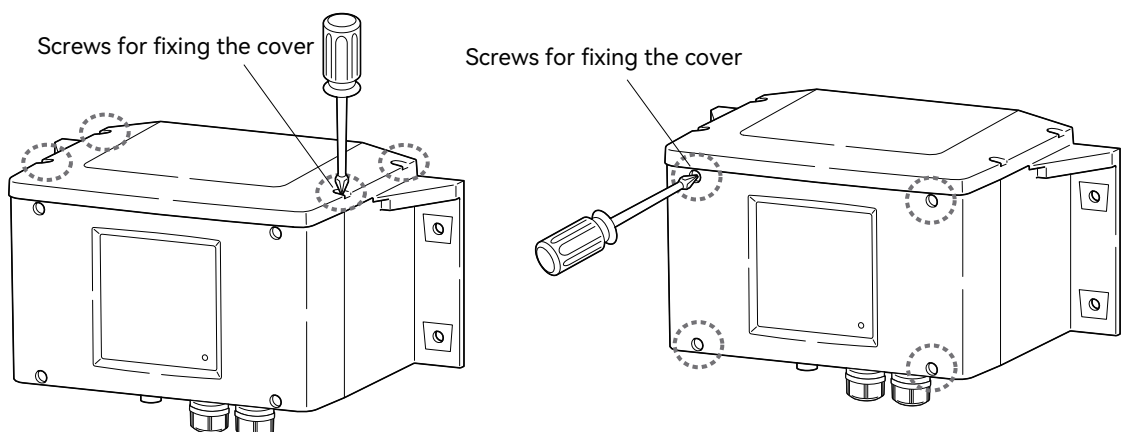


How to open / close the Cover

Open/close the cover by loosening/fastening the four cover fixing screws.

How to open / close the Panel

Open/close the panel by loosening/fastening the four cover fixing screws.



Caution

Fasten the cover fastening screws surely. If these screws are loose, turbidity might not be measured correctly due to the light entered in the measurement bath or dust mixed in the measurement water.

Screws must be tightened securely. Otherwise, sufficient protection cannot be obtained.

How to connect / disconnect the tube

Caution

Do not apply strong impact or excessive force to the joint. Otherwise, it may damage the joint, as well as may cause crush, rupture, or disconnection of the tube.

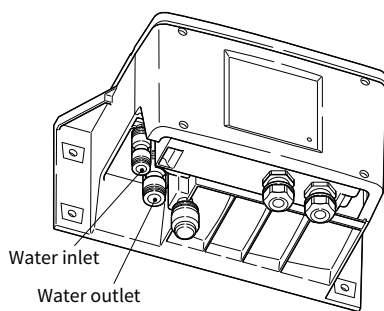
Water temperature must be between 0 and 40 °C.

The unit must be isolated not to damage other machines or equipment in case of water leakage.

Use insert rings if necessary. To determine whether to insert rings or not, check the specification of the tube. Selection of insert rings unmatched to the specification of the tube may cause tube coming-off and water leakage.

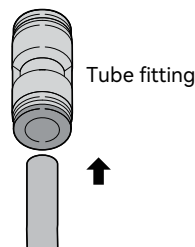
Follow the precautions below when attaching the tube.

- The cutting section must be right angle.
- Outer circumference must have no damage.
- The tube must not be shaped like an ellipse.
- The tube must be fully inserted to the end.
- Ensure that the tube is securely inserted and cannot come off after attached.



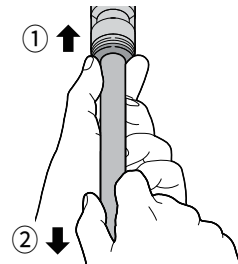
Connecting

Insert the tube to the tube fitting.



Disconnecting

Pull out the tube while push the lip of the tube fitting.



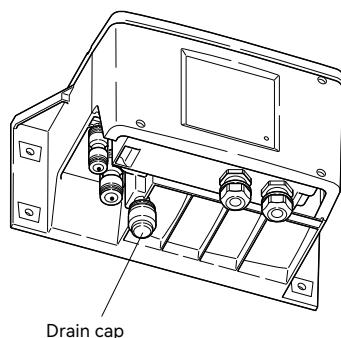
Applicable tube diameter for water inlet:

Nylon tube: 8 +/- 0.1 mm dia. Urethane tube: 8 +/- 0.15 mm dia.

Applicable tube diameter for water outlet:

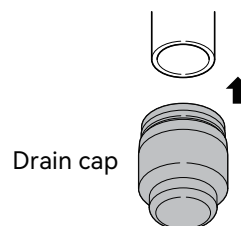
Nylon tube: 10 +/- 0.1 mm dia. Urethane tube: 10 +/- 0.15 mm dia.

How to attach / detach the Drain cap



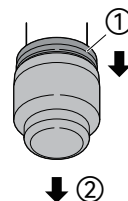
Attaching

Insert the Drain cap as far as it goes.



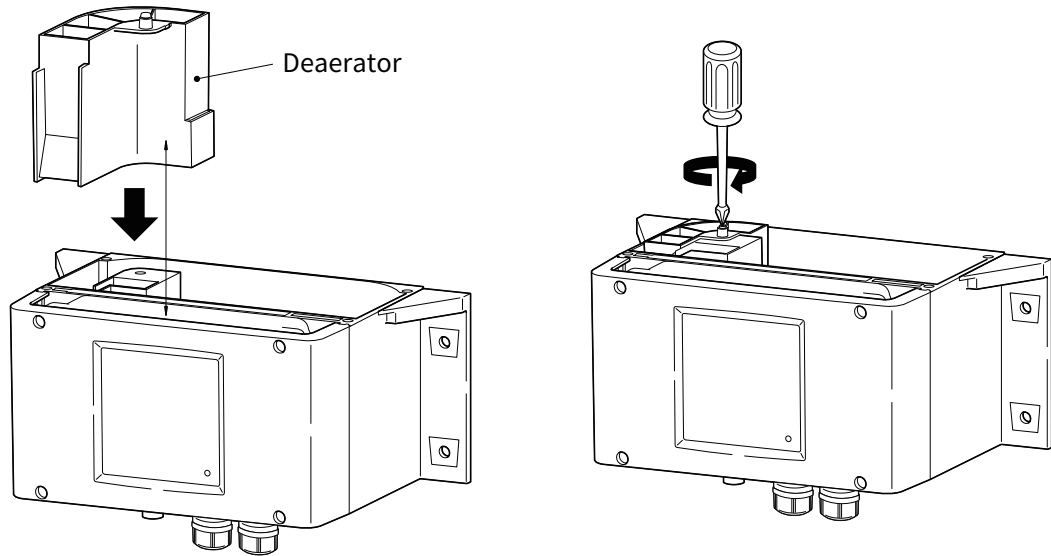
Detaching

Pull out (②) while pressing down the tip (①) of the Drain cap.



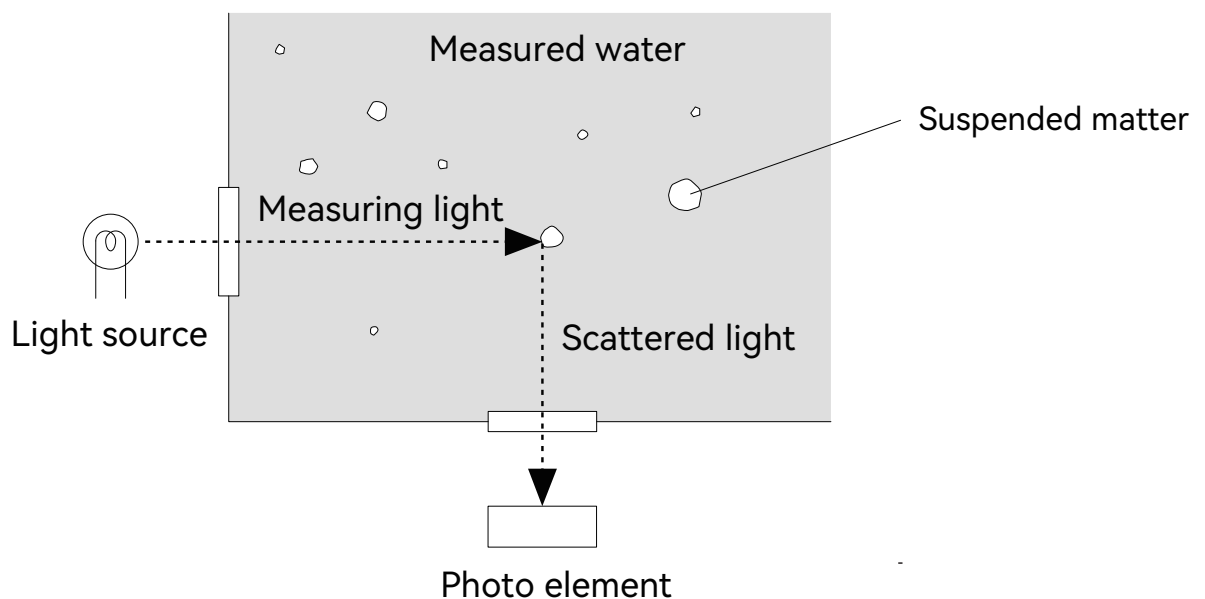
How to attach / detach the Deaerator

Attach the Deaerator and fix it by using the fixing screws.



Measuring principle

Turbidity Sensor innoSens 850T uses a method of 90 degree scattered light. In his method, a light source illuminates the surfaces of matter suspended in the water, and the light is scattered by these surfaces is detected by a photo element installed at an angle of 90 degrees from the light axis of the measured light. The turbidity is determined by the amount of the scattered light.

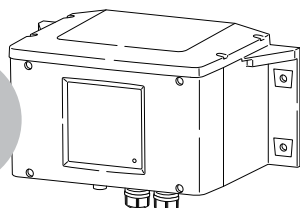
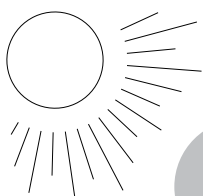


Installation

Installing innoSens 850T Turbidity Sensor

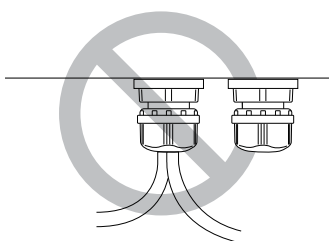
Before installation, remove the cable from the power supply, and after completion, wire the power supply cable.

“” denotes “Prohibited action”, and “” denotes “Required action”.

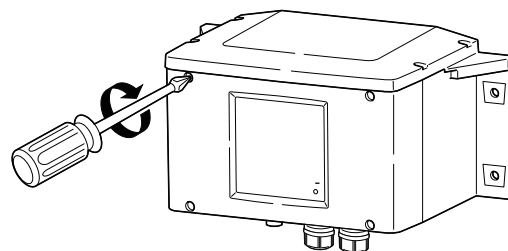


The innoSens 850T must be installed at the place which is well-ventilated, and is not exposed to direct sunlight.

For wiring the unit, use the bundled cable clamps.

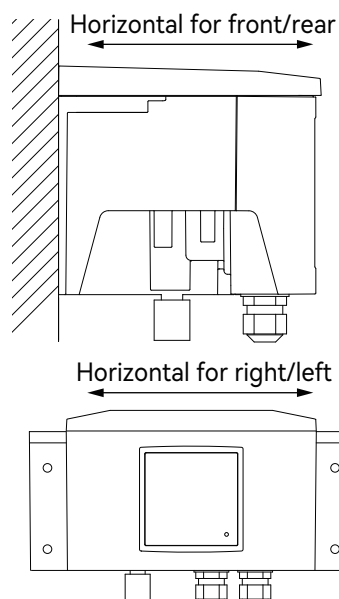
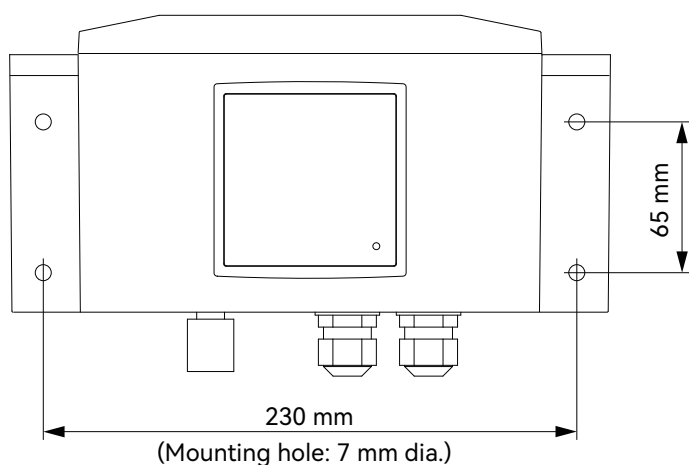


The signal output cable and the power cable must not be bound together or put in the same cable clamps.



Securely tighten the panel fixing screws. When the screws are loose, sufficient protection cannot be obtained.

Install the innoSens 850T on the wall. For the mounting pitch, see the figure below.



Caution

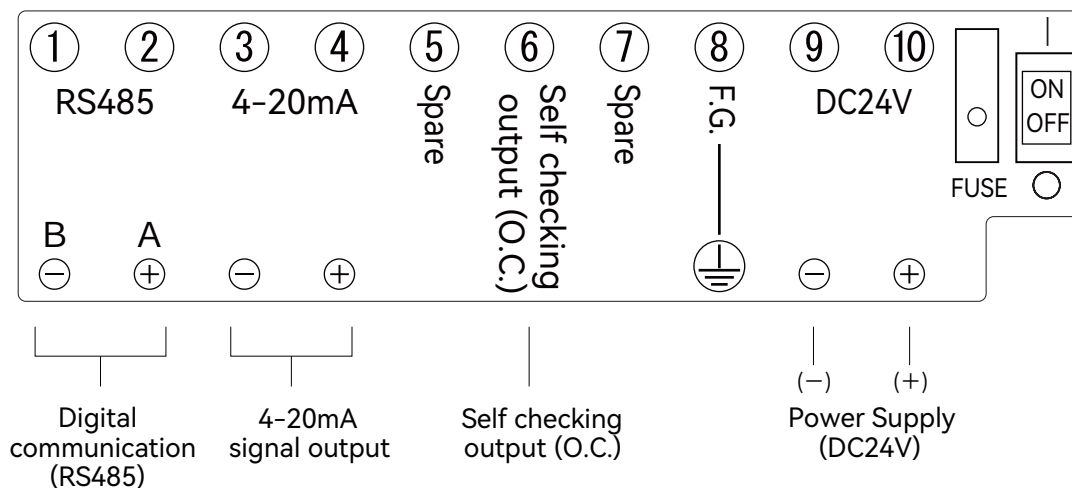
Install the innoSens 850T horizontally for all directions (front/rear, right/left).

Electrical Connection

Caution

Be sure to use the power supply of DC24V. Otherwise it may cause fire or electric shock. Before installation, turn off the power supply switch, and then wire the power supply cable. Otherwise it may cause fire or electric shock.

Terminal block



Compatible cable diameter with the Cable Clamps is 6 to 8 mm

Reference

For the digital communications, refer to page 21, "10 Digital Communications".

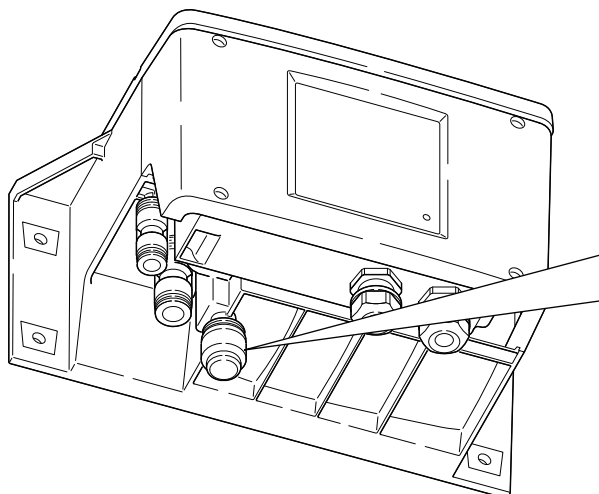
Maintenance

Cleaning is required in proper interval (the interval depends on the water quality).

Clean the following locations:

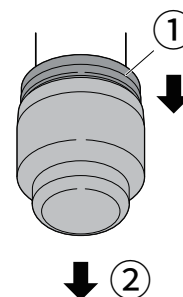
Clean the measurement tank and Deaerator using a clean soft cloth.

If dirt accumulates at the bottom of the measurement tank, detach the drain cap and drain off the water before cleaning it.

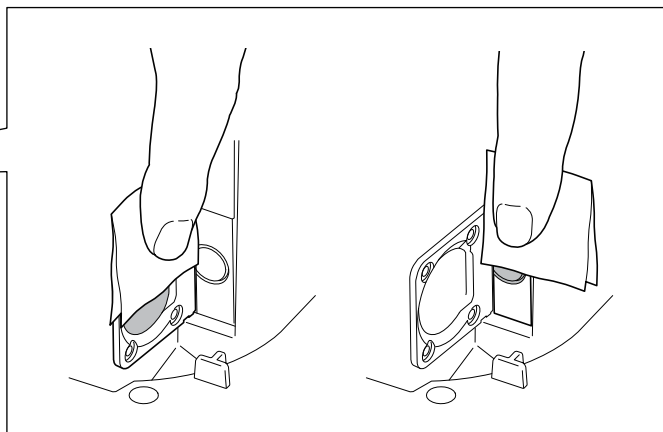
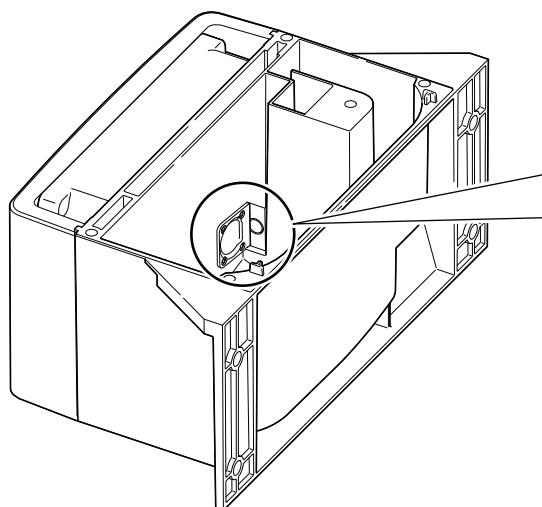


Pull out (②) while pressing down the tip (①) of the drain cap.

Drain cap



Clean the measurement windows (2 places) using a clean soft cloth.



If the cover or panel is contaminated, first wipe away lightly with a clean soft cloth immersed in a diluted mild detergent solution and then wipe off the moisture by using a dry clean soft cloth.

Caution

Do not use organic solvent such as benzene for cleaning this product.

Do not wipe innoSens 850T with organic solvent such as benzene.

Wiping the light source window with a hard cloth may cause scratches, which disables the correct measurement. Use a clean soft cloth or a cotton swab to remove dirt.

Periodic inspection

Inspect the following items every month:

Scratches on the cable or cable deterioration

Water leakage from the water inlet, water outlet, or drain

Check if the unit outputs a correct value when the measurement water with known concentration is used.

Storage for a long time

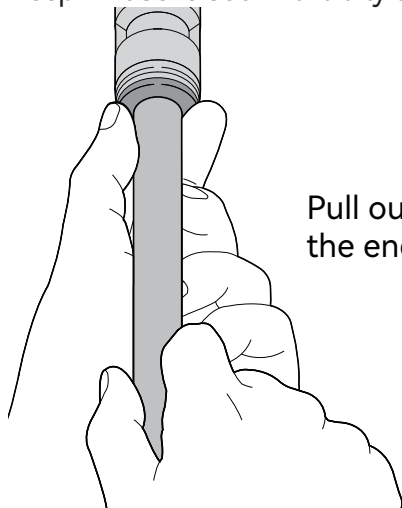
When the Turbidity Sensor innoSens 850T is not used over a prolonged period, keep it as follows:

Drain off the water from the measurement tank and keep the water.

Follow the procedure below.

- 1、 Stop feeding water to this product.
- 2、 Detach the drain cap and let the water come out of the tank, and protect the water outlet.
- 3、 Wash the drain cap and keep it in a clean place.
- 4、 Disconnect the tube at the water inlet (In order to protect the inflow port, keep the joint attached.).
- 5、 The tube does not have to be disconnected from the water outlet.
- 6、 Open the panel and shut down the power supply switch.
- 7、 Disconnect the power cable from the power source and attach the panel.

Keep innoSens 850T Turbidity Sensor at a place not being exposed to direct sunshine.



Pull out the tube as pushing
the end of the joint in.

Caution

Leaving the drain cap in place allows rain to come into the measurement tank. The drain cap must be detach and kept.

Be careful not to damage the water inlet and outlet. Damage causes water leakage and could result in malfunction, which requires replacement of the unit.

Technical Parameters

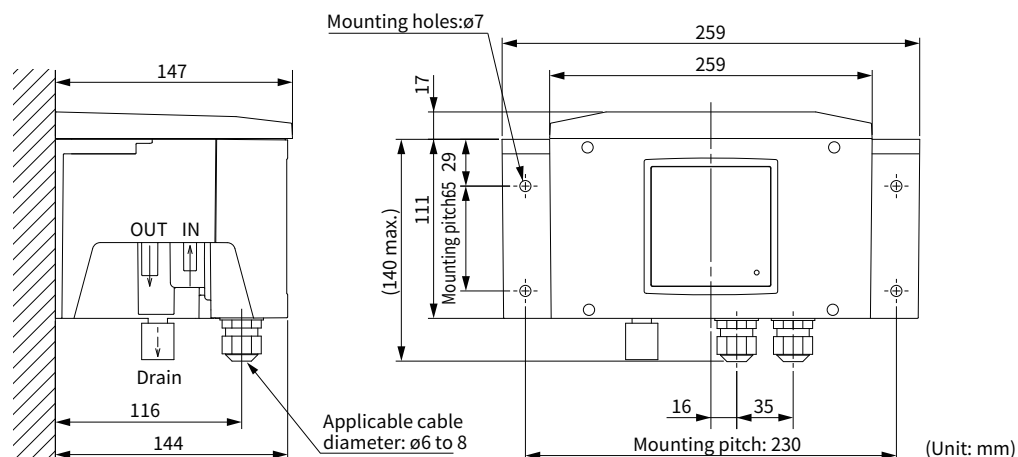
innoSens 850T Turbidity Sensor:



Specifications are subject to change without prior notice.

Name	Turbidity Sensor
Model No.	innoSens 850T
Measurement principle	Turbidimetric light-scattering method
Light source	LED
Measuring range	0-100 NTU
Power supply voltage	24VDC±10%
Current consumption	Normal: 100mA or less, During activation: 600mA max.
Output	Signal output (analog 4-20 mA, resistive load 300Ω or less)
	Self-checking relay output (open collector)
Digital communication	MODBUS protocol (RS485)
Measured water flow	100 to 200 mL/min
Measuring water temperature	0 to +40°C (unfrozen)
Ambient temperature	-20 to +50C, humidity 95%Rh or less
Main material	PPO, AES, SUS316L
Dimensions	W×H×D 259×157×147 mm Protruding portions are included
Weight	approx. 2 kg
Degree of protection	IP65

Dimensions



Digital communications

Communication Method

Item	Specification
Protocol	MODBUS RTU (default)
Baud rate	9600 (default) / 14400 / 19200 / 38400 bps
Data bits	8bit
Start bits	1bit
Stop bits	1bit
Parity bit	None
Slave address MODBUS only	56 (default)

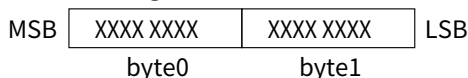
MODBUS protocol

Frame Configuration

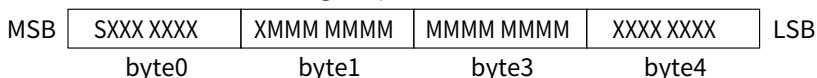
Function Codes	Description
4	Read input registers
6	Write single registers

Data Type

ushort (unsigned short)

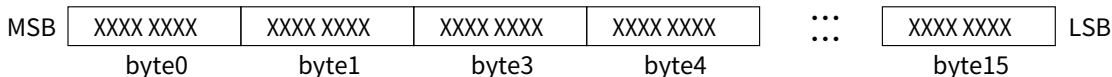


float (IEEE 754 format, single byte)



where 'S' = sign bit, 'X' = exponent bits and 'M' = mantissa bits.

string



Register Map

Register(Dec)	Size (registers)	R(Read)/W(Write)	Data type	Description
0002	1	R	W	ushort
				Read: Confirm measurement state (Not in measurement = 0x0000, In measurement = 0xFFFF)
				Write: Start measurement (write in 0xFFFF)
0003	1	-	W	ushort
				Stop measurement (write in 0xFFFF)
0047-0054	8	R	-	string
				Store serial number
0070	1	R	-	ushort
				Store error number
0084	1	R	W	ushort
				Store communication protocol
0085	1	R	W	ushort
				Store transmission speed
0087	1	R	W	ushort
				Store slave address (default = 1)
0100-0101	2	R	-	float
				Store measured value
0110	1	R	W	ushort
				Store unit indication
0111-0112	2	R	W	float
				Store offset adjustment value
0115-0116	2	R	W	float
				Store span adjustment value
0123	1	R	W	ushort
				Store signal output response time
0124-0126	2	R	W	float
				Store measurement range
0196	1	R	W	ushort
				Store the noise reduction setting

Reset the power supply after changing protocol, baud rate or slave address. The settings do not change until power reset.

JENSPRIMA INSTRUMENTS LIMITED

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