

Logger Type Current Velocity Meter

AEMD-USB

Operation Manual



For Your Safety Use

1. Prior to use, read this manual carefully.
2. Unsuitable handling causes some accident.
3. Store this manual with caution.



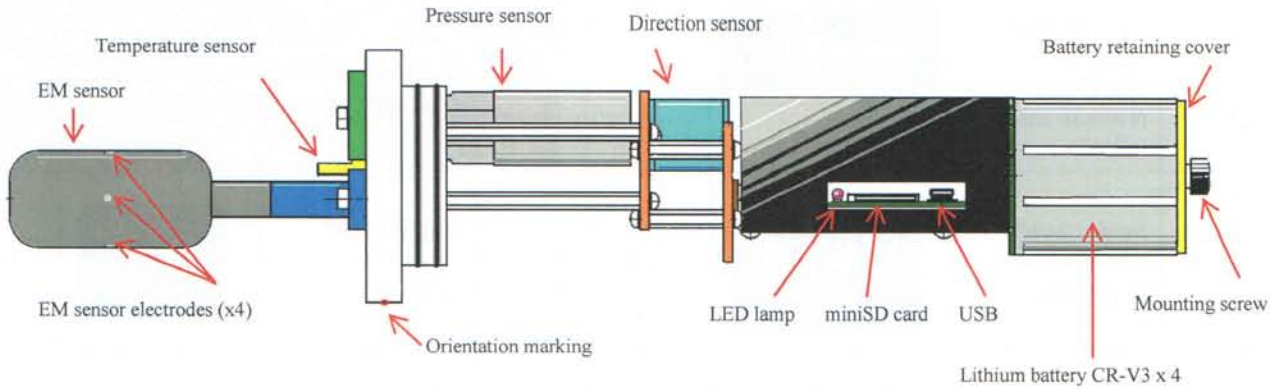
JFE Advantech Co., Ltd.

JFE

1. Part Names

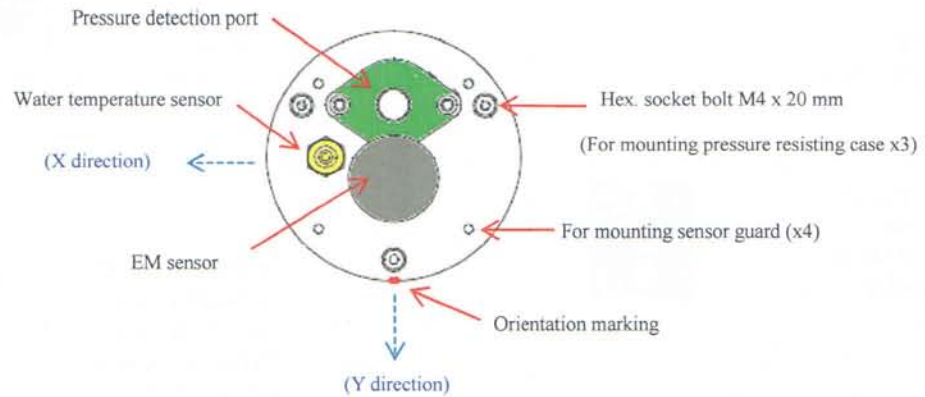
1.1 Name of Sensor Parts

Sensor main body (internal unit)

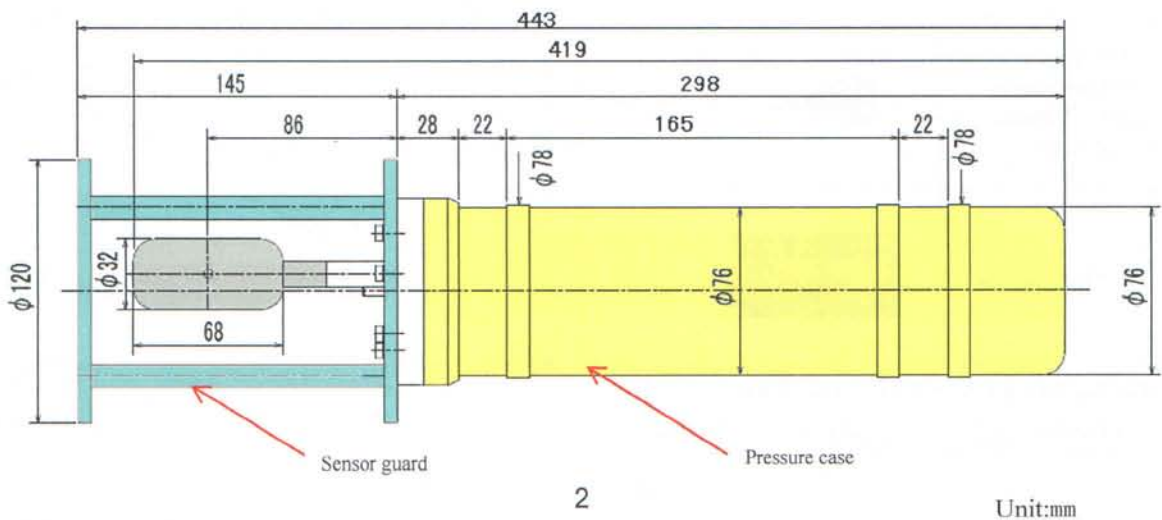


Instrument top

(Top view)



1.2 Outline drawing



3. Safety Notation

**DANGER**

Improper operation will result in serious personal injury or death, and also when danger occurs, warning urgency (degree) is high and definite (including high risk).

**WARNING**

Improper operation may result in serious personal injury or death.

**CAUTION**

Improper operation may result in slight personal injury or property damage only.

Please read before use

**DANGER**

- When operating on water, adequate safety in the working environment must be secured to prevent a fall.

**WARNING**

- Care should be taken not to injure your waist, etc. in an uncomfortable position when installing and collecting the instrument.
- When mooring with wires, wear gloves or the like not to injure your hands with cable burr and protrusion.
- When putting the internal unit into the pressure resisting case, care should be taken not to squeeze your fingers and hands there.

**CAUTION**

- Be sure to use a new battery, and after attaching of batteries, attach a battery pressing cover securely. Mounting the pressure resisting case with the screw loose may cause a breakage of the battery box.
- Replace the O-ring, if it has flaw or foreign matter attached. Otherwise, it causes the internal unit to be submerged.
- Handle the instrument in a wet condition carefully because it can be slippery.
- When mooring, be careful for the instrument and cables not to touch obstacles around them.

4.3 Communication with the application software

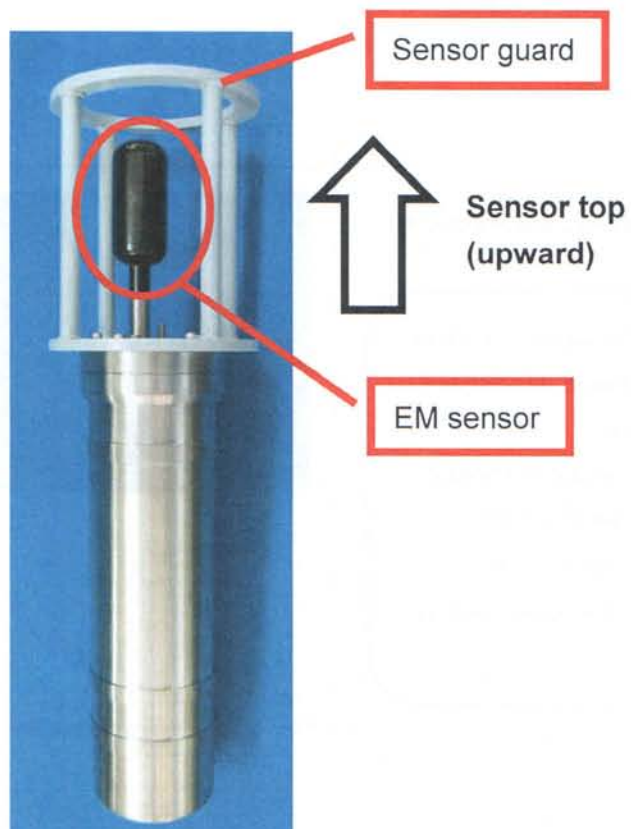
- (1) Prior to use, insert the miniSD card into the main body.
- (2) Do not forcibly pull out or insert the main-body USB connector which is easily broken.

4.4 Disposal

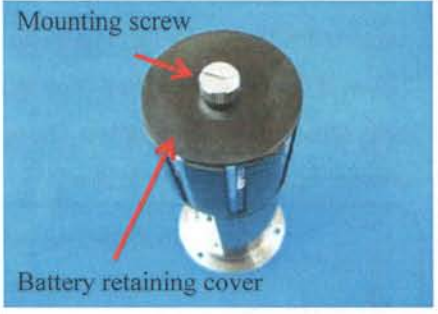


- (1) When disposing this product, you are kindly requested to suitably treat in accordance with the rules such as law, ordinance (regulation), etc.
- (2) Dispose the used lithium battery according to the segregation method in each area.

4.5 Mounting direction of EM sensor


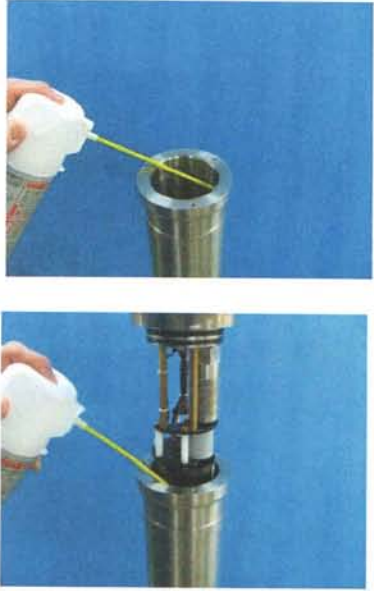


- (1) Pay attention to the mounting direction of the instrument during measurement. Detach the sensor guard, and keep the EM sensor to the upward direction.



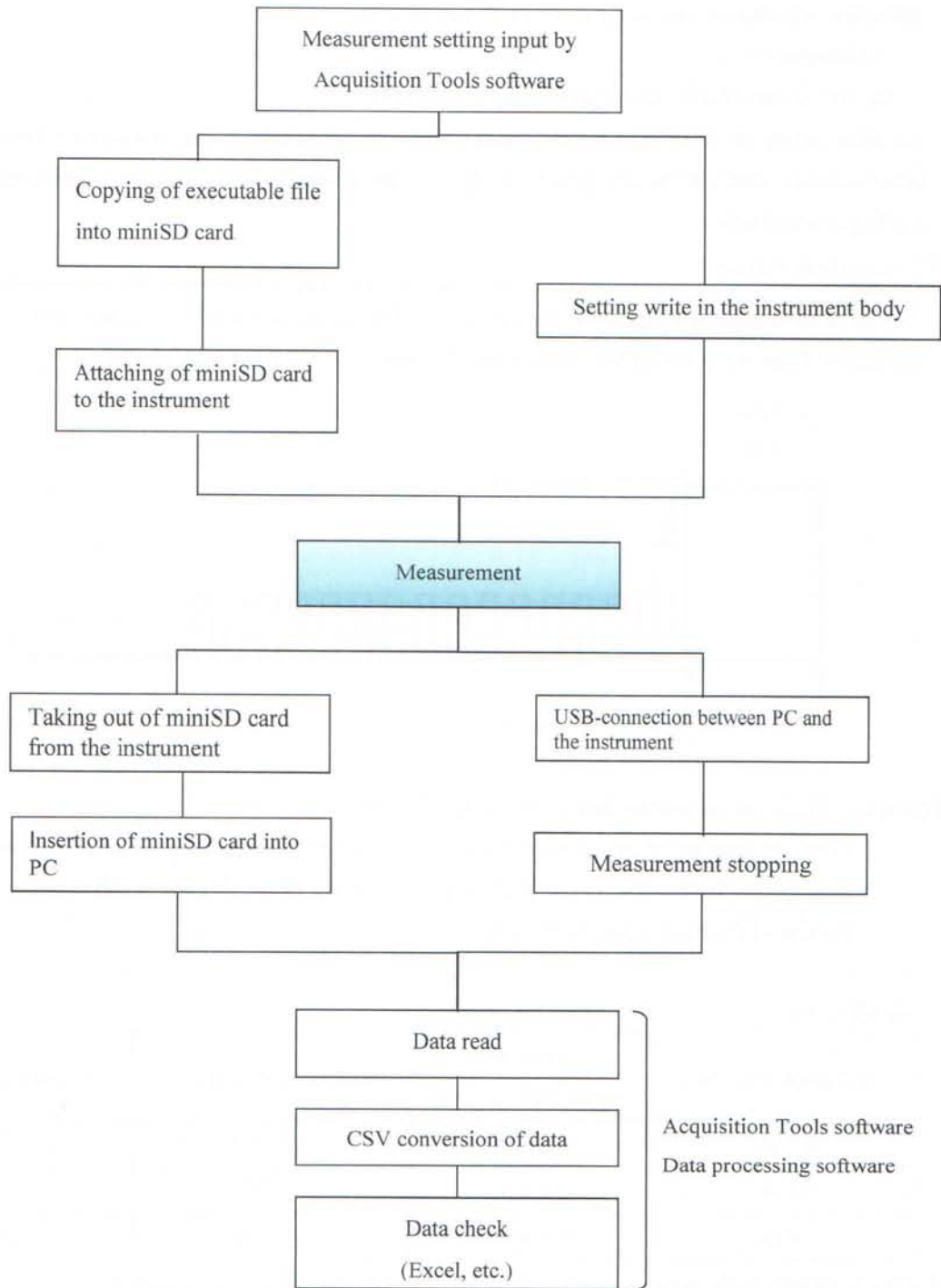
5.2 Battery replacement

1	<p>Loosen the mounting screw and remove the battery retaining cover.</p>	 <p>Mounting screw</p> <p>Battery retaining cover</p>
2	<p>Replace the battery and re-mount the battery retaining cover removed.</p> <div data-bbox="327 806 954 1339" style="border: 1px solid black; border-radius: 15px; padding: 10px;"><p> CAUTION</p><ul style="list-style-type: none">● Securely tighten the mounting screw to the end by hand. Tightening it insufficiently may lead to a breakage of the battery case when closing the pressure resisting case.● Replace all of the four batteries with new ones.● Be careful about the inserting direction of the batteries. The flat surface is the inside. Forcibly inserting a battery in the opposite direction will cause a breakage of the battery case.</div>	

5.5 Charging instruction

1	<p>(1) After checking for foreign matter adhered to the O-ring and its contact surface (inside the pressure resisting case), apply appropriate quantity of silicone grease (attachment) to the both.</p> <p>(2) Charge the dew condensation preventive gas and insert the instrument main body (internal unit) into the pressure resisting case. Charge the gas into the instrument also from the slit of the miniSD card insertion slot.</p> <div data-bbox="331 696 991 1014" style="border: 1px solid black; border-radius: 15px; padding: 10px;"><p> CAUTION</p><ul style="list-style-type: none">● Make sure that there is no fouling on the O-ring.● Prevent from catching of O-ring when pushing in the case.● Be sure to charge the dew condensation preventive gas.</div>	
2	<p>Secure the pressure resisting case with the hex. socket bolt. (Use a hex. wrench.)</p> <div data-bbox="331 1308 991 1442" style="border: 1px solid black; border-radius: 15px; padding: 10px;"><p> CAUTION</p><ul style="list-style-type: none">● Tighten the three hex. socket bolts uniformly to the end.</div>	

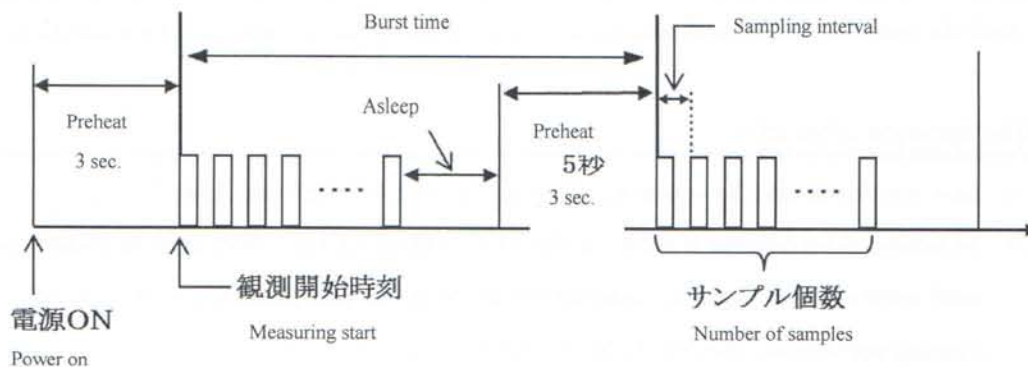
6. Measurement Flow



7.2 Burst mode

Set the Start-measuring-time, Burst time, Sampling interval, Number of samples.

The measurement will be continuously conducted from the specified Start-measuring-time once in the Burst time.



<Reference> Maximum measuring time in the burst mode *1

(The consumption of the memory and battery*2 will be automatically calculated by the Acquisition Tools software and displayed on the setting screen. For the details, refer to the manual of the Acquisition Tools software.)

AEMD-USB (Sampling interval: 0.5 sec)

Number of samples	10					20					30					60					120				
	Max. measuring time & Memory consumption [**days (**MB)]																								
	Battery consumption [**Ah (**%)]																								
Burst time (min)	10	309 days	190 days	138 days	75 days	39 days	64.6 MB	79.7 MB	86.5 MB	94.5 MB	99.0 MB	10.6Ah (100%)	10.6Ah (100%)	10.6Ah (100%)	10.6Ah (100%)	10.6Ah (100%)									
		614 days	380 days	275 days	150 days	78 days	64.1 MB	79.4 MB	86.2 MB	94.3 MB	98.9 MB	10.6Ah (100%)	10.6Ah (100%)	10.6Ah (100%)	10.6Ah (100%)	10.6Ah (100%)									
	20	915 days	567 days	411 days	225 days	118 days	63.7 MB	79.0 MB	85.9 MB	94.1 MB	98.9 MB	10.6Ah (100%)	10.6Ah (100%)	10.6Ah (100%)	10.6Ah (100%)	10.6Ah (100%)									
		1792 days	1120 days	815 days	448 days	236 days	64.2 MB	78.0 MB	85.1 MB	93.7 MB	98.6 MB	6.4Ah (60%)	9.2Ah (87%)	10.6Ah (100%)	10.6Ah (97%)	10.6Ah (100%)									
	60	3445 days	2186 days	1600 days	887 days	469 days	60.0 MB	76.1 MB	83.6 MB	92.7 MB	98.1 MB	3.3Ah (15%)	4.7Ah (23%)	6.1Ah (29%)	10.3Ah (49%)	10.6Ah (100%)									

*1 The maximum measurement time varies depending on the conditions.

*2 Check whether the remaining memory capacity is sufficient from the setting screen.

The battery capacity is calculated based on new batteries with a safety factor (x 0.8).

9. Troubleshooting

No	Situation	Countermeasures
1	No communication with PC	Re-start the PC and try to re-communicate. If communicating is still in trouble, re-install the driver. (Refer to software manual for Acquisition Tools.)
2	No starting of measurement	Check if the time and measurement time information written in the instrument is correct with Acquisition Tools. In addition, if the battery capacity remains less, normal starting is not done.
3	No entry of batteries	Use specified batteries. Further, check if the direction of batteries is correct. (See 5.2.)
4	Current velocity and current direction measurements are not accurate.	Check the installation state of the instrument. The correct installation direction of the instrument is that the EM sensor is on the top . In addition, be sure to detach the sensor guard before starting measurement. The possible causes include the inclined installation of the instrument, the existence of an obstacle interrupting the current velocity, and the existence of a magnetic or metal obstacle around the EM sensor.
5	The EM sensor or water temperature sensor is bent.	The current velocity or water temperature value may not be output accurately. It may also cause a water intrusion, leading to a failure. Inspection at our factory is recommended.* ¹
6	Current velocity measurements have started to deviate.	Inspect the surface of the electrodes of the EM sensor for stains. When the electrodes are dirty, clean them with a neutral detergent. In case the stains still remain, remove them by wiping the electrodes of the EM sensor gently with a soft cloth to which alcohol is applied. Hard scrub may cause a breakage of the electrodes. If the stains cannot be removed or there is no improvement in the symptom, inspection at our factory is recommended.* ¹
7	The output of current velocity value is not stable.	When the EM sensor in a dry condition is submerged into water, it may take several minutes before the output is stabilized, which is not a malfunction. If there is no improvement in the symptom, clean the electrodes of the EM sensor (See No. 6).

10. Specifications

(1) Sensor specifications

	Parameter	Specification
Sensor type	Temperature	Thermistor
	Velocity	2 axis EM
	Direction	Hall element
	Pressure	Semiconductor sensor
	Slope	2 axis type
Measuring range	Temperature	-3 to 45 [°C]
	Velocity	0 to ±100 [cm/s]
	Direction	0 to 360 [°]
	Pressure	0 to 60 [MPa]
	Slope	0 to ±30 [°]
	Battery voltage	2.5 to 3.6 [V]
Resolution	Temperature	0.001 [°C]
	Velocity	0.02 [cm/s]
	Direction	0.1 [°]
	Pressure	0.002 [MPa]
	Slope	0.01 [°]
Accuracy ^{*1}	Temperature	±0.02 [°C]
	Velocity	±1.0 [cm/s] or ±2% RD, whichever is greater
	Direction	±2 [°]
	Pressure	±0.3 %FS
	Slope	±1 [°]

*1 The accuracy guaranteed range for water temperature is 0 to 35 [°C].

The accuracy guaranteed range for speed is 0 to ±60 [cm/s].

11. Warranty

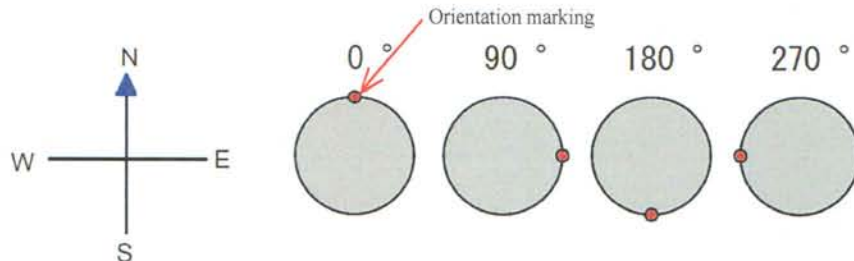
The following warranty applies to this product.

- (1) The warranty period shall be **one year** after the product has been delivered. Then, within this warranty period, if it is judged that any trouble attributed to design/manufacturing fault occurs or any trouble occurs in normal condition, repair or replacement is to be made free of charge.
- (2) The accessories, consumables, packings, visual flaw, dirt and rust shall be excluded from the scope of warranty.
- (3) Even within the warranty period, the following cases shall be for profit (nonfree):
 1. Breakage at mounting, mooring and storage
 2. Trouble and damage caused by incorrect operation and carelessness
 3. Trouble and damage caused by unwarrantable repair/modification
 4. Trouble and damage due to transportation, falling, shock, etc. after purchasing
 5. Trouble and damage caused by external factors such as fire, earthquake, flood disaster, thunder, natural disaster, pollution and abnormal voltage
 6. Trouble and damage caused by a defective equipment to be connected
 7. Consumables are damaged and need to be replaced
- (4) Our company is never responsible for any damage or lost earnings caused by use of this instrument, or any claim (request) by the third party. Then, your acceptance will be appreciated.
- (5) Any breakage which occurs at mounting and during operation shall be excluded from the scope of warranty. If there is a fear of breaking, it is preferable that the customers purchase insurance by themselves.

12.2 Direction sensor

An electronic compass using magnets and hall elements is incorporated. The sensor generates two-phase orthogonal outputs, with which the direction is calculated.

When the direction of the orientation marking is to the north, the azimuth is defined as 0 [°]. The degree increases clockwise.



12.3 Temperature sensor

A highly stable thermistor with a high response speed is used.

12.4 Tilt sensor

A two-axis acceleration sensor capable of static acceleration measurement is used to calculate the angle.

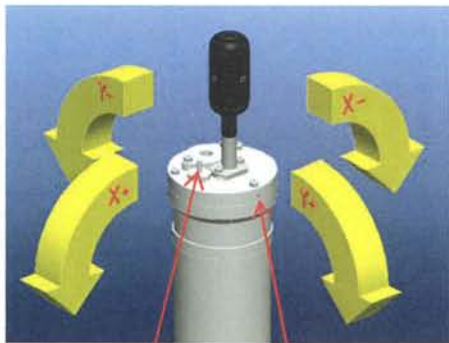
Incline direction and sign When the instrument is vertical: both x axis and y axis are 0 [°]

Tilt x axis-: inclined against the temperature sensor side

Tilt x axis+: inclined to the temperature sensor side

Tilt y axis-: inclined against the orientation marking side

Tilt y axis+: inclined to the orientation marking side



Temperature sensor

Orientation marking

12.5 Pressure sensor

A semiconductor pressure sensor with high-pressure range is used.