

Digital COD Sensor

User Manual

Contents

Contents.....	1
Preface.....	1
Overview.....	2
Features:.....	2
Probe dimensions.....	2
Cable Definition.....	5
Technical Specifications.....	5
Installation.....	6
Part List.....	6
protective cover.....	6
Installation precautions.....	6
Installation procedure:	7
Installation recommendations:	8
Maintenance.....	9
Recommended Maintenance schedule.....	9
Maintenance.....	9
Wiper replacement.....	10
Calibration.....	11
Introduction.....	11
Calibration Standards Preparation.....	11
Equipment and materials required.....	11
Trouble Shooting.....	11
Quality Assurance.....	13

Preface

Dear customer

Thank you for choosing our water quality instruments and sensors. We strongly recommended to read the entire manual carefully before use for an overall understanding of the instrument's operation and features.

Please follow the operating procedures and precautions in this manual.

To maintain post-sales warranty protection provided by the instrument, please do not use any operation or maintenance other than which mentioned in the manual.

Due to non-compliance with the precautions specified in this manual, any fault and loss caused shall not be covered by the warranty, and the manufacturer shall not bear any relevant responsibility. If you have any questions, please contact our post-sales service department or your representative.

Carefully unpack the instrument and accessories from the shipping container, and inspect for possible damage during shipping. Check parts listed on the packing list, if any parts or materials are damaged or missing, please contact our customer service group or the authorized distributor immediately.

Save all packing materials until you are sure that the instrument functions properly. Any damaged or defective items must be returned in their original packaging materials.

Overview

Digital COD sensor features highly reliable UVC LED for light absorption measurement. This proven technology provides reliable and accurate analysis of organic pollutants for water quality monitoring at low cost and low maintenance. With rugged design, and integrated turbidity compensation, it is an excellent solution for continuous monitoring of source water, surface water, municipal and industrial wastewater.

Features:

- Modbus RS-485 output for easy system integration
- Programmable auto-cleaning wiper
- No chemicals, direct UV254 spectral absorption measurement
- Proven UVC LED technology, long lifetime, stable and instant measurement
- Measurement of COD、TSS, and BOD
- Advanced TSS compensation algorithm

Probe dimensions

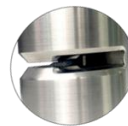


auto-cleaning wiper

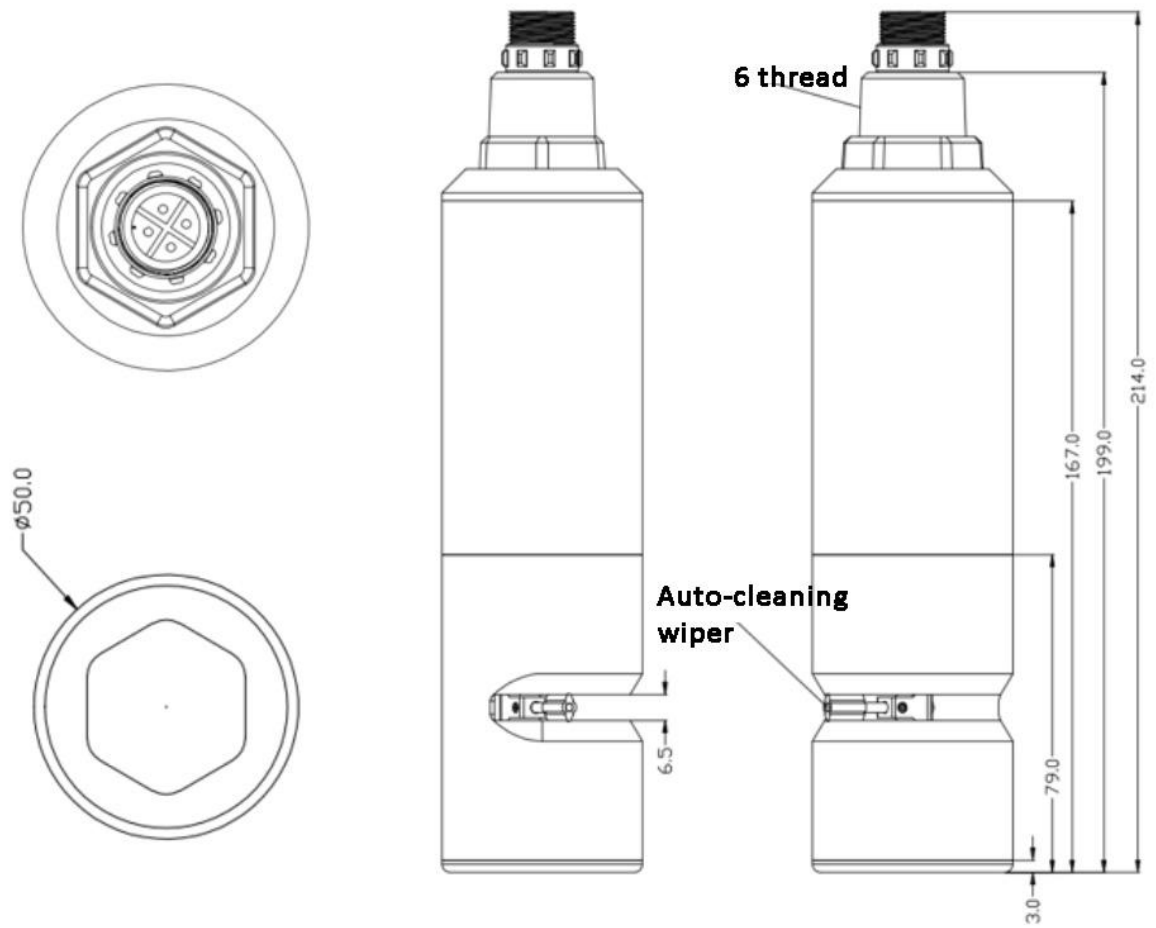
BH6602D 6.5mm Pathlength Gap



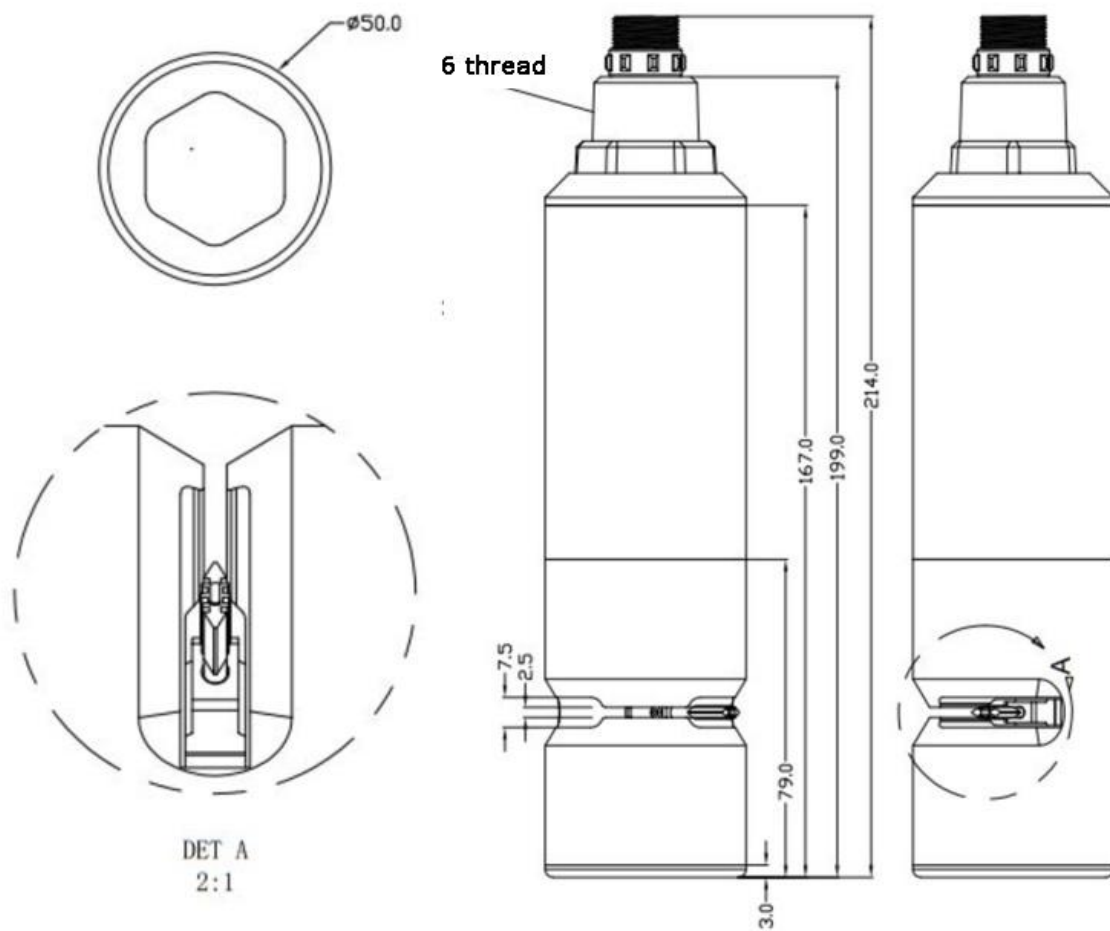
auto-cleaning wiper



BH6603D 2.5mm Pathlength Gap



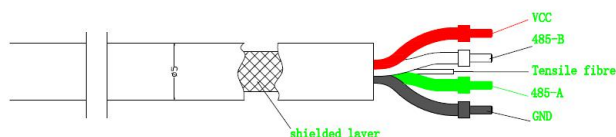
Dimensions of BH6602D



Dimension of BH6603D

Cable Definition

4 wire AWG-24 or AWG-26 shielding wire. OD=5mm



- 1, Red—Power (VCC)
- 2, White—485 Date_B (485_B)
- 3, Green ---485 Date_A (485_A)
- 4, Black --- Ground (GND)
- 5, Bare wire ---- shield

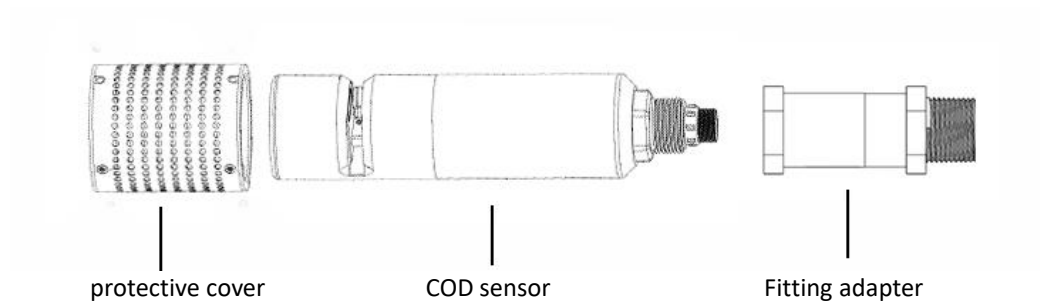
Technical Specifications

Model	BH6602D	BH6603D
Interface	Support RS-485, Modbus protocols	
COD Range	0.5 to 500mg/L equiv.KHP	1 to 2000mg/L equiv.KHP
COD accuracy	±5% equiv.KHP	±5% F.S. equiv.KHP
COD resolution	0.01mg/L	
BOD Range	0.3 to 500mg/L equiv.KHP	0.4 to 600mg/L equiv.KHP
BOD accuracy	<5% equiv.KHP	±5% F.S. equiv.KHP
BOD resolution	0.01mg/L	
TSS Range	0-500 mg/L	0-500 mg/L
TSS accuracy	<5% equiv.KHP	<5% equiv.KHP
TSS resolution	0.01mg/L	
Temperature Range	0~50℃ (No ice)	
Housing IP Rating	IP68	
Maximum pressure	3 bar	
calibration	1 point or 2 points	
Power Requirements	DC 12V -24V, current<50mA (non wiping)	
Sensor OD	50 mm	
Sensor Length	214 mm	
Cable Length	10m (default)	
Body Materials	POM and 316L (Ti optional)	

Installation

Part List

Item	Number	Note
COD sensor	1	
protective cover	1	
Fitting adapter	1	Optional Mounting part
cable	1	10m
brush	1	
Optional mounting parts		
Elbow, mounting backboard kit, etc		

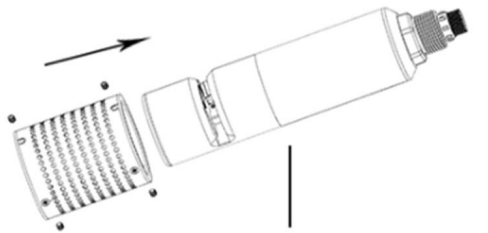


Installation precautions

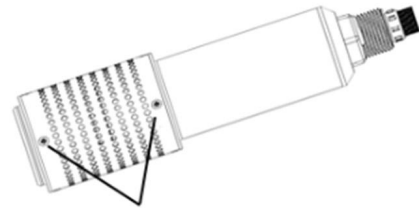
- Secure the sensor in safe place, in case of high-water flow fasten the probe to a wall or a pole.
- Consider fluctuation of water level, the sensor needs to be fully submerged in water. We recommend 30mm below water surface to keep wiper in wet.

Installation procedure:

1. After unpacking of the sensor, install a protective probe cover onto the sensor, as shown in the figure below (4 screws on the cover shall be tightened).

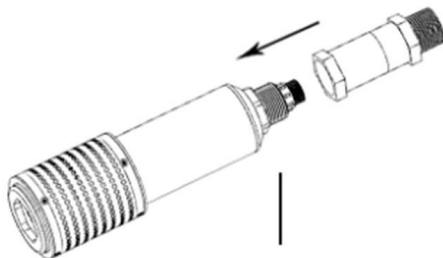


Loose 4 screws on the protection cover, and then slid the cover on the sensor gap.

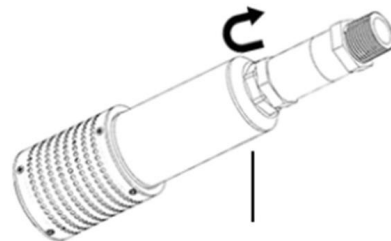


Tighten the screws to complete installation

2. When the protective cover is installed, please install the adapter as shown in the drawing if necessary



Mounting adapter installation



Turn counterclockwise to tighten the adapter

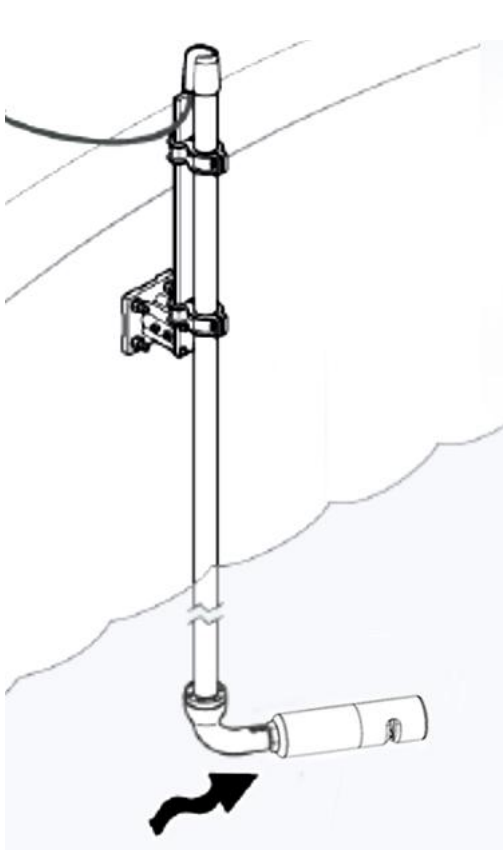


CAUTION:

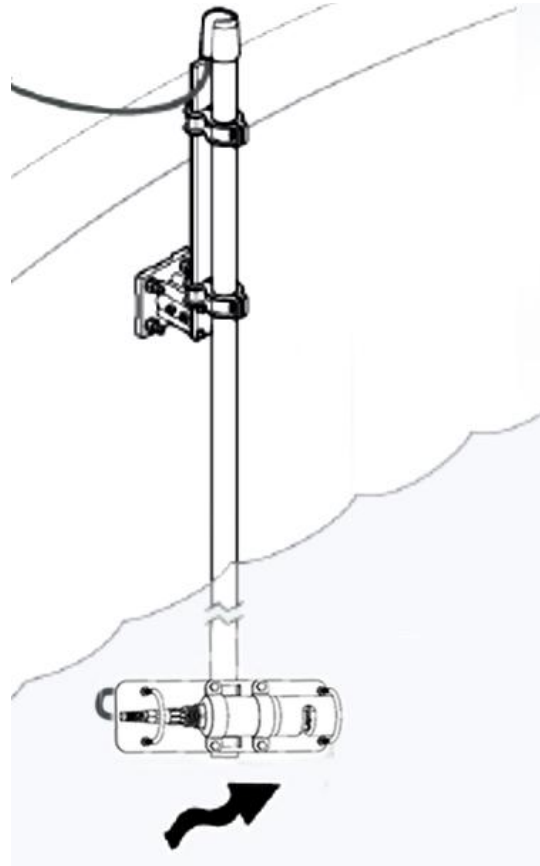
1. Please install the protective cover correctly.
2. Do not hang a sensor with sensor cable.
3. Do not cover or install anything in the measurement gap.

Installation recommendations:

It is suggested to carry out a fixed installation in the following two ways as shown in Figure (1) and Figure (2). Elbow installation in Figure (1) is good for environment with no rapid water flow and less debris. Fig. (2) is an illustration for plate installation, which provide a stable installation in rapid water flow.

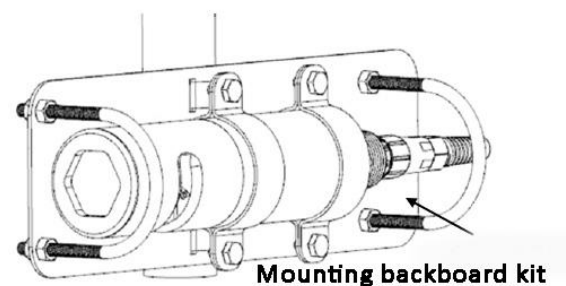


(1)



(2)

Part details of elbow and plate installation



Maintenance

Recommended Maintenance schedule

Although BH6602D/BH6603D comes with standard self-cleaning brush, harsh water environments will still cause the sensor optical window to be stained and the wiper blade can be strained by debris. To ensure accurate measurement, keep the probe clean is very critical to the performance of the probe. Regular maintenance of the sensor is strongly recommended.

Maintenance tasks	Maintenance frequency recommendation
Sensor cleaning	Every 3-4 weeks
Calibration	Calibration before every field deployment
Maintain and check wiper system	Replace a new brush every 3 to 6 months (depending on water condition)

Maintenance

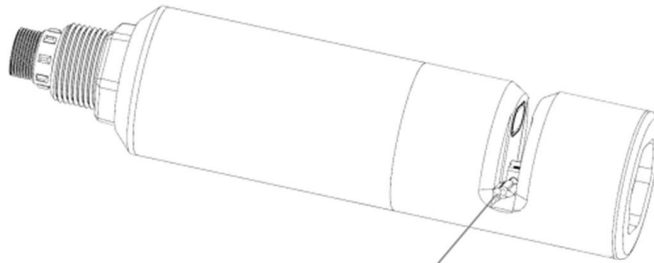
- (1) **Inspect probe body:** Wash the probe body with tap water, if there is still a clastic residues, using wet soft cloth to wipe, for some stubborn dirt, can add household detergents in tap water to clean.
- (2) **Check the cable :** The cable should not be in any force, tension, or twist. It cause the internal wire broken.
- (3) **Check the sensor measurement window:** carefully inspect probe optical window for potential stains, scratches, or dirty spots. Clean the window gently using cotton swabs. DO NOT USE ANY SOLVENT.
- (4) **Check the sensor wiper:** replace the wiper as necessary if see any tear and wear of the blade.
- (5) Recommend to return the probe to factory for wiper O-ring seal replacement after continuous use for 18 months.

Attention:

- (1)The sensor has optical components and electronic components which have more than ten years expected lifetime. Ensure to keep that the sensor away from mechanical impact or vibration.
- (2)force to rotate or obstruct the cleaning brush. The large external force will lead to the damage of the motor gear.
- (3)If there are many debris in the water body at the installation point, it is recommended to install a protective net around the sensor or a protective sleeve to prevent debris from enter into sensor optical gap.
- (4)Sensors should not be installed directly opposite the water flow and where there are many bubbles.

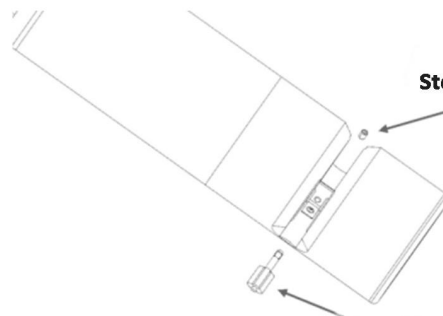
Wiper replacement

- (1) Place the sensor horizontally in a secure work bench and rotate the brush to side (see the picture below).



Step 1: Place the sensor horizontally in a secure work bench and rotate the brush to side

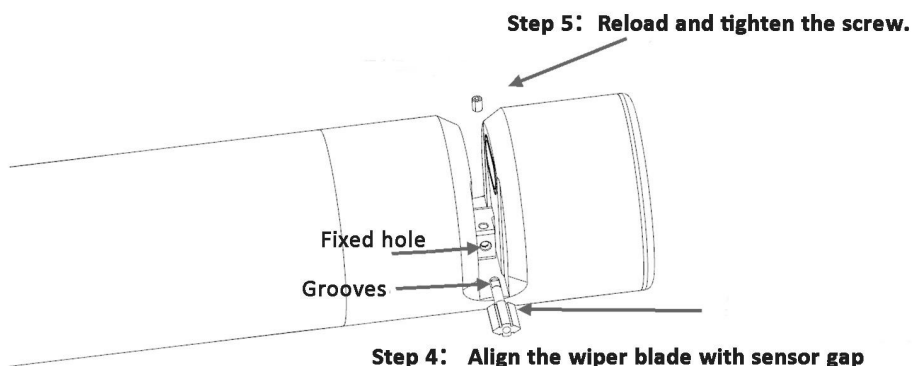
- (2) Use a screwdriver to unscrew the screw
- (3) Gently pull the wiper out, use tweezers if necessary



Step 2: Use a screwdriver to unscrew the screw

Step 3: Gently pull the wiper out, use tweezers if necessary

- (4) Align the wiper blade with sensor gap and then insert it into wiper mounting base .
- (5) Tighten the screw, DO NOT OVER TIGHTEN.



Step 5: Reload and tighten the screw.

Step 4: Align the wiper blade with sensor gap and then insert it into wiper mounting base .

Calibration

Introduction

COD sensor supports zero point, one point or two-points calibration. For more detailed information, please contact our customer service group directly.

Calibration Standards Preparation

Equipment and materials required

Analytical balance, Lab spoon, 50mL beaker, 100mL measuring cylinder, glass rod, Pipette 1L volumetric flask, 1L brown flask

KHP(potassium hydrogen phthalate, $C_8H_5KO_4$),CAS# 877-24-7, as a commonly used stain in environmental research, can be used for COD calibration, deionized water

Preparation of standard solutions of different concentrations

(1) Weigh 1.2754g potassium hydrogen phthalate, transfer and dissolve to DI water in a 1L volumetric flask, make up to volume with DI water to get a concentration of 1500mg/LCOD standard solution;

(2)Dilute the stock solution of 1500mg/LCOD in DI water to give working concentration of 150mg/L COD.

(3)Other concentration standard solution can also be diluted from stock solution

Note:

- 1. For the best results, choose standard solution concentration similar to your estimated sample concentration;**
- 2. High concentration stock solution (such as 1500mg/L) can be kept in refrigerator for late use, however it is recommended not to discard after a month;**

Trouble Shooting

Table 5-1 lists symptoms, possible causes, and recommended solutions for common problems encountered with COD sensor. If your symptom is not listed, or if none of the solutions solves your problem, please contact us.

Table 5-1 Troubleshooting

ERROR	POSSIBLE CAUSE	SOLUTION
Communication Failure	Power supply or wiring error	Check whether the power supply and wiring are correct according to the instruction
	Interface or communication issues	Check with our communication protocol if correctly programmed
No change in reading	Cleaning brush failure	Check whether the brush is entangled by debris, if so, please remove them gently Turn on the power again and observe whether the brush rotates. If it cannot rotate or rotates abnormally, please contact customer service Check whether the power supply meets the requirements,
	Hardware or software Failure	Contact customer service
Reading is too high, too Low or unstable	Sensor outside window is attached	Wash the surface
	Sensor self - cleaning damage	Replace the cleaning brush
	Calibration is required	Perform user calibration
Other errors	Contact customer service	

Quality Assurance

Warranty period:

1 year for all sensors

3 months for all electrical chemical electrodes (Non-chemical environment, Non industrial wastewater).

If there are defects found during the warranty period, Fluidings promises to repair or replace the defective products, or return the payment of product except the charge for the first time for transport and related formalities. In the warranty period, repair or replacement of any product will only enjoy the rest of the original warranty.

After receiving feedback for the product quality problems from the customer, Fluidings will confirm whether the product need repair within two weeks; It can't be returned without approval to repair the product.

This warranty does not include the following:

Damage caused due to force majeure, natural disasters, social unrest, war (published or unpublished), terrorism, civil war or any government forced.

Damage caused due to improper use, negligence, accident, or caused by the improper application and installation.

Freight for the product shipped back to Fluidings.

Freight for parts or products express or express delivery within the warranty.

Travel expense for repair in local in warranty

The quality assurance includes all content of products provided by Fluidings.

It constitutes the final, complete and exclusive statement about the quality guarantee, no person or agent is authorized in the name of Fluidings to develop other warranty.

As described above, the remedial measures such as repair, replacement or return the payment for product is not in violation of the warranty, and it aim at our own products only. Based on the strict liability or other legal theory, Fluidings is not responsible for defects or any other damage due to careless operation, including the subsequent damage with a causal connection between these situations.

