

Distribution Holder CF-501 Series

Instruction Manual

CODE: M000793-3200305802-GZ0000214589

Preface

This manual describes the operation of the Distribution Holder (CF-501 series).

Be sure to read this manual before using the product to ensure proper and safe operation of the instrument. Also safely store the manual so it is readily available whenever necessary.

Product specifications and appearance, as well as the contents of this manual are subject to change without notice.

Warranty and Responsibility

HORIBA Advanced Techno, Co., Ltd. warrants that the Product shall be free from defects in material and workmanship and agrees to repair or replace free of charge, at option of HORIBA Advanced Techno, Co., Ltd., any malfunctioned or damaged Product attributable to responsibility of HORIBA Advanced Techno, Co., Ltd. for a period of one (1) year from the delivery unless otherwise agreed with a written agreement. In any one of the following cases, none of the warranties set forth herein shall be extended;

- Any malfunction or damage attributable to improper operation
- Any malfunction attributable to repair or modification by any person not authorized by HORIBA Advanced Techno, Co., Ltd.
- Any malfunction or damage attributable to the use in an environment not specified in this manual
- Any malfunction or damage attributable to violation of the instructions in this manual or operations in the manner not specified in this manual
- Any malfunction or damage attributable to any cause or causes beyond the reasonable control of HORIBA Advanced Techno, Co., Ltd. such as natural disasters
- Any deterioration in appearance attributable to corrosion, rust, and so on
- Replacement of consumables

HORIBA ADVANCED TECHNO, CO., LTD. SHALL NOT BE LIABLE FOR ANY DAMAGES RESULTING FROM ANY MALFUNCTIONS OF THE PRODUCT, ANY ERASURE OF DATA, OR ANY OTHER USES OF THE PRODUCT.

Trademarks

Generally, company names and brand names are either registered trademarks or trademarks of the respective companies.

For Your Safety

Hazard Classification and Warning Symbols

Warning messages are described in the following manner. Read the messages and follow the instructions carefully.

- **Hazard classification**



Danger

This indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.



Warning

This indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Caution

This indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. Without safety alert indication of hazardous situation which, if not avoided, could result in property damage.

- **Warning symbols**



Description of what should be done, or what should be followed



Description of what should never be done, or what is prohibited

Safety Precautions

This section provides precautions to enable you to use the product safely and correctly and to prevent injury and damage. The terms of “DANGER” and “WARNING” and “CAUTION” indicate the degree of imminency and hazardous situation. Read the precautions carefully as it contains important safety messages.

Warning



When handling hydrochloric acids, be sure to wear protective goggles and protective gloves. Eye contact may result in mucous membrane irritation and blindness.

In the case of eye contact, wash the affected face with plenty of water immediately for at least 15 minutes, and get medical attention.

When washing the affected face, open the eyelids with fingers so that running water can spread easily to every corner of the eyeballs and eyelids. Moreover, contact with human body and clothing may result in burns (chemical injury). Take off contaminated clothing promptly, and flush the affected area with plenty of water promptly.

Caution



Caution Against Blowout

If a clamping nut is loosened, the liquid in a Distribution Holder may blow out. This may pose a risk of serious injury to persons

Loosen a clamping nut after completely reducing pressure in the Distribution Holder.

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Overview

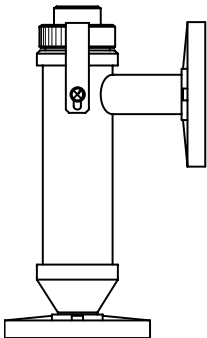

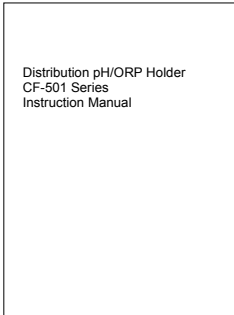
This Distribution Holder can be used only for a system under which a measured liquid line is opened to atmospheric pressure.

If an internal pressure exists in the measured liquid line, please consult with HORIBA Advanced Techno.

Unpacking

This Product has been inspected and packed with meticulous care to prevent any damage in transit. Upon delivery of this Product, unpack and check this Product for any damage. Check the accessories for shortage. For any deficiencies, please contact your dealer.

Breakdown of Complete Set (standard)

● Distribution Holder	● Accessories
	• O-ring (P44) 1
● Instruction Manual	
	

After unpacking, store the accessories carefully not to lose them.

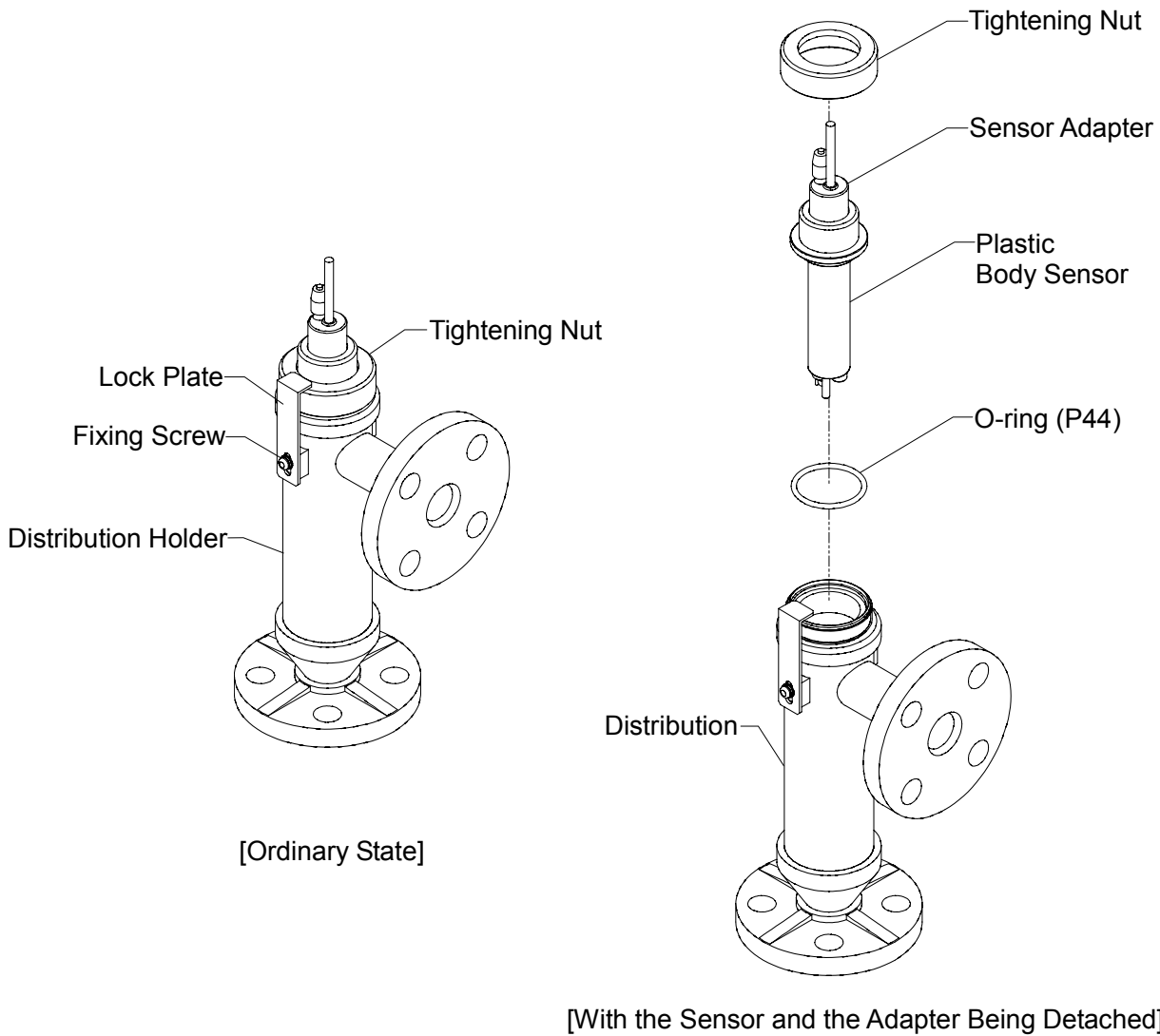
Options

● Electrode

● Internal liquid (3.3 mol/L KCl)

Names of Parts

Distribution Holder



⚠ Caution	
!	<p>Caution Against Blowout If a clamping nut is loosened, the liquid in a Distribution Holder may blow out. This may pose a risk of serious injury to persons Loosen a clamping nut after completely reducing pressure in the Distribution Holder.</p>

Installation

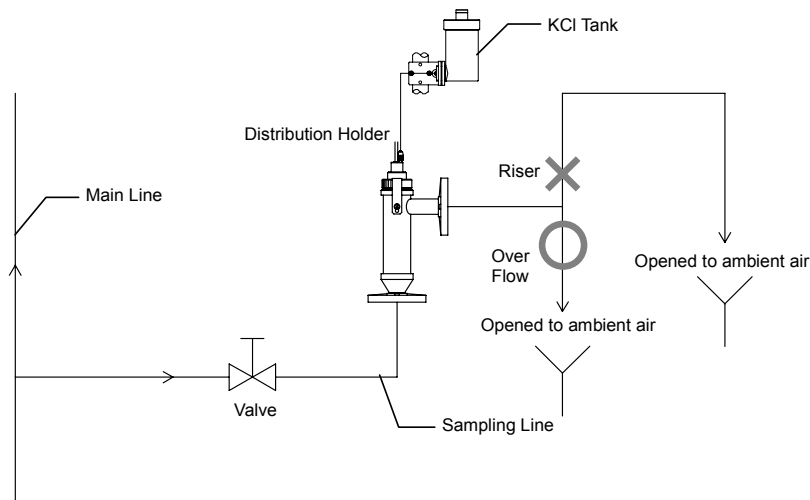
Be sure to following the following instructions for setup.

- **Install the Distribution Holder at a location where maintenance work can be easily performed.**
- **Leave a maintenance space of 15 cm or more at the top of the CF-501. Give room to an electrode cable to detach it for maintenance, etc.**
- **Avoid installing the Distribution Holder at a location exposed to violent vibrations or heavy dust.**
- **Attach an electrode so that it does not float up in the air even when the supply of an internal liquid is stopped and the internal liquid in the Distribution Holder is drawn out.**
- **Avoid installing the Distribution Holder at a location where corrosive liquid is splashed, or in an atmosphere of corrosive gas.**
- **Avoid installing the Distribution Holder at a location where a surface temperature and an ambient temperature are 50°C or higher in the vicinity of a heat source.**
- **If measured liquid contains air bubbles, slurry and solids that may cause damage to an electrode, eliminate them from the measured liquid in advance.**
- **Do not connect the Distribution holder to the main line. Be sure to provide a sampling line to connect it to the Distribution Holder. (Maintenance work cannot be performed without closing the main line.)**
- **For use of a KCl Tank, install the KCl Tank at a position where the bottom surface of the KCl Tank is higher than the top of the Plastic Body Sensor (the tip of a tube joint).**

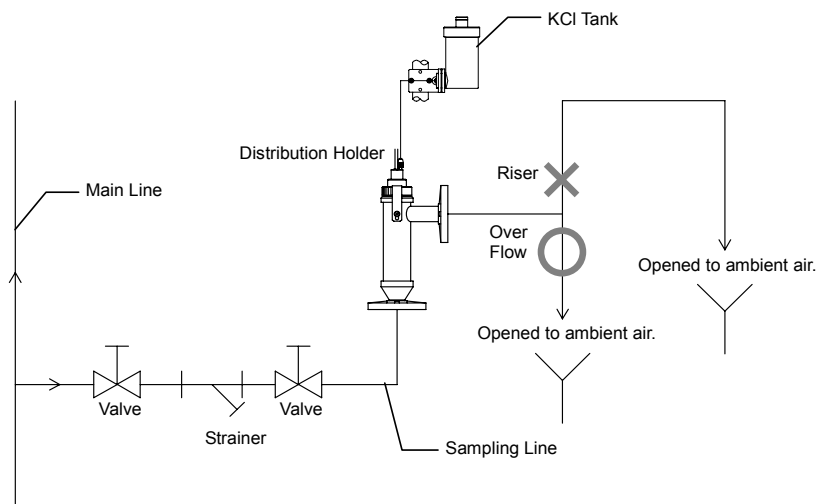
Piping

- For installation of the Distribution Holder, provide a sampling line from the main line so that the measured liquid flows into the bottom side of the Distribution Holder and flows out of the lateral side of the Distribution Holder.
- ❗ • Make the length of an outlet pipe of the Distribution Holder as short as possible. Be sure to open the outlet pipe to the ambient air once
- ⊘ • Do not use a riser for outlet piping.
The inside of the Distribution Holder is held under back pressure, thus causing a reverse-leak of measured liquid to the inside of an pH/ORP electrode. It becomes impossible to make accurate measurements. (An electrode causing reverse leaks cannot be used.)
- Be sure to provide a pipe on the inflow side See Fig. 1.
If the flow rate of measured liquid is too much, this may cause capitation, etc. or fluctuation of indicated values because the electrode's liquid junction section is pressurized by flow velocity. If a flow rate is too little, this may cause a response delay of indicated values. Regulate a flow rate according to the conditions of measured liquid.
- If many suspended solids are contained in the measured liquid, provide a strainer on the inflow side of the Distribution Holder.
See [Fig. 2].
- For use of a KCl Tank, install the KCl Tank at a position where the bottom surface of the KCl Tank is higher than the top of the Plastic Body Sensor (the tip of a tube joint).

[Fig. 1]



[Fig. 2]



Measurement

Before Measurement

A sensor is not factory-incorporated in this Holder.
Read the Instruction Manual for the Sensor carefully prior to use.

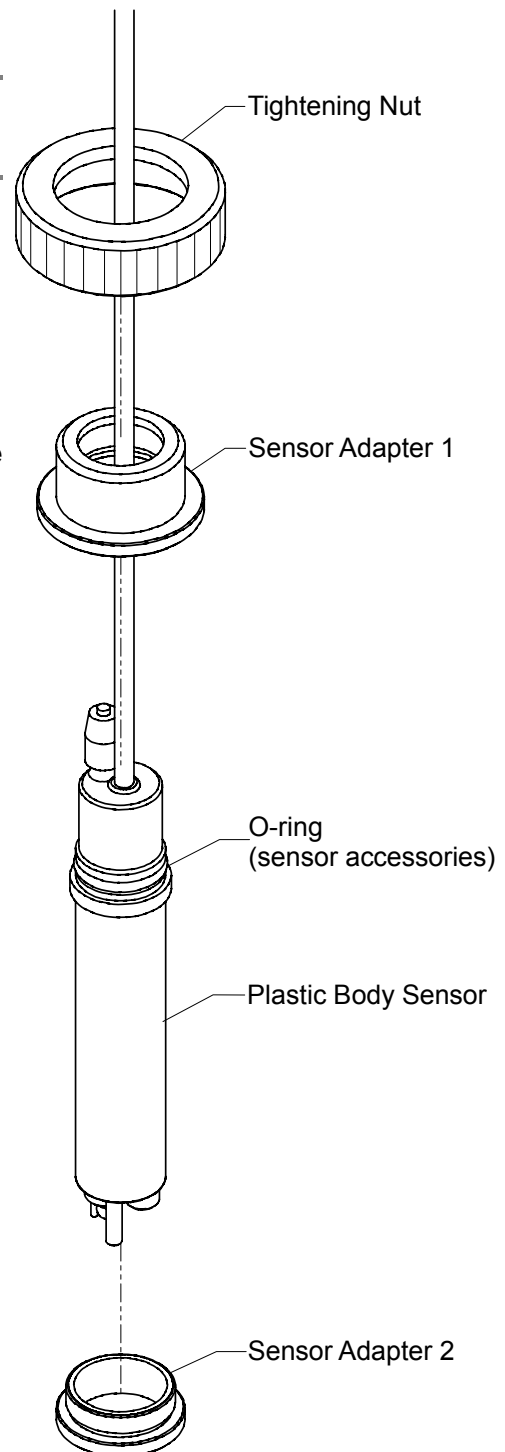
• Incorporating a Sensor

Note

An electrode is made of glassware. An electrode may be broken if any shock or strong force is applied.

1. Detach the lock plate from the Distribution Holder, remove the tightening nuts and draws out Sensor Adapters 1 and 2.
2. Detach Sensor Adapter 2 from Sensor Adapter 1.
3. Insert the Plastic Body Sensor to Sensor Adapter 1 until the end face of the plastic body Sensor hits the working face of the Sensor Adapter 1. (See the right Fig.)
Be careful of the engagement of the Sensor O-ring.
4. Pass Sensor Adapter 2 from the tip of the Plastic Body Sensor as shown in the right Figure, and screw in Sensor Adapter 1 firmly.
5. If this instrument is used for the first time or reused after stored for a long period, be sure to perform a calibration by a standard liquid to adjust the electrical characteristics of the electrode and the measuring instrument mainframe (calibration by standard liquid).
6. Make sure that an O-ring is placed in the Distribution Holder, and attach the Plastic Body Sensor with the Sensor Adapter to the Distribution Holder.

Now that it is ready to make measurements.



Maintenance

Replenishing the Internal Liquid (3.3 mol/L KCl)

Maintain the level of internal liquid (3.3 mol/L KCl) higher than the level of measured liquid.
Replenish the consumed amount of internal liquid periodically.
For the method of replenishing, see the Instruction Manual for the KCl Tank.

About Calibration by Standard Liquid

- **For a pH Meter**

The properties of an electrode change over time, thus causing errors between measured values. For this reason, perform a calibration by standard liquid periodically to adjust the electrical characteristics of an electrode and the measuring instrument.

As a rule of thumb, a cycle of performing a calibration by a standard liquid is once in 1 week to 2 weeks. Determine a proper calibration cycle as appropriate, depending on the properties of a measured liquid and the operating conditions.

For details about a calibration procedure, see the instrument manuals for each measuring instrument.

- **For a ORP Meter**

An ORP meter does not need corrections like calibration of a pH meter.

However, as the check of sensitivity, it is necessary to check whether an ORP electrode has proper sensitivity.

As a rule of thumb, a check cycle is once in 1 week to 2 weeks, depending on the properties of a measured liquid and the operating conditions as is the case with a pH meter. Determine a cycle of checking proper sensitivity as appropriate.

For details about a procedure, see the instruction manual for each measuring instrument.

Cleaning an Electrode

Any dirt of an electrode may cause an decrease in response speed, indication drift, and instability. Check the tip of an electrode (metallic pole and responsive film) periodically. Clean all dirt and coatings off an electrode with water to maintain the electrode and the liquid junction section in a clean condition.

It is recommended that an electrode should be cleaned at the same time as a calibration by a standard liquid (an pH electrode) is performed. In this case, perform a calibration by a standard liquid after cleaning.

Method of Cleaning Various Dirt off an Electrode

[1], [2] and [3] indicate the order of cleaning steps, depending on a degree of dirt.

If properties are not restored at Step [1], follow Step [2] (and then Step [3]). If the properties are not persistently restored, a possible cause may be the life of an electrode. So replace the electrode with a new one.

For a method of cleaning an electrode, see the Instructions Manual for the Electrode too.

Warning

When handling hydrochloric acids, be sure to wear protective goggles and protective gloves. Eye contact may result in mucous membrane irritation and blindness.



In the case of eye contact, wash the affected face with plenty of water immediately for at least 15 minutes, and get medical attention.

When washing the affected face, open the eyelids with fingers so that running water can spread easily to every corner of the eyeballs and eyelids. Moreover, contact with human body and clothing may result in burns (chemical injury). Take off contaminated clothing promptly, and flush the affected area with plenty of water promptly.

Note

Avoid soaking in hydrochloric acid for long hours absolutely.

	General Dirt	Removal of Soft Adhesion Matters Organic substance Fabric Algae	Removal of Cohesive Adhesion Matters Oils Organic substance	Removal of Hard Adhesion Matters Calcium salt Inorganic salt
○ Common Work: Wash dirt with deionized water and wipe dirt with gauze.	[1]	[1]	[1]	[1]
Wipe dirt with a gauze moistened with an organic solvent, and wash the dirt with deionized water.	[2]	[2]	[2]	↓
Wipe dirt with a gauze moistened with a mild detergent, and wash the dirt with deionized water.	↓	[3]	[3]	↓
* Soak dirt in diluted hydrochloric acid (1 mol/L) for 15 seconds, and wash the dirt with deionized water (repeatedly).	[3]	-	-	[2]

About Dirt of ORP Electrode (metallic pole)

If dirt is not wiped off as a result of following steps in the “Method of Various Dirt of an Electrode” as described above, causing any troubles in making measurements, place a polishing agent (cerium oxide of about 1 μm in particle size) on a polishing pad, and then drop deionized water slightly. Place the metallic pole surface on there horizontally, and polish the metallic pole surface in a manner that a circle is drawn. At this time, protect the liquid junction section by winding a tape around the liquid junction section so that the polishing agent can be prevented from adhering to the liquid junction section.

Storage

For a purpose of preventing the tip of an electrode (metallic pole and responsive film) from being dry, pour tap water in the supplied Protective Cap and place the Protective Cap on the tip of the electrode at the time of storage.

Attaching and Detaching a Sensor

Attaching a Sensor

See “Before Measurement” and “Incorporating a Sensor”.

Detaching a Sensor

Note

An electrode is made of glassware. An electrode may be broken if strong force is applied.

1. Stop the supply of measured liquid from the sampling line.
2. Loosen the fixing screw of the Lock Plate.
3. Loosen the tightening nut, and detach the Electrode Holder from the Distribution Holder.
4. Remove Sensor Adapter 1 and Sensor Adapter 2 from the Plastic Body Sensor.
5. Wash Sensor Adapter 1 and Sensor Adapter 2 with alcohol, etc., and dry them.

Specifications

Product Name		Distribution Holder		
Model		CF-501	CF-501P	CF-501S
Ambient Temperature		-5°C to 60°C	-5°C to 50°C	-5°C to 60°C
Conditions for measurement solution	Temperature *1	-5°C to 80°C	-5°C to 60°C	-5°C to 100°C
	Pressure	Atmospheric pressure (opened on the outlet side)		
	Flow Rate	0.3 L/min to 10 L/min		
Materials for Liquid Contact Section *2		PP,FKM	PVC,PP,FKM	SUS316,PPS,FKM
Bore Size of Measured Liquid Connection		JIS 10K 25A FF flange		
Mass		Approx. 0.6 kg	Approx. 0.9 kg	Approx. 4.2 kg
Typical combinational sensor (chip replacement system)		pH :6170-60B ORP :6870-60B		
Special Note		<ul style="list-style-type: none"> • Be sure to use it in combination with the KCl Tank (RR-22). • This product is not supplied with an electrode. 		

*1 Working temperature ranges vary with combinational electrodes. Check the working temperature of an electrode. Moreover, measurements cannot be made when a measured liquid is in a freezing or boiling state.

*2 If any problem with weatherability occurs under direct sunshine, use a holder made of PVC or a holder made of SUS316+PPS.

For the sample properties that affect FKM (fluorine rubber) (strong alkali, etc.), please consult with HORIBA Advanced Techno.

Replacement Parts

Replacement of consumables

Internal liquid				
Part Name	Model	Specifications		Part No.
Internal liquid for comparison electrode (For pH, ORP, F-)	#300	3.33 Mol/L KCl solution	250 mL	3200043618
Powder for comparison electrode internal liquid (For pH, ORP, F-)	#350	KCl powder	500 g	3200043623

Replacement Parts

Spare parts for the Distribution Holder				
Part Name	Model	Specifications		Part No.
Sensor Adapter		For installation in the CF-501 Distribution Holder (PP)	1 set	3200295894
		For installation in the CF-501P Distribution Holder (PVC)	1 set	3200295895
		For installation in the CF-501S Distribution Holder (PPS)	1 set	3200295896
O-ring		P44 FKM for the seal between the chamber and the holder	1	3200295705

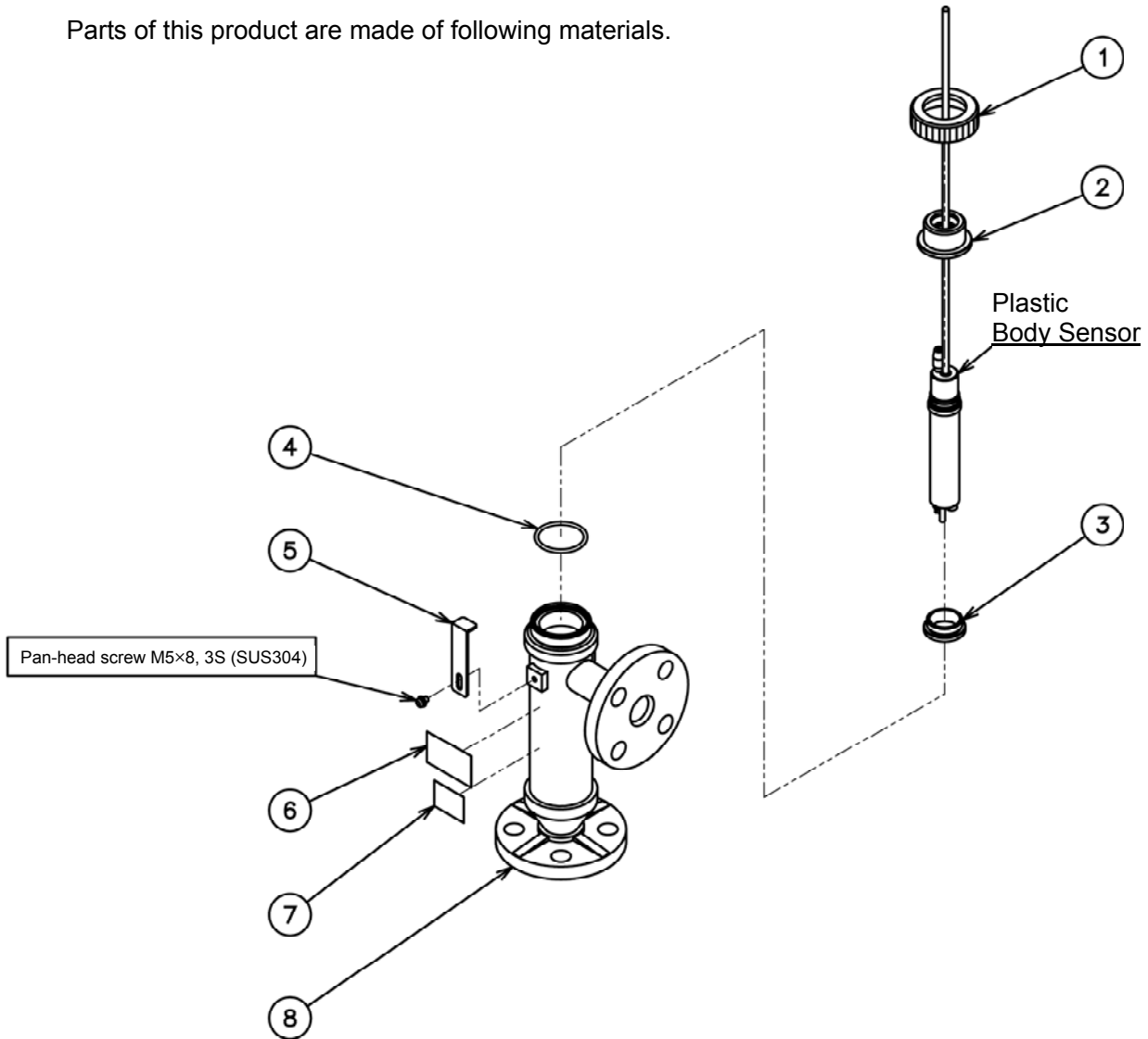
Accessories (optional)

Standard solution/standard material				
Part Name	Model	Specifications		Part No.
pH standard solution	#100-4	Standard solution for pH4 (Accuracy ± 0.02 pH)	500 mL	3200043638
	#100-7	Standard solution for pH7 (Accuracy ± 0.02 pH)	500 mL	3200043637
	#100-9	Standard solution for pH9 (Accuracy ± 0.02 pH)	500 mL	3200043636
pH standard powder	#150-4	Standard powder for pH4 (Accuracy ± 0.05 pH)	10 bags	3200043619
	#150-7	Standard powder for pH7 (Accuracy ± 0.05 pH)	10 bags	3200043620
	#150-9	Standard powder for pH9 (Accuracy ± 0.05 pH)	10 bags	3200043621
ORP standard material	#160-22	ORP standard powder (electric potential 260 mV ± 20 mV)	10 bags	3200043617

Method of Disposal

For disposal of this instrument, dispose of the instrument in accordance with the laws, ordinances and regulations stipulated in local regions.

Parts of this product are made of following materials.



No.	Names	CF-501	CF-501P	CF-501S
1	Tightening Nut	PP	PVC	SUS304
2	Sensor Adapter 1	PP	PVC	PPS
3	Sensor Adapter 2	PP	PVC	PPS
4	O-ring		FKM	
5	Lock Plate		SUS304	
6	Label (Caution Against Blowout)		PET	
7	Label (Caution Against Storage)		PET	
8	Distribution Holder	PP	PVC	SUS316

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