



Push Down Connector

PDC

Operation Manual

Surpass Industry Co., Ltd.

Before You Use

WARNING

Confirm the compatibility of the type of fluid to be used and the material of the part in contact with fluids before using this product.

Before using this product, carefully read this operation manual to learn the correct usage of this product.

Keep this manual at hand to see it any time you need.

Follow the correct usage of this product specified in this manual.

Comply with the statements of warning described in this manual.

The above instructions are mandatory. Neglecting these instructions may result in personal injury or accidents.

< Description of Operation Manual and Warning Labels >

The information described in this manual is subject to change without prior notice, due to improvements of product in performance and/or functionality.

The WARNING label instructing handling of socket must be labeled on an easily visible spot close to the socket-mounted place.

No parts of Operation Manual may be reproduced or utilized in any form or by any means.

Please download the electronic manual from our homepage in case that you lost this manual.

Every effort was made to ensure that all information included in Operation Manual were complete and accurate at the time of printing. However, if you have any point of doubt, errors, and omissions, please contact Surpass Industry.

<Call to:>

SURPASS

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○ Important Safety Instructions

About Marks Used

Warnings and cautionary notes are provided in this manual to ensure this product is used correctly and to prevent personal injury and property damage. The meanings of the WARNING and CAUTION symbols in this manual are as described below. Read and understand these notes before reading the rest of this manual.

In particular, fully understand and obey the instruction of DANGER mark.

 DANGER	This symbol indicates warnings against impending danger which, if not observed, may cause death or severe injury to the user.
 WARNING	This symbol indicates warnings which, if not observed, may cause death or severe injury to the user.
 CAUTION	This symbol indicates warnings which, if not observed, may physically impair the user or damage surrounding objects.
	Provides important notices and indications to operate the product correctly.

DANGER and WARNING statements

Before using this product, carefully read the statements of DANGER and WARNING marks as below that you must comply with.

Instructions on Installing



DANGER Mandatory instruction!!

Whenever using this product for hazardous chemical fluids or solvents, wear anti-chemical protective gear (protective gloves, protective mask, and protective clothing) that completely protects your body. Exposure of chemical fluids may result in personal injury.



WARNING

Follow the procedures provided in this manual when installing the PDC plug and socket and piping with them. An improper way or wrong procedures may cause liquid leakage, resulting in personal injury.

Instructions on Handling



WARNING

Be careful not to damage the connecting part (sealing part) of the PDC plug and socket. Damage in the connecting part may cause liquid leakage, resulting in personal injury.

Keep this product from contacting with anything rigid since it is made of resin materials and subject to breakage. Any breakage of the product may cause liquid leakage, resulting in personal injury.

Instructions on Operation



DANGER This is Mandatory Rule!!

Release pressure from the piping before attaching/detaching the connector. A pressurized condition may cause spouting of chemicals, resulting in personal injury.

Always wear anti-chemical protective gear (protective gloves, protective mask, and protective clothing) that protects your entire body when attaching/detaching the connector. A contact with chemicals may cause personal injury.

Attach/detach the connector in a clean place with no dust. Degradation of sealing performance due to adhesion of dust may cause liquid leakage, resulting in personal injury.

Always attach/detach the connector at right angle to the surface of container. Attaching/detaching the connector at an angle may cause spouting of chemicals, resulting in personal injury.

Do not apply the connector to rotary joint or other rotary application. Lower tackiness caused by the wrong application may result in personal injury due to leakage of chemical fluids.

When the connector is connected, make sure that the connector is fully connected. The chemicals may splash and personal injury may be caused.

Use out of the operating pressure range may result in slip-off. Be sure to use within the operating pressure range.



- Apply operating fluid or pure water to the O-Ring of the socket (inner) or O-Ring sliding part of the plug (sealing part) when connecting the socket or plug to prevent the O-Ring from being damaged and to reduce the slide resistance (insertion load).
- Please be careful when use abrasive compound or fluid that is easy to clot as they may impair normal function.

Instructions on Maintenance and Inspection



CAUTION

Surpass Industry is not be liable to any failure or leakage of the product due to O-Ring replacement and/or disassembly performed by any parties other than Surpass Industry.

When you need maintenance work, please call Surpass Industry.

1. Description of the Product

PDC-type Pushdown Connector is a handy connector used to transfer high-purity EL chemicals. It is designed for containers with the capacity of 200L, such as a CHEMICAL DRUM, POWER DRUM, which are commonly used in the semiconductor industry.

Features

- The new mechanism developed specially for PDC is implemented, which eliminates leakage when detaching the connector.
- All parts in contact with liquids are provided with the fluorine resin finishing.
- The auto-stop valve, which minimizes interfusion of foreign particles, is deployed to facilitate the attaching/detaching of the connector.
- Surpass original "Super one-touch method" enables the connection of the PDC connector by one single push.
- Surpass original key-type and dimension systems are implemented for misconnection-protection mechanism, which allows the socket to be connected only to its corresponding plug to prevent wrong types of chemicals from getting mixed.
- The auto-stop valve with no O-ring incorporated makes the connector free from leakage.

2. Specification

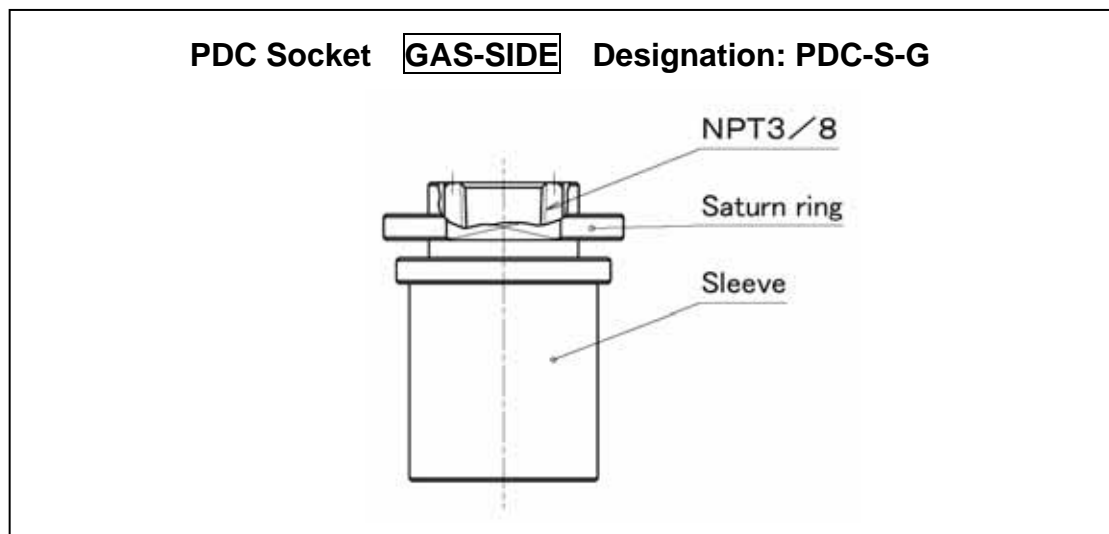
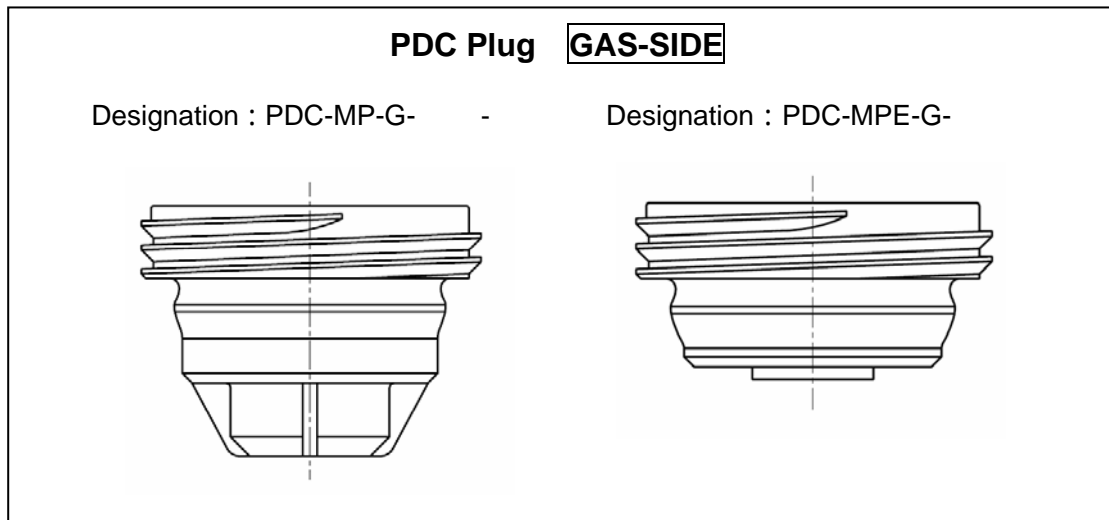
Operating Fluid Pressure	: 0 ~ 250 kPa (36.25 psi)
Operating Environmental Temperature	: 5 ~ 50 (41 ~ 122 °F)
Operating Fluid Temperature	: 5 ~ 60 (41 ~ 140 °F)
Wetted parts	: PCTFE, PFA, PTFE, HDPE, O RING (Depends on the materials.)



Please be careful when use abrasive compound or fluid that is easy to clot as they may impair normal function.

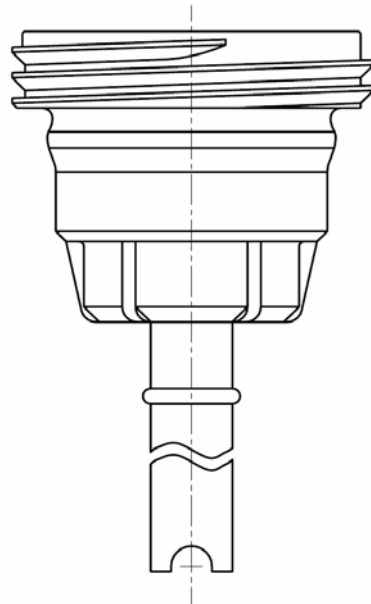
3. Outside Dimensions

Gas-side

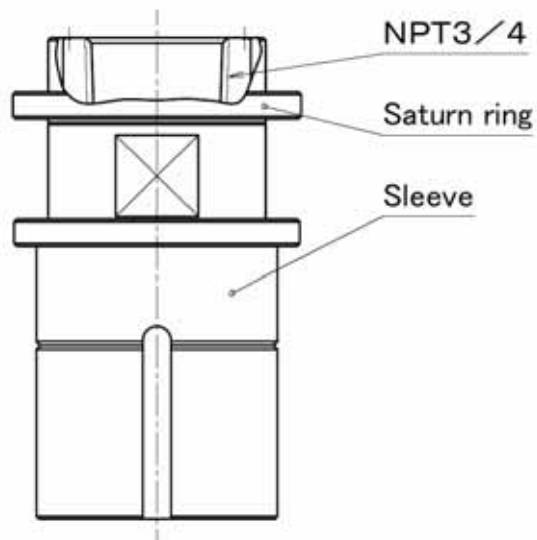


Liquid-side

PDC Plug **LIQUID-SIDE** Designation : PDC-MP- - -



PDC Socket **LIQUID-SIDE** Designation : PDC-S- -



4. List of Jigs Used



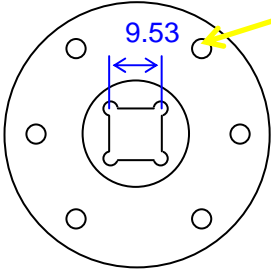


Jigs are optional. Please contact us and order your desired jig by its product name and designation listed in the table below.

Jig used to mount/remove the bracket to/from the drum.

	Product name: Bracket attaching/removing jig
	Designation: PDC-AIN
	Application: <ul style="list-style-type: none"> • Mounting of the PDC plug to the drum • Removing of the PDC plug from the drum

PRELIMINARY Torque wrench (The following can be used.)

Application: Mounting of the bracket	
DB50N-S (Tohnichi Mfg.Co.,Ltd)	
	
PDC-AIN A mount size	
Mounting standard :For torque wrench of the standard head size is 9.53.	

5. Installation



DANGER Mandatory instruction!!

Always wear anti-chemical protective gear (protective gloves, protective mask, and protective clothing) that protects your entire body when using this product for hazardous chemicals or solvents. If an accidental spout of the chemicals or solvents occurs, a contact with chemicals may cause personal injury.

5-1 Unpacking

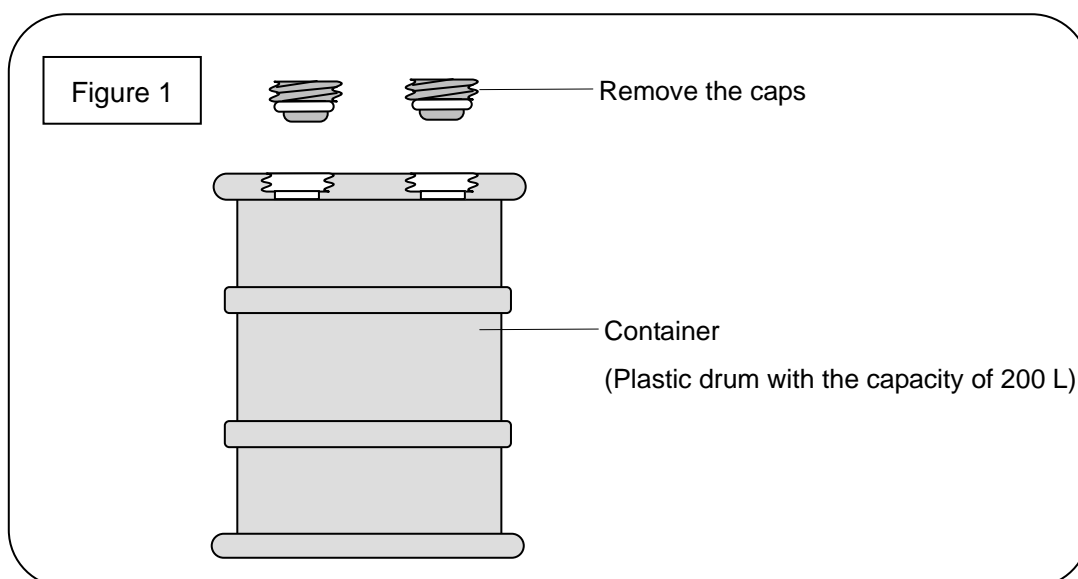
Be careful not to damage the plug and socket when unpacking.

5-2 Preparing a container

Prepare a container with the capacity of 200 liters (see the photo showing the container with the caps being attached).



Remove the caps from the container (see the photo and Figure 1 below).



Check the bracket mounting part of the container for adhesion of foreign substances. If any foreign substance is found adhered, remove it.

5-3 Mounting the PDC Plug

WARNING

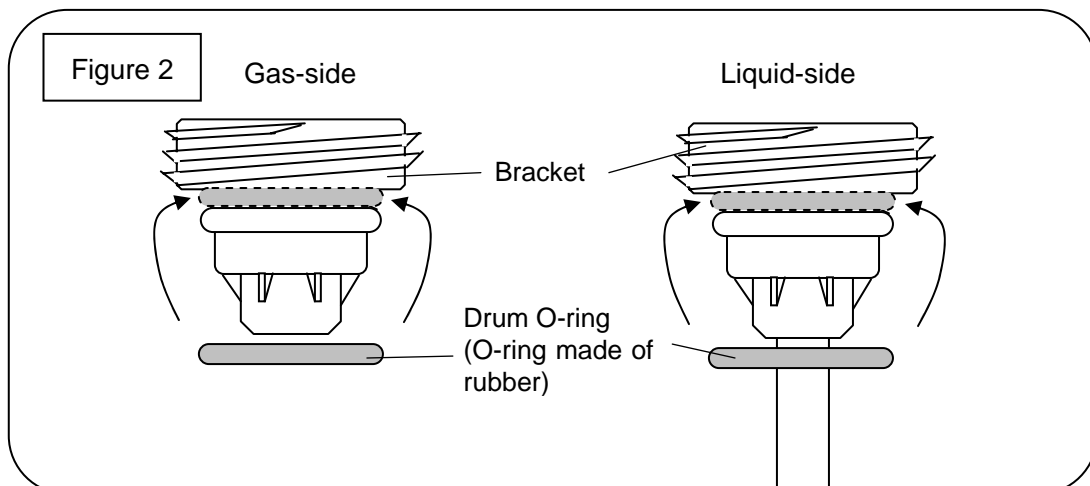
Follow the procedures provided in this manual when mounting the PDC plug. An improper way or wrong procedure of mounting the plug may cause an accident such as liquid leakage, resulting in personal injury.

Insert a drum O-ring into the bracket of PDC plug (see the photo and Figure 2 below).

(1)



(2)



Mount the PDC plug in the container (see the photo and Figure 3 below).

Torque : 20 ~ 25 [N·m]

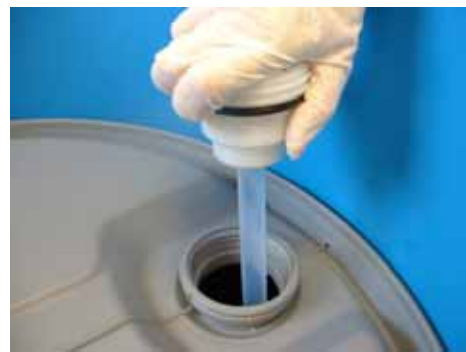
CAUTION

Use a drum O-ring which is made of rubber (size: P55) and it with 20 ~ 25[N·m] of torque. Excessive or inadequate tightening may cause breakage or liquid leakage.

(1)



(2)



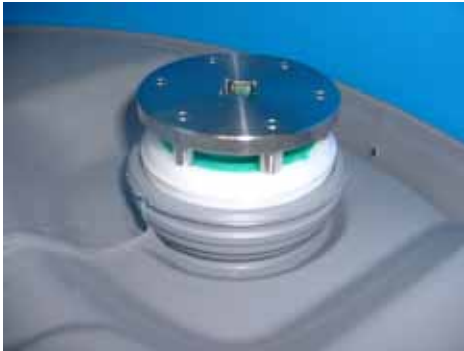
(3)



(4)



(5)

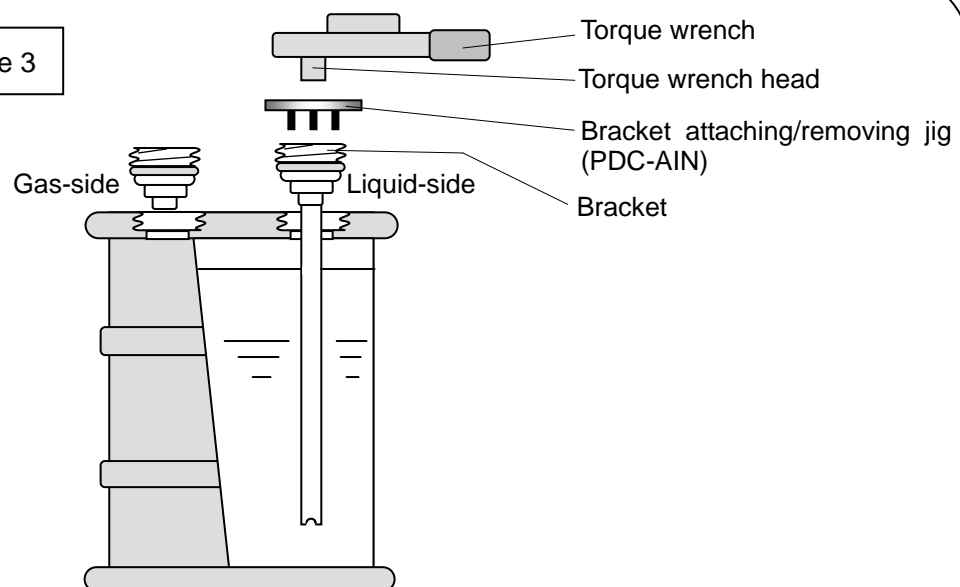


(6)



Tighten the plug with
20 ~ 25[N · m].

Figure 3



The exclusive clamp jig for PDC plugs is available at Surpass. If you wish to purchase, please order it by its designation "PDC-AIN". Please use torque wrench whose head size is 9.53 when you tighten the plug with "PDC-AIN".

5-4 Piping with the PDC Socket

Wrap PTFE sealing tape around the connecting part (male thread) three or four times, and screw it into the NPT female thread of the PDC socket.



WARNING

Follow the procedures provided in this manual when installing the PDC plug and socket and piping with them. An improper way or wrong procedures may cause liquid leakage, resulting in personal injury.



- Always use a NPT male thread since the female thread of the PDC socket for piping is compliant with the American standard pipe taper thread (NPT).
- For a male thread, that is made of the resin (PTFE, PCTFE, PFA, PE, or PP) but rigid materials such as metallic. Using a male thread made of rigid materials may break the female thread, resulting in liquid leakage.
- Be aware that the thread sizes are different between the gas-side and liquid-side.

Taper thread specifications

Gas-side socket (PDC-S-G): NPT 3/8

Liquid-side socket (PDC-S- -): NPT 3/4

- Tighten the male thread with the correct value of torque. Excessive tightening may break the product.
- After screwing the male thread, perform the leakage test to confirm that the connecting part has no leakage.

6. Operation Procedure

**DANGER**

This is Mandatory Rule!!

Release pressure from the piping before attaching/detaching the connector. A pressurized condition may cause spouting of chemicals, resulting in personal injury.

Always wear anti-chemical protective gear (protective gloves, protective mask, and protective clothing) that protects your entire body when attaching/detaching the connector. A contact with chemicals may cause personal injury.

Attach/detach the connector in a clean place with no dust. Degradation of sealing performance due to adhesion of dust may cause liquid leakage, resulting in personal injury.

Always attach/detach the connector at right angle to the surface of container. Attaching/detaching the connector at an angle may cause spouting of chemicals, resulting in personal injury.

Do not apply the connector to rotary joint or other rotary application. Lower tackiness caused by the wrong application may result in personal injury due to leakage of chemical fluids.

When the connector is connected, make sure that the connector is fully connected. The chemicals may splash and personal injury may be caused.

Use out of the operating pressure range may result in slip-off. Be sure to use within the operating pressure range.



- Apply operating fluid or pure water to the O-Ring of the socket (inner) or O-Ring sliding part of the plug (sealing part) when connecting the socket or plug to prevent the O-Ring from being damaged and to reduce the slide resistance (insertion load).
 - Please be careful when use abrasive compound or fluid that is easy to clot as they may impair normal function.
-

6-1 Connecting the gas-side socket

Confirm that the container is not pressurized (with no pressure applied).



DANGER Mandatory instruction!!

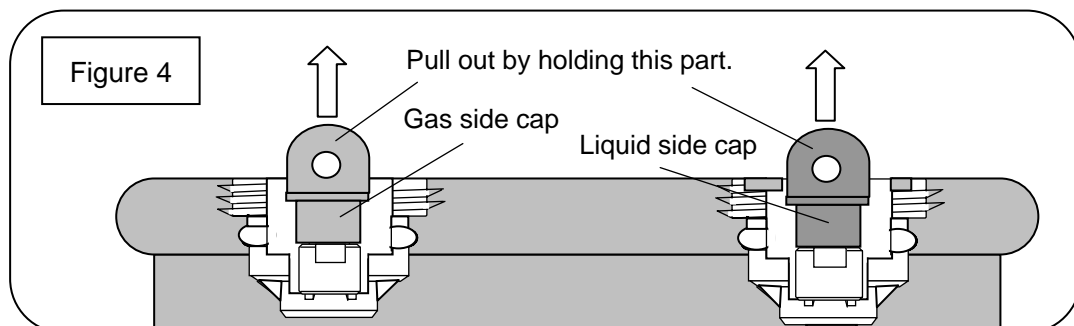
Release pressure from the piping before attaching the connector.
A pressurized condition may cause spouting of chemicals,
resulting in personal injury.
Connect the tube without any moment or tension to bend the joint
portion.

Remove the dust-proof caps from the gas-side and liquid-side plugs (see the photo and Figure 4 below).

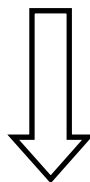
Gas-side cap



Liquid-side cap



Hold the gas-side socket at its Saturn ring, and insert it into the gas-side plug vertically (see the photo and Figure 5 below).



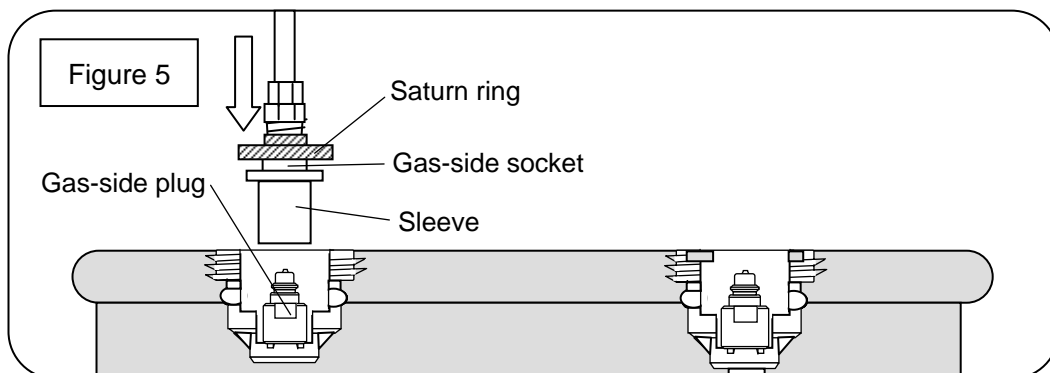


Never pull in the sleeve when connecting the socket, or the socket cannot be connected.

A good example



A bad example



Confirm that the socket is connected securely (see the photo and Figure 6 below).

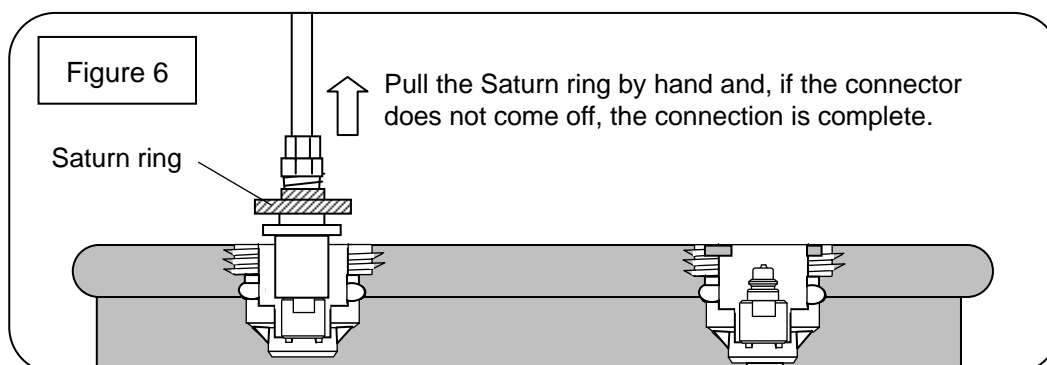


Pull the Saturn ring by hand and, if the socket does not come off, the connection is complete.

(1)



A bad example



6-2 Connecting the liquid-side socket

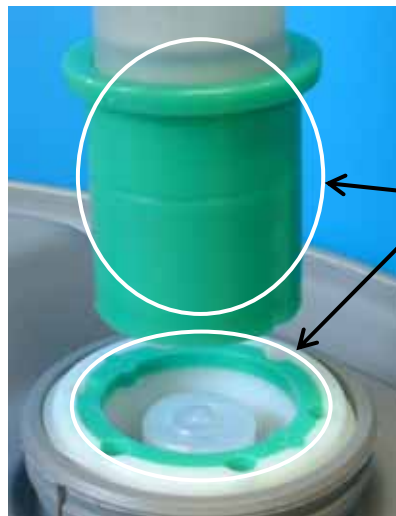
Confirm that the container is not pressurized (with no pressure applied).



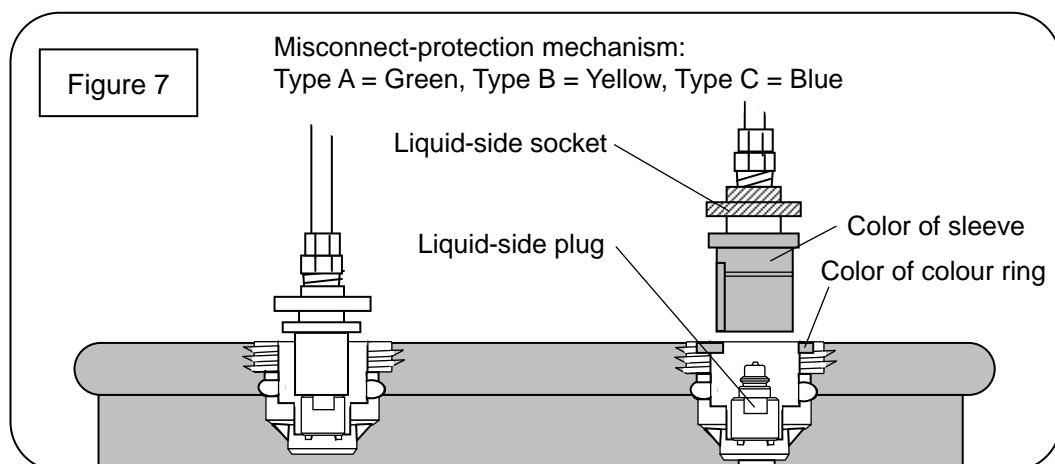
DANGER Mandatory instruction!!

Release pressure from the piping before attaching the connector.
A pressurized condition may cause spouting of chemicals,
resulting in personal injury.
Connect the tube without any moment or tension to bend the joint
portion.

Confirm that the sleeve of the liquid-side socket and the
color ring of the liquid-side plug have the same color (see
the photo and Figure 7 below).



Must be the
same color.

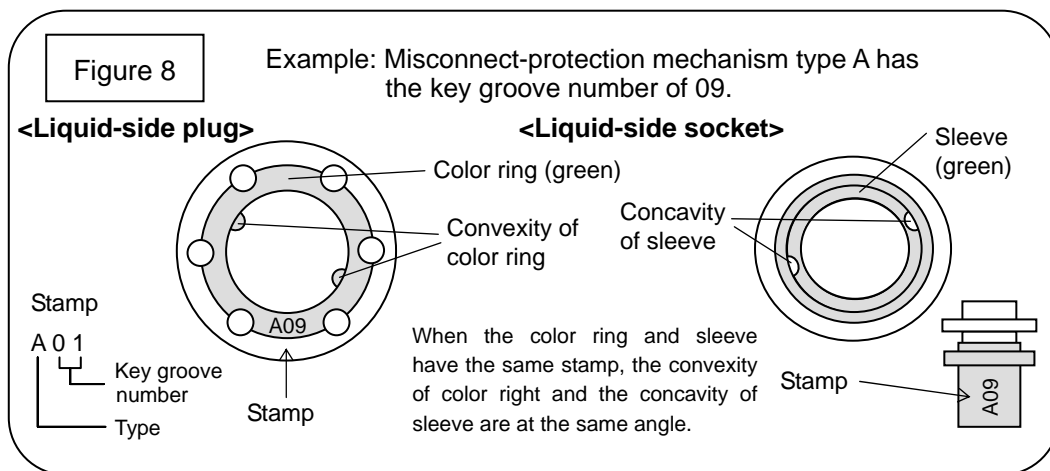
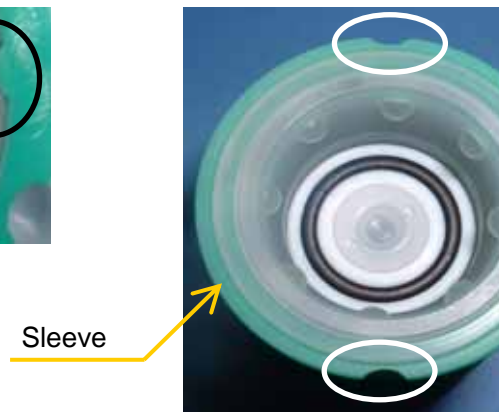


Confirm that the sleeve of the liquid-side socket and the color ring of the liquid-side plug have the same key groove number (see the photo and Figure 8 below).

PLUG



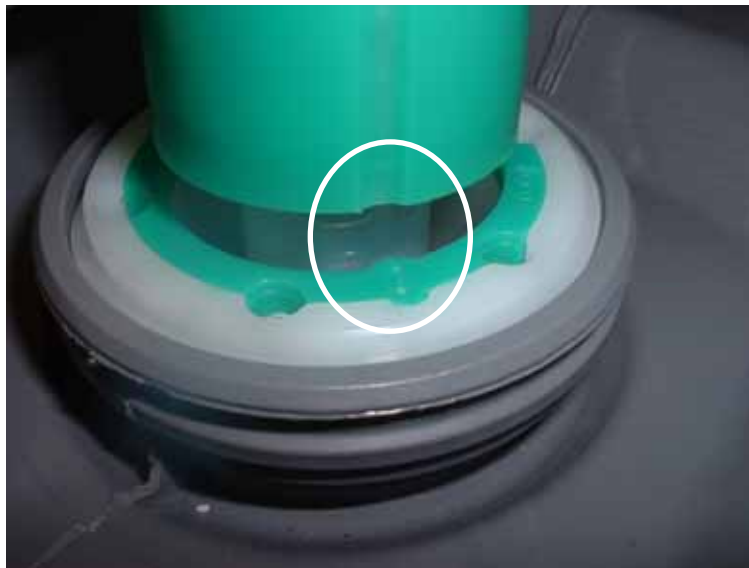
SOCKET



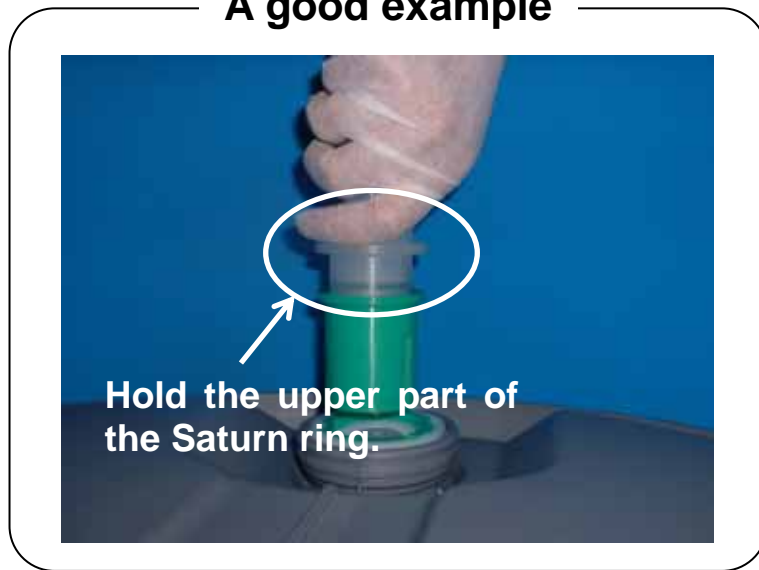
Hold the liquid-side socket at its Saturn ring, and insert it into the plug vertically, aligning the key grooves of the sleeve and color ring (see the photo and Figure 9 below).



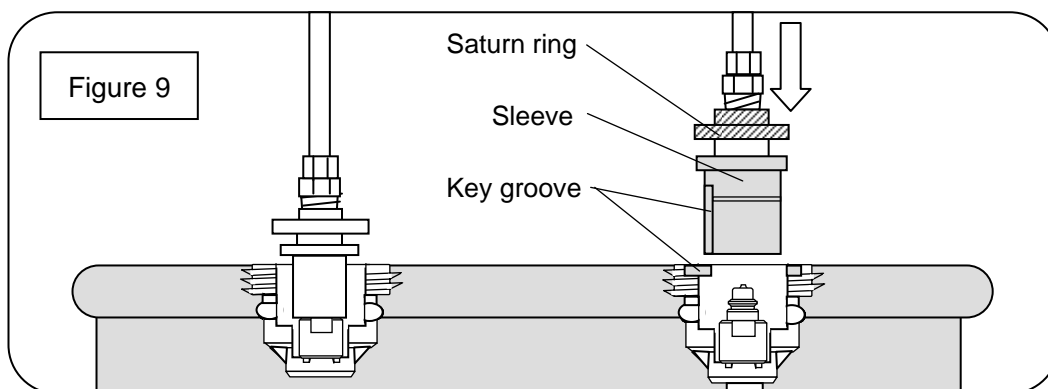
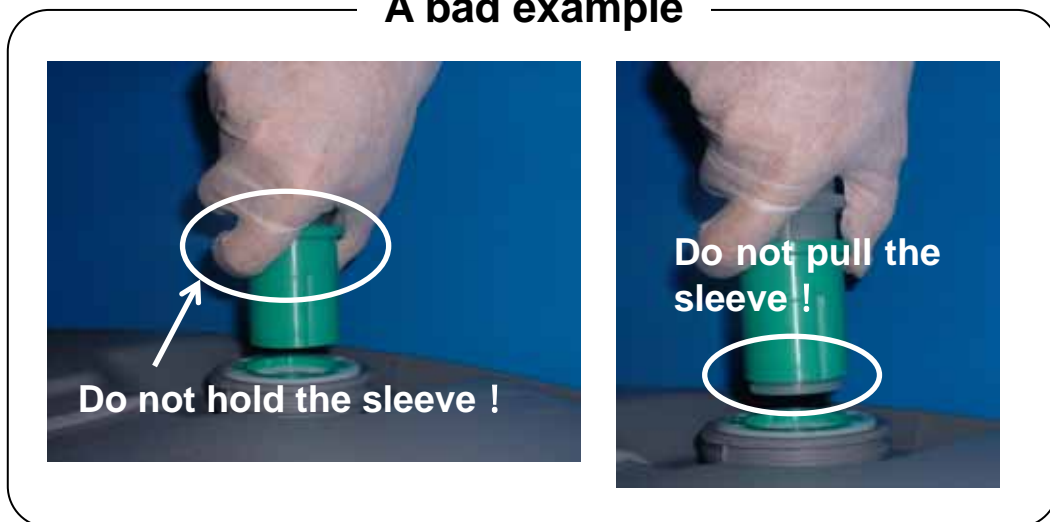
Never pull in the sleeve when connecting the socket, or the socket cannot be connected.



A good example



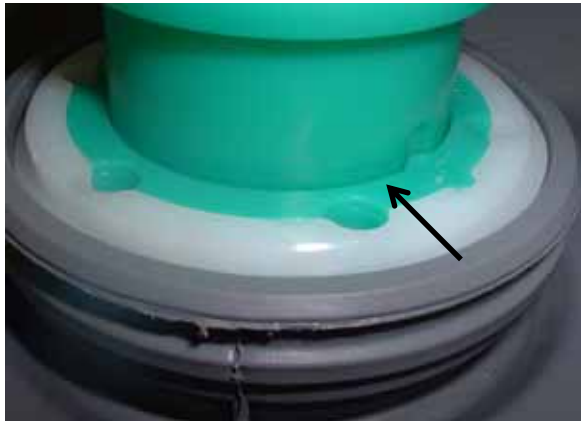
A bad example



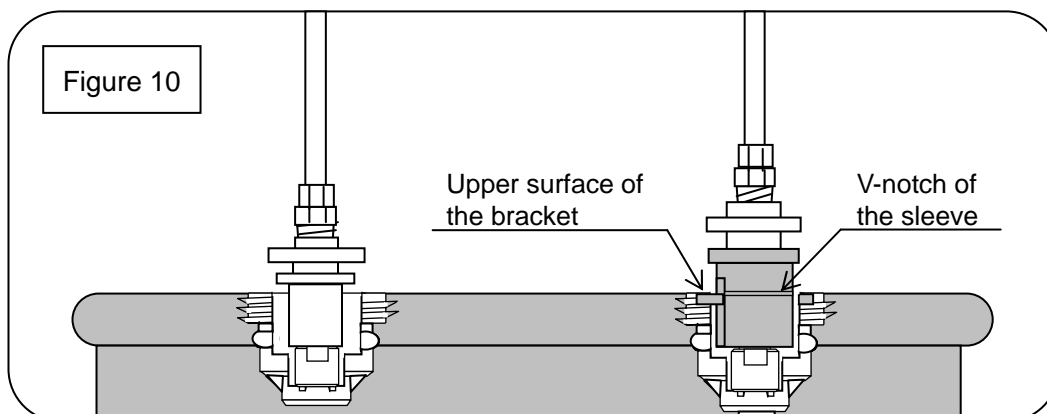
Confirm that the socket is connected securely (see the photo and Figure 10 below).



Confirm that the V-notch of the sleeve is aligned with the upper surface of the bracket.



Pull in the Saturn ring by hand and, if the socket does not come off, the connection is complete.



6-3 Transferring liquid

Start transferring liquid when all procedures for connecting the gas-side and liquid-side connectors are successfully complete.

6-4 Detaching

Release pressure from the container.



DANGER Mandatory instruction!!

Release pressure from the piping before detaching the connector. A pressurized condition may cause spouting of chemicals, resulting in personal injury. Connect the tube without any moment or tension to bend the joint portion.

Pull out the gas-side socket vertically while pulling in the sleeve with both hands (see the photo and Figure 11 below).



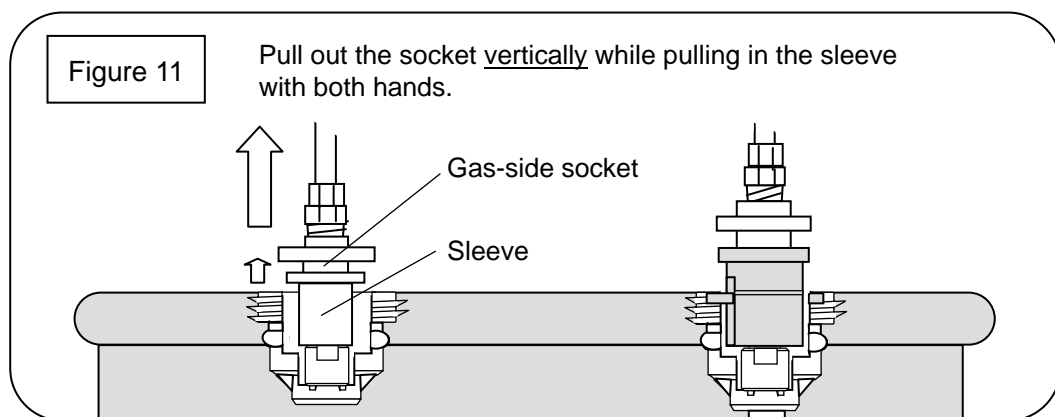
DANGER Mandatory instruction!!

Always detach the connector at right angle to the surface of container. Detaching the connector at an angle may cause spouting of chemicals, resulting in personal injury.

(1) Pull in the sleeve with both hands.



-
- (2) Be sure to vertically pull out the socket while pulling in the sleeve with both hands.



Pull out the liquid-side socket vertically while pulling in the sleeve with both hands (see the photo and Figure 12 below).

 **DANGER** Mandatory instruction!!

Always detach the connector at right angle to the surface of container. Detaching the connector at an angle may cause spouting of chemicals, resulting in personal injury.

(1) Pull in the sleeve with both hands.

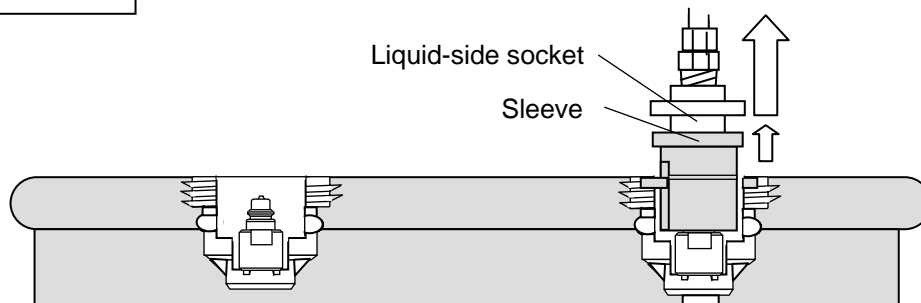


(2) Be sure to vertically pull out the socket while pulling in the sleeve with both hands.



Figure 12

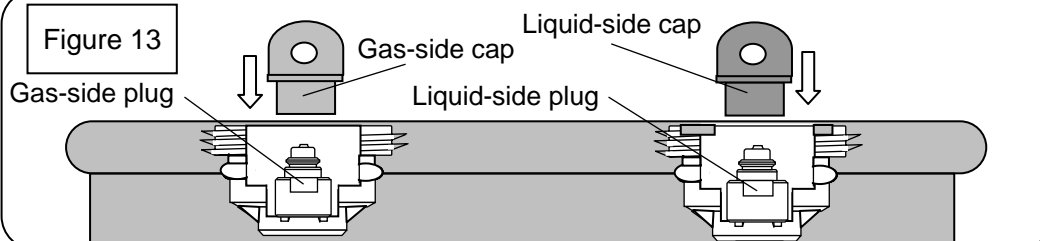
Pull out the socket vertically while pulling in the sleeve with both hands.



Set a dust-proof cap to each of the gas-side and liquid-side plugs of the container (see the photo and Figure 13 below) .

Gas-side cap**Liquid-side cap**

Figure 13



The dust-proof cap for the socket is optional. Please contact us for ordering it.

7. Maintenance and Inspection

7-1 Periodic inspection

CAUTION

Surpass Industry is not be liable to any failure or leakage of the product due to O-Ring replacement and/or disassembly performed by any parties other than Surpass Industry.

When you need maintenance work, please call Surpass Industry.

7-1-1 Periodic tightening of the plug-side bracke

Inspection procedure : Insert a PDC plug mounting jig (designation: PDC-AIN) into the bracket of the liquid-side plug and gas-side plug, and tighten it with **20 ~ 25 [N·m]** of torque using a torque wrench.



Inspection frequency : Inspect every bracket of the liquid-side and gas-side plug whenever the containers are shipped or the connector are installed.

7-2 Daily inspection

Check the product for the following, and take a corrective action if necessary.

- Adhesion of foreign particles, dust or dirt
 - Leakage in the piping or connecting parts
 - Looseness of bracket
 - Liquid leakage from the O-ring part
-

8. Troubleshooting

Trouble Condition	Checking Points	Correcting Action
The socket cannot be connected to the plug.	Check if you pull in the sleeve of the socket when connecting. Check if the colors of the socket sleeve and the plug color ring are different. Check if the key groove numbers of the socket and the plug are different.	Connect the socket without pulling in its sleeve. Connect the socket and plug of the same color. Connect the socket and plug of the same key groove number.
Liquid does not flow.	Check if the socket is connected securely. Check if the container is not pressurized.	Insert the socket completely into the plug to connect. Apply appropriate pressure.
The socket cannot be detached.	Check if the container is pressurized. Check if you pull in the sleeve of the socket when detaching.	Release pressure. Pull out the socket while pulling in the sleeve with both hands.

Notify your nearest sales office for problems not listed above.

9. Product Warranty

The warranty runs for one year after the day when Surpass Industry products are delivered from Surpass factory in Japan. In case Surpass Industry should agree in writing that the defects in performance or material were caused by faulty design or workmanship of Surpass Industry, replacement products will be supplied free of charge. This warranty shall not be applied to any defects caused by misuse, alteration, neglectful treatment, and neglect of our recommendations or instructions.

In addition, we are not be liable to any direct or consequential loss, damage, and personal injury due to an unauthorized usage in combination with other products and an improper usage outside of the specifications. Our product warranty shall be limited to replacement of product.

Replacement with expense to the purchaser shall be applied to the followings:

- Any defective products caused by usage that is not described in the Instruction Manual.

- Any defective products caused by neglectful treatment.

- Any defective products caused by decomposition, alteration, and improper adjustment or repair.

- Any defects of products caused by acts of God including natural disaster or fires.

- Consumables and accessories.

<Call to:>

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