



## One-Way Polyethylene Connector

# USE

Operation Manual

Surpass Industry Co., Ltd.

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## 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.

### <About Operation Manual>

The information described in this manual is subject to change without prior notice, due to improvements of product in performance and/or functionality. No parts of this 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 this manual was complete and accurate at the time of printing. However, if you have any point of doubt, errors, or omissions, please contact Surpass Industry.

<Call to:>

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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.**

 <b>DANGER</b>	This symbol indicates warnings against impending danger which, if not observed, may cause death or severe injury to the user.
 <b>WARNING</b>	This symbol indicates warnings which, if not observed, may cause death or severe injury to the user.
 <b>CAUTION</b>	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.

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## 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 USE 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 USE 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.

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## 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.

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# 1. Description of the Product

USE-type Quick 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

- All parts in contact with liquids are provided with the fluorine resin finishing.
- Surpass original "Super one-touch method" enables the connection of the USE 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 mechanism to prevent liquid spouting is provided, ensuring safety without any valve.
- Siphon tube is integrated into the connector, facilitating installation.

## 2. Specification

Operating Fluid Pressure	: 0 ~ 250 kPa (36.25 psi)
Operating Environmental Temperature	: 5 ~ 40 °C (41 ~ 104 °F)
Operating Fluid Temperature	: 5 ~ 60 °C (41 ~ 140 °F)
Wetted parts	: Plug side····HDPE,O-ring(FKM Standard) Socket side··PCTFE,PTFE,PFA, O-ring(Kalrez® Standard)



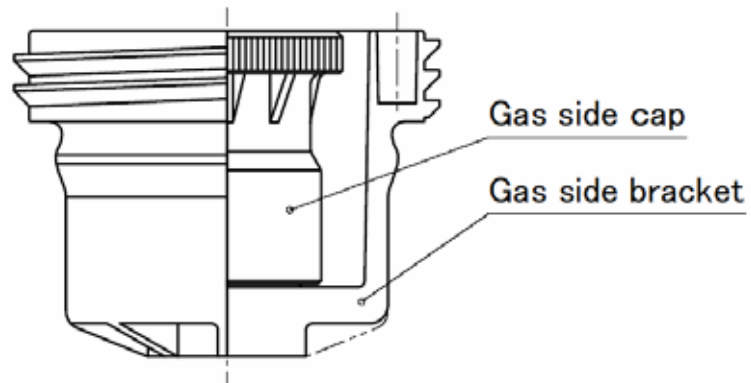
Please be careful when use abrasive compound or fluid that is easy to clot as they may impair normal function.

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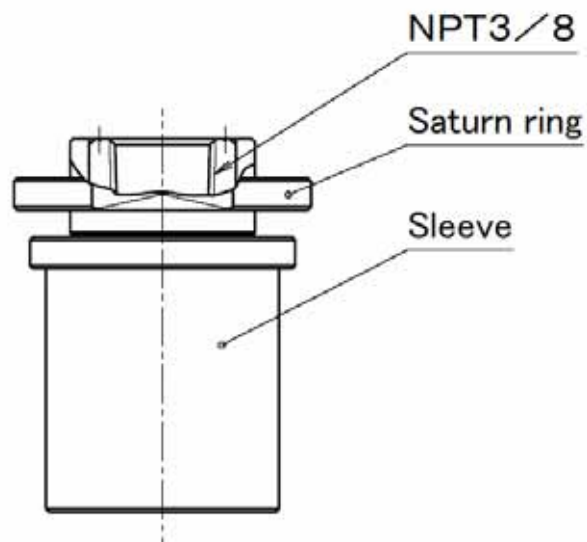
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### 3. Designations of Parts

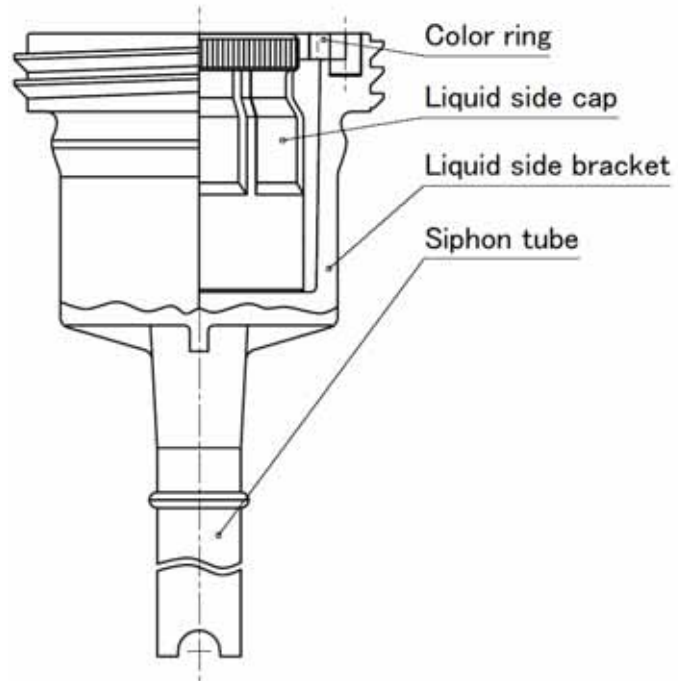
**Gas-side plug: USE-P-G-**



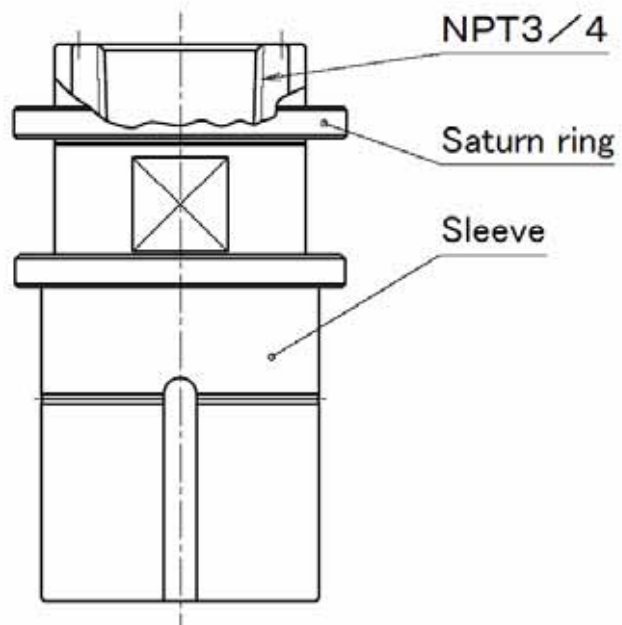
**Gas-side socket: PDC-S-G**



**Liquid-side plug: USE-P-L- -**



**Liquid-side socket : USE-S-**






## 4. List of Jigs Used



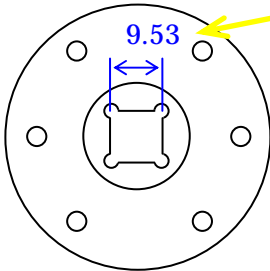


Jigs are optional. Please contact us and order your desired jig by its product name and designation listed in the table below.


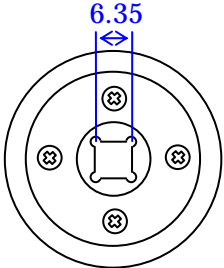
### Jig used to mount/remove the USE plug to/from the drum.

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



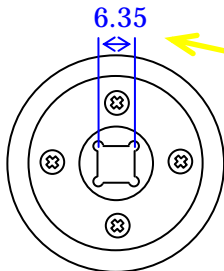
### **PRELIMINARY** Torque wrench (The following can be used.)

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

**jig used to attach/remove the cap**

	<b>Product name :</b> Cap attaching/removing jig
	<b>Designation :</b> USE-TOOL
	<b>Application :</b> <ul style="list-style-type: none"> <li>• Attaching the cap to the bracket-embedded plug</li> <li>• Removing the cap from the bracket-embedded plug</li> </ul>
<b>USE-TOOL</b> A mount size	

**PRELIMINARY** Torque wrench (The following can be used.)

<b>Application :</b> Mounting and removing of the cap	
<b>DB3N4-S (Tohnichi Mfg.Co.,Ltd)</b>	
	
<b>USE-TOOL</b> A mount size	
Mounting standard : For torque wrench of the standard head size is 6.35.	

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## 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).

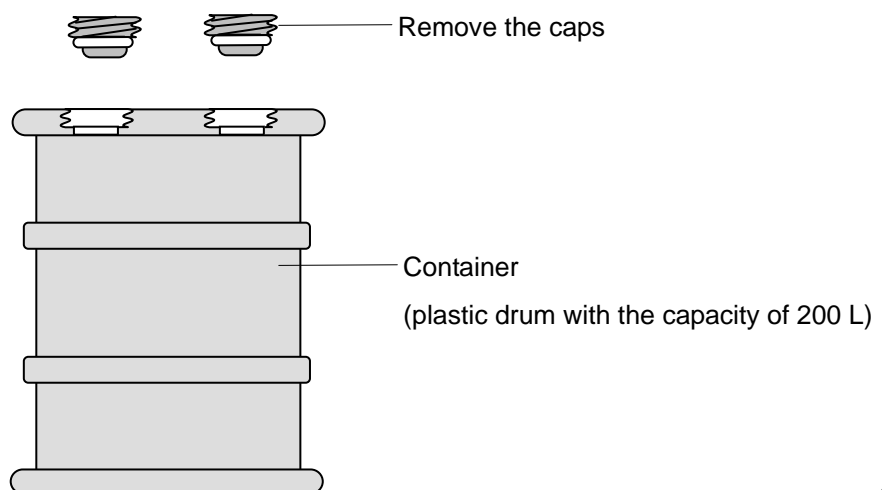


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Remove the caps from the container.  
(see the photo and Figure 1 below)



Figure 1



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

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## 5-3 Mounting the USE Plug



### WARNING

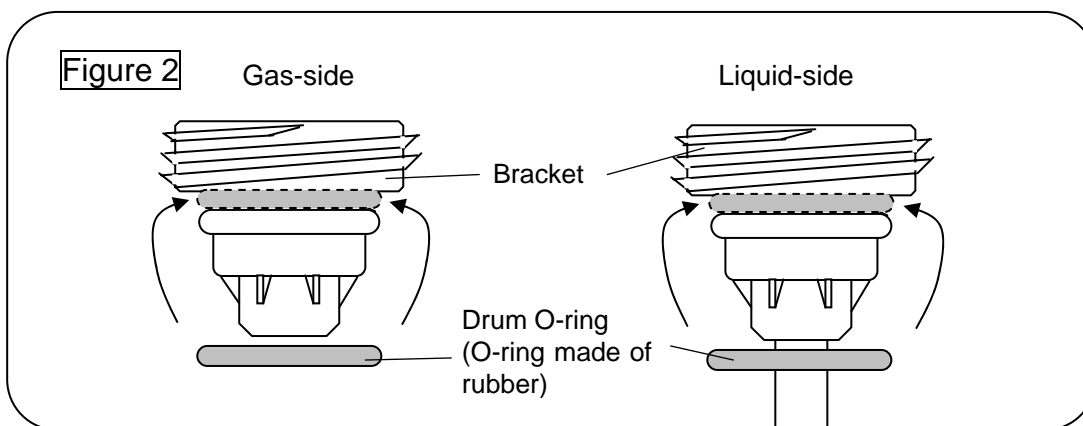
Follow the procedures provided in this manual when mounting the USE plug. An improper way or wrong procedure of mounting the plug may cause an accident such as liquid leakage, resulting in personal injury.

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

(1)



(2)



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Mount the USE 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)

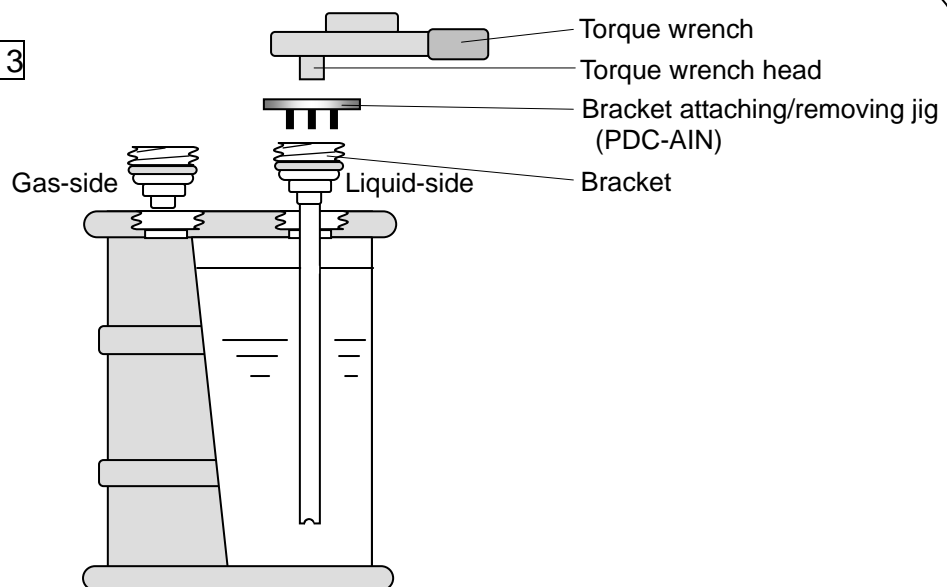


(6)



Tighten the plug with  
**20 ~ 25 [ N · m ]**.

Figure 3



The exclusive clamp jig for USE 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 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 socket.



### WARNING

Follow the procedures provided in this manual when installing the USE 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 socket for piping is compliant with the American standard pipe taper thread (NPT).
- For a male thread, use one 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 (USE-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.



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## 6. Attaching 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.
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## 6-1 Removing the Cap

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



**DANGER** Mandatory instruction!!

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



**DANGER** Mandatory instruction!!

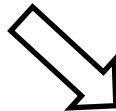
Whenever removing the cap, do the operation at the gas side first and then at the liquid side. Works without anti-chemical protective gears may injure your body in an exposure of chemical fluids.

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Slowly remove the gas-side cap first, then the liquid-side.  
(see the photo and Figure 4 below)

**[ 1 ] Gas-side cap**

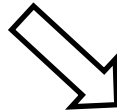


When depressure sound and gas discharge sound can be heard in a cap at the time of removal work, please interrupt work and resume work after checking that depressure sound and discharge sound have disappeared.



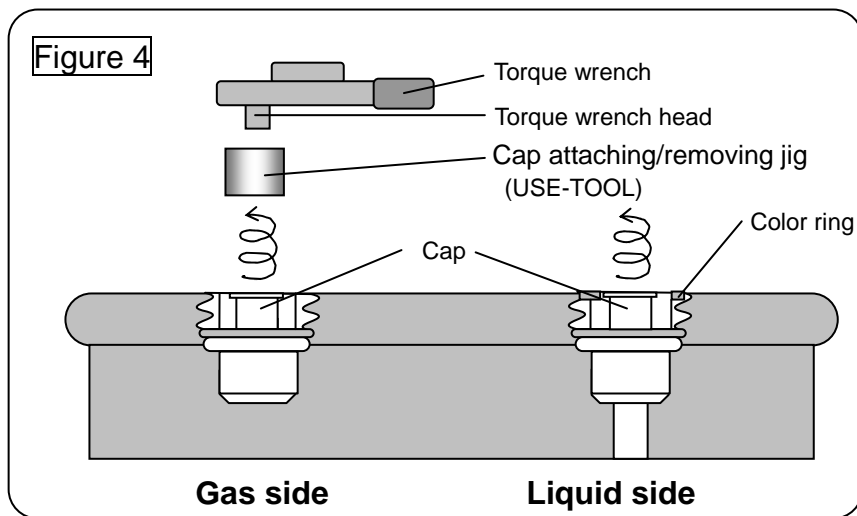
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## [ 2 ] Liquid-side cap



When depressure sound and gas discharge sound can be heard in a cap at the time of removal work, please interrupt work and resume work after checking that depressure sound and discharge sound have disappeared.





Surpass Industry provides our special tightening jig designed for mounting the cap. If you need, please order us by model type "USE-TOOL".

Please use torque wrench whose head size is 6.35 when you tighten the plug with "USE-TOOL".



When depressure sound and gas discharge sound can be heard in a cap at the time of removal work, please interrupt work and resume work after checking that depressure sound and discharge sound have disappeared.

## 6-2 Connecting the liquid-side socket

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

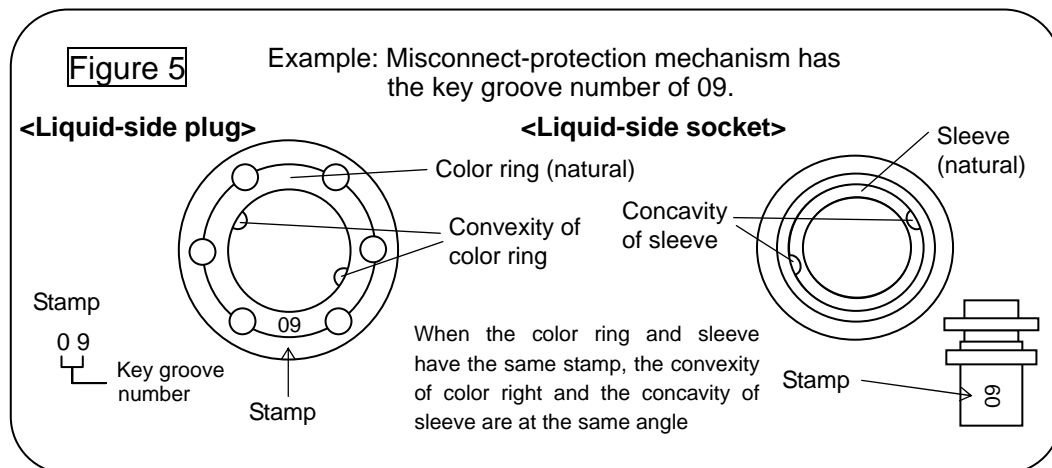
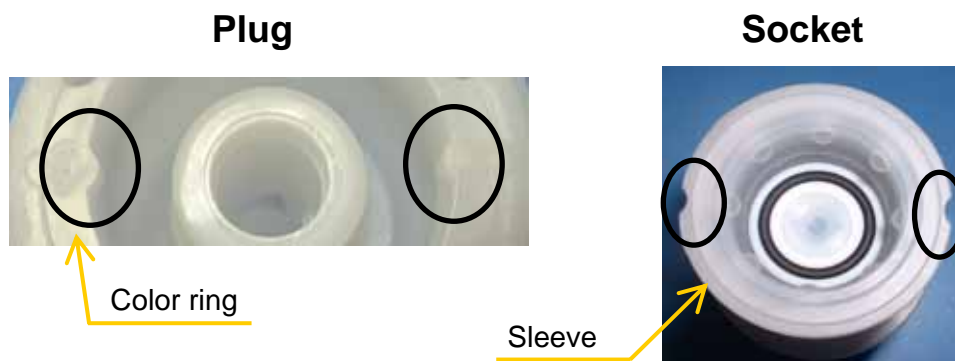


**DANGER** Mandatory instruction!!

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

First start to connect the socket at the liquid-side and then at the gas side. Confirm that the sleeve of the liquid-side socket and the color ring have the matching key groove.

(see the photo and Figure 5 below)



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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 6 below)





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

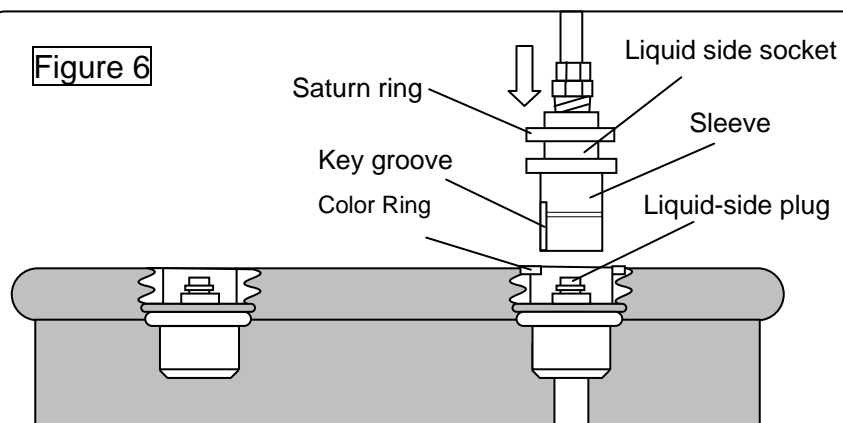
### A good example



### A bad example



Figure 6



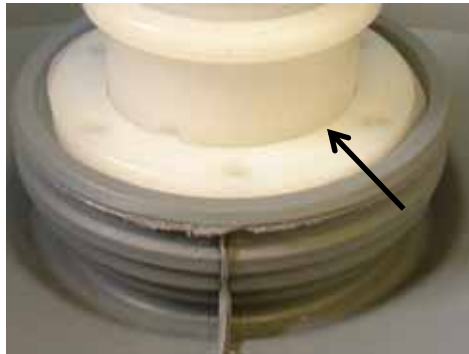


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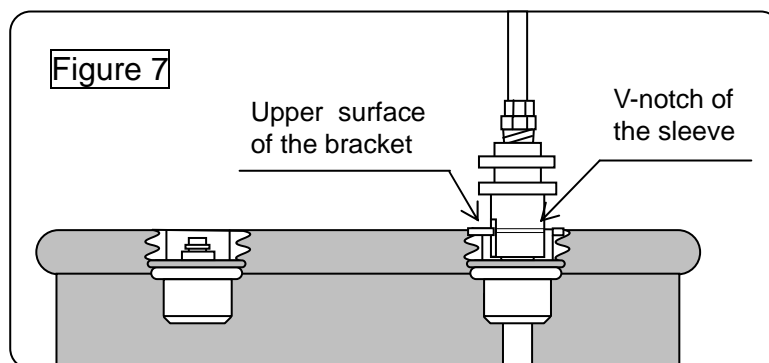
Confirm that the socket is connected securely.  
(see the photo and Figure 7 below)



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.



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## 6-3 Connecting the gas-side socket

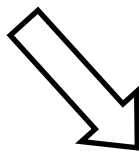
Confirm that the container is not pressurized (with no pressure applied).



**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.

Hold the gas-side socket at its Saturn ring, and insert it into the gas-side plug vertically. (see the photo and Figure 8 below)



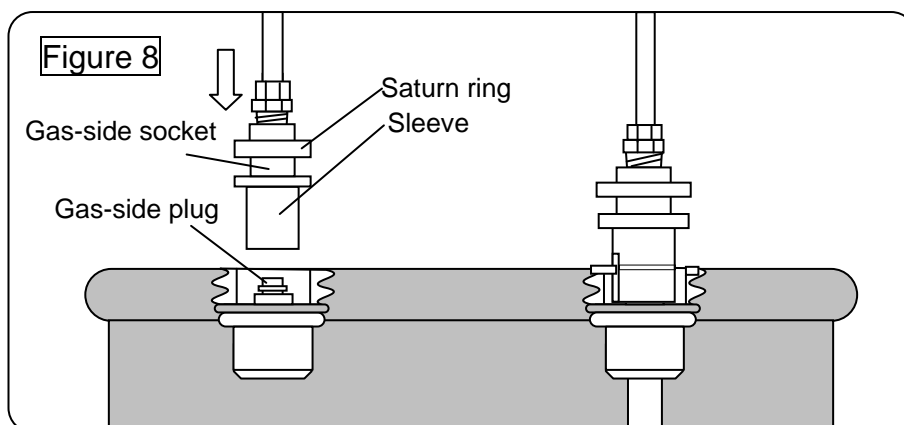


Never pull in the sleeve when connecting the socket, or the socket cannot be connected.

### A good example



### A bad example



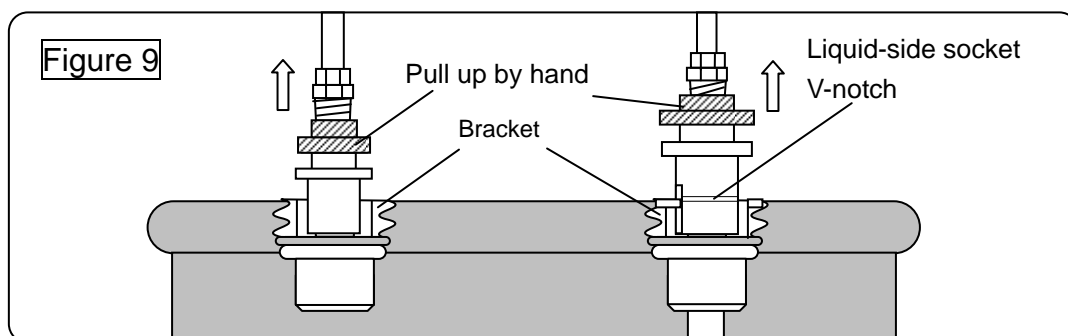
Confirm that the socket is connected securely.  
(see the photo and Figure 9 below)



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



### A bad example



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## 6-4 Transferring liquid

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

## 6-5 Detaching

Release pressure from the container.

 **DANGER** Mandatory instruction!!

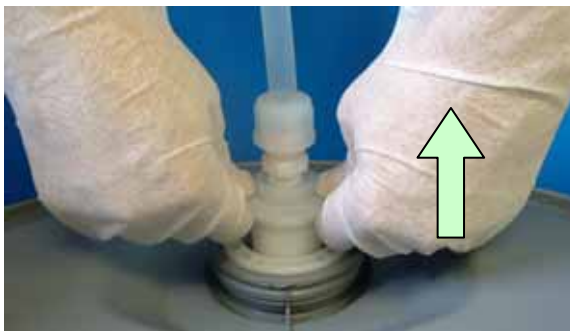
Release pressure from the piping before attaching the connector. A pressurized condition may cause spouting of chemicals, resulting in personal injury. Connect the tube without any moment or tension to bend the joint portion.

- First start to disconnect the socket at the gas-side and then at the liquid-side.
- Pull out the gas-side socket vertically while pulling in the sleeve with both hands. (see the photo and Figure 10 below)

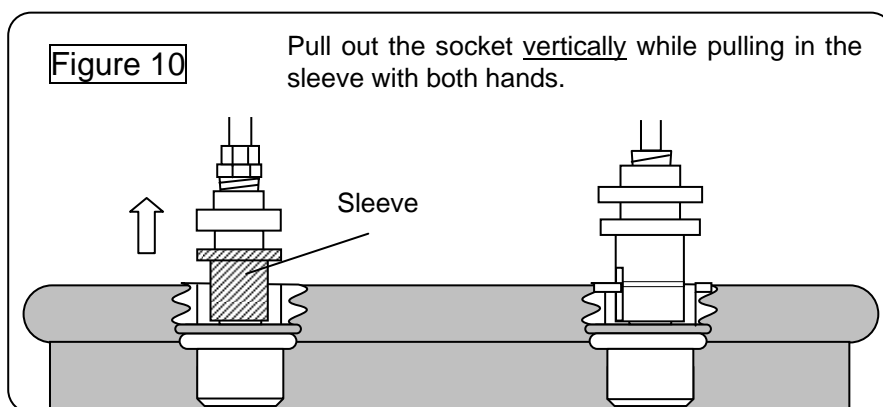
 **DANGER** Mandatory instruction!!

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 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.

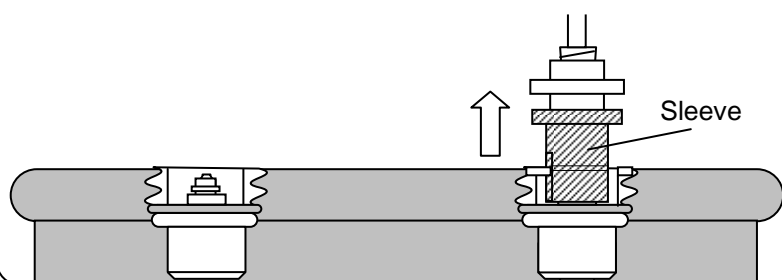


( 2 ) Be sure to vertically pull out the socket while pulling in the sleeve with both hands.



**Figure 11**

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



Attach the liquid-side cap first, then the gas side.  
(see the photo and Figure 12 below)

Liquid Side : 1.5 ~ 2.5 [ N · m ]
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Gas Side : 1.5 [ N · m ]
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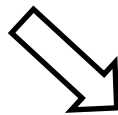


When you tighten the cap. Please check top surface of the cap for being alignment with the top surface of the bracket.

## CAUTION

Put the special jig into the cap and tighten it with a torque wrench.  
Excessive or inadequate tightening may cause breakage or liquid leakage.

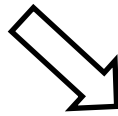
### [ 1 ] Liquid-side cap



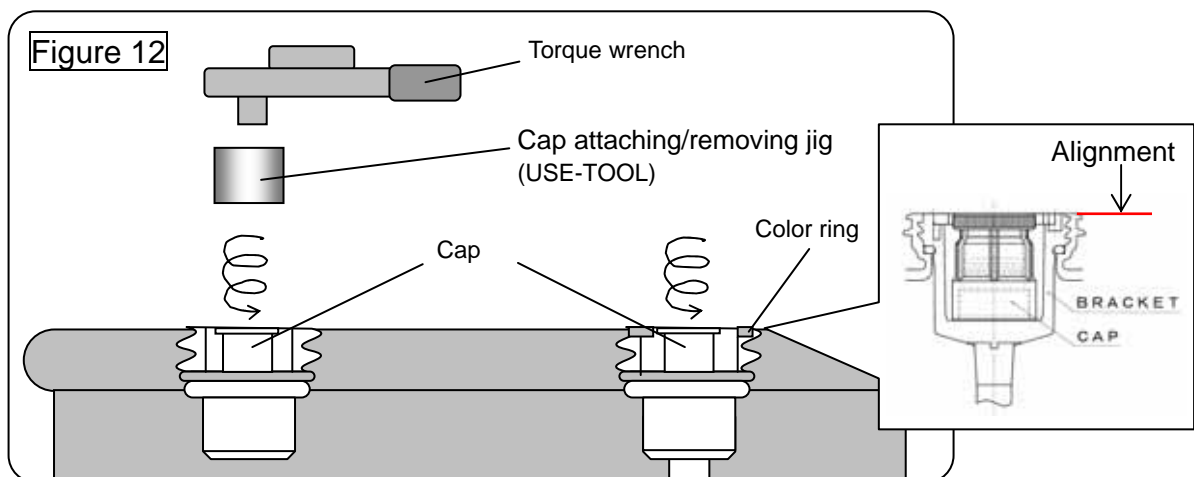
Tighten the cap with  
**1.5 ~ 2.5 [ N · m ]**.



## [ 2 ] Gas-side cap



Tighten the cap with  
**1.5 [ N · m ]**.



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## 7. Maintenance and Inspection

### 7-1 Daily Inspections

**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.

Inspect the following items every day before and after the operation. Whenever the inspection detects any abnormality, take a corrective action.

- Adhesion of coarse particles, dust or dirt
  - Liquid leakage from the piping or connecting part
  - Looseness of bracket
  - Liquid leakage from the O-ring part
-

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## 8. Troubleshooting

<b>Trouble Condition</b>	<b>Checking Points</b>	<b>Correcting Action</b>
The socket cannot be connected to the plug.	Check if you pull in the sleeve of the socket when connecting. 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 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.

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## 9. Warranty

### ~ Plug warranty ~

This product is developed for the purpose of single-use. We cannot guarantee all responsibility of the guarantee of a product and a secondary calamity, etc.

### ~ Socket 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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