

# **Pipe with Valve**

## **Instruction Manual**

**Export Control Policy**

We recommend that ALL customers be sure to follow all rules and regulations such as Foreign Exchange and Foreign Trade Law when exporting or reexporting our products.



## Introduction

Thank you for choosing our products. This instruction manual gives information and precautions on handling, installation, operation, and maintenance of the product.

This product is intended for use by qualified personnel who recognize shock hazards and are familiar with the safety precautions required to avoid possible injury. To ensure proper use of this product, read this instruction manual carefully and keep this manual close at hand so that you can use for reference during operation.

If you purchased our other products and/or optional devices with this product, read relevant instruction manuals carefully.

### 1. About the personnel who are involved in handling our products

All personnel involved in handling our products should take a general safety education and training that is officially accepted in the country where our product is used. The personnel are also required to have specialized knowledge/skills and qualification on the electricity, the machinery, the cargo handling, and the vacuum. Especially, the personnel should be familiar with handling a cryopump in order to use it safely. Since we offer a training session (which is subject to fees) as needed for people who use cryopumps for the first time, please do not hesitate to contact our Service Engineering Division to join the training session.

### 2. Warranty

#### 2.1 Gratis warranty period and Warranty coverage

##### 【Gratis warranty period】

Note that an installation period of less than one year after installation in your company or your customer's premises or a period of less than 18 months (counted from the date of production) after shipment from our company, which is shorter, is selected.

##### 【Coverage】

##### (1) Failure diagnosis

As a general rule, diagnosis of failure should be done on site by customer.

However, ULVAC CRYOGENICS or our service network can perform this service for an agreed fee upon the customer's request. There will be no charge if the cause

of the breakdown is found to be a fault of ULVAC CRYOGENICS.

(2) Damage during transportation

When damage by delivery/transportation is admitted, the product will be repaired free of charge within the range of the guarantee expressed in the sales contract.

(3) Breakdown repairs

There will be a charge for breakdown repairs, replacements and on-site visits for the following seven conditions. In those cases the cost shall be your own expense even though the product is within the warranty period.

- ① Breakdowns due to improper storage or handling, careless accident, software or hardware design by the customer.
- ② Breakdowns due to modifications of the product without consent of the manufacturer.
- ③ Breakdowns due to maintenance of the product without authentic parts or breakdowns resulting from using the product outside the specified specifications of the product.
- ④ Breakdowns due to contamination or corrosion caused by user's use conditions.
- ⑤ Breakdowns due to natural disasters (such as fire, earthquake, flood, lightning, salt damage, and so on) , environmental pollution, irregular voltage, and /or usage of undesignated power source.
- ⑥ Breakdowns that are outside the terms of warranty.
- ⑦ Consumables and/or replacement service.

Since the above services are limited to within Japan, diagnosis of failures, etc are not performed abroad. If you desire the after service abroad, please contact ULVAC CRYOGENICS and consult us for details in advance.

## 2.2 Exclusion of opportunity loss from warranty liability

Regardless of the gratis warranty term, compensation to opportunity losses incurred to your company or your customers by failures of ULVAC CRYOGENICS products and compensation for damages to products other than ULVAC CRYOGENICS products and other services are not covered under warranty.

### 2.3 Repair period after production is discontinued

ULVAC CRYOGENICS shall accept product repairs for seven years after production of the product is discontinued.

### 3. Service Form

After the products are delivered, please fill out the following information in the blanks. If you have any questions or technical problems, please feel free to contact the nearest Customer Support Center or headquarters. Please refer to "Service Network".

Cryopump/Super trap Model	:	_____
Cryopump/Super trap Serial No.	:	_____
Refrigerator Model	:	_____
Refrigerator Serial No.	:	_____
Compressor Model	:	_____
Compressor Serial No.	:	_____
Temperature controller/Thermal display Model	:	_____
Temperature controller/Thermal display Serial No.	:	_____
Option Part Model	:	_____
Optional Part Serial No.	:	_____

### 4. Notes for repair and maintenance requests

We may decline your request for the repair or the maintenance of our products if you refuse to give us information about the presence of the hazardous substance and/or contaminant.

Also, please be aware that we do not accept liability for damages by the contaminant, which might be caused during transportation to our office or the nearest customer support center. To avoid such accident, please pay careful attention to packing of the product

### 5. In case of breakdown and accident

When breakdown or accident occurs, we may ask for keeping the product on site as it is or retrieving the product to investigate its cause. Also we may ask for reporting the detailed process and/or the operating condition. When unidentified malfunction was generated, please contact our Service Engineering Division or

the nearest customer support center with reference to the chapter of Service Network. We ask for cooperation about the above.

## 6. General Precautions

- (1) It is strictly prohibited to duplicate, open, and transfer this instruction manual or any of its parts to a third person without written permission from ULVAC CRYOGENICS.
- (2) Information in this document might be revised without a previous notice for the specification change and the improvement of the product.
- (3) If you have any questions or comments on this document, please do not hesitate to contact us. The phone numbers of local customer support centers are listed at the end of this manual.

## Safety Considerations

Our products have been designed to provide extremely safe and dependable operation when properly used. Following safety precautions must be observed during normal operation and when servicing them.

**WARNING**

A warning describes safety hazards or unsafe practices which could result in severe injury or loss of life.

**CAUTION**

A caution describes safety hazards or unsafe practices which could result in personal injury or equipment damage.

**Toxic gas or chemicals used.**

There is a risk of severe injury upon contact.

**Corrosive chemicals used.**

There is a risk of severe injury upon contact.

**Flammable gas used.**

There is a danger of fire or burn injury.

**Explosive gas used.**

There is a risk of fire or explosion.

**Hazardous voltage .**

Electric shock may cause severe injury or loss of life.

**Hot heating part present.**

There is a risk of burn injury.

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## Disposal Considerations

Disposal of our products must be done in accordance with applicable national and local laws and regulations.

				<b>WARNING</b>
<p>The cryopumps or cryocoolers may contain residue of hazardous substances resulting from actual use. Contact your safety supervisor and follow the instructions to remove such toxic substances before disposing.</p>				

We provide Safety Data Sheet (SDS) of our products upon your request.  
Please contact us if necessary.

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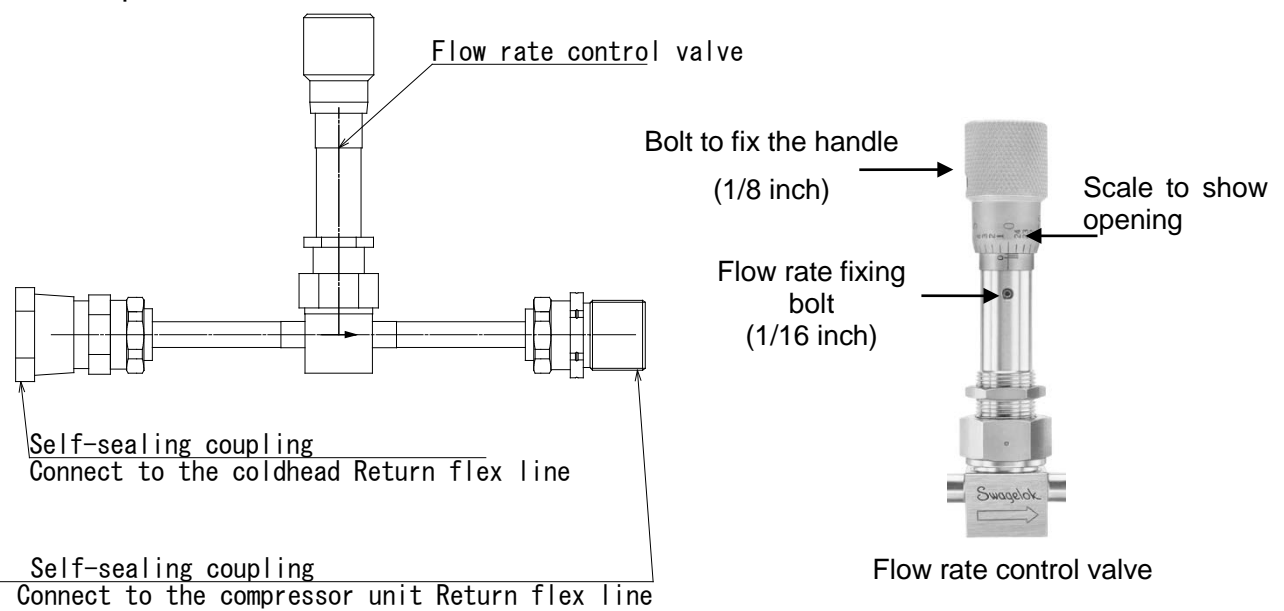
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## 1. General

The “Pipe with Valve” works to adjust the 1st-stage temperature by controlling the flow rate of cooling gas (helium) in the refrigeration system to improve the pumping performance when deteriorated by overcooling of 1st-stage temperature.

When the processing pressure is high and the 1st-stage of cryopump is overcooled (e.g., 1st-stage temperature is 40K at 0.1Pa), the pumping time may be longer when pumping Argon gas which is used as process gas to high-vacuum. By using the Pipe with Valve and control the 1st-stage temperature, pumping time to high vacuum can be shorter.

## 2. Component Identification



**Figure 1 Exterior and description of Pipe with Valve**

## 3. How to use

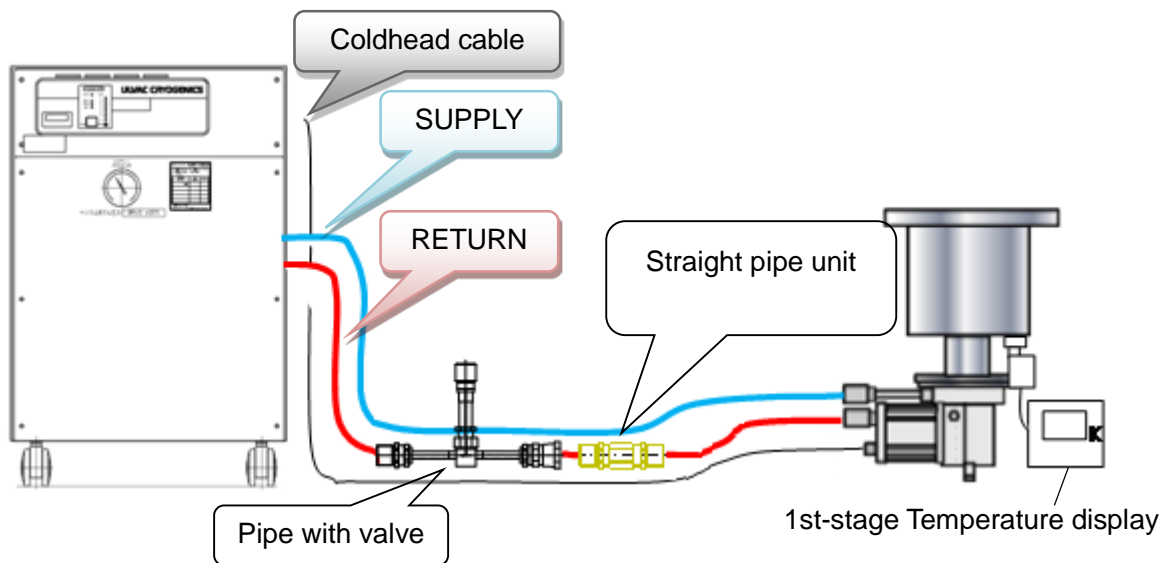
### 3.1 Installation



## CAUTION

- The tube part is welded stainless. When connecting or removing self-sealing coupling, fix the pipe with a wrench to prevent torque to the pipe.
- Attach the Pipe with Valve via flexible hose of about 1 meter on the return side of the compressor and prevent placing burden on the pipe with the weight of the flexible hose.

Connect the Pipe with Valve between the flexible hoses on the RETURN side as shown in Figure 2.



**Figure 2 Configuration with the Pipe with Valve**

### 3.2 Adjustment

#### 3.2.1 Required parts

- (1) 1st stage temperature indicator SR series from Shimaden  
Temperature indicators from other makers that show the compensated room temperature are also acceptable.  
Or, you can use the value thermos-electromotive force (to smallest 0.01mV) to convert to temperature.
- (2) Cable for K thermocouple  
Cable to connect 1st temperature measure and temperature display. Compensating lead wire for K thermocouple is used as the cable.
- (3) Hexagon wrench: 1/16 inch
- (4) Paint marker (or equivalent)
- (5) Cable ties with label (or equivalent)

#### 3.2.2 Works before adjustment

- (1) Check that flexible hoses including the Pipe with Valve and coldhead cable are all connected.
- (2) Close the valve of the pipe completely and record the reading.  
After recording, fully open the valve before starting-up the cryopump operation.



## CAUTION

If the valve of the pipe is completely closed while cryopump is running, the pressure relief valve of coldhead will be activated. Do not completely close the valve while cryopump is in operation.

- (3) Connect the K thermocouple connector for 1st-stage temperature of MBS-C (cryometer) and the temperature display with the cable for K thermocouple.
- (4) Start cooling down the cryopump with the main valve of the cryopump inlet port closed.
- (5) While cooling down, check the 1st-stage temperature with the temperature display and wait for the 1st-stage to reach 60K or lower. If the 1st-stage temperature becomes stable between 60K and 70K, it is not necessary to operate the valve.

### 3.2.3 How to adjust

Adjust the cryopump 1st-stage temperature between 60K and 70K.

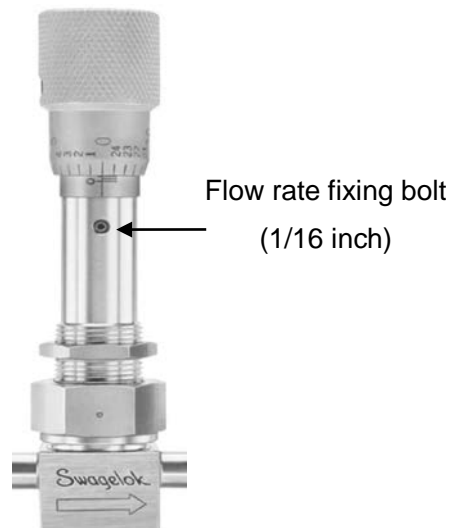
When the cryopump is cooled down to below 60K, immediately operate the valve.



### CAUTION

If the cryopump is cooled down to lower than 60K and reach around 40K, the time required to adjust between 60K and 70K will be longer. Start operating the valve when the cryopump is lower than 60K.

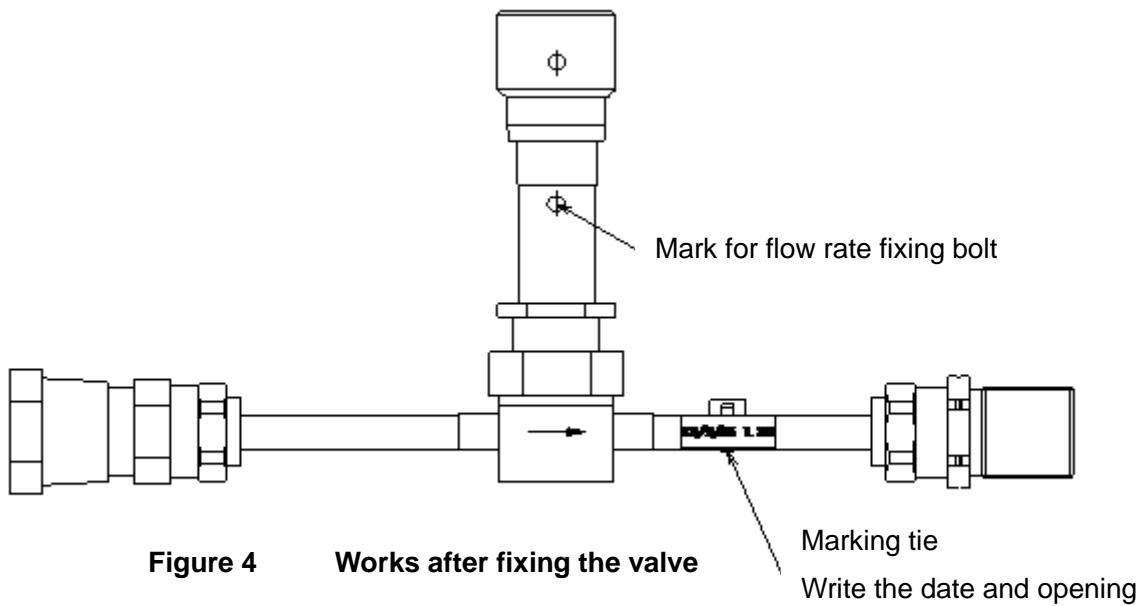
- (1) Loosen the Flow rate fixing bolt on the valve.



**Figure 3** Valve detail

- (2) If the cryopump 1st-stage temperature is below 60K, helium flow rate needs to be reduced. Turn the valve handle clockwise to lead the cryopump 1st temperature between 60K and 70K.

- (3) If the cryopump 1st-stage temperature is above 70K, helium flow rate needs to be increased. Turn the valve handle counter-clockwise to lead the cryopump 1st temperature between 60K and 70K.
- (4) Check that high-vacuum pumping is being done and the pumping time is reduced.
- (5) Close and lock the Flow rate fixing bolt on the valve.
- (6) Mark the Flow rate fixing bolt with a marker pen.
- (7) Read the scale, record the date and opening on a marking tie, and attach it to the valve.



※Note: How to read the opening

Scale A has marking with the interval of 0.25 round, and scale B has marking with the interval of 0.01 round. In the figure below, the opening is 1.45 rounds (Figure 5)



**Figure 5 How to read the scale**



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## SERVICE NETWORK

- For technical support, servicing or additional contact information, visit us at [www.ulvac-cryo.com](http://www.ulvac-cryo.com).

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**Revision History**

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