

HRW*-**-Z**
Automatic Circulating Fluid Collector (Option)
Operation Manual
Applicable model: HRW Series
(Thermo-Chiller)

Introduction



Thank you for purchasing SMC's Automatic Circulating Fluid Collector for HRW series Thermo-Chiller.
 This Operation Manual is intended for those who have knowledge of machinery for general industry, and sufficient knowledge of assembly, operation and maintenance of such equipment. Read this Operation Manual and the Operation Manual for the HRW series Thermo-Chiller before assembling, operating or providing maintenance to the product.
 Connection of purge gas and mounting of the accessories are to be carried out by the user according to this Operation Manual.
 Refer to the Operation Manual for the product warranty of HRW series Thermo-Chiller.
 This Operation Manual is subject to change without prior notice.


Outline of This Option

- This optional product has a function that automatically returns the circulating fluid to the user's system (including piping); into the tank in the Thermo-Chiller.
 It automatically starts supplying the fluid again to the system after returning the fluid into the tank.

Safety Instructions

- Please ensure that you fully understand the definition of the following messages (signs) before going on to read the text, and always follow the instructions.

Display	Definition
 Warning	Hazard with a risk which, if not avoided, could result in death or serious injury.
 Caution	Hazard with a risk, which if not avoided, could result in minor or moderate injury and/or failure of the product, facility, equipment, etc.


 **Warning**

- **Check the specification range before use.**
 This is an automatic circulating fluid collector set designed for SMC's Thermo-Chiller, HRW series. Do not use out of the specification range or for any purposes other than shown above.

- **Fully understand the contents and procedures shown in this manual before use.**
 Ensure that this manual and the Operation Manuals for HRW Series Thermo-Chiller [document number: HRX-OM-K002] are fully understood. Keep this manual accessible for whenever it is necessary.

- **Disconnect power from the Thermo-Chiller before mounting the product to it.**
 Make sure to lock out and tag out the power supply, as there is a possibility that the Thermo-Chiller may start operating by mistake.

- **After discharging the circulating fluid, begin to mount the Thermo-Chiller, before refilling it with circulating fluid.**
 The temperature of the circulating fluid must be returned to ambient before being discharged, or the operators may get burnt.

 **Caution**

- **Do NOT disassemble or modify the product, as it may cause fluid leakage and/or operation failure.**
 - **Confirm that there is no fluid leakage or dew condensation after mounting of the product.**
 Operate the Thermo-chiller to check that there is no fluid leakage or dew condensation. When any fluid leakage is found, stop the operation of the Thermo-Chiller immediately.

- **Use a silicone sealant (SMC's part number: HRZ-S0003) for sealing. The sealant needs to be ordered separately from this automatic circulating fluid collector set.**
 It takes approximately 8 hours for the sealant, HRZ-S0003, to harden completely. Using sealants other than specified may cause fluid leakage.

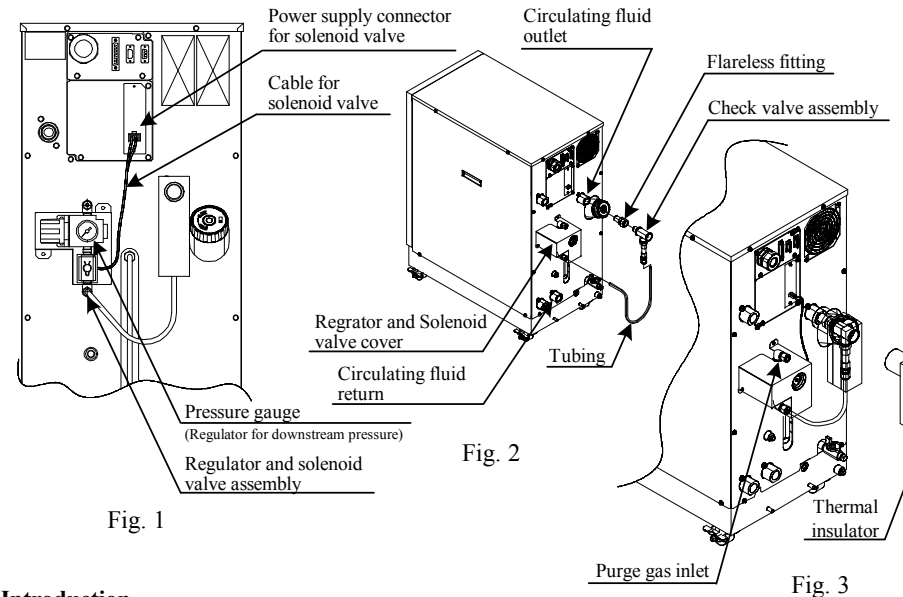
- **Air bleeding type regulator is used for this product.**
 An air bleeding type regulator is used for purge gas supply, and the air leakage from the regulator is not an abnormality. Mount a valve to the supply source of the purge gas, if necessary.

- **When using a by-pass piping set (HRW-BP001 or HRW-BP002) together with the automatic circulating fluid collector, close the by-pass valve before starting collection of the circulating fluid.**
 With the by-pass valve open, it is not possible to supply purge gas to the user's system (including piping) sufficiently and it may fail to collect the circulating fluid. To collect the circulating fluid without operating the by-pass valve, use a check valve assembly (SMC's part number: HRW-S0079).

Items to be Prepared

1. Spanner (Width across flats: 16mm, 18mm, 27mm, 29mm), 2. Phillips screwdriver (M5), 3. Nitrogen gas or compressed air supply piping (O.D.: 8 mm)

Mounting of Parts



Introduction

Refer to "Accessories" on the back side of this page and check that there are no parts missing. Check that "-Z" which is a part number for option is shown on the product label on the Thermo-Chiller unit.

Step 1

Mount the regulator and solenoid valve assembly to the Thermo-Chiller with an M5 screw (accessory), and mount the regulator/solenoid valve cover with an M5 screw (accessory) using the recommended torque of 3Nm. When mounting the cover, take one end of the cable for the solenoid valve from the hole on the side of the cover.

Step 2

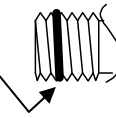
Connect the other end of the cable for the solenoid valve to the power supply connector for the solenoid valve shown in Fig. 1.

Step 3

Apply sealant to the flareless fitting, and screw in the fitting to the circulating fluid outlet port as shown in Fig. 2. (Width cross flats of the spanner: 27 mm, Recommended torque: 28 to 30 Nm) It will take approximately 8 hours before the sealant hardens completely in the room temperature. Do not operate the Thermo-Chiller before the sealant hardens completely.

Apply the sealant to the entire circumference leaving the first thread with the sealant not applied. (Apply the sealant to the part shown with the thick line in the figure.)

* Excessive sealant may cause fluid leakage.



Step 4

Insert the check valve assembly to the flareless fitting and tighten the nut by hand, and then tighten the nut for 1.5 rotations with a spanner. Use two spanners to prevent the thread part of the flareless fitting from rotating. (Width across flats of the spanners: 27mm and 29 mm)

Step 5

Check that the inserts have been secured to both ends of the tubing. Ensure that the ends of the tubing touch the Thermo-Chiller and the check valve assembly respectively, then tighten the nuts by hand. Apply spanner (width across flats: 18 mm) to the nuts for one more rotation. Use two spanners (width across flats: 16 mm and 18 mm) to prevent the flareless fitting from rotating.

Step 6

Connect the piping of nitrogen or compressed air to the purge gas supply port. Insert the piping of O.D. 6 to the end, and apply spanner for one more rotation after tightening the nut by hand. Supply pressure of the purge gas should be 0.4 MPa to 0.7 MPa. The specified supply pressure is shown on the label on the regulator/solenoid valve cover.

Step 7

Supply purge gas to the regulator. Check that the downstream pressure of the regulator is within the range of 0.15 MPa and 0.3 MPa. If the downstream pressure is out of the range, remove the regulator/solenoid valve cover and adjust the pressure with the adjusting handle. The specified supply pressure is shown on the label of the regulator/solenoid valve cover.

Step 8

Perform a test run in accordance with the instructions shown in the Operation Manual for Thermo-Chiller, HRX-OM-K002.

Step 9

Check that there is no fluid leakage, and mount the insulator to the check valve assembly that has been mounted to the Thermo-Chiller. (Use the double sided adhesive tape at the slit of the insulator.)

How to Operate with the Operation Panel

Step 1

Set the temperature of the circulating fluid to 20 to 40 degrees (recommended temperature: 25 degrees) and stop the operation. If the temperature is out of the range, [TEMP OUT] is displayed on [PURGE MODE WINDOW1] and collection will not start.

Step 2

The amount of circulating fluid in the tank before collection should be lower than the upper level of the specified circulating fluid level. If the circulating fluid level is higher than the specified level and the amount of the fluid to be collected is too much, it may overflow from the tank.

Step 3

Press the [SEL] button on [Model display screen] or [Status screen] to display [Menu screen 1]. Move the cursor to [4. MAINTENANCE] with the [▲] or [▼] button and press the [ENT] button. [MAINTENANCE screen] is displayed.

Step 4

Move the cursor to [1. PURGE MODE] and press the [ENT] button. [PURGE MODE screen 1] is displayed.

Step 5

The collection will start by pressing the [▲] or [▼] button and [PURGE START] is displayed. When the collection is completed, it will be stopped automatically and [FINISH] is displayed.

Step 6

If it is necessary to stop the collection temporarily, press the [▲] or [▼] button. The collection will restart by pressing the [▲] or [▼] button again. The collection stops with the conditions below.

- When the collection is finished successfully and completion of the collection is detected. -> [MSG: FINISH] is displayed.
- When the time from the collection start exceeds the set PURGE TIME. -> [MSG: TIME OUT] is displayed.
- When the temperature of the returned circulating fluid exceeds 10 to 40 degrees. -> [MSG: TIME OUT] is displayed.
- When the sub tank is filled up. -> [MSG: ALARM] is displayed and the buzzer sounds. When alarm is generated -> [MSG: ALARM] is displayed and the buzzer sounds.

Step 7

When the [RESET] button is pressed while [FINISH] is displayed after collection, [MSG] is changed to [READY] and the collection status is returned to stand-by.

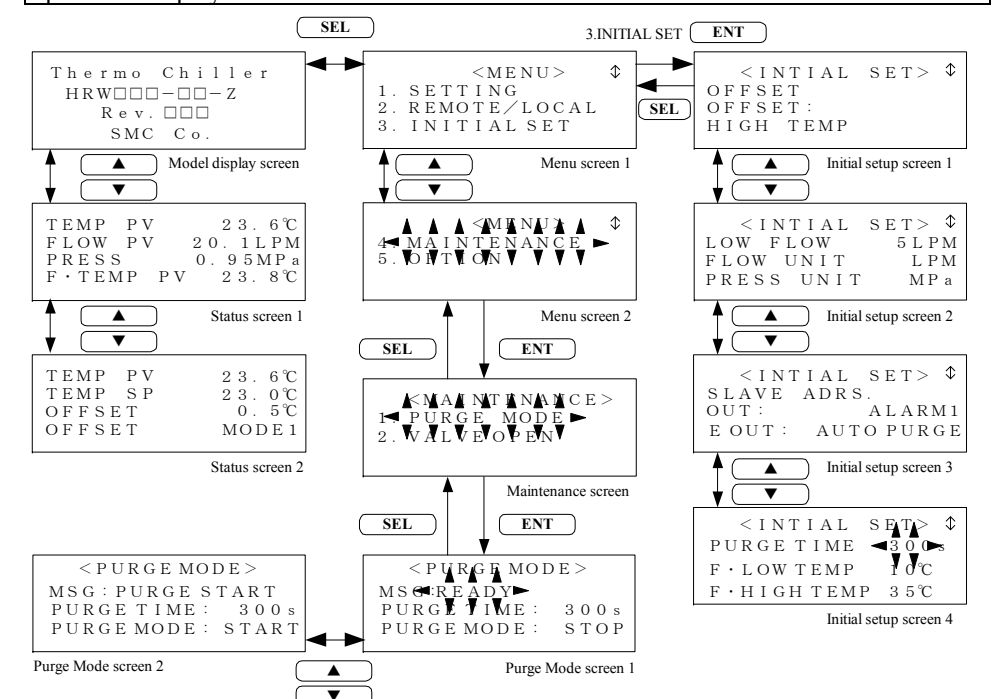
How to Change the Time of Time-Out

- Move the cursor to [3. INITIAL SET] on [Menu screen 1] and press the [ENT] button. [Initial set screen 1] is displayed.
- Move the cursor to [PURGE TIME] by pressing the [▲] and [▼] button and press the [ENT] button.
- Change the set time by pressing the [▲], [▼] and [▶] button. After changing the value, press the [ENT] button.

How to Operate with External Communication

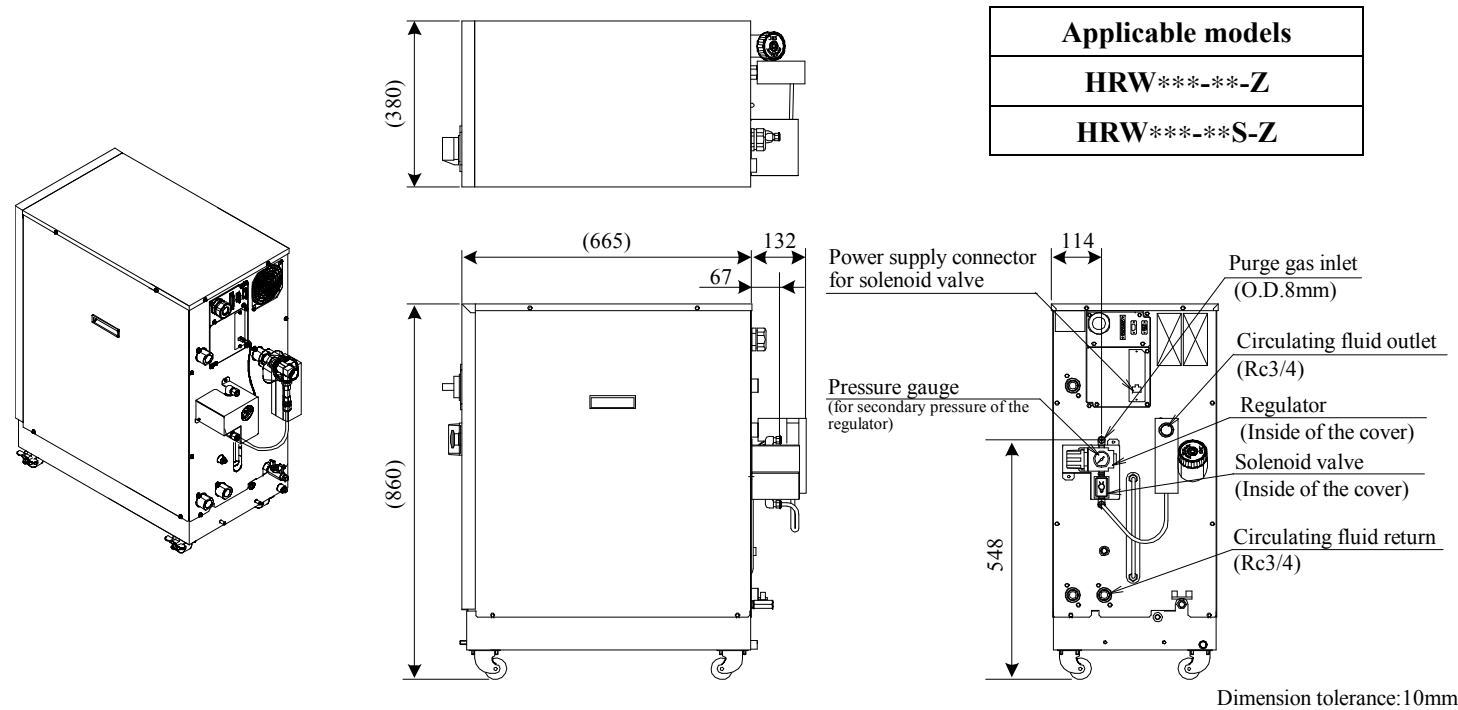
The collection can be operated with serial RS-485 or contact input and output. Refer to Communication Specifications HEX-PS-K033 for details. In case of analog communication (optional), refer to HRX-PS-K018.

Operation Display Flow Chart



HRW***-**-Z

Automatic Circulating Fluid Collector Information (Optional)



Applicable models
HRW***-**-Z
HRW***-**-S-Z

Specifications

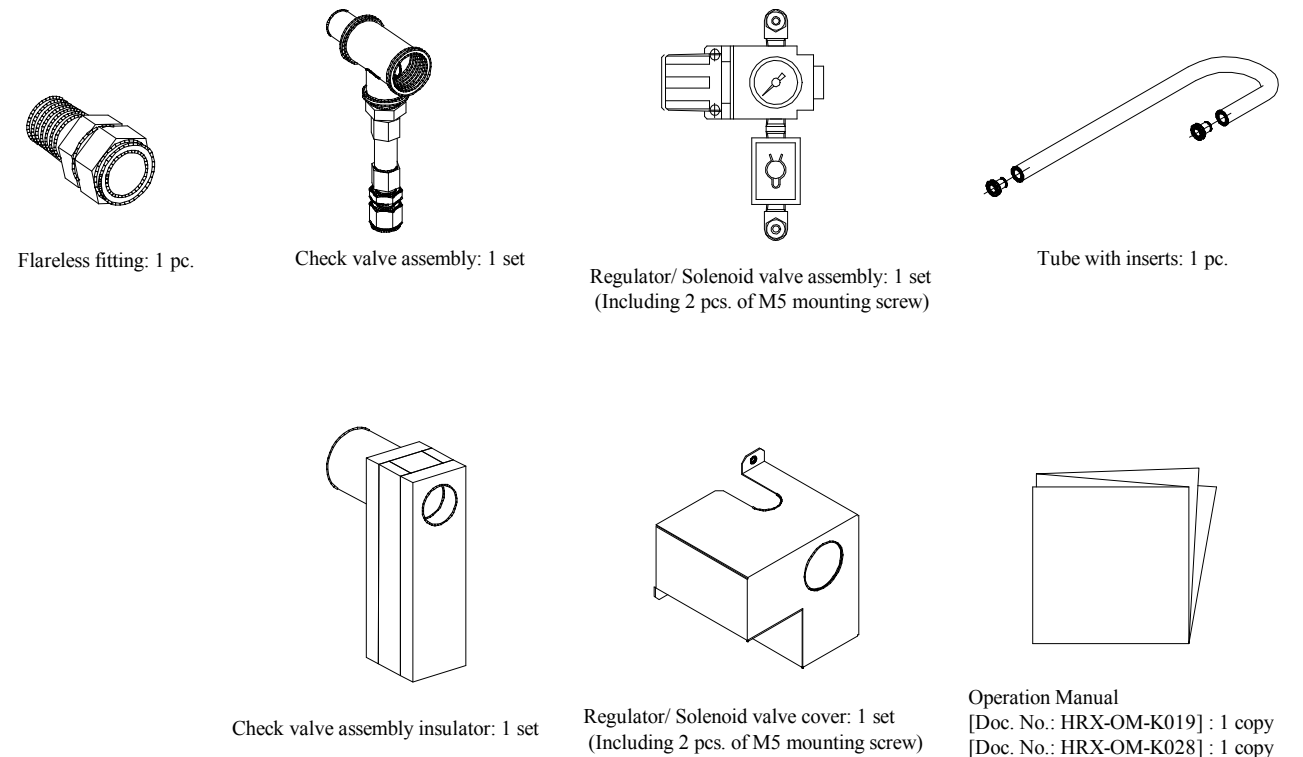
Applicable models	HRW***-**-Z, HRW***-**-S-Z	
Circulating fluid tank capacity *1	L	12
Purge gas	-	Nitrogen gas, compressed air *2
Purge gas inlet	-	Flareless fitting for O.D. ø8 mm *3
Purge gas supply pressure	MPa	0.4 to 0.7
Purge gas filtration rating	µm	0.01 or less
Regulator set pressure	MPa	0.15 to 0.3 *4
Collectable circulating fluid temperature	°C	10 to 40
Collection start/stop	-	Start: Serial RS-485 with contact input/output or operation panel Stop: Automatic *5
Time-out error	Second	Timer from the collection start to the end. Stops collection at the time set by the timer. Settable range: 60 to 600 Default value: 300
Height difference from user's system	m	10 or less

- *1: Spatial volume when the fluid level in the tank is within the specified circulating fluid level shown on the label. Roughly, 80% of the tank volume is collectable fluid amount.
- *2: Use compressed air which has a dew point of -30°C or less. Compressed air with a high dew point generates dew drop water which leads to cooling failure. Ensure that compressed air does not contain chemicals, synthetic oil containing organic solvent, salinity, nor corrosive gas. Do not use the lubricator at compressed air supply side. It clogs bleed holes of the regulator and leads to operation failure.
- *3: Before connecting, perform air blow or cleaning inside of the piping. Use piping with no particles which is cleaned by purge gas. When the resin tube is used, use the insert so that the tube is not deformed when connecting the flareless fitting.
- *4: The default setting is 0.2MPa.
- *5: Refer to Communication Specifications HRX-PS-K033 for details. For analogue communication (optional), refer to HRX-PS-K018.

Notes:

- 1: This device is to automatically direct the fluid circulating in the piping of user's system into the Thermo-Chiller. Do not use the product for any other purpose.
- 2: Customer connects purge gas.
- 3: Customer mounts accessories referring to the operation manuals.
- 4: Sealing material for accessories is not included. Silicone sealant needs to be ordered separately (SMC's part number: HRZ-S0003).
- 5: An air bleeding type regulator is used for purge gas, and the air leakage from the regulator is not an abnormality. Mount a valve to the supply source of the purge gas, if necessary.

Accessories



Flow Diagram : Optional parts

