

OPERATION MANUAL

REFRIGERANT GAS CHARGE AND RECYCLING UNIT

TYPE: RCS-20A (220V) MODEL No. 853753
TYPE: RCS-20ABB (220V) MODEL No. 881047

When you purchase a kit including this machine, the following options are supplied with the main unit RCS-20A. (See page 6.)



RCS-20A 853753

WARNING

For safe operation, be sure to read this OPERATION MANUAL thoroughly before using the pump to understand the "Warnings and Cautions" particularly. Be sure to keep this OPERATION MANUAL handy for future reference.

YAMADA CORPORATION

– Introduction

This OPERATION MANUAL describes the correct operation procedures and contains notes on usage, so that you can operate this reel effectively without any problems. Do not operate this reel before reading this manual. Be sure to read all of the warnings and cautions. Keep this manual handy for future reference.

If you have any questions on the operation of this reel, or if the reel operates improperly, contact your dealer or our office (see back page of this manual for our contact information).

If your manual is damaged or lost, additional copies may be purchased your dealer, or from Yamada directly.

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1. Purpose of Use

This product recovers, fills, vacuums, refills and/or reproduces refrigeration media that are used for car air conditioning systems. Refrigeration media that can be recovered with the product are HFC-134a (R-134a) and CFC-12 (R-12).

2. Warnings and Cautions

For safe use of this product, be sure to note the following: In this document, warnings and cautions are indicated by symbols. These symbols are for those who will operate this product and for those who will be nearby, for safe operation and the prevention of personal injury and/or property damage. The following warning and caution symbols are described below.



WARNING

If you ignore the warning described and operate the product in an improper manner, there is danger of serious bodily injury or death.



CAUTION

If you ignore the caution described and operate the product in an improper manner, there is danger of personal injury or property damage.

Furthermore, to indicate the type of danger and damage, the following symbols are also used along with those mentioned above:



This symbol indicates a DON'T, and will be accompanied by an explanation on something you must not do.



This symbol indicates a DO, and will be accompanied by instructions on something you must do in a certain situation.

– Operating Cautions

For safe use of the reel, be sure to follow the warnings and cautions described below.



WARNING



- Do not bring any fire (such as a match, cigar lighter, and cigarette) or heat source close to the product while you are handling refrigeration media.
* If refrigeration media are in contact with an extremely hot area, it generates harmful gas. When you breathe the gas, it may cause a serious injury or fatal accident.



- Do not recover any refrigeration media without using the designated tank.
* It may damage or explode the product itself or tank used for recovering the media, and then cause a serious injury or fatal accident.



- Do not use or store the product in a place where it will be subject to direct sunlight or high temperature: 40 °C or higher.
* It may damage or explode the product itself or tank used for recovering the media, and then cause a serious injury or fatal accident.




















- Do not use or store the product in a place that is filled with flammable gas or near to gasoline or paint thinner.
* Flammable gas or solution may catch fire, and it may cause a serious injury or fatal accident due to explosion or fire.



- Do not use or store the product in a tightly closed room or a poor-ventilated place.
* If gas leaks, it may cause a serious injury or fatal accident due to lack of oxygen.

CAUTION

-  – Use 220 V AC, 50/60 Hz as a power supply.
 - * It may cause the product to malfunction, or cause an electrical shock or fire.
 - * If you use a cable reel for extending the power cable, use the cable whose cross-section area is 1.25² mm or larger and whose length is 10 mm or shorter.
-  – Do not use or store the product in a place to which any children or infants can get.
 - * It may cause an injury or cause the product to malfunction.
-  – Do not use or store the product in a place whose floor is inclined or dented.
 - * The product uses the load cell to detect the amount and mass of the contents that fill up the tank used for recovering refrigeration media. When you use the product with inclined, it cannot detect the amount and mass of the contents, and this may damage or explode the product or tank.
-  – Do not touch the power plug with your hands when they are wet.
 - * If you connect or disconnect the power plug with wet hands, you may receive an electrical shock.
-  – When you store the product, disconnect the power cable from the AC outlet.
 - * It may cause a fire due to dust or moisture.
-  – Be sure to hold the power plug to disconnect the power cable.
 - * If you pull the cable itself, it damages the cable and may cause a fire or electrical shock.
-  – When you connect a hose or similar device, be sure to connect it securely so that there cannot be any leakage-spots at the connection.
 - * If you connect a hose or similar device improperly, air is mixed inside it while the product is recovering refrigeration media, filling, vacuuming or self-cleaning, and then the product malfunctions and may break down.
-  – To connect or disconnect a hose or similar device, be sure to wear safety glasses.
 - * The remaining chlorofluorocarbon gas blows out, and it may cause an injury.
-  – Do not block any ventilating holes.
 - * If you happen to block any ventilating hole, the inside of the product heats up and it may cause a fire or cause the product to malfunction. It degrades the product performance also.
-  – Do not use any chlorofluorocarbon gas other than the designated one.
 - * It may cause the product to malfunction or damage the product.
-  – Do not disassemble or remodel the product.
 - * It may cause the product to malfunction or damage the product.
-  – Vacuum a tank before using it.
 - * This operation is required to remove any moisture inside the tank. If any moisture is in the product, it is frozen and may cause a trouble to occur at each part. Before using the product, be sure to vacuum the tank.
 - * However, you do not have to vacuum the tank every time you recover refrigeration media. Vacuum the tank when:
 - 1 you use the product for the first time after purchasing it,
 - 2 you replace the tank, or
 - 3 change the refrigeration medium type.
 - * The main unit of the product is vacuumed at the factory. If you have to vacuum it again, follow Section 5-4 “Procedure for Vacuuming the Main Unit” to vacuum the main unit.
-  – Never vacuum the tank containing refrigeration media.
 - * Chlorofluorocarbon gas blows out from the exhaust outlet together with vacuumed air.
-  – Do not move or give a shock to the product while it is operating.
 - * It may cause the product to malfunction or damage the product.
-  – If you hear abnormal noise or the product malfunctions, immediately stop operating the product.
 - * If you keep using the product without stopping it, it may cause the product to malfunction or damage the product.
-  – Considering the case you happen to operate the product in a wrong way, take the protective action (such as wearing protective glasses) and paste a warning label on the necessary positions.
 - * Make copies of the Warning mark on page 41 to paste each copy on the product and other devices you use together with the product.
-  – Do not give a shock to the product while you are carrying it.
 - * It may cause the load cell to malfunction.



CAUTION



- If you want to start the engine of a vehicle while you operate the product, take care not to be caught in the rotating parts (such as a pulley and belt) inside the engine. It may cause an injury.



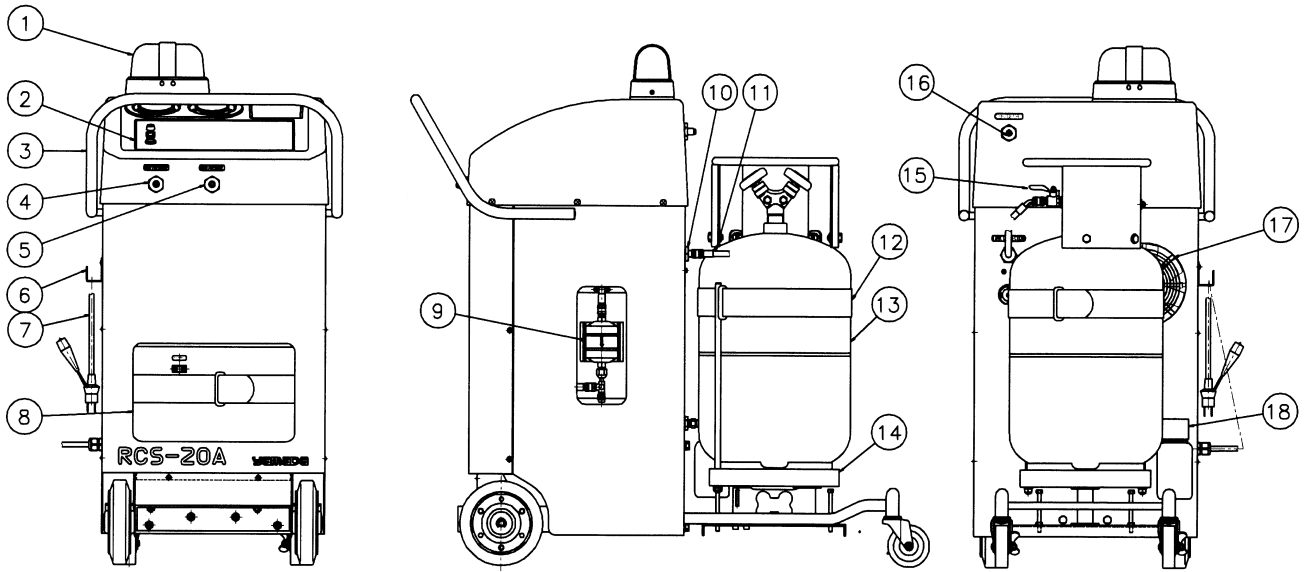
- If you keep operating the product for a long time, it may stop the operation abruptly because load imposed on the pump inside the main unit activates the protection circuit. This is not any failure; so leave the product until the temperature of the pump is lowered. When the temperature is lowered enough, the product automatically starts operating again.



- As you operate the product, oil collects in the oil drain. Remove the oil cup and discard the collected oil.

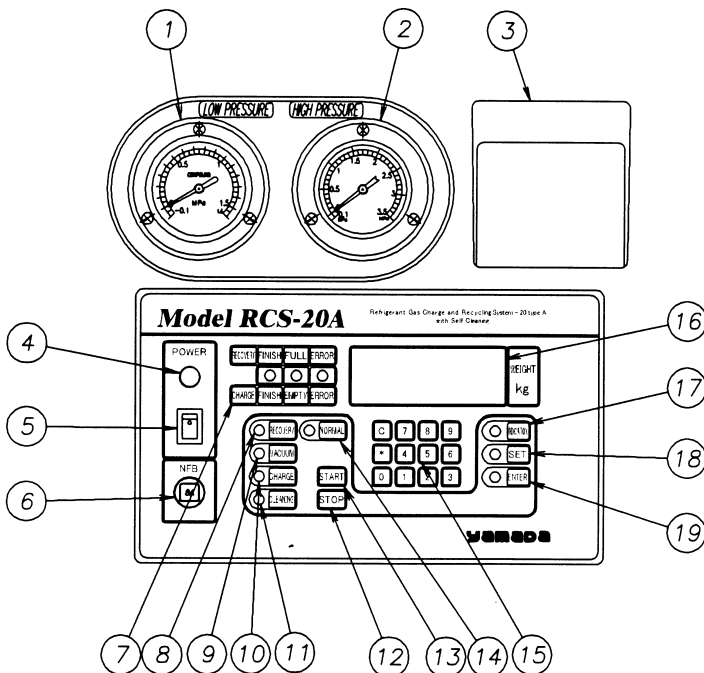
3. Name of Each Part

3.1 Main Unit



- | | |
|---------------------------------------|--------------------------------------|
| (1) Signal light | (2) Operation panel |
| (3) Handle | (4) Low-pressure side recovery inlet |
| (5) High-pressure side recovery inlet | (6) Hook for the power cable |
| (7) Power cable | (8) Hose storage section |
| (9) Filter dryer | (10) Container connection port |
| (11) Hose for the tank | (12) Band |
| (13) Tank (optional) | (14) Tank support |
| (15) Ball valve | (16) Hose inlet for a service can |
| (17) Ventilating hole | (18) Oil drain |

3.2 Detailed Figure of the Operation Panel

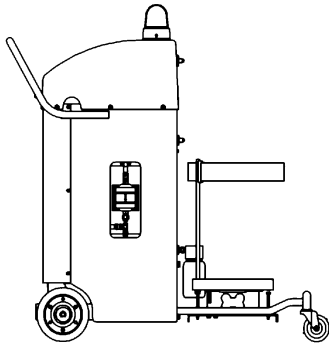


- | | |
|---------------------------------------|-------------------------|
| (1) Low-pressure side pressure gauge | (5) Power switch |
| (2) High-pressure side pressure gauge | (6) Circuit breaker |
| (3) Small accessory compartment | (7) Condition indicator |
| (4) Power lamp | (8) [Recovery] key |
| (9) [Vacuum] key | (10) [Charge] key |
| (11) [Cleaning] key | (12) [Stop] key |
| (13) [Start] key | (14) [Normal] key |
| (15) Setting input key | (16) Mass indicator |
| (17) [Indication] key | (18) [Set] key |
| (19) [Enter] key | |

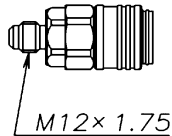
4. Main Unit and Supplied Parts (Check to See If All Parts Are Supplied.)

The following parts are supplied with this machine. After unpacking the machine, check to see if the machine is not damaged and if you have all supplied parts.

853753 RCS-20A 1 Set



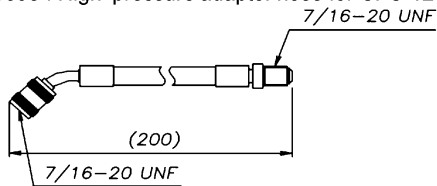
685495 : High pressure quick chuck for HFC-134a 1P



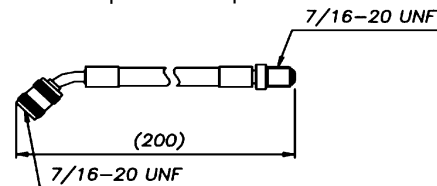
685496 : Low-pressure quick chuck for HFC-134a 1P



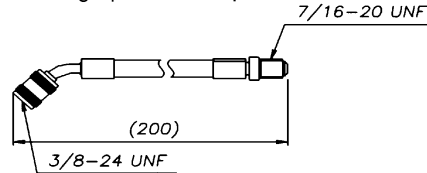
695693 : High-pressure adaptor hose for CFC-12 (Red) 1P



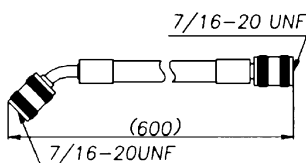
695694 : Low-pressure adaptor hose for CFC-12 (Yellow) 1P



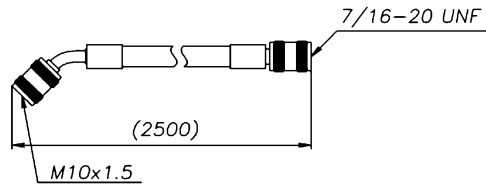
695695 : High-pressure adaptor hose for CFC-12 (Red) 1P



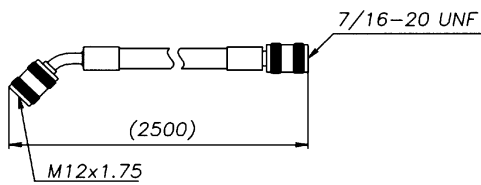
685678 : hose (for tank) 1P



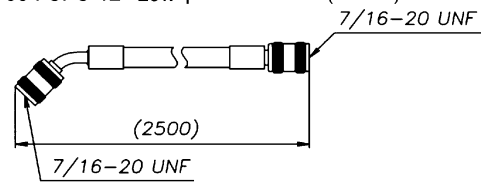
695778 : HFC-134a Low-pressure hose (Yellow) 1P



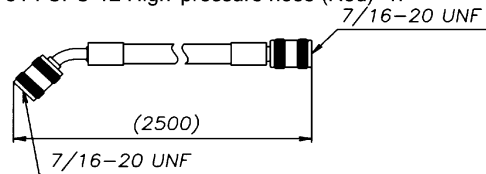
695779 : HFC-134a High pressure hose (Red) 1P



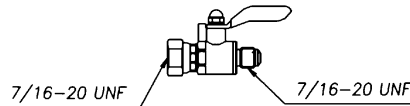
695780 : CFC-12 Low-pressure hose (Yellow) 1P



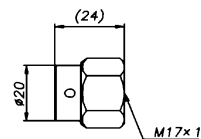
695781 : CFC-12 High-pressure hose (Red) 1P



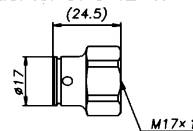
685428 : Ball valve 4P



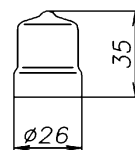
685497 : Can holder for HFC-134a 1P



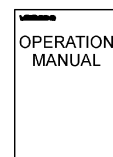
685498 : Can holder for CFC-12 1P



685494 : Cap 1P



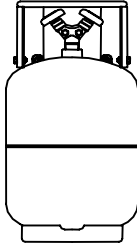
OPERATION MANUAL 1P



* When you purchase a kit including this machine, the following options are supplied with the main unit RCS-20A.

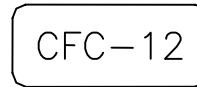
881047 RCS-20A BB

684978: Two-opening tank Two



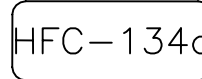
790942: Label (CFC-12)

One sheet



790943: Label (HFC-134a)

One sheet



5. Before Using the Machine

CAUTION



- Before using the machine, vacuum the main unit, tank, hoses and ball valves.
 - * You have to vacuum these parts to remove moisture from them. If any moisture exists in each part, it is frozen and may cause a trouble to occur at it. Before using the machine, be sure to vacuum these parts.
 - * However, you do not have to vacuum them every time you operate the machine. Vacuum these parts when:
 - 1 you use the machine for the first time after purchasing it,
 - 2 you replace the tank, or
 - 3 you change the refrigeration medium type.



- Never vacuum the tank containing chlorofluorocarbon gas.
 - * Chlorofluorocarbon gas blows out from the exhaust outlet together with the vacuumed air.



- When you connect a hose or similar device, be sure to connect it securely so that there cannot be any leakage-spots at the connection.
 - * If you connect a hose or similar device improperly, chlorofluorocarbon gas leaks. The machine sucks in chlorofluorocarbon gas together with air while the machine is operating, and it may cause the machine to malfunction.



- If you keep operating the machine for a long time, the machine may stop operating abruptly because load imposed on the pump inside the main unit activates the protection circuit. This is not any failure; so leave the machine until the temperature of the pump is lowered. When the temperature is lowered enough, the machine automatically starts operating again.

5.1 Vacuuming the Tank and the Main Unit

The tank is filled with nitrogen gas (N₂) at the factory to prevent it from deteriorating. Purge the nitrogen gas from the tank, and then vacuum the tank.

- 1) Open the valve of the tank for the gas little by little to purge the nitrogen gas from the tank. (See Fig.5-1.)

CAUTION



- Before vacuuming a new tank, be sure to purge nitrogen gas from the tank.
 - * If you vacuum the tank without purging the nitrogen gas, it may cause the vacuum pump to malfunction or compressor oil may fly in all directions.



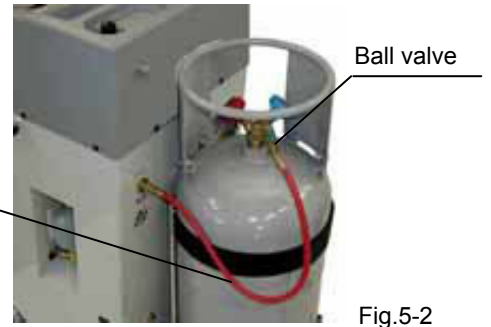
Fig.5-1

- 2) After finishing purging the nitrogen gas from the tank, place the tank on the tank support of the main unit, and fix it with the band securely.

- 3) Connect the hose for the tank to the gas side of the tank open/close

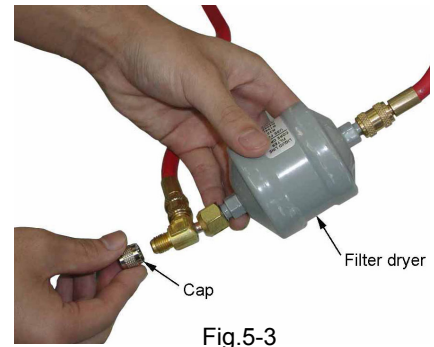
valve in the following order: ball valve, hose for the tank, and container connection port. (See Fig.5-2.)

Note: Securely connect the hose to the ball valve with a wrench or similar tool so that any gas cannot leak. If you connect it improperly, gas may leak.

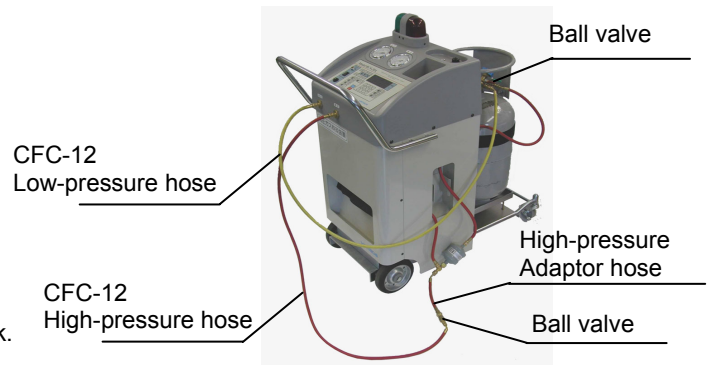


- 4) Connect the low-pressure side hose to the liquid side of the tank open/close valve in the following order: ball valve, CFC-12 low-pressure hose, and low-pressure side recovery inlet. (See Fig.5-4.)

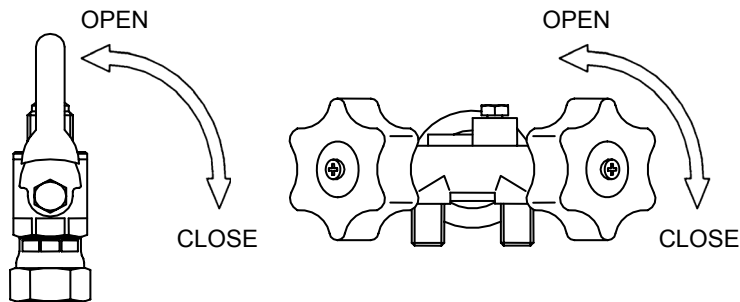
- 5) Pull out the filter dryer section from the main unit, and remove the cap for the vacuuming port. (See Fig.5-3.)



- 6) Connect the high-pressure hoses in the following order: vacuuming port, high-pressure adaptor hose, ball valve and CFC-12 high-pressure hose. (See Fig.5-4.)

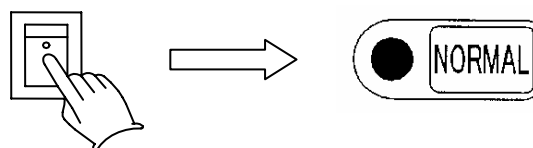


- 7) Open the ball valve and the open/close valve of the tank.

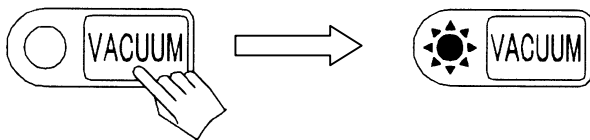


- 8) Insert the power cable of the main unit into the AC outlet.

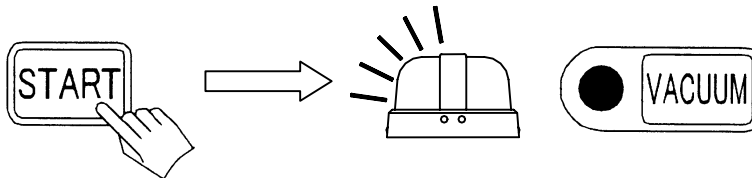
- 9) Turn on the power switch of the operation panel of the main unit. The buzzer sounds once, and all lamps excluding the green signal lamp light. Then, only the power lamp and the [Normal] LED light, the fan inside the main unit starts up, and the machine enters the waiting state.



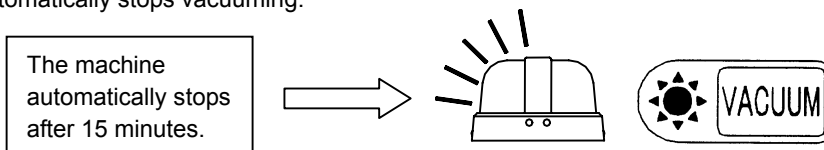
10) Press the [Vacuum] key. The [Vacuum] LED flashes.



11) Press the [Start] key. The green signal lamp and the [Vacuum] LED light, and the machine starts vacuuming the tank and the main unit.



- After 15 minutes, the buzzer sounds, the green signal lamp and the [Vacuum] LED flash, and the machine automatically stops vacuuming.



- To stop vacuuming in the middle of operation, press the [Stop] key.



12) When the machine finishes vacuuming the tank and the main unit, press the [Stop] key. The machine enters the waiting state.



13) Use the high-pressure side and low-pressure side pressure gauges to check to see if the pressure is negative (0 MPa to -0.1 MPa).

* If the negative pressure is not held, vacuum the tank and the main unit again.

14) Use the high-pressure side and low-pressure pressure side gauges to check to see if the pressure becomes negative again, and close the ball valve and the open/close valve of the tank.




15) Disconnect the high-pressure adaptor hose from the vacuuming port. Remove the ball valve from the liquid side of the tank open/close valve.

Note: Do not disconnect any other hoses and ball valves. If you happen to disconnect any hose or valve, vacuum the tank and the main unit again.







16) Put the cap over the vacuuming port, and push the filter dryer section into the main unit.

6. How to Use

WARNING

-  – Do not operate the machine with a tank any other the designated one.
* It may cause a serious injury or fatal accident due to damage or explosion of this machine or tank.
-  – Do not use or store the machine in a place that is filled with flammable gas or near gasoline or paint thinner.
* If you use the machine in such a place, the flammable gas or other solution catches fire, and it may cause a serious injury or fatal accident due to a fire or explosion.
-  – Do not use or store the machine in a tightly closed room or in a poor-ventilated place.
* If gas leaks, it makes oxygen insufficient and may cause a serious injury or fatal accident.

CAUTION

-  – If you want to start the engine of a vehicle while you operate the machine, take care not to be caught in the rotating parts (such as a pulley and belt) inside the engine. It may cause an injury.
-  – Do not use or store the machine in a place whose floor is inclined or dented.
* This machine uses the load cell to detect the amount and mass of the contents that fills up the tank used for recovering refrigeration media. When you use the machine with inclined, the machine cannot detect the amount and mass of the contents, and it may damage or explode the machine or tank.
-  – Do not block any ventilating holes.
* If you happen to block any ventilating hole, the inside of the machine heats up and it may cause a fire or cause the machine to malfunction. It degrades the machine performance also.
-  – To connect or disconnect a hose or similar device, be sure to wear safety glasses.
* The remaining chlorofluorocarbon gas blows out, and it may cause an injury.
-  – If you keep operating the machine for a long time, the machine may stop operating abruptly because load imposed on the pump inside the main unit activates the protection circuit. This is not any failure; so leave the machine until the temperature of the pump is lowered. When the temperature is lowered enough, the machine automatically starts operating again.
-  – As you operate the machine, oil collects in the oil drain. Remove the oil cup and discard the collected oil.

6.1 Moving or Installing the Main Unit

- 1) Check to see if the power cable is disconnected from the AC outlet.
- 2) Check to see if the caster brake is released.
- 3) When the tank is placed on the tank support, fix it with the band securely.
- 4) Grasp the handle and move the main unit while pushing it toward the front direction. (See Fig.6-1.)



Fig.6-1

- 5) Move the machine to the place appropriate for your purpose, and lock the brake to fix the machine. (See Fig.6-2.)

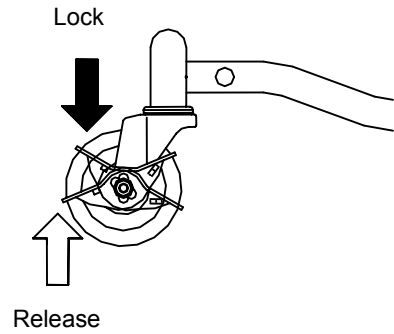


Fig.6-2

⚠ CAUTION



- Be sure to use or store the machine on the flat floor and lock the caster brake.
- * The machine may start moving depending on the installation place, and it may cause unexpected property damage.

6.2 Connections and Preparations

[When you use CFC-12]

- 1) Follow the Section "Vacuuming the Tank and the Main Unit."
- 2) After vacuuming the tank and the main unit, connect the low-pressure adaptor hose to the ball valve disconnected from the liquid side of the tank open/close valve. (See Fig.6-3.)
- 3) Connect the low-pressure adaptor hose and the high-pressure one to the low-pressure side and the high-pressure side of a vehicle respectively.

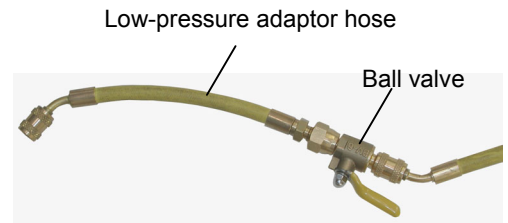
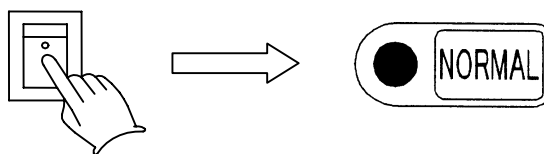


Fig.6-3

- 4) Connect the power cable of the main unit to the AC outlet.

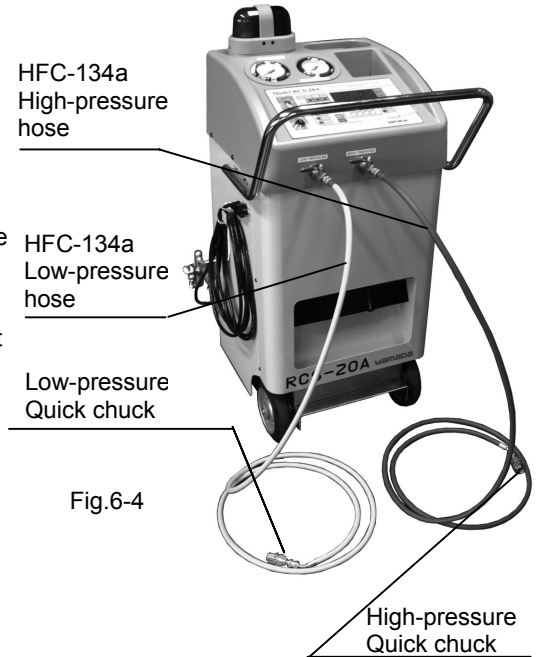
- 5) Turn on the power of the operation panel of the main unit. The buzzer sounds once, and all lamps other than the green signal lamp light. Then, only the power lamp and [Normal] LED light, and the fan inside the main unit start up. The machine enters the waiting state.



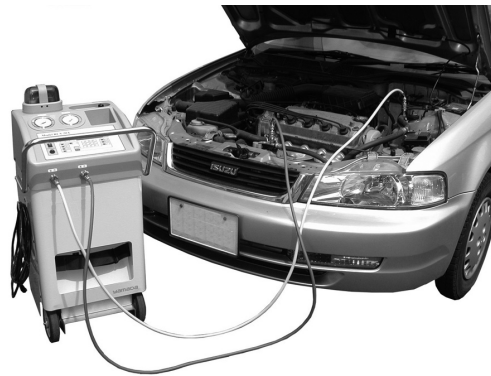
[When you use HFC-134a]

- 1) Follow the Section "Vacuuming the Tank and the Main Unit."
- 2) After vacuuming the tank and the main unit, disconnect the hoses and ball valves from the low-pressure side recovery inlet and the high-pressure side one respectively.
- 3) Connect the following parts to the low-pressure side recovery inlet in this order: ball valve, HFC-134a low-pressure hose and low-pressure quick chuck. (See Fig. 6-4.)

Note: When you connect the hose to the ball valve, securely connect them with a wrench or similar tool so that there cannot be any leakage-spots at the connection. If you connect them improperly, gas may leak.
- 4) Connect the following parts to the high-pressure side recovery inlet in this order: ball valve, HFC-134a high-pressure hose and high-pressure quick chuck. (See Fig. 6-4.)
- 5) Connect the low-pressure quick chuck and the high-pressure one to the low-pressure side and the high-pressure side of a vehicle respectively. (See Fig. 6-5.)
- 6) Follow Steps 4 and 5 of "When you use CFC-12."

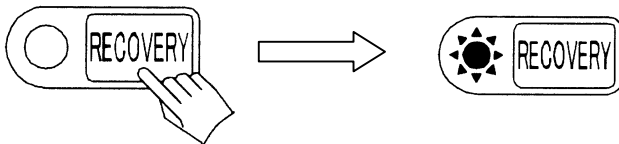


(Installation example)

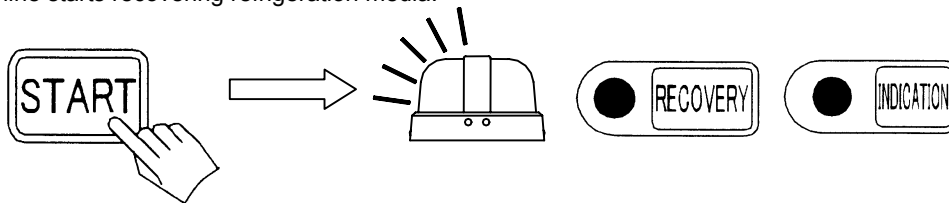


6.3 Recovering Refrigeration Media

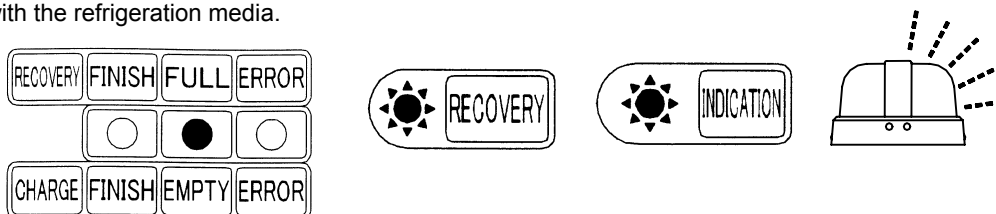
- 1) Press the [Recovery] key. The [Recovery] LED flashes.



- 2) Press the [Start] key. The green signal lamp, the [Recovery] LED and the [Indication] LED light, and the machine starts recovering refrigeration media.

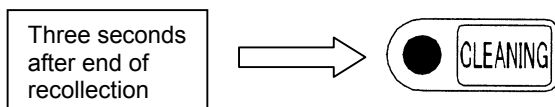


- When each needle on the high-pressure side pressure gauge and the low-pressure side pressure gauge indicates the smaller value gradually, it indicates that the machine normally recovers refrigeration media from the air conditioning system of the vehicle.
- When the [Full] LED lights, and the [Recovery] LED, the [Indication] LED and the red signal lamp flash at the same time the buzzer sounds while the machine recovers refrigeration media, it indicates that the tank is filled up with the refrigeration media.



3) When all refrigeration media are recovered from the air conditioning system of the vehicle, the pressure becomes 0 MPa. The machine automatically enters Self-Cleaning mode three seconds later.

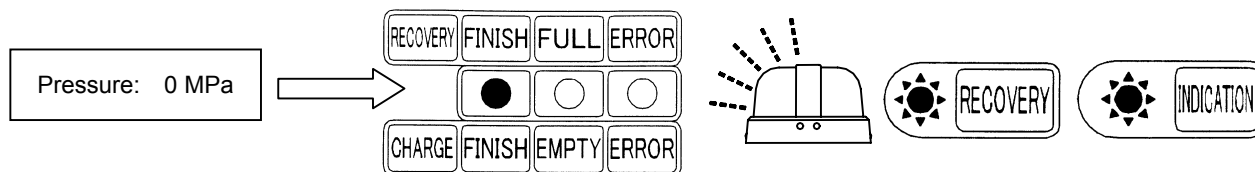
- The [Cleaning] LED lights, and the machine starts self-cleaning.



- When each needle on the high-pressure side pressure gauge and the low-pressure side pressure gauge indicates the larger value gradually, it indicates that the machine normally recovers the refrigeration media from the main unit.

NOTE: "Self-Cleaning" is the function that pushes the refrigeration media remained in the main unit into the tank.

4) When all refrigeration media are recovered from the main unit, the pressure becomes 0 MPa. The [Finish] LED lights, and the green signal lamp, the [Recovery] LED and the [Indication] LED flash at the same time the buzzer sounds that indicates end of recovery of the refrigeration media.



5) When the machine finishes recovering the refrigeration media, press the [Stop] key. The machine enters the waiting state.



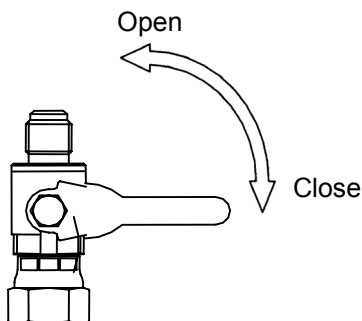
- If you leave the machine without operating it for a while, the pressure may increase. Recover the refrigeration media if the pressure is 0.1 MPa or higher in such a case. If the pressure is 0.03 MPa or lower, the machine cannot recover any refrigeration media.

6) Close the open/close valve of the tank and the ball valve.

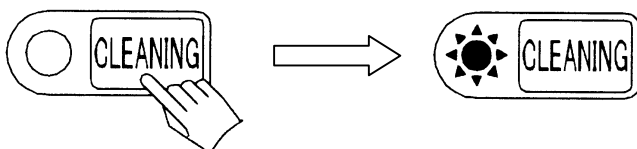
6.4 If You Perform the Self-Cleaning Function

Self-Cleaning is the function that pushes the refrigeration media remained in the main unit into the tank. Be sure to perform this function before vacuuming a vehicle or changing the type of refrigeration media to be recovered.

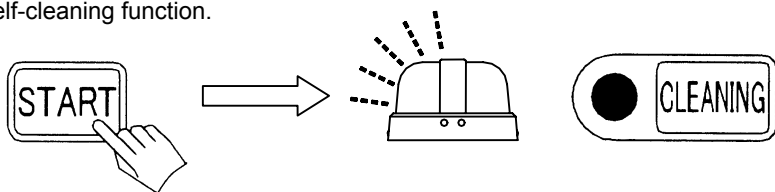
1) Close the ball valve on the recovery inlet side.



2) Press the [Cleaning] key. The [Cleaning] LED flashes.

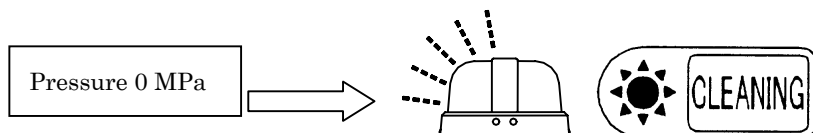


- 3) Press the [Start] key. The green signal lamp and the [Cleaning] LED light and the machine starts the self-cleaning function.

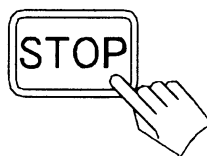


- When each needle on the high-pressure side pressure gauge and the low-pressure side pressure gauge indicates the smaller value gradually, it indicates that the machine normally recovers the refrigeration media from the main unit.

- 4) When the refrigeration media is recovered from the main unit, the pressure becomes 0 MPa. The buzzer sounds that indicates end of recovery, the green signal lamp and the [Cleaning] LED flash, the machine finishes recovering the refrigeration media.



- 5) When the machine finishes the self-cleaning function, press the [Stop] key. The machine enters the waiting state.



- 6) Close the open/close valve of the tank and the ball valve.

6.5 When the tank is filled with refrigeration media

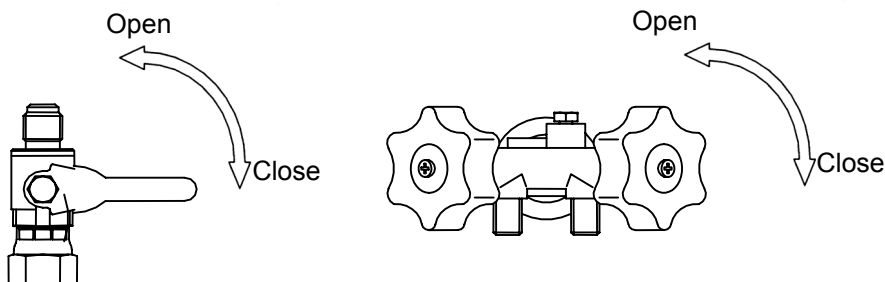
When the buzzer sounds during recovery of refrigeration media, the [Full] LED lights, and the [Recovery] LED, the [Indication] LED and the red signal lamp flash, it indicates that the tank is full of refrigeration media. Follow the procedure below to replace the tank with a new one.



- 1) Press the [Stop] key. The machine enters the waiting state.



- 2) Close the ball valve and the open/close valve of the tank.



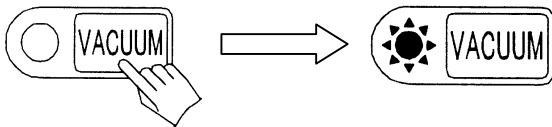
- 3) Remove the ball valve from the tank.
- 4) Lower the tank that is full of refrigeration media from the tank support.
- 5) Place another tank onto the tank support, and attach the ball valve to this tank.

Note: You have to use the tank that is already vacuumed or that can be still filled with refrigeration media (that is, already contains refrigeration media).

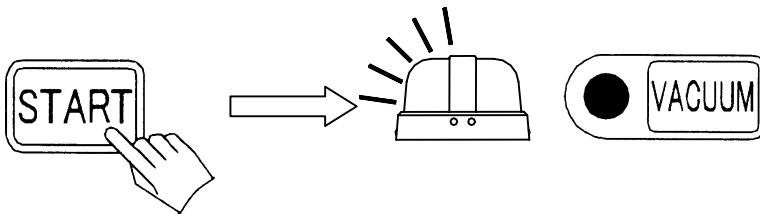
- 6) If you use a tank that already contains the refrigeration media, check to see if the contained refrigeration media is the same type.
- 7) Open the ball valve and the open/close valve of the tank.
- 8) Recover the refrigeration media again.

6.6 Vacuuming a Vehicle

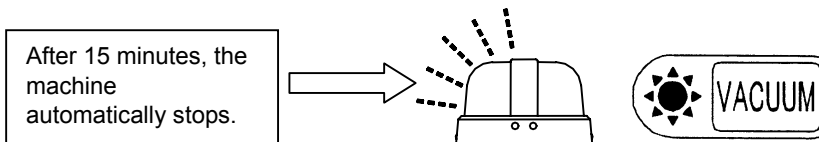
- 1) Press the [Vacuum] key. The [Vacuum] LED flashes.



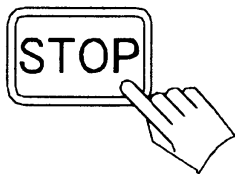
- 2) Press the [Start] key. The green signal lamp and the [Vacuum] LED light, and the machine starts vacuuming the vehicle.



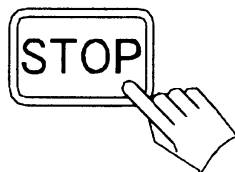
- After 15 minutes, the buzzer sounds, the green signal lamp and the [Vacuum] LED flash, and then the machine automatically stops vacuuming the vehicle.



- To cancel vacuuming the vehicle before the machine finishes it, press the [Stop] key.



- 3) When the machine finishes vacuuming the vehicle, press the [Stop] key. The machine enters the waiting state.



- 4) Use the high-pressure side and low-pressure pressure side gauges to check to see if the pressure is negative (0 MPa to - 0.1 MPa).
 - If the negative pressure is not held, vacuum the vehicle again.
- 5) Use the high-pressure side and low-pressure side pressure gauges to check to see if the pressure is negative again, and close the ball valve and the tank open/close valve.

6.7 Filling Up Refrigeration Media

Note: Immediately after you perform the self-cleaning function or vacuum the main unit, approximately 100 g refrigeration media remain inside the main unit even though you try to fill a vehicle up with refrigeration media. Therefore, the amount of refrigeration media that can fill up the vehicle actually is reduced by approximately 100 g. Set the amount of refrigeration media 100 g more than that you want to fill up the vehicle.

Example: If the amount of refrigeration media you want to fill is 450 g, set 550 g to the machine as the amount of refrigeration media.

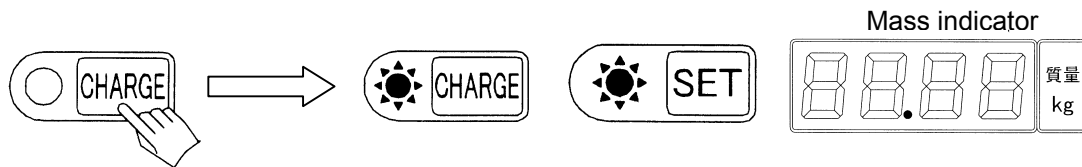
- There are two ways for filling up a vehicle with refrigeration media as shown below. Select either one depending on the use conditions or environment. Use the [Normal] key to switch each mode.

“Normal Fill-Up mode”: Fills up a vehicle with the desired amount of refrigeration media with the setting input keys.

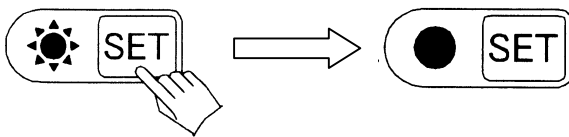
- 1) Check to see if the [Normal] LED lights. When it does not light, press the [Normal] key.



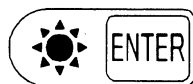
- 2) Press the [Charge] key. The [Charge] LED and the [Set] LED flash, and the Mass indicator goes off.



- 3) Press the [Set] key. The [Set] LED condition changes from flashing to lighting.

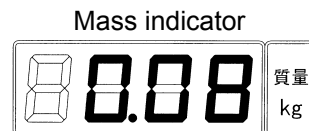
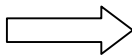


- 4) Enter the mass of the refrigeration media with which you want to fill up a vehicle by using the setting input keys. When you enter the first digit of the mass with the corresponding setting input key, the [Enter] LED flashes at the same time.

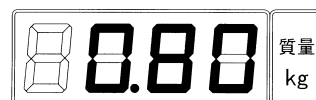
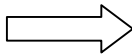


Example: When filling up 800 g refrigeration media

Enter “8” with the corresponding setting input key.	“0.08 kg” appears on the Mass indicator.
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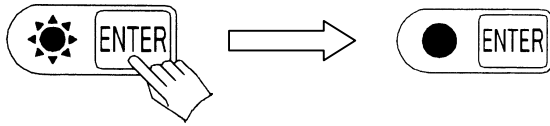


Enter “0” with the corresponding setting input key.	“0.80 kg” appears on the Mass indicator.
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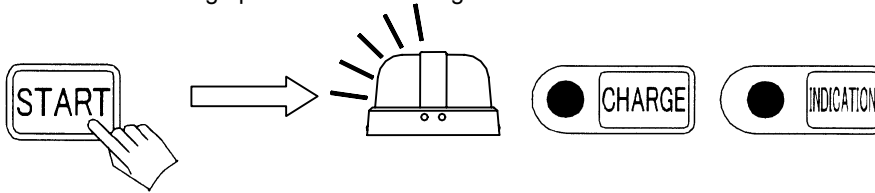
* If you enter a wrong value, press the [C] setting input key and enter the correct value.

5) Press the [Enter] key. The [Enter] LED condition changes from flashing to lighting.



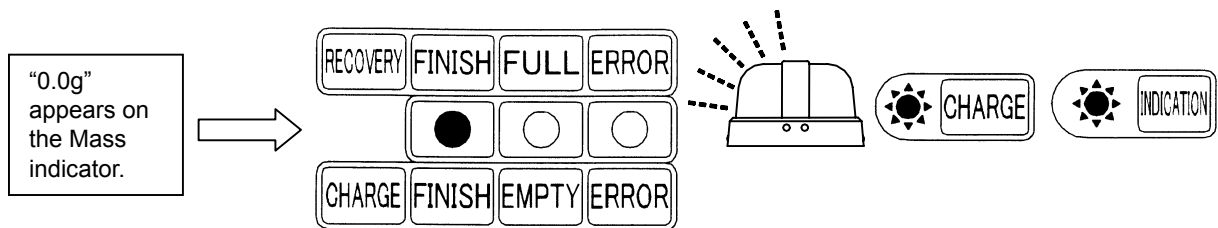
Note: If you set the value larger than the amount of refrigeration media that are contained in the tank, the machine cancels your input. Fill the tank with refrigeration media.

6) Press the [Start] key. The green signal lamp, the [Charge] LED and the [Indication] LED light, and the machine starts filling up a vehicle with refrigeration media.



Note: If the [Error] lamp lights when the machine fills up a vehicle with refrigeration media or if it takes a long time to fill up a vehicle, start the air conditioning system of the vehicle, and fill up the low-pressure side only

7) When the value on the Mass indicator becomes “0.00g,” the buzzer sounds that notices you of end of filling-up operation, the [Finish] LED lights, and the green signal lamp, the [Charge] LED and the [Indication] LED flash. The machine finishes filling up the vehicle with refrigeration media.



8) When the machine finishes filling up the vehicle with refrigeration media, press the [Stop] key. The machine enters the waiting state.



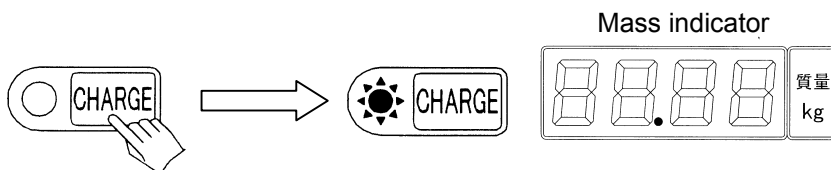
9) Close the open/close valve of the tank and the ball valve.

“SP Filling-Up mode”: Fills up a vehicle with refrigeration media whose amount you can select from the preset values.

1) Check to see if the [Normal] LED does not light. If it lights, press the [Normal] key.



2) Press the [Charge] key. The [Charge] LED flashes, and the Mass indicator goes off.



3) Press the setting input key corresponding to the desired amount.

– The values preset at the factory are shown below.

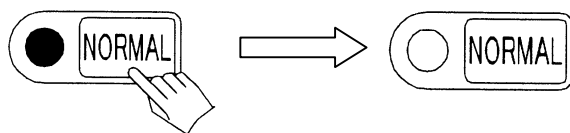
Setting input key No.	Amount of refrigeration media to be filled up (kg)
1	0.40
2	0.50
3	0.60
4	0.70
5	0.80
6	0.90
7	1.00
8	1.10
9	1.20

– If you want to change any of the values above, see the section “Changing the Preset Value in “SP Filling-Up” Mode.”

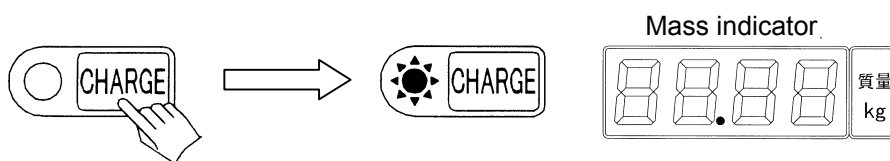
4) Follow Steps from 6 to 9 in “Normal Filling Up mode.”

6.8 Changing the Preset Value in “SP Filling-Up” Mode

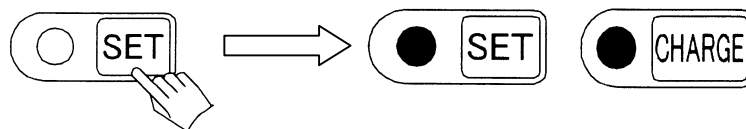
1) Press the [Normal] key to turn off the [Normal] LED.



2) Press the [Charge] key. The [Charge] LED flashes, and the Mass indicator goes off.

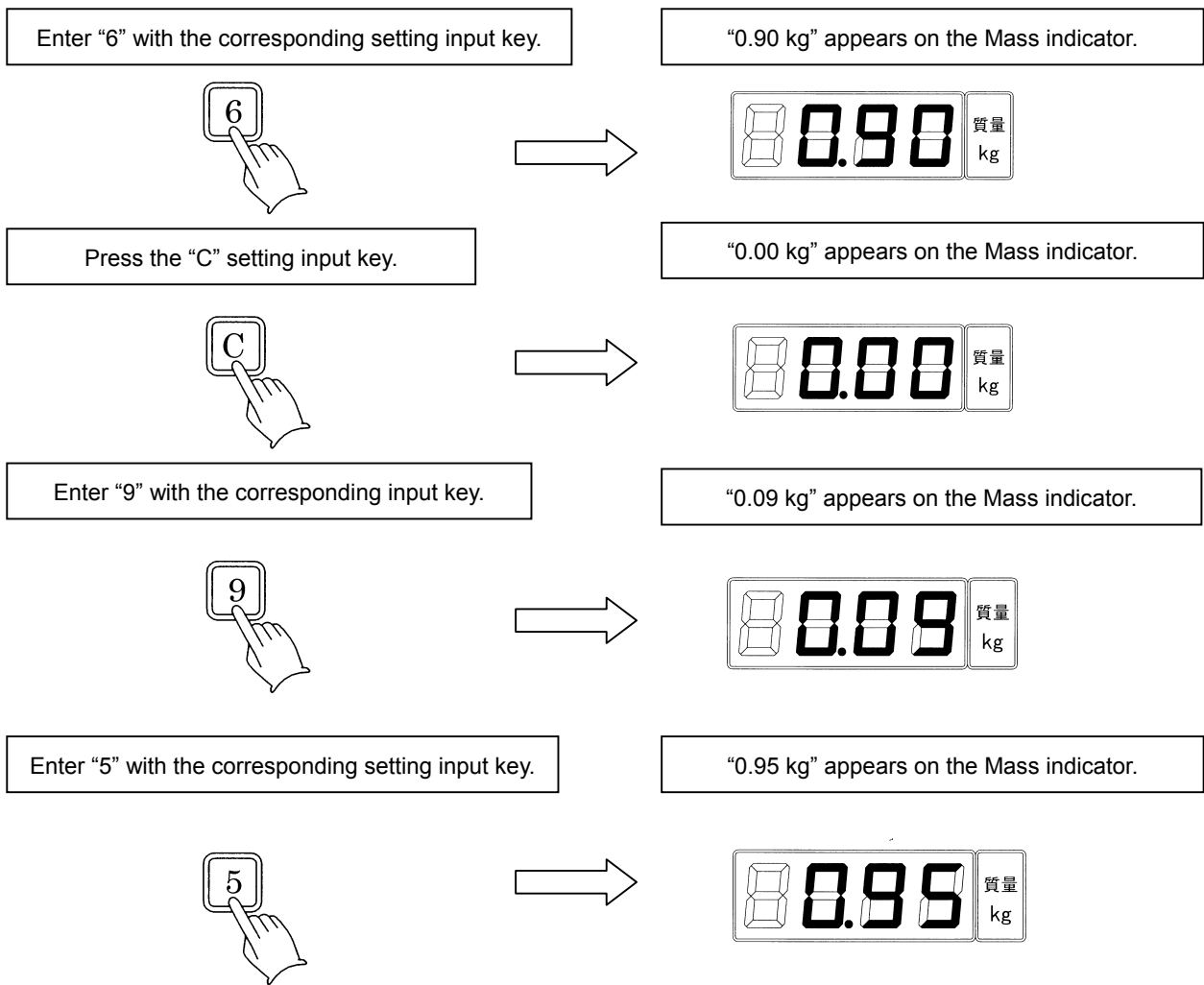


3) Press the [Set] key. The [Set] LED lights, and the [Charge] LED condition changes from flashing to lighting.



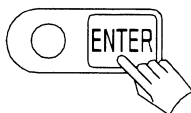
4) Change the value preset to the setting input keys.

Example: When you change the value “0.90 kg” preset to the setting input key [6] to “0.95 kg”



* If you enter a wrong value, press the [C] setting input key and enter the correct value.

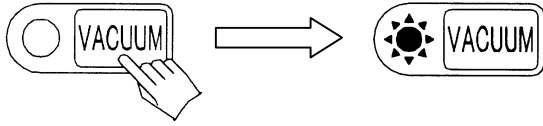
5) Press the [Enter] key. The preset value changes to the value you entered, and the machine enters the waiting state.



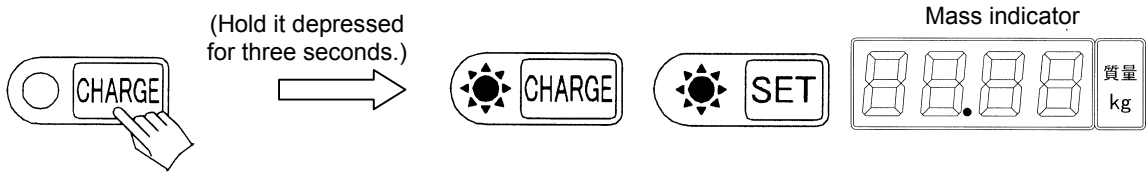
6.9 Continuously Vacuuming and Filling Up Refrigeration Media

- The vacuuming and filling-up continuous operation is the mode that allows the machine to fill a vehicle with refrigeration media automatically after vacuuming it.
- * This operation is available either in Normal Filling-Up mode or SP Filling-Up mode. Before starting the operation, select either mode by the [Normal] key.

1) Press the [Vacuum] key. The [Vacuum] LED flashes.

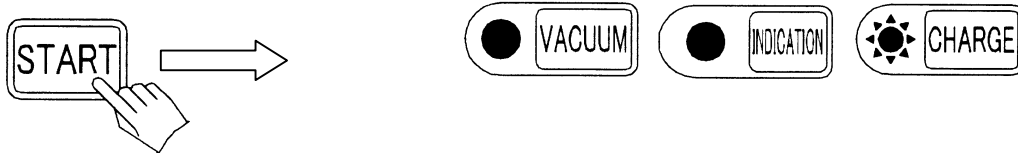


2) Hold the [Charge] key depressed for three seconds. The [Charge] LED and the [Set] LED flash, and the Mass indicator goes off. (In SP Filling-Up mode, the [Indication] LED does not flash.)



3) In Normal Filling-Up mode
Follow Steps from 3 to 5 in Normal Filling-Up mode.
In SP Filling-Up mode
Follow Step 3 in SP Filling-Up mode.

4) Press the [Start] key. The green signal lamp, the [Vacuum] LED and the [Indication] LED light, the [Charge] LED flashes, and the machine starts vacuuming a vehicle. (In SP Filling-Up mode, the [Indication] LED does not light.)



* When the machine finishes vacuuming a vehicle 15 minutes later, it automatically starts filling up the vehicle with the set amount of refrigeration media.

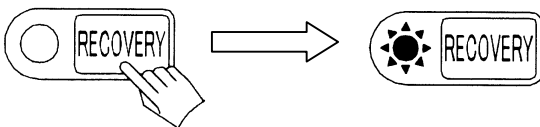
Note: To prevent the machine from malfunctioning, the machine does not start filling up a vehicle with refrigeration media even though you press the [Stop] key while it is vacuuming the vehicle during continuous operation. The machine enters the waiting state.

5) Follow Steps from 6 to 9 in Normal Filling-Up mode.

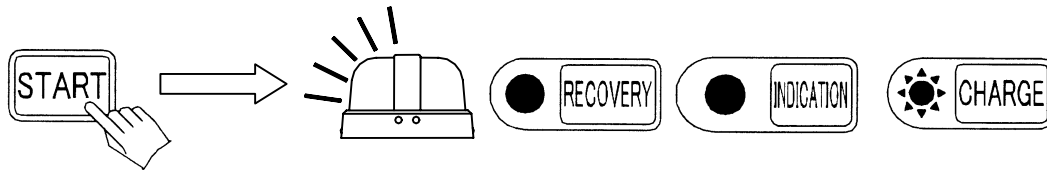
6.10 Continuously Recovering and Filling Up Refrigeration Media

- The recovering and filling-up continuous operation is the mode that allows the machine to fill a vehicle with refrigeration media automatically after recovering the used media.
- * This operation is available either in Normal Filling-Up mode or SP Filling-Up mode. Before starting the operation, select either mode by the [Normal] key.

1) Press the [Recovery] key. The [Recovery] LED flashes.



- 2) Follow Steps from 2 to 3 of the Section “Continuously Vacuuming and Filling Up Refrigeration Media”.
- 3) Press the [Start] key. The green signal lamp, the [Recovery] LED and the [Indication] LED light, the [Charge] LED flashes, and the machine starts recovering refrigeration media. (In SP Filling-Up mode, the [Indication] LED does not light.)



- When the machine finishes recovering refrigeration media, it automatically starts filling up a vehicle with the amount of refrigeration media you set.
- 4) Follow Step 5 of the Section “Continuously Vacuuming and Filling Up Refrigeration Media.”

6.11 Filling Up a Vehicle with Refrigeration Media of a Service Can (Purchase a Service Can Separately.)

Note: When you fill up an air conditioning system of a vehicle with refrigeration media from a service can, be sure to perform the self-cleaning function to push the refrigeration media inside the main unit to the tank. Or another type of refrigeration media may be mixed to that from a service can and/or the machine may release the refrigeration media in the atmosphere.

- 1) Attach each ball valve to the hose inlet of a service can, the low-pressure side recovery inlet and the high-pressure side recovery inlet. Close all ball valves. (See Fig. 6-6.)
- 2) Connect the CFC-12 low-pressure hose to the ball valve attached on the hose inlet of the service can and that on the low-pressure side recovery inlet. (See Fig. 6-6.)

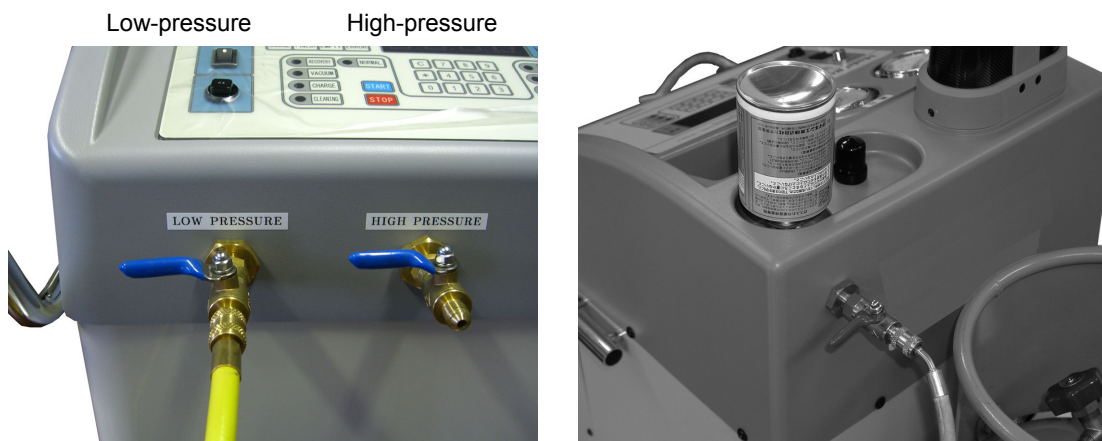


Fig.6-6

- 3) Attach the can holder for refrigeration media to be filled up onto the port of the service can.

NOTE: The screw diameter of the service can inlet of CFC-12 is different from that of HFC-134a. If you do not use the service can, tighten the cap of the can holder.

- 4) Check to see if the ball valve is closed, and fix the service can onto the attached can holder.
- 5) Open only the ball valve attached on the low-pressure side recovery inlet.
 - Note:** Close the ball valve attached on the hose inlet of the service can and the ball valve attached on the high-pressure side recovery inlet. Or the ball valve sucks in air.
- 6) Vacuum the inside of the CFC-12 low-pressure hose. (Follow Steps from 1 to 4 of the section “Vacuuming a Vehicle” for how to vacuum.)
- 7) After vacuuming the inside of the hose, open the ball valve attached on the hose inlet of the service can.
 - Note:** Close the ball valve attached on the high-pressure side recovery inlet. Or the ball valve sucks in air.
- 8) Push the refrigeration media inside the service can into the tank. Follow the section “Recovering Refrigeration Media” to recover the refrigeration media.

7. Maintenance and Inspection

7.1 Maintenance and Inspection

- Before performing the maintenance or inspection operation, be sure to check to see if there is no flaw on the hose.
- Check to see if there is no fleck of dust at any connection of a hose or other device.
- Regularly check the packing and other parts at connections with your eyes. If you find any flaw or deterioration that may cause a leak during operation, replace it with a new one as immediately as possible.
- Do not store the machine on a floor that is inclined or dented.
- Do not store the machine in a place exposed to water such as rain and snow, or highly humid place.
- Do not store the machine in a tightly closed room or a poor-ventilated place.
- Do not store the machine to which any children or infants can get.
- If you do not use the machine for a long time, encapsulate 0.1 MPa to 0.3 MPa refrigeration media gas to prevent the internal parts from rusting.
- When storing the machine, connect the hose and ball valve to the inlet of the container connection port and close the ball valves.

7.2 Replacing the Filter Dryer

Check the sight glass for when to replace the filter. If the color of the center of the sight glass changes to yellow, replace the filter dryer with a new one. (See Fig. 7-1.)

- 1) Pull out the filter dryer located on the side of the main unit toward your side.
- 2) Disconnect the hose and the connector.
- 3) Remove the old filter, and replace it with a new filter.
 - A filter has directions. (See Fig. 7-2.)
- 4) Connect the hose and the connector securely.
- 5) Replace the filter dryer onto the side of the main unit.

container connection port



Fig.7-1



Fig.7-2

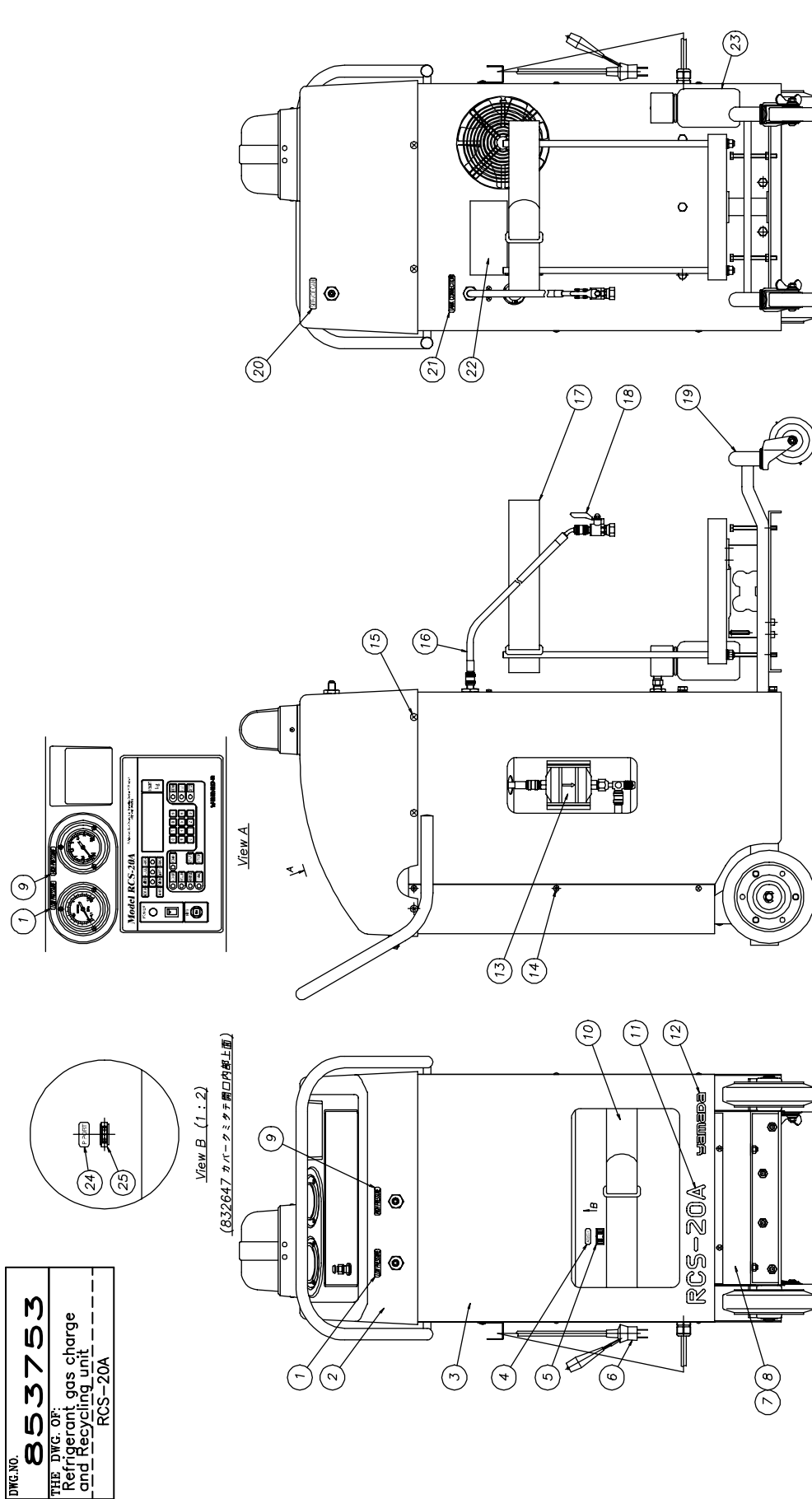
7.3 Troubleshooting

Check the following symptoms and their corresponding corrective actions before contacting us for service. (If your problem is not listed below or if the trouble cannot be recovered even though you take the corresponding corrective action, complete the "Trouble Information Fax Form" as thoroughly as possible by writing down the detailed symptom, and send it to us.)

Symptom	Check	Corrective action
Even though you press the [Start] key, the [Finish] lamp lights and the buzzer sounds immediately, and the machine cannot recover refrigeration media.	<ul style="list-style-type: none"> – Is the pressure at the recovery inlet 0.1 MPa or higher? – Does the ball valve open? – Are the couplers connected to the high-pressure side and the low-pressure side securely? 	<ul style="list-style-type: none"> – Supply 0.1 MPa or higher pressure to the recovery inlet side. – Open the ball valve. – Connect the couplers to both sides securely.
Immediately after you press the [Start] key, the [Error] lamp lights, the buzzer sounds, and the machine cannot recover any refrigeration media.	<ul style="list-style-type: none"> – Does the valve of the tank open? – Does the ball valve open? – Is the recovery tank heated up due to rise of the temperature? – Is air mixed into the recovery tank? 	<ul style="list-style-type: none"> – Open the valve of the tank. – Open the ball valve. – Lower the temperature of the tank by cooling it down with a wet rag or similar one to lower the inner pressure. – Open the valve of the tank to release the air remained in the upper section of the tank.
The [Error] lamp lights and the buzzer sounds, so the machine cannot recover any refrigeration media.	<ul style="list-style-type: none"> – Is the tank full of refrigeration media? – Did you place a substance other than a tank onto the tank support? – Is any substance caught between the main unit and the tank support? 	<ul style="list-style-type: none"> – Measure the mass of the tank by weight. If the weight is 31 kg or heavier, the tank is full of refrigeration media. Replace the tank with a new one. – Lower the substance other than the tank from the tank support. – Remove the substance caught between the main unit and the tank support.
The Power lamp does not light even though you turn on the Power switch.	<ul style="list-style-type: none"> – Is the power plug connected to the AC outlet properly? – Is 220 V AC supplied to the machine? 	<ul style="list-style-type: none"> – Connect the power plug to the AC outlet securely. – Use a multi-meter to measure the voltage of the AC outlet.
The circuit breaker on the operation panel cuts off 220 V AC.	<ul style="list-style-type: none"> – Is the power supply short-circuited? – Do you use the cord reel whose cord length is 10 m or longer? – Does the power voltage become 200 V or lower when the pump operates? 	<ul style="list-style-type: none"> – Check to see if the power plug or extension cord is not short-circuited. – Use the cable reel whose cable length is 10 m or shorter and whose cable diameter is 1.25 mm². – Connect the power plug to the AC outlet that can secure 200 V or higher voltage. <p>* After you find the cause of the trouble and perform the corrective action, push the circuit breaker.</p>
The pump does not operate or stops during recovering or filling up of refrigeration media.	The voltage of the power supply is unstable.	If the power voltage is lowered extremely, the machine cannot be used. Connect it to the AC outlet to which any other device is not connected.

8. Exploded View and Parts List

8.1 Refrigerant Gas Charge and Recycling Unit: 853753

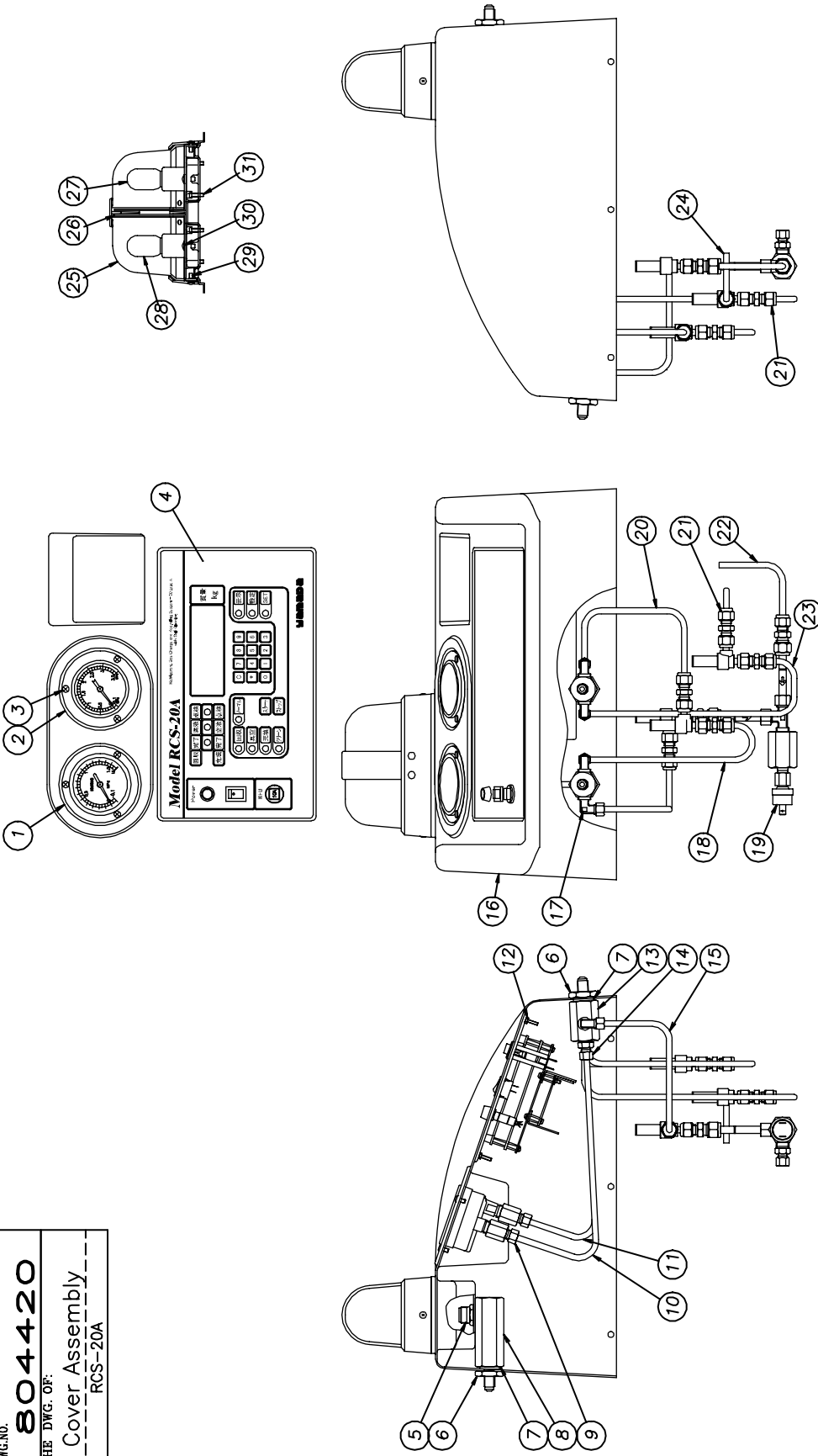


Q'TY	REMARKS	DESCRIPTION	PART NO.	Q'TY
1		Accessories	804344	1
1		Solenoid coil	804423	1
1		Band	681229	10
1		Sticker	683540	6
1		Cable	685437	1
1		Label	791123	1
1		Oil drain kit	804318	1
1		CPU board	791121	1
1		Label	791114	1
1		Label	791122	1
1		Body Assembly	804424	1
1		Stop Valve	685428	1
1		Band	685066	1
1		Hose	695678	1
1		Screw	603019	8
1		Screw	602992	8
1		Filter dryer	804377	1
1		Label	790751	1
1		Label	791101	1
1		Band	685499	1
2		Label	791120	1
4		Screw	683347	1
1		Duct	714765	1
1		Cord Assembly	803952	1
1		Socket	685438	1
1		Label	791124	1
1		Cover Assembly	832647	1
1		Cover Assembly	804420	1
2		Label	791119	1
				1

DWG. NO. **853753**
 THE DWG. OF:
 Refrigerant gas charge
 and Recycling unit
 RCS-20A

8.3 Cover Assembly: 804420

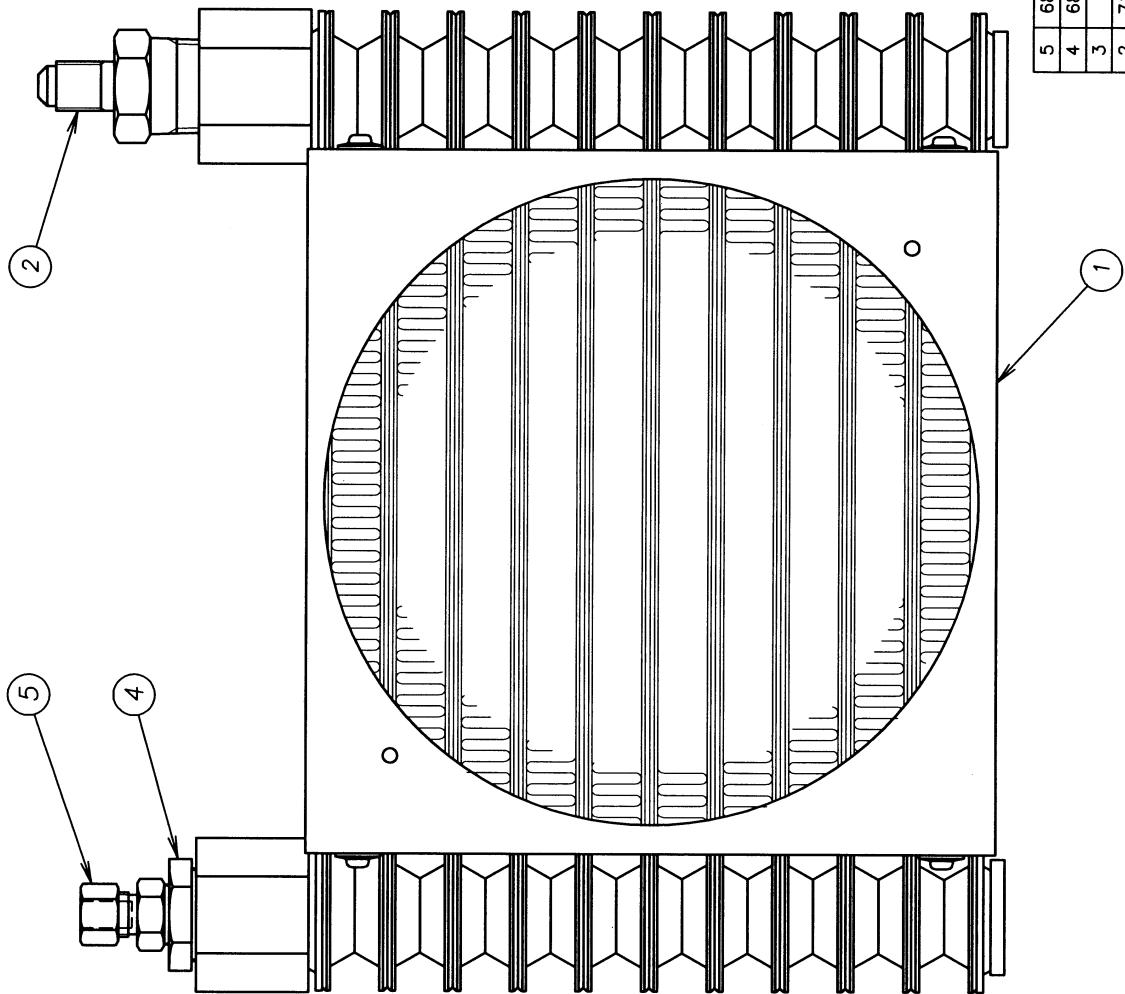
DWG. NO. **804420**
 THE DWG. OF: **Cover Assembly**
 RCS-20A



Q'TY	PART NO.	DESCRIPTION
1	715069	Copper pipe
2	684485	Gauge Union
1	715067	Socket
3	631015	Washer
3	714767	Nut
1	715066	Nipple
1	804421	Electricity equipment
6	685336	Tapping screw
1	684818	Gauge
1	684471	Gauge
1	715070	Copper pipe
1	804371	Solenoid valve assembly
2	715073	Copper pipe
1	804370	Valve assembly
1	715072	Copper pipe
4	682874	L-Union
1	780193	Cover
1	715071	Copper pipe
2	680954	Hafe-Union
1	715068	Socket
1	627005	Nut
1	715070	Copper pipe
31	685491	Tapping screw
30	685490	Tapping screw
29	683872	Screw
28	804234	Lamp-Red
27	804233	Lamp-Green
26	714556	Reflection board
25	804372	Cover assembly
24	715076	Copper pipe
23	715075	Copper pipe
22	715074	Copper pipe

8.4 Radiator Assembly: 804024

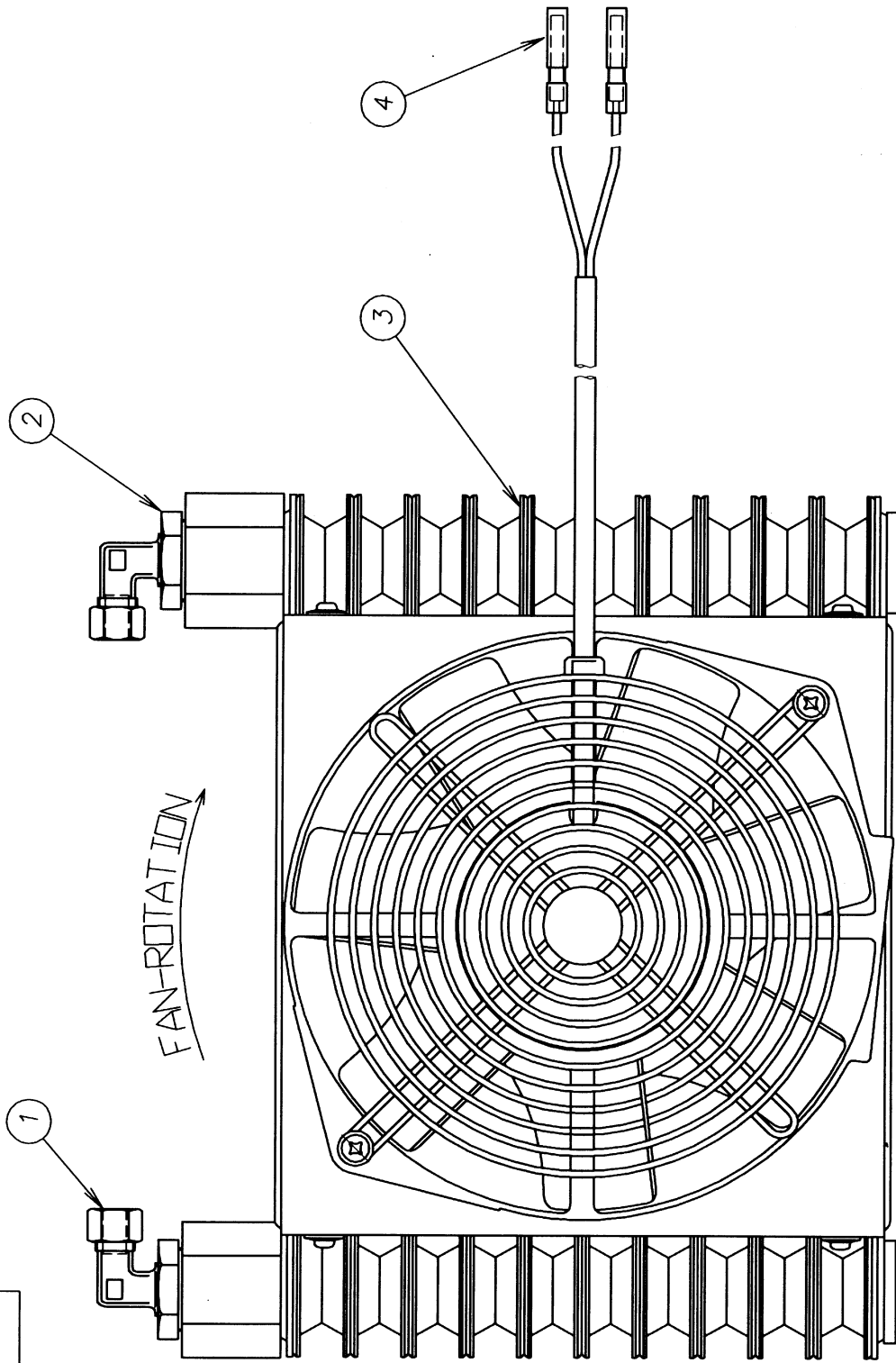
DWG. NO. **804024**
 THE DWG. OF: Radiator Assembly
 RCS-20A



QTY	PART NO.	DESCRIPTION	REMARKS
1	680945	Half-Union	
1	685030	Bushing	
	3		
1	714038	Nipple	
1	684988	Radiator	

8.5 Radiator Assembly: 804426

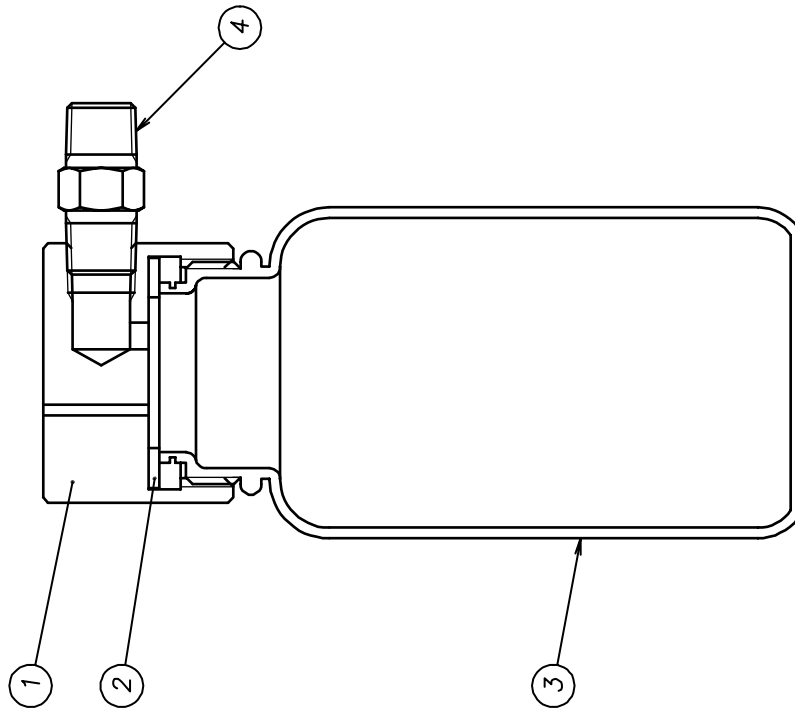
DWG. NO. **804426**
 THE DWG. OF:
Radiator Assembly
 RCS-20A



QTY	PART NO.	DESCRIPTION	REMARKS
2	685351	Pin-Terminal	
1	685507	Radiator	
2	685030	Bushing	
2	682874	L-Union	

8.6 Oil Drain Kit: 804318

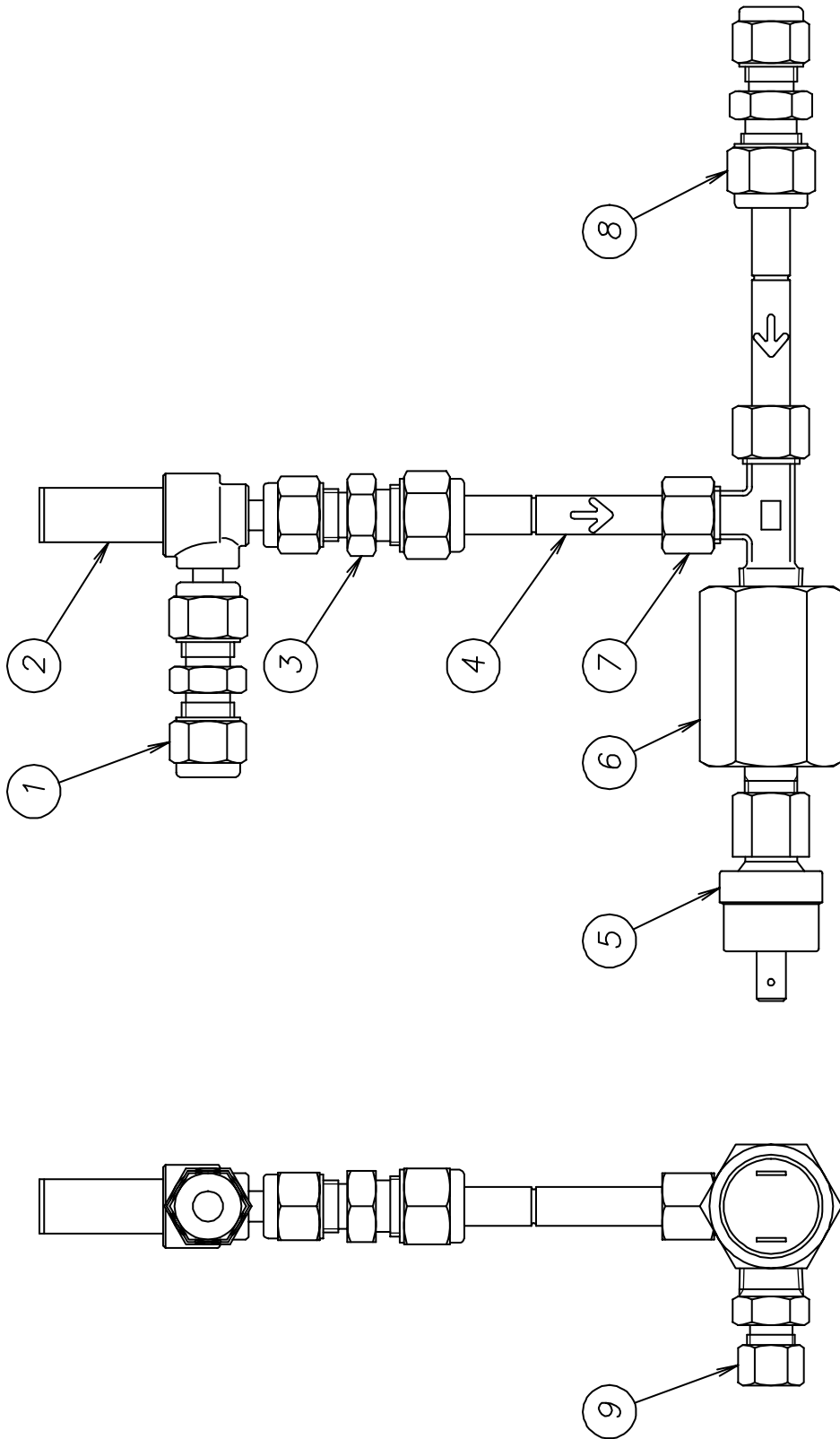
DWG. NO.	804318
THE DWG. OF:	Oil drain kit
	RCS-20A



QTY	PART NO.	DESCRIPTION	REMARKS
1	682284	Nipple	
1	686106	Bottle	
1	772330	Packing	
1	715993	Adapter	

8.8 Valve Assembly: 804370

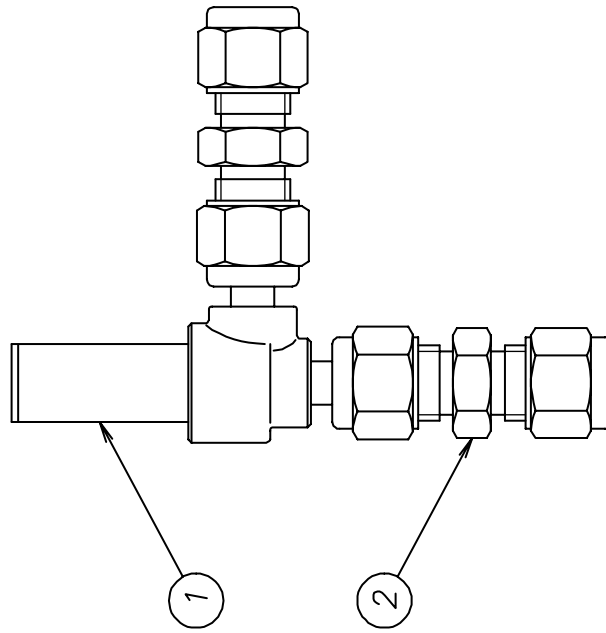
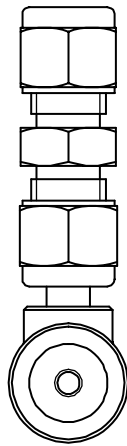
DWG. NO. **804370**
 THE DWG. OF:
 Valve Assembly
 RCS-20A



QTY	DESCRIPTION	PART NO.	QTY
1	Pressure switch	684458	1
1	Socket	715077	1
1	T-Union	684871	1
1	Union	684526	1
1	Union	684811	1
1	Solenoid valve body	685492	1
1	Union	684490	1
1	Check valve	684810	2

8.9 Solenoid Valve Assembly: 804371

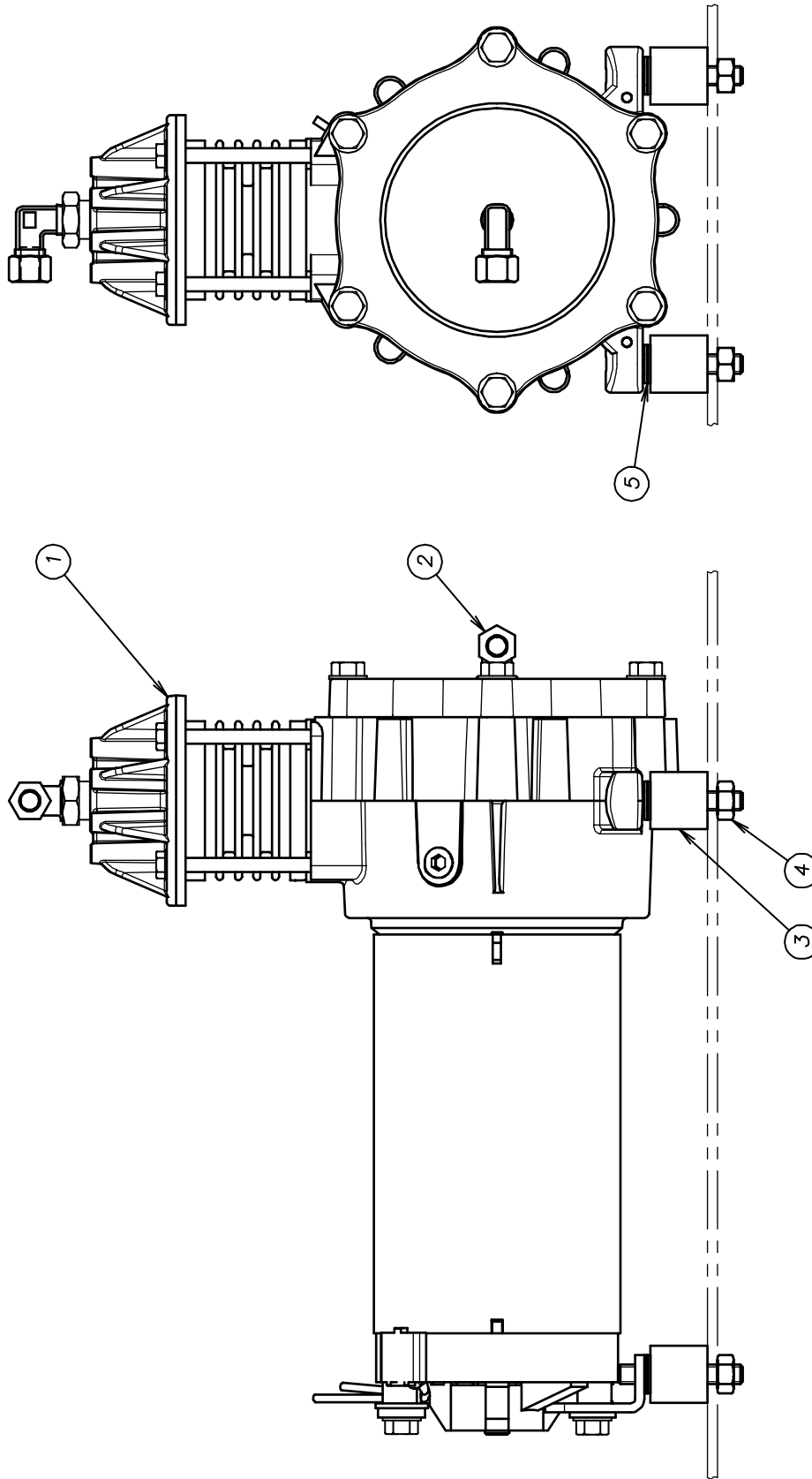
DWG. NO. **804371**
 THE DWG. OF:
 Solenoid valve Ass'y
 RCS-20A



QTY	PART NO.	DESCRIPTION
2	684490	Union
1	685492	Solenoid valve body

8.10 Pump Assembly: 804425

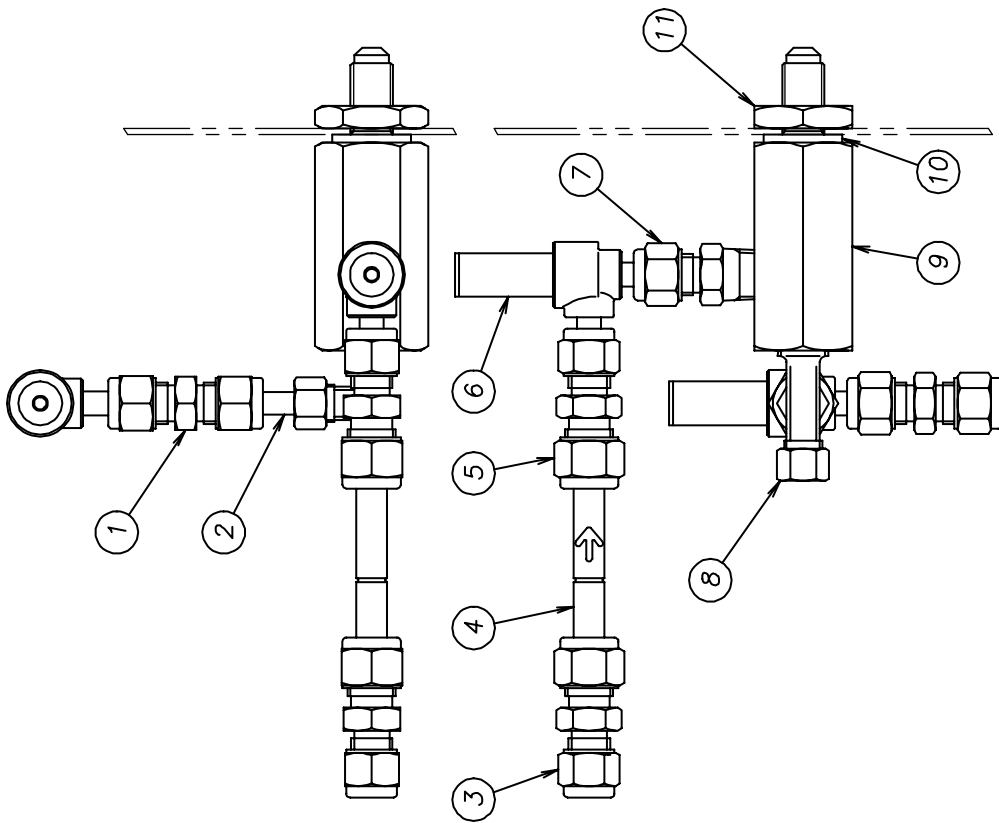
DWG. NO. **804425**
 TITLE DWG. OF:
 Pump Assembly
 RCS-20A



№	PART NO.	DESCRIPTION	Q'TY
5	631012	Washer	6
4	685104	Nut	3
3	685103	Anti-vibration rubber	3
2	685101	L-Union	2
1	685528	Vacuum Pump	1

8.11 Solenoid Valve Assembly: 804374

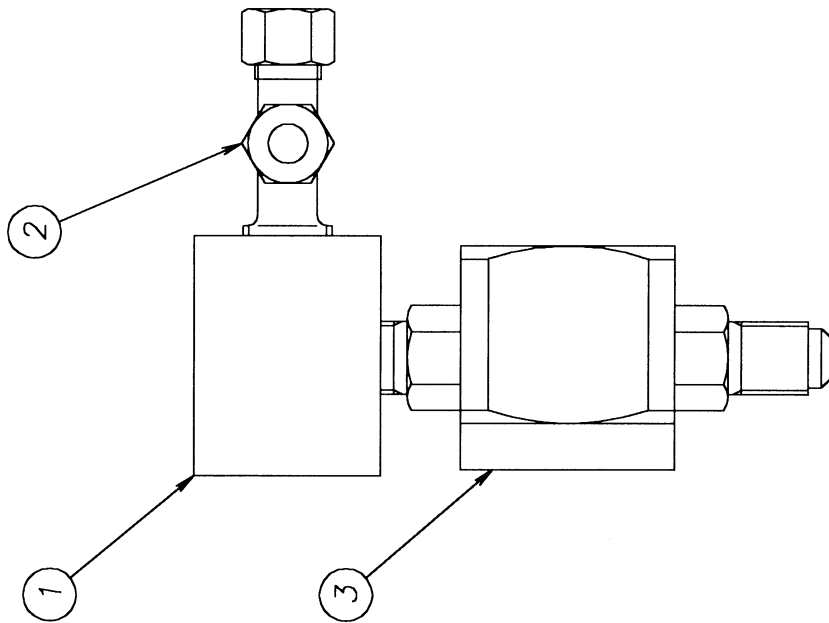
DWG. NO. **804374**
 THE DWG. OF:
 Solenoid valve Ass'y
 RCS-20A



11	714767	Nut	1	5	684811	Union	1
10	631015	Washer	1	4	684810	Check valve	1
9	715098	Socket	1	3	684526	Union	1
8	682900	T-Union	1	2	713595	Copper pipe	1
7	684796	Union	1	1	804371	Solenoid valve Ass'y	1
6	685492	Solenoid valve body	1	1	PART NO.	DESCRIPTION	QTY

8.12 Sight Glass Assembly: 804375

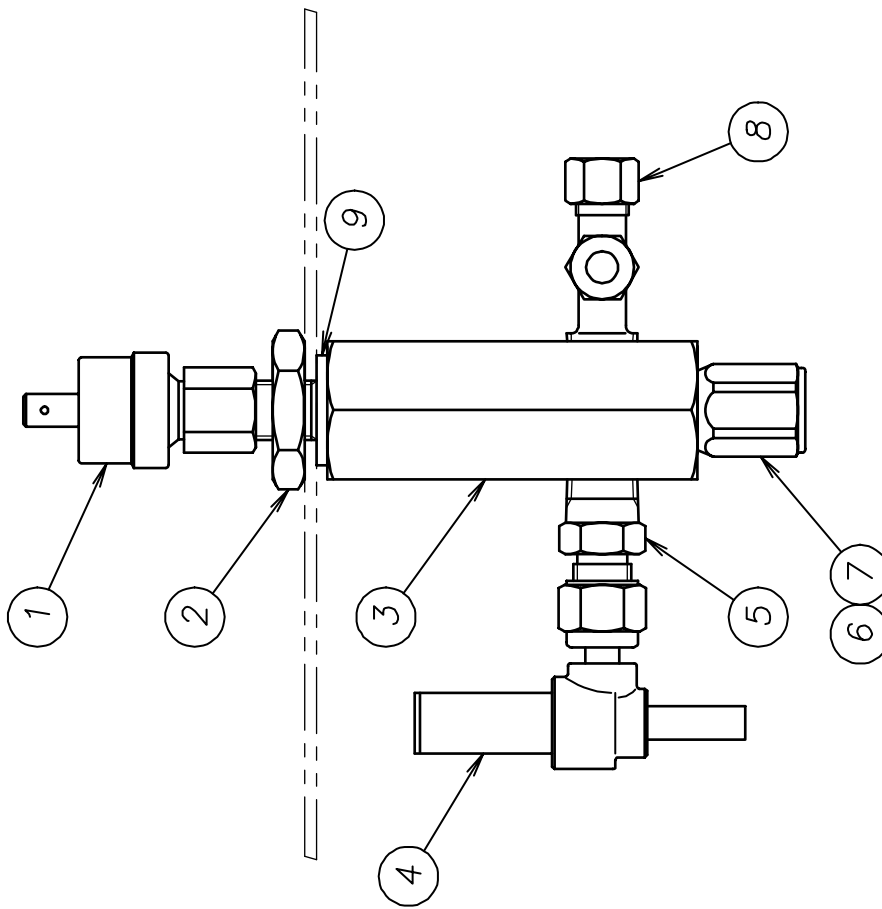
DWG NO.	804375
THE DWG. OF:	Sight glass Assy
	RCS-20A



QTY	PART NO.	DESCRIPTION	REMARKS
1	685271	Sight glass	
1	682900	T-Union	
1	715099	Socket	

8.13 Safety Valve Assembly: 804376

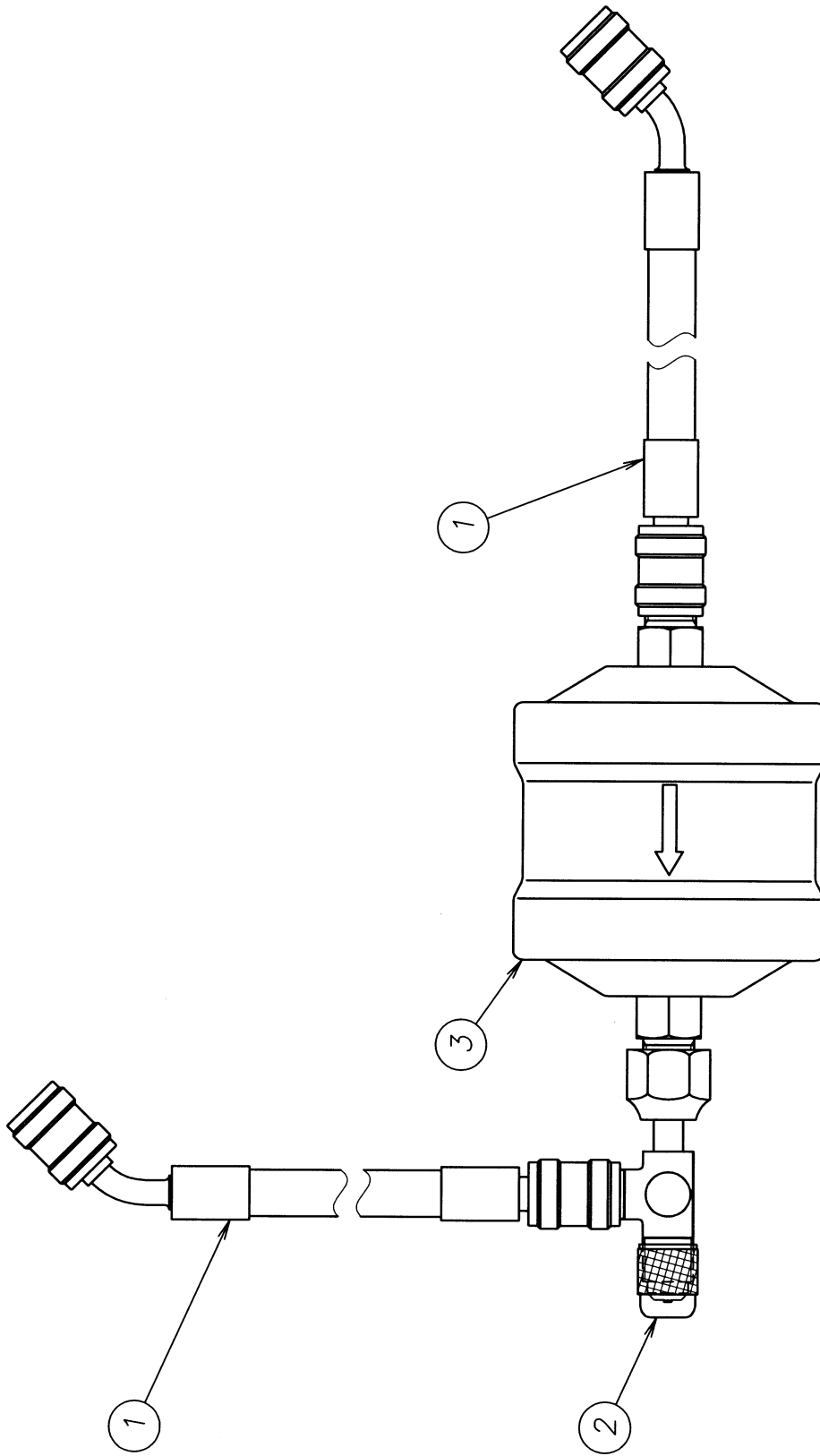
DWG. NO.	804376
THE DWG. OF:	Safety valve Ass'y
	RCS-20A



9	631015	Washer	1	4	685492	Solenoid valve body	1		Q'TY
8	682900	T-Union	1	3	715100	Socket	1		
7	640005	O-Ring	1	2	714767	Nut	1		
6	685335	Safety valve	1	1	685028	Pressure switch	1		
5	684796	Union	1	1					

8.14 Filter Dryer Assembly: 804377

DWG. NO. **804377**
 THE DWG. OF: **Filter dryer Ass'y**
 RCS-20A



QTY	PART NO.	DESCRIPTION	REMARKS
3	685272	Filter dryer	1
2	684951	Flare connector	1
1	695678	Hose	2

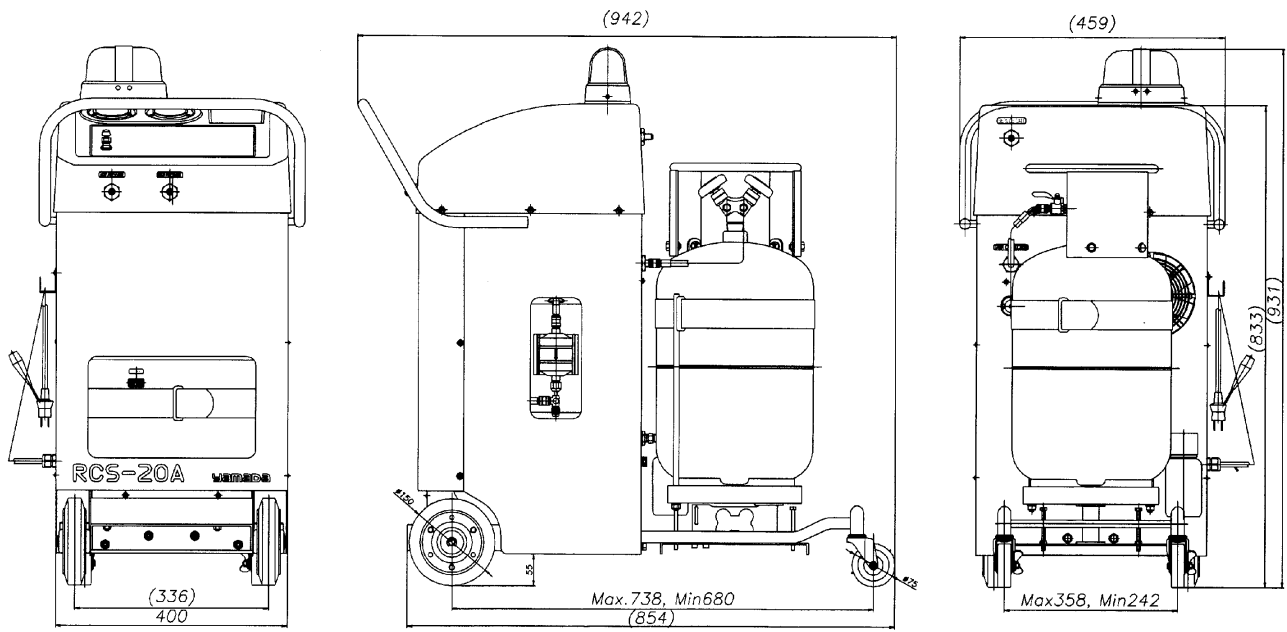
9. Specifications

9.1 Specifications

Name	REFRIGERANT GAS CHARGE AND RECYCLING UNIT			
Model name	RCS-20A			
Product number	853753			
Power supply	AC220V 50/60 Hz			
Power consumption	380/370 W			
Current consumption	3 A			
Recovering method	Compression system, liquefaction			
Recovering capability	Gaseous matter	Approximately 240 g/minutes (25 °C)		
Recovered refrigeration media	CFC series	R12		
	HFC series	R134a		
Regeneration method	Filter absorption system			
Vacuuming capability	14 L/min			
Over filling-up protection mechanism	Mass system			
Use environment	Temperature: 0 to 35 °C			
Dimensions	W460 × D942 × H931 (mm)			
Mass	Approximately 50 kg (Main unit only)			
Accessories	685428 Ball valve.....	Four	695780 Low-pressure hose	One
	685495 Quick chuck	One	695781 High-pressure hose	One
	685496 Quick chuck	One	695693 High-pressure adaptor hose	One
	685497 Can holder	One	695694 Low-pressure adaptor hose	One
	685498 Can holder	One	695695 Special adaptor hose	One
	695778 Low-pressure hose	One	685494 Cap	One
	695779 High-pressure hose.....	Three	695678 Hose (for a tank)	One
Option (*1)	803893 Quick chuck set			
	686149 Two-opening tank			

*1 Contact our Sales department for other accessories such as a hose and adaptor.

9.2 Appearance and Dimensions



10 Trouble Information Fax Form

Complete necessary information in the following fax form since your information is necessary to find the cause of the trouble or failure and it enriches our repair services. After filling it, send it to us.

Trouble Information Fax Form	
Company name _____	Name _____
Address _____ _____	Department name _____
Product name	Model
Duration of use 20__ year__ month to 20__ year__ month	Product number
Storage place <input type="checkbox"/> Indoor <input type="checkbox"/> Outdoor Operation site <input type="checkbox"/> Indoor <input type="checkbox"/> Outdoor Operation frequency _____ hr / <u>Day/week/month</u> Recovered refrigeration media <input type="checkbox"/> HFC134a <input type="checkbox"/> CFC12 <input type="checkbox"/> HFC134a · CFC12	Purchase date _____ Sales outlet _____
Machine conditions (descriptions of the trouble)	

11. Limited warranty

YAMADA'S ONE-YEAR LIMITED WARRANTY.

REFRIGERANT GAS CHARGE AND RECYCLING UNIT are warranted by YAMADA to the original user against defects in workmanship or materials under normal use for one year from date of purchase.

Any part which is determined by Yamada to be defective in material or workmanship and returned to an authorized service location, as Yamada designates, shipping costs pre-paid, will be, as the exclusive remedy, repaired or replaced at Yamada's option. For limited warranty claim procedures, see PROMPT DISPOSITION below.

WARRANTY DISCLAIMER AND LIMITATION OF REMEDIES.

Yamada neither makes nor authorizes anyone else to make any warranties other than those herein.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED, OR STATUTORY, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

THE REMEDIES SET FORTH HEREIN ARE EXCLUSIVE. YAMADA SHALL NOT BE RESPONSIBLE FOR INCIDENTAL CONSEQUENTIAL, OR SPECIAL DAMAGES OR LOST PROFITS.

IN NO EVENT SHALL YAMADA'S LIABILITY EXCEED THE PURCHASE PRICE PAID.

PRODUCT SUITABILITY.

Many states and localities have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. Yamada cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, please review the product application, national and local codes and regulations to be sure that the product, installation, and use will comply with them.

PROMPT DISPOSITION.

For any product believed to be defective, first write or call dealer from whom the product was purchased.

The dealer will give additional directions. If the dealer cannot correct the defect, write to Yamada, citing dealer's name, address, date and number of dealer's invoice, and describe the nature of the defect.

Title and risk of loss pass to buyer on delivery to common carrier. If a product was damaged in transit to you, file claim with the carrier.

12. Warning Symbols



General warnings, cautions and Danger notifications



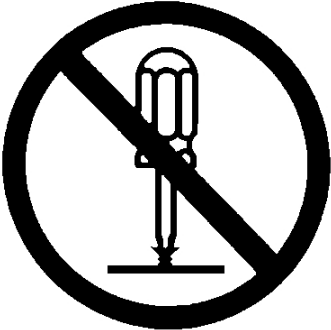
Electric shock



Explosion



Fire strictly prohibited



Dissolution prohibition



Do not wet

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FAX: +81-(0)3-3777-0584