Asada

Recovery and Reclaim machine

ECOcycle Aurora Ⅱ

INSTRUCTION MANUAL

【Please read this manual before operating】

IM1401

ECOcycle Aurora Ⅱ

FOR SAFE OPERATION

Thank you for selecting ECOcycle Aurora Ⅱ .

- Please give this Operation Manual to the persons who operate this machine.
- The contents of this manual must be thoroughly read by the operating persons.
- Obtain the highest performance efficiency of this machine by an appropriate safe operation.
- Keep this manual at a safe place easily accessible by operating person.
- Do not use this machine for purposes other than originally intended.
- Check the following as soon the unit is delivered:
  - Is the specification same as the ordered product?
  - Is there damage or deformation caused during delivery transit?
  - Is there shortage of accessories?

If any dissatisfaction is found, please contact the store you have purchased or our sales department.
(The contents of this manual may be changed without prior notice for changes made for improvement.)

CATEGORIES OF WARNING SIGNS

The warning signs used in this manual or on the product are divided in the following two categories.

⚠ WARNING Situation that may cause death or serious injury if the operating Personnel contact or stand near the machine or the third party person Erroneously operates the machine.

⚠ CAUTION Situation that may cause minor to medium injury or may cause damage to the machine, if the operating personnel contact or stand near the machine or The third party person erroneously operates the machine.


Deadly Poison


Caution for Gas


Explosion


Fire


No Fire


Electric Shock


Burn


Rotating


Wear Protective Gear


Do Not Disassemble


Grounding


Power Source Voltage


Handling of Wire


Working Condition


Others


User's Manual

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WARNING FOR SAFETY

- General warnings in operating this machine are mentioned in this section.
- While specific details are mentioned in each particular clause.

⚠ WARNING

◆ **When performing recovery, choose location that has good ventilation.**
Leakage of gas without sufficient ventilation may cause lack of oxygen cause suffocation.

◆ **Can not recover flammable gas (Hydrocarbon or this kind of hydrocarbon material) When mix except refrigerants [Ammonia, hydrocarbon(propane, isobutene,) etc] to the machine, it may cause explosion.**

◆ **Burning Freon creates a deadly poisonous Carbon Oxy-Chloride and inhaling of this gas is very dangerous.**
There should be absolutely no flammable material near the working area and must operate under good ventilation.

◆ **Absolutely no fire material and smoking during the work in process.**
Cigarette light may creates Carbon Oxy-Chloride and ignite fire.

◆ **Use protective eye glass and hand glove when disconnecting hoses.**
If Freon gas was touch your skin or gets in your eyes, it may cause frostbite or damage your eye-sight.

◆ **Do not close the valves of the machine and the hoses when they are full of liquid refrigerant.**

◆ **Do not operate or storage the machine at the place where temperature gets above 35℃ .**
It may cause explosion for expand liquid gas on the higher temperature site. When the recovery operation will finish, do operation purge certainly.

◆ **Use our original recovery cylinders.**

◆ **Do not operate the machine with wet hands or in the rain.**
If you handle electric plug and power switch with wet hands or in the rain you may have electric shock.

◆ **Make sure to have the machine earthed (grounded).**
If the machine is not properly grounded, it may cause electric shock when the machine has electric leak.

⚠ WARNING

◆ **Check electric power plug regularly to make sure there is no problem. Always have the plug inserted firmly.**
When the plug has dirt or oil, and the connection is incomplete, it may cause electric shock or fire.

◆ **Do not have the electric cord connected with other electric devices or branched with other cords.**
It may cause fire.

◆ **Do not pull the electric power source cord and remove from the outlet.**
It may cause fire or injury.

◆ **The power source should be AC220-240V 10A or use a generator whose capacity is 3KVA or more.**
If the capacity of the generator is not large enough, it may lead to heating, smoking or fire.
See the machine plate or this manual for the detailed specifications.

◆ **Do not setup the machine at location where gasoline, thinner, or flammable Gas exists.**
The recovery machine sparks at the start-up time and may ignite gasoline and thinner.
If leaked gasoline or flammable gas accumulates at near the machine, it may cause explosion and fire.

◆ **Always turn off the switch and pull out the power source cord when performing inspection and maintenance.**
The machine may suddenly starts and cause accident.

◆ **Do not disassemble by un-authorized repair person.**
◆ **Do not operate the machine with the cover removed.**
It may cause abnormal movement and may cause injury or damage.

⚠ CAUTION

◆ **Install a filter at the suction port.**
Otherwise the compressor may be damaged.

◆ **An extension cord used should be a three-core cabtyre cable with a length of 20m or less when its wire diameter is 2.0mm^2 or with a length of 30m or less when its wire diameter is 3.5mm^2.**
An unsuitable extension cord (too thin or too long) may lead to starting failure or fire.
Or electrical components such as capacitor, relay and so on may be damaged.
If the cord used is a two-core cord without a ground wire, you may get electric shock.

◆ **Do not recover refrigerant which contains sealant.**
Sealant may clog the valves or the check valves.

◆ **Do not let visitors touch the machine.**

◆ **Do not use the machine when the result is unpredictable.**

◆ **Do not use the machine for purposes other than the original intent.**
This machine is designed to recover the specified refrigerants.

◆ **Do not operate under an excessive heavy load to the machine.**
Operating under an excessive load can not only cause damage to the machine but also causes an accident.

◆ **Do not use the machine on a vibrating floor or on a sloping place.**
The machine or the cylinder may fall down and lead to accident.

◆ **The operating platform and the work area must be kept neat and clean. at all time and have enough lighting.**
Poor working environment causes accident.

◆ **Do not operate the machine if the operator is under fatigue condition or influenced by alcoholic drink or medicines.**

◆ **When the Recovery Machine is not in use, storage at dry space and out of reach by children.**

◆ **Do not use accessories other than referred in this manual or shown on our catalogue. Use of other accessories may cause problem.**

⚠ CAUTION

◆ **When the Recovery Machine is dropped or hit, inspect immediately for damage, crack, dent, etc.**
Recovery under damaged, cracked and dented condition may cause injury.

◆ **Check every day if there is deformed or corroded area.**

◆ **If abnormal condition (strange smell, vibration, strange noise) is noticed, stop the unit and refer to the Page22 “BEFORE REQUESTING REPAIR OR SERVICES” in the manual.**

◆ **Request for repair or service instead of disassembling for repair, contact the store where the machine was purchased.**

◆ **Use our cylinders that are expressly made for recovery and recycling.**

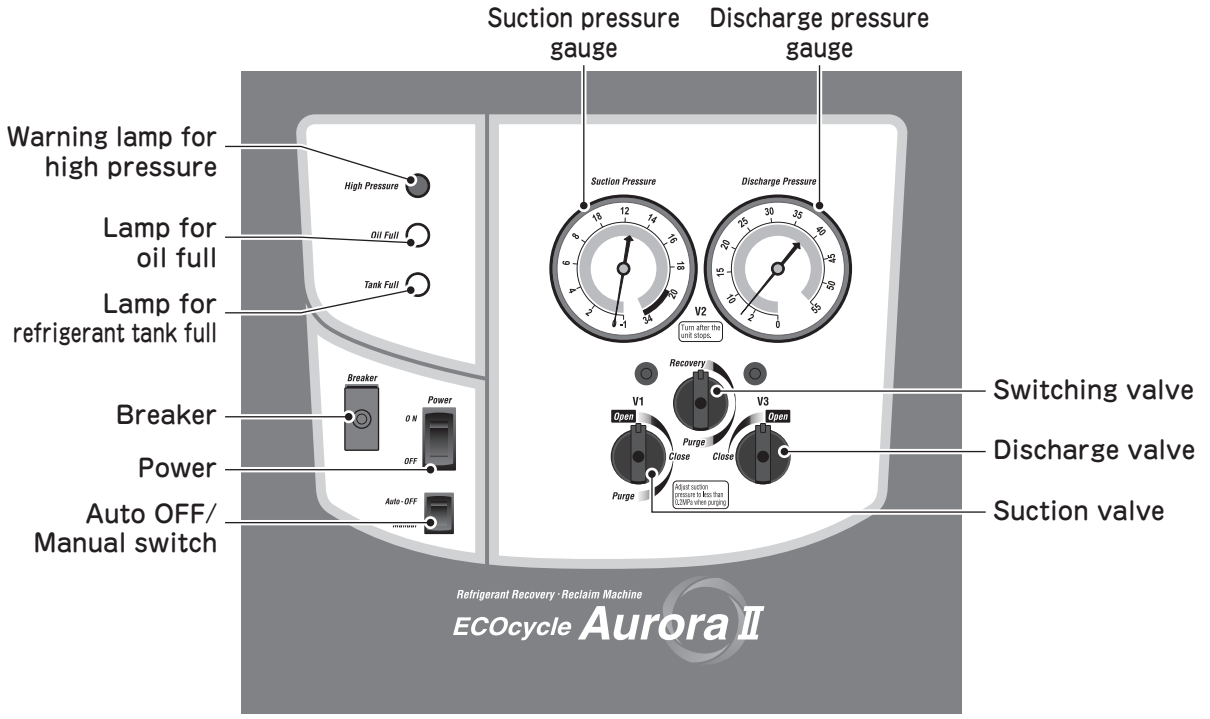
◆ **Use cylinders that match to the type of Freon being recovered or reclaimed.**

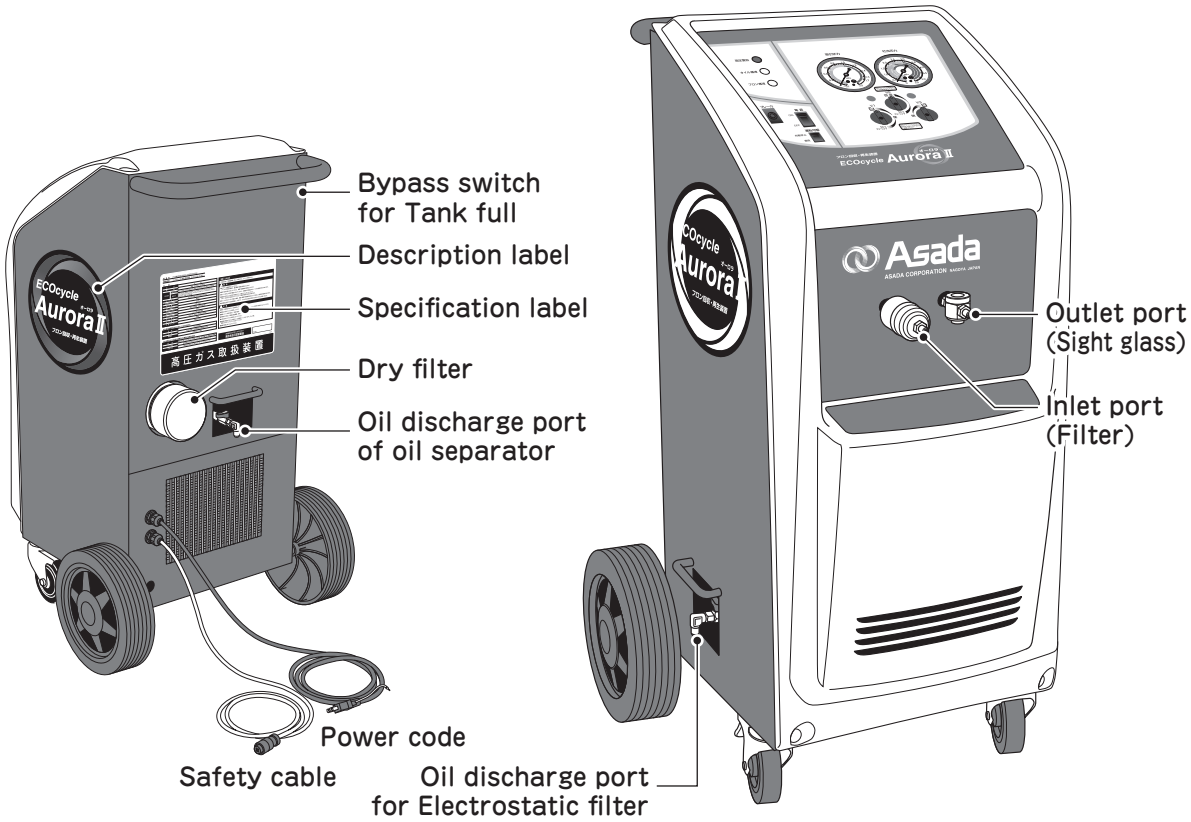
◆ **Dispose molecular sieve pack in accordance with local regulation.**

COMPONENTS OF THE MACHINE

Name of Each Part

Labels are required by law for safety and the warnings are placed on the recovery machine.
If the label comes off the machine or became dirty and unreadable, request us for new label. Replace the label at the same position on the machine.





ECOcycle Aurora Ⅱ

Specification

Description	Eco Cycle Aurora Ⅱ
Code No.	AR023
Recovery refrigerant	R12 、R22 、R500 、R502 、R114 、R124 、R134a 、R403B 、R404A 、R407C 、R407D 、R410 A、R412 A、R413 A、R417A、R422 A、R422D 、R423 A、R507 A、R509A、R32, and more
Reclaimable refrigerant	R12、R22、R500、R502、R134a、R404A、R410A、R507A、R509A、R32
Recovery method	Liquid recovery method (possible to vapor recovery)
Reclaim method	Electric statistic separation reclaim method
Power supply	220V-240V (50 / 60Hz) recommending 10A over
Compressor	750W (1HP) Oil less
Dimension	560 x 520 x 973mm (L x W x H)
Weight	63kg
Electric consumption	587/622W (50/60Hz)
Electric current of operation Electric current of starting	8.9/6.0A (50/60Hz)・34A
Operating temperature	5 - 35℃
Applicable cylinder (over fill protection method)	Float sensor type : Recovery cylinder (with float sensor) 6L・12L・24L・40L・120L
	Weighing type : Recovery cylinder (without float sensor) with Limit Scale 12L・21L・24L・120L

Recovery / Reclaim rate	R22	R410A
Liquid (g/min)	220	220
Vapor (g/min)	90	90

＊ Specifications are subject to change without prior notice.
＊ Recovery / Reclaim rates vary under different conditions.

Reclaim capacity	R22	R410A
Moisture (ppm)	- 5	- 7
Acid (ppm)	- 0.1	- 0.1
Total residue on evaporation (%)	- 0.005	- 0.005
Non condensable gas (%)	- 0.5	- 0.5

＊ Reclaim capacity will vary depending on the contamination of the reclaimed refrigerant.

Standard Accessories

Description	Code No.
1/4" Charging hose Plus II with ball valve (Red) 183cm	Y29672
1/4" Charging hose Plus II with ball valve (Blue) 183cm	Y29272
Filter	TF011
Molecular sieve pack	AR179
Instruction Manual	IM0345
Manual for operation	IM0346

Optional Accessories (Recovery Cylinder)

Description	Capacity	Port	Code No.
Refrigerant recovery cylinder (with float sensor)	1L	1/4" flare	TF040
	6L		TF090
	12L		TF056
	24L		TF057
	40L	1/4" flare	TF130
		3/8" flare	TF131
	120L	1/4" flare	TF110
		3/8" flare	TF129
		1/2" flare	TF097
		3/4" flare	TF098

Description	Capacity	Port	Code No.
Refrigerant recovery cylinder (without float sensor)	24L	1/4" flare	TF080
	120L		TF070

* Our Limit Scale must be used when recovery cylinders (without float sensor) are used.
* Our original recovery cylinder should be used.

Optional Accessories (Other Air-Conditioning Equipment)

Name of Item	Code No.	Explanation of the Item
Limit Scale LS-45 Ⅱ	LS452	Scale to be used to prevent over-filling when recovery cylinder has no float sensor.
Limit Scale LS-150 Ⅱ	LS152	
AR molecular sieve pack	AR222	Replacement molecular sieve for inside of Molecular sieve pack.
Charge faster	WA6625	Use when recovering R134a and R12.
Check Mate	RT700K	Easily calculation PPM for contaminate of oil and moisture / acid of refrigerant.
Refrigerant Analyzer Ultima HV	NT2004HV	Judgment of refrigerant if possible to use for reclaim.
Vacuum Pump	Various Type	High efficient 2-stage vacuum pump with a check valve.
Cooling unit CL3 (3/8")	ES801	Improves the efficiency of recovery in summer climate, recovery in a large volume or recovery of R410A by using together with a recovery machine.
Header	TF013	Recovery of up to 6 units at the same time.
Piercing valve	TF014	Makes a connection port for recovery from a system which has no service port such as a home use refrigerator, etc.
1/4" Charging hose with pressure gauge (for use with cylinder)	Y02002A	Connect to recovery cylinder and check the amount of air mixed in the refrigerant.
1/4" Hose with vacuum needle	Y02003A	Checks depth of vacuum in the system being recovered to judge completion of recovery.
Sight Glass	Y41145	Visually check refrigerant flow either in vapor or liquid.
Adapter for different diameter for auto A/C (quick type) 3/16" female x 1/4" male	Y19120	Adapter to connect to the small service port (3/16") for R12.
High pressure quick joint for R134a (M12)	Y03100A	For quick connection to the service port (high pressure side) for R134a.
Low pressure quick joint for R134a (M10)	Y03200A	For quick connection to the service port (low pressure side) for R134a.
1/4" Ball Valve	Y93843	Prevent release of refrigerant when Disconnecting hose.
Quick charging valve A	Y18975	Can be used without leaking refrigerant. Recovery speed improves without Schrader.
Charging hose plus Ⅱ with SealRight fitting	Various sizes available	Low loss anti-blow back SealRight fitting traps refrigerant in the hose when disconnected.
Charging hose plus Ⅱ for R410A		Charging hose for R410A.
Charging hose plus Ⅱ with ball valve for R410A		Charging hose with ball valve for R410A.
Charging hose plus Ⅱ for R134a		Charging hose for R134a.

HOW TO USE

Preparation before Operation

1) Discharge nitrogen gas from inside machine

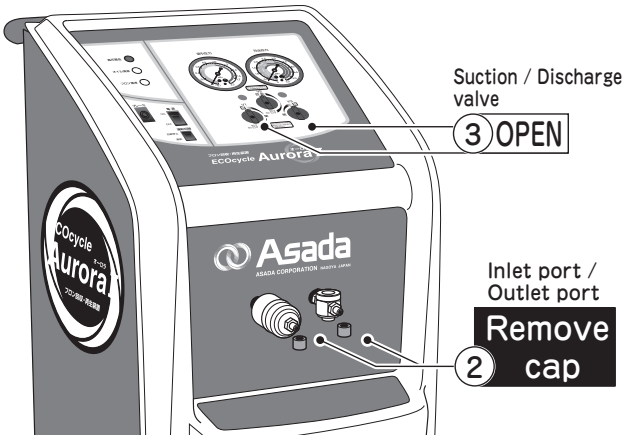
The unit is filled with Nitrogen gas to prevent damage during transit.

① Connecting machine to the proper power supply.

② [Remove cap] of inlet port and discharge port.

③ [Open] suction valve and discharge valve.

④ Inside machine will become atmospheric pressure after exhaust Nitrogen gas.



2) Preparation of Cylinder

⚠ CAUTION

◆ Brand-new cylinders have nitrogen inside.
Evacuation should be done after discharging nitrogen by opening the vapor valve.
◆ Do not evacuate air from cylinders which contain refrigerant.
The refrigerant will be discharged to the air and the vacuum pump oil will blow out.

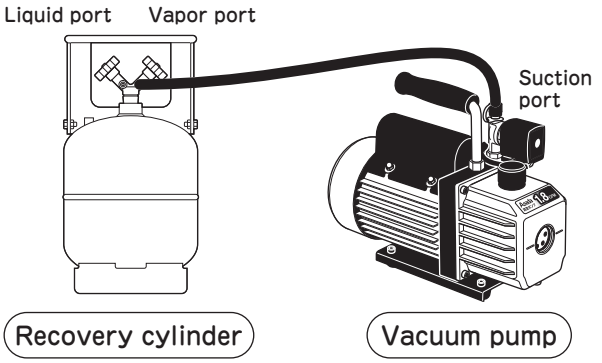
Vacuum the tank use vacuum pump (optional accessories).

① Connect the suction port of the vacuum pump to the vapor port of the cylinder with a hose.

② Switch on the vacuum pump.

③ Close the liquid port of the cylinder and open the vapor port.

④ Close the vapor port of the cylinder when the vacuum reaches − 0.095MPa (− 13.8psi) ～ − 0.1MPa (− 14.5psi) .



⑤ Switch off the vacuum pump.

⑥ Disconnect the hose between the vacuum pump and the cylinder.

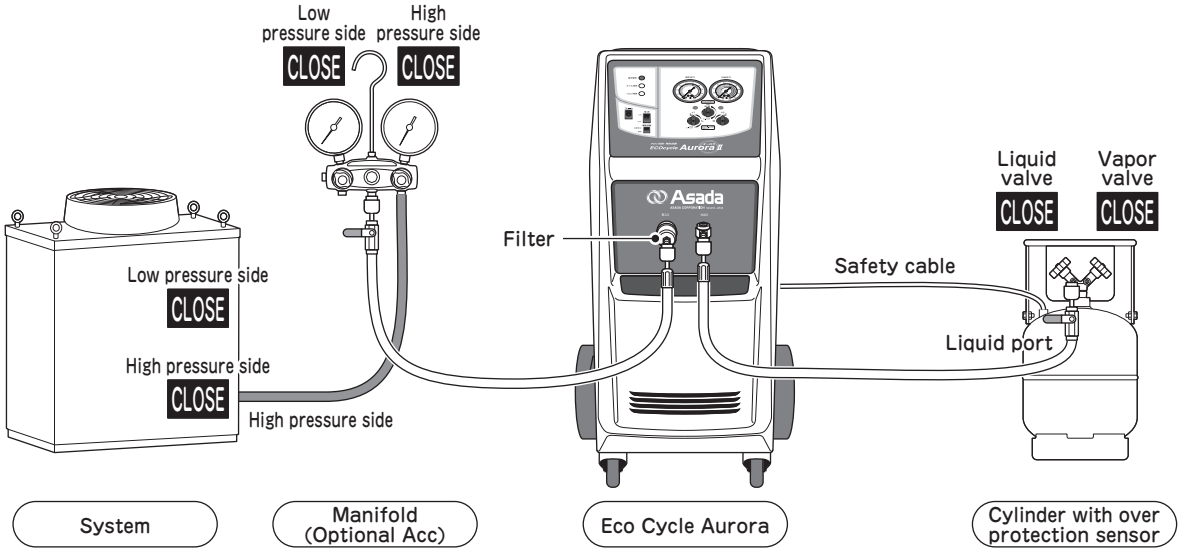
3) Precautions concerning

① In case of the temperature under 10℃ it needs warming up before operation.
Warm up Operation Refer to page 17.

② A filter of standard accessories must be installed on the inlet port when operating machine.

Recovery / Reclaim Operation

1) Connection of hose and cords



① Connect the hoses as above.

⚠ CAUTION

◆ **Use our Limit Scale (Code No. LS452) when a cylinder without float sensor is used.**

② Connect the safety cable to the connector on the cylinder or on Limit Scale.

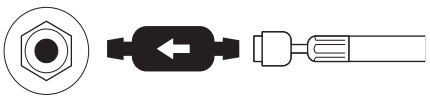
⚠ CAUTION

◆ **The recovery machine will not start without connecting the safety cable.**

③ Install a filter to the suction port of the recovery machine. (Code No.TF011)

⚠ CAUTION

◆ **Make sure the installing direction.**
◆ **Connect the filter dryer with holding the inlet valve by wrench.**
◆ **Replace the filter every recovery of 90kg or when it is clogged.**



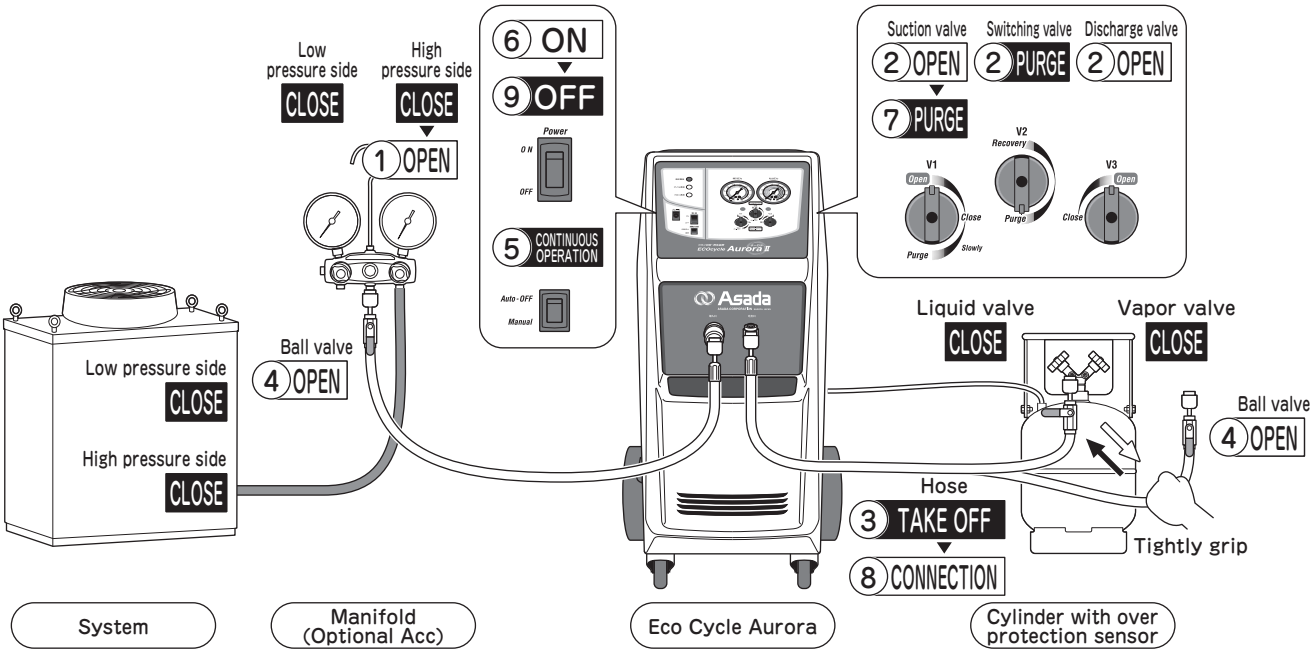
④ Install Molecular sieve pack drier (refer to page 20) after take off a back lid on the machine.

⚠ CAUTION

◆ **This replace operation doing as soon as possible to avoid spoiling the quality of filter drier.**

⑤ Connect a charge faster when recovering R134a and R12.

2) Evacuation of the recovery machine and the hoses



① [OPEN] high pressure side valve of manifold.

② [OPEN] suction valve.

[PURGE] Switching valve.

[OPEN] discharge valve.

③ [Disconnect] the hose which is connected to the liquid port of the cylinder.

＊ Hold the hose tightly.

④ [OPEN] the ball valve of the hose.

⑤ Set the Auto OFF/Manual switch to the [Manual] position.

⑥ Set the Power switch to the [ON] position.

⑦ When the suction pressure reaches vacuum, set the valve of the recovery machine to the [Purge] position.

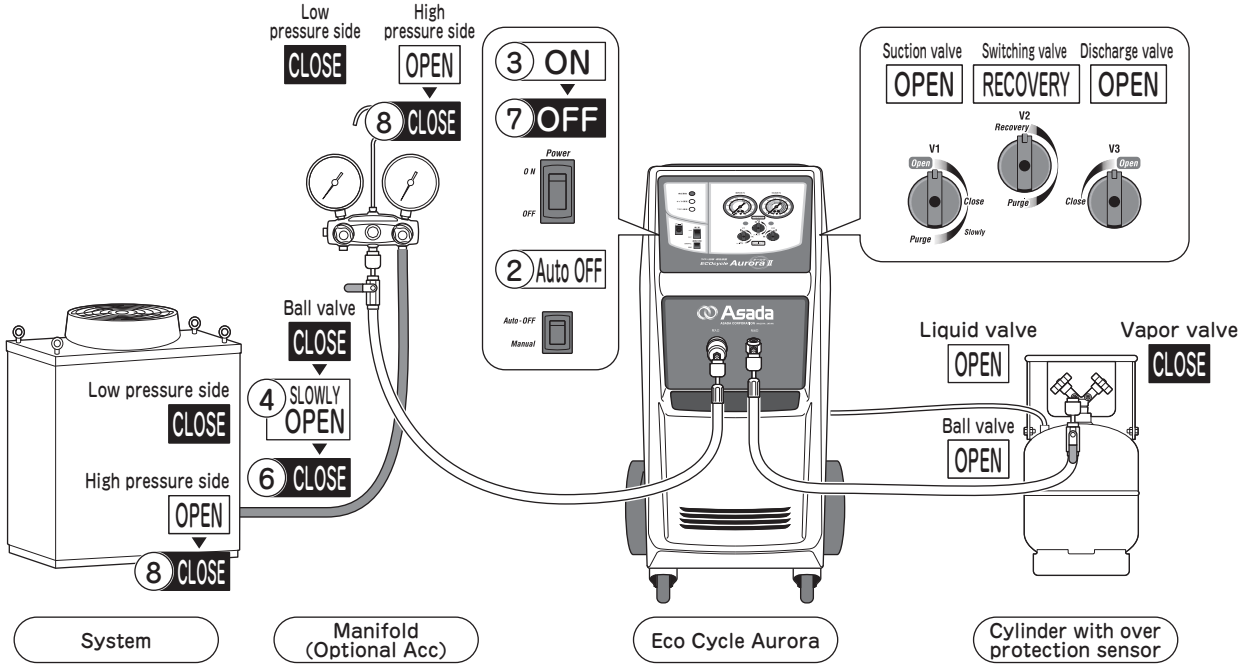
⑧ [Connect] hose (③) to liquid side of cylinder after the suction pressure gauge was reach vacuum again.

⑨ Set the Power switch to the [OFF] position.

3) Recovery / Reclaim procedure

⚠ CAUTION

- **Warm up the unit when operating lower than temperature of 10℃ .**
  Refer to page 17 “Warming up Operation”
- **Connect the charge faster to suction port when recovering R134a and R12 and warm up the unit.**
  Refer to page 13 “Recovery/reclaim method in recovering R134a and R12”



① Set each valve as above.

② Set the Auto OFF/Manual switch to the [Auto OFF] position.

＊ In case of automatically stop, The inlet side pressure must be higher than atmospheric pressure for machine operation.

③ Set the Power switch to the [ON] position.

④ Slowly [OPEN] the ball valve of suction hose.

⑤ The unit automatically stops when the suction pressure becomes -0.03MPa (psi).

⑥ [CLOSE] the ball valve of suction hose.

⑦ Set the Power switch to the [OFF] position.

⑧ [CLOSE] high pressure side of Manifold and system.

After the recovery operation, leave the system for 5 to 10 minutes to see if the refrigerant mixed in the refrigeration oil will evaporate.
If the pressure rises from the set value, repeat the recovery operation.

Refrigerant	Charged value	Set value
R12、R500、R502、R509、R22、R134a、R412A、R407C、R407D、R410A、R507A、R404A	less than 2kg	0MPa (psi)
	2kg or more	− 0.01MPa (− 1.4psi)

Recovery/reclaim method in recovering R134a and R12

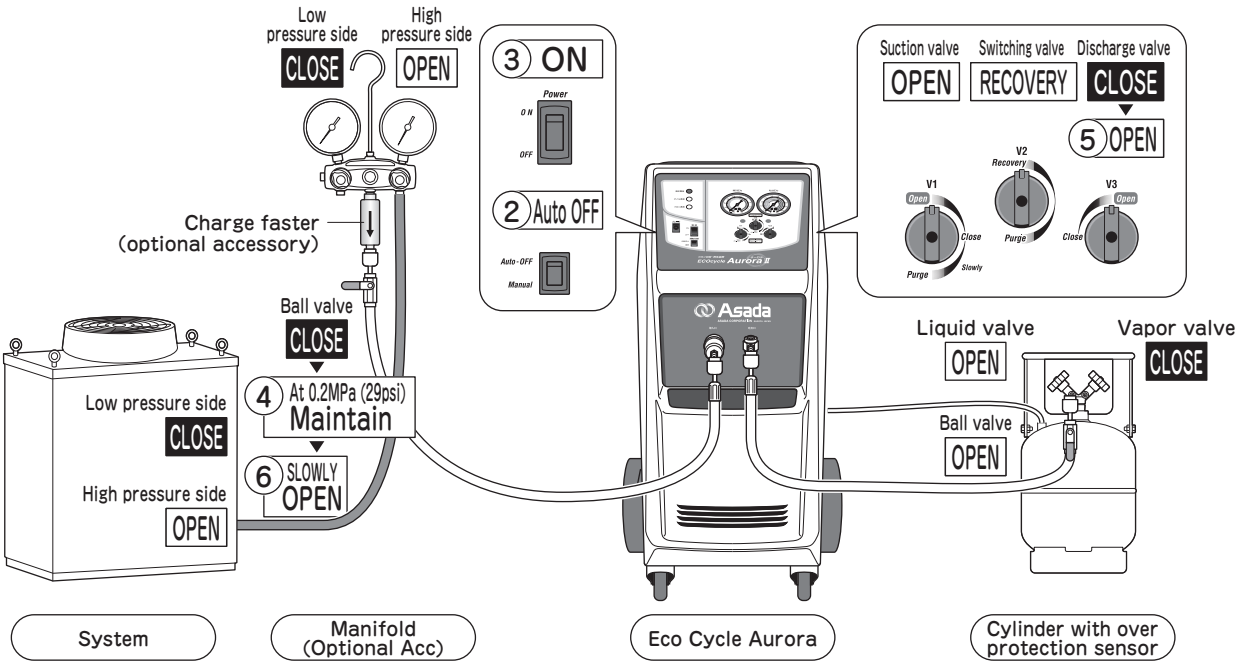
● Operate in accordance with following procedure.

■ Use the charge faster (optional accessory)

● Connect the charge faster (optional accessory) between the suction side charging hose and the manifold.

■ Warm up

● Always warm up the unit regardless of temperature.



① Connect hoses as above after carry out Page11 “2) Evacuation of the recovery machine and the hoses”

② Set the Auto OFF/Manual switch to the [Auto OFF] position.

③ Set the Power switch to the [ON] position.

④ As opening the ball valve of the suction hose, adjust suction pressure to around 0.2MPa（29psi）, keep operating for 5 to7 minutes.

[In case of R134a, the suction pressure until become 1.0 MPa（145psi）]

⑤ After operating for 5 to 7 minutes, [OPEN] suction valve.

⑥ Slowly open the ball valve of the suction hose which almost opened with taking 20 seconds.

⑦ Follow ordinal recovery/ reclaim procedure.

Recovery Procedure of R410A or When the Pressure of Refrigerant is High

● Follow the following procedure when R410A or refrigerant at high pressure by heat is recovered.
See “Liquid/Vapor Recovery Procedure” for the standard operation.

⚠ CAUTION

◆ **Noncondensable substance (air) may exist in the cylinder when the temperature of the cylinder rises abnormally during recovery.**
Remove the air or replace the cylinder.

◆ **The method of removing air is refer to Page18 “How to Purge Non condensable Gases”**

■ Use Cooling Unit CL3 (optional accessory)

● Cooling Unit (Code No. ES801) can lower the temperature of refrigerant at high pressure by approximately 5 to 10℃ .
It improves the recovery rate.
See the instruction manual of Cooling Unit for detailed information.

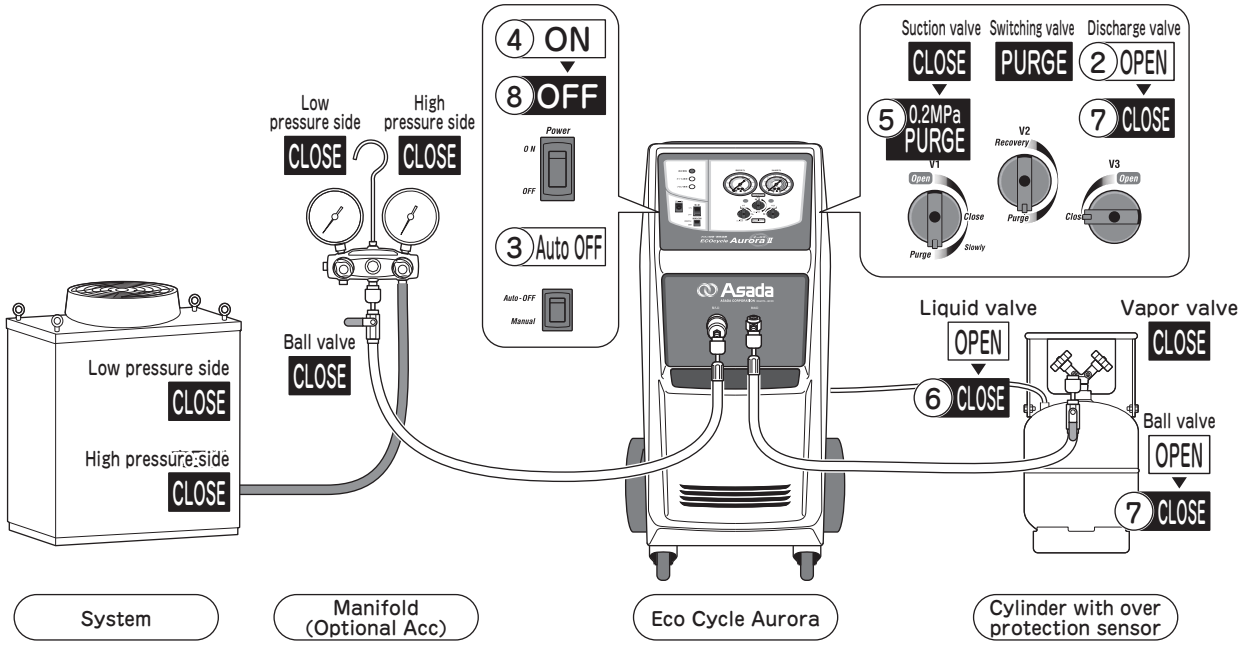
■ Replacement of spare cylinder

● Use an evacuated spare cylinder.

4) Refrigerant Discharge (Purge) Procedure

⚠ CAUTION

◆ **Adjust suction pressure less than 0.2MPa on purging.**
This may cause of damaging compressor.



① Setting up as the above drawing.

② Turn switching valve to [PURGE] position.

＊ Do not turn the valve during operation.
Otherwise, the discharge pressure gauge may be damaged.

③ Set the Auto OFF/Manual switch to the [Auto OFF] position.

＊ In case of auto off, the unit does not starts when suction pressure is lower than atmospheric pressure.

④ Set the Power switch to the [ON] position.

⑤ [PURGE] with adjusting suction pressure less than 0.2MPa.

⑥ [CLOSE] the liquid port of the cylinder when the machine stops automatically.

⑦ Turn the discharge position and [CLOSE] the ball valve of the hose at the discharge side.

⑧ Set the Power switch to the [OFF] position.

⑨ [Disconnect] the hoses.

＊ There is vapor refrigerant left in the recovery machine and the hose of the discharge side.
Connect the hose of the discharge side to an evacuated cylinder to recover the refrigerant left in the recovery machine and the hose.

⚠ CAUTION

◆ **Wear protective goggles and rubber (leather) gloves as a minute amount of refrigerant is discharged.**
If refrigerant falls in your eyes or touches your skin, it may lead to sight loss or cold injury.

Discharge Oil Method (Oil separator)

Oil discharge operate when turn on the oil tank full lump（①～⑧）or finish daily operation（⑤～⑧）.

① [CLOSE] the ball valve of suction hose.

② Starting machine during push the tank full bypass switch on the lower right of handle in the back panel under turn to automatically stop of power switch.

＊ Keep pushing the switch, the switch will get back if stop pushing.

③ This machine will be automatically stop when the suction pressure reach－0.03MPa(－4.4psi).

④ Switch [OFF] the machine.

⑤ Adjust pressure in order to suction side pressure gauge become 0.1MPa(14.5psi)－ 0.2 MPa(29psi) during open the ball valve of suction hose.

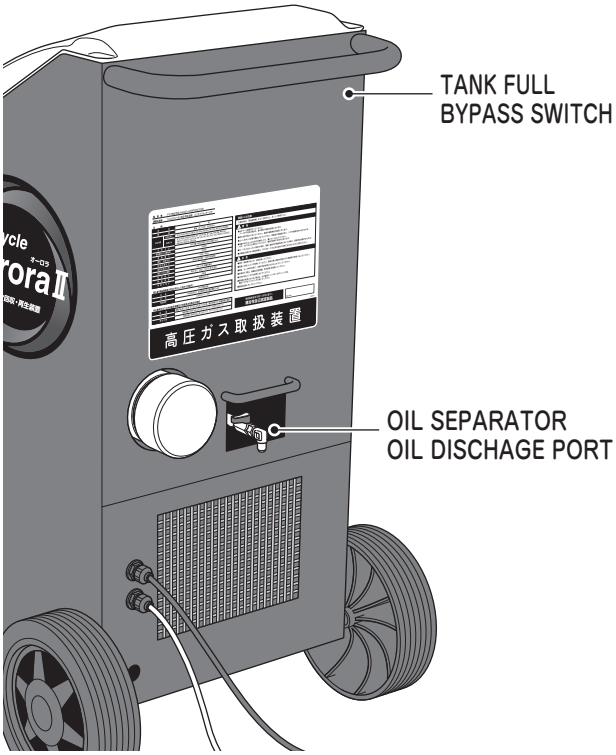
⑥ [REMOVE] the cap of oil discharge port on the back of machine.

⑦ Slowly open the valve and discharge oil to other container.

＊ The oil is collecting about 2L when the tank is full.

⑧ [CLOSE] the valve after discharge oil.

[CLOSE] the cap of oil discharge port after finish discharge of oil.



Discharge Oil Method (Electrostatic filter)

Checking each 100 hours operation or per month operation if the oil or contamination is accumulating in the electrostatic filter.

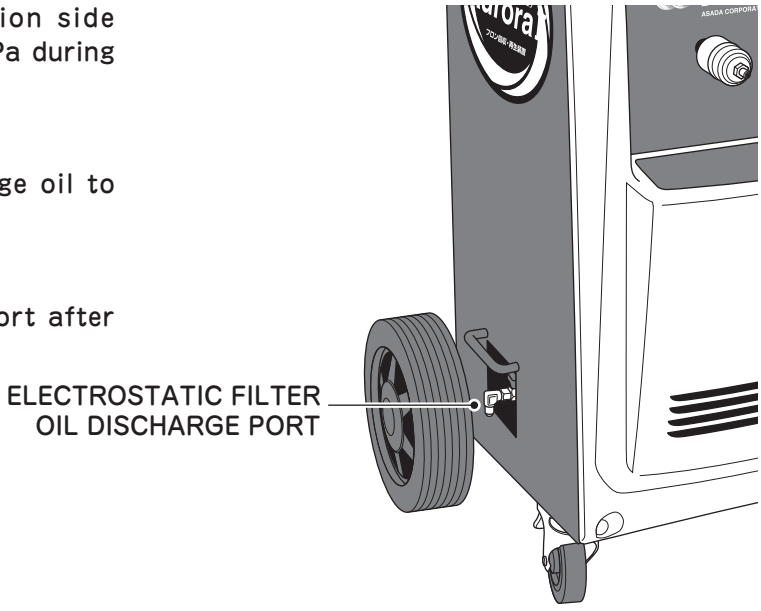
① Adjust pressure in order to suction side pressure gauge become 0.1 － 0.2 MPa during open the ball valve of suction hose.

② [REMOVE] cap of oil discharge port.

③ Slowly open the valve and discharge oil to other container.

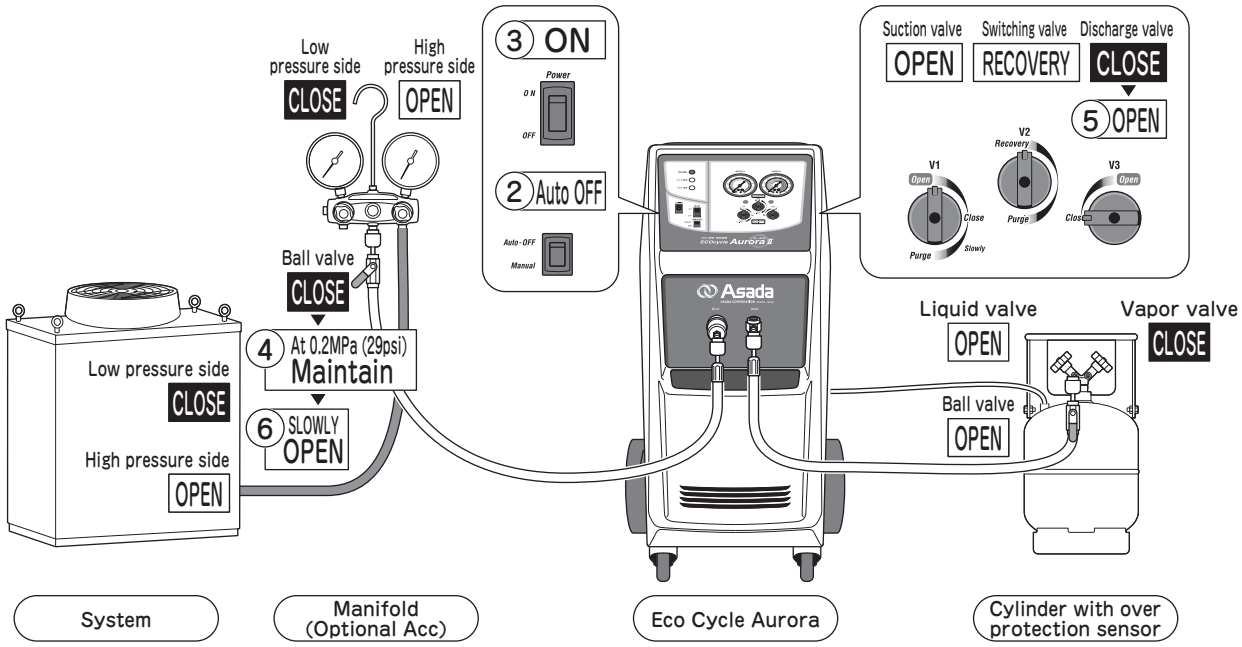
④ [CLOSE] the valve after discharge oil.

[CLOSE] the cap of oil discharge port after finish discharge of oil.



Warm up Operation

In this machine need warm up operation for drop down the effective of heat exchange in the oil separator when the temperature become under 10 ℃. Please follow up the warm up operation.



① Connect hoses as above after carry out Page11 “2) Evacuation of the recovery machine and the hoses”

② Set the Auto OFF/Manual switch to the [Auto OFF] position.

③ Set the Power switch to the [ON] position.

④ As opening the ball valve of the suction hose, adjust suction pressure to around 0.2MPa（29psi）, keep operating for 5 to7 minutes.

[In case of R134a, the suction pressure until become 1.5 MPa（145psi）]

⑤ After operating for 5 to 7 minutes, [OPEN] suction valve.

⑥ Slowly open the ball valve of the suction hose which almost opened with taking 20 seconds.

⑦ Follow ordinal recovery/ reclaim procedure.

How to Purge Non condensable Gases

Leave the cylinder for more than 2 hours.

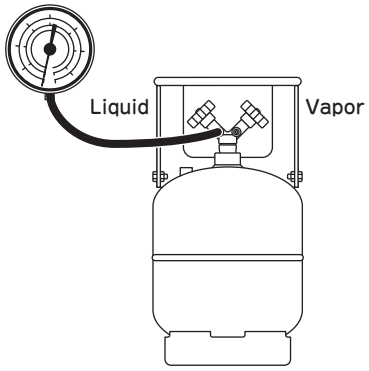
① Measure the surface temperature of the cylinder.

② Connect a pressure gauge to the liquid port of the cylinder and check the pressure.

③ See the saturation temperature and pressure chart. (chart1)

④ Compare pressure in the chart with pressure of the cylinder.

⑤ If the pressure of the cylinder is higher by 0.0345MPa (5psi) than pressure in the chart, open the vapor valve of the cylinder to purge for 15 second.



⑥ Leave the cylinder for 3 minutes and check the pressure again.

⑦ Purge the cylinder repeatedly until the pressure of the cylinder becomes in the range of ± 0.0345MPa (5psi) .

Chart1 The saturation temperature and pressure (Pressure is gauge pressure)

Temperature (℃)	Saturation pressure (MPa)		
	R22	R410A	R134a
− 10	0.2534	0.4776	0.0998
− 8	0.2791	0.5185	0.1161
− 6	0.3063	0.5616	0.1335
− 4	0.3349	0.6069	0.1519
− 2	0.3650	0.6545	0.1714
0	0.3996	0.7044	0.1920
2	0.4298	0.7569	0.2138
4	0.4647	0.8119	0.2369
6	0.5012	0.8695	0.2612
8	0.5395	0.9300	0.2868
10	0.5796	0.9930	0.3138
12	0.6216	1.0590	0.3422
14	0.6654	1.1280	0.3721
16	0.7112	1.2000	0.4035
18	0.7590	1.2750	0.4364
20	0.8089	1.3530	0.4709
22	0.8609	1.4350	0.5071
24	0.9150	1.5200	0.5449

Temperature (℃)	Saturation pressure (MPa)		
	R22	R410A	R134a
26	0.9714	1.6080	0.5846
28	1.0301	1.7000	0.6260
30	1.0911	1.7960	0.6693
32	1.1544	1.8950	0.7145
34	1.2203	1.9980	0.7616
36	1.2886	2.1050	0.8108
38	1.3596	2.2160	0.8621
40	1.4331	2.3320	0.9155
42	1.5093	2.4510	0.9710
44	1.5883	2.5750	1.0289
46	1.6702	2.7030	1.0890
48	1.7549	2.8360	1.1515
50	1.8425	2.9740	1.2164
52	1.9332	3.1160	1.2838
54	2.0269	3.2631	1.3538
56	2.1238	3.4150	1.4265
58	2.2240	3.5720	1.5018
60	2.3275	3.7350	1.5799

Conversion: 0.1MPa = 14.5psi

RECOVERY CYLINDER

Risk of overfilling

● Refrigerant is a high pressure gas and mistakes in use or handling will lead to a serious accident.

1) Relation between the temperature and the pressure of refrigerant in a cylinder

The pressure of the refrigerant varies depending on the ambient temperature when the refrigerant is filled in a cylinder.

Temperature rises ▶ Some liquid refrigerant evaporates ▶ Pressure rises

At this time, lowering of the liquid level by evaporation and rising of the liquid level by specific volume increase occur at the same time and balance.

Temperature drops ▷ Some vapor refrigerant liquefies ▷ Pressure drops

At this time, rising of the liquid level by liquefaction and lowering of the liquid level by specific volume decrease occur at the same time and balance.

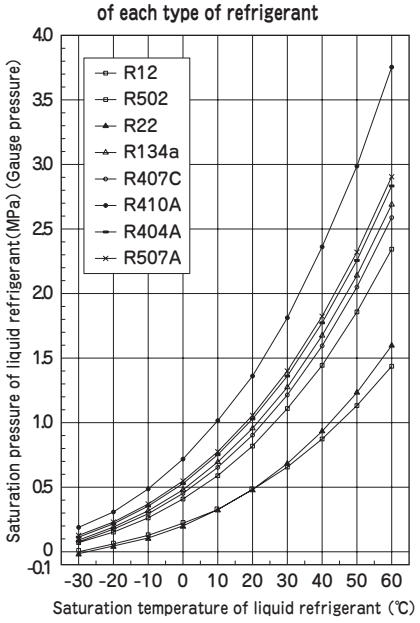
The right graph shows the relation between the pressure (saturation pressure) and the temperature (saturation temperature) for each kind of refrigerant.

This relation between the saturation pressure and the saturation temperature is found when both liquid and vapor exist in a cylinder. Normally the inside of the cylinder is under this condition and this chart is useful for field operation.

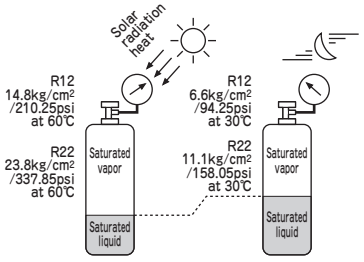
When a cylinder is almost full with liquid and no vapor, the pressure rises rapidly even with a slight increase in temperature.

This phenomenon must be avoided in any circumstances.

Saturation pressure and saturation temperature of each type of refrigerant



Temperature and pressure of refrigerant in cylinder



MAINTENANCE & INSPECTION

● Inspect and clean regularly as instructed below and perform correction or replacement timely.

Maintenance

① Keep clean gauges and each part of indication on the front panel by wiping clean cloth.

② Keep clean air blow hole and condenser to make cooling down by Air effective.

Replace Molecular sieve pack

Dry filter is installed back side of machine.

● Replacement period・・・amount of refrigerant 150 – 200 kg

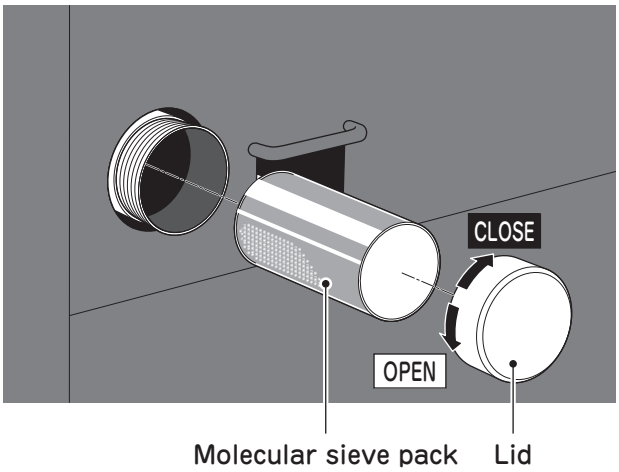
① Recover all of refrigerant from machine until 0MPa (psi).

② Open the lid of Dry filter and remove out the filer core.

③ Open the lid of removed Molecular sieve pack and remove Spring, Mesh plate, and Filter.

④ Take off old molecular sieve.

＊ No need to take off filter at the bottom in the Molecular sieve pack.



⚠ CAUTION

◆ **Carry out following operation as soon as possible to avoid spoiling the quality of filter drier.**

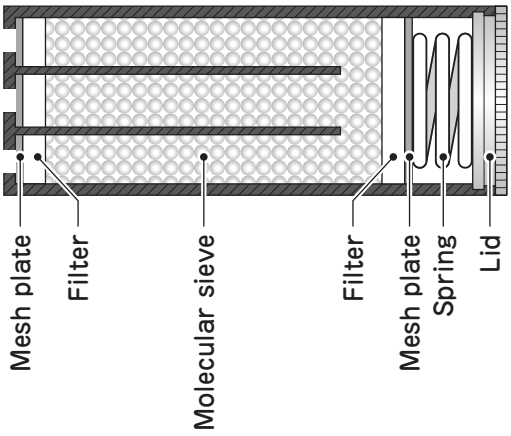
⑤ Fill up all of new molecular sieve (AR222) to Molecular sieve pack.

⑥ Set Filter, Mesh plate, and spring in the reverse 'take off procedure'.

⑦ Put new Molecular sieve pack in the machine and close the lid surely with holding spring.

⑧ Leak check the filter.

< Internal structure of the Molecular sieve pack >



In case of reclaim other refrigerant

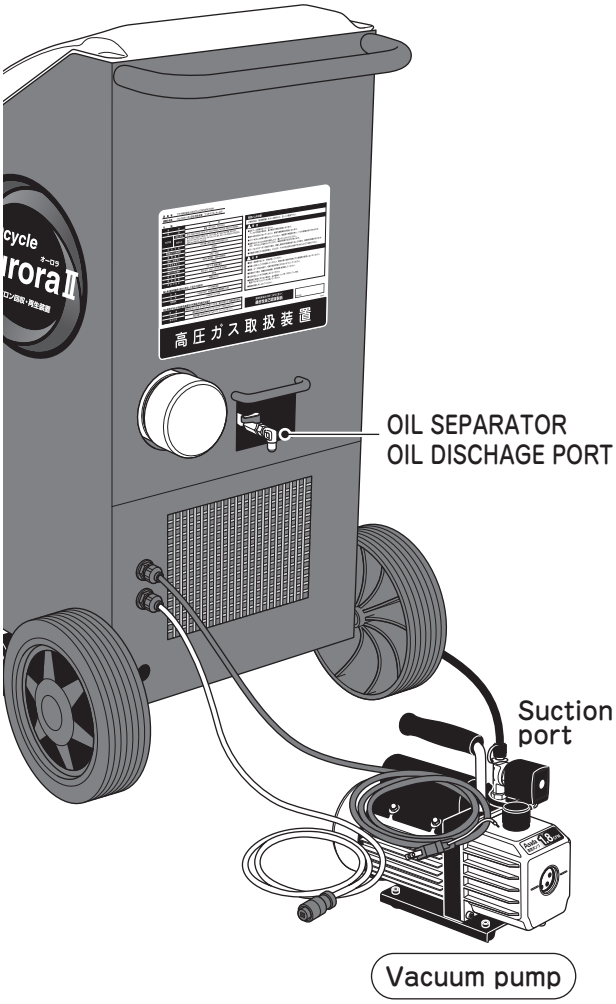
① Replacing Molecular sieve pack refer to P20 after discharging oil refer to P16.

② Connect vacuum pump to the discharge port of the oil separator by using hose.

③ Turn [ON] the vacuum pump and [OPEN] the valve of oil discharge port.

④ [CLOSE] the oil discharge valve and turn [OFF] the vacuum pump after more than 1 hour of vacuum.

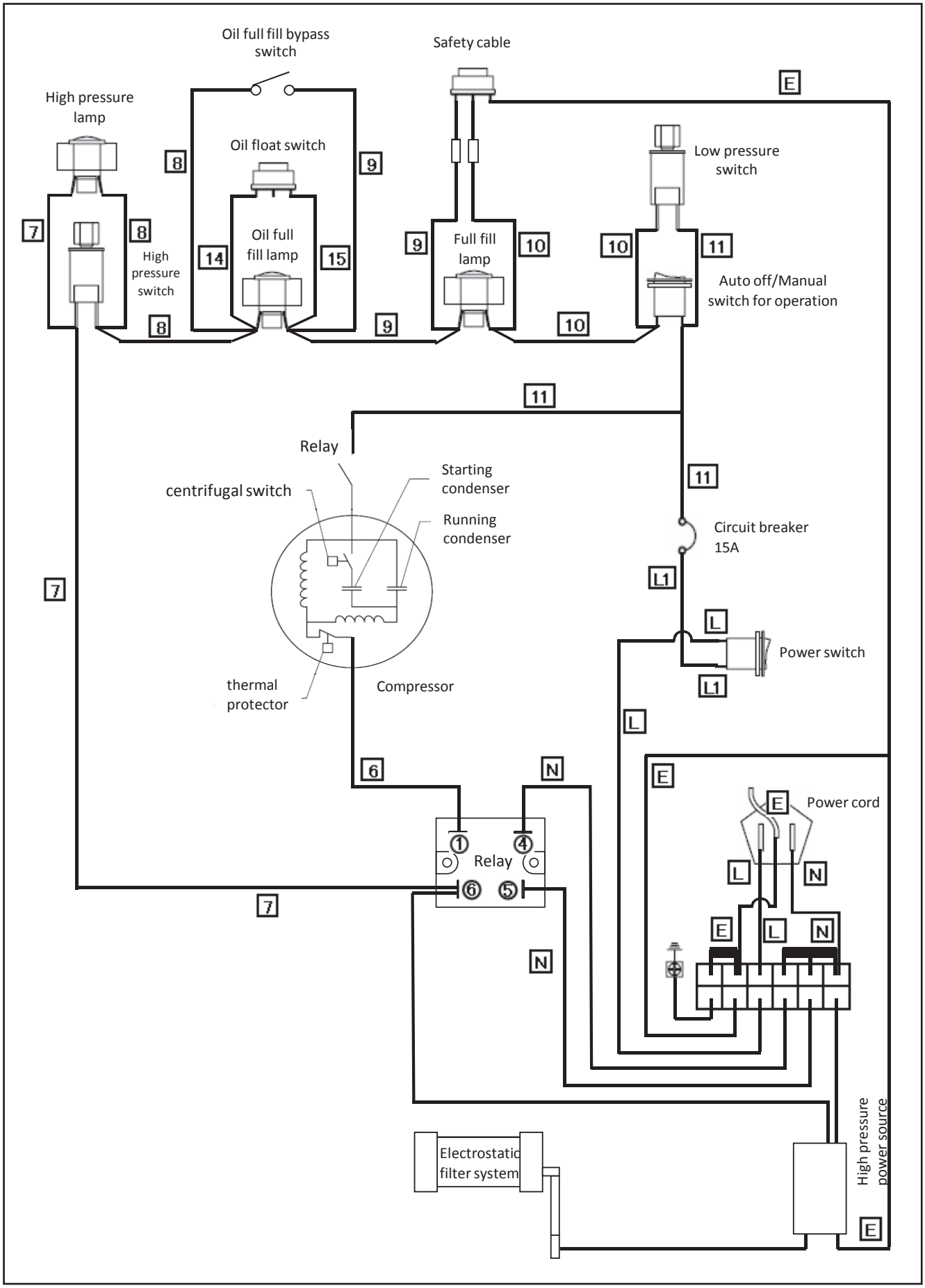
⑤ Take off connected hose between vacuum pump and the discharge port of oil separator.



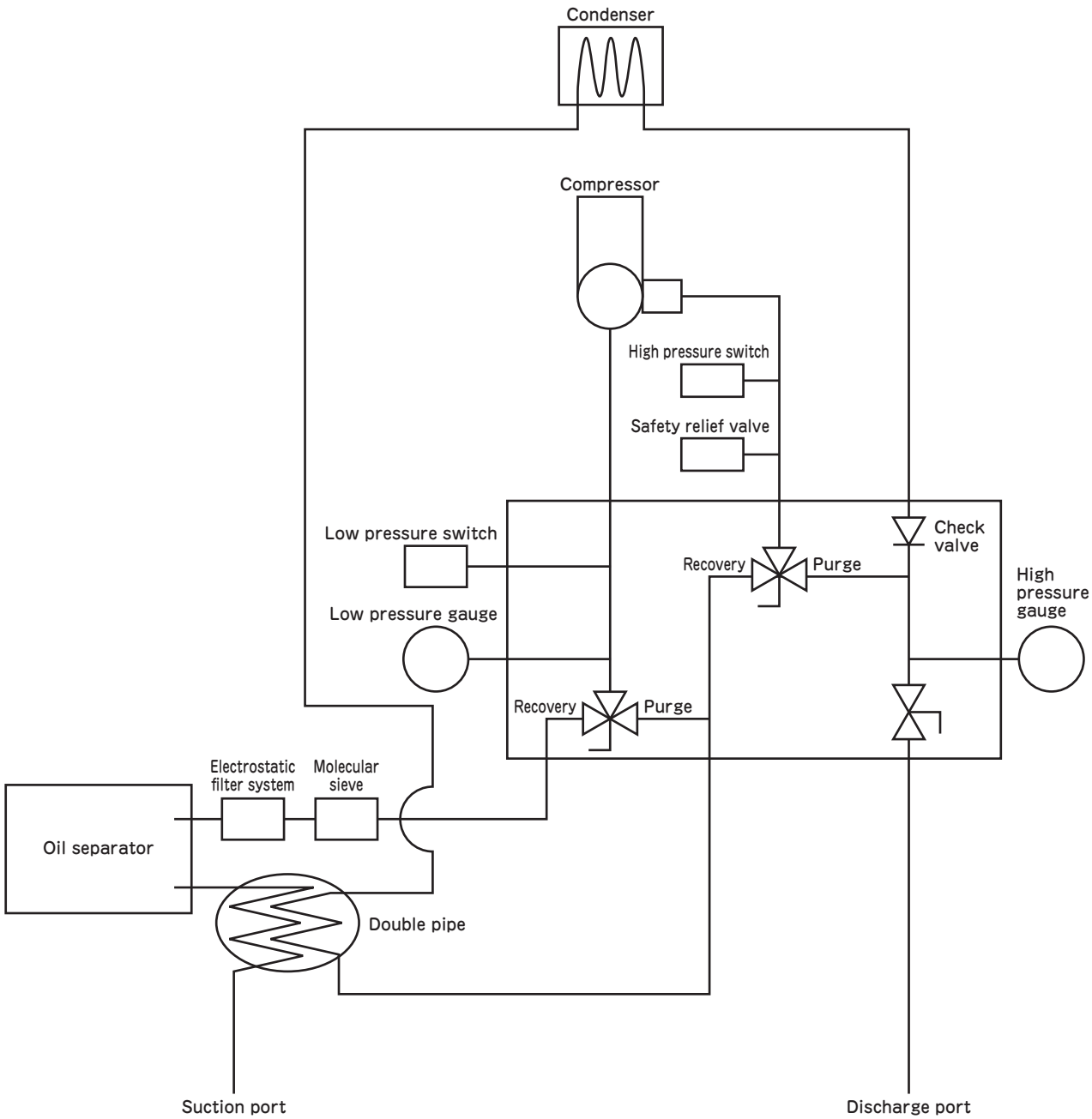
BEFORE REQUESTING REPAIR OR SERVICES

Symptom	Cause	Solution
The machine will not start.	① The power cord is not plugged in.	① Plug in the power cord
	② The safety cable is not connected.	② Connect the safety cable.
	③ The machine is in high pressure shut off.	③ Reduce the pressure in the high pressure line.
	④ The breaker tripped.	④ Reset the breaker.
	⑤ The thermal protector operates due to overheating of the motor.	⑤ Wait until the motor cools down.
	⑥ The cylinder is full.	⑥ Replace the cylinder
	⑦ The float sensor of the cylinder is out of order.	⑦ Repair
	⑧ The motor is burned.	⑧ Repair
	⑨ The compressor is locked.	⑨ Repair
	⑩ Wiring disconnection	⑩ Repair
	⑪ The high pressure switch is out of order.	⑪ Repair
	⑫ The low pressure switch is out of order.	⑫ Repair
The machine stops soon after starting.	① The valve on the discharge side hose is closed.	① Open the valve on the hose of discharge side.
	② The liquid valve on the cylinder is closed.	② Open the liquid valve on the cylinder.
	③ The pressure in the cylinder is high.	③ Cool the cylinder or use Cooling Unit.
	④ Voltage drop	④ Connect to a 220V power source. Use appropriate extension code.
The recovery speed is slow or the machine will not recover.	① The suction side hose is connected to vapor port.	① Connect to liquid port of suction side hose.
	② The filter dryer is clogged.	② Clean or replace the filter dryer.
	③ The pressure in the cylinder is high.	③ Cool the cylinder.
	④ The hose has a core depressor.	④ Remove the core depressor in the hose.
	⑤ The refrigerant in the system is frozen.	⑤ Perform liquid recovery after melting.
The machine will not restart.	① The motor is overheated.	① Wait until the motor cools down.
	② The difference in pressure between the suction side and the discharge side is too large as the pressure in the cylinder is high.	② Balance the pressure.
	③ The breaker tripped.	③ Reset the breaker.
	④ The low pressure switch tripped.	④ Make suction side pressure higher than atmospheric pressure.
Turn on the oil flooded lamp.	① Flooded of oil in the oil separator.	① Discharge oil operation following Page 16.

ELECTRIC WIRING DIAGRAM



FLOW DIAGRAM



ECOcycle Aurora Ⅱ

●Customer Memo

Please fill in for your record in the future
The information is helpful for inquiry and ordering parts.

Products Number:
Date Purchased:
Store Purchased the Unit:

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ASADA CORPORATION
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