CKD

SM－13024－A

INSTRUCTION MANUAL

SUPER HEATLESS AIR DRYER

SHD3025
SHD3045
SHD3075
SHD3100
SHD3125
SHD3150
SHD3200
SHD3240

- Please read this instruction manual carefully before using this product, particularly the section describing safety.
- Retain this instruction manual with the product for further consultation whenever necessary.

DEC-21 12th edition
ＣＫＤ Corporation

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1.INTRODUCTION

Thank you very much for purchasing our heatless air dryer, SHD series.
This manual explains basic points of installation, operation, etc. to have our dryers perform at their best.　Be sure to read this manual before using your dryer.
Keep this booklet handy for quick reference.
Please be advised in advance that there may be some discrepancies between products and contents of this book due to improvement of specification after printing.

Safety instructions

This manual is intended for personnel who are familiar with basic knowledge about electricity, compressed air, fluid, piping, and refrigerant. CKD shall not be held responsible for troubles or accidents that result from installation, operation or repairs made by personnel who are not qualified or trained for the above subjects.
Improper handling may cause the machine not to be operated at its maximum performance level or lead to accidents or personal injury.
Always confirm the machine specification and operate the machine in the correct manner designated by CKD.
This machine is equipped with various safety and other protective devices.
However, improper handling of the machine may cause personal injury and/or damage to the machine. Read this operation manual carefully and fully comprehend its contents before operation.
Read the contents of the following warning labels, as well as cautions stated in the operation manual, and follow the instructions contented therein.
Keep this operation manual near the machine where all concerned personnel have easy access to it.

Safety precautions

Safety precautions are classified into the following groups, WARNING and CAUTION.

WARNING **CAUTION**

WARNING This denotes hazards which COULD result in severe personal injury or death, if not avoided.

CAUTION This denotes hazards which COULD result in minor personal injury and/or product or property damage, if not avoided.

WARNING : ELECTRICAL SHOCK

★Power supply terminal box, switches, etc. may cause you electrical shock.
●Be sure to turn off the power before inspection. Do not operate the dryer with your wet hands.

CAUTION:GROUND CONNECTION

★Be sure to connect earth to prevent electrical shock.

CAUTION : FOOT HOLD

★You could fall if you climb on the panel.
●Do not climb on the panel.

This machine is designed for industrial use. Always carefully handle the machine in the correct manner.

3. CAUTIONS

3-1.Formalities when installed Super Heatless Dryer

Super Heatless Dryer is classified “Pressure vessel” subject to “Safety Regulation of Pressure Vessel”.

Safety Regulation of Pressure Vessel

As models SHD3075- SHD3240 are applied as “Second Class Pressure Vessel” according to “Boiler and Pressure Vessel Safety Regulation” by legislation of Ministry of labor, they are accompanied by a certificate for withstanding pressure of the Second Class Pressure Vessel.
During use of this machine, keep this certificate in your possession.

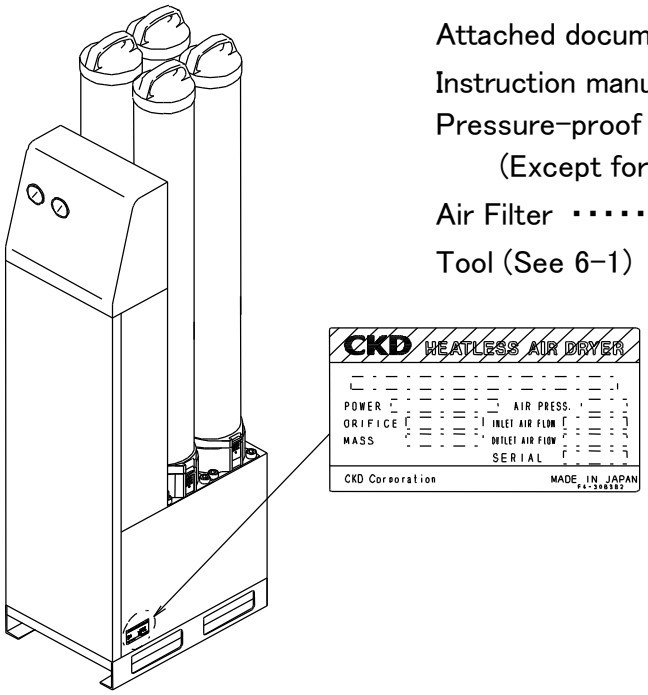
3-2.Cautions at operation

1) Do not use the dryer to remove humidity of except compressed air.
   *Breakdown, explosion, or fire may result.
2) Install an earth leakage breaker on the power supply.
   *Electric shock may result.
3) Need to earth wiring.
   *Causes of an electric shock or a fire.
4) Operate the dryer within specification ranges.
   *Operation may stop abnormally, or the product’s service life may be shortened.
   *When the working pressure range is low, it is not likely to be able to start.
5) Do not turn on the power switch without enclosures.
   *Electric shock or heat injury may result.
6) Do not remodel this dryer.
   *Break-down or shorter life time of the product may result. If you did, the warranty is expired.
7) Remote start terminal (11-13 or 12-13) is alternate non-voltage input.
8) Do not operate local-remote switch during operation.
   *It becomes the cause of stop.
9) Do not touch any parts, wires, terminals or piping in side of the dryer.
   *Causes of an electric shock or a fire.
10) If emergency stop occurs during operation, remove the cause of abnormal conditions referring to the trouble shooting.
    *If the emergency stop occurs repeatedly, this may cause the dryer to malfunction.
11) Do not use the dryer for pneumatic caisson shield or respiratory medical equipment.
    *It could cause an accident includes injury.
12) Do not use the dryer for transportation devices such as automobile, ship etc.
    *Vibration could be a cause of break down of the internal components.

4. INSTALLATION

4-1 Check items before installation

Check the contents stated on the nameplate, such as model No. and specifications.



Attached documents

Instruction manual (this document)･･･1 copy

Pressure-proof certificate

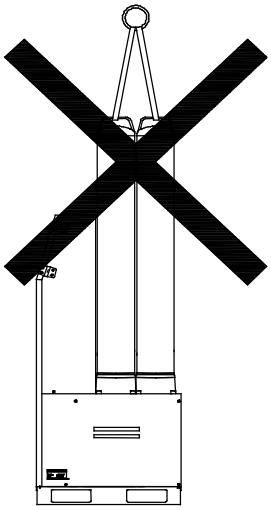
(Except for SHD3025/3045)････1 copy

Air Filter ･･･････････････････････2 pieces

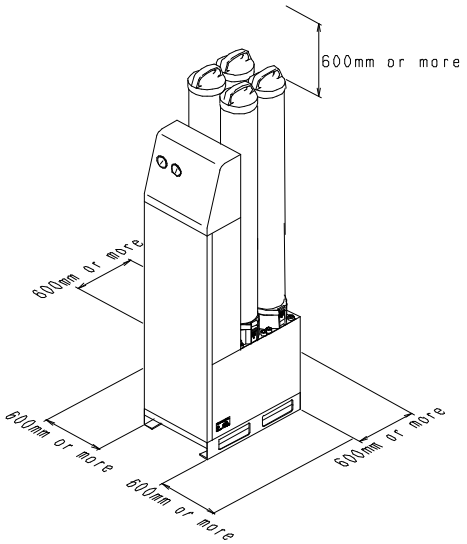
Tool (See 6-1) ･･･････････････････1 piece

4-2 Transportation

1) Never lay down this product or apply any vibration or impact to the product during transportation. Failure to do so may cause damage to internal components.
2) Do not step on this product or place any object on it. Doing so may cause personal injury.
3) Do not lift up this product using the handle on the top of the desiccant vessel. Doing so may cause damage to the main body. Transport this product properly using the fork holes in the base.



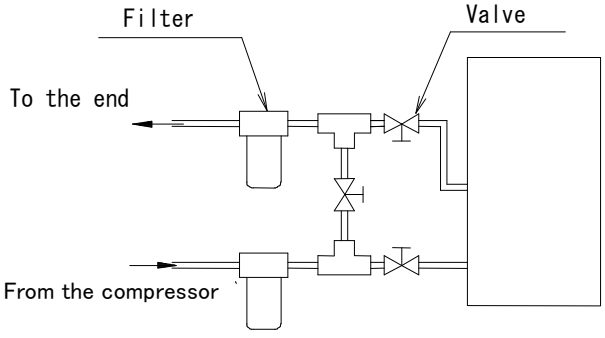
4-3 Installation place



1) Install this product in a place where the ambient temperature is 0 to 40°C.
2) Install this product on a leveled floor where any vibration does not exist.
   When a floor is not level, distortion may arise for a product and fault may occur.
3) If the foundation of the installation place is weak, carry out the foundation construction work.
4) Keep the following space for the maintenance and inspection work. (600 mm or more).
5) Secure this product firmly using anchor bolts so that the product is not laid down if an earthquake or a sudden impact occurs.
6) Do not install this product in an outdoor place. This product does not have any water-proof structure. If rainwater is splashed onto the electrical system, earth leakage or fire accident may occur.
7) Do not install this product in a place where it is not exposed to the direct sunlight, particle dust, or heating element, or any corrosive gas, explosive gas, flammable gas, or combustible material does not exist.
   *Breakdown, explosion, or fire may result.
8) Compressed air should not flow backwards for filter protection.
9) Waterdrop may disperse from the exhaust silencer of dryer rarely under the influence of ambient temperature etc. Install drain pan etc. in that case.
10) Do not mix waterdrop in air inlet. Performance not only gets worse, but it becomes the cause of failure. When there is a possibility that waterdrop may mix, install aftercooler or refrigerated air dryer in the upstream of this equipment.

4-4 Air piping

1) Always start the piping work after checking the air inlet and outlet.
2) Attach the air filter M-series supplied with the product to the air inlet. In addition, when the quality of air flowing in is bad, attach an optional filter before the M series concerned.
3) Attach the air filter P-series supplied with the product to the air outlet. In addition, when a visitor's quality of demand air is high, attach an optional filter after the P series concerned.
4) Since moisture may condense within piping, the distance between air filter M series and the entrance of main part is set to 1m or less as a standard.
5) Make the distance between the air filter M-series and the inlet of the main body as short as possible since water contents may be condensed inside the piping.
6) If the flow inside the piping cannot be shut down when starting the maintenance and inspection work of the main body, install a bypass circuit having the stop valve.
7) Carefully design the piping route so that the weight of the piping is not applied to the main body.



8) Always use the piping withstanding the working pressure and temperature. Carry out the piping work so that no air leaks from the connection part.

9) For piping materials, use galvanized or stainless pipes. Before connecting the piping, always perform the flushing so that no dust enters the air circuit.

4-5 Drain piping

1) Use a tube with an inside diameter of ϕ6 or more for the drain piping of the air filter. Open the discharge end to the atmosphere.

2) If the drain piping rises or is too long, the back pressure is applied, causing the drain not to be discharged. Always carry out the downward piping so that the drain flows naturally.

3) The drain is normally discharged by the air pressure. Always secure the drain discharge tube firmly so that it does not deflect when the drain is discharged.

4) If oil is mixed with the drain, an appropriate waste water treatment is required. For waste water treatment, consult with your nearest industrial waste disposal company.

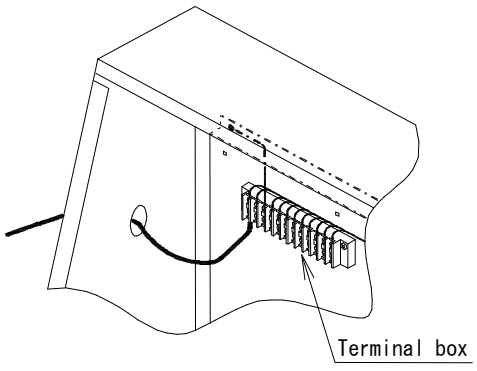
4-6 Electric wiring

1) Always operate the product at a proper power voltage.
- Operate the product at a voltage range of rated voltage ±10% or less.

2) Mount a circuit breaker for overload protection and earth leakage shut down (rated current: 5A, sensitivity current: 30mA) on the main power supply.

3) Connection of power cable
- Make a hole in the rubber bushing at the upper portion of the side panel of the main body, through which the electric cables and wires are passed.
- Connect the earth leakage circuit breaker to the terminal block L1 and L2 inside the main body.

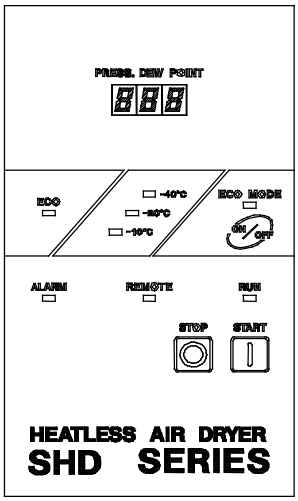
4) Connection of grounding cable
- Connect the grounding cable to the terminal block PE inside the main body.
- Never connect the grounding cable to any city water pipe, gas pipe, and lightning rod.



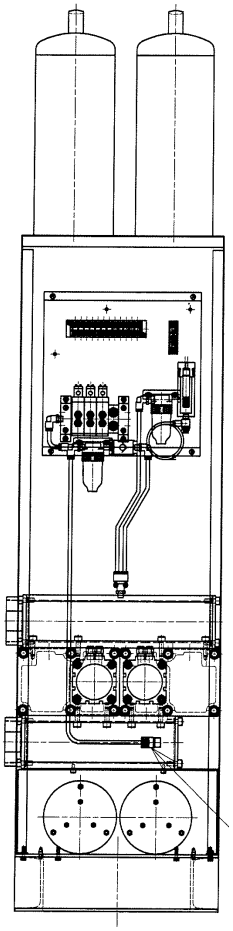
5) Insulation resistance and withstand voltage test
- Don't perform insulation resistance and withstand voltage test. Carried dew point meter and temperature and humidity sensor are damaged.
- When you carry out unavoidably, carry out after removing dew point meter and temperature and humidity sensor.

5. OPERATION

5-1 Operation



1) Make sure again that the air piping, drain piping, and electric wiring have been connected properly.
2) Close the outlet and inlet valves, and the bypass valve.
3) Turn ON the main power supply. A numeric value is shown on DEW POINT. This value shows the dew point at that time.
4) Slowly open the inlet valve to sufficiently pressurize the main body. Two pressure gauges show the same pressure level.
5) Since inlet valve may have closed when pressure is not improved, even if it introduces air, even when it is troublesome, open manual valve in front panel. If it works normally, be sure to close manual valve.(Do measures same as the above in there being the thing that the inlet valve of both vessels closes it at the time of re-pressurization when you skipped pressure in the dryer without stopping it by STOP button or when you did START in less than 0.4MPa.)
6) After checking that the pressure level is 0.4 MPa or more, press the START button.
7) Check that the left and right desiccant vessels are switched alternately at intervals of 2 min.
8) If the product has not been used for an extended period of time, the desiccant may get damp. Close the outlet valve and carry out the regeneration purge for several hours while referring to DEW POINT.
9) When the dew point becomes close to the required level, slowly open the outlet valve to flow the compressed air.
10) During operation, when the power supply return is carried out after the former power supply was shut off by power failure etc., operation is resumed. But the phenomenon that informed 5) clauses may occur when pressure in the dryer is less than inlet pressure range.
11) If you use it under by the selected pressure, since you may be unable to demonstrate a performance, please use it above the surely selected pressure.
12) Be careful that the dew point will not be stabilized if using flow rate is changed sharply.
13) At the time of test run starting after this machine installation, pass about 10-20% of flow rate, and operate the following time.



Pressure dew point (℃)(NOTE)	-20	-30	-40	-60
(reference) Atmospheric dew point (℃)	-40	-48	-57	-74
Time(h)	6	12	24	72

NOTE:Pressure dew point is 0.7MPa.

14) Since it has set up beforehand, do not touch the needle valve (refer to 6-3 clause) attached to the dew point sensor lower part.

5-2 Operation stop

1) Close the inlet and outlet valves.
2) Press the STOP button. DEW POINT is still displayed even at this time.
3) Turn OFF the main power supply.
4) Since dryer passes air also during a stop, be sure to close inlet and outlet valve.

5-3 Energy saving unit

This product is equipped with an energy saving unit as a standard accessory. The following shows the outline of the energy saving unit.

1) Turn ON or OFF the energy saving unit using the ECO MODE button. When the energy saving unit is powered ON, the indication lamp is lit. Additionally, the lamp is lit to show the dew point value, which is set at this time.
2) To change the set dew point, keep the ECO MODE button pressed for 2 sec. with the energy saving unit turned OFF ([ECO] lamp is off.). Since ECO MODE blinks in that case and it displays that a change is possible, please be sure to check blinking. When pressing the STOP button in this state, the numeric value can be changed. When a desired numeric value is shown, press the ECO MODE button to set this value. (Blinking changes to lighting.)
3) The dew point set for the G-type (standard type) is different from that set for the M-type (high-grade type).

Pressure dew point	-10℃	-20℃	-40℃	-60℃
G-type	○	○	○	
M-type		○	○	○

4) The dew point, at which the operation is actually changed to the energy saving operation, is set at a level slightly lower than the set dew point level. Therefore, the energy saving operation is not started at the set dew point.

	-10℃ setting	-20℃ setting	-40℃ setting	-60℃ setting
Dew point changed to energy saving	Less than -14℃	Less than -24℃	Less than -44℃	Less than -64℃
Dew point which energy saving goes out	Over -12℃	Over -22℃	Over -42℃	Over -62℃

5) If the flow consumption is small, the dew point does not become worse with the energy saving operation started. At this time, the operation is forcibly returned to the normal operation after 1 hour has elapsed.

6) The sensor used for the G-type is different from that for the M-type.

G-type	Temperature and humidity sensor Approximately +20°C to −45°C	In particular, the accuracy becomes very bad in the low dew point area (standard use). Trouble may occur in energy saving operation by the case at the time of −40 ℃ specification.
M-type	Dew point meter +20℃ to −80℃	The measurement can be performed with a high accuracy in the entire area (±2°C at dew point >−60°C)

7) When the energy saving operation is started, the ECO lamp is lit, the purge is stopped, and both vessels A and B are pressurized. The desiccant vessels are not switched and the current status is kept. (The switching time is extended.) When the operation is returned to the normal operation, the ECO lamp goes off and the purge is restarted.

8) We recommend you to make it the energy-saving setting dew point in the same numerical value as the rated dew point selected in model. Be careful, since the disposal of reducing inlet flow is needed in case the setting dew point is changed more into a low dew point side.

9) If 24 hours after operation start pass, energy saving rate can be displayed to display part as numerical value by pushing START button during operation. Use for management every day. In addition, be careful, since it cannot be used during stop.

ENERGY SAVING RATE = 1- (PURGE TIME IN ENERGY SAVING) / (PURGE TIME IN RATING)

5-4 No load operation

After purchase, or when there is little air consumption by the side of secondary, and energy-saving operation has not been carried out, the surface outside the desiccant vessels may get cold and may dew or freeze. This is a phenomenon which happens at the time of desiccant reproduction, and is not alarm. If you put in energy-saving equipment, dew condensation will stop being able to occur easily.

5-5 Alarm outlet

This product is equipped standardly with the alarm signal output. In addition, when the power supply is not on, it shows you as alarm.

1) Alarm sensor

① Disconnection of a sensor etc. shows you with a non-voltage contact output (alarm time) and displaying the dew point display part of an operation panel as "A01"after starting, However, main part does not stop. It will be canceled if it returns to normal. In addition, after pushing STOP in the state of the abnormalities in a sensor (A01 display), even if it pushes START, it does not start. It will start, if START is pushed after canceling abnormalities or making it reset (it is 2-second length aggressiveness about START). (Since reset cannot do at the time of remote operation, perform reset, once changing to local operation.)

② Keep in mind that the contact capacity of the relay for an output and the minimum application load are shown in the 「8-5 electric circuit diagram」.

2) Alarm dew point

① To the energy-saving setting dew point, if it becomes +2 degrees C, alarm dew point shows you with a non-voltage contact output (alarm time) and blinking the dew point value of the dew point display part of an operation panel. However, a main part does not stop. If the dew point returns within normal limits, abnormalities will be canceled automatically. (See 「5-8 Parameter setting change」 in case of changing dew point alarm setting value.)

Energy-saving setting dew point	-10℃	-20℃	-40℃	-60℃
Alarm dew point	-5℃	-15℃	-35℃	-55℃

Moreover, an alarm output is sent with the dew point setting value usually turned on at the time of the last energy-saving operation at the time of operation (when the dew point setting lamp is off).

② Since, as for immediately after operation, the dew point is bad in many cases, dew point alarm output is not taken out for about 12 hours after operation. (See 「5-8 Parameter setting change」 in case of changing time setting value.)

③ Keep in mind that the contact capacity of the relay for an output and the minimum application load are shown in the 「8-5 electric circuit diagram」.

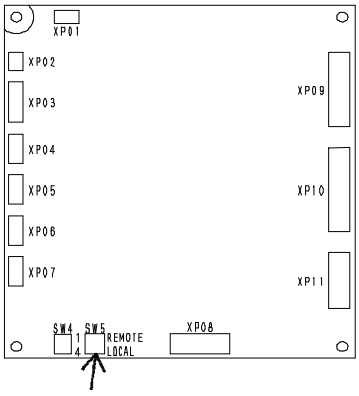
④ Even if former power supply is on, and dew point gets worse at the time of dryer stop, alarm dew point do not output.

⑤ Alarm dew point sent during operation is continued sending after stop. It is reset at the time of re-operation.

5-6 Remote operation

1) Please switch the switch in a controller side to REMOTE. The REMOTE lamp of an operation panel side lights up.
2) Please wire a proper terminal after checking power supply voltage based on 「8-5 electric circuit diagram」.
3) Keep in mind that the "start" and "stop" button of an operation panel side does not work during remote operation.
4) Dryer is stopped after changing to LOCAL. by change switch during remote operation.

<Controller side>

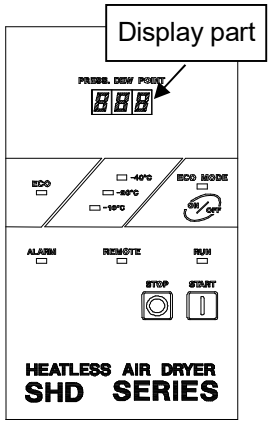


Change switch

5-7 Operation output

1) Non-voltage contact output closed during operation is equipped standardly. Wire proper based on 「8-5 Electric circuit diagram」.

2) Keep in mind that the contact capacity of the relay for an output and the minimum application load are shown in the 「8-5 electric circuit diagram」.



5-8 Parameter setting change

1) When you change a setup of a control board unavoidably, Change carefully in the following procedures.

① Stop this machine with the STOP button.

② Pushing the STOP button previously, push the ECO MODE button for 5 seconds.

③ A display part is set to 0 0 -7 and -7 blinks.

④ The meaning of a display number is shown below.

NO	Display number			Contents	
1	0	0	-7	The dew point excluded energy saving at the time of -10℃ setup	Over -12℃
2	-7	0	-1	The dew point included in energy saving at the time of -10℃ setup	Less than -14℃
3	-7	-7	-7	The dew point excluded energy saving at the time of -20℃ setup	Over -22℃
4	-1	-7	-1	The dew point included in energy saving at the time of -20℃ setup	Less than -24℃
5	-7	-1	-7	The dew point excluded energy saving at the time of -40℃ setup	Over -42℃
6	-7	-1	-1	The dew point included in energy saving at the time of -40℃ setup	Less than -44℃
7	7	-7	-7	The dew point excluded energy saving at the time of -60℃ setup	Over -62℃
8	-7	-7	-1	The dew point included in energy saving at the time of -60℃ setup	Less than -64℃
9	-7	7	7	Factory set (Don't touch)	
10	7.	7	7		
11	0.	7	7		
12	-7.	7	7		
13	-7.	7	7		

１４	7.	7	7	Dew point alarm value （A difference with the dew point to which energy saving goes out is shown.）	7℃ difference
１５	7.	7	7	Factory set (Don't touch)	
１６	7.	7	7		
１７	7.	7	7		
１８	7.	7	7		
１９	7.	7	7	Time not to take out a dew point alarm output	12 hours

⑤ Since a display changes from No1 to No19 whenever it pushes the ECO MODE button every 1 time, change to the item which makes a setting change.

⑥ Since the number of blink increases one by one, the next of "9" is set to "0" and it comes to increase again by pushing the START button once, change to the number of hope.

⑦ Push the STOP button, when you change the beam of blink number. Whenever it pushes, central number and right number blink by turns. The number which blinked can be changed like ⑤.

⑧ If it is set as the numerical value of hope, ECO MODE button is repeated and pushed again, and return to a dew point display. A setup is an end above.

⑨ Push and reboot the START button.

2) Setup of a dew point alarm value sets up difference with the dew point to which energy saving goes out. (The dew point set up in No.1, 3, 5 and 7)

(Example: 「42−7=35」−35℃ becomes a setting value at the time of 40℃ setup. If dew point alarm value setup is changed, setup of all each energy saving dew point will change simultaneously.

3) Don't change the parameter of factory set by any means. Once intercepting a power supply completely at the times at the time of changing accidentally etc. Supply power supply, pushing the STOP button and the START button simultaneously. An all clearance is carried out and it returns to the same state as the time of purchase.

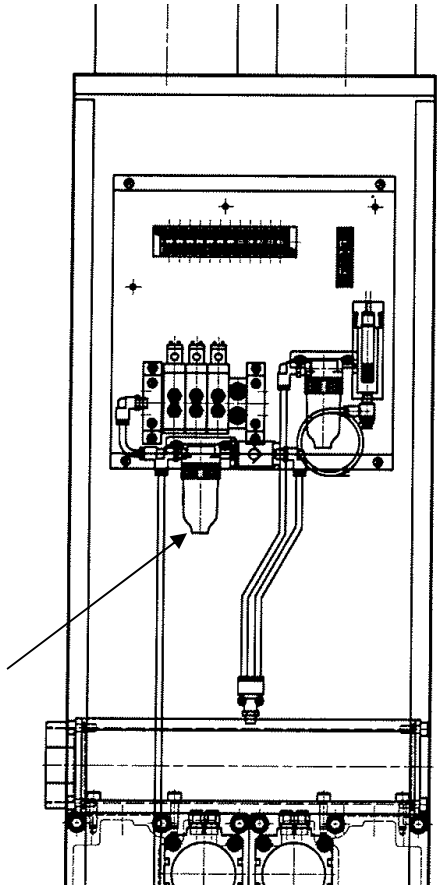
6. MAINTENANCE AND INSPECTION

Periodic inspection

Carry out the following inspections to operate this product at its optimal operating level, prevent a trouble beforehand, and operate the product correctly for an extended period of time. If any inspection item is satisfied, take appropriate actions while referring to section 5. Troubleshooting.

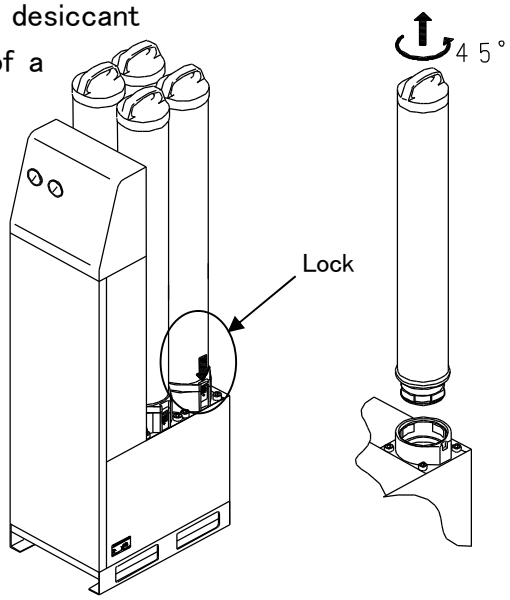
Inspection location	Inspection item	Inspection frequency				
		Every day	Every week	Every month	Half a year	
[RUN] lamp	[RUN] lamp is lit	○				
Dew point display	Dew point is displayed.	○				
Indicator for differential pressure between pre- and after-filter.	Do not enter the red zone.		○			

Note: At the time of maintenance, stop dryer, and check that there is no pressure with a pressure gauge, and also extract residual pressure in filter from filter lower part of the right figure.

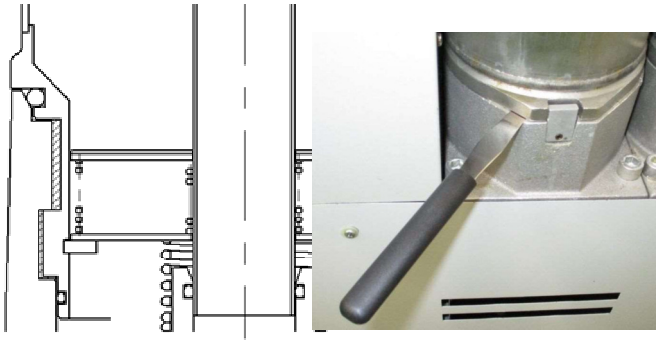


6-1 Replacement of desiccant vessel

A spring, desiccant, porous plate, filter, etc. are assembled into the desiccant vessel, and this desiccant vessel is mounted on the main body. The desiccant vessel needs to be replaced at reference intervals of 2 years. since it has shown the of desiccant exchange method to 「8-6 list of spare parts」, it is chosen of a visitor.



1) Stop the operation while referring to section 5-2, Operation stop.
2) Loosen the lock set screw at the lower portion of the desiccant vessel and slide it downward.
3) Turn the desiccant vessel 45° and pull it out upward.
   Note) If the vessel does not move steadily and the cylinder cannot rotate, push the tool attached to the product into the gap as shown on the right. When the pressure remains, the pressure is released and the cylinder moves steadily, allowing it to rotate.
   (Relieve the pressure remaining in the shaded area)

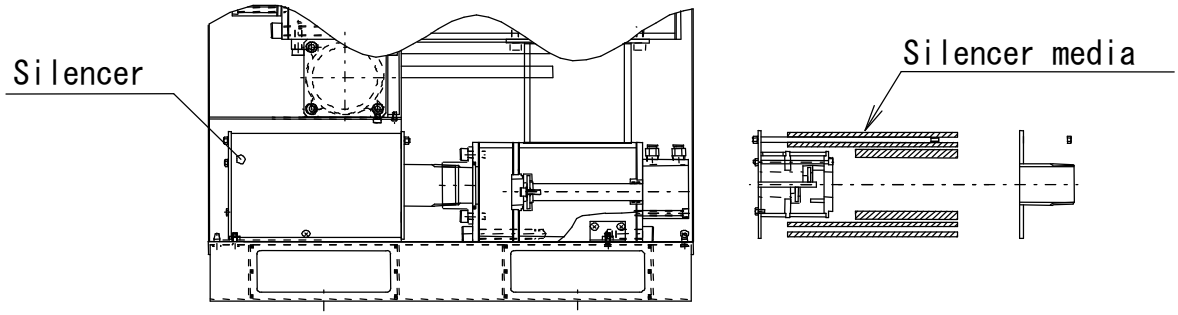


4) Please exchange by the selected drier exchange method.
5) Check that the O-ring is mounted on a new desiccant vessel and that the grease is applied to the O-ring. Mount a new vessel in the reverse order of disassembly.
6) After the new vessel has been mounted completely, slide the lock upward and secure the lock using the set screw.(Please tighten at 2.5Nm)

6-2 Replacement of silencer

Change one year for an aim.

1) Remove the front panel and side panel.
2) Remove the silencer using an appropriate tool, such as pipe wrench.
3) Disassemble the silencer as shown in the Fig. and replace the silencer media part with a new one.
4) Reassemble the silencer in the reverse order of disassembly, and then mount the panels.

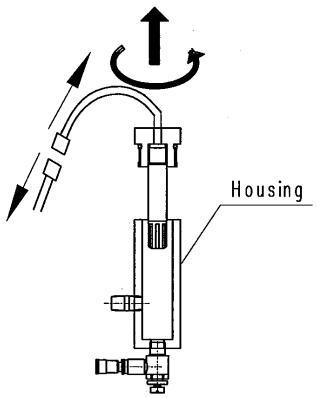


6-3 Replacement of dew point sensor

1) G-type (standard type)

This product uses a temperature and humidity sensor. It is recommended to replace this dew point sensor at reference intervals of 1 year.

If the sensor is used continuously for 1 year or longer, the accuracy becomes worse gradually.

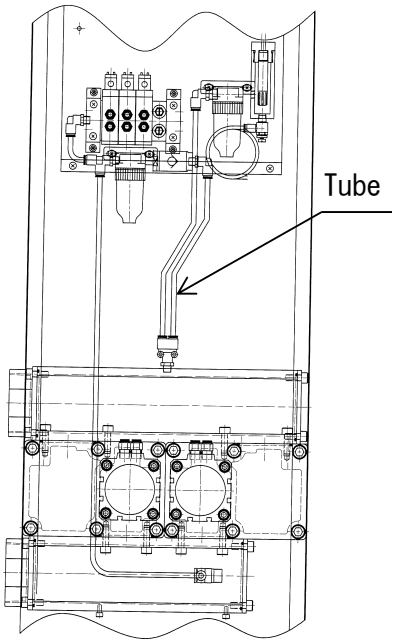


① Stop the operation while referring to 「5-2 Operation stop」.

② Open the operation panel and front panel.

③ Disconnect the connector located at the intermediate position between the board and sensor. Turn the sensor assembly to remove it from the housing.

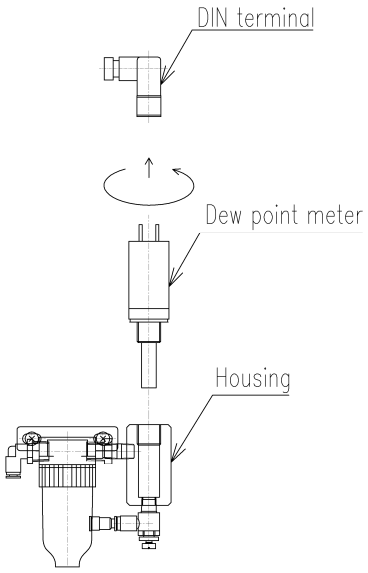
④ Check that the grease is applied to the O-ring of a new sensor assembly and reassemble the new sensor assembly in reverse order of disassembly.



⑤ Since the former power supply is returned when making it start where the sensor is removed, please push START. Operation panel display part displays "A01" with the alarm sensor simultaneously with starting. Refer to page 9 "alarm sensor". In addition, please remove the tube (right figure) which is piped from this machine to the dew point sensor in that case, and attach 6mm blank plug. If the plug is not attached, air will breathe out.

2) M-type (high-grade type)

This product uses a highly precise dew point meter. It is recommended to calibrate this dew point meter at reference intervals of 1 year. If the dew point meter is used continuously for 1 year or longer, the accuracy becomes worse gradually.



① Stop the operation while referring to 「5-2 Operation stop」.

② Open the operation panel and front panel.

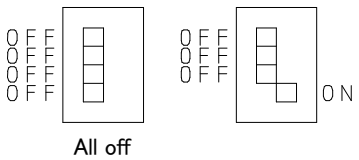
③ Remove the DIN terminal box, which is attached to the dew point meter. Turn the dew point meter to remove it from the housing.

④ Please remove the tube (right figure) piped from this machine to the dew point meter, and attach 6mm blank plug instead. If it does not attach, air will breathe out.

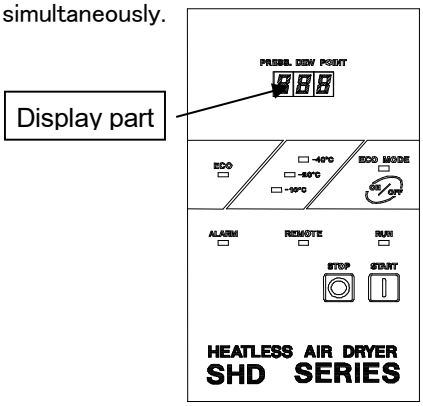
⑤ Since the former power supply is returned when making it start removed, please push START. An operation panel display part displays "A01" with the alarm sensor simultaneously with starting. Refer to page 9 "alarm sensor".

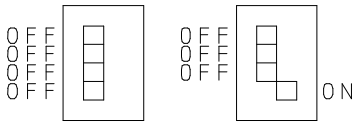
⑥ If the proofread dew point meter arrives, please attach with a reverse power supply.

7. TROUBLESHOOTING

Condition	Display	Causes	Measures
Regeneration purge cannot be performed.		Power is not supplied.	Turn ON the power (DEW POINT is displayed).
		Voltage is different.	Use the correct voltage.
		Faulty wiring exists.	Repair the defective part after checking.
		Fuse is blown out.	Replace the fuse after checking.
		Energy saving operation is started. (ECO lamp is lit.)	This is correct operation. To return to the normal operation, turn OFF the ECO button.
Regeneration purge occurs too frequently.		Solenoid valve is faulty.	Replace the solenoid valve.
		Cylinder is faulty.	Replace the cylinder.
		Foreign matter is caught in the main valve.	Disassemble the valve to clean it.
		Gasket of the exhaust valve is faulty.	Replace the gasket.
		Foreign matter is caught in the check valve.	Disassemble the valve to clean it.
[RUN] lamp does not light up.		Lamp bulb is burnt up.	Replace the controller.
		[START] switch is faulty.	Replace the controller.
[DEW POINT] is not displayed.		Lamp bulb is burnt up.	Replace the controller.
		Controller is faulty.	Replace the controller.
	A01	Position of the DIP-switch on the rear of the controller is incorrect.	Change the DIP-switch to its proper position, and then all clear is carried out. 「G-type」 「M-type」  All off
		Dew point sensor is faulty.	Replace the dew point sensor.

Note) All clear : Power supply is supplied pushing [STOP] button and [START] button simultaneously.



Condition	Display	Causes	Measures
[ALARM] lamp is lit.	A01	Wiring of the dew point sensor is not connected.	Connect the wiring of the dew point sensor. (A01 puts out the light.)
	A01	Dew point sensor is faulty.	Replace the dew point sensor. (A01 puts out the light.)
	Blink	Dew point is high.	Lower the inlet air temperature and inlet air flow.
	A01	Position of the DIP switch on the rear of the controller is incorrect.	Change the DIP switch to its proper position, and then all clear is carried out. 「G-type」 「M-type」  All off
	A01	Connector of board (XP03, XP04) has not fitted in.	It is fitted in. (A01 puts out the light.)
White powder particles come out from the silencer.		Powder particles sticking to the desiccant, which is not in use, may scatter.	It is correct. Powder particles are produced when this product is operated for the first time. This symptom may disappear after the product has been operated for a while.
Water comes out from the silencer.		Inlet air temperature is too high.	Lower the inlet air temperature.
		Auto drain of the filter is broken and water drops may enter the dryer.	Repair the auto drain.
		Air flow is too high.	Lower the air flow rate to its rated level.
The dew point does not fall.		Time is required in order to reach the low dew point.	The standard of time is indicated in "5-1 operation."
Dew is attached to a desiccant vessel.		At the time of desorption, it is because it gets cold and is not unusual. There are especially few amounts of secondary side consumption, and it is the phenomenon which is easy to set while not putting in energy saving equipment.	It will become difficult to set if energy saving equipment is put in.
Even if it puts in energy-saving equipment, it will fall from the setting dew point.		Since the desiccant is new immediately after installation, the dew point will fall.	It is not unusual. If you can use for a while, it will become close to the setting dew point.
Do not start		Both inlet valve shut when pressuring it afterwards because it had done STRAT when pressure was low.	A manual valve is opened. Refer to 5-1-5) to the clause.
		STRAT button is not pushed.	It is started pushing the STRAT button.

8. ATTACHED REFERENCES

8-1 Specifications

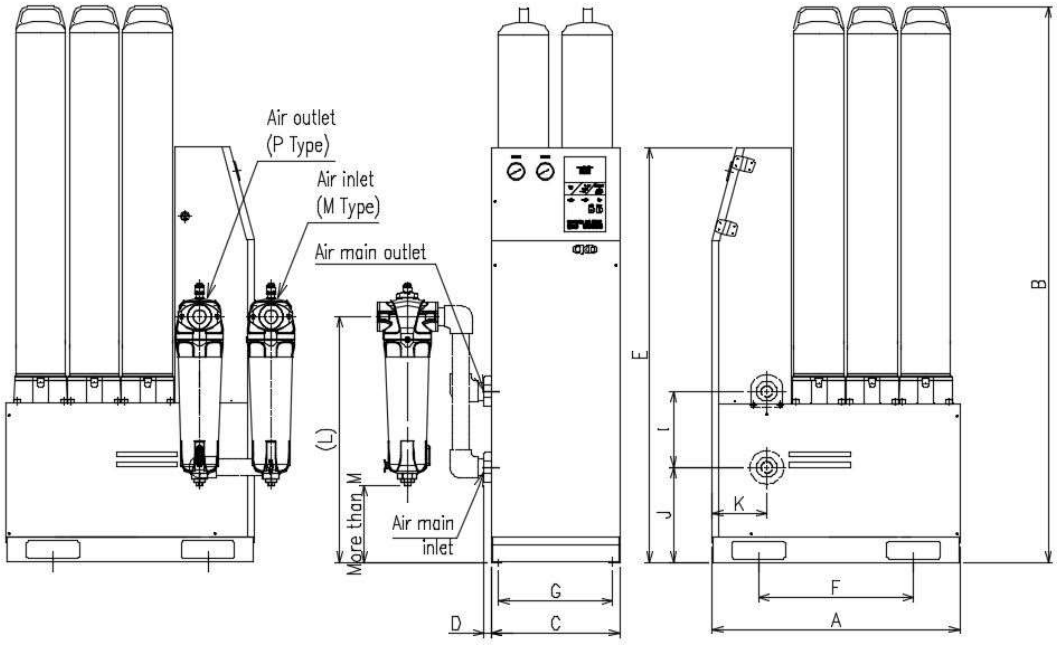
Item			SHD3025	SHD3045	SHD3075	SHD3100	SHD3125	SHD3150	SHD3200	SHD3240
Media			Compressed air							
Inlet air pressure range		MPa	0.4～1.0							
Inlet air temperature range		℃	5～50							
Ambient temperature		℃	0～40							
Rated conditions	Inlet air temperature	℃	35 (No water drops allowed.)							
	Ambient temperature	℃	25							
	Inlet air pressure	MPa	0.7							
	Inlet air flow	m^3/min(ANR)	2.5	4.5	7.5	10	12.5	15	20	24
	Outlet pressure dew point	℃	−20,−40,−60							
	Average purge ratio	%	−20℃:14 / −40℃:16.5 / −60℃:23							
Number of desiccant vessel modules			1	2	3	4	5	6	8	10
Regeneration method			Self-regeneration heatless method							
Desiccant			Activated alumina, synthetic zeolite							
Dew point sensor			G type: Capacitance type temperature and humidity sensor/ M type: Dew point meter (Capacitance type ceramics sensor)							
Power supply			Single-phase AC100/200V, 50/60Hz							
Power consumption			15W							
Connecting port diameter		Rc	1	1	$1^1/_2$	$1^1/_2$	2	2	$2^1/_2$	$2^1/_2$
Mass		kg	120	180	240	300	370	430	550	670
Accessory filter (For inlet side) STD.			AF2-05M25A	AF2-08M32A	AF2-11M40A	AF2-13M50A	AF2-13M50A	AF2-20M50A	AF2-24M65A	
Accessory filter (For outlet side) STD.			AF2-05P25A	AF2-08P32A	AF2-11P40A	AF2-13M50A	AF2-13P50A	AF2-20P50A	AF2-24P65A	
Accessory filter (For inlet side) Option:E2			AF4004M-25	AF4007M-40	AF4010M-40	AF4010M-40	AF4013M-50	AF4020M-50	AF5032M-80	
Accessory filter (For outlet side) Option:E2			AF4004P-25	AF4007P-40	AF4010P-40	AF4010P-40	AF4013P-50	AF4020S-50	AF5032P-80	

Note 1: The standard paint color is quality cool white (Munsell No. 5GY7.5/0.5).

Note 2: Mount the filters supplied with the product on the inlet and outlet sides.

Note 3: ANR shows the status at an atmospheric temperature of 20° and at a relative humidity of 65%.

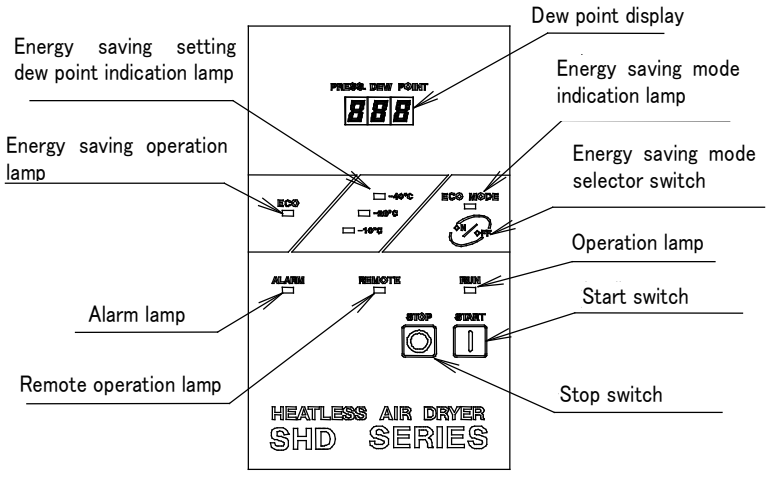
8-2 Outside drawing



Model	Port size	A	B	C	D	E	F	G	H	I	J	K	L	M	L (option:E2)	M (option:E2)
SHD3025	Rc1	545	1559	360	20	1163	285	320	Φ12	213	266.5	153.5	427.6	80	570	126
SHD3045	Rc1	545	1559	360	20	1163	285	320	Φ12	213	266.5	153.5	574	100	730	212
SHD3075	Rc1 1/2	695	1559	360	20	1163	435	320	Φ12	213	266.5	153.5	574	100	940	314
SHD3100	Rc1 1/2	845	1559	360	20	1163	585	320	Φ12	213	266.5	153.5	574	100	940	314
SHD3125	Rc2	995	1589	360	20	1193	590	330	Φ15	213	296.5	153.5	574	100	1100	387
SHD3150	Rc2	1145	1589	360	20	1193	700	330	Φ15	213	296.5	153.5	774	100	1420	550
SHD3200	Rc2 1/2	1445	1589	360	20	1193	780	330	Φ15	213	296.5	153.5	785	100	1255	–
SHD3240	Rc2 1/2	1745	1589	360	20	1193	780	330	Φ15	213	296.5	153.5	785	100	1255	–

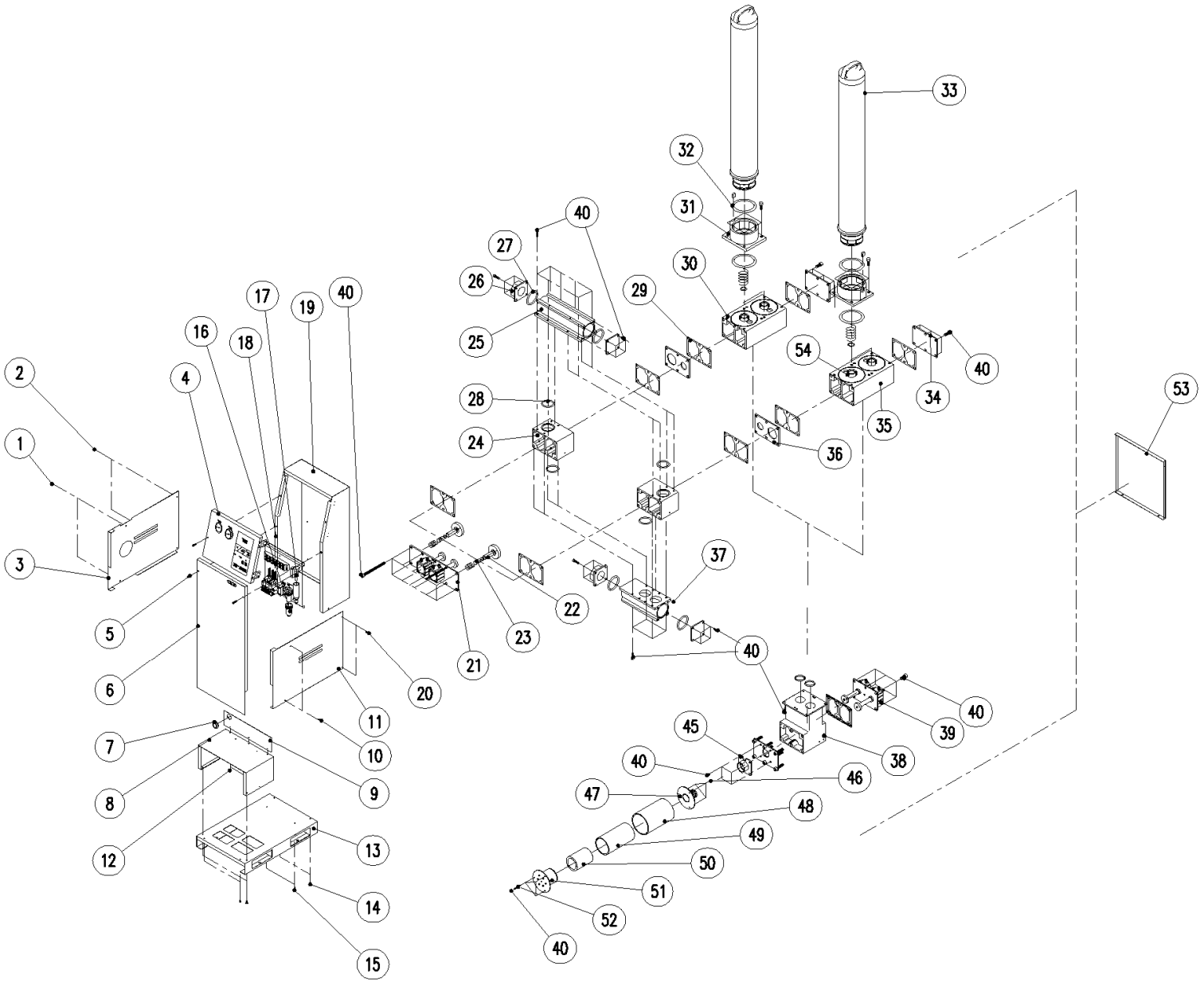
The dashed line in the figure is not attached.
The filter is attached.

Operation panel



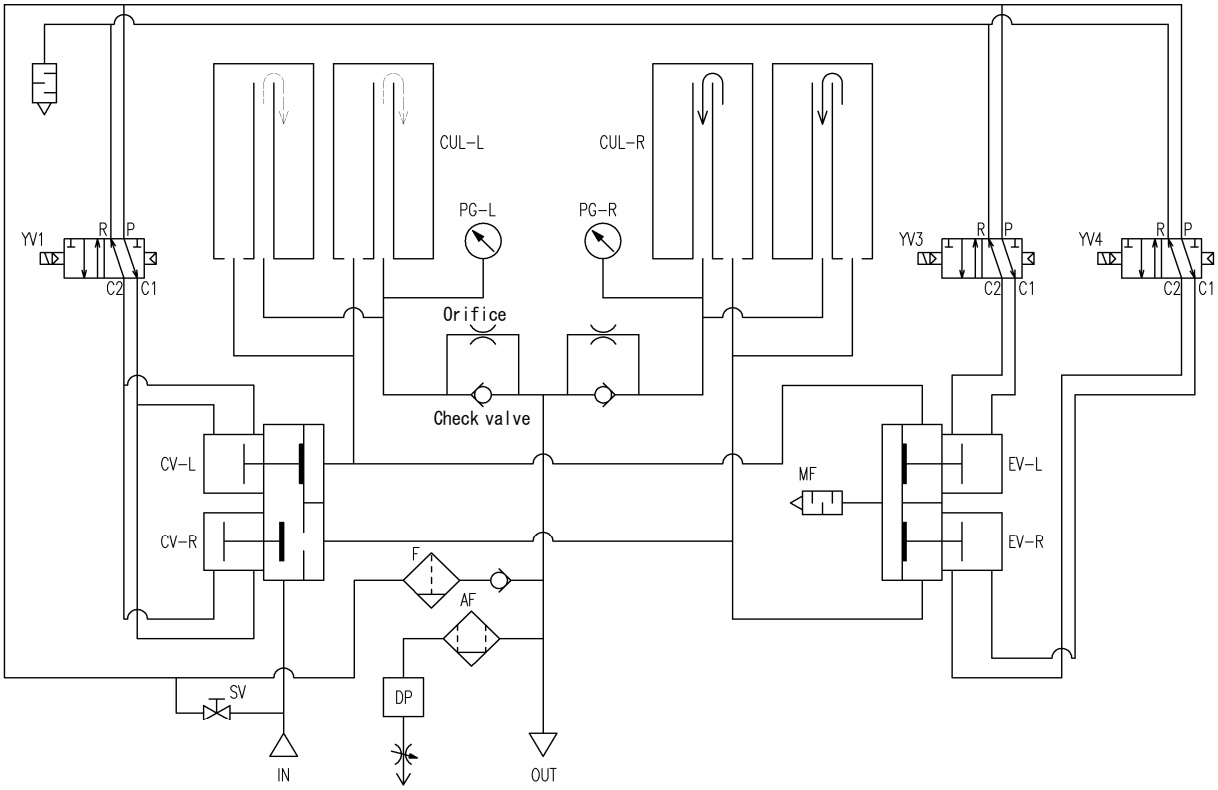
8-3 Internal structure drawing

No.	Parts name	No.	Parts name
1	Pan head B tight screw	36	Main block plate
2	Tapping truss head screw 3	37	Outlet piping
3	Side panel L	38	Exhaust block
4	Operation panel assembly	39	Exhaust valve assy
5	Tapping truss head screw 1	40	Hexagon socket head cap bolt
6	Front panel	45	Exhaust piping adapter
7	Rubber bushing	46	Nut
8	Base	47	Silencer top plate
9	Shield plate	48	Silencer outer media
10	Pan head B tight screw	49	Silencer medium media
11	Side panel R	50	Silencer inner media
12	Tapping truss head screw 3	51	Silencer bottom plate assembly
13	Base	52	Tie rod
14	Pin welded	53	Rear panel
15	Hexagon nut	54	Pipe guide
16	Microalescer		
17	Dew point sensor		
18	Unit base assembly		
19	Main panel		
20	Tapping truss head screw 3		
21	Inlet valve assembly		
22	Check valve assembly		
23	Orifice		
24	Main block		
25	Outlet piping		
26	Piping adapter		
27	O ring		
28	O ring		
29	Passage gasket		
30	Passage R		
31	Body clamp		
32	O ring		
33	Desiccant vessel assembly		
34	Passage cap		
35	Passage L		



<SM-13024-A>

8-4 System diagram



Model	Parts name	Numbers
CV-R	Air activation valve (Right)	1
CV-L	Air activation valve (Left)	1
EV-R	Exhaust valve(Right)	1
EV-L	Exhaust valve(Left)	1
YV1	Solenoid valve	1
YV3	Solenoid valve	1
YV4	Solenoid valve	1
CUL-R	Desiccant vessel (Right)	1
CUL-L	Desiccant vessel (Left)	1
MF	Silencer	1
AF	Microalescer	1
DP	Dew-point sensor	1
PG-R	Pressure gauge (Right)	1
PG-L	Pressure gauge (Left)	1
SV	Manual valve	1
F	Filter	1

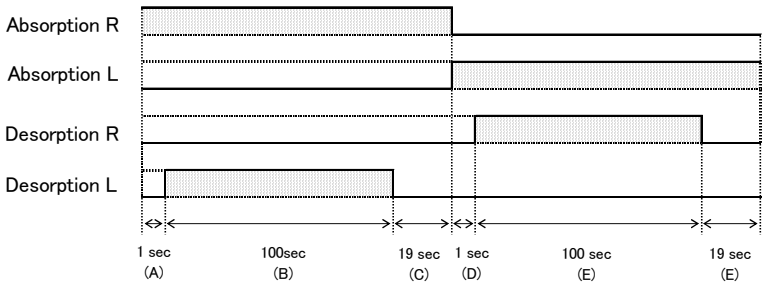
The damp compressed air which entered from IN goes into desiccant vessel CUL-L through Valve CV-R. The damp compressed air flows the inside of the desiccant equally, with the desiccant, it adsorbs the steam in compressed air, turns into super-dry air, and comes out of OUT through a check valve. A part of super-dry air decompressed through the orifice goes into desiccant vessel CUL-R, and it is used for reproduction dryness of the desiccant of CUL-R, and is emitted to the atmosphere. A part of air which came out of OUT is led to the dew point sensor DP, and dew point measurement is carried out. It goes into the energy-saving mode which switches by the dew point and extends time.
(Desorption process is ended, and after that, both vessels are held in pressure rising state and carry out change time extension.)

Time chart drawing

Normal process is shown in the following.
The state (C, F) after desorption is completed is held at the time of energy saving If subsequent dew point becomes bad, change will be resumed and it will return to normal process.

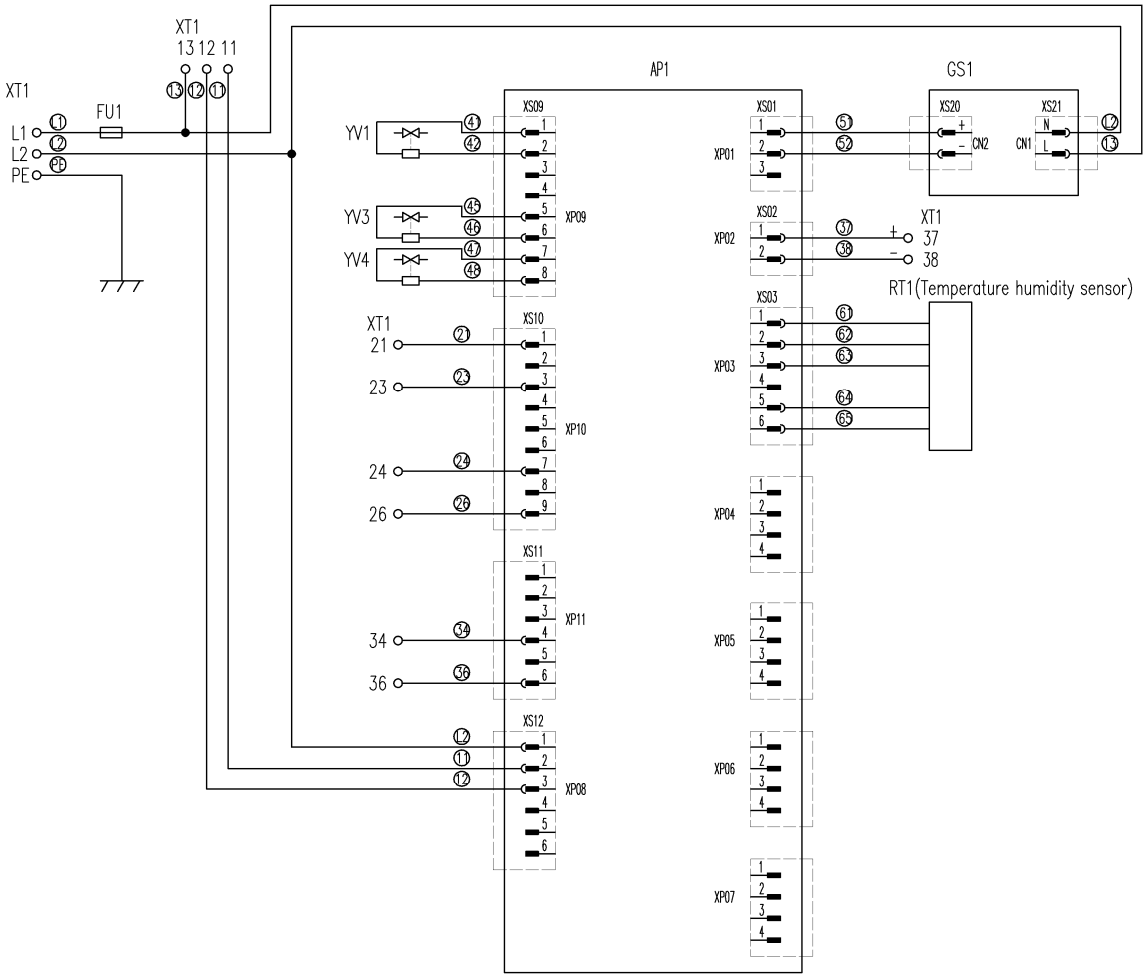
B、E is desorption(regeneration) time

C,F shows pressure rising time.



8-5 Electric circuit diagram

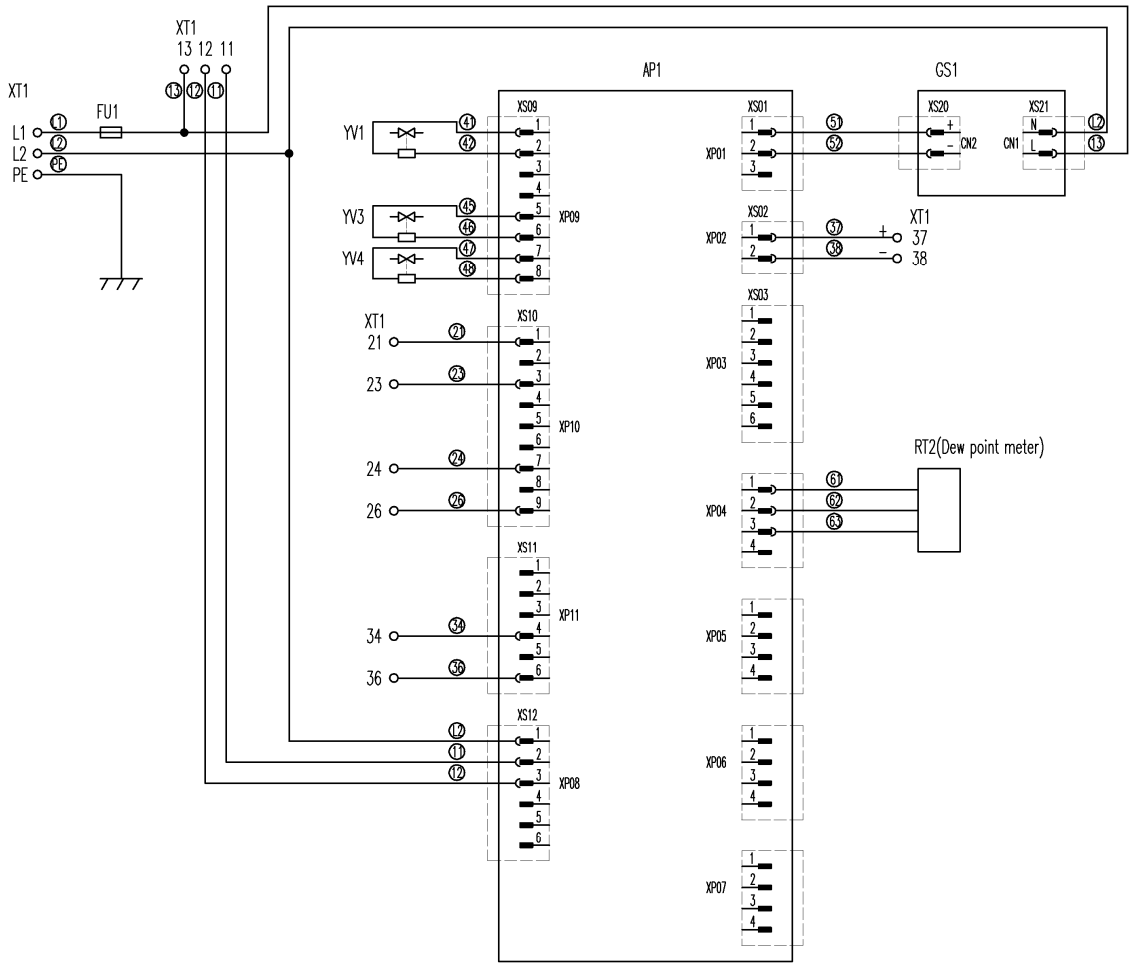
1）G-type



Model	Parts list
GS1	Power supply
RT1	Temperature and humidity sensor
AP1	Main board
YV1	Solenoid valve
YV3	Solenoid valve
YV4	Solenoid valve
XT1	Terminal block
FU1	Fuse
XS01,03,20	Connector
XS08～11,21	Connector

Terminal mark	Contents
L1,L2	Power supply: single-phase AC100V/200V, 50/60Hz
PE	Ground
11,13	Remote operation signal input at a power voltage of 100V Non-voltage contact input (closed during operation)
12,13	Remote operation signal input at a power voltage of 200V Non-voltage contact input (closed during operation)
21,23	Operation signal output, non-voltage contact output (closed during operation) Contact capacity: 220V AC 0.5A, 28V DC 1A Minimum application load : DC5V 100mA
24,26	Dew-point error signal output, non-voltage contact output (opened if error occurs.) Contact capacity: 220V AC 0.5A, 28V DC 1A Minimum application load : DC5V 100mA
34,36	Sensor error signal output, non-voltage contact output (opened if error occurs.) Contact capacity: 220V AC 0.5A , 28V DC 1A Minimum application load : DC5V 100mA
37,38	Dew point output, Analog output : 0～5V Dew point : -80～+20℃

2）M-type

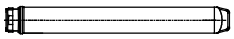
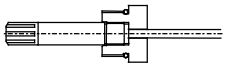
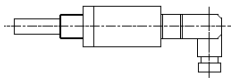
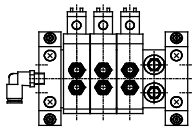
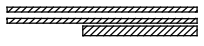
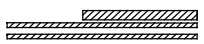


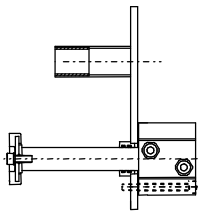
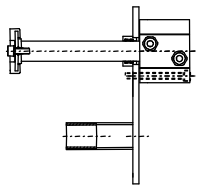
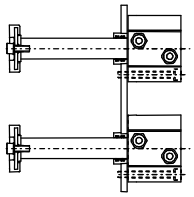
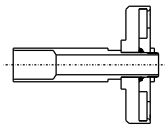
Model	Parts list
GS1	Power supply
RT2	Dew point meter
AP1	Main board
YV1	Solenoid valve
YV3	Solenoid valve
YV4	Solenoid valve
XT1	Terminal block
FU1	Fuse
XS01,03,20	Connector
XS08～11,21	Connector

Terminal mark	Contents
L1,L2	Power supply: single-phase AC100V/200V, 50/60Hz
PE	Ground
11,13	Remote operation signal input at a power voltage of 100V Non-voltage contact input (closed during operation)
12,13	Remote operation signal input at a power voltage of 200V Non-voltage contact input (closed during operation)
21,23	Operation signal output non-voltage contact output (closed during operation) Contact capacity: 220V AC 0.5A, 28V DC 1A Minimum application load : DC5V 100mA
24,26	Dew-point error signal output, non-voltage contact output (opened if error occurs.) Contact capacity: 220V AC 0.5A, 28V DC 1A Minimum application load : DC5V 100mA
34,36	Sensor error signal output, non-voltage contact output (opened if error occurs.) Contact capacity: 220V AC 0.5A , 28V DC 1A Minimum application load : DC5V 100mA
37,38	Dew point output, Analog output : 0～5V Dew point : -80～+20℃

8-6 List of spare parts

To always operate this product safely, keep adequate spare parts in stock corresponding to the service life of each maintenance part.

No.	Part name	Parts No.	Sketch	Numbers		Service life of maintenance part		
						1 year or less	2 year or less	3 year or less
1	Desiccant vessel assembly	SHD3025-AFL-326465 SHD3045-AFL-326466		1				
2	Desiccant exchange	SHD3025-KFL-326473 SHD3045-KFL-326474 SHD3075-KFL-326475 SHD3100-KFL-326476 SHD3125-KFL-326477 SHD3150-KFL-326478 SHD3200-KFL-326479 SHD3240-KFL-326480	When replacing only the desiccant, this replacement work is performed by CKD. To do so, send the desiccant vessel assembly back to CKD. CKD will return the desiccant vessel assembly with the desiccant replaced	1			○	
3	Desiccant	SHD3025-KFL-329872 SHD3045-KFL-329873 SHD3075-KFL-329874 SHD3100-KFL-329875 SHD3125-KFL-329876 SHD3150-KFL-329877 SHD3200-KFL-329878 SHD3240-KFL-329879	This is the desiccant for local exchange. Contact to CKD at the time of exchange.	1				
4	Temperature and humidity sensor	SHD-AFL-328221		1		○		
5	Dew point meter	SHD-KFL-358299		1		○		
6	Calibration of dew point meter	SHD-QFL-358300	The dew point meter of the M-type product needs to be calibrated. To do so, send the dew point meter back to CKD. CKD will return the dew point meter after it has been calibrated correctly.	1		○		
7	Solenoid valve	SHD-A FL-328224		1				○
8	Silencer media	SHD-Q FL-328225		SHD3025 SHD3045 SHD3075	1	○		
				SHD3100 SHD3125 SHD3150	2			
9	Silencer media	SHD-Q FL-328226		SHD3200 SHD3240	2	○		

No.	Part name	Parts No.	Sketch	Numbers		Service life of maintenance part		
						1 year or less	2 year or less	3 year or less
10	Inlet valve assembly R	SHD-AFL-413334		SHD3025 SHD3045 SHD3075	1			○
		SHD-AFL-413336		SHD3100 SHD3125	1			
		SHD-AFL-413338		SHD3150 SHD3200 SHD3240	1			
11	Inlet valve assembly L	SHD-AFL-413335		SHD3025 SHD3045 SHD3075	1			○
		SHD-AFL-413337		SHD3100 SHD3125	1			
		SHD-AFL-413339		SHD3150 SHD3200 SHD3240	1			
12	Exhaust valve assembly	SHD-AFL-413340		SHD3025 SHD3045 SHD3075	1			○
		SHD-AFL-413341		SHD3100 SHD3125	1			
		SHD-AFL-413342		SHD3150 SHD3200 SHD3240	1			
13	Check valve assembly	SHD-AFL-331853		2				○
14	Mantle assembly	1219-MANTLE-ASSY	Microalescer mantle for dew point sensor	1				○

Note

1. Since SHD3075 or more model corresponds to the second sort pressure vessel structure standard, correspondence by the desiccant vessel assembly cannot be performed.(It becomes vessel change and re-taking an examination is needed.)
2. Desiccant exchange serves as which method of 1, 2, and 3. It chooses of a visitor.