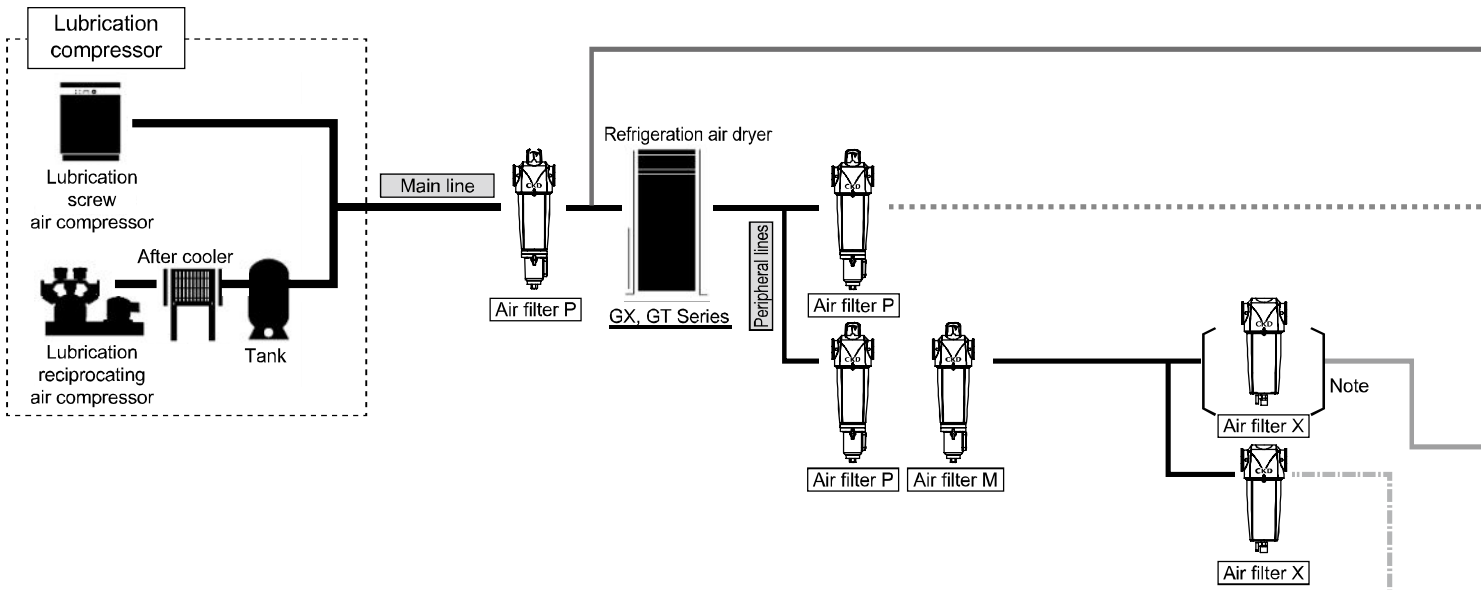
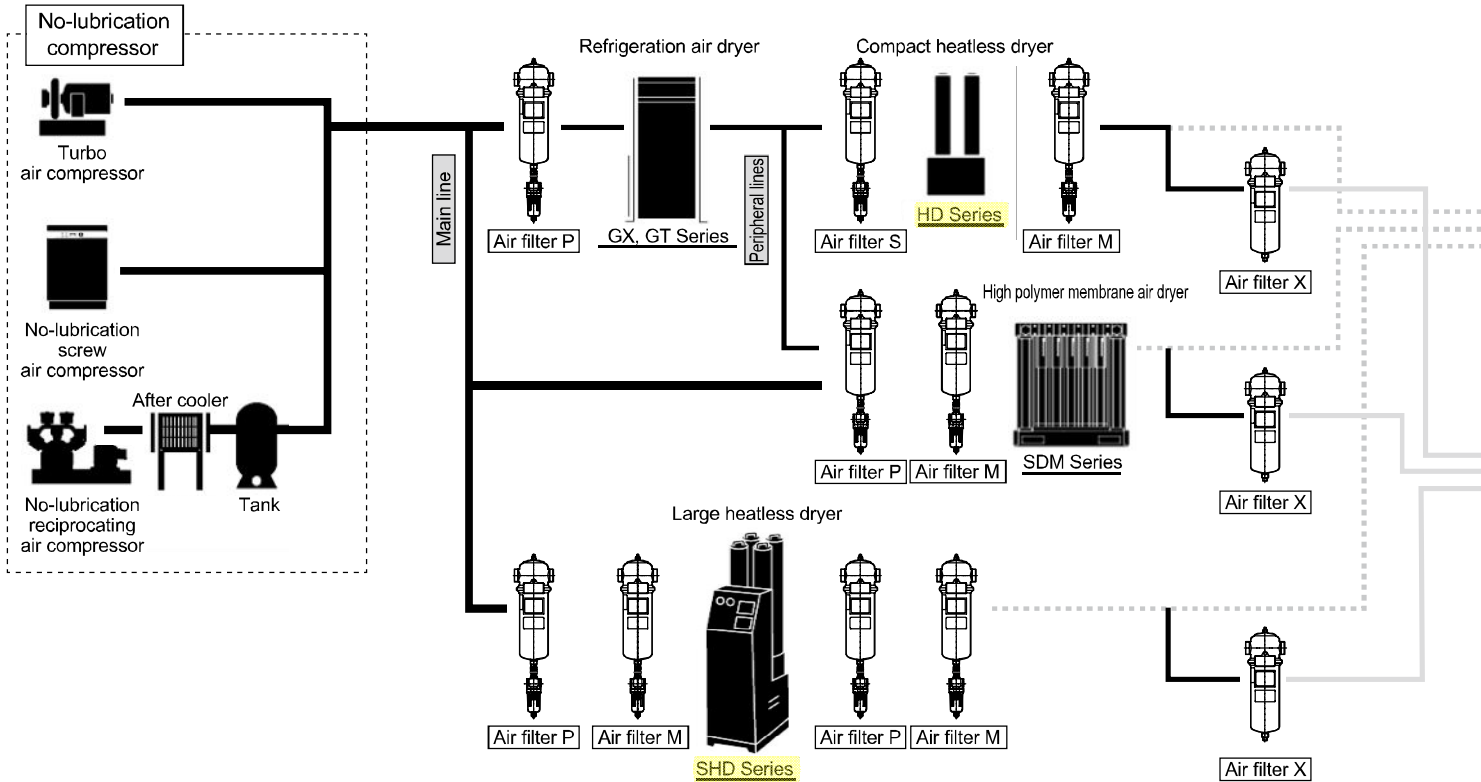


Main line component system configuration

F.R.L Medium main line filter device recommended system configuration



Note: Install the X type shown in brackets when the inlet oil vapor is 0.005 mg/m³ or more (at 21°C). The oil grade is "Grade 2" when not installed.



JIS B 8392-1:2012 Compressed air purity grade

Grade	Solid particles			Humidity and moisture		Oil
	Max. number of particles per 1 m ³ for particle diameter d (μm)	Mass concentration Cp	Pressure dew point	Water conc Cw	Total oil concentration	
	0.1 < d ≤ 0.5	0.5 < d ≤ 1.0	1.0 < d ≤ 5.0	mg/m ³	°C	g/m ³
0	Conditions stricter than Grade 1 to be specified by user or supplier.					
1	≤ 20,000	≤ 400	≤ 10	-	≤ -70	≤ 0.01
2	≤ 400,000	≤ 6,000	≤ 100	-	≤ -40	≤ 0.1
3	-	≤ 90,000	≤ 1,000	-	≤ -20	≤ 1
4	-	-	≤ 10,000	-	≤ +3	≤ 5
5	-	-	≤ 100,000	-	≤ +7	-
6	-	-	-	0 < Cp ≤ 5	≤ +10	-
7	-	-	-	5 < Cp ≤ 10	-	Cw ≤ 0.5
8	-	-	-	-	-	0.5 < Cw ≤ 5
9	-	-	-	-	-	5 < Cw ≤ 10
X	-	-	-	Cp > 10	-	Cw > 10

JIS B 8392-1:2003 has been revised to JIS B 8392-1:2012.

For example,
What is Grade 1:2:1?

- Solid particles 0.1 to 0.5 μm are 20,000 particles or less, 0.5 to 1.0 μm are 400 particles or less, and 1.0 to 5.0 μm are 10 particles or less
- Pressure dew point -40°C or less
- Oil concentration 0.01 mg/m³ or less.

Main line unit

System configuration

Air quality	Applications	Impurities in air			Grade
		Solid particles	Moisture	Oil content	
Water drip removal air/ coarse dust removal air	For construction/civil engineering machinery Air for cleaning (dry air not required)	1 μm	-	-	2:-:-
General dry air	Standard pneumatic components Standard pneumatic tools Labor saving components Jigs and tools for air Air chucks Air vices Air for cleaning precision components	1 μm	Pressure dew point 10°C	0.6 mg/m ³	2.6.3
			Pressure dew point 7°C		2.5.3
Dry air (oil-free)	For instrumentation For measurement Sequence control High-grade paint	0.01 μm	Pressure dew point 10°C	0.01 mg/m ³ [0.003 mg/m ³]	1.6.1
			Pressure dew point 7°C		1.5.1
Dry air (odorless)	Food product industry (where air is not directly blown onto food) Pharmaceutical industry For stirring/transporting/drying/packaging/ brewing	0.01 μm	Pressure dew point 10°C	0.003 mg/m ³	1.6.1
			Pressure dew point 7°C		1.5.1
Ultra dry air (oil-free)	Ozone generator Powder transfer Drying of atmospheric gas for furnaces Drying of high-voltage generator insulation gas Drying of computer rooms For centralized control instruments	0.01 μm	Pressure dew point -20°C	0.01 mg/m ³	1.3.1
			Pressure dew point -40°C		1.2.1
			Pressure dew point -60°C		1.2.1
Ultra dry air (odorless)	Food product industry (where air is not directly blown onto food) Pharmaceutical industry For stirring/transporting/drying/packaging/ brewing	0.01 μm	Pressure dew point -20°C	0.003 mg/m ³	1.3.1
			Pressure dew point -40°C		1.2.1
			Pressure dew point -60°C		1.2.1

*1: The system No. is based on the P2 class.
X in the table indicates odor removal. "-" indicates no specification.

⚠ Precautions for system selection

- *1: If your conditions are different, refer to the specifications in the catalog to select a model.
- *2: This example of system selection is based on an air-cooling refrigeration air dryer.
When selecting based on an air-cooling refrigeration air dryer, since standard processing air flow rate may differ, model No. of filter may vary.
Contact CKD for details.
- *3: Air filter and oil mist filter are to be used where the inlet air temperature is 60°C or less, and X type where the inlet air temperature is 30°C or less.
If air temperature from the secondary side of the refrigeration air dryer is high, keep enough distance from the refrigeration air dryer to maintain a temperature no greater than the inlet air temperature.
- *4: This system cannot be used for high pressure specifications (1 to 1.6 MPa). Consult with CKD for details.
- *5: Use anti-rust processed materials for piping (zinc plated pipe, lining pipe or stainless steel pipe).
- *6: If a processing air rate larger than the refrigeration air dryer supplies may be used instantaneously, install a tank to the secondary side of the refrigeration air dryer.
Installing a tank supplies stable moisture removed air.
- *7: The air filter at the secondary side of the refrigeration air dryer can be used as a pre-filter before an oil mist filter.
- *8: Depending on working conditions, condensation may form on the inside of the refrigeration air dryer and drip to the floor. To prevent water drops from flowing out, install a drain-pan, etc., before installing the dryer.
- *9: Consult with CKD for energy-saving systems.
- *10: Install a filter immediately before the equipment to be used to remove contaminants caused in piping.




F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
PhiResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PresCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterPtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

Main line unit

- F.R.L
- F (Filtr)
- R (Reg)
- L (Lub)
- PresSW
- Shutoff
- SlowStart
- FlmResistFR
- Oil-ProhR
- MedPresFR
- No Cu/
PTFE FRL
- Outdrs FR
- F.R.L
(Related)
- CompFRL
- LgFRL
- PrecsR
- VacF/R
- Clean FR
- ElecPneuR
- AirBoost
- SpdContr
- Silncr
- CheckV/
other
- Jnt/tube
- AirUnt
- PrecsCompn
- Mech/
ElecPresSw
- ContactSW
- AirSens
- PresSW
Cool
- AirFloSens/
Contr
- WaterRtSens
- TotAirSys
(Total Air)
- TotAirSys
(Gamma)
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg
etc
- Ending

Selection guide of air dryer

The air dryers include refrigeration air dryers, desiccant dryers, and high polymer separation membrane dryers. The types are selectable according to the required dew point, usage conditions, and applications.

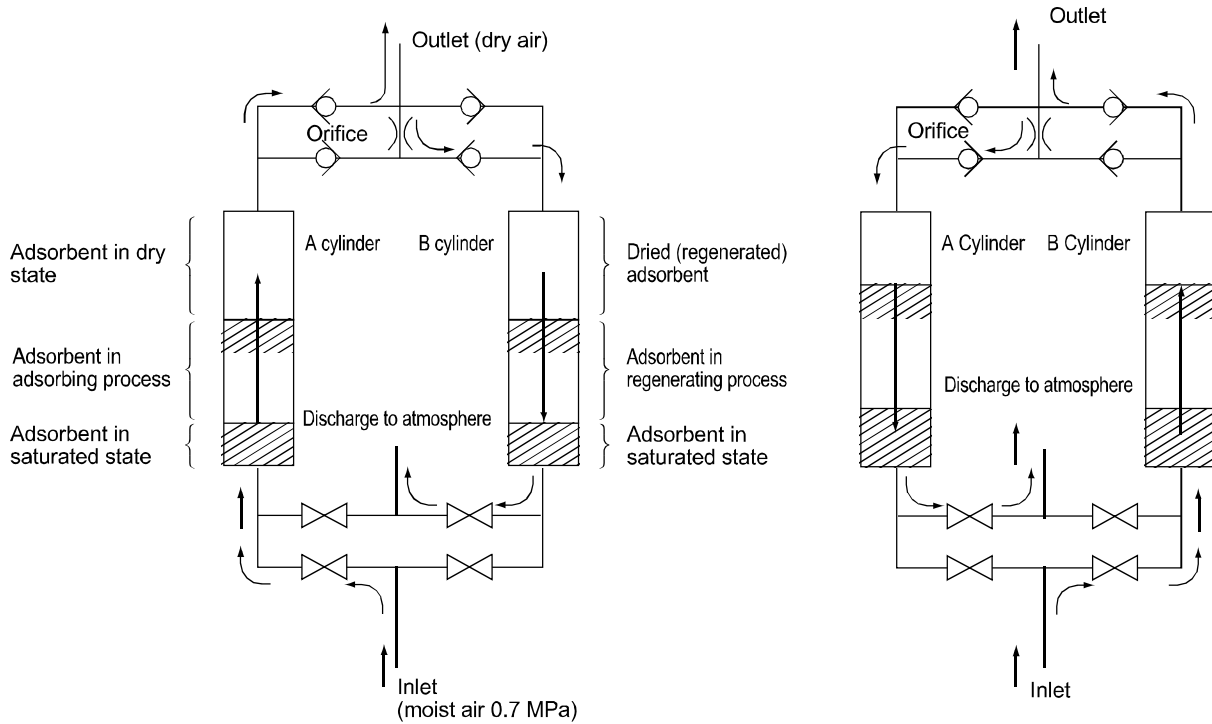
Type of air dryer	Refrigerating	Desiccant	
		Heatless	
Atmospheric dew point performance (°C)	to -17	-20 to -72	
Drying principle	Compressed air is cooled by a refrigerating machine to condense water vapor in the air and to remove it as drain water.	Water vapor in compressed air is adsorbed and removed by desiccant. Basic structure is the same as the heat type. Heat is not used to regenerate the desiccant. Some dried air is depressurized and expanded, and passed through humid desiccant to regenerate it.	
Features	<ul style="list-style-type: none"> ·Most common ·Both equipment and operating costs are reduced. 	<ul style="list-style-type: none"> ·Stable low dew point is obtained ·Equipment cost is less expensive than heat type ·Large air consumed to regenerate desiccant 	
Major applications	<ul style="list-style-type: none"> ·General plants ·General pneumatic circuits and pneumatic components 	<ul style="list-style-type: none"> ·Ultra dry air required manufacturing line ·Semiconductor manufacturing facilities, liquid crystal panel manufacturing lines, foodstuffs, pharmaceutical plants, chemical plants, ozone generators, powder transfer 	
Appearance (Example)	 <p style="text-align: center;">·GT Series</p>	 <p style="text-align: center;">·HD Series</p>	 <p style="text-align: center;">·SHD Series</p>
Page	1569	1601	

Desiccant (heatless) air dryer functions

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FlmResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PrecsCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

Suction principles and circuit diagram

The heatless dryer is a system that utilizes the characteristics of an adsorbent (desiccant) which constantly tries to create a state of equilibrium with the vapor concentration of the ambient air. The unit has 2 cylinders, repeatedly switching between the one for the process of absorbing the water vapor from the air, and the other for the regeneration process of releasing the adsorbed moisture with the dry air created. This device will constantly supply dry air at the outlet as moist air enters it.



Moist air coming in from the inlet will enter the A cylinder, have its moisture removed due to the adsorbent, and then leave from the outlet as dry air. Part of the dry air coming out of the A cylinder will flow through the orifice, be reduced in pressure to an atmospheric pressure, enter the B cylinder, remove moisture from the moist adsorbent, and be exhausted into the air.

By using a part of the air dried under pressure, when it is reduced in pressure by the atmosphere to regenerate the desiccant, the drying efficiency will increase and improve regeneration efficiency.

For example, when dry air of 0.7 MPa is reduced in pressure to the atmospheric pressure, the volume of air expands to approximately 8 times as much and the relative humidity per unit of volume becomes approximately 1/8. Accordingly, the adsorbent releases a greater amount of moisture in trying to create a state of equilibrium with that air.

After a certain amount of time, the flow of air is reversed with a timing motor for adsorption to take place in the B cylinder while regeneration will take place in the A cylinder. These operations will be repeatedly performed.

Heatless dryer system

1. Purge flow rate

The heatless dryer uses some of the dry air created by the dryer for the regeneration of the adsorbent that has absorbed moisture. The air used in this regeneration is referred to as the purge air, and the min. required volume is determined from principles.

$$\text{Theoretical purge rate} = \frac{1}{\text{Air pressure during adsorption (absolute pressure)}} \quad \text{For example, when operating under 0.7 MPa, the theoretical purge rate is approximately 12.9% (under 100% load).}$$

In reality, 15 to 23% is configured in consideration of the absorbing/releasing efficiency of the desiccant and the efficiency of the device. Accordingly, if the operating conditions differ, the purge rate will differ and so will the processing air rate and purge volume. Be sure to review the catalog to make sure that the operating conditions of use and necessary outlet dew point will be satisfied. In addition, ideal purge volumes can be set at the plant to suit the specifications of customers (special order). As it will be necessary to reconfigure the unit when working conditions are changed due to relocation, etc., consult with CKD.

2. Oil removal

In the case of desiccant air dryers, as the desiccant adsorbing oil will interfere with the adsorption of moisture, the outlet dew point may become lower and the life of the desiccant may become shorter.

Accordingly, when installing a desiccant air dryer in an air line using a lubrication air compressor, be sure to install an oil removing filter (M type filter) on the primary side of the dryer.

3. Installation of filter on dryer secondary side

In the case of desiccant air dryers, as desiccant powder will flow out to the secondary side of the dryer, depending on the air purpose (required air quality), install a filter (a P, S, or M type filter or a combination thereof) on the secondary side of the dryer.

4. Silencer replacement

When switching the adsorbing side of the desiccant cylinder, as the cylinder (in a pressurized state) that had until then been adsorbing is suddenly reduced in pressure, a loud exhaust noise will be generated every time the switching takes place. Although a silencer is provided in order to suppress this exhaust noise, after a long period of use, the desiccant powder will build up and clog the pores thereof. Neglecting this will have an impact on the regenerating performance of the desiccant and the described dew point performance may not be exhibited. In addition, when the clogging becomes worse, the silencer may become damaged by the pressure during exhaust.

As a guideline for replacement, be sure to replace when the pressure on the side of the regenerating cylinder exceeds 0.05 MPa or when one year has passed.

5. Pressure fluctuation on dryer secondary side

Pressure fluctuates around the switching process (suction/release) for the desiccant cylinder, as air flow rate fluctuation other than the user's is caused by temporary purge stop and the pressurized filling process of the atmospheric pressure cylinder (regeneration cylinder). The fluctuation range is greatly affected by the situation of the piping with which the dryer is installed, and in the worst case may be as large as 0.1 MPa. In cases when this pressure fluctuation may impact factory operation, consider setting the source pressure higher or installing an air tank on the secondary side.

6. Bypass circuit

In most cases with dryers, a bypass circuit which bypasses the dryer is provided for emergency air supply. This can be used by opening the valve in cases when it is necessary to supply air even when the dryer is broken or in cases when repairing the dryer while allowing the air to flow as a temporary measure. However, in this case, moist air from which moisture has not been removed will of course be supplied within the factory.

When a heatless dryer is selected, it is often the case that extremely dry air is required. Use extreme caution when opening the bypass circuit since opening it will cause moisture to enter all the air pipes past the dryer, creating a great amount of work to recover from this state. In such cases, it is recommended that a spare unit be installed.

7. Dew point display



In accordance with common practice, although performance display has been the pressure dew point for refrigeration air dryers and atmospheric dew point for heatless dryers and membrane dryers (refer to page 1534 for terminology), due to establishment of JISB8392-1 there is a trend of unifying the display to the pressure dew point. At CKD, performance will be displayed with the pressure dew point from the super heatless dryer SHD3000 Series. Note that depending on the model or manufacturer, the display signals may become mixed.

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FmResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrescR
VacF/R
Clean FR
ElecPneur
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PresCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesiccDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

Series variation

Desiccant air dryer (heatless dryer)

- F.R.L
- F (Filtr)
- R (Reg)
- L (Lub)
- PresSW
- Shutoff
- SlowStart
- FlmResistFR
- Oil-ProhR
- MedPresFR
- No Cu/ PTFE FRL
- Outdrs FR
- F.R.L (Related)
- CompFRL
- LgFRL
- PrecsR
- VacF/R
- Clean FR
- ElecPneuR
- AirBoost
- SpdContr
- Silncr
- CheckV/ other
- Jnt/tube
- AirUnt
- PrecsCompn
- Mech/ ElecPresSw
- ContactSW
- AirSens
- PresSW Cool
- AirFloSens/ Contr
- WaterRtSens
- TotAirSys (Total Air)
- TotAirSys (Gamma)
- RefrDry
- DesiccDry
- HiPolymDry
- MainFiltr
- Dischrg etc
- Ending

	Compact			Large		
Series	HD Series			Super heatless SHD Series		
Applications of installation	Factory terminal installation, equipment embedded					
Features	Inlet air temperature 21°C			Inlet air temperature 35°C		
	Atmospheric dew point -17.5°C	Atmospheric dew point -40°C	Atmospheric dew point -72°C	Pressure dew point -20°C (-40°C) *2	Pressure dew point -40°C (-57°C) *2	Pressure dew point -60°C (-74°C) *2
kW						
0.4			● (HD-0.5)			
0.75	● (HD-0.5)	● (HD-0.5)	● (HD-1)			
1.5	● (HD-1)	● (HD-1)	● (HD-1.5)			
2.2	● (HD-1.5)	●● (HD-1.5,-2)	● (HD-2)			
3.7	● (HD-2)	● (HD-4)	● (HD-4)			
5.5	● (HD-4)		● (HD-6)			
7.5	● (HD-6)	● (HD-6)	● (HD-9)			
11	● (HD-9)	● (HD-9)				
15	▲ (HD-9)			● (SHD3025-G/M)	● (SHD3025-G/M)	● (SHD3025-M)
22				● (SHD3045-G/M)	● (SHD3045-G/M)	● (SHD3045-M)
37				● (SHD3075-G/M)	● (SHD3075-G/M)	● (SHD3075-M)
55				● (SHD3100-G/M)	● (SHD3100-G/M)	● (SHD3100-M)
75				● (SHD3125-G/M)	● (SHD3125-G/M)	● (SHD3125-M)
95				● (SHD3150-G/M)	● (SHD3150-G/M)	● (SHD3150-M)
120				● (SHD3200-G/M)	● (SHD3200-G/M)	● (SHD3200-M)
150				● (SHD3240-G/M)	● (SHD3240-G/M)	● (SHD3240-M)
200						
250						
300						
400						
480						
710						
960						
1450						
Dew point monitor	×	×	×	● Standard equipment	● Standard equipment	● Standard equipment
Energy-saving device equipped	×	×	×	● Standard equipment	● Standard equipment	● Standard equipment
Different voltage compatible	● Option	● Option	● Option	● Option	● Option	● Option
Paint color specification	● Option	● Option	● Option	● Option	● Option	● Option
Remote control, external signals	● Custom order	● Custom order	● Custom order	● Standard equipment	● Standard equipment	● Standard equipment
Outdoor	×	×	×	×	×	×
Anchor bolt	×	×	×	● Option	● Option	● Option
SUS nameplate	● Option	● Option	● Option	● Custom order	● Custom order	● Custom order
Export specifications	● Option	● Option	● Option	● Option	● Option	● Option
Export packing	● Option	● Option	● Option	● Option	● Option	● Option
Product photo	● Option	● Option	● Option	● Custom order	● Custom order	● Custom order
Appearance						
Page	1602			1608		

*1: This table has been prepared based on the conditions listed below; correction of models will be necessary depending on multiplier calculations in cases when the conditions are different.
 Inlet air pressure: 0.7 MPa, Inlet air temperature: in accordance with rating of each series,
 *2: The value in parentheses is the atmospheric dew point converted value.

Heatless dryer HD/SHD

■ Refining and pressure adjusting components/main line unit/desiccant air dryer

Overview

This is a heatless dryer of the pressure reduction self-regenerating system which does not use heat for regeneration of the desiccant.

Ultra dry air can be supplied easily and stably.

Features

- (1) Ultra dry air can be easily supplied
Ultra-low dew point -60 to -72°C (at atmospheric pressure)
- (2) Easy maintenance
- (3) With indicator for dew point monitor
Pressure dew point digital display (SHD only)
- (4) High durability



CONTENTS

● Compact (HD)	1602
● Medium/large (SHD)	1608
▲ Safety precautions	1616

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FmResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdirs FR
F.R.L (Related)
CompFRL
LgFRL
PrescR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PresCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterPtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending



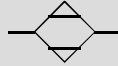
Desiccant air dryer (compact heatless dryer)

HD Series

Stable supply of ultra dry air with atmospheric dew point -72°C .

● Processing air flow rate: 75 to 1235 ℓ/min . (ANR) (0.7 MPa, atmospheric dew point -72°C)

JIS symbol



Specifications

Descriptions	HD-0.5	HD-1	HD-1.5	HD-2	HD-4	HD-6	HD-9	
Port size Rc	3/8						3/4	
Inlet air pressure range MPa	0.2 (≈ 29 psi, 2 bar) to 1.0 (≈ 150 psi, 10 bar)							
Inlet air temperature range $^{\circ}\text{C}$	5 (41°F) to 52 (125.6°F)							
Ambient temperature $^{\circ}\text{C}$	-1 (30.2°F) to 52 (125.6°F)							
Regenerating system	Self-regeneration non-heating system							
Regenerative cycle	1 minute (0.5-minute switch)					4 minute (2-minute switch)		
Power supply V	Single-phase 100 VAC, 200 VAC 50/60 Hz							
Power consumption W	26						52	
Desiccant	Synthetic zeolite							
Weight kg	6.5	7.0	7.5	9.5	11.5	21.5	42.5	
Desiccant cylinder No.	15-8771	15-8772	15-8773	15-8774	15-8775	505026	505026	
Desiccant filling No.	15-8771-D	15-8772-D	15-8773-D	15-8774-D	15-8775-D	505026D	505026D	
Indicator for dew point monitoring	Standard equipment							
Silencer	Standard equipment							

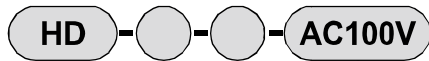
*1: In cases when the fluid contains oil, attach an oil removing filter (oil mist filter) on the inlet side. Attach a filter ($5\mu\text{m}$, $0.3\mu\text{m}$, oil mist filter) with a filtration rating that suits the usage purpose on the OUT side.

*2: As the IN port and OUT port are provided at 2 locations each to the right and left, use a blanking plug with any port that will not be used.

*3: The standard paint color is quality cool white (Munsell No. 5 GY 7.5/0.5).

*4: For applications for use within clean rooms, consult with your CKD branch or dealer.

How to order



A Flow rate classification

B Option

*4

C Voltage

Code	Content
A Flow rate classification	
0.5	
1	
1.5	
2	
4	
6	
9	
B Option	
Blank	Standard
F	Specified color paint
G	Voltage specification
H	English language specifications
H2	SUS nameplate
Y2	Product photo
C Voltage	
100 VAC	
200 VAC	

When placing an order

● The heatless dryer is adjusted to the required atmospheric dew point, flow rate, etc., at shipment.

Always indicate the following items when placing an order.

- Model No.
- Required outlet flow rate ℓ/min (ANR)
- Required atmospheric dew point $^{\circ}\text{C}$
- Inlet air pressure MPa
- Inlet air temperature $^{\circ}\text{C}$

⚠ Precautions for model No. selection

*1: For lubrication compressors, attach an oil removal filter (oil mist filter) on the inlet side of the heatless dryer. Attach a filter with a filtration rating that suits the usage purpose on the OUT side.

*2: As the heatless dryer is equipped with a dew point monitoring device (moisture indicator), it is possible to check the drying status.

*3: Unit performance may not be attained if used at less than the selected pressure. Always select the model No. for the working pressure.

*4: When ordering several options, indicate the required options in alphabetical order.

Selection guide

● Reading the max. flow rate table

Two numbers are listed in each box in the max. flow rate table. The number on the top indicates the inlet air flow rate necessary to dry the flow rate listed on the bottom. The number on the bottom indicates the max. outlet flow rate of the dry air. The difference between the number on the top and the number on the bottom is the purge flow rate necessary for regeneration drying.

Max. flow rate table

Unit: ℓ/min (ANR)

Model No.	Atmospheric dew point -17.5°C						Atmospheric dew point -40°C						Atmospheric dew point -72°C								
	HD-0.5	HD-1	HD-1.5	HD-2	HD-4	HD-6	HD-0.5	HD-1	HD-1.5	HD-2	HD-4	HD-6	HD-0.5	HD-1	HD-1.5	HD-2	HD-4	HD-6	HD-9		
1.0	165	325	445	665	1,225	1,870	3,000	130	255	335	500	935	1,405	2,150	105	210	290	435	735	1,105	1,685
	145	280	380	570	1,085	1,645	2,605	110	210	270	405	795	1,180	1,830	85	165	225	340	595	880	1,345
0.9	150	300	405	615	1,120	1,710	2,740	115	235	310	460	855	1,285	1,970	95	195	265	400	670	1,010	1,540
	130	255	340	520	980	1,485	2,345	95	190	245	365	715	1,060	1,650	75	150	200	305	530	785	1,200
0.8	135	270	370	555	1,015	1,545	2,475	105	215	280	415	775	1,160	1,780	85	175	240	360	610	910	1,390
	115	225	305	460	875	1,320	2,080	85	170	215	320	635	935	1,460	65	130	175	265	470	685	1,050
0.7	120	240	325	490	890	1,370	2,195	95	190	245	370	685	1,030	1,575	75	155	215	320	540	810	1,235
	100	195	260	395	750	1,145	1,800	75	145	180	275	545	805	1,255	55	110	150	225	400	585	895
0.6	105	210	285	430	785	1,195	1,915	80	165	215	320	600	900	1,375	65	135	185	280	470	705	1,075
	85	165	220	335	645	970	1,520	60	120	150	225	460	675	1,055	45	90	120	185	330	480	735
0.5	90	180	245	370	675	1,030	1,650	70	140	185	280	515	775	1,185	55	115	160	240	405	610	930
	70	135	180	275	535	805	1,255	50	95	120	185	375	550	865	35	70	95	145	265	385	590
0.4	75	150	205	305	560	855	1,370	60	120	155	230	430	640	985	45	95	135	200	335	505	770
	55	105	140	210	420	630	975	40	75	90	135	290	415	665	25	50	70	105	195	280	430
0.3	60	120	165	245	450	690	1,105	45	95	125	185	345	520	795	40	80	105	160	270	405	620
	40	75	100	150	310	465	710	25	50	60	90	205	295	475	20	35	40	65	130	180	280
0.2	45	90	125	185	340	515	825	35	70	95	140	260	385	595	30	60	80	120	205	305	465
	25	45	60	90	200	290	430	15	25	30	45	120	160	275	10	15	15	25	65	80	125

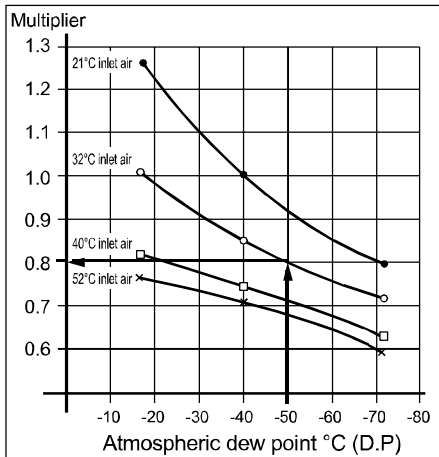
● Selection method

The above flow rate table is for conditions of an inlet air temperature of 21°C and an atmospheric dew point of -17.5°C, -40°C, and -72°C. When conditions differ, determine the specifications by using the multiplier table on the top right.

Inlet air flow rate = (Inlet air flow rate listed in the max. flow rate table when the atmospheric dew point is -40°C) x multiplier

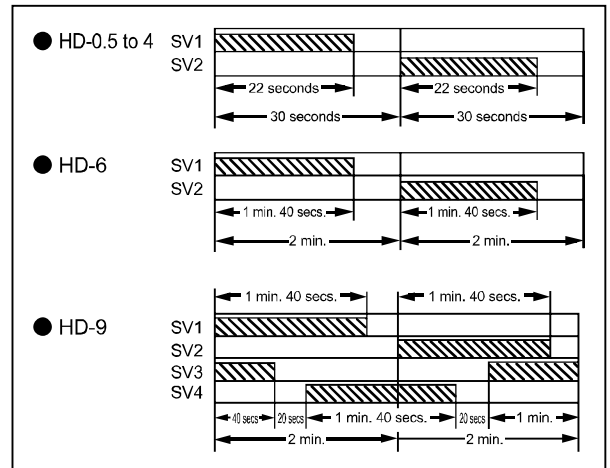
Purge flow rate = (Inlet air flow rate listed in the max. flow rate table when the atmospheric dew point is -40°C) - (Outlet air flow rate listed in the max. flow rate table when the atmospheric dew point is -40°C)

Outlet air flow rate = (Inlet air flow rate) - (Purge flow rate)



(Example) When pressure is 0.9 MPa, atmospheric dew point is -50°C, and inlet air temperature is 32°C, the inlet air flow rate, purge flow rate, and outlet air flow rate of HD-4 are,
 Inlet air flow rate = 855 × 0.8 ≈ 684 ℓ/min
 Purge flow rate = 855 - 715 = 140 ℓ/min
 Outlet air flow rate = 684 - 140 = 544 ℓ/min

Time chart



* Number of seconds is displayed at 60Hz.
 Multiply by approx. 1.2 for 50 Hz.

When a heatless dryer is installed

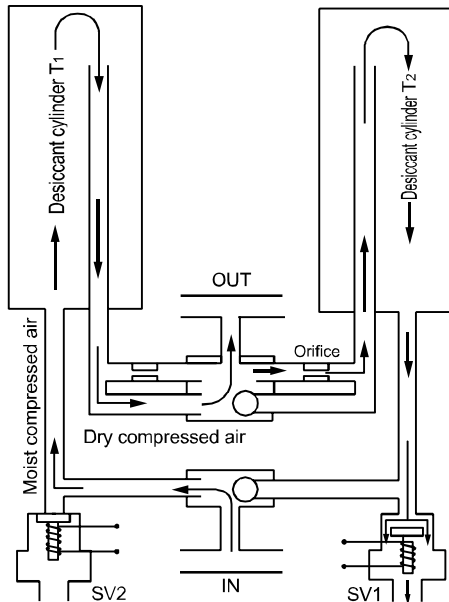
● When starting test operation after installation of this unit, operate the unit for the time below with a flow rate that is approximately 10 to 20% of the flow rate that will be used.

Atmospheric dew point (°C)	-17.5	-40	-72
Time (h)	2	6	72

- F.R.L
- F (Filtr)
- R (Reg)
- L (Lub)
- PresSW
- Shutoff
- SlowStart
- FlnResistFR
- Oil-ProhR
- MedPresFR
- No Cu/ PTFE FRL
- Outdrs FR
- F.R.L (Related)
- CompFRL
- LgFRL
- PrecsR
- VacF/R
- Clean FR
- ElecPneUR
- AirBoost
- SpdContr
- Silncr
- CheckV/ other
- Jnt/tube
- AirUnt
- PresCompn
- Mech/ ElecPresSw
- ContactSW
- AirSens
- PresSW Cool
- AirFloSens/ Contr
- WaterRtSens
- TotAirSys (Total Air)
- TotAirSys (Gamma)
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg etc
- Ending

- F.R.L
- F (Filtr)
- R (Reg)
- L (Lub)
- PresSW
- Shutoff
- SlowStart
- FmResistFR
- Oil-ProhR
- MedPresFR
- No Cu/PTFE FRL
- Outdrs FR
- F.R.L (Related)
- CompFRL
- LgFRL
- PrecsR
- VacF/R
- Clean FR
- ElecPneuR
- AirBoost
- SpdContr
- Silncr
- CheckV/other
- Jnt/tube
- AirUnt
- PrecsCompn
- Mech/ElecPresSw
- ContactSW
- AirSens
- PresSW Cool
- AirFloSens/Contr
- WaterRtSens
- TotAirSys (Total Air)
- TotAirSys (Gamma)
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg etc
- Ending

Functions

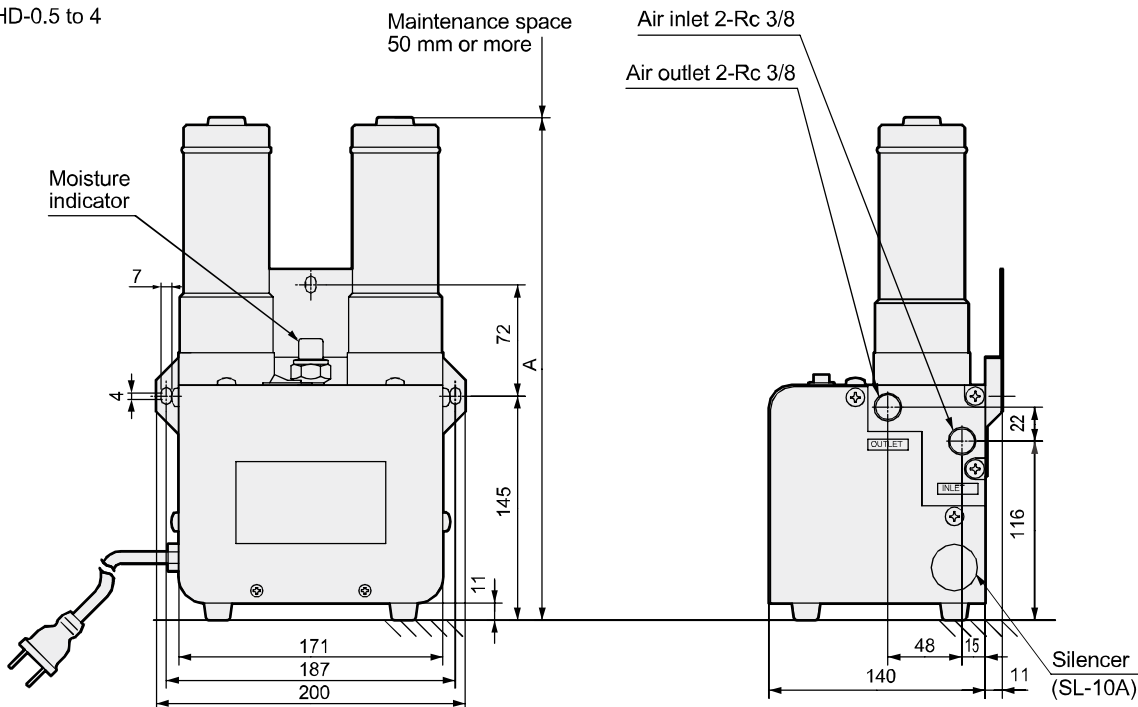


Moist compressed air coming in from IN goes through the shuttle valve and enters desiccant cylinder T1. The moist compressed air evenly flows within the desiccant cylinder, the water vapor within the moist compressed air is adsorbed by the desiccant, and once transformed into ultra dry air, comes out of the OUTlet via the shuttle valve. Part of the ultra dry air that has been reduced in pressure via the orifice enters the desiccant cylinder T2, is used for the regeneration drying of the desiccant of desiccant cylinder T2, and is then released into the air. With this drying and regeneration process, the switching is performed with a timing motor within the control box and ultra dry air is continuously supplied in a stable manner to the OUT side.

Dimensions



● HD-0.5 to 4

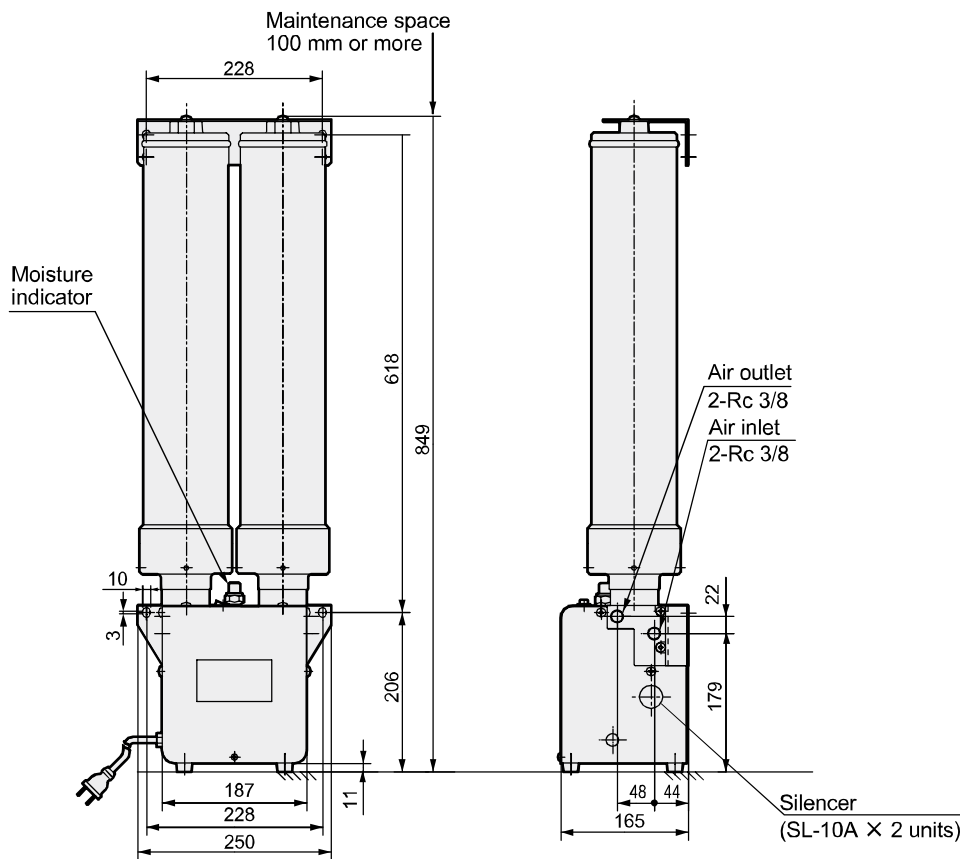


Model No.	Dimension A
HD-0.5	325
HD-1	440
HD-1.5	485
HD-2	467
HD-4	689

Dimensions

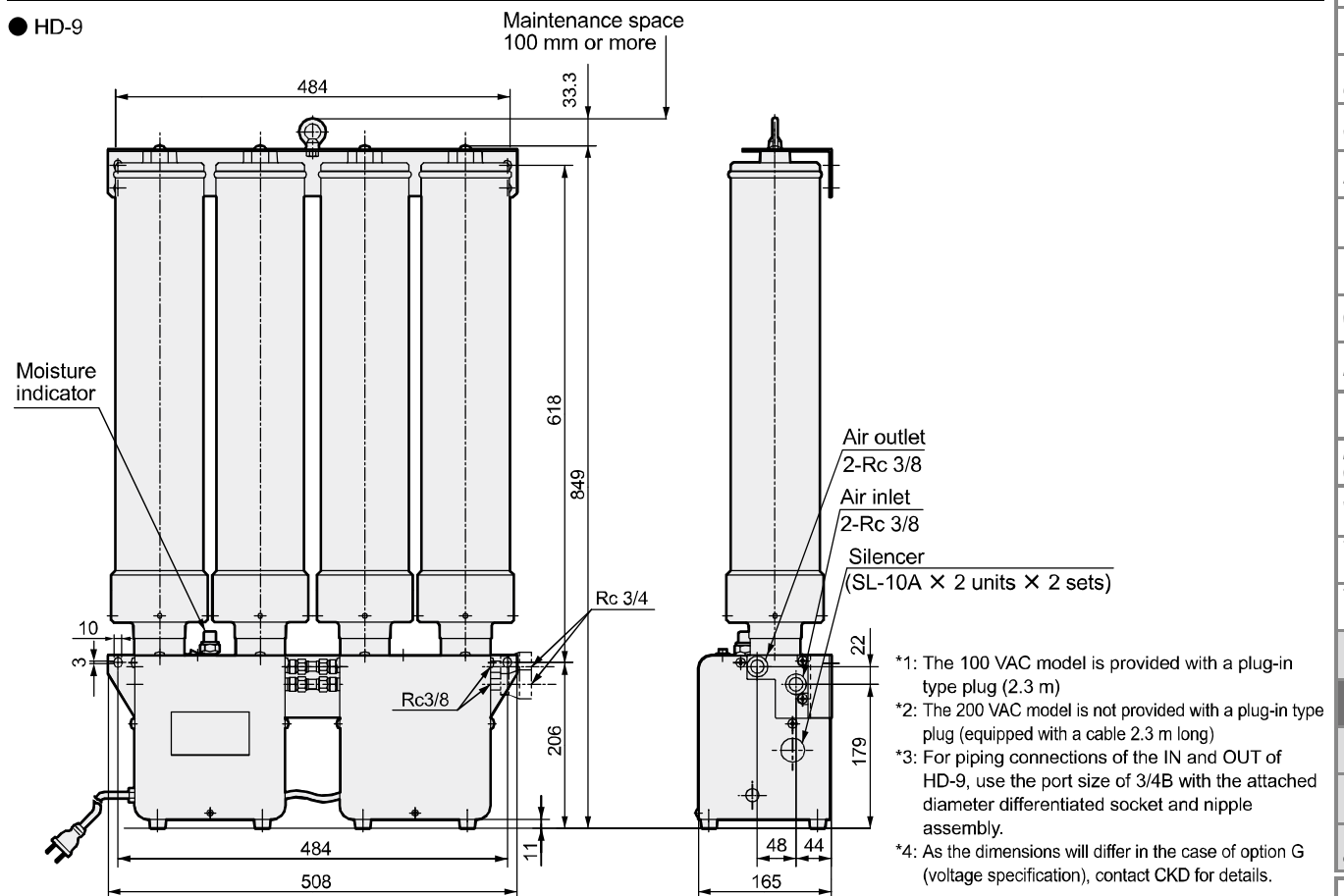


● HD-6



Dimensions

● HD-9



F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FmResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PresCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending



Pneumatic components (main line components)

Safety Precautions

Be sure to read this section before use.
Refer to Intro Page 63 for general precautions.

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FlmResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacFR
Clean FR
ElecPneuR
AirBoost
SpdContr
SiIncr
CheckV/ other
Jnt/tube
AirUnt
PrecsCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

Product-specific cautions: Heatless dryer

Manufacturer's Exemption of Liability

⚠ WARNING

- The manufacturer cannot be held liable in the following cases:
 - In the case where there are serious errors in the operator's use.

- Inappropriate modifications or repairs using nonstandard parts, made by the user.

Design/selection

⚠ WARNING

- Avoid direct sunlight and rainwater. The resin parts, etc., could deteriorate and break.
- Do not use in locations with corrosive gases.
- Use this product within the operating ambient temperature.
- Do not use in locations at risk of freezing.
The accumulated condensation water could freeze and damage the product.
- Do not use in hazardous locations (possibly explosive atmospheres, etc.).

- Do not use this product in an ozone generating environment.
- We recommend keeping the inlet air temperature as low as possible. Adsorption performance of desiccants will be lower at high temperature.
- Do not use when the inlet air contains corrosive gas, chemical solutions, organic solvents, or combustible gas.
- Carefully prevent water drops from entering the inside.
- The dew point value indicated by G type of the SHD Series can be used as a guide, but the accuracy is low especially in the low dew point range.
Use M type for accurate dew point monitoring.

Mounting, installation and adjustment

⚠ CAUTION

- "Class 2 pressure vessel" of the "safety regulation of boiler and pressure vessel" of Occupational Safety Sanitation Act applies to model No. SHD3075 to SHD3240.
- Model numbers SHD3075 to SHD3240 have a Class 2 pressure vessel withstand pressure proof certificate. This certificate must be kept safely while using this device. (Application to the Labor Standards Supervision Office in Japan is not required.)
- This device may only be used in Japan. (Contact CKD for use overseas.)
- Install this device on a stable, flat surface not subject to vibration.
- Do not step onto this main unit.
- Secure enough space for maintenance and inspection. (600 mm and over in front, sides and back)
- Stainless steel pipes or galvanized pipes (white pipe) are recommended as piping materials. Flush the pipes before connecting them.

- Use a forklift to carry the product. Pass the forks of forklift through the forklift hole. (Excluding compact HD Series)
- Do not block the forklift hole since it also discharges regenerated air. (SHD Series only)
- Establish a ground connection.
- Filters are supplied with SHD Series.
Install the supplied oil removing filter (M type) on the primary side (inlet side) and the supplied dust filter (P type) on the secondary side.
If the inlet air is low quality, add a filter before the M type. Additional filters may be necessary if customer requires higher air quality.
- Filters are not supplied with other series (HD Series) than SHD Series.
Select filters appropriate for the system, purchase and install them as a separate order.
- Install a filter as close as possible to the dryer.

Use/maintenance

Operation

⚠ CAUTION

- Use within the working pressure range.
- Use within the power voltage range in the specifications.
- Energy-saving operation can be set with the “ECO MODE” ON/OFF button as desired. (SHD Series only)
- Keeping a constant dew point is not possible if the working air flow rate changes significantly.
- Leakage may occur from the silencer, though rarely, depending on the air intake condition and ambient temperature. If it occurs, place a drain pan underneath.

Inspection/maintenance

⚠ CAUTION

- The replacement timing for the desiccant will differ depending on the working conditions and required dew point. It is preferable that the desiccant be replaced when degradation of its performance is observed in dew point monitoring. Normally replacement is approximately 2 years.
- Desiccants may adsorb various substances other than moisture contained in the compressed air. Always dispose of used desiccants as industrial waste in an appropriate manner.
- Replace the silencer if the pressure of regeneration chamber has exceeded 0.05 MPa or when one year has passed from the beginning of use.
- It is preferable that the humidity sensor for G type of the SHD Series be replaced once a year. (It cannot be calibrated.)
As for the dew-point meter for M type, calibration once a year is recommended.
In extreme conditions, more frequent replacement and calibration will be necessary.

Repair parts

⚠ CAUTION

- Periodically check the parts for deterioration and replace them as necessary to use the product safely through its service life. Refer to the instruction manual included with the product for details.

Regular maintenance parts

⚠ CAUTION

- Periodically inspect the regular maintenance parts and replace them according to the standard replacement frequency to use the product safely through its service life.
Refer to the instruction manual included with the product for details.

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FmResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PresCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

Earth-friendly heatless type with

Purge flow rate is minimized with the energy-saving dew point monitor (approx. 96% max.). It also achieves low noise with the original exhaust system. Super heatless dryer SHD Series with excellent reliability, performance and ease of use.

Energy saving

Reduces unnecessary purge by dew point monitoring

By directly monitoring the outlet air dew point, the switching time of adsorption and regeneration can be variably controlled in response to changes in the dew point. Reduces the purge and achieves the optimum energy-saving operation.

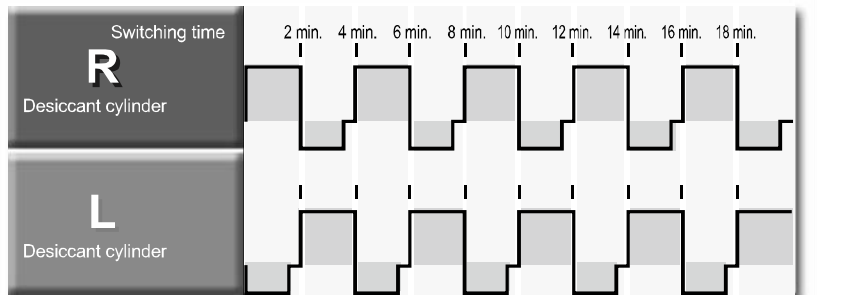
Normal operation

Regardless of the outlet dew point, adsorption and regeneration are switched at 2-minute intervals.

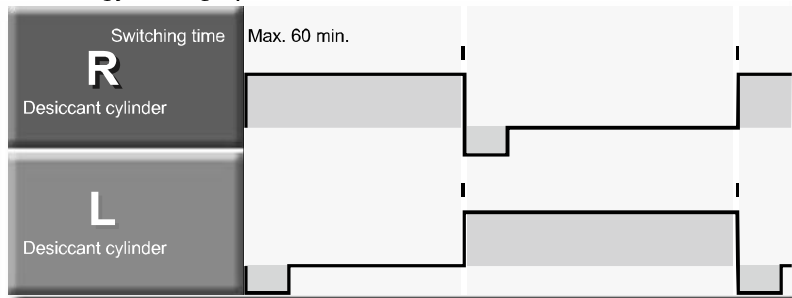
Energy saving operation

If the set dew point is cleared at the time of switching, the state is maintained without switching the desiccant cylinder. When it reaches the set dew point, it switches the cylinder, returns to normal operation and maintains the dew point. The changeover time is up to 60 minutes (in this case, the purge flow rate is reduced by about 96%).

Normal operation



Energy saving operation



About 13% reduction even in normal operation

The optimum design of the desiccant cylinder reduces the purge rate by 13% even in normal operation. (compared to CKD conventional products)

Desiccant cylinder switching time and purge reduction rate

Switching time	Purge reduction rate
2 min.	0%
4 min.	50%
10 min.	80%
20 min.	90%
60 min.	96%

Achieves 1/3 lower power consumption

The electronic control system reduces the main power consumption by 1/3. (compared to CKD conventional products)

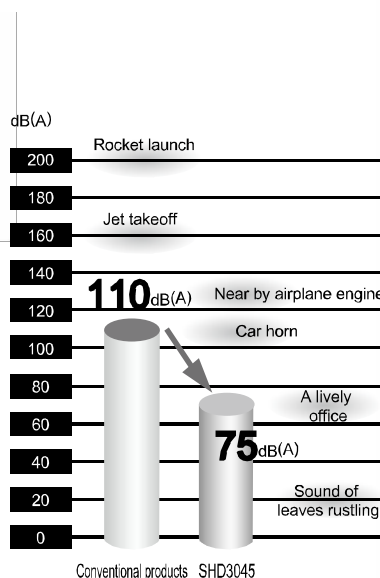
Low noise

Significantly reduces noise when switching

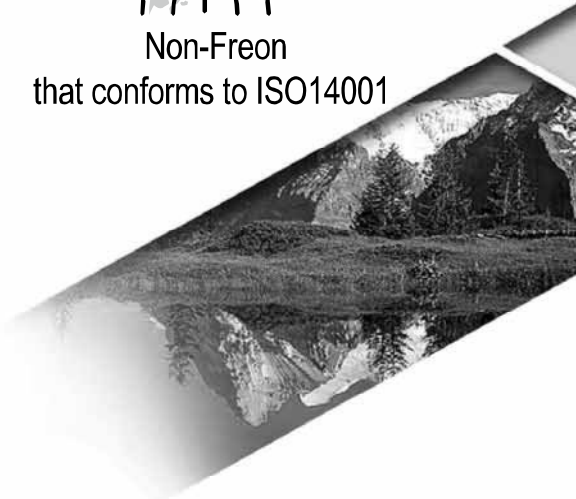
The 2-stage exhaust system (PAT.P) achieves a significant noise reduction of about 35dB (A) as compared with conventional products.

Noise reduction

When the noise is reduced by 10db, human ears perceive the noise to be reduced by half



Non-Freon
that conforms to ISO14001



- F.R.L
- F (Filtr)
- R (Reg)
- L (Lub)
- PresSW
- Shutoff
- SlowStart
- AmResistFR
- Oil-ProhR
- MedPresFR
- No Cu/ PTFE FRL
- Outdrs FR
- F.R.L (Related)
- CompFRL
- LgFRL
- PrecsR
- VacF/R
- Clean FR
- ElecPneR
- AirBoost
- SpdContr
- Silncr
- CheckV/ other
- Jnt/tube
- AirUnt
- PrecsCompn
- Mech/ ElecPresSw
- ContactSW
- AirSens
- PresSW Cool
- AirFloSens/ Contr
- WaterRtSens
- TotAirSys (Total Air)
- TotAirSys (Gamma)
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg etc
- Ending

improved environmental performance.

SHD Series

Directly manages the pressure dew point using numeric values

Equipped as standard with a dew point sensor. As it digitally displays the pressure dew point, the performance can be confirmed safely and reliably.

Stainless steel tower adopted

Non-corrosive stainless steel vessel is used for the desiccant cylinder to improve the supply air quality and reliability.

Easy maintenance

The desiccant cylinder can be easily removed by rotating it by 45°. Moreover, as the cylinder is locked by a latch mechanism, the safety is excellent.

Air compressor can be connected directly

Refrigeration air dryer is not required on the inlet side. Just one unit reliably maintains performance.

Equipped with filters in the inlet and outlet Standard equipment

AF2000 Series filters are equipped as standard on both the inlet filter for maintaining the performance of the heatless dryer and outlet filter for maintaining the quality of supply air. (Included)
Stainless steel AF4000 and AF5000 Series can be optionally selected.

A wide variety of 16 models is available.

16 models are available, with 8 types of air flow rates (2.5 to 24 m³/min ANR) and 2 types of dew point sensors (G: temperature / humidity sensor, M: dew point meter).

Applicable compressor kW	15	22	37	55	75	95	125	
Inlet air flow rate m ³ /min (ANR)	2.5	4.5	7.5	10	12.5	15	20	24
G type	●	●	●	●	●	●	●	●
M type	●	●	●	●	●	●	●	●



Significantly reduced footprint

1/3 to 1/2 (CKD conventional products comparison)

HEATLESS AIR DRYER SHD 3000

Operability improved by the electronic control system

Pressure dew point digital display

Also displays dew point abnormalities, sensor abnormalities, etc.

Can be switched between energy saving and normal operation

The energy-saving mode and normal mode can be easily switched manually.

Energy-saving set dew point selectable

The G type has 3 stages of -10, -20 and -40°C, and the M type has 3 stages of -20, -40 and -60°C. The switch setting can be selected according to the required dew point, making the optimal energy conservation possible.

Allows centralized management in control rooms, etc.

Equipped as standard with remote operation/dew point sensor abnormality output terminal, dew point abnormality output terminal dew point analog output terminal. The operating status of the device can be centrally managed.

ECO display

You will be notified when it enters into energy-saving mode.

Energy-saving rate display

It can display the energy saving rate per 24 hours. It can be used in day-to-day management.

- F.R.L
- F (Filtr)
- R (Reg)
- L (Lub)
- PresSW
- Shutoff
- SlowStart
- FmResistFR
- Oil-ProhR
- MedPresFR
- No Cu/ PTFE FRL
- Outdrrs FR
- F.R.L (Related)
- CompFRL
- LgFRL
- PrescR
- VacF/R
- Clean FR
- ElecPneuR
- AirBoost
- SpdContr
- Silncr
- CheckV/ other
- Jnt/tube
- AirUnt
- PresCompn
- Mech/ ElecPresSw
- ContactSW
- AirSens
- PresSW Cool
- AirFloSens/ Contr
- WaterRtSens
- TotAirSys (Total Air)
- TotAirSys (Gamma)
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg etc
- Ending



Desiccant air dryer (heatless dryer)

SHD Series

JIS symbol



Specifications

Descriptions	SHD3025	SHD3045	SHD3075	SHD3100	SHD3125	SHD3150	SHD3200	SHD3240	
Working fluid	Compressed air								
Inlet air pressure range MPa	0.4 (≈58 psi, 4 bar) to 1.0 (≈150 psi, 10 bar)								
Inlet air temperature range °C	5 (41°F) to 50 (122°F)								
Ambient temperature °C	0 (32°F) to 40 (104°F)								
Rated conditions	Inlet air temperature °C	35 (95°F) (no water drops)							
	Ambient temperature °C	25 (77°F)							
	Inlet air pressure MPa	0.7 (≈100 psi, 7 bar)							
	Inlet air flow rate m ³ /min(ANR)	2.5	4.5	7.5	10	12.5	15	20	24
	Outlet pressure dew point °C	-20 (-4°F), -40 (-40°F), -60 (-76°F)							
Average purge rate %	-20°C (-4°F):14 / -40°C (-40°F):16.5 / -60°C (-76°F):23								
Desiccant cylinder module quantity	1	2	3	4	5	6	8	10	
Regenerating method	Self-regeneration non-heating system								
Desiccant	Activated alumina, synthetic zeolite								
Dew point sensor	G type: Electrostatic capacitance temperature and humidity sensor / M type: Dew point meter (Electrostatic capacitance polymer sensor)								
Power supply	Single-phase 100/200 VAC 50/60 Hz								
Power consumption	15 W								
Port size Rc	1	1	1 1/2	1 1/2	2	2	2 1/2	2 1/2	
Weight kg	120	180	240	300	370	430	550	670	
Standard filter (for inlet side)	AF2004M-25	AF2007M-40	AF2010M-40	AF2013M-50	AF2013M-50	AF2020M-50	AF2026M-65	AF2026M-65	
Standard filter (for outlet side)	AF2004P-25	AF2007P-40	AF2010P-40	AF2013P-50	AF2013P-50	AF2020P-50	AF2026P-65	AF2026P-65	
Optional E2 filter (for inlet side)	AF4004M-25	AF4007M-40	AF4010M-40	AF4010M-40	AF4013M-50	AF4020M-50	AF5032M-80	AF5032M-80	
Optional E2 filter (for outlet side)	AF4004P-25	AF4007P-40	AF4010P-40	AF4010P-40	AF4013P-50	AF4020S-50	AF5032P-80	AF5032P-80	

*1: The standard paint color is quality cool white (Munsell No. 5 GY 7.5/0.5).

*2: Attach the included accessory filters on the inlet side and the outlet side. Filters may be required for the sake of the system. In such cases, please prepare them separately.

*3: ANR shows conditions where 20°C atmospheric pressure and relative humidity 65%.

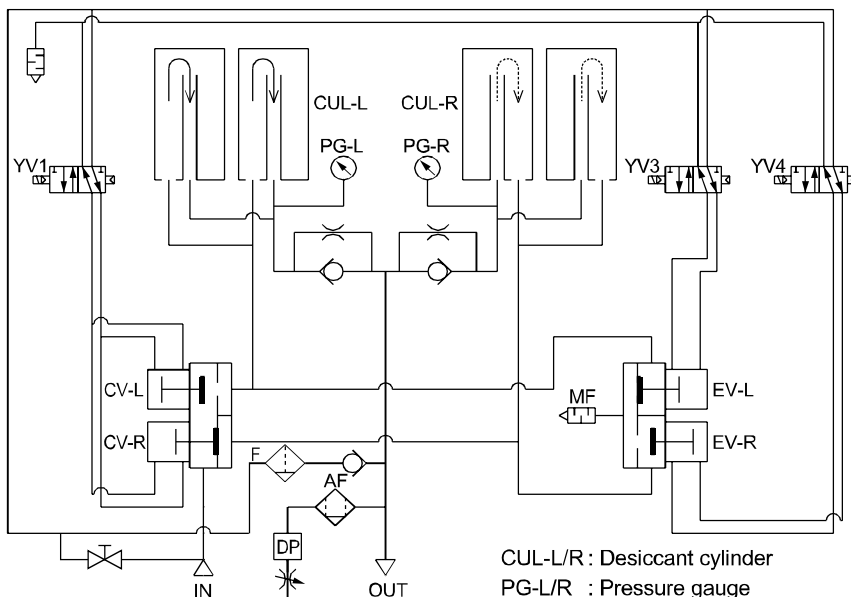
*4: "S type" for the outlet of option E2 of SHD3150 only.

*5: AF5032 will be used only for option E2 of SHD3200 and SHD3240.

*6: Refer to pages 1655 and 1665 of the catalog for details regarding the accessory filters.

*7: The G type sensor requires regular replacement and the M type dew point meter requires regular calibration. (Refer to page 1617 for details)

Functions



Moist compressed air coming in from IN goes through the valve CV and enters desiccant cylinder CUL-L. The moist compressed air evenly flows within the desiccant cylinder, the water vapor within the compressed air is adsorbed by the desiccant, and once transformed into ultra dry air, comes out of the OUTlet via the check valve. Part of the ultra dry air that has been reduced in pressure via the orifice enters the desiccant cylinder CUL-R, is used for the regeneration drying of the desiccant of CUL-R, and is then released into the air. Part of the air exiting the OUTlet is guided to the dew point sensor DP for its dew point to be measured. Depending on the dew point, it will be in energy-saving mode in which the switching time is extended. (After the removal process ends, both cylinders are kept in an increased state of pressure and the switching time is extended.)

CUL-L/R : Desiccant cylinder
 PG-L/R : Pressure gauge
 CV-L/R : Inlet switching valve
 EV-L/R : Exhaust switching valve
 (L/R indicates the left and right sides.)

MF : Silencer
 AF : Dew point sensor protection filter
 DP : Dew point sensor
 YV1 : Valve for inlet switching valve
 YV3/4 : Valve for exhaust switching

How to order

SHD3 - **045** - **G** - **07** - **40** - **E** - **AC100V**

Model No.

A Flow rate classification

B Sensor
*1

C Inlet air pressure

D Outlet pressure dew point

E Option
*3

F Voltage

Code	Content
A Flow rate classification	
025	2.5 m ³ /min(ANR)
045	4.5 m ³ /min(ANR)
075	7.5 m ³ /min(ANR)
100	10 m ³ /min(ANR)
125	12.5 m ³ /min(ANR)
150	15 m ³ /min(ANR)
200	20 m ³ /min(ANR)
240	24 m ³ /min(ANR)
B Sensor	
G	Temperature and humidity sensor
M	Dew point meter
C Inlet air pressure	
04	0.4 MPa
05	0.5 MPa
06	0.6 MPa
07	0.7 MPa
08	0.8 MPa
09	0.9 MPa
10	1 MPa
D Outlet pressure dew point	
20	-20°C
40	-40°C
60	-60°C
E Option	
E	Standard (AF2000 attached)
E1	Without accessory filter
E2	AF4000 series attached
F	Color specification
G	Voltage specification
H	English text
L	Foundation bolt nut (SS400)
L1	Foundation bolt nut (SUS304)
F Voltage	
	100 VAC
	200 VAC

⚠ Precautions for model No. selection

- *1: With the sensor of the "G" type, it is not possible to select the "-60°C" specification for the outlet pressure dew point. In addition, the dew point display value of the "G" type is of an accuracy to serve as a guide, as accuracy will be lowered in particular in the low dew point range. When prioritizing dew point management, use of the "M" type is recommended.
- *2: Unit performance may not be attained if used at less than the selected pressure. Always select the model No. for the working pressure.
- *3: When ordering several options, indicate the required options in alphabetical order.

[Example of model No.]

SHD3045-G07-40-EL-AC100V

Model No.: Super heatless dryer

- A** Flow rate classification : 4.5 m³/min(ANR)
- B** Sensor : Temperature and humidity sensor
- C** Inlet air pressure : 0.7 MPa
- D** Outlet pressure dew point : -40°C
- E** Option : Foundation bolt nut
- F** Voltage : 100 VAC

	Dew point sensor	Rated dew point °C (*1)	Energy-saving/setting dew point °C (*2)	
SHD3000 Series	-G	-20	-10	} 3-step switching
		-40	-20	
		-40	-40	
	-M	-20	-20	} 3-step switching
		-40	-40	
		-60	-60	

*1: Factory default setting (purge amount setting)

*2: Configured by the user
Arbitrary configuration at 3 steps is possible depending on the applications or conditions of use

When the load is smaller than the rating, the unit will enter the energy conservation operating mode at this configured temperature.

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FmResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PresCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FmResistFR
Oil-ProhrR
MedPresFR
No Cu/
PTFE FRL
Outdrs FR
F.R.L
(Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/
other
Jnt/tube
AirUnt
PrecsCompn
Mech/
ElecPresSw
ContactSW
AirSens
PresSW
Cool
AirFloSens/
Contr
WaterRtSens
TotAirSys
(Total Air)
TotAirSys
(Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg
etc
Ending

Selection guide

Max. flow rate table Values are with an inlet temperature of 35°C.

Model No.	SHD3025	SHD3045	SHD3075	SHD3100	SHD3125	SHD3150	SHD3200	SHD3240
Inlet air flow rate	2.5	4.5	7.5	10	12.5	15	20	24

*1: The -20, -40, and -60°C specifications will be of the same air flow rate.

Unit: m³/min (ANR)

● Selection method

The above flow rate table lists values for when the inlet pressure is 0.7 MPa and the inlet air temperature is 35°C. When conditions differ, determine the specifications by using the coefficient table and curve listed below.

Inlet air flow rate = (Inlet flow rate of max. flow rate table (*2)) x (Pressure coefficient) x (Temperature coefficient)

Purge flow rate (*3) = (Inlet flow rate of max. flow rate table (*2)) x (Purge rate for each dew point (*4))

Outlet air flow rate = (Inlet air flow rate) - (Purge flow rate)

*2: These are values from the above table and are values decided based on the model No.

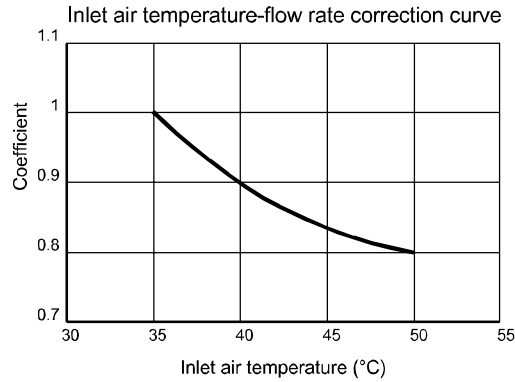
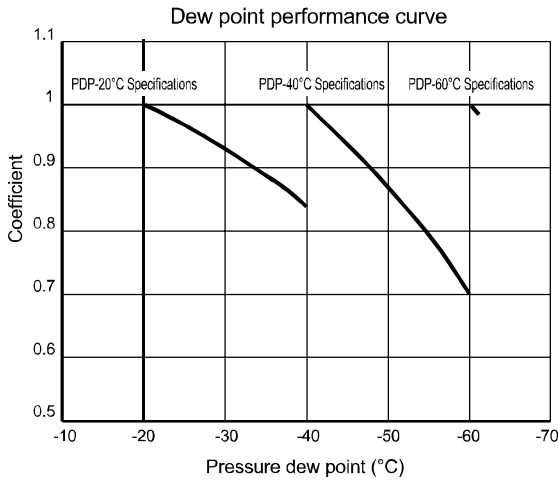
*3: The average value is listed.

*4: 14% for -20°C specifications, 16.5% for -40°C specifications, 23% for -60°C specifications.

*5: Abbreviation for PDP (pressure dew point).

Pressure coefficient table (be sure to make a selection with the pressure that will be used)

Inlet air pressure (MPa)	0.4	0.5	0.6	0.7	0.8	0.9	1
Coefficient	0.63	0.75	0.88	1.00	1.13	1.25	1.38



(Example)

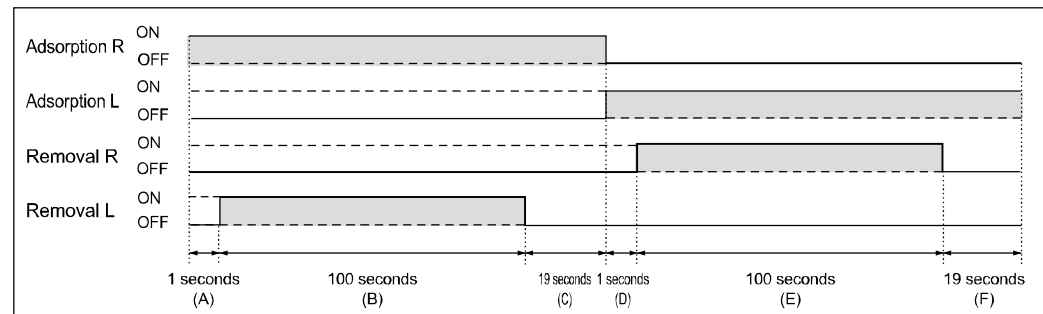
Air flow rate of SHD3045 when pressure is 0.6 MPa, pressure dew point is -40°C, and inlet air temperature is 50°C

Inlet air flow rate = 4.5 x 0.88 x 0.8 = 3.168 m³/min

Purge flow rate = 4.5 x 0.165 = 0.743 m³/min

Outlet air flow rate = 3.168 - 0.743 = 2.425 m³/min

Time chart



The normal processes are listed on the left. During energy conservation, the state (C, F) after the removal has been completed will be retained. After this, as soon as the dew point degrades, switching will resume to return to the normal processes.

B and E indicate removal (regeneration) time; C and F indicate rising pressure time.

When a heatless dryer is installed

● Model numbers SHD3075 through SHD3240 come provided with a class-2 pressure vessel certificate.

Keep this while using the components. (Applications to the Labor Standards Supervision Office are no longer required in Japan.)

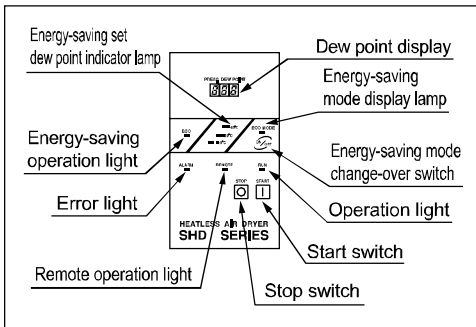
● When starting a test after the installation of this unit, operate the unit for the period of time designated below with a flow rate that is approximately 10 to 20% of the flow rate that will be used.

Pressure dew point (°C) (*6)	-20	-30	-40	-60
(Reference) Atmospheric dew point (°C)	-40	-48	-57	-74
Time (h)	6	12	24	72

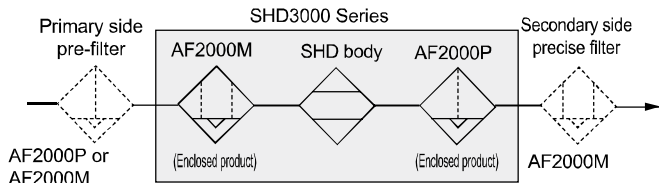
*6: The pressure dew point is for when the pressure is 0.7 MPa.

Dimensions

Operation panel



Piping system

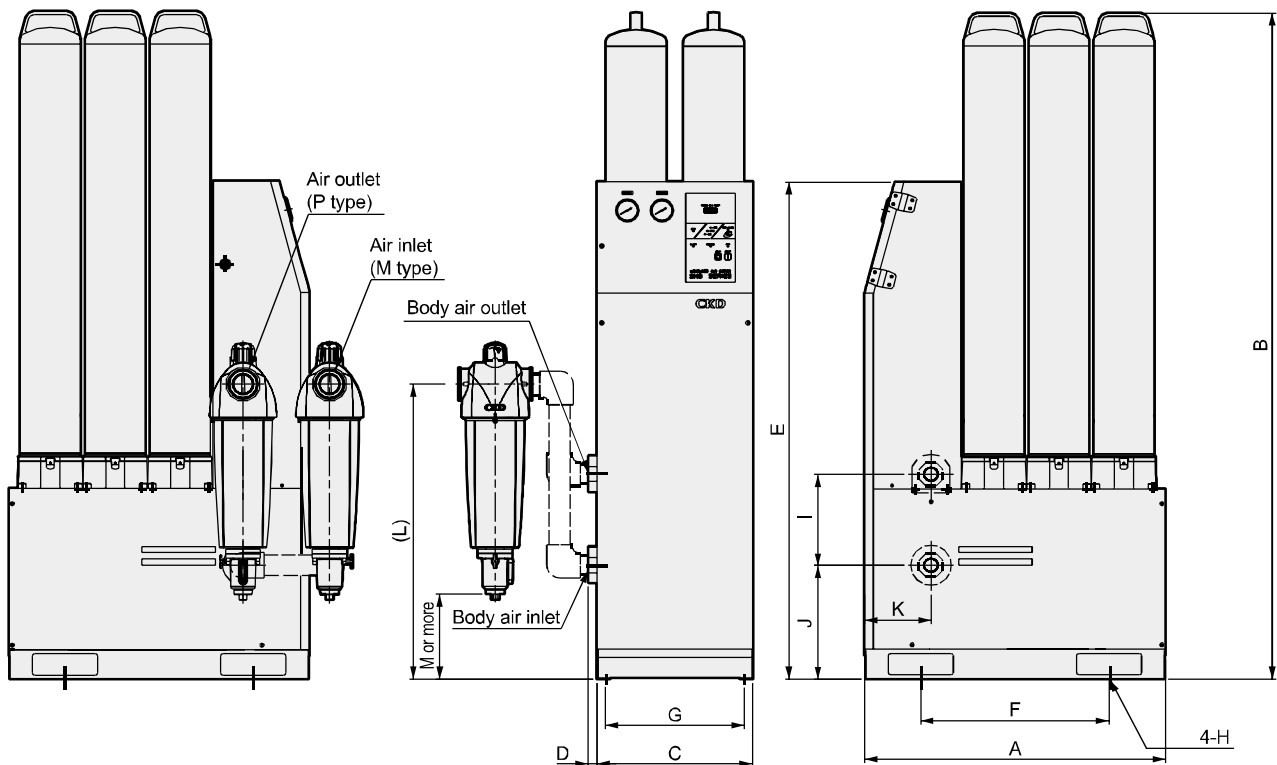


Assuming use with a line of a lubrication air compressor, although the SHD3000 Series is provided with the AF2000M for the primary side of the heatless dryer and the AF2000P for the secondary side, as needed, separately install a primary side pre-filter or a secondary side fine filtration filter.

Filter performance

	AF2000P	AF2000M	AF4000P AF5000P	AF4000S	AF4000M AF5000M
Filtration (μm)	1	0.01	5	1	0.01
Secondary side oil concentration (mg/m ³)	0.6	0.01	-	-	0.01

Furthermore, in cases when the AF4000 or 5000 Series has been selected with the options, select the AF4000 or 5000 Series for the filter to install separately as well.



* The figure shows AF2000.

Model No.	Port size	A	B	C	D	E	F	G	H	I	J	K	L	M (Option E2)	M (Option E2)	
SHD3025	Rc1	545	1559	360	20	1163	285	320	φ12	213	266.5	153.5	410	70	570	126
SHD3045	Rc1	545	1559	360	20	1163	285	320	φ12	213	266.5	153.5	500	70	730	212
SHD3075	Rc1 1/2	695	1559	360	20	1163	435	320	φ12	213	266.5	153.5	591	100	940	314
SHD3100	Rc1 1/2	845	1559	360	20	1163	585	320	φ12	213	266.5	153.5	683	100	940	314
SHD3125	Rc2	995	1589	360	20	1193	590	330	φ15	213	296.5	153.5	683	100	1100	387
SHD3150	Rc2	1145	1589	360	20	1193	700	330	φ15	213	296.5	153.5	683	100	1420	550
SHD3200	Rc2 1/2	1445	1589	360	20	1193	780	330	φ15	213	296.5	153.5	810	120	1255	-
SHD3240	Rc2 1/2	1745	1589	360	20	1193	780	330	φ15	213	296.5	153.5	810	120	1255	-

The piping illustrated with the broken lines in the figure is not attached with the product. Customers are asked to prepare items as necessary.

The filters are provided with the product.

Install the M type on the inlet side and the P type on the outlet side. Filters may be required for the sake of the system. In such cases, please prepare them separately. The M dimension shows the min. dimension required to remove the element. Allow for the auto-drain piping dimensions when actually laying the pipe.

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FlnResistFR
Oil-ProhR
MedPresFR
No Cu/PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneur
AirBoost
SpdContr
Silncr
CheckV/other
Jnt/tube
AirUnt
PresCompn
Mech/ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/Contr
WaterPtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending



Pneumatic components (main line components)

Safety Precautions

Be sure to read this section before use.
Refer to Intro Page 63 for general precautions.

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FlmResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacFR
Clean FR
ElecPneuR
AirBoost
SpdContr
SiIncr
CheckV/ other
Jnt/tube
AirUnt
PrecsCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

Product-specific cautions: Heatless dryer

Manufacturer's Exemption of Liability

WARNING

- The manufacturer cannot be held liable in the following cases:
 - In the case where there are serious errors in the operator's use.

- Inappropriate modifications or repairs using nonstandard parts, made by the user.

Design/selection

WARNING

- Avoid direct sunlight and rainwater. The resin parts, etc., could deteriorate and break.
- Do not use in locations with corrosive gases.
- Use this product within the operating ambient temperature.
- Do not use in locations at risk of freezing.
The accumulated condensation water could freeze and damage the product.
- Do not use in hazardous locations (possibly explosive atmospheres, etc.).

- Do not use this product in an ozone generating environment.
- We recommend keeping the inlet air temperature as low as possible. Adsorption performance of desiccants will be lower at high temperature.
- Do not use when the inlet air contains corrosive gas, chemical solutions, organic solvents, or combustible gas.
- Carefully prevent water drops from entering the inside.
- The dew point value indicated by G type of the SHD Series can be used as a guide, but the accuracy is low especially in the low dew point range.
Use M type for accurate dew point monitoring.

Mounting, installation and adjustment

CAUTION

- "Class 2 pressure vessel" of the "safety regulation of boiler and pressure vessel" of Occupational Safety Sanitation Act applies to model No. SHD3075 to SHD3240.
- Model numbers SHD3075 to SHD3240 have a Class 2 pressure vessel withstand pressure proof certificate. This certificate must be kept safely while using this device. (Application to the Labor Standards Supervision Office in Japan is not required.)
- This device may only be used in Japan. (Contact CKD for use overseas.)
- Install this device on a stable, flat surface not subject to vibration.
- Do not step onto this main unit.
- Secure enough space for maintenance and inspection. (600 mm and over in front, sides and back)
- Stainless steel pipes or galvanized pipes (white pipe) are recommended as piping materials. Flush the pipes before connecting them.

- Use a forklift to carry the product. Pass the forks of forklift through the forklift hole. (Excluding compact HD Series)
- Do not block the forklift hole since it also discharges regenerated air. (SHD Series only)
- Establish a ground connection.
- Filters are supplied with SHD Series.
Install the supplied oil removing filter (M type) on the primary side (inlet side) and the supplied dust filter (P type) on the secondary side.
If the inlet air is low quality, add a filter before the M type. Additional filters may be necessary if customer requires higher air quality.
- Filters are not supplied with other series (HD Series) than SHD Series.
Select filters appropriate for the system, purchase and install them as a separate order.
- Install a filter as close as possible to the dryer.

Use/maintenance

Operation

⚠ CAUTION

- Use within the working pressure range.
- Use within the power voltage range in the specifications.
- Energy-saving operation can be set with the “ECO MODE” ON/OFF button as desired. (SHD Series only)
- Keeping a constant dew point is not possible if the working air flow rate changes significantly.
- Leakage may occur from the silencer, though rarely, depending on the air intake condition and ambient temperature. If it occurs, place a drain pan underneath.

Inspection/maintenance

⚠ CAUTION

- The replacement timing for the desiccant will differ depending on the working conditions and required dew point. It is preferable that the desiccant be replaced when degradation of its performance is observed in dew point monitoring. Normally replacement is approximately 2 years.
- Desiccants may adsorb various substances other than moisture contained in the compressed air. Always dispose of used desiccants as industrial waste in an appropriate manner.
- Replace the silencer if the pressure of regeneration chamber has exceeded 0.05 MPa or when one year has passed from the beginning of use.
- It is preferable that the humidity sensor for G type of the SHD Series be replaced once a year. (It cannot be calibrated.)
As for the dew-point meter for M type, calibration once a year is recommended.
In extreme conditions, more frequent replacement and calibration will be necessary.

Repair parts

⚠ CAUTION

- Periodically check the parts for deterioration and replace them as necessary to use the product safely through its service life. Refer to the instruction manual included with the product for details.

Regular maintenance parts

⚠ CAUTION

- Periodically inspect the regular maintenance parts and replace them according to the standard replacement frequency to use the product safely through its service life.
Refer to the instruction manual included with the product for details.

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FmResistFR
Oil-ProhR
MedPresFR
No Cu/PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/other
Jnt/tube
AirUnt
PresCompn
Mech/ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending