

## Improved environmental performance, heatless

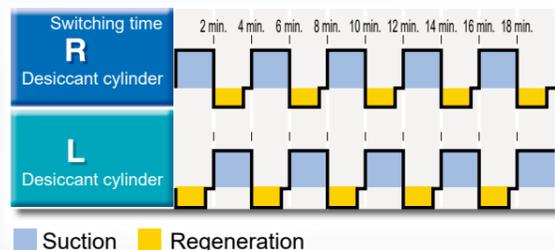
An energy-saving dew point monitoring device drastically reduces the purge flow rate (by up to approx. 96%). Additionally, a proprietary exhaust system achieves low-noise operation. The SHD Series Super Heatless Dryer, perfecting reliability, performance, and ease of use.

### Energy saving

#### Reduces unnecessary purge by dew point monitoring

##### Normal operation

Regardless of the outlet dew point, adsorption ⇌ regeneration switches 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%).



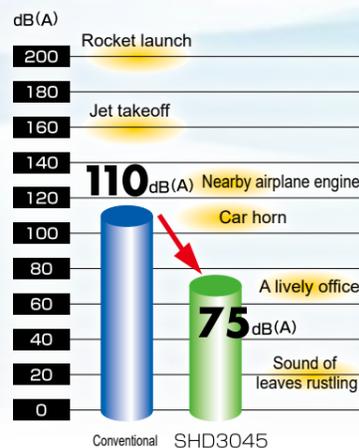
### Low noise

#### Significantly reduces noise when switching

Variable exhaust method (PAT. By adopting P), a significant noise reduction of about 35dB (A) is achieved compared to conventional products.

##### Noise reduction

When the noise level is reduced by 10 dB, human hearing perceives the noise level to be "halved".



#### Achieves 1/3 lower power consumption

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

#### Equipped with filters at inlet and outlet as standard

An AF2 Series filter is 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)

#### Air compressor can be connected directly

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



#### Stainless steel tower adopted

#### Operability improved by the electronic control system

##### Digital display of pressure dew point

Pressure dew point, sensor abnormalities, etc., are also displayed.

##### Can be switched between energy saving and normal operation

##### Selectable energy-saving set dew point

G-type: 3 stages of -10, -20 and -40°C

M-type: 3 stages of -20, -40 and -60°C

##### Allows centralized management in control rooms, etc.

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

##### ECO display

Lights when entering energy-saving mode.

##### Energy-saving rate display

It can display the energy saving rate per 24 hours.

#### Easy maintenance

The desiccant cylinder can be easily removed by simply rotating it 45°. Moreover, the latch mechanism locks the cylinder for safety.

#### Significantly reduced footprint

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

#### A wide variety of 16 models are available.

A total of 16 models are available, with 8 models based on air flow rate (2.5 to 24 m³/min ANR) and 2 sensor types (G: Temperature/Humidity Sensor, M: Dew Point Meter).

Compatible compressor	kW	15	22	55	75	90	125		
Inlet air flow rate	m³/min(ANR)	2.5	4.5	7.5	10	12.5	15	20	24
G type (Wet temperature sensor)		●	●	●	●	●	●	●	●
M type (Dew point meter)		●	●	●	●	●	●	●	●

Inlet air pressure 0.7 MPa  
Inlet air temperature of 35°C (no water drops)



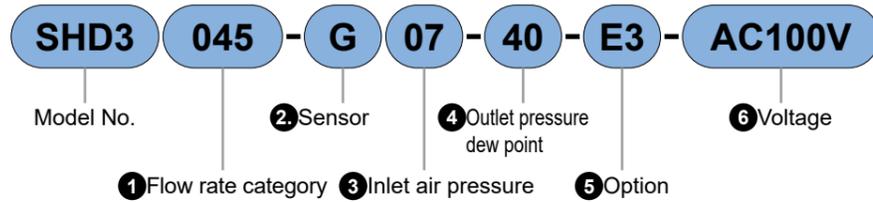
Desiccant Air Dryer (heatless dryer)

# SHD Series

Circuit Diagram Symbol



## Model No. Notation



Note: The unit's full performance may not be obtained if used at less than the selected pressure. Be sure to select the model No. with your working pressure.

### 1 Flow Rate Category

Code	Description
025	2.5 m³/min (ANR)
045	4.5 m³/min (ANR)
075	7.5 m³/min (ANR)
100	10 m³/min (ANR)
125	12.5 m³/min (ANR)
150	15 m³/min (ANR)
200	20 m³/min (ANR)
240	24 m³/min (ANR)

### 2 Sensor

Code	Description
G	Temperature and Humidity Sensor
M	Dew point meter

Note: With the sensor type "G", 4 outlet pressure dew point "60" - 60°C specification cannot be selected. In addition, the "G" type dew point indication value is only a guide accuracy, and the accuracy decreases especially in the low dew point range. When prioritizing dew point management, use of the "M" type is recommended.

### 3 Inlet air pressure

Code	Description
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

### 4 Outlet pressure dew point

Code	Description
20	-20°C
40	-40°C
60	-60°C

### 5 Option

Code	Description
E1	Without accessory filter
E2	AF4000 Series included
E3	Standard (AF2 included)
G	Voltage designation
H	English text
L	Foundation bolt nut (SS400)
L1	Foundation bolt nut (SUS304)

Note: If there is more than one option, please list them in alphabetical order.

### 6 Voltage

Code	Description
AC100V	100 VAC
AC200V	200 VAC

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

\*1: Default setting (Setting purge rate)

\*2: Configured by the user  
Can be set to any of three levels depending on application and usage conditions

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

## Specifications

Item	SHD3025	SHD3045	SHD3075	SHD3100	SHD3125	SHD3150	SHD3200	SHD3240	
Working fluid	Compressed air								
Inlet air pressure range MPa	0.4 to 1.0								
Inlet air temperature range °C	5 to 50								
Ambient temperature °C	0 to 40								
Rated conditions	Inlet air temperature °C	35 (no water drops)							
	Ambient temperature °C	25							
	Inlet air pressure MPa	0.7							
	Inlet air flow rate m³/min (ANR)	2.5	4.5	7.5	10	12.5	15	20	24
	Outlet pressure dew point °C	-20, -40, -60							
Average purge rate %	-20°C:14 / -40°C:16.5 / -60°C: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: Capacitive temperature/humidity sensor / M-type: Dew point meter (capacitive 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	
Accessory filter (for inlet side) standard	AF2-05M25A	AF2-08M32A	AF2-11M40A	AF2-13M50A	AF2-13M50A	AF2-20M50A	AF2-24M65A	AF2-24M65A	
Accessory filter (for outlet side) standard	AF2-05P25A	AF2-08P32A	AF2-11P40A	AF2-13P50A	AF2-13P50A	AF2-20P50A	AF2-24P65A	AF2-24P65A	
Accessory filter (for inlet side) option E2	AF4004M-25	AF4007M-40	AF4010M-40	AF4010M-40	AF4013M-50	AF4020M-50	AF5032M-80	AF5032M-80	
Accessory filter (for outlet side) option E2	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.5GY7.5/0.5).

\*2: Attach the included 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 of 20°C atmospheric pressure and relative humidity 65%.

\*4: For the SHD3150, only the outlet for option E2 is the 'S-type'.

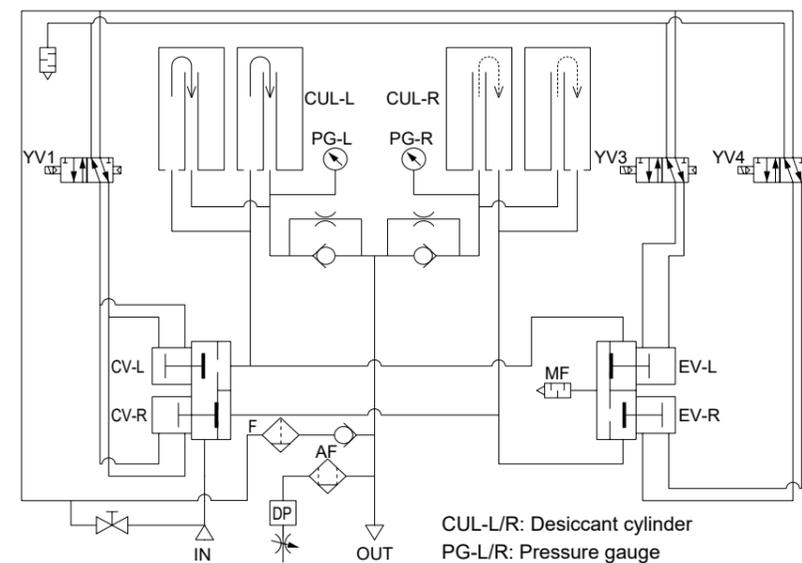
\*5: For the SHD3200 and SHD3240, only option E2 uses the AF5032.

\*6: See the AF2 series on page 219 and the AF4000 series on page 229 of the catalog for details on attached filters.

\*7: The G-type sensor requires regular replacement and the M-type dew point meter requires regular calibration.

(CKD components product website (<https://www.ckd.co.jp/kiki/en/>) -> "Model No." -> [Instruction Manual])

## Functions



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  
YV3/4: Valve for exhaust switching

Wet compressed air entering from IN passes through valve CV into desiccant cylinder CUL-L. Enters desiccant cylinder CUL-L passing through valve CV. Wet compressed air flows evenly inside the desiccant, and the desiccant absorbs the water vapor in the compressed air to become super-dry air, which exits OUT through the check valve. Some ultra-dry air, depressurized through the orifice, enters the desiccant cylinder CUL-R, is used to regenerate and dry the desiccant in the CUL-R, and is then released to the atmosphere. A portion of the air coming out of the OUT is directed to the dew point sensor DP for dew point measurement. Depending on the dew point, it will enter the energy-saving mode in which the switching time is extended. (After the desorption process is completed, both cylinders are held in a boosted state to extend the changeover time.)

Selection Guide

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

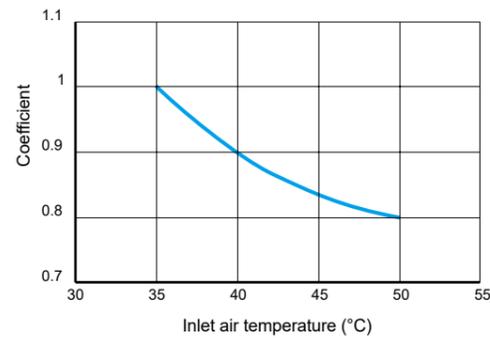
Model No.	SHD3025	SHD3045	SHD3075	SHD3100	SHD3125	SHD3150	SHD3200	SHD3240
Inlet air flow rate	2.5	4.5	7.5	10	12.5	15	20	24

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

Unit: m³/min (ANR)

**STEP 1** Confirm the working conditions and the rated values listed in the specifications.  
Working Conditions: Inlet air pressure, inlet air temperature, required pressure dew point

**STEP 2** Confirm the compensation coefficient for inlet air flow rate affected by inlet air temperature.  
(1) Temperature - Flow rate compensation coefficient



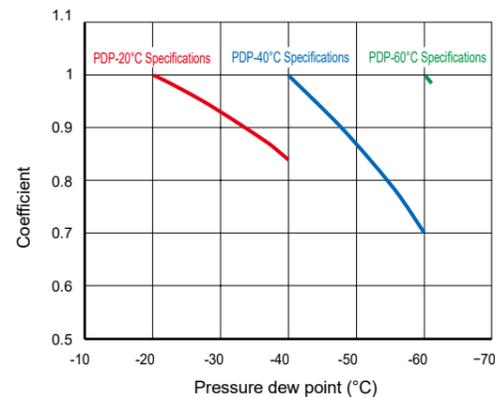
**STEP 3** Confirm the compensation coefficient for inlet air flow rate affected by inlet air pressure.  
(2) Pressure - Flow rate compensation coefficient

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 of Calculation

Conditions	Working Conditions	Selecting Conditions	Compensation coefficient for inlet flow rate
Inlet air temperature	35 to 40 °C	40°C	0.9
Inlet air pressure	0.5 to 0.55 MPa	0.5 MPa	0.75
Outlet pressure dew point	-40°C	-40°C	1.0

**STEP 4** Confirm the compensation coefficient for inlet air flow rate affected by outlet pressure dew point.  
(3) Dew point - Flow rate compensation coefficient

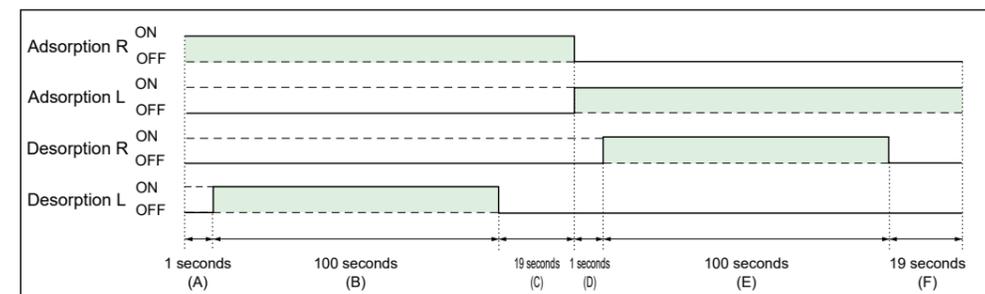


**STEP 5** Find the inlet air flow rate from the rated inlet air flow rate of each model.  
Rated inlet air flow rate × (1)Temperature flow rate correction coefficient × (2)Pressure correction coefficient × (3)Dew point correction coefficient = Corrected inlet air flow rate

**STEP 6** Find the outlet air flow rate from the purge flow rate and inlet air flow rate of each model.  
Rated inlet air flow rate × Purge rate (\*1) = Purge flow rate  
Inlet air flow rate corrected by STEP 5 - Purge flow rate = Outlet air flow rate  
\*1 at -20°C: 14%  
-40°C: 16.5%  
-60°C: 23%

Substitute the conditions on the left into the equation above to obtain the outlet air flow rate when using the SHD3240.  
Inlet air flow rate is 24 × 0.9 × 0.75 × 1.0 = 16.2 m³/min (ANR)  
Purge flow rate is 24 × 0.165 = 3.96 m³/min (ANR)  
In this case, the outlet air flow rate is 16.2-3.96 = 12.24 m³/min (ANR).

Time Chart



The normal processes are listed on the left. During energy conservation, after the desorption has been completed, the state (C,F) is maintained. If the subsequent dew point worsens, switching is resumed and the process returns to normal.

B and E are desorption (regeneration) times  
C and F indicate rising pressure time.

When a heatless dryer is installed

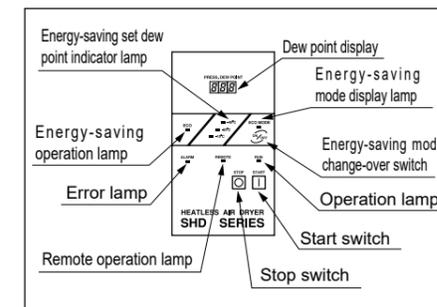
- Model Nos. SHD3075 to SHD3240 are equipped with a Class II Pressure Vessel Pressure Resistance Certificate. Please keep it in a safe place at your company while the unit is in use. (Applications to the Labor Standards Supervision Office are no longer required in Japan.)
- When starting a test after 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)(*1)	-20	-30	-40	-60
(Reference) Atmospheric dew point (°C)	-40	-48	-57	-74
Time (h)	6	12	24	72

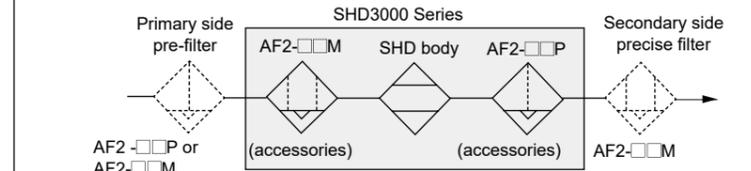
\*1: The pressure dew point is for when the pressure is 0.7 MPa.

Dimensions

Operation panel



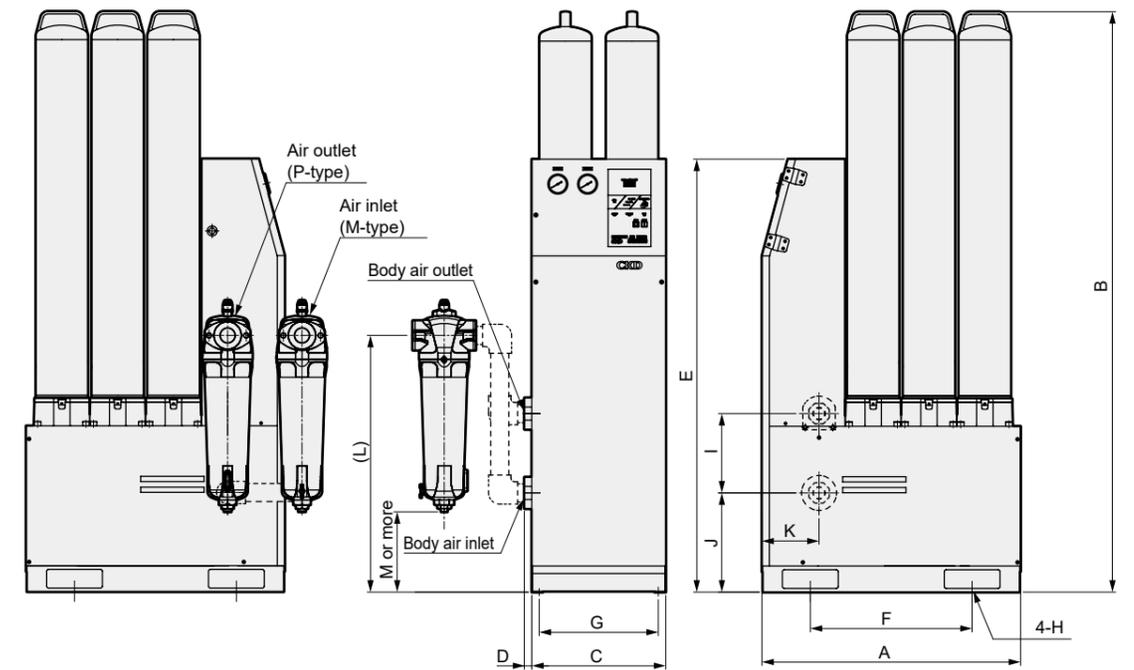
Piping system



Assuming use with a line of a lubrication air compressor, although the SHD3000 Series is attached with the AF2-□□M type for the primary side of the heatless dryer and the AF2-□□P type for the secondary side, as needed, separately install a primary side pre-filter or a secondary side fine filtration filter. 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.

Filter performance

	AF2-□□P	AF2-□□M	AF4000P AF5000P	AF4000S	AF4000M AF5000M
Filtration rating (µm)	1	0.01	5	1	0.01
Secondary side oil Concentration (mg/m³)	0.6	0.01	-	-	0.01



Note: The figure shows AF2.

Model No.	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	ø12	213	266.5	153.5	410	70	570	126
SHD3045	Rc1	545	1559	360	20	1163	285	320	ø12	213	266.5	153.5	500	70	730	212
SHD3075	Rc1-1/2	695	1559	360	20	1163	435	320	ø12	213	266.5	153.5	591	100	940	314
SHD3100	Rc1-1/2	845	1559	360	20	1163	585	320	ø12	213	266.5	153.5	683	100	940	314
SHD3125	Rc2	995	1589	360	20	1193	590	330	ø15	213	296.5	153.5	683	100	1100	387
SHD3150	Rc2	1145	1589	360	20	1193	700	330	ø15	213	296.5	153.5	683	100	1420	550
SHD3200	Rc2 1/2	1445	1589	360	20	1193	780	330	ø15	213	296.5	153.5	810	120	1255	-
SHD3240	Rc2 1/2	1745	1589	360	20	1193	780	330	ø15	213	296.5	153.5	810	120	1255	-

- \*1: The piping illustrated with the broken lines in the figure is not included with the product. Customers are asked to prepare them as necessary.
- \*2: The filters are included with the product.
- \*3: 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.
- \*4: The M dimension shows the min. dimension required to remove the element. Allow for the auto-drain piping dimensions when actually laying the pipe.

For maintenance parts, refer to the CKD Components Product site  
Refer to (<https://www.ckd.co.jp/kiki/en/>) → "Model No." → Maintenance Parts

Main Line Components

Refrigeration Dryers

Desiccant Dryers

High Polymer Membrane Dryers

Main Line Filters

Drain discharger, etc.

Main Line Components

Refrigeration Dryers

Desiccant Dryers

High Polymer Membrane Dryers

Main Line Filters

Drain discharger, etc.



Pneumatic Components (Desiccant air dryers)

# Safety Precautions

Be sure to read this section before use.

For general precautions for pneumatic equipment, please refer to Intro 15.

Product-specific cautions: Heatless Dryer SHD Series

## Manufacturer's Disclaimer

### WARNING

■The manufacturer cannot be held liable in the following items:

- In the case where there are serious errors in the operator's use.
- Illegal modifications or repairs using non-standard parts by user.

## Design / Selection

### WARNING

■Avoid direct sunlight and rain water. Resin parts may deteriorate and break.

■Do not use in locations with corrosive gases.

■Use this product within the range of the working temperature.

■Do not use the product where it could freeze.  
There is a risk of damage to the product due to freezing of condensation water, etc. that have accumulated inside the product.

■Do not use in hazardous locations (e.g., potentially explosive atmospheres).

■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 temperatures.

■Do not use when the inlet air contains corrosive gas, chemical solutions, organic solvents, or combustible gas.

■Carefully prevent water drops from entering inside.

■The dew point indication value of G-type is an approximate accuracy, and the accuracy decreases especially in the low dew point range. M-type is recommended for dew point control.

### CAUTION

■Model Nos. SHD3075 to SHD3240 are applicable to "Class 2 Pressure Vessels" under the "Boiler and Pressure Vessel Safety Regulations" based on the Industrial Safety and Health Law.

■The Model Nos. SHD3075 to SHD3240 are accompanied by a Class II Pressure Vessel Pressure Certificate, which should be kept in a safe place at your company while the unit is in use. (Application to the Labor Standards Supervision Office in Japan is not required.)

MEMO

For precautions during mounting, installation, adjustment, use and maintenance, refer to the CKD Components Product Site (<https://www.ckd.co.jp/kiki/en/>) → "Model No. → Instruction Manual"