Refrigerant R134a (HFC)
IDH☐ Series

CE   UK CA   RoHS

How to Order

For use in Japan	IDH	6	–	10		–	

For use in Europe and Southeast Asia	IDHA	6	–	23		–	

Size

Size	Rated air flow capacity	Air compressor size
4	400 L/min [ANR]	3.7 kW
6	600 L/min [ANR]	5.5 kW

Voltage

Symbol	Voltage	Specification
10	Single-phase 100 VAC (50/60Hz)	For use in Japan
20	Single-phase 200 VAC (50/60Hz)	
23	Single-phase 230 VAC (50/60Hz)	For use in Japan and Southeast Asia

Option

Nil	None (Standard)
E	Auto drain normally closed
G	With Chinese labels and a Chinese operation manual

∗ When multiple options are combined, indicate symbols in alphabetical order.

Combination of built-in products

Symbol	Regulator	Filter① (AMH)	Filter② (AME)
Nil	●	●	●
A	●	●	—
B	●	—	—

Descripiton	Filter details	Filter size	
		IDH4, IDHA4	IDH6, IDHA6

Filter① (AMH)	Micro mist separator with pre-filter
	· Nominal filtration rating:
	  0.01 μm (99.9% filtration efficiency)
	· Outlet oil mist concentration:
	  MAX. 0.1 mg/m³ [ANR] (≈0.08 ppm)
		AMH250C	AMH350C

Filter② (AME)	Super mist separator
	· Nominal filtration rating:
	  0.01 μm (99.9% filtration efficiency)
	· Outlet oil mist concentration:
	  MAX. 0.01 mg/m³ [ANR] (≈0.008 ppm)
	· Cleanliness at outlet:
	  Particles of 0.3 μm or more:
	  3.5 particles/L [ANR] or less
		AME250C	AME350C

Optional Specifications

Option symbol

E — Auto drain normally closed

The auto drain which exhausts dehumidified drainage and the auto drain on the built-in filter are changed to the "normally closed" specification. Recommended for small flow rate (100 to 150 L/min).

## Construction (Pneumatic/Refrigerant Circuit)

Pneumatic circuit

Hot and humid air entering this product is cooled down by the cooler. The moisture condensed at this time is separated by the drain separator and exhausted automatically. The pressure of the dry air is adjusted by the regulator, and oil mist and solid particles are separated by the micro mist separator with pre-filter and super mist separator. Note) The temperature of the dry and high purity air Note) is adjusted by the heater and supplied to the outlet side.
Note) The type without filter is not applicable.
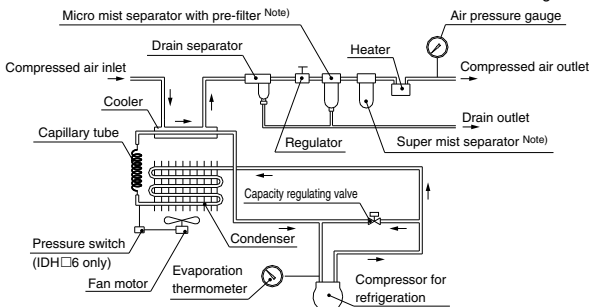
Refrigerant circuit

The HFC gas contained in the refrigerant circuit is compressed by the compressor, and cooled and liquefied by the condenser. When passing through the capillary tube, the HFC gas is regulated and its temperature decreases. While passing through the cooler part, it evaporates rapidly, taking the heat from the compressed air, and is sucked in by the compressor. The capacity regulating valve opens when the compressed air has been cooled sufficiently, and prevents condensed water from being frozen by excessive cooling.

Symbol

SMC

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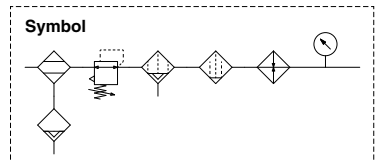
Standard Specifications

Specifications	Model	IDH4-10☐	IDH4-20☐	IDHA4-23☐	IDH6-10☐	IDH6-20☐	IDHA6-23☐
Operating range Note 3)	Fluid	Compressed air					
	Air flow capacity Note 1)	100 to 500 L/min [ANR] Note 9)			200 to 800 L/min [ANR]		
	Inlet air temperature	5 to 40°C					
	Inlet air pressure	0.3 to 1.0 MPa					
	Ambient temperature	15 to 35°C (Relative humidity 85% or less)					
	Outlet air temperature adjustment range Note 2)	15 to 30°C					
	Outlet air set pressure range	0.15 to 0.85 MPa (The inlet air pressure should be at least 0.15 MPa higher than the outlet air pressure.)					
Rated conditions	Air flow capacity	400 L/min [ANR]			600 L/min [ANR]		
	Inlet air pressure	0.7 MPa					
	Inlet air temperature	35°C					
	Ambient temperature	30°C					
	Outlet air set temperature	30°C					
Rated performance Note 4)	Outlet air pressure dew point	10°C					
	Outlet air temperature stability Note 5)	±0.1°C (This may vary depending on the conditions.)					
	Outlet air temperature display accuracy	±0.5°C (including accuracy of the sensor)					
Electric specifications	Power supply Note 6)	Single-phase 100 VAC (50/60 Hz)	Single-phase 200 VAC (50/60 Hz)	Single-phase 230 VAC (50/60 Hz)	Single-phase 100 VAC (50/60 Hz)	Single-phase 200 VAC (50/60 Hz)	Single-phase 230 VAC (50/60 Hz)
	Operating current	4.2 A	2.1 A	2.1 A	9.4 A	4.8 A	4.8 A
	Earth leakage breaker capacity	10 A	5 A	5 A	15 A	10 A	10 A
	Compressor input	180/200 W 50/60 Hz			385/440 W 50/60 Hz		
	Heater input	220 W			420 W		
Built-in filter specifications Note 7)	Nominal filtration rating	0.01 μm (99.9% filtration efficiency)					
	Cleanliness of the filter outlet side	Particles of 0.3 μm or more: 3.5 particles/L [ANR] or less					
Temperature control method		Heater operation: PID control					
Refrigerant type/Refrigerant charge		R134a/0.14 kg			R134a/0.26 kg		
Noise level (reference value) Note 8)		52 dB(A)			55 dB(A)		
Weight		26 kg			37 kg		
Applicable drain tube O.D.		10 mm					
Applicable directive		CE/UKCA Marked					

Note 1) ANR is the value at 20°C, atmospheric pressure, and relative humidity of 65%.
Note 2) About 10 minutes are required until the temperature becomes stable after setting the temperature.
Note 3) The upper limit of the settable outlet air temperature varies depending on the conditions even within the operating range. Be sure to read the selection document before selecting the models.
Note 4) Performance when the operation of each part is stable without fluctuations in operating conditions and power supply
If the air flow capacity is beyond its specified range or if the air flows intermittently, the outlet air temperature range or temperature stability may not be satisfied. (If this happens, install a purge line and flow the compressed air continuously.)
Note 5) In case, the outlet air temperature is set in the range of the ambient temperature +/–5 deg.C.

Note 6) Keep the voltage within -5 to +10% of the rated voltage. If there is voltage fluctuation, the outlet air temperature stability may decrease. So if highly accurate temperature adjustment is required, please use a stable power supply to make the voltage fluctuation smaller.
Note 7) The specification changes depending on the cleanliness of the inlet side air. It may take time until the cleanliness of the filter outlet side air stabilizes immediately after start of operation. The filter performance only applies to the built-in type filter.
Note 8) 1 m in front of the product, 1 m in height, without load, stable conditions
Note 9) Customers considering operating the product at an air flow capacity of 100 L/min (ANR) or less should select the special order IDH☐4-☐☐-EX120 with a min. air flow capacity of 30 L/min (ANR). However, keep in mind that the ambient temperature and outlet air temperature adjustment range are from 20 to 30°C.

Output Signal

Specifications

Description	Terminal no.	Description of operation	Contact capacity	Minimum load
Operating signal N.O. (a contact)	1-2	Close after 10 minutes of operation	Resistance load 2 A, Induction load 80 VA, Lamp load 100 W	5 VDC 2 mA
Error signal N.O. (a contact)	3-4	Open at an emergency stop or set temperature error		
Error signal N.O. (b contact)	4-5	Close at an emergency stop or set temperature error		

Output signal timing chart
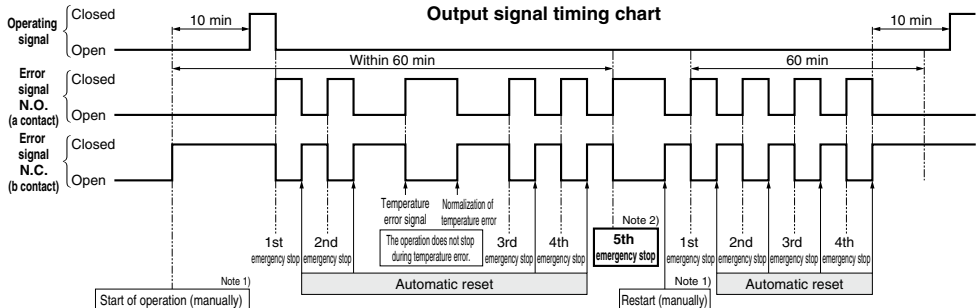
Note 1) The operation can be started or restarted (manually) by the operation stop switch mounted on the thermo-dryer or a remote switch prepared by the user.
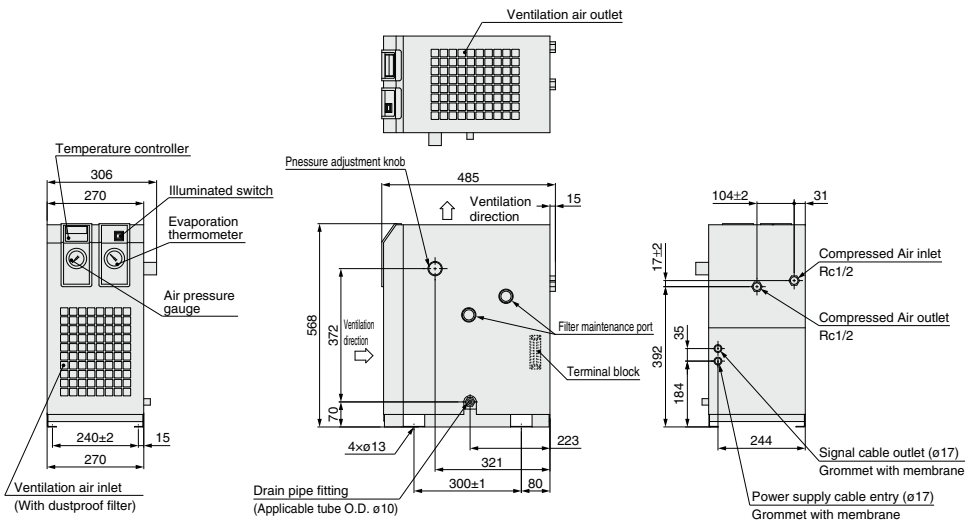Note 2) When emergency stop is generated 5 times in an hour or the heater protection equipment (thermo-stat) is operated, the emergency stop status will be held. At this time, the dryer can be restarted by reset operation using the switch stated in Note 1.
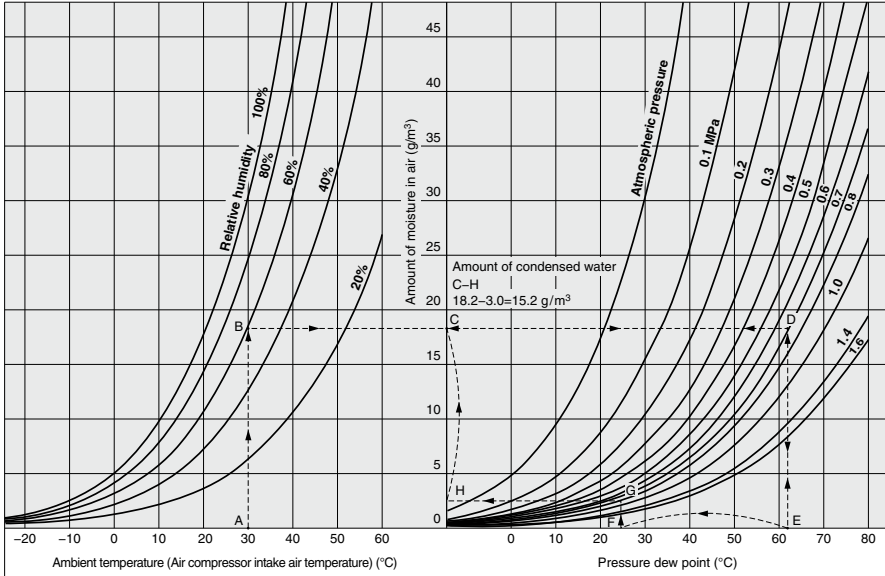
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IDH□ *Series*

Dimensions

IDH□4

Ventilation air outlet

Temperature controller
297
270
Illuminated switch
Evaporation thermometer
Air pressure gauge

240±2   15
270

Ventilation air inlet
(With dustproof filter)

Pressure adjustment knob
455
15
Ventilation direction

Ventilation direction

498
389

Ventilation direction

70
4×ø13
284
275±1   80
207

Drain pipe fitting
(Applicable tube O.D. ø10)

Filter maintenance port
Terminal block

80±2   24

56±2
320
184
35

Compressed Air inlet
Rc3/8
Compressed Air outlet
Rc3/8

244

Signal cable outlet (ø17)
Grommet with membrane
Power supply cable entry (ø17)
Grommet with membrane

IDH□6

Ventilation air outlet

Temperature controller
306
270
Illuminated switch
Evaporation thermometer
Air pressure gauge

240±2   15
270

Ventilation air inlet
(With dustproof filter)

Pnessure adjustment knob
485
15
Ventilation direction

568
372

Ventilation direction

70
4×ø13
321
300±1   80
223

Drain pipe fitting
(Applicable tube O.D. ø10)

Filter maintenance port
Terminal block

104±2   31

17±2
392
184
35

Compressed Air inlet
Rc1/2
Compressed Air outlet
Rc1/2

244

Signal cable outlet (ø17)
Grommet with membrane
Power supply cable entry (ø17)
Grommet with membrane

SMC

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Data

Condensed Water Calculation

The chart axes and labels include: Amount of moisture in air (g/m³), Relative humidity (100%, 80%, 60%, 40%, 20%), Ambient temperature (Air compressor intake air temperature) (°C), Atmospheric pressure, Pressure dew point (°C), pressure lines 0.1 MPa, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 1.0, 1.4, 1.6. Note on chart: "Amount of condensed water C–H 18.2–3.0=15.2 g/m³". Points A, B, C, D, E, F, G, H.

Dew Point Conversion Chart

Chart: Pressure dew point (°C) vs Atmospheric pressure dew point (°C). Pressure lines: 1.5 MPa, 1.3 MPa, 1.1 MPa, 0.9 MPa, 0.7 MPa, 0.5 MPa, 0.3 MPa, 0.1 MPa, Atmospheric pressure. Points A, B, C.

How to read the dew point conversion chart

Example) To obtain the atmospheric pressure dew point at a pressure dew point 10°C and a pressure 0.7 MPa.
1. Trace the arrow mark → starting from the point A at a pressure dew point 10°C to obtain the intersection B on the pressure characteristic line for 0.7 MPa.
2. Trace the arrow mark → starting from the point B to obtain the intersection C at the dew point under atmospheric pressure.
3. The intersection C is the conversion value –17°C under atmospheric pressure dew point.
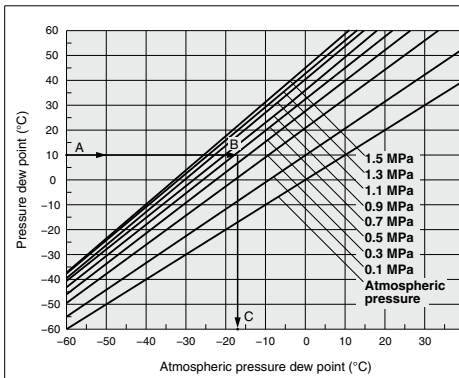
How to calculate the amount of condensed water

Example) To obtain the amount of condensed water when the pressure is applied to air up to 0.7 MPa with an air compressor, then cooled down to 25°C. Given an ambient temperature at 30°C and a relative humidity 60%.
1. Trace the arrow mark from the point A at an ambient temperature 30°C to obtain the intersection B on the curved line for the relative humidity 60%.
2. Trace the arrow mark from the intersection B to obtain the intersection D on the pressure characteristic line for 0.7 MPa.
3. Trace the arrow mark from the intersection D to obtain the intersection E.
4. The intersection E is the dew point under pressure 0.7 MPa with an ambient temperature 30°C and a relative humidity 60%. The value for E is 62°C.
5. Trace the intersection E upward, and trace from the intersection D leftward to obtain the intersection C.
6. The intersection C is the amount of moisture included in the compressed air 1 m³ at 0.7 MPa and a pressure dew point 62°C. **The amount of moisture is 18.2 g/m³.**
7. Trace the arrow mark, starting from F for cooling temperature 25°C (pressure dew point 25°C) to obtain the intersection G on the pressure characteristic line for 0.7 MPa.
8. From the intersection G, trace the arrow mark to obtain the intersection H on the vertical axis.
9. The intersection H is the amount of moisture included in the compressed air 1 m³ at 0.7 MPa, and a pressure dew point 25°C. **The amount of moisture is 3.0 g/m³.**
10. Therefore, the amount of condensed water is as follows (per 1 m³):

> The amount of moisture at the intersection C
> – the amount of moisture at the intersection H
> = the amount of condensed water
> 18.2 – 3.0 = 15.2 g/m³

SMC

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