No.1 Share in Japan

ORION®

冷熱と真空でイノベーション
Innovating with Thermal Control and Vacuum

# ICE Clean Air System

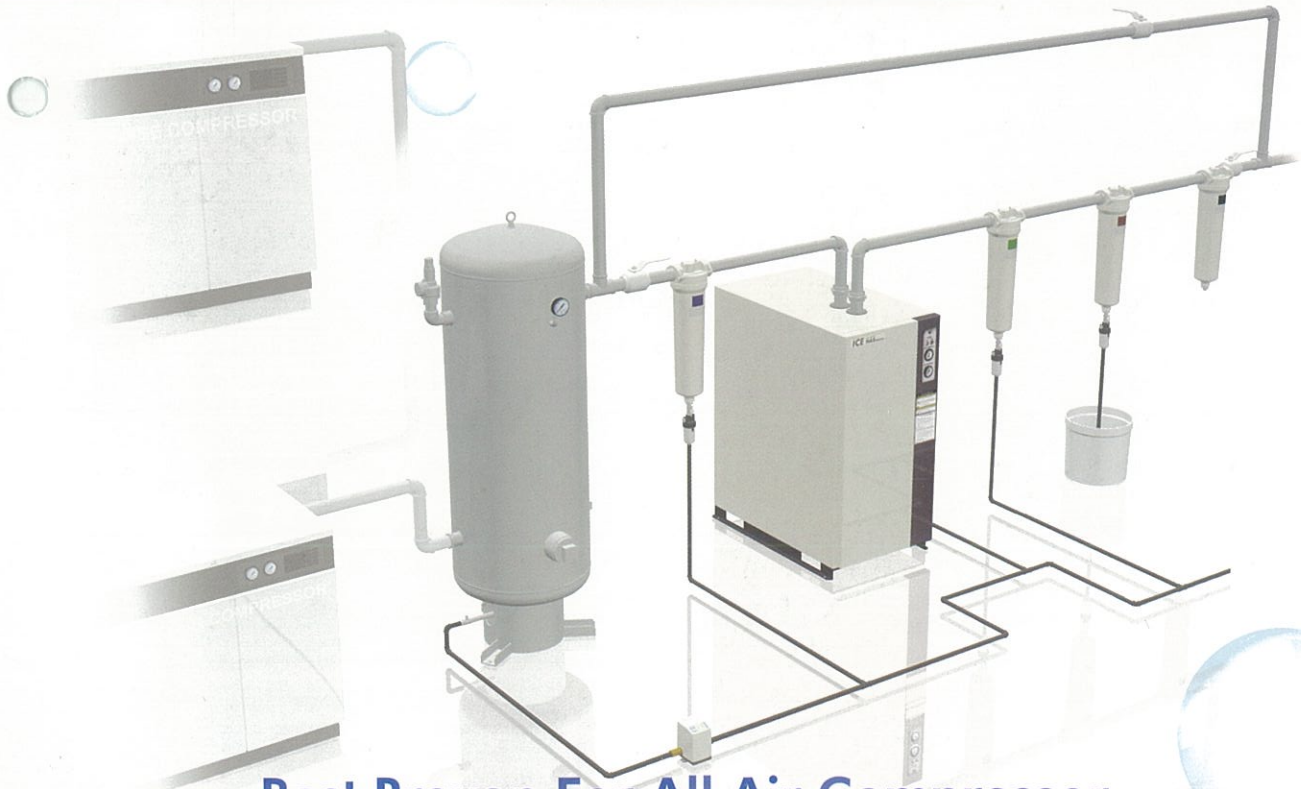
*ISO Quality Policy*
*HAS strives to offer products that delight its customers.*


**Low Pressure Loss & Energy Saving**

**Eco-Friendly Refrigerant Applied**

**Powerful performance in Asia with heavy duty specification**

**ICE**
AIR DRYER / AIR FILTER
**NEW**



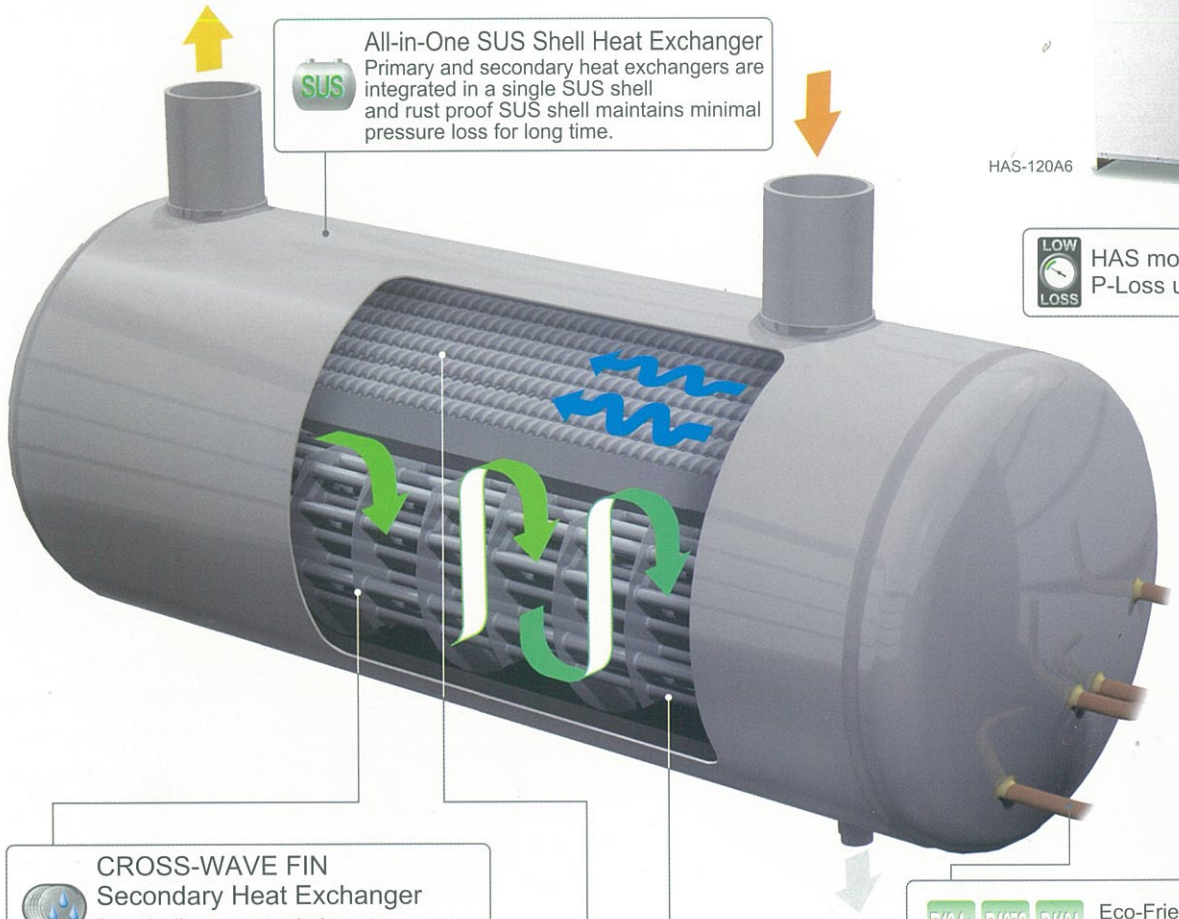
## Best Proven For All Air Compressor

# ICE Refrigerated Air Dryer

Feature-Packed Air Dryer for Energy Saving and Stable Productivity,

## ICE HAS series

HAS-120A6



**All-in-One SUS Shell Heat Exchanger**
Primary and secondary heat exchangers are integrated in a single SUS shell and rust proof SUS shell maintains minimal pressure loss for long time.

**HAS model**
P-Loss under 0.015MPa

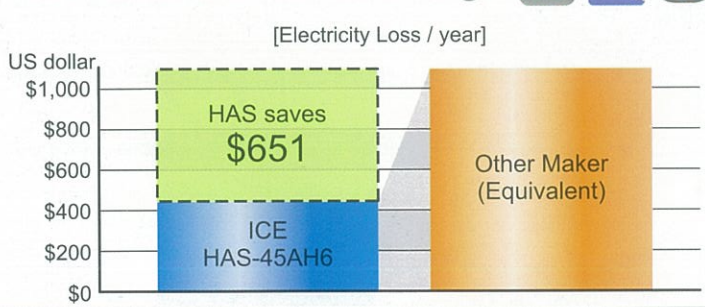
**CROSS-WAVE FIN Secondary Heat Exchanger**
Drastically separate drain water from compressed air without pressure loss

**TURBO TUBE Primary Heat Exchanger**
Efficient pre-cooling and re-heating without pressure loss

**Eco-Friendly refrigerant applied**

**Heavy Duty Refrigerant Circuit**
Durable performance in severe condition at ambient temp. of 43℃

## HAS Pressure Loss Advantage

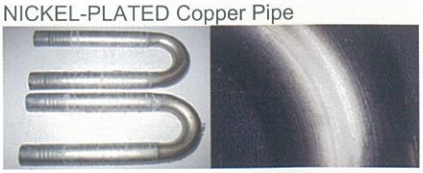



| | ICE HAS-45AH6 | Other Maker (Equivalent) | Difference |
|---|---|---|---|
| Pressure Loss | 0.013MPa | 0.032MPa | 0.019MPa |
| Electricity Loss/year | $446 | $1,097 | $651 |

| Compressor | Air Pressure Source | Capacity | Electricity Charge | Running Hour |
|---|---|---|---|---|
| 37kW(50HP) | 0.69MPa | 7m³/min | US$0.15/kWh | 8000h |

**NICKEL-PLATED Copper Pipe**
Anti-corrosion and prevention gas leakage

NICKEL-PLATED Copper Pipe



Copper pipe not plated

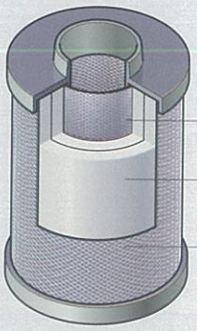
**Condenser Filter**
Protection against dust and easy maintenance

# ICE Clean Air Filter

Advanced Technology Packed "ICE" Clean Air Filter

## Drain Filter HAS-D_ALT/T

Location※1 Before Air Dryer

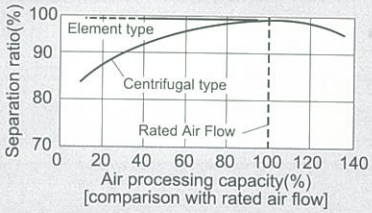



Sectioned Drawing of Element

Water droplet and solid particulate (5μm) removal
No water drop in filtration performance
Low pressure loss (0.005MPa or less) as pre-Filter
Float operated auto drain trap installed

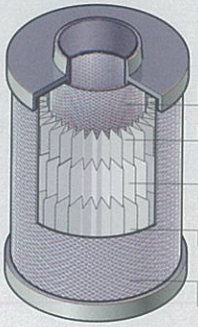
LOW LOSS **P-loss 0.005MPa**

Performance Curve




## Line Filter HAS-L_ALT/T

Location※1 After Air Dryer

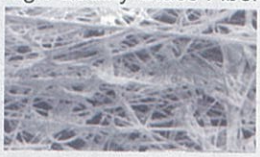



Sectioned Drawing of Element

Solid particulate (1μm, 99.999%) removal
High quality glass fiber element installed(HAS-LS_E)
Float operated auto drain trap installed
Precision differential pressure gauge "DGX-50A" is the optional part for HAS-L39ALT and bigger model.

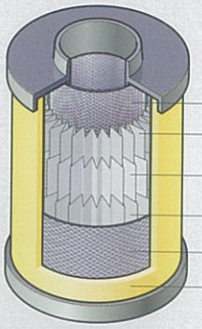
LOW LOSS **P-loss 0.005MPa**

High Quality Glass Fiber



## Mist Filter HAS-M_ALT/T

Location※1 After Line Filter




Sectioned Drawing of Element

Oil mist (0.01wt ppm) and fine solid particulate (0.01μm, 99.999%) removal
Newly developed element installed(HAS-MS_E)
Float operated auto drain trap installed
Precision differential pressure gauge "DGX-50A" is the optional part for HAS-M39ALT and bigger model.

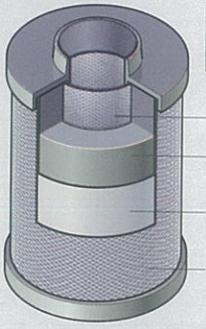
LOW LOSS **P-loss 0.01MPa**

Oil-Resistant Plastic Form

High Quality Glass Fiber

## Carbon Filter HAS-K_ALT/T

Location※1 After Mist Filter

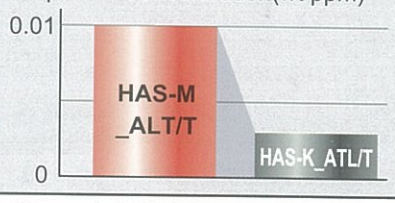



Sectioned Drawing of Element

Removes Odor (0.003wt ppm) .
Newly developed element "Fibrous Activated Carbon" installed(HAS-KS_E)
Great reduction in amount of loose carbon as compared with previous filters

LOW LOSS **P-loss 0.009MPa**

Output Oil Concentration(wt ppm)




All ALT filter are alumite-treated on the inside surface.

※1 : Please refer to Basic System Example catalog on page 5

# ICE Refrigerated Air Dryer
# *HAS Series*


HAS-3A6


HAS-15A6


HAS-55A6


HAS-120A6

## Specifications

## Standard inlet air temp. model

| Descriptions | Type | HAS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 3A6 | 8A6 | 15A6 | 22A6 | 37A6 | 55A6 | 75A6 | 120A6 | 175A6 | 75AW6 | 120AW6 | 150AW6 |
| | | Air cooled | | | | | | | | | Water cooled | | |
| Air Processing Capacity | m³/min | 0.6 | 1.1 | 2.4 | 4.4 | 7.0 | 9.8 | 14.0 | 23.5 | 26.5 | 14.0 | 23.5 | 26.5 |
| Applicable compressor size | kw | 3 | 7.5 | 15 | 22 | 37 | 55 | 75 | 120 | 175 | 75 | 120 | 150 |
| Inlet Air Temperature | ℃ | 10~50 | | | | | | | | | | | |
| Dew Point Temperature | ℃ | 2~15 | | | | | | | | | | | |
| Ambient Temperature | ℃ | 2~40 | | | | | | | | | 2~45 | | |
| Operating Pressure | MPa | 0.2~0.98 | | | | | | | | | | | |
| Dimensions Height | mm | 445 | 515 | 627 | | 922 | | 1140 | 1169 | 1275 | 1140 | 1169 | 1275 |
| Dimensions Depth | mm | 490 | 758 | 832 | | 979 | | 973 | 1022 | 1291 | 973 | 1022 | 1291 |
| Dimensions Width | mm | 233 | 255 | 255 | | 305 | | 470 | 592 | 702 | 470 | 592 | 702 |
| Mass | kg | 18 | 24 | 36 | 43 | 75 | 83 | 120 | 172 | 228 | 120 | 158 | 220 |
| Pipe Connections | R | 1/2 | 3/4 | 1 | | 1 1/2 | | 2 | 2 1/2 | 3 | 2 | 2 1/2 | 3 |
| Power Source(60Hz) | | 1ph 220V (60Hz) | | | | 3ph 220V (60Hz) | | | | | | | |
| Power Consumption(60Hz) | kW | 0.3 | 0.38 | 0.54 | 1.0 | 1.6 | 1.8 | 2.6 | 4.0 | 4.1 | 2.4 | 3.9 | 4.0 |
| Refrigerant | | R134a | | R407C | | R410A | | R407C | | | | | |

※ Rated condition: Compressed air inlet pressure(gauge pressure):0.69MPa, Pressure dew point: 10℃, Inlet air temperature:35℃, Ambient temperature:32℃
※ Air Processing Capacity is converted to the suction air condition(atmospheric, 32℃, 75%RH).
※ Refer to the specification sheet for further details.

## High inlet air temp. model

| Descriptions | Type | HAS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 6AH6 | 8AH6 | 15AH6 | 30AH6 | 45AH6 | 55AH6 | 75AH6 | 75AHW6 |
| | | Air cooled | | | | | | | Water cooled |
| Air Processing Capacity | m³/min | 0.6 | 1.1 | 2.4 | 4.4 | 7.0 | 9.8 | 14.0 | 14.0 |
| Applicable compressor size | kw | 6 | 8 | 15 | 30 | 45 | 55 | 75 | 75 |
| Inlet Air Temperature | ℃ | 10~80 | | | | | | | |
| Dew Point Temperature | ℃ | 2~15 | | | | | | | |
| Ambient Temperature | ℃ | 2~40 | | | | | | | 2~45 |
| Operating Pressure | MPa | 0.2~0.98 | | | | | | | |
| Dimensions Height | mm | 445 | 515 | 627 | 922 | | 1140 | 1169 | |
| Dimensions Depth | mm | 490 | 758 | 832 | 979 | | 973 | 1022 | |
| Dimensions Width | mm | 233 | 255 | 255 | 305 | | 470 | 592 | |
| Mass | kg | 19 | 28 | 43 | 75 | 83 | 120 | 172 | 158 |
| Pipe Connections | R | 1/2 | 3/4 | 1 | 1 1/2 | | 2 | 2 1/2 | |
| Power Source(60Hz) | | 1ph 220V (60Hz) | | | 3ph 220V (60Hz) | | | | |
| Power Consumption(60Hz) | kW | 0.4 | 0.5 | 1.0 | 1.6 | 1.8 | 2.6 | 4.0 | 3.9 |
| Refrigerant | | R134a | | R407C | R410A | | R407C | | |

※ Rated condition: Compressed air inlet pressure(gauge pressure):0.69MPa, Pressure dew point: 10℃, Inlet air temperature:55℃, Ambient temperature:32℃
※ Air Processing Capacity is converted to the suction air condition(atmospheric, 32℃, 75%RH).
※ Refer to the specification sheet for further details.

# ICE Clean Air Filter

## HAS-D / L / M / K_T Series

- 39T ~ 200T
- 39A-T ~ 215A-T
- Stainless steel vessel.

## HAS-D / L / M / K_ALT Series

- 04ALT ~ 200ALT
- Aluminum die-casting vessel with alumite-treated on the inside surface.


HAS-L200T


HAS-L66T

HAS-L66ALT

## Specifications

| Descriptions \ Type HAS-D / L / M / K_ALT / T | | | 04ALT | 12ALT | 18ALT | 27ALT | 39ALT | 66ALT | 106ALT | 138ALT | 200ALT | 39T | 66T | 106T | 150A-T | 215A-T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Air processing capacity ※2 | 0.69MPa | m³/min | 0.35 | 1.2 | 1.8 | 2.7 | 3.9 | 6.6 | 10.6 | 13.8 | 20.0 | 3.9 | 6.6 | 10.6 | 15.0 | 21.5 |
| Casing Material | | | Aluminum Die Casting (All ALT-Filter are alumite-treated on the inside surface. ) | | | | | | | | | stainless steel construction | | | | |
| Operating Range | Fluid | | Compressed Air | | | | | | | | | | | | | |
| | Inlet Air Pressure | MPa | 0.05~0.98 (HAS-D / L / M / K 138ALT, 200ALT : 0.1~0.98) | | | | | | | | | 0.05~0.98 (HAS-D : 0.2~0.98) | | | | |
| | Inlet Air Temperature | ℃ | 5~60 | | | | | | | | | | | | | |
| | Ambient Temperature | ℃ | 2~60 | | | | | | | | | | | | | |
| Performance ※3 | Filtration | | HAS-D : 5μm and Water Separation Efficiency 99% / HAS-L :1μm (Filtration Efficiency 99.999%) HAS-M : 0.01μm (Filtration Efficiency 99.999%) / HAS-K : Adsorption | | | | | | | | | | | | | |
| | Outlet Oil Contamination | wt ppm | HAS-M : 0.01 / HAS-K : 0.003 | | | | | | | | | | | | | |
| Filter Element Replacement | Usual | | 1 year whichever comes first | | | | | | | | | | | | | |
| | Pressure Loss | MPa | HAS-D : 0.02 / HAS-L • HAS-M : 0.035 | | | | | | | | | | | | | |
| Connection | | | Rc3/8 | Rc3/4 | | Rc1 | | Rc1/2 | | Rc2 | | Rc1 | Rc1 1/2 | | Rc2 | |
| Mass | | kg | 1.0 | | 2.0 | 2.1 | 2.6 | 5.0 | 6.0 | 6.5 | 9.0 | 3.0 | 3.3 | 3.7 | 5.6 | 6.5 |
| Accessories | Filter Element Type | DS / LS MS / KS_E | 04 | 12 | 18 | 27 | 39 | 66 | 106 | 138 | 200 | 39 | 66 | 106 | 138 | 200 |
| | Q'ty | | 1 each | | | | | | | | | | | | | |
| | Auto Drain Trap | T Series | — | | | | | FD2, none with HAS-K | | | | | | | | |
| | | ALT Series | NH-503MR built-in, none with HAS-K | | | | | | | FD2, none with HAS-K | | | | | | |
| | Differential Pressure Gauge | | Option | | | | | | | | | | | | | |

※1. K_ALT available from 12 to 200. ※2. Air Processing Capacity is converted to the suction air condition (atmospheric, 32℃, 75%RH). ※3. All Performances are tested at standard Air Processing Capacity (0.69MPa), Inlet oil contamination 3 wt ppm(HAS-L / M), 0.01wt ppm(HAS-K) ※4. Oil concentration is measured in conformity with ISO8573-2 "Compressed air - Part 2 : Test methods for oil aerosol content" , not including oil-vapor. ※5. Refer to the specification sheet for further details.

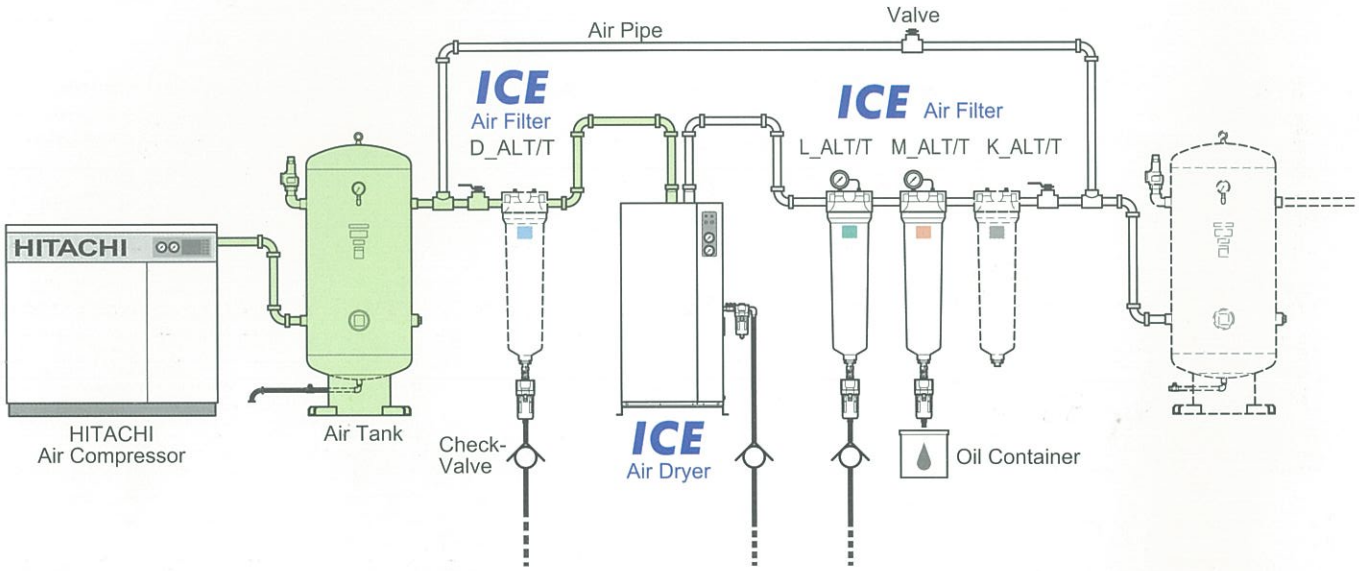
# Basic System Examples

## Air Quality Notes

Please install genuine Clean Air Filters 'before and after dryer' for the best performance.

## Safety Notes

Before operating equipment, please read the operating manual carefully, and only use as indicated. For installation of equipment and required wiring, employ a qualified person or consult with your dealer. Be sure to select equipment which suits your needs. Do not use equipment for purposes other than intended. Doing so can lead to accidents or equipment breakdown.




| System | Applications |
|---|---|
| ★☆ Drain Filter · Air Dryer · Line Filter · Oil Mist Filter · Carbon Filter | General Painting, Precision Machinery Industry, etc |
| ☆ Drain Filter · Air Dryer · Line Filter · Oil Mist Filter | Standard Pneumatic |
| Air Dryer · Line Filter · Oil Mist Filter | Standard Pneumatic |
| ⚠ Line Filter · Air Dryer · Oil Mist Filter | ⚠ Not recommended |

1) Please consult with us for further information when compressed air is supplied for medical, food, or clean room use.
2) Please install a Super Drain Filter (D_ALT/T) before air dryer to guarantee its performance.
3) Please set up above ☆system when Oil-Free compressor is installed.
4) Please set up above ★system when intake air of an air compressor includes large amount of oil droplets.
5) ⚠L_ALT/T is not recommended to be installed before dryers because it will increase differential pressure and drain water will be accumulated in the differential pressure gauge.
6) SUS pipe and SUS air tank are recommended when Oil-Free compressor is installed (as indicated in Green).
7) Please install a check valve on exhaust pipe of filter.
8) Please consult with us when you are not certain of air tank location (before or after air dryer).

# Model Selection

## 1. For Air Dryer

**1** **Temperature conditions**
Table A : High Inlet Air Temp. Models
Table B : Standard Air Temp. Models
Table C : Air Pressure Coefficient

**2** Calculate the necessary air capacity for the model selection.
**Air capacity required = Intake air volume / ( A or B × C )**

**3** Please select the suitable model from the specification which has bigger Air Processing Capacity than the air capacity required.

Model selection Example

| Inlet Air Temp. | 65℃ | Ambient Temp. | 35℃ | Air Flow | 6m³/min |
|---|---|---|---|---|---|
| PDP | 10℃ | Air Pressure | 0.60MPa | Frequency | 60Hz |

**1** From charts, Inlet temp. coefficient → **0.79**
Air Pressure coefficient → **0.93**

**2** Air capacity required for ICE Dryer,
**6 / (0.79×0.93)=8.2m³/min**

**3** The suitable model to process 8.2m³/min is HAS-55AH6, as its capacity exceeds the required value.

### A: Inlet Air Temperature Coefficient ( High Inlet Air Temp. Models / Air cooled & Water cooled models)

| Inlet air temperature(℃) | | 55 | | | 65 | | | 75 | | | 80 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Outlet dew point (℃) | | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 |
| Ambient temperature(℃) | 32 | 0.82 | 1.00 | 1.10 | 0.78 | 0.89 | 1.03 | 0.71 | 0.82 | 0.98 | 0.57 | 0.75 | 0.88 |
| | 35 | 0.74 | 0.89 | 1.06 | 0.67 | 0.79 | 1.00 | 0.61 | 0.73 | 0.92 | 0.49 | 0.64 | 0.82 |
| | 40 | — | — | — | 0.56 | 0.60 | 0.81 | 0.48 | 0.54 | 0.75 | 0.40 | 0.46 | 0.63 |

### B: Inlet Air Temperature Coefficient ( Standard Inlet Air Temp. Models / Air cooled & Water cooled models)

| Inlet air temperature(℃) | | 35 | | | 40 | | | 45 | | | 50 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Outlet dew point (℃) | | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 |
| Ambient temperature(℃) | 32 | 0.93 | 1.00 | 1.10 | 0.60 | 0.84 | 1.02 | 0.48 | 0.69 | 0.89 | 0.26 | 0.45 | 0.88 |
| | 35 | 0.68 | 0.97 | 1.10 | 0.53 | 0.80 | 0.97 | 0.42 | 0.65 | 0.81 | 0.19 | 0.43 | 0.60 |
| | 40 | — | — | — | 0.47 | 0.74 | 0.93 | 0.34 | 0.60 | 0.73 | 0.10 | 0.39 | 0.50 |

### C: Air Pressure Coefficient

| Air Pressure (MPa) | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 100 |
|---|---|---|---|---|---|---|---|---|---|
| Coefficient | 0.67 | 0.73 | 0.80 | 0.87 | 0.93 | 1.00 | 1.07 | 1.13 | 1.20 |

## 2. For Air Filter (Common with HAS-D / L / M / K_ALT / T models)

Calculate the necessary air capacity for the model selection.

$$\text{Air processing capacity} \geqq \frac{\text{Desired capacity}}{\text{Pressure correction coeffcient}}$$

### Pressure Correction Coefficient ( inlet pressure )

| Pressure (MPa) | 0.2 | 0.29 | 0.39 | 0.49 | 0.59 | 0.69 | 0.78 | 0.88 | 0.98 |
|---|---|---|---|---|---|---|---|---|---|
| Pressure Correction Coefficient | 0.38 | 0.49 | 0.62 | 0.75 | 0.87 | 1.0 | 1.06 | 1.12 | 1.17 |

# Accessories

## Auto Drain Trap

| Item | | | Float operated | | | Disc operated |
|---|---|---|---|---|---|---|
| | | | FD2 | FD6 | FD-10-A | AD-5 |
| | | |  |  |  |  |
| Maximum drain flow capacity ※1 | | | 10 cm³/ cycle | 30 cm³/ cycle | 80 cm³/ cycle | 450 L / h |
| Operable pressure range | | MPa | 0.1 ～ 1.0 | | 0.20 ～ 0.98 | 0.29 ～ 0.98 |
| Operable temperature range | | ℃ | 2 ～ 60 | | | |
| Processed fluid | | | Compressed air drain | | | |
| Drain release method | | | Float operated | | | Disc operated |
| Connections | Inlet | | Rc 1/2 | | | 1/2 |
| | Drain outlet | | ID ϕ5.7 ～ 6.0<br>OD ϕ8 | | Rc 3/8 | Rc 1/2 |
| Mass | | kg | 0.3 | 0.45 | 1 | 1.7 |
| Outside dimensions | | mm | Outside diameter: 63 × length: 178 | Outside diameter: 80 × length: 201 | Outside diameter: 96 × length: 193 | Outside diameter: 86 × length: 198 |

※1. Drain conditions: Air pressure (gauge pressure): 0.69MPa. ※Indoor specifications (Operable in environment where it would not be exposed to water splash.)
※When setting up drain piping, to prevent back pressure from other traps, be sure to install a check valve. Also install drain traps at each drain port. (Please refer to detail on page 5) ※Refer to the specification sheet for further details.

## Differential Pressure Gauge

DGX-50A


For inquiries, please contact the following representative:

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Important:
This catalog contains product specifications as of Jul., 2018.
- Images in this catalog are printed images and actual product colors may differ from the colors herein.
- Product mechanisms, specifications, etc. listed in this catalog are subject to change without notice.
- Designed by Orion Machinery Japan. Assembled in Taiwan.

S No.3273 18.07.23 pdf DG