

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

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

Clean Air System



Low Pressure Loss & Energy Saving

Eco-Friendly Refrigerant Applied

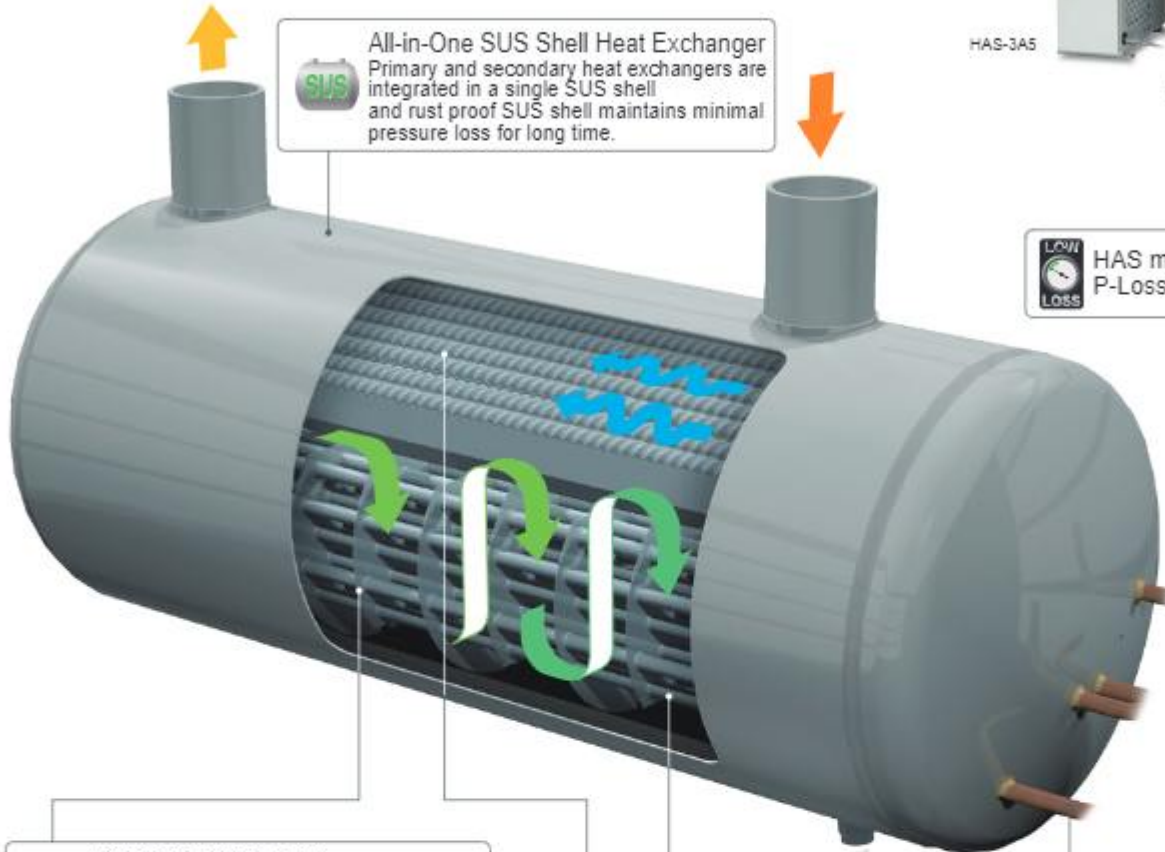
Powerful performance in Asia
with heavy duty specification



Best Proven For All Air Compressor

ICE Refrigerated Air Dryer

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



SUS 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.

LOW LOSS 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

R134a R407C R410A Eco-Friendly refrigerant applied

43°C Heavy Duty Refrigerant Circuit
Durable performance in severe condition at ambient temp. of 43°C

HAS Pressure Loss Advantage



	HAS-45AH5	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)	0.7MPa	7m³/min	US\$0.15/kWh	8000h

*Comparison at 50Hz


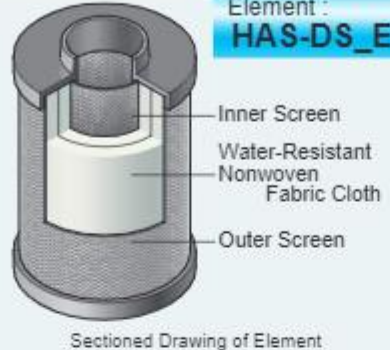
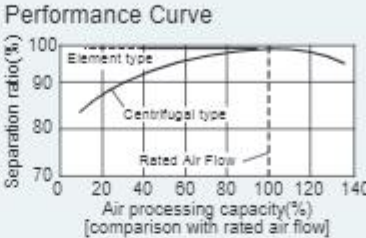


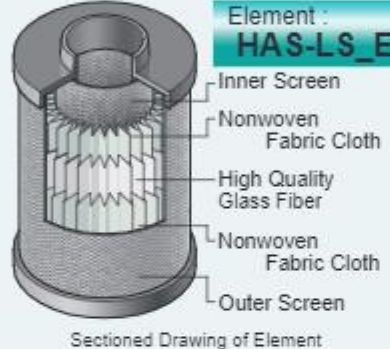



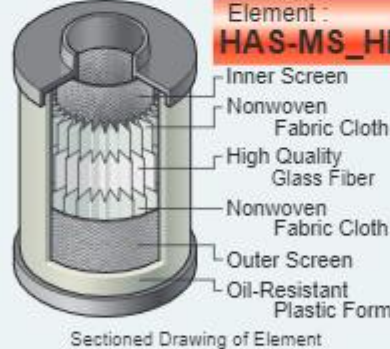
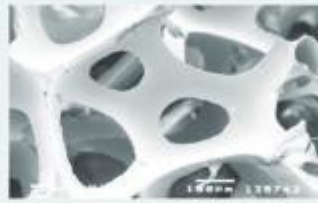
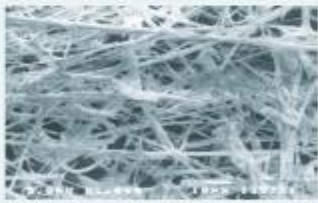


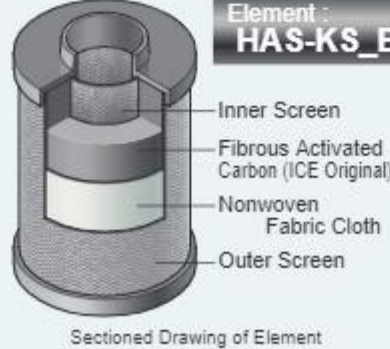
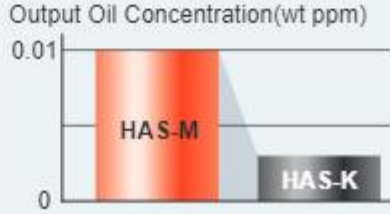

Ni NICKEL-PLATED Copper Pipe
Anti-corrosion and prevention gas leakage
NICKEL-PLATED Copper Pipe



Condenser Filter
Protection against dust and easy maintenance

ICE Clean Air Filter

Advanced Technology Packed "ICE" Clean Air Filter

Drain Filter HAS-D		Location*1 Before Air Dryer
	 <p>Element : HAS-DS_E</p>	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
	Sectioned Drawing of Element	 <p>Performance Curve</p>
		 P-loss 0.005MPa
Line Filter HAS-L		Location*1 After Air Dryer
	 <p>Element : HAS-LS_E</p>	Solid particulate (1µm, 99.999%) removal High quality glass fiber element installed(HAS-LS_E) Float operated auto drain trap installed
	Sectioned Drawing of Element	High Quality Glass Fiber 
		 P-loss 0.005MPa
Mist Filter HAS-M		Location*1 After Line Filter
	 <p>Element : HAS-MS_HE</p>	Oil mist (0.01wt ppm) and fine solid particulate (0.01µm, 99.999%) removal Newly developed element installed(HAS-MS_HE) Float operated auto drain trap installed
	Sectioned Drawing of Element	Oil-Resistant Plastic Form 
		High Quality Glass Fiber 
		 P-loss 0.01MPa
Carbon Filter HAS-K		Location*1 After Mist Filter
	 <p>Element : HAS-KS_E</p>	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
	Sectioned Drawing of Element	Output Oil Concentration(wt ppm) 
		 P-loss 0.009MPa

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

* : All ALF-Filter are alumite-treated on the inside surface.

ICE Refrigerated Air Dryer HAS Series



* Specifications

Standard inlet air temp. model

Descriptions	Type	HAS-									
		3A5	8A5	15A5	22A5	37A5	55A5	75A5	80AL5	90AL5	132AL5
Air Processing Capacity	m ³ /min	0.54	1.0	2.3	4.0	6.4	9.0	12.0	13.0	19.0	26.0
Applicable Compressor Size	kw	3	7.5	15	22	37	55	75	80	90	132
Inlet Air Temperature	°C	10~50									
Dew Point Temperature	°C	3~15									
Ambient Temperature	°C	2~43									
Operating Pressure	MPa	0.2~1.0									
Dimensions	Height	mm	480	510	610	900	990	1050	1054	1229	1275
	Depth	mm	450	600	820	960	980	1010	1022	1023	1291
	Width	mm	180	240	240	300	300	380	470	592	702
Mass	kg	18	26	35	44	83	94	106	143	181	244
Pipe Connections	B	R1/2	R3/4	R1		R1·1/2		R2		R2·1/2	
Power Source		1ph 220V 50Hz						3ph 380V 50Hz			
Power Consumption	kW	0.26	0.27	0.36	0.68	1.7		2.9	3.3	3.6	
Refrigerant		R134a					R410A				

※ Rated condition: Compressed air inlet pressure (gauge pressure): 0.7MPa, Pressure dew point: 10°C, Inlet air temperature: 35°C, Ambient temperature: 30°C
 ※ Air processing capacity is converted to the suction air condition (atmospheric, 32°C, 75%RH). ※ Please refer to the specifications sheet for further details.

High inlet air temp. model

Descriptions	Type	HAS-									
		3AH5	6AH5	8AH5	15AH5	30AH5	45AH5	55AH5	65AHL5	75AHL5	90AHL5
Air Processing Capacity	m ³ /min	0.32	0.7	1.1	2.8	4.6	7.6	8.8	10.7	14.9	18.4
Applicable Compressor Size	kw	3	6	8	15	30	45	55	65	75	90
Inlet Air Temperature	°C	10~80									
Dew Point Temperature	°C	3~15									
Ambient Temperature	°C	2~43									
Operating Pressure	MPa	0.2~1.0									
Dimensions	Height	mm	480	510	610	900	990	1050	1054	1229	1275
	Depth	mm	450	600	820	960	980	1010	1022	1023	1291
	Width	mm	180	240	240	300	300	380	470	592	702
Mass	kg	18	26	35	44	83	94	106	143	181	244
Pipe Connections	B	R1/2	R3/4	R1		R1·1/2		R2		R2·1/2	
Power Source		1ph 220V 50Hz						3ph 380V 50Hz			
Power Consumption	kW	0.27	0.28	0.37	0.74	1.9	2.0		3.4	3.7	4.0
Refrigerant		R134a					R410A				

※ Rated condition: Compressed air inlet pressure (gauge pressure): 0.7MPa, Pressure dew point: 10°C, Inlet air temperature: 50°C, Ambient temperature: 35°C
 ※ Air processing capacity is converted to the suction air condition (atmospheric, 32°C, 75%RH). ※ Please refer to the specifications sheet for further details.

Heavy Duty model

Descriptions	Type	HAS-													
		120A5	150A5	190A5	270A5	145AW5	240AW5	350AW5	400AW5						
		Air Cooled Models				Water Cooled Models									
Air Processing Capacity	m ³ /min	23	31	35	45	29	41	53	74						
Applicable Compressor Size	kW	120	150	190	270	145	240	350	400						
Inlet Air Temperature	°C	10~60				10~60									
Dew Point Temperature	°C	3~15				3~15									
Ambient Temperature	°C	2~45				2~45									
Operating Pressure	MPa	0.29~1.0				0.29~1.0									
Dimensions	Height	mm		1500	1500	1500	1500	1500	1620						
	Depth	mm		1500	1996	1000	1000	1199	1654						
	Width	mm		802	850	802	802	850	877						
Mass	kg	323	385	380	470	278	350	395	495						
Pipe Connections	FLG	2·1/2B (65A)		3B (80A)		4B (100A)		2·1/2B (65A)		3B (80A)		4B (100A)			
Dual-Drive Eco System		-		=		-		=		-		=			
Power Source		3ph 380V 50Hz				3ph 380V 50Hz									
Power Consumption	kW	5.6		10		12		4.2		6.8		9.5		12.5	
Recommended Pre-Filter (Option)		D290SF		D350SF		D530SF		D290SF		D410SF		D530SF		D610SF	
Refrigerant		R407C				R410A									

※ Rated condition: Compressed air inlet pressure (gauge pressure): 0.7MPa, Pressure dew point: 10°C, Inlet air temperature for air cooled model: 50°C, Ambient temperature for air cooled model: 35°C, Inlet air temperature for water cooled model: 45°C, Cooling water temperature for water cooled model: 32°C at specified water flow rate. ※ Air processing capacity figures are based on ANR and adjusted to atmospheric pressure, 32°C, 75% RH. ※ Please install Drain Filter (HAS-D) before air dryer to guarantee its performance. ※ Air connection flange: JIS 10K FF, No companion flange is attached. ※ Please refer to the specification sheet for further details.

ICE Clean Air Filter HAS-D / L / M / K Series



* Specifications

Descriptions	Type		HAS-D/L	04ALF	12ALF	18ALF	27ALF	39ALF	66ALF	106ALF	138ALF	200ALF	
			HAS-M	04ALF1	12ALF1	18ALF1	27ALF1	39ALF1	66ALF1	106ALF1	138ALF1	200ALF1	
			HAS-K	—	12ALF	18ALF	27ALF	39ALF	66ALF	106ALF	138ALF	200ALF	
Air Processing Capacity			m ³ /min	0.35	1.2	1.8	2.7	3.9	6.6	10.6	13.8	20.0	
Material			Aluminum Die Casting (All AL-Filter are alumite-treated on the inside surface.)										
Operating Range	Fluid		Compressed Air										
	Inlet Air Pressure		MPa	0.05~1.0 (HAS-D/L/M138, 200 : 0.1~1.0)									
	Inlet Air Temperature		°C	5~60									
	Ambient Temperature		°C	2~60									
Performance	Filtration		HAS-D : 5µm (Liquid water separation efficiency: 99%) HAS-L : 1µm (Filtration efficiency: 99.999%) HAS-M : 0.01µm (Filtration efficiency: 99.999%) HAS-K : Adsorption by activated carbon fiber										
	Outlet Oil Contamination		wt ppm	HAS-M : 0.01 / HAS-K : 0.003									
Filter Element Replacement	Usual		1 year										
	Pressure Loss		MPa	HAS-D : 0.02 / HAS-L/M : 0.035									whichever comes first
Connection			B	Rc3/8	Rc1/2	Rc3/4	Rc1	Rc1-1/2	Rc2				
Mass			kg	1.0		2.0	2.1	2.6	5.0	6.0	6.5	9.0	
Accessories	Filter Element	Type	HAS-LS/DS/MS/KS	04	12	18	27	39	66	106	138	200	
		Q'ty	1 each										
	Auto Drain Trap		NH-503MR (Built-in), None with HAS-K										FD2, None with HAS-K
	Differential Pressure Gauge		DG-50(A) (Option)										

※ Air processing capacity is converted to the suction air condition (atmospheric, 32°C, 75%RH). ※ All performances are tested at standard air processing capacity (0.7MPa), Inlet oil contamination 3wt ppm(HAS-L/M), 0.01wt ppm(HAS-K). ※ Oil concentration is measured in conformity with ISO8573-2 "Compressed air - Part 2 : Test methods for oil aerosol content", not including oil-vapor. ※ Please refer to the specification sheet for further details.

Descriptions	Type		HAS-D/L/K	290SF	350SF	410SF	530SF	610SF	800SF	
			HAS-M	290SF1	350SF1	410SF1	530SF1	610SF1	800SF1	
Air Processing Capacity			m ³ /min	29	35	41	53	61	80	
Material			Stainless Steel							
Operating Range	Fluid		Compressed Air							
	Inlet Air Pressure		MPa	0.1~1.0 (HAS-D : 0.2~1.0, HAS-K:0.05~1.0)						
	Inlet Air Temperature		°C	5 - 60						
	Ambient Temperature		°C	2 - 60						
Performance	Filtration		HAS-D : 5µm (Liquid water separation efficiency: 99%) HAS-L : 1µm (Filtration efficiency: 99.999%) HAS-M : 0.01µm (Filtration efficiency: 99.999%) HAS-K : Adsorption by activated carbon fiber							
	Outlet Oil Concentration		wt ppm	HAS-M : 0.01 / HAS-K : 0.003						
Filter Element Replacement	Usual		1 year							
	Pressure Loss		MPa	HAS-D : 0.02 / HAS-L/M : 0.035						
Connection			FLG	2·1/2B (65A), JIS 10K FF	3B (80A), JIS 10K FF		4B (100A), JIS 10K FF			
Mass			kg	26	28		48		95	
Accessories	Filter Element	Type	HAS-LS/DS/MS/KS	138	200		200			
		Q'ty	2			2		3		4
	Auto Drain Trap		FD-10-A (HAS-D), FD2 (HAS-L/M), None with HAS-K							
	Differential Pressure Gauge		DG-50(A) (Option)							
Stand			—							O

※ Air processing capacity is converted to the suction air condition (atmospheric, 32°C, 75%RH). ※ All performances are tested at standard air processing capacity (0.7MPa), Inlet oil contamination 3wt ppm(HAS-L/M), 0.01wt ppm(HAS-K). ※ Oil concentration is measured in conformity with ISO8573-2 "Compressed air - Part 2 : Test methods for oil aerosol content", not including oil-vapor. ※ Air connection flange : JIS 10K FF, No companion flange is attached. ※ Please refer to the specification sheet for further details.

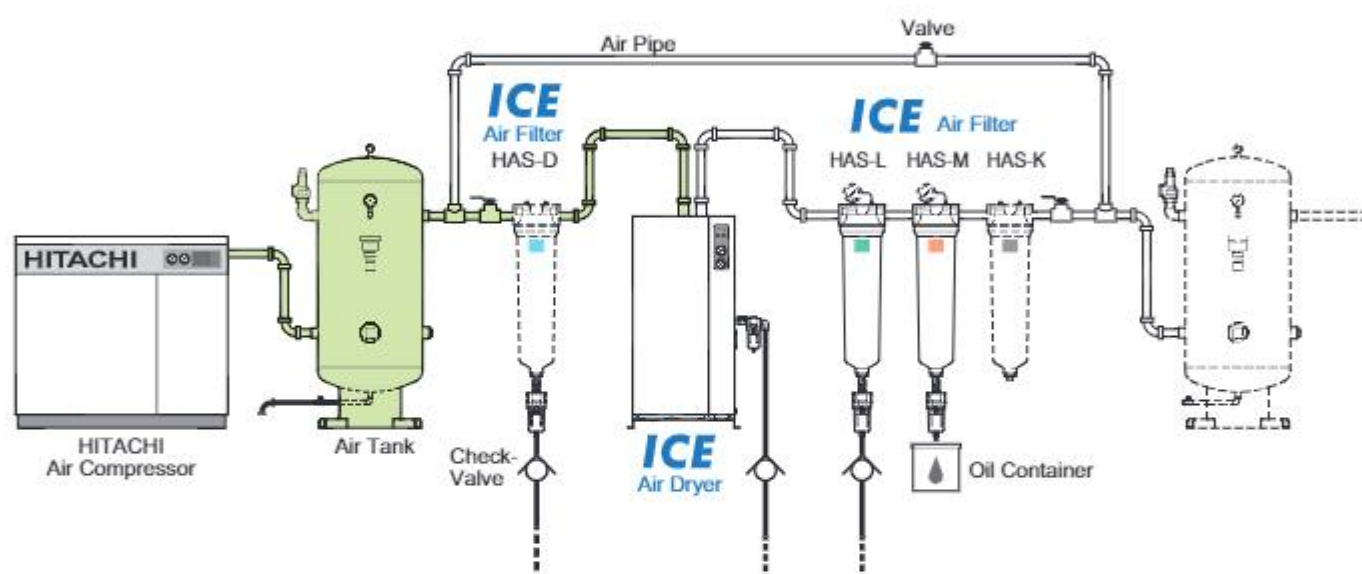
Basic System Examples

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
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px; background-color: #00a0e3; color: white; font-weight: bold;">Drain Filter</div> <div style="border: 1px solid black; padding: 2px; background-color: #c6e0b4; font-weight: bold;">Air Dryer</div> <div style="border: 1px solid black; padding: 2px; background-color: #00a0e3; color: white; font-weight: bold;">Line Filter</div> <div style="border: 1px solid black; padding: 2px; background-color: #e67e22; color: white; font-weight: bold;">Oil Mist Filter</div> <div style="border: 1px solid black; padding: 2px; background-color: #34495e; color: white; font-weight: bold;">Carbon Filter</div> </div>	General Painting, Precision Machinery Industry, etc
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px; background-color: #00a0e3; color: white; font-weight: bold;">Drain Filter</div> <div style="border: 1px solid black; padding: 2px; background-color: #c6e0b4; font-weight: bold;">Air Dryer</div> <div style="border: 1px solid black; padding: 2px; background-color: #00a0e3; color: white; font-weight: bold;">Line Filter</div> <div style="border: 1px solid black; padding: 2px; background-color: #e67e22; color: white; font-weight: bold;">Oil Mist Filter</div> </div>	Standard Pneumatic
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px; background-color: #c6e0b4; font-weight: bold;">Air Dryer</div> <div style="border: 1px solid black; padding: 2px; background-color: #00a0e3; color: white; font-weight: bold;">Line Filter</div> <div style="border: 1px solid black; padding: 2px; background-color: #e67e22; color: white; font-weight: bold;">Oil Mist Filter</div> </div>	Standard Pneumatic
<div style="display: flex; justify-content: space-around; align-items: center;"> ▲ <div style="border: 1px solid black; padding: 2px; background-color: #00a0e3; color: white; font-weight: bold;">Line Filter</div> <div style="border: 1px solid black; padding: 2px; background-color: #c6e0b4; font-weight: bold;">Air Dryer</div> <div style="border: 1px solid black; padding: 2px; background-color: #e67e22; color: white; font-weight: bold;">Oil Mist Filter</div> </div>	▲ 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 (HAS-D) 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) ▲ HAS-L is not recommended to be installed before dryers because it will increase differential pressure.
- 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 : Water Cooled Models
	Table D : Air Cooled Models
Table E : Air Pressure Coefficient	

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

3	Please select the suitable model from the specification which has bigger air processing capacity(P3) than the air capacity required.
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Model selection Example

Inlet Air Temp.	60°C	Ambient Temp.	35°C	Air Flow	6m ³ /min
PDP	10°C	Air Pressure	0.6MPa	Frequency	50Hz

1	From charts, Inlet temp. coefficient → 0.70
	Air pressure coefficient → 0.93

2	Air capacity required for ICE Dryer,
	6 / (0.70×0.93)=9.2m³/min

3	The suitable model to process 9.2m ³ /min is HAS-65AHL5, as its capacity exceeds the required value.
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A: Inlet Air Temperature Coefficient (High Inlet Air Temp. Models)

Inlet air temperature (°C)		50			60			70			80		
Outlet dew point (°C)		5	10	15	5	10	15	5	10	15	5	10	15
Ambient temperature (°C)	30	0.78	1.06	1.27	0.62	0.80	0.92	0.53	0.68	0.82	0.48	0.63	0.79
	35	0.73	1.00	1.21	0.57	0.70	0.86	0.47	0.60	0.74	0.41	0.57	0.71
	40	0.55	0.75	0.91	0.44	0.56	0.66	0.37	0.46	0.55	0.33	0.42	0.51

B: Inlet Air Temperature Coefficient (Standard Inlet Air Temp. Models)

Inlet air temperature (°C)		35			40			45			50		
Outlet dew point (°C)		5	10	15	5	10	15	5	10	15	5	10	15
Ambient temperature (°C)	25	0.87	1.10	1.31	0.72	0.86	1.05	0.60	0.72	0.86	0.55	0.69	0.76
	30	0.80	1.00	1.20	0.66	0.79	0.96	0.55	0.66	0.79	0.50	0.63	0.70
	35	0.78	0.94	1.15	0.63	0.74	0.92	0.51	0.62	0.74	0.46	0.57	0.65
	40	0.73	0.88	1.08	0.58	0.65	0.86	0.47	0.56	0.68	0.40	0.51	0.58

C: Inlet Air Temperature Coefficient (Heavy Duty / Water cooled Models)

Inlet air temperature		40			45			50			55			60		
Outlet dew point		5	10	15	5	10	15	5	10	15	5	10	15	5	10	15
Coefficient		0.88	1.14	1.14	0.77	1.00	1.14	0.66	0.91	1.10	0.59	0.83	0.98	0.54	0.75	0.89

D: Inlet Air Temperature Coefficient (Heavy Duty / Air Cooled Models)

Inlet air temperature		40			45			50			55			60		
Outlet dew point		5	10	15	5	10	15	5	10	15	5	10	15	5	10	15
Ambient temperature	30	0.85	1.15	1.37	0.83	1.12	1.35	0.78	1.06	1.27	0.67	0.88	1.04	0.62	0.80	0.92
	32	0.82	1.12	1.34	0.80	1.09	1.31	0.76	1.03	1.24	0.64	0.85	1.01	0.60	0.75	0.89
	35	0.79	1.09	1.30	0.77	1.06	1.28	0.73	1.00	1.21	0.62	0.81	0.98	0.57	0.70	0.86
	40	0.60	0.81	0.98	0.58	0.80	0.96	0.55	0.75	0.91	0.47	0.62	0.75	0.44	0.56	0.66

E: Air Pressure Coefficient

Air pressure MPa	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	0.95	1.00
Coefficient	0.67	0.73	0.80	0.87	0.93	1.00	1.07	1.13	1.16	1.20

Please ask to HAS dealer about coefficient at dew point 3 The coefficient is only for reference, please ask HAS dealer about its guaranteed performance.

2. For Air Filter

Calculate the necessary air capacity for the model selection.

Air processing capacity





Desired capacity
Pressure correction coefficient

Pressure Correction Coefficient

Air pressure MPa	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Coefficient	0.38	0.49	0.62	0.75	0.87	1.00	1.06	1.12	1.17

Accessories

Auto Drain Trap

		FD2	FD6	FD-10-A	AD-5
					
Max. Drain Flow Capacity		10 cm ³ / cycle	30 cm ³ / cycle	80 cm ³ / cycle	450 L / h
Operable Pressure Range	MPa	0.1 ~ 1.0		0.20 ~ 1.0	0.29 ~ 1.0
Operable Temperature Range	°C	2 ~ 60			
Processed Fluid		Compressed Air Drain			
Drain Release Method		Float Operated			Disc Operated
Connections	Inlet	Rc 1/2			Rc 1/2
	Drain Outlet	ID ϕ 5.7 ~ 6.0 OD ϕ 8		Rc 3/8	Rc 1/2
Mass	kg	0.3	0.45	1	1.7
External Dimensions (External Diameter × Length)	mm	ϕ 63×178	ϕ 80×201	ϕ 96×193	ϕ 86×198

※ Drain conditions: Air pressure (gauge pressure): 0.7MPa.

※ Please refer to the specification sheet for further details.

Differential Pressure Gauge

		DG-50(A)
		
Max. Working Pressure (Gauge Pressure)	Mpa	1.0
Pressure Difference Indication Range (Gauge Pressure)	Mpa	0 ~ 0.15
Pipe Connections		R1/4
External Dimensions (External Diameter × Length)	mm	ϕ 70×43
Mass	kg	0.5
Accessories	Nylon Tube	External Diameter ϕ 4mm × L1000mm
	Straight Fitting	R1/4× ϕ 4mm (For Tube)
	Elbow Joint	R1/4× ϕ 4mm (For Tube)

Remote Control Functions

Optional kit (On-site installation is possible)

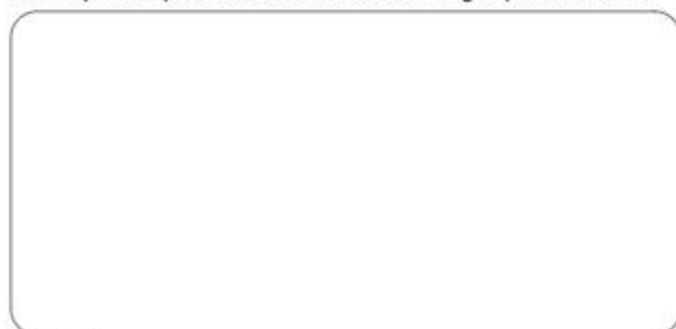
- Remote ON/OFF
- Shutdown alarm
- Operation status

Standard function with Heavy Duty model

- Maintenance alarm
- Dew point indication
- Energy saving operation



For inquiries, please contact the following representative:



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Important:

- This catalog contains product specifications as of Aug., 2023.
- 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 Thailand.