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

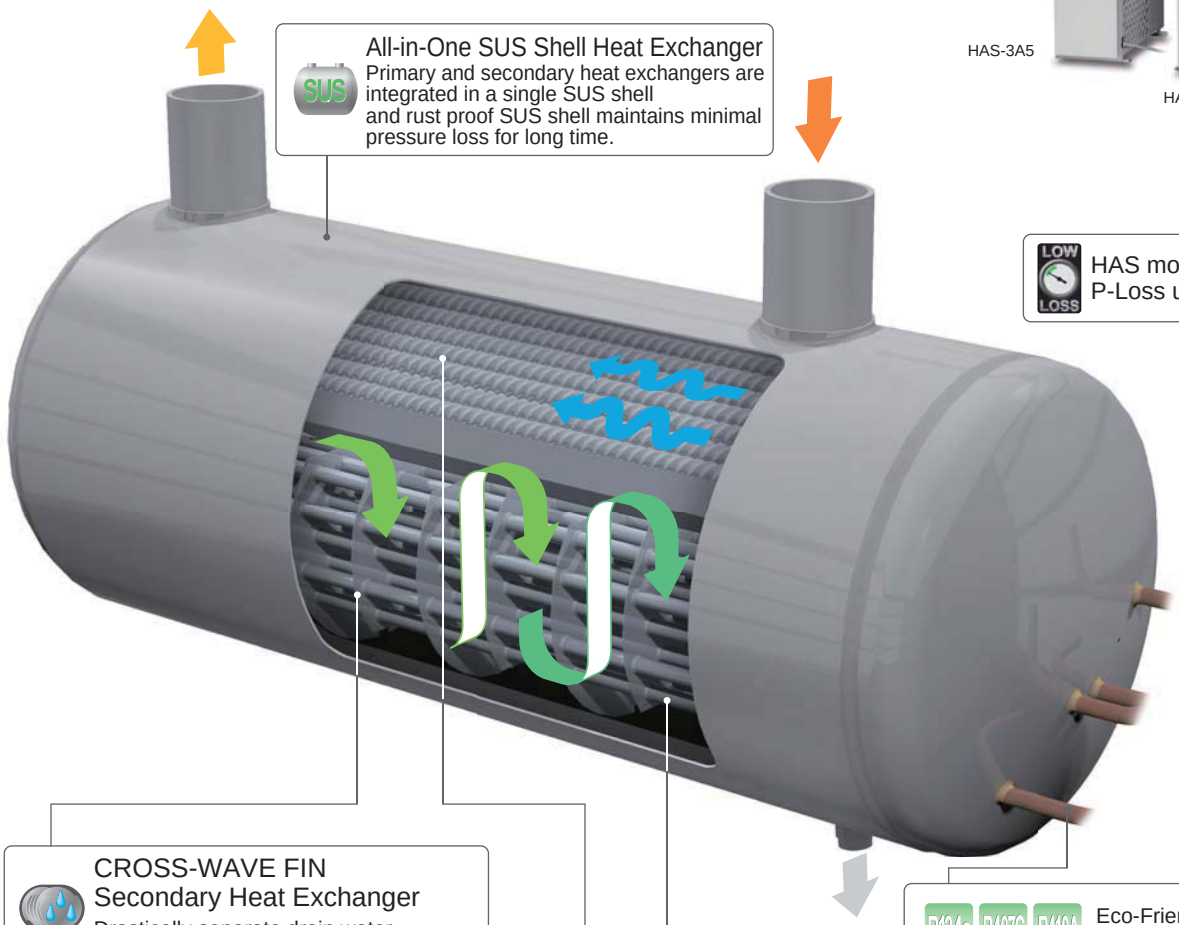
Feature-Packed Air Dryer for Energy Saving and Stable Productivity,

ICE HAS series

HAS-3A5

HAS-15A5

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

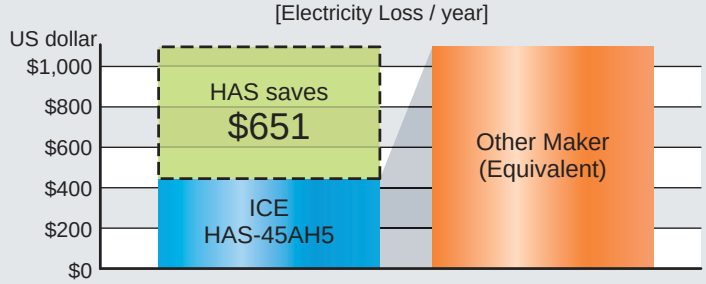
TURBO TUBE Primary Heat Exchanger
Efficient pre-cooling and re-heating without pressure loss

R134a R407C R410A Eco-Friendly refrigerant applied

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

HAS Pressure Loss Advantage

[Electricity Loss / year]



	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)	0.69MPa	7m³/min	US$0.15/kWh	8000h

*Comparison at 50Hz

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

NICKEL-PLATED Copper Pipe

Copper pipe not plated

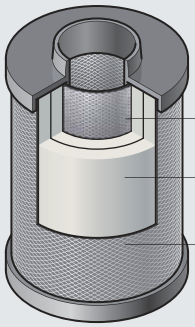
Condenser Filter
Protection against dust and easy maintenance

ICE Clean Air Filter

Advanced Technology Packed "ICE" Clean Air Filter

Drain Filter HAS-D_ALF / SF

Location※1 Before Air Dryer

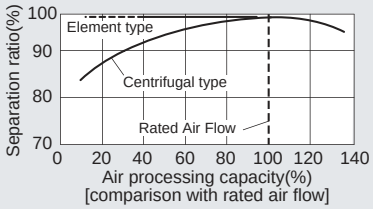


Sectioned Drawing of Element

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

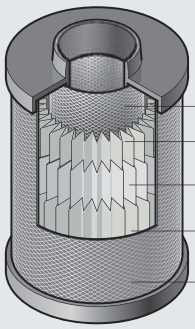
LOW LOSS **P-loss 0.005MPa**

Performance Curve



Line Filter HAS-L_ALF / SF

Location※1 After Air Dryer



Sectioned Drawing of Element

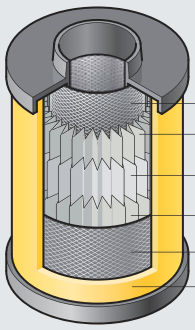
Solid particulate (1μm, 99.999%) removal
High quality glass fiber element installed(HAS-LS_E)
Float operated auto drain trap installed
Precision different pressure gauge "DG-50(A)" installed (HAS-L39ALF and bigger model)

LOW LOSS **P-loss 0.005MPa**

High Quality Glass Fiber

Mist Filter HAS-M_ALF / SF

Location※1 After Line Filter

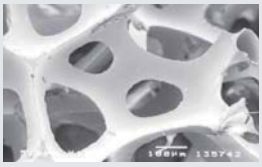


Sectioned Drawing of Element

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 different pressure gauge "DG-50(A)" installed (HAS-M39ALF and bigger model)

LOW LOSS **P-loss 0.01MPa**

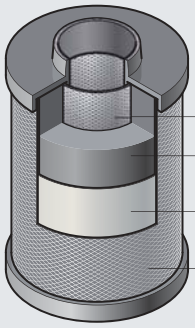
Oil-Resistant Plastic Form



High Quality Glass Fiber

Carbon Filter HAS-K_ALF / SF

Location※1 After Mist Filter

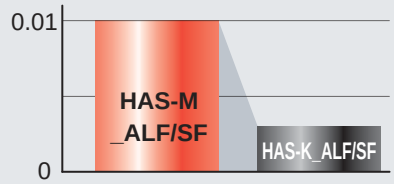


Sectioned Drawing of Element

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 ALF-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-3A5 HAS-15A5


HAS-90A5 HAS-132A5

Specifications

Standard inlet air temp. model

Descriptions	Type	HAS									
		3A5	8A5	15A5	22A5	37A5	55A5	75A5	80A5	90A5	132A5
Air Processing Capacity	m³/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	℃	10~50									
Dew Point Temperature	℃	3~15									
Ambient Temperature	℃	2~43									
Operating Pressure	MPa	0.2~0.98									
Dimensions Height	mm	480	510	610		900	990	1050	1054	1229	1275
Dimensions Depth	mm	450	600	820		960	980	1010	1022	1023	1291
Dimensions Width	mm	180	240	240		300		380	470	592	702
Mass	kg	18	26	35	44	83	94	106	140	167	233
Pipe Connections	B	R1/2	R3/4	R1		R1・1/2		R2			R2・1/2
Power Source		1ph 220V ±10%(50Hz)							3ph 380V ±10%(50Hz)		
Power Consumption	kW	0.26	0.27	0.36	0.68	1.7			3.3	3.4	5.0
Refrigerant		R134a		R410A							

※ Rated condition: Compressed air inlet pressure (gauge pressure): 0.69MPa, Pressure dew point: 10℃, Inlet air temperature: 35℃, Ambient temperature: 30℃
※ Air Processing Capacity is converted to the suction air condition (atmospheric, 32℃, 75%RH). ※ Refer to the specifications sheet for further details.

High inlet air temp. model

Descriptions	Type	HAS									
		3AH5	6AH5	8AH5	15AH5	30AH5	45AH5	55AH5	65AH5	75AH5	90AH5
Air Processing Capacity	m³/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	℃	10~80									
Dew Point Temperature	℃	3~15									
Ambient Temperature	℃	2~43									
Operating Pressure	MPa	0.2~0.98									
Dimensions Height	mm	480	510	610		900	990	1050	1054	1229	1275
Dimensions Depth	mm	450	600	820		960	980	1010	1022	1023	1291
Dimensions Width	mm	180	240	240		300		380	470	592	702
Mass	kg	18	26	35	44	83	94	106	140	167	233
Pipe Connections	B	R1/2	R3/4	R1		R1・1/2		R2			R2・1/2
Power Source		1ph 220V ±10%(50Hz)							3ph 380V ±10%(50Hz)		
Power Consumption	kW	0.27	0.28	0.37	0.74	1.9	2.0		3.7	3.8	4.8
Refrigerant		R134a		R410A							

※ Rated condition: Compressed air inlet pressure (gauge pressure): 0.69MPa, Pressure dew point: 10℃, Inlet air temperature: 50℃, Ambient temperature: 35℃
※ Air Processing Capacity is converted to the suction air condition (atmospheric, 32℃, 75%RH). ※ Refer to the specifications sheet for further details.

Heavy Duty model

Descriptions	Type	HAS						
		120A5	150A5	190A5	145AW5	240AW5	350AW5	400AW5
		Air Cooled Models			Water Cooled Models			
Air Prosessing capacity	m³/min	23	31	35	29	41	53	74
Applicable compressor size	kW	120	150	190	145	240	350	400
Inlet Air Temperature	℃	10~60			10~60			
Dew Point Temperature	℃	3~15			3~15			
Ambient Temperature	℃	2~45			2~45			
Operation Pressure	MPa	0.29~0.98			0.29~0.98			
Dimensions Height	mm	1500			1500	1500	1500	1620
Dimensions Depth	mm	1500			1000	1000	1199	1654
Dimensions Width	mm	802			802	802	850	877
Mass	kg	323	385	380	278	350	395	495
Pipe Connections	FLG	2・1/2B (65A)	3B (80A)		2・1/2B (65A)	3B (80A)	4B (100A)	
Dual-Drive Eco System		—	○		—	○		
Power Source		3ph 380V±10% (50Hz)			3ph 380V±10% (50Hz)			
Power Consumption	kW	5.6	10		4.2	6.8	9.5	12.5
Recommended Pre-Filter (Option)		D290SF	D350SF		D290SF	D410SF	D530SF	D610SF
Refrigerant		R407C			R407C			R410A

※ Rated condition: Compressed air inlet pressure (gauge pressure): 0.69MPa, Pressure dew point: 10℃, Inlet air temperature for air cooled model: 50℃, Ambient temperature for air cooled model: 35℃, Inlet air temperature for water cooled model: 45℃, Cooling water temperature for water cooled model: 32℃ at specified water flow rate. ※ Special-order models available with an air pressure specification of 1.0 MPa. ※ Air processing capacity figures are based on ANR and adjusted to atmospheric pressure, 32℃, 75% RH. ※ Refer to the specification sheet for further details.
※ Please install Drain Filter (HAS-D_ALF / SF) before air dryer to guarantee its performance. ※ Air connection flange : JIS 10K FF, No companion flange is attached.

ICE Clean Air Filter

HAS-D / L / M / K_ALF / SF Series


HAS-L39ALF

HAS-M39ALF


HAS-D290SF


HAS-D410SF

Specifications

Descriptions			Type HAS-D / L / M / K_ALF	※1 04ALF	12ALF	18ALF	27ALF	39ALF	66ALF	106ALF	138ALF	200ALF
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
Casing Material				Aluminum Die Casting (All AL-Filter are alumite-treated on the inside surface.)								
Operating Range	Fluid			Compressed Air								
	Inlet Air Pressure		MPa	0.05~0.98 (D / L / M138ALF, 200ALF : 0.1~0.98)								
	Inlet Air Temperature		℃	5~60								
	Ambient Temperature		℃	2~60								
Performance ※3	Filtration			D_SF：5μm (Liquid water separation efficiency: 99%) L_SF：1μm (Filtration efficiency: 99.999%) M_SF：0.01μm (Filtration efficiency: 99.999%) K_SF：Adsorption by activated carbon fiber								
	Outlet Oil Contamination		wt ppm	M_ALF : 0.01 / K_ALF : 0.003								
Filter Element Replacement	Usual			1 year whichever comes first								
	Pressure Loss		MPa	D_ALF : 0.02 / L・M_ALF : 0.035								
Connection				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	D/L/M/ KS_E	04	12	18	27	39	66	106	138	200
		Q'ty		1 each								
	Auto Drain Trap		D/L/M _ALF	NH-503MR built-in, none with K_ALF							FD2, none with K_ALF	
	Differential Pressure Gauge			Option				DG-50(A)(L & M_ALF Equipped) / D & K_ALF Option				

※1. K_ALF available from 12ALF to 200ALF. ※2. Air Processing Capacity is converted to the suction air condition (atmospheric, 32℃, 75%RH). ※3. All Performance are tested at standard Air Processing Capacity (0.69MPa), inlet oil contamination 3wt ppm(L/M_ALF/SF), 0.01wt ppm(K_ALF/SF). ※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. Special-order models available with an air pressure specification of 1.0 MPa. ※6. Refer to the specification sheet for further details.

Descriptions			Type HAS-D / L / M / K_SF	290 SF	350 SF	410 SF	530 SF	610 SF	800 SF
Air processing capacity	0.69 MPa		m³/min	29	35	41	53	61	80
Body and housing				Stainless steel					
Operating Ranges	Fluid			Compressed Air					
	Inlet Air Pressure		MPa	0.1 - 0.98 (D_SF: 0.2 - 0.98, K_SF:0.05 - 0.98)					
	Inlet Air Temperature		℃	5 - 60					
	Ambient Temperature		℃	2 - 60					
Performance	Filtration			D_SF：5μm (Liquid water separation efficiency: 99%) L_SF：1μm (Filtration efficiency: 99.999%) M_SF：0.01μm (Filtration efficiency: 99.999%) K_SF：Adsorption by activated carbon fiber					
	Outlet Oil Concentration		wt ppm	M_SF：0.01 K_SF：0.003 ※ Subject to inlet air conditions of the system piping.					
Filter Element Replacement	Usual			1 year whichever comes first					
	Pressure Loss		MPa	D_SF : 0.02 / L・M_SF : 0.035					
Connection				2 1/2B (65A), JIS 10K FF	3B (80A), JIS 10K FF		4B(100A), JIS 10K FF		
Mass			kg	26	28		D / L / M_SF : 48 K_SF : 46		95
Accessories	Filter Element	Type	D/L/M/ KS_E	138	200		200		
		Q'ty		2	2		3		4
	Auto Drain Trap			FD-10-A（D_SF） FD2（L/M_SF） None with K_SF					
	Pressure Differential Gauge			DG-50(A) (Comes standard only with the M_SF. Available as an option on other models.)					
	Other			-					with leg

※1. Air Processing Capacity is converted to the suction air condition(atmospheric, 32℃, 75%RH). ※2. All Performance are tested at standard Air Processing Capacity (0.69MPa), inlet oil contamination 3wt ppm(L/M_ALF/SF), 0.01wt ppm(K_ALF/SF). ※3. Oil concentration is measured in conformity with ISO8573-2 "Compressed air - Part 2 : Test methods for oil aerosol content" , not including oil-vapor. ※4. Air connection flange : JIS 10K FF, No companion flange is attached. ※5. Special-order models available with an air pressure specification of 1.0 MPa. ※6. Refer to the specification sheet for further details.

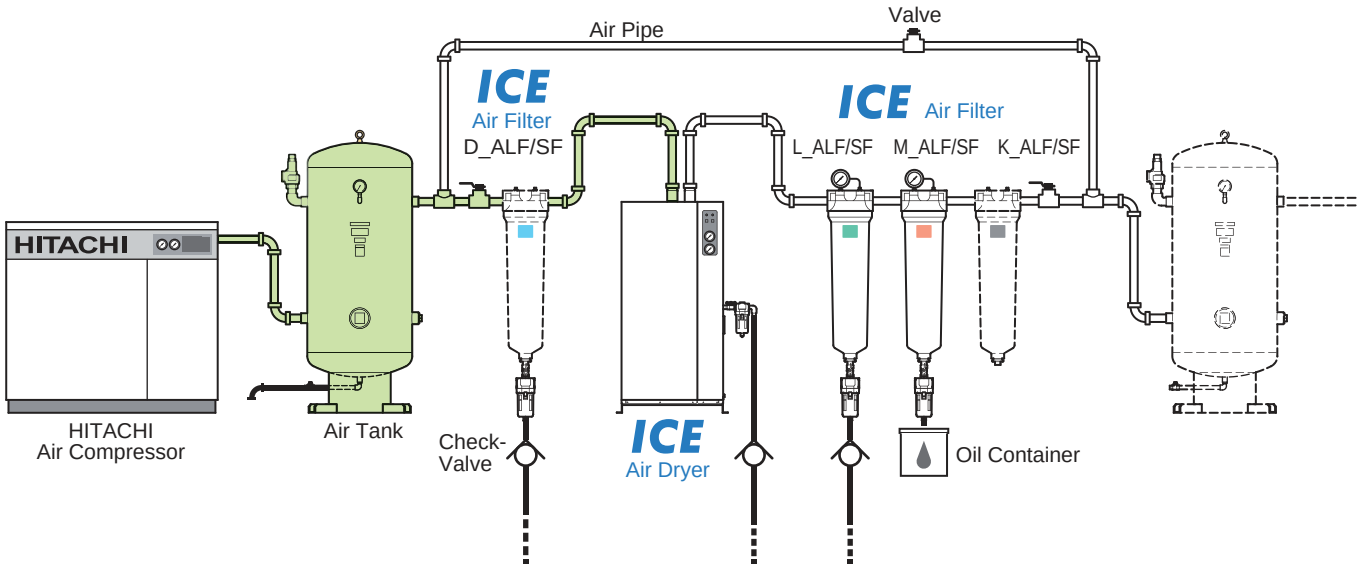
Basic System Examples

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_ALF/SF) 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_ALF/SF 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 : 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.

Model selection Example

Inlet Air Temp.	60℃	Ambient Temp.	35℃	Air Flow	6m³/min
PDP	10℃	Air Pressure	0.59MPa	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 9.2m³/min is HAS-65AH5, as its capacity exceeds the required value.

A: Inlet Air Temperature Coefficient (High Inlet Air Temp. Models)

Inlet air temperature(℃)		50			60			70			80		
Outlet dew point (℃)		5	10	15	5	10	15	5	10	15	5	10	15
Ambient temperature(℃)	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(℃)		35			40			45			50		
Outlet dew point (℃)		5	10	15	5	10	15	5	10	15	5	10	15
Ambient temperature(℃)	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	0.29	0.39	0.49	0.59	0.69	0.78	0.88	0.93	0.98
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 (Common with HAS-D / L / M / K_ALF / SF)

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 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

DG-50(A)

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:

ORION MACHINERY ASIA CO., LTD.
33 / 3 Moo 5 Sambundid, U-Thai,
Ayutthaya 13210, Thailand
TEL : +66-35-246-828 / FAX : +66-35-246-829

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 Thailand.