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

オリオンクリーンエアシステム
冷凍式圧縮空気除湿装置

Clean Air System

Low Pressure Loss & Energy Saving

Eco-Friendly Refrigerant Applied

Powerful performance in Asia with heavy duty specification

Best Match for Inverter Compressor & Oil-Free Compressor

ORION
Clean Air System

ORION Refrigerated Air Dryer

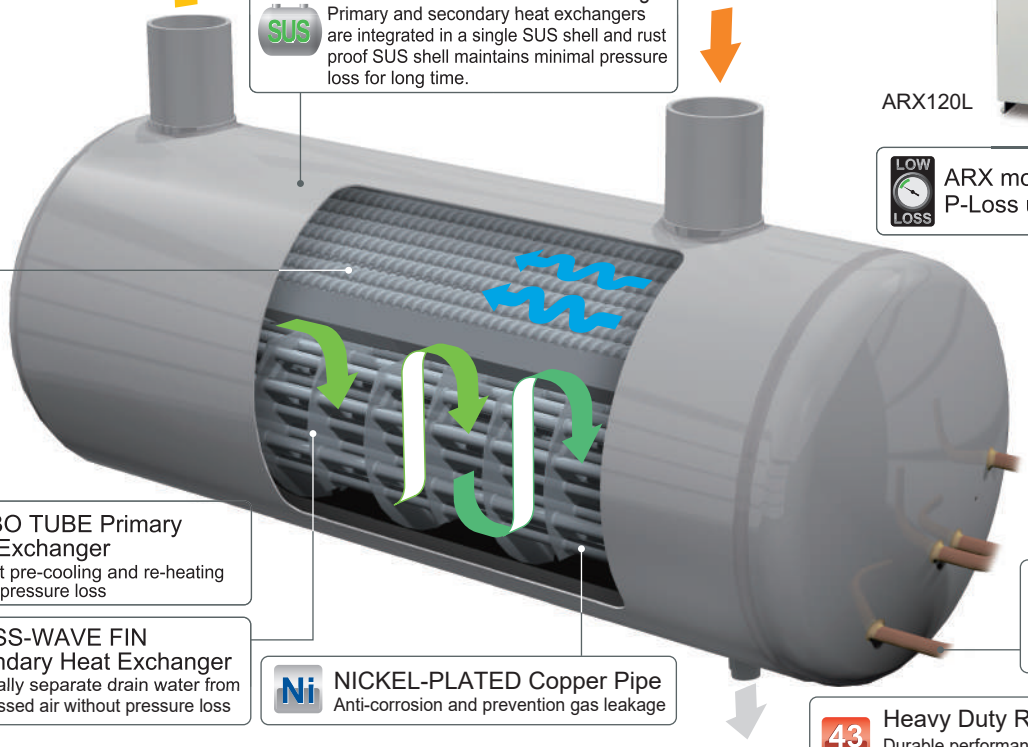
Feature-Packed Air Dryer for Energy Saving and Stable Productivity,

ORION ARX series (Up to ARX120HL / 180L)

ARX120L

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.

ARX model
P-Loss under 0.015MPa



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

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

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

Eco-Friendly refrigerant applied

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

ARX Function Chart

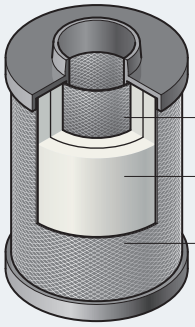
Function	Model : ARX																			
	Standard inlet air temperature model										High inlet air temperature model									
	5J	10J	20J	30J	50J	75J	100J	110L	120L	180L	3HJ	5HJ	10HJ	20HJ	30HJ	50HJ	75HJ	90HL	100HL	120HL
All-in-One SUS Shell Heat Exchanger		●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
SUS Shell Heat Exchanger	●										●									
TURBO TUBE Primary Heat Exchanger	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
CROSS-WAVE FIN Secondary Heat Exchanger	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
NICKEL-PLATED Copper Pipe			●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●
R134a / R410A Refrigerant	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heavy Duty Refrigerant Circuit	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Condenser Filter		●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Wide Adjusting Range CCV (capacity control valve)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Operation Lamp	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alarm Lamp								●	●	●								●	●	●
Evaporating Pressure Gauge		●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Air Pressure Gauge			●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●
Long Life Fan-Control Switch	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
One Touch Open Front Cabinet	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
I/F (Remote ON/OFF, Operation Status, Alarm)	Option							●	●	●	Option							●	●	●
Exhaust Duct								Option										Option		
Float Operated Auto Drain Trap FD6 with Ball Valve					●	●	●	●	●						●	●	●	●	●	
Float Operated Auto Drain Trap FD2 with Ball Valve		●	●	●								●	●	●						
Float Operated Auto Drain Trap FD2	●										●									
Disc Operated Auto Drain Trap AD-5 with Ball Valve										●										●

ORION Clean Air Filter

Advanced Technology Packed Clean Air Filter,ORION “AL-Filter” series

Drain Filter DSF-AL

Location※1 Before ARX

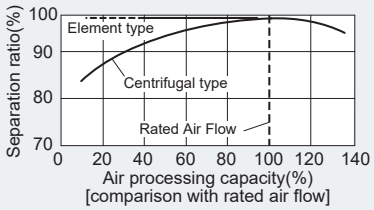


Sectioned Drawing of Element

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

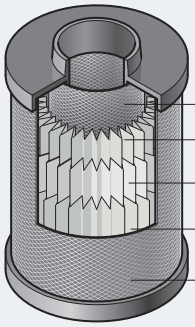
LOW LOSS **P-loss 0.005MPa**

Performance Curve



Line Filter LSF-AL

Location※1 After ARX

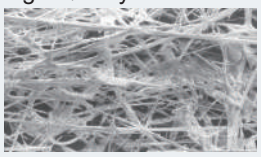


Sectioned Drawing of Element

Solid particulate (1μm, 99.999%) removal
High quality glass fiber element installed(ELS)
Float operated auto drain trap installed
Precision different pressure gauge "DG-50(A)" installed (LSF400AL and bigger model)

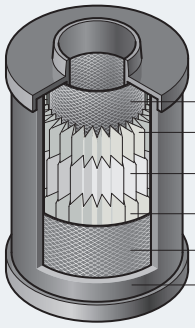
LOW LOSS **P-loss 0.005MPa (Initial)**

High Quality Glass Fiber



Mist Filter MSF-AL

Location※1 After LSF-AL



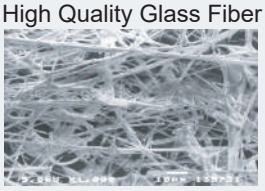
Sectioned Drawing of Element

Oil mist (0.01wt ppm) and fine solid particulate (0.01μm, 99.999%) removal
Newly developed element installed(EMS)
Float operated auto drain trap installed
Precision different pressure gauge "DG-50(A)" installed (MSF400AL and bigger model)

LOW LOSS **P-loss 0.01 ～ 0.02MPa**

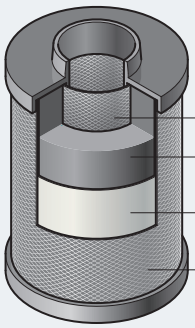
Oil-Resistant Plastic Form

High Quality Glass Fiber



Carbon Filter KSF-AL

Location※1 After MSF-AL

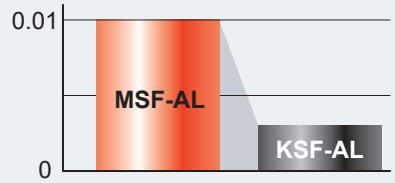


Sectioned Drawing of Element

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

LOW LOSS **P-loss 0.009MPa**

Output Oil Concentration(wt ppm)



All AL-Filter are alumite-treated on the inside surface.

※1 : Please refer to Basic System Example catalog on page 4

ORION
Clean Air System

ORION Refrigerated Air Dryer
ARX Series

ARX5J ARX20J

ARX120L

ARX7400A-WE

Standard inlet air temp. model

Descriptions	Type	ARX									
		5J	10J	20J	30J	50J	75J	100J	110L	120L	180L
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
Inlet Air Temperature	℃	10~50									
Dew Point Temperature	℃	3~15									
Ambient Temperature	℃	2~43									
Operating Pressure	MPa	0.2~1.0									
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 50Hz							3ph 380V 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	ARX									
		3HJ	5HJ	10HJ	20HJ	30HJ	50HJ	75HJ	90HL	100HL	120HL
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
Inlet Air Temperature	℃	10~80									
Dew Point Temperature	℃	3~15									
Ambient Temperature	℃	2~43									
Operating Pressure	MPa	0.2~1.0									
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 50Hz							3ph 380V 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	ARX							
		2300A	3100A-E	3500A-E	4500A-E	2900A-W	4100A-WE	5300A-WE	7400A-WE
		Air Cooled Models				Water Cooled Models			
Air Prosessing capacity	m³/min	23	31	35	45	29	41	53	74
Inlet Air Temperature	℃	10~60				10~60			
Dew Point Temperature	℃	3~15				3~15			
Ambient Temperature	℃	2~45				2~45			
Operation Pressure	MPa	0.29~1.0				0.29~1.0			
Dimensions Height	mm	1500			1500	1500	1500	1500	1620
Dimensions Depth	mm	1500			1996	1000	1000	1199	1654
Dimensions 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)		DSF2900A	DSF3500A		DSF5300A	DSF2900A	DSF4100A	DSF5300A	DSF8000A
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. ※ 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 (DSF) before air dryer to guarantee its performance.
※ Air connection flange : JIS 10K FF, No companion flange is attached.

ORION Clean Air Filter


LSF400-AL

MSF400-AL


DSF2900A


DSF4100A

AL Small-size Air Filter

Descriptions			Type DSF/LSF/MSF/KSF	75-AL ※1	150-AL	200-AL	250-AL	400-AL	700-AL	1000-AL	1300-AL1 ※4	2000-AL1 ※4
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	0.05~1.0 (DSF / LSF / MSF 1300AL1, 2000AL1 : 0.1~1.0)								
	Inlet Air Temperature		℃	5~60								
	Ambient Temperature		℃	2~60								
Performance ※3	Filtration			DSF : 5μm and Water Separation Efficiency 99% / LSF :1μm (Filtration Efficiency 99.999%) MSF : 0.01μm (Filtration Efficiency 99.999%) / KSF : Adsorption								
	Outlet Oil Contamination		wt ppm	MSF : 0.01 / KSF : 0.003								
	Pressure Loss		MPa	DSF :Initial 0.005 / LSF :Initial 0.005 / MSF : Initial : 0.01 ・ Usual 0.02 / KSF : 0.009								
When to replace filter element				One year or pressure loss 0.02 MPa for DSF, 0.035 MPa for LSF/MSF, whichever comes first.								
Connections	Pipe Connections			Rc3/8	Rc1/2	Rc3/4	Rc1		Rc1・1/2		Rc2	
	Different Pressure Gauge Connection			Rc1/4								
Mass			kg	1.0		2.0	2.1	2.6	5.0	6.0	6.5	9.0
Accessories	Filter Element	Type	EDS/ELS EMS/EKS	75	150	200	250	400	700	1000	1300	2000
		Q'ty		1 each								
	Auto Drain Trap		LSF/MFS DSF	NH-503MR built-in, none with KSF							FD2, none with KSF	
	Differential Pressure Gauge			Option				DG-50(A)(LSF・MSF Equipped) / DSF・KSF Option				

※1. KSF available from 150 to 2000. ※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(LSF/MSF), 0.01wt ppm(KSF)
※4. Model name of KSF is "KSF1300-AL" and "KSF2000-AL".
※5. Oil concentration is measured in conformity with ISO8573-2 "Compressed air - Part 2 : Test methods for oil aerosol content" , not including oil-vapor.

SUS Large-size Air Filter

Descriptions			Type DSF/LSF/MSF/KSF	2900A	3500A	4100A	5300A	6100A	8000A
Air processing capacity	0.69 MPa		m³/min	29	35	41	53	61	80
Body and housing				Stainless steel					
Operating Ranges	Fluid			Compressed Air					
	Operating Ranges		MPa	0.1~1.0 (DSF: 0.2~1.0, KSF:0.05~1.0)					
	Inlet Air Temperature		℃	5~60					5~60
	Ambient Temperature		℃	2~60					2~60
Performance	Filtration			DSF：5μm (Liquid water separation efficiency: 99%) LSF：1μm (Filtration efficiency: 99.999%) MSF：0.01μm (Filtration efficiency: 99.999%) KSF：Adsorption by activated carbon fiber					
	Outlet Oil Concentration		wt ppm	MSF：0.01 KSF：0.003 ※ Subject to inlet air conditions of the system piping.					
When to replace filter element				One year or pressure loss 0.02 MPa for DSF, 0.035 MPa for LSF/MSF, whichever comes first.					
Air Connection (FLG)				2・1/2B (65A), JIS 10K FF	3B (80A), JIS 10K FF		4B (100A), JIS 10K FF		
Mass			kg	26	28		DSF/LSF/MSF : 48 KSF : 46		DSF / LSF / MSF / KSF : 95
Accessories	Filter Element	Type	EDS/ELS EMS/EKS	1300	2000		2000		
		Quantity		2	2		3		4
	Auto Drain Trap			FD-10-A（DSF） FD2（LSF/MSF） None with KSF					
	Pressure Differential Gauge			DG-50A (Comes standard only with the MSF. Available as an option on other models.)					
	Other			-					Stand

※Air processing capacity is converted to the suction air condition(at atmospheric pressure, 32deg.C and 75%). ※Special-order models available with an air pressure specification of 1.0 MPa. ※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. ※ Refer to the specification sheet for further details.

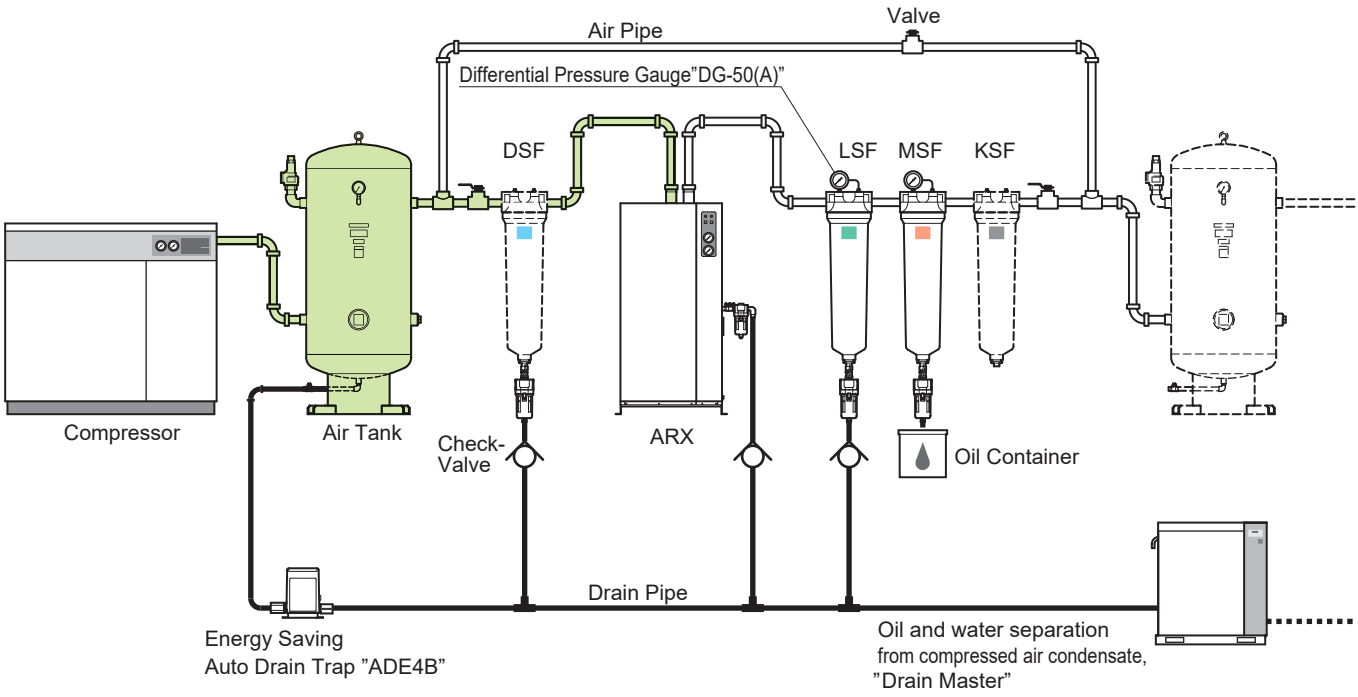
Basic System Examples

Air Quality Notes

Please install ORION genuine Clean Air Filters 'before and after ARX 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
★☆ DSF ARX LSF MSF KSF	General Painting, Precision Machinery Industry, etc
☆ DSF ARX LSF MSF	Standard Pneumatic
ARX LSF MSF	Standard Pneumatic
⚠ LSF ARX MSF	⚠ Not recommended

1) In case no Drain Filter (DSF) before large ARX air dryer (Heavy duty model) does not cover its warranty.
2) Please consult with your dealer or ORION directly for further information when compressed air is supplied for medical, food, or clean room use.
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) ⚠LSF-AL is not recommended to be installed before ARX dryers because it will increase differential pressure and drain water will be accumulated in the differential pressure gauge.
6) Please refer to "Compressed Clean Air catalog" (D-AG02) for details of "DRAIN MASTER" series.
7) SUS pipe and SUS air tank are recommended when Oil-Free compressor is installed (as indicated in Green).
ARX Heat-Exchanger is made of SUS SUS
8) Please install a check valve on exhaust pipe of filter.
9) Please consult with your dealer or ORION directly when you are not certain of air tank location (before or after ARX).

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 dryer.
6 / (0.70×0.93)=9.2m³/min

3 The suitable model to process 9.2m³/min is ARX90HL, 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	1.0
Coefficient	0.67	0.73	0.80	0.87	0.93	1.00	1.07	1.13	1.16	1.20

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

2. For Air Filter

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)	0.20	0.29	0.39	0.49	0.59	0.69	0.78	0.88	1.0
Pressure Correction Coefficient	0.38	0.49	0.62	0.75	0.87	1.00	1.06	1.12	1.17

ORION
Clean Air System

Accessories

Auto Drain Trap

Item			Float operated			Disc operated
			FD2-G3	FD6-G1	FD-10-A	AD-5-G7
						
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 ～ 1.0	0.29 ～ 1.0
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)

Various Accessories Available

ORION MACHINERY ASIA CO., LTD.

ORION MACHINERY ASIA PRODUCTS

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Important:
This catalog contains product specifications as of July, 2021.
- 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.

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