

No.1 Share in Japan

**ORION**<sup>®</sup>

ISO Quality Policy

Orion strives to offer products that delight its customers.

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**

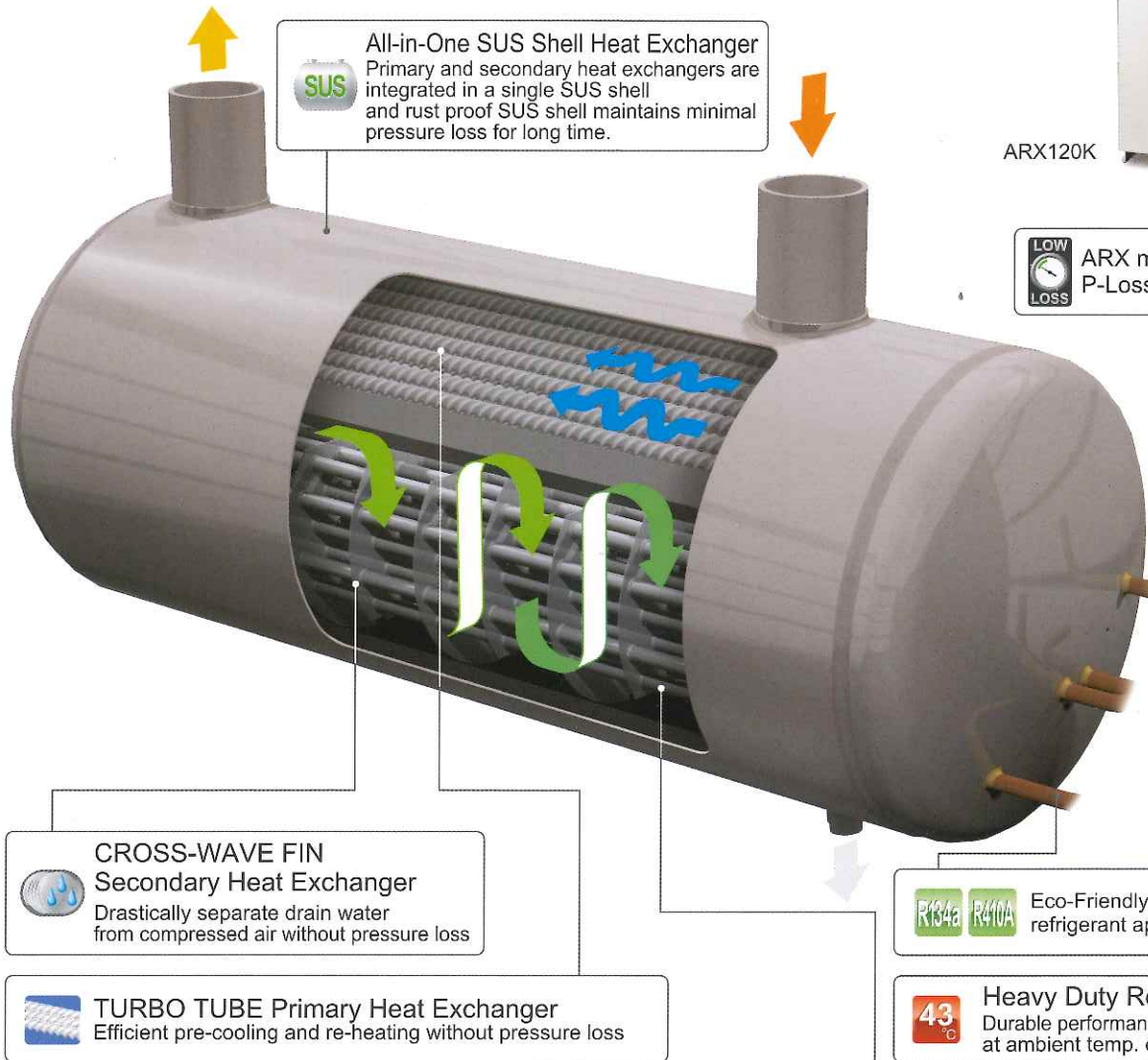
## ORION Refrigerated Air Dryer

Feature-Packed Air Dryer for Energy Saving and Stable Productivity,  
**ORION ARX series**

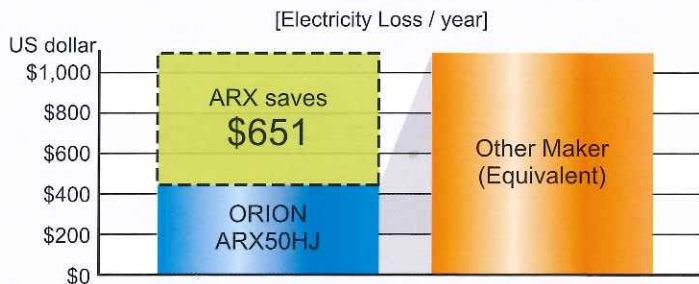


ARX120K

**LOW LOSS** ARX model  
P-Loss under 0.015MPa



### ARX Pressure Loss Advantage



	ORION ARX50HJ	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

**Ni** 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










# ARX Function Chart

## High inlet air temperature model

Function	Model : ARX								
	3HJ	5HJ	10HJ	20HJ	30HJ	50HJ	75HJ	90HK	100HK
 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	●	●	●	●	●	●	●	●	●
3 Signal Outputs (remote, operation status, alarm)								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	●								

## Standard inlet air temperature model

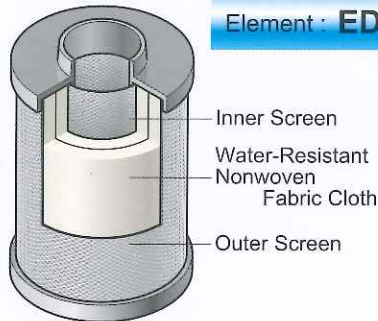
Function	Model : ARX								
	5J	10J	20J	30J	50J	75J	100J	110K	120K
 All-in-One SUS Shell Heat Exchanger SUS Shell Heat Exchanger	●	●	●	●	●	●	●	●	●
 TURBO TUBE Primary Heat Exchanger	●	●	●	●	●	●	●	●	●
 CROSS-WAVE FIN Secondary Heat Exchanger	●	●	●	●	●	●	●	●	●
 NICKEL-PLATED Copper Pipe			●	●	●	●	●	●	●
 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	●	●	●	●	●	●	●	●	●
3 Signal Outputs (remote, operation status, alarm)								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	●								

## ORION Clean Air Filter

Advanced Technology Packed Clean Air Filter, ORION "AL-Filter" series

### Drain Filter DSF-AL

Location\*1 Before ARX



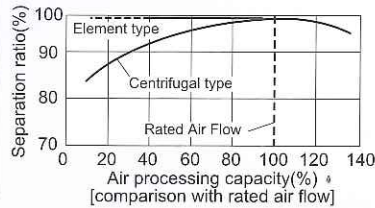
Sectioned Drawing of Element

Element : **EDS**

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

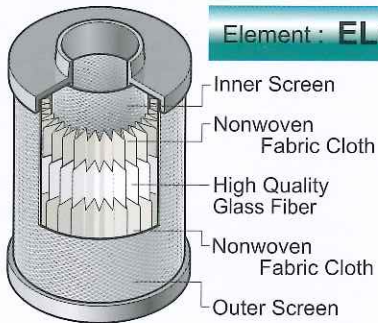
**LOW LOSS**  
P-loss  
**0.005MPa**

#### Performance Curve



### Line Filter LSF-AL

Location\*1 After ARX



Sectioned Drawing of Element

Element : **ELS**

Solid particulate (1 $\mu$ m, 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)

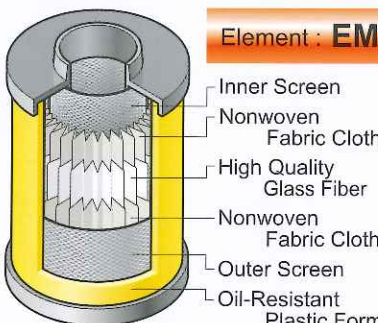
**LOW LOSS**  
P-loss  
**0.005MPa**  
(Initial)

#### High Quality Glass Fiber



### Mist Filter MSF-AL

Location\*1 After LSF-AL



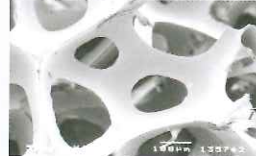
Sectioned Drawing of Element

Element : **EMS**

Oil mist (0.01wt ppm) and fine solid particulate (0.01 $\mu$ m, 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

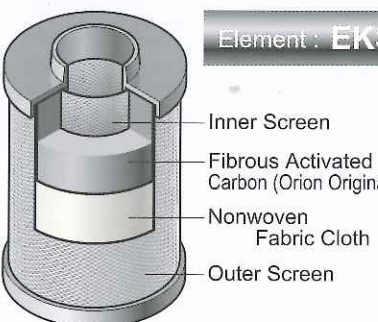


#### High Quality Glass Fiber



### Carbon Filter KSF-AL

Location\*1 After MSF-AL



Sectioned Drawing of Element

Element : **EKS**

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)



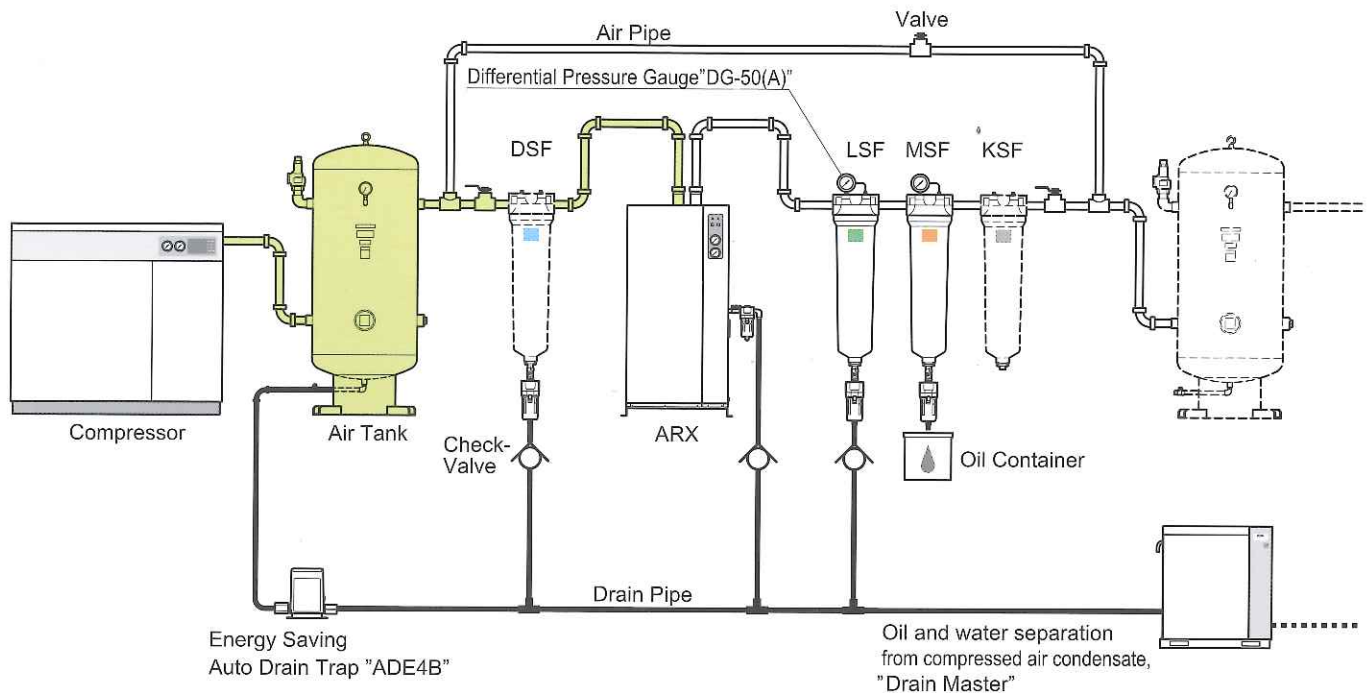
# Basic System Examples

## 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
★ ☆ <b>DSF</b> <b>ARX</b> <b>LSF</b> <b>MSF</b> <b>KSF</b>	General Painting, Precision Machinery Industry, etc
☆ <b>DSF</b> <b>ARX</b> <b>LSF</b> <b>MSF</b>	Standard Pneumatic
<b>ARX</b> <b>LSF</b> <b>MSF</b>	Standard Pneumatic
▲ <b>LSF</b> <b>ARX</b> <b>MSF</b>	▲ Not recommended

- 1) Please consult with your dealer or ORION directly for further information when compressed air is supplied for medical, food, or clean room use.
- 2) Please set up above ☆ system when Oil-Free compressor is installed.
- 3) Please set up above ★ system when intake air of an air compressor includes large amount of oil droplets.
- 4) ▲ 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.
- 5) Please refer to "Compressed Clean Air catalog" (D-AG02 ) for details of "DRAIN MASTER" series.
- 6) 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 .
- 7) Please install a check valve on exhaust pipe of filter.
- 8) Please consult with your dealer or ORION directly when you are not certain of air tank location (before or after ARX).

## Specifications Refrigerated Air Dryer

### ARX Series



### Refrigerated Air Dryer : High inlet air temp. model

OIL FLOOD 55KW

OIL FREE 75KW

Descriptions	Type	ARX																				
		3HJ	5HJ	10HJ	20HJ	30HJ	50HJ	75HJ	90HK	100HK												
Air Processing Capacity	m <sup>3</sup> /min	0.32	0.7	1.1	2.8	4.6	7.6	8.8	10.7	14.9												
Inlet Air Temperature	°C	10~80																				
Dew Point Temperature	°C	3~15			<table border="1"> <thead> <tr> <th colspan="4">Rated Condition</th> </tr> <tr> <th>Air Pressure</th> <th>Ambient Temp.</th> <th>Dew Point (PDP)</th> <th>Inlet Air Temp.</th> </tr> </thead> <tbody> <tr> <td>0.69MPa</td> <td>35°C</td> <td>10°C</td> <td>50°C</td> </tr> </tbody> </table>						Rated Condition				Air Pressure	Ambient Temp.	Dew Point (PDP)	Inlet Air Temp.	0.69MPa	35°C	10°C	50°C
Rated Condition																						
Air Pressure	Ambient Temp.	Dew Point (PDP)	Inlet Air Temp.																			
0.69MPa	35°C	10°C	50°C																			
Ambient Temperature	°C	2~43																				
Operating Pressure	MPa	0.2~0.98																				
Dimensions	Height	480	510	610	900	990	1050	1054	1229													
	Depth	450	600	820	960	980	1010	1022	1023													
	Width	180	240	240	300			380	470	592												
Mass	kg	18	26	35	44	83	94	106	140	167												
Pipe Connections	B	R1/2	R3/4	R1		R1 1/2		R2														
Power Source (50Hz)	V	1ph220±10%							3ph380V±10%													
Power Consumption (50Hz)	kW	0.27	0.28	0.37	0.74	1.9	2.0		3.0	4.4												
Refrigerant		R134a				R410A																

### Refrigerated Air Dryer : Standard inlet air temp. model

Descriptions	Type	ARX																				
		5J	10J	20J	30J	50J	75J	100J	110K	120K												
Air Processing Capacity	m <sup>3</sup> /min	0.54	1.0	2.3	4.0	6.4	9.0	12.0	13.0	19.0												
Inlet Air Temperature	°C	10~50																				
Dew Point Temperature	°C	3~15			<table border="1"> <thead> <tr> <th colspan="4">Rated Condition</th> </tr> <tr> <th>Air Pressure</th> <th>Ambient Temp.</th> <th>Dew Point (PDP)</th> <th>Inlet Air Temp.</th> </tr> </thead> <tbody> <tr> <td>0.69MPa</td> <td>30°C</td> <td>10°C</td> <td>35°C</td> </tr> </tbody> </table>						Rated Condition				Air Pressure	Ambient Temp.	Dew Point (PDP)	Inlet Air Temp.	0.69MPa	30°C	10°C	35°C
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Pipe Connections	B	R1/2	R3/4	R1		R1 1/2		R2														
Power Source (50Hz)	V	1ph220±10%							3ph380V±10%													
Power Consumption (50Hz)	kW	0.26	0.27	0.36	0.68	1.7		2.6	4.2													
Refrigerant		R134a				R410A																



## Specifications Clean Air Filter

### DSF-AL / LSF-AL / MSF-AL / KSF-AL Series

Descriptions	Type		Model										
	DSF/LSF/MSF/KSF	Type	75-AL <sup>※1</sup>	150-AL	200-AL	250-AL	400-AL	700-AL	1000-AL	1300-AL1 <sup>※4</sup>	2000-AL1 <sup>※4</sup>		
Air Processing Capacity <sup>※2</sup>	0.69MPa	m <sup>3</sup> /min	0.35	1.2	1.8	2.7	3.9	6.6	10.6	13.8	20.0		
	0.75MPa		0.38	1.3	2.0	2.9	4.2	7.2	11.5	15.0	21.7		
	0.85MPa		0.42	1.5	2.2	3.3	4.7	8.0	12.9	16.8	24.3		
Casing Material			Aluminum Die Casting (All AL-Filter are alumite-treated on the inside surface.)										
Operating Range	Fluid		Compressed Air										
	Inlet Air Pressure		0.05~0.98 (DSF / LSF / MSF 1300AL1, 2000AL1 : 0.1~0.98)										
	Inlet Air Temperature		5~60										
	Ambient Temperature		2~60										
Performance <sup>※3</sup>	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		MSF : 0.01 / KSF : 0.003										
	Pressure Loss		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°C, 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 "Test method of oil concentration", not including oil-vapor.

## Auto Drain Trap

Item	Float operated			Disc operated
	FD2-G3	FD6-G1	FD-10-A	AD-5-G7
Maximum drain flow capacity <sup>※1</sup>	10 cm <sup>3</sup> / cycle	30 cm <sup>3</sup> / cycle	80 cm <sup>3</sup> / cycle	450 L / h
Operable pressure range	MPa 0.1 ~ 1.0		0.20 ~ 0.98	0.29 ~ 0.98
Operable temperature range	°C 2 ~ 60			
Processed fluid	Compressed air drain			
Drain release method	Float operated			Disc operated
Connections	Inlet Rc 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 4)

※Please consult your Orion dealer for further details.

## Differential Pressure Gauge



## Model Selection For ARX Series

### Model Selection

**1** Temperature conditions  
Table A : ARX-HJ/HK Models  
Table B : ARX-J/K 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 (P5) than the air capacity required.

### Model selection Example

Inlet Air Temp.	60°C	Ambient Temp.	35°C	Air Flow	6m <sup>3</sup> /min
PDP	10°C	Air Pressure	0.59MPa	Frequency	50Hz

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

**2** Air capacity required for Orion Dryer,  
**6 / (0.70×0.93)=9.2m<sup>3</sup>/min**

**3** The suitable model to process 9.2m<sup>3</sup>/min is ARX90HK, as its capacity exceeds the required value.

### A: Inlet Air Temperature Coefficient ( ARX-HJ/HK Models )

Inlet air temperature(°C)	50			60			70			80			
	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 ( ARX-J/K Models )

Inlet air temperature(°C)	35			40			45			50			
	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: 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

## ISO Certification

Orion Machinery Asia Co., Ltd is an ISO Certified, Quality Management company.



For inquiries, please contact the following representative:

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- 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.