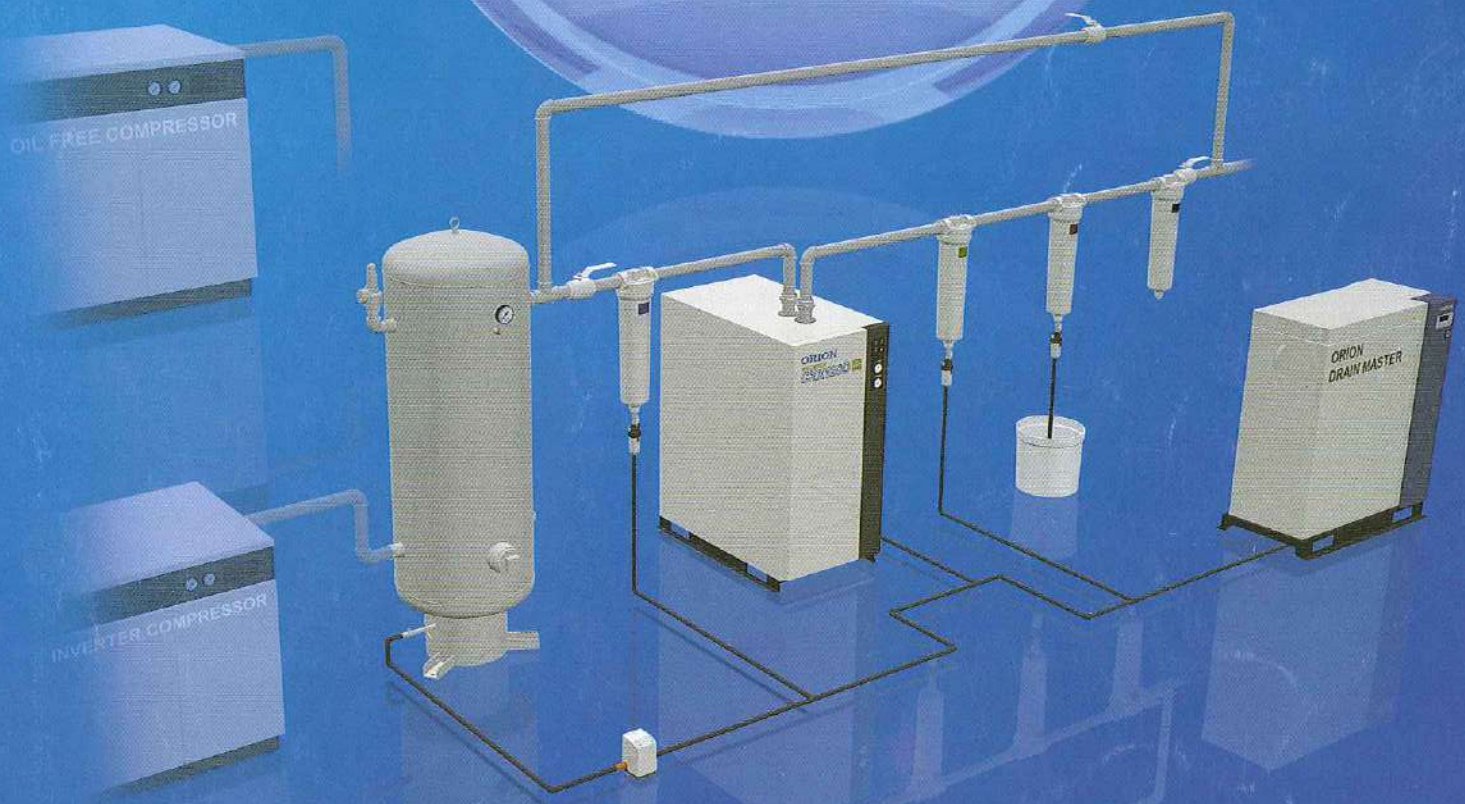


# Clean Air System

**Low Pressure Loss & Energy Saving**  
**Eco-Friendly R407C Refrigerant Applied**  
**Powerful performance in Asia**  
**with heavy duty specification**



Best Match for Inverter Compressor & Oil-Free Compressor





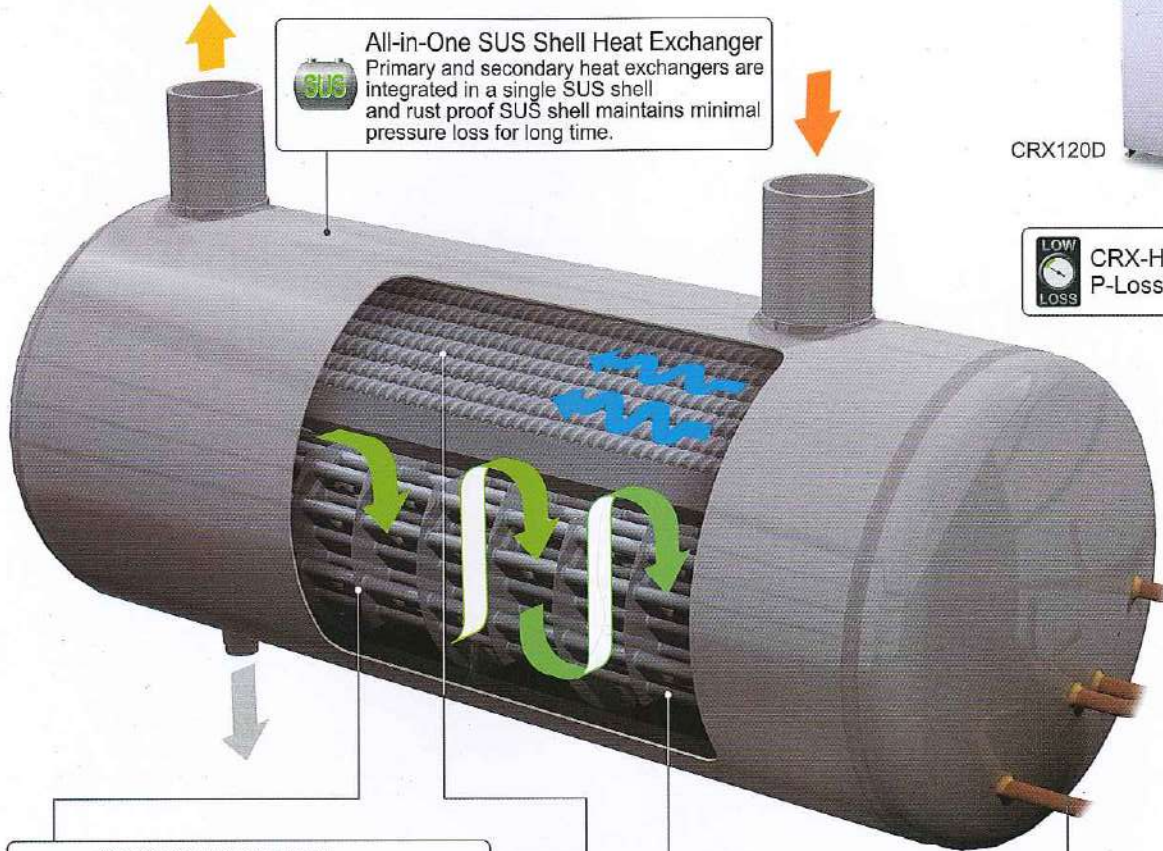
# ORION Refrigerated Air Dryer

Feature-Packed Air Dryer for Energy Saving and Stable Productivity,  
**ORION "CRX" series** <sup>※1</sup>



CRX120D

**CRX-HD model**  
P-Loss under 0.015MPa



**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.

**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

**R407C** R407C Refrigerant  
Eco-Friendly refrigerant applied

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

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

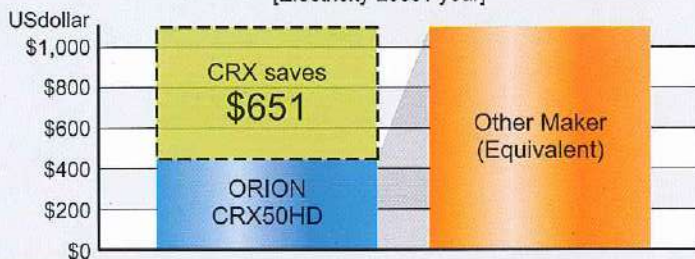
NICKEL-PLATED Copper Pipe

Copper pipe not plated

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

## CRX Pressure Loss Advantage

[Electricity Loss / year]



	ORION CRX50HD	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

※1: Please refer to detail on page 2











# CRX Function Chart

## High inlet air temperature model

Function	Model : CRX									
	3HD	5HD	10HD	20HD	30HD	50HD	75HD	90HD	100HD	
 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			●	●	●	●	●	●	●	●
 R407C Refrigerant	●	●	●	●	●	●	●	●	●	●
 Heavy Duty Refrigerant Circuit	●	●	●	●	●	●	●	●	●	●
 Condenser Filter		●	●	●	●	●	●	●	●	●
Wide Adjusting Range CCV (capacity control valve)	●	●	●	●	●	●	●	●	●	●
Operation Lamp	●	●	●	●	●	●	●	●	●	●
Alarm Lamp								●	●	●
Condensing Pressure Gauge										
Evaporating Pressure Gauge		●	●	●	●	●	●	●	●	●
Air Pressure Gauge			●	●	●	●	●	●	●	●
Long Life Fan-Control Switch	●	●	●	●	●	●	●	●	●	●
One Touch Open Front Cabinet		●	●	●	●	●	●	●	●	●
3 Signal Output (remote, operation status, alarm)								●	●	●
Disk Operated Auto Drain Trap AD-5 with Ball Valve				●	●	●	●	●	●	●
Float Operated Auto Drain Trap FD-1D with Ball Valve		●	●							
Float Operated Auto Drain Trap FD-1D	●									

## Standard inlet air temperature model

Function	Model : CRX									
	5D	10D	20D	30D	50D	75D	100D	110D	120D	180D
 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			●	●	●	●	●	●	●	●
 R407C Refrigerant	●	●	●	●	●	●	●	●	●	●
 Heavy Duty Refrigerant Circuit	●	●	●	●	●	●	●	●	●	●
 Condenser Filter		●	●	●	●	●	●	●	●	●
Wide Adjusting Range CCV (capacity control valve)	●	●	●	●	●	●	●	●	●	●
Operation Lamp	●	●	●	●	●	●	●	●	●	●
Alarm Lamp								●	●	●
Condensing Pressure Gauge										
Evaporating Pressure Gauge		●	●	●	●	●	●	●	●	●
Air Pressure Gauge			●	●	●	●	●	●	●	●
Long Life Fan-Control Switch	●	●	●	●	●	●	●	●	●	●
One Touch Open Front Cabinet		●	●	●	●	●	●	●	●	●
3 Signal Output (remote, operation status, alarm)								●	●	●
Disk Operated Auto Drain Trap AD-5 with Ball Valve				●	●	●	●	●	●	●
Float Operated Auto Drain Trap FD-1D with Ball Valve		●	●							
Float Operated Auto Drain Trap FD-1D	●									



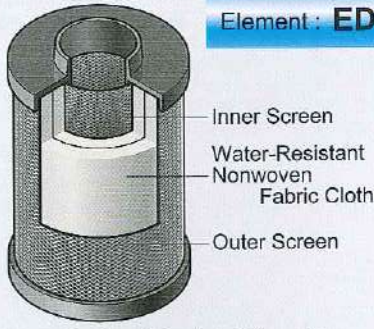


# ORION Clean Air Filter

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

## Drain Filter DSF-AL

Location\*1 Before CRX

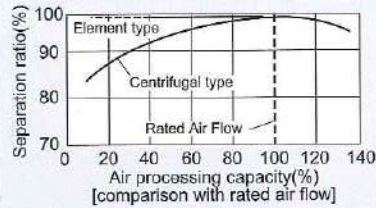


Sectioned Drawing of Element

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

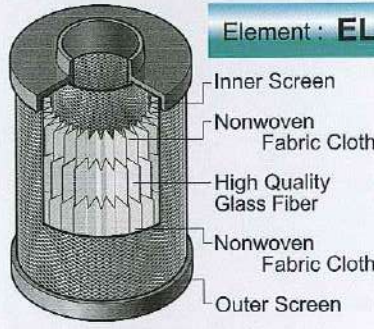
**LOW LOSS** P-loss  
**0.005MPa**

### Performance Curve



## Line Filter LSF-AL

Location\*1 After CRX



Sectioned Drawing of Element

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 "DGX50A" installed (LSF400AL and bigger model)

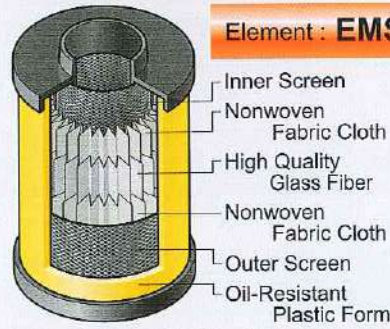
**LOW LOSS** P-loss  
**0.005MPa**  
(Initial)

### 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 (0.01 $\mu$ m, 99.999%) removal  
Newly developed element installed(EMS)  
Float operated auto drain trap installed  
Precision different pressure gauge "DGX50A" installed (MSF400AL and bigger model)

**LOW LOSS** P-loss  
**0.01 ~ 0.02MPa**

### Oil-Resistant Plastic Form

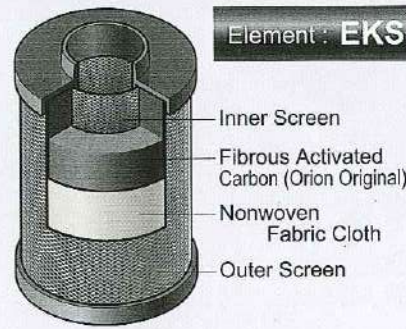


### High Quality Glass Fiber



## 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



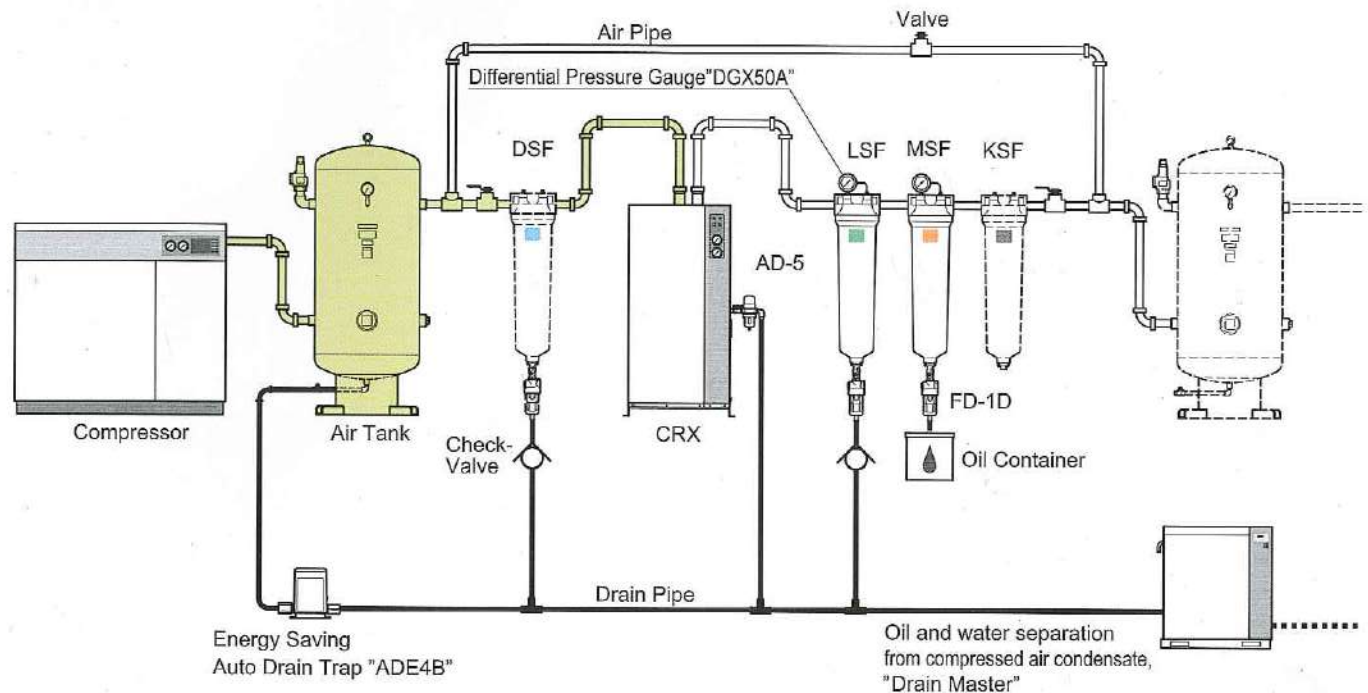
# Basic System Examples

## Air Quality Notes

Please install ORION genuine Clean Air Filter 'before and after CRX 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>CRX</b> <b>LSF</b> <b>MSF</b> <b>KSF</b>	General Painting, Precision Machinery Industry, etc
☆ <b>DSF</b> <b>CRX</b> <b>LSF</b> <b>MSF</b>	Standard Pneumatic
<b>CRX</b> <b>LSF</b> <b>MSF</b>	Standard Pneumatic
▲ <b>LSF</b> <b>CRX</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 CRX 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). CRX Heat-Exchanger is made of SUS 304.
- 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 CRX).



**Specifications** Refrigerated Air Dryer  
**CRX-HD Series / CRX-D Series**

**New**  
Smallest Model CRX3HD, CRX5D



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

Descriptions	Type	CRX									
		3HD	5HD	10HD	20HD	30HD	50HD	75HD	90HD	100HD	
Air Processing Capacity	m <sup>3</sup> /min	0.32	0.7	1.2	3.1	4.6	7.6	8.8	10.7	14.9	
Inlet Air Temperature	°C	10~80									
Dew Point Temperature	°C	3~10									
Ambient Temperature	°C	2~43									
Operating Pressure	MPa	0.39~0.98									
Dimensions	Height	mm	463	550	619	930	999	1054	1229	1229	
	Depth	mm	540	574	817	979	1007	1029	1023	1023	
	Width	mm	240	255	255	305	380	470	592	592	
Mass	kg	23	30	40	46	87	92	108	145	185	
Pipe Connections	B	R1/2	R3/4	R1	R1 1/2	R2	R2	R2	R2	R2	
Power Source (50Hz)	V	1ph220±10%						3ph380V±10%			
Power Consumption (50Hz)	kW	0.48	0.44	0.46	0.97	1.62	2.08	2.11	3.00	4.40	
Refrigerant		R407C									

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

Descriptions	Type	CRX										
		5D	10D	20D	30D	50D	75D	100D	110D	120D	180D	
Air Processing Capacity ※1	Ambient 25°C	m <sup>3</sup> /min	0.59	1.1	2.8	4.4	7.0	9.9	13.2	14.3	20.9	26.0 ※1
	Ambient 30°C	m <sup>3</sup> /min	0.54	1.0	2.6	4.0	6.4	9.0	12.0	13.0	19.0	
Inlet Air Temperature	°C	10~50									10~60	
Dew Point Temperature	°C	3~10										
Ambient Temperature	°C	2~43										
Operating Pressure	MPa	0.39~0.98										
Dimensions	Height	mm	463	550	619	930	999	1054	1229	1275		
	Depth	mm	540	574	817	979	1007	1029	1023	1291		
	Width	mm	240	255	255	305	380	470	592	702		
Mass	kg	23	30	40	46	87	92	108	145	185	250	
Pipe Connections	B	R1/2	R3/4	R1	R1 1/2	R2	R2	R2	R2	R2 1/2		
Power Source (50Hz)	V	1ph220±10%						3ph380V±10%				
Power Consumption (50Hz)	kW	0.45	0.43	0.45	0.90	1.60	1.85	1.95	2.60	4.20	4.70	
Refrigerant		R407C										

※1 CRX180D's Air Processing capacity is based on the conditions of Inlet 40°C, Ambient 30°C, PDP 10°C and Air Pressure 0.69MPa.



LSF400-AL MSF400-AL



## Specifications Clean Air Filter

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

Descriptions	Type		※1									
	DSF/LSF/MSF/KSF		75-AL	150-AL	200-AL	250-AL	400-AL	700-AL	1000-AL	1300-AL	2000-AL	
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	
	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	MPa	0.05~0.98									
	Inlet Air Temperature	°C	5~60									
	Ambient Temperature	°C	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									
Filter Element Replacement	Usual		1 year									
	Pressure Loss	MPa	DSF : 0.02 / LSF : MSF : 0.035 <span style="border: 1px solid black; padding: 2px;">Whichever comes first.</span>									
Dimensions	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	75	150	200	250	400	700	1000	1300	2000
		Q'ty	EMS/EKS	1 each								
	Auto Drain Trap ※4	LSF/MFS	NH-503MR built-in							FD-1D		
	Differential Pressure gauge	DSF	Option					DGX-50A(LSF • MSF Equipped) / DSF • KSF Option				

※1. KSF available from 150 to 2000B. ※2. Air Processing Capacity is converted to the suction air condition (atmospheric, 32°C, 75%RH and Air Pressure 0.69MPa).  
 ※3. All Performance are tested at standard Air Processing Capacity (0.69MPa), Inlet oil contamination 3 wt ppm(LSF/MSF), 0.01wt ppm(KSF)  
 ※4. Float Type only, NH-503MR/FD-1D Drain Port Rc1/4, O.D φ16, Drain Port Rc3/8.

## Auto Drain Trap

Item	Float operated		Disc operated	Timer operated	
	FD-1D	FD10-A	AD-5	ADE4B	
Maximum drain flow capacity ※1	7 cm³/cycle	80 cm³/cycle	450 L/h	0.32L/cycle (at 0.69MPa)	
Operable pressure range MPa	0.05 ~ 0.98	0.20 ~ 0.98	0.29 ~ 0.98	0.25 ~ 0.98	
Operable temperature range °C	2 ~ 60			2 ~ 40 (Should not be operated in freezing conditions)	
Processed fluid	Compressed air drain				
Drain release method	Float operated		Disc operated	Solenoid valve, timer/temperature control	
Power specifications	Power Source	-			Single phase 200V 50/60Hz
	Power consumption	-			19/16
Connections	Inlet	Rc 1/2		1/2	
	Drain outlet	Rc 1/4	Rc 3/8	Rc 1/2	Rc 1/2
Mass kg	0.4	1	1.7	1.2	
Outside dimensions	Outside diameter: 62 × length: 159	Outside diameter: 96 × length: 193	Outside diameter: 86 × length: 198	150 (H) × 117 × 100	

※1. Drain conditions: Air pressure (gauge pressure): 0.69MPa.

※Indoor specifications (Operable in environment where it would not be exposed to water splash.)

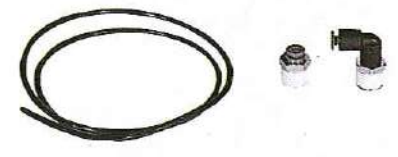
※When setting up drain piping, to prevent back pressure from other traps, be sure to install a check valve. Also install drain traps at each drain port. (Please refer to detail on page 4)

※Piping (inlet and outlet) for the ADE4B should have an inside diameter of at least 12mm.

※Please consult your Orion dealer for further details.

## Differential Pressure Gauge

DGX-50A





## Model Selection For CRX Series

### Model Selection

<b>1</b>	Temperature conditions
	Table A : CRX5HD~100HD    Table C : CRX180D Table B : CRX10D~120D    Table D : Air Pressure Coefficient

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

<b>3</b>	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

<b>1</b>	From charts, Inlet temp. coefficient → <b>0.70</b>
	Air Pressure coefficient → <b>0.93</b>

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

<b>3</b>	The suitable model to process 9.2m <sup>3</sup> /min is CRX90HD, as its capacity exceeds the required value.
----------	--

### A: Inlet Air Temperature Coefficient ( CRX3HD~100HD )

Inlet air temperature(°C)	50			60			70			80			
	5	10	15	5	10	15	5	10	15	5	10	15	
Outlet dew point (°C)	30	0.78	1.06	1.29	0.62	0.80	0.92	0.55	0.71	0.82	0.48	0.63	0.79
Ambient temperature(°C)	35	0.73	1.00	1.21	0.59	0.70	0.86	0.47	0.64	0.74	0.41	0.57	0.71
	40	0.55	0.75	0.91	0.44	0.56	0.66	0.37	0.52	0.58	0.33	0.42	0.51

### B: Inlet Air Temperature Coefficient ( CRX5D~120D )

Inlet air temperature(°C)	35			40			45			50			
	5	10	15	5	10	15	5	10	15	5	10	15	
Outlet dew point (°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
Ambient temperature(°C)	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 ( CRX180D )

Inlet air temperature(°C)	35			40			45			50			55			60			
	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15	
Outlet dew point (°C)	30	0.80	1.10	1.20	0.72	1.00	1.10	0.62	0.91	0.98	0.55	0.79	0.85	0.38	0.65	0.72	0.25	0.46	0.59
Ambient temperature(°C)	35	0.75	0.97	1.10	0.67	0.90	0.97	0.55	0.80	0.85	0.44	0.65	0.72	0.32	0.51	0.56	0.20	0.35	0.45
	40				0.60	0.80	0.90	0.50	0.70	0.77	0.38	0.55	0.62	0.25	0.37	0.47	0.12	0.20	0.30

### D: 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



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Orion Machinery Co., Ltd. has been certified by CBPVI (Center of Boiler and Pressure Vessel Inspection and Research of state Bureau of Quality and Technical Supervision of the P.R. China) since 1998 as an authorized pressure vessel factory.

- This catalogue was issued as of Jan. 2010.
- All specifications and information are subject to change without notice.