

FRD Refrigerant Dryers

7cfm-3885cfm





Compressed Air contains water, oil and dirt

The Problem

Compressed air is an essential power source that is widely used throughout industry. This safe, powerful and reliable utility can be the most important part of your production process. However, your compressed air will contain water, dirt, wear particles, bacteria and even degraded lubricating oil which all mix together to form an unwanted abrasive sludge. This sludge, often acidic, rapidly wears tools and pneumatic machinery, blocks valves and orifices causing high maintenance and costly air leaks. It also corrodes piping systems and can bring your production process to an extremely expensive standstill! Only compressed air that is totally clean and dry will ensure maximum savings.



Corrosion



Unwanted Abrasive Sludge



Damaged Tools

The Solution

All of these costly problems can be avoided by installing a Fluidair FRD compressed air refrigeration dryer package complete with FP filtration. The packages are suitable for use with any compressor type and provide air quality to ISO 8573.1 Class 1.4.1.

Benefits

Clean, Dry, Compressed Air



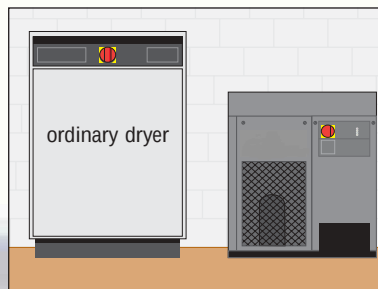
Stops Damage & Corrosion

Prevents product spoilage and prolongs life of compressed air systems and pneumatic tools.



Energy Efficient, Low Running Costs

Use of R134a & R407C reduces refrigerant charge, compressor size and running costs when compared to more traditional HFC refrigerants. Scroll compressors in models FRD388 to FRD3885 reduce energy costs by a further 20%.



Compact & Lightweight

Efficient heat exchanger and refrigeration circuit design combined with R134a & R407C refrigerant reduces size and weight when compared to dryers charged with more traditional HFC refrigerants.



Reliable Operation

Simple circuit design and use of high quality components, ensures a long operating life. Easy to remove casing and instant access to condensate drain simplifies routine cleaning and maintenance.

Montreal Protocol compliant

Use of R134a & R407C environmentally friendly HFC refrigerant ensures compliance with the Montreal Protocol. With no proposed 'phase out' of this refrigerant, the dryer will not have to be replaced prematurely.



Compressed Air Technology

The inside story



Simple Controller

Fitted on models FRD 007 to FRD 318, the simple controller provides on / off operation and visual indication of dryer performance.



Electronic Controller

Models FRD388 to FRD3885, are fitted with an electronic control system. A keypad provides total control of the dryer and allows access to performance and service functions. The digital display shows dryer performance and alarm conditions for high refrigerant pressure, high refrigerant temperature, high and low dewpoint and compressor faults. Manual electrical isolation and a full refrigeration system mimic display is also included on the front panel.

Efficient Heat Exchanger Design

All models use the High Performance Cross Flow Heat Exchange Module.

Using R407C&R134a and the High performance Cross Flow Heat Exchanger module allows the refrigeration circuit to be typically 30% smaller than traditional HFC based systems, providing savings of up to 10% in energy consumption.

Energy Efficiency

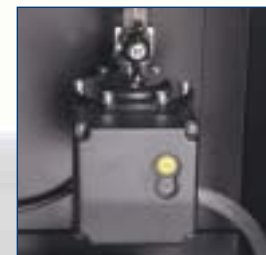
The combination of an efficient heat exchanger design, R407C & R134a, refrigerant and level sensing, no air loss condensate drains produces a compact energy efficient dryer. Models FRD388 to FRD3885 utilise energy efficient scroll compressors. Scroll compressors have 50% less moving parts, lower vibration and noise levels and consume 20% less energy than an equivalent output piston compressor, increasing energy efficiency even further.



Additional Energy Saving 'Cold Mass' Control System

The electronic controller can also be connected to the compressor start - stop circuit, a flow switch or a remote timer to provide additional energy savings in periods of no demand such as evenings or weekends.

In 'Cold Mass' mode, the evaporator temperature is always maintained allowing instant start up when required.



Energy Efficient Level Sensing Drain*

Level sensing condensate drains only discharge when liquid is present and close before compressed air is lost. Saving Air – Saves Energy – Saves Money.

*(MODELS FRD 388 to FRD 3885)
*(Models FRD 388 to FRD 3885)

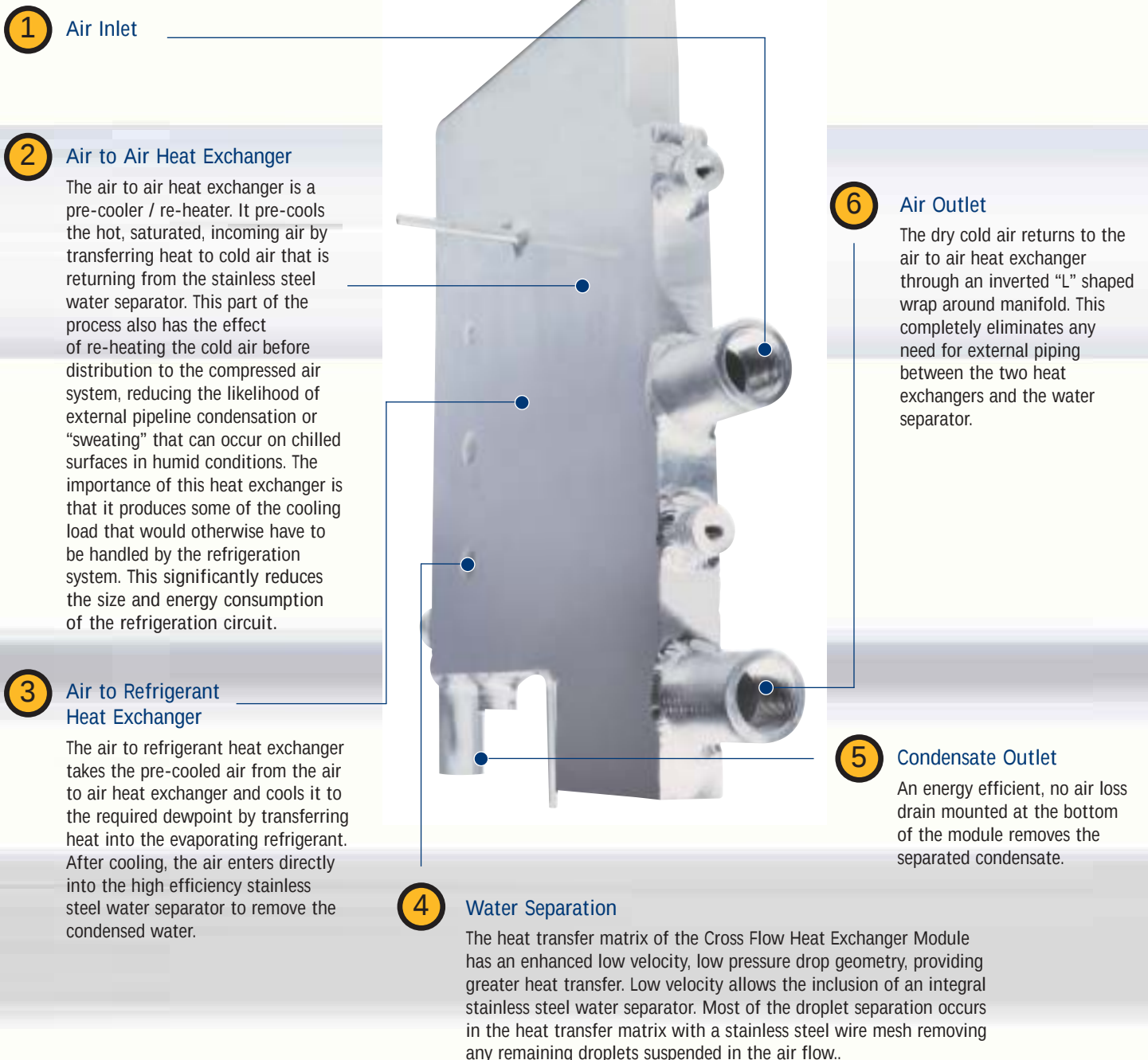




High Performance Cross Flow Heat Exchanger

At the centre of the FRD dryer is the high performance Cross Flow Heat Exchanger Module. This module is a combination of two brazed aluminum bar and plate heat exchangers and a high efficiency stainless steel water separator.

The flow paths through each heat exchanger allow them to be constructed into a single, very compact package. By using a cross flow arrangement, the air flow can exit the air to air heat exchanger and enter directly into the air to refrigerant heat exchanger without any interconnecting piping to direct the flow, resulting in a size, weight and pressure drop reduction when compared to conventional heat exchangers. The brazed and welded construction also means that there are no gasket joints internal to the assembly, providing a maintenance free unit.





How it Works

Refrigeration Compressor

This compressor forms part of a closed loop system compressing the refrigerant and circulating it around the system. Models FRD007 to FRD318 use piston compressors, and models FRD388 to FRD3885 use energy efficient scroll compressors.



Evaporator (air to refrigerant heat exchanger)

The evaporator removes heat from the compressed air and transfers it to the cold refrigerant. The saturated refrigerant evaporates with the heat from the compressed air. Superheated vapour is then returned to the compressor.

Hot Gas by-pass Valve

The function of the hot gas by-pass valve is to prevent freezing of the evaporator in low load conditions. It does this by sensing low pressure refrigerant leaving the evaporator and re-directing hot refrigerant gas back to the compressor inlet as required. This ensures optimum dewpoint control under all operating conditions. FRD dryers use a 100% modulating valve which is pressure operated, providing a quicker response than temperature controlled valves.

4 Water Separator

Condenser

The condenser receives the hot, high pressure vapour from the compressor and cools it. The heat added to the refrigerant is exchanged with the cooling air flow. Condensation occurs as the refrigerant passes through the condenser and high pressure, sub-cooled liquid is formed to feed the capillary expander.

Filter / Dryer

The filter dryer removes moisture or particulate that may be present in the refrigerant system.

Capillary Expander

The capillary expander reduces the pressure of the liquid refrigerant to ensure the correct refrigerant flow rate enters the evaporator. This provides maximum heat exchange, and correct compressed air dewpoint. Simple design with no moving parts offers increased reliability.

Air to Air Heat Exchanger 2

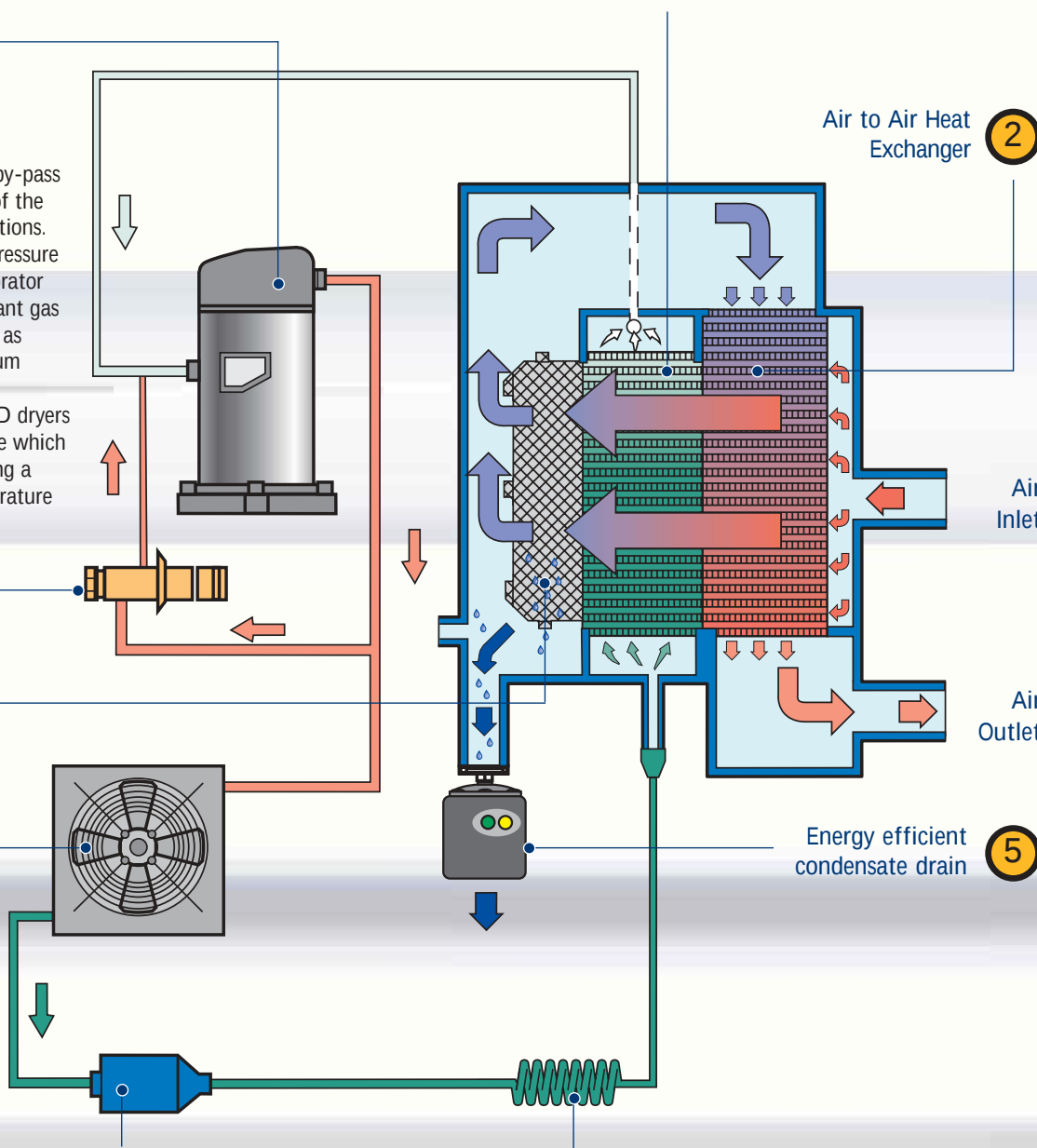
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Air Inlet

Air Outlet

Energy efficient condensate drain 5

5



Technical Specification FRD 007 to FRD 107

* Flow capacities in accordance with ISO7183, air suction of FAD 20°C (68°F), 1 bar (14.5 psi) at the following operating conditions :
 Ambient temperature = 25°C (77°F), Inlet temperature = 35°C (95°F), Relative humidity 60%. Working pressure = 7 bar g (102 psi g), Dewpoint 3°C (37°F).

MODEL	INLET / OUTLET	CAPACITY			ABSORBED POWER		DIMENSIONS (mm)			WEIGHT	
		m3/min	m3/hr	cfm	kW	hp	width	height	depth	Kg	lbs
FRD007	3/8	0.2	12	7	0.16	0.21	197	455	450	18	40
FRD014	3/8	0.4	24	14	0.17	0.23	197	455	450	19	42
FRD021	3/8	0.6	36	21	0.2	0.27	197	455	450	20	44
FRD032	1/2	0.9	54	32	0.24	0.32	282	530	600	32	71
FRD042	1/2	1.2	72	42	0.33	0.44	282	530	600	33	73
FRD064	3/4	1.8	108	64	0.48	0.64	352	605	700	46	101
FRD074	3/4	2.1	126	74	0.58	0.78	352	605	700	55	121
FRD085	3/4	2.4	144	85	0.63	0.84	352	605	700	56	123
FRD107	3/4	3.03	181.8	107	0.8	1.07	352	605	700	58	128

Correction Factors

To obtain dryer capacity at new conditions, multiply nominal capacity * x C1 x C2 x C3 x C4

Ambient Temperature (C1)

Deg C	20	25	30	35	40	45	50
Deg F	68	77	86	95	104	113	122
Correction factor	1.05	1.00	0.94	0.88	0.81	0.75	0.68

Maximum Pressure 16 bar
 Refrigerant R134a
 230v/1ph/50Hz

Inlet Temperature (C2)

Deg C	30	35	40	45	50	55	60
Deg F	86	95	104	113	122	131	140
Correction Factor	1.22	1.00	0.83	0.69	0.58	0.46	0.45

Inlet Pressure (C3)

Pressure bar g	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pressure bar psi g	44	58	73	87	100	116	131	145	160	174	189	203	218	232
Correction Factor	0.73	0.83	0.90	0.95	1.00	1.03	1.07	1.09	1.12	1.13	1.15	1.17	1.18	1.19

Dewpoint (C4)

Deg C	3	5	7	10
Deg F	38	41	45	50
Correction Factor	1.00	1.12	1.24	1.46

Maximum ambient temperature 50°C (122°F)
 Maximum inlet temperature 60°C (140°F)
 Minimum ambient temperature 5°C (41°F)



Technical Specifications FRD 118 to FRD 3885

* Flow capacities in accordance with ISO7183, air suction of FAD 20°C (68°F), 1 bar (14.5 psi) at the following operating conditions :
Ambient temperature = 25°C (77°F), Inlet temperature = 35°C (95°F), Relative humidity 60%. Working pressure = 7 bar g (102 psi g), Dewpoint 3°C (37°F).

MODEL	INLET / OUTLET	CAPACITY			ABSORBED POWER		DIMENSIONS (mm)			WEIGHT	
		m3/min	m3/hr	cfm	kW	hp	width	height	depth	Kg	lbs
FRD118	1 1/2	3.3	198	118	0.57	0.76	615	791	552	65	143
FRD141	1 1/2	4	240	141	0.58	0.78	615	791	552	66	146
FRD182	1 1/2	5.2	312	182	0.95	1.29	615	791	552	68	150
FRD224	1 1/2	6.3	378	224	0.96	1.27	615	791	552	69	152
FRD265	1 1/2	7.5	450	265	0.98	1.31	615	791	552	70	154
FRD318	1 1/2	9	540	318	1.23	1.65	615	791	552	73	161
FRD388	2	11	660	388	1.18	1.58	920	1015	672	140	309
FRD433	2	12	720	433	1.21	1.62	920	1015	672	142	313
FRD506	2	14	840	506	1.49	2	920	1015	672	144	317
FRD647	2	18	1080	647	1.49	2	920	1015	672	150	331
FRD789	DN80	22	1320	789	2.11	2.83	1010	1500	1310	400	882
FRD883	DN80	25	1500	883	2.69	3.61	1010	1500	1310	420	926
FRD971	DN80	28	1680	971	2.76	3.7	1010	1500	1310	425	937
FRD1148	DN80	33	1980	1148	3.08	4.13	1010	1500	1310	450	992
FRD1354	DN80	38	2280	1354	3.19	4.28	1010	1500	1310	456	1005
FRD1766	DN100	50	3000	1766	4.38	5.87	1010	1500	1310	470	1036
FRD2266	DN100	64	3840	2266	5.63	7.55	1010	1500	1810	550	1213
FRD2719	DN150	77	4620	2719	8.57	11.49	1010	1500	1810	580	1279
FRD3178	DN150	90	5400	3178	7.72	10.35	1010	1500	1810	590	1301
FRD3885	DN150	110	6600	3885	9.93	13.32	1010	1500	1810	660	1455

Correction Factors

To obtain dryer capacity at new conditions, multiply nominal capacity * x C1 x C2 x C3 x C4

Ambient Temperature (C1)

Deg C	20	25	30	35	40	45	50
Deg F	68	77	86	95	104	113	122
Correction factor	1.03	1.00	0.96	0.92	0.88	0.80	0.70

Maximum Pressure 16 bar
Refrigerant R407C

Inlet Temperature (C2)

Deg C	30	35	40	45	50	55	60
Deg F	86	95	104	113	122	131	140
Correction Factor	1.20	1.00	0.84	0.71	0.60	0.50	0.45

FRD 118 to FRD 318 230V/1ph/50Hz
FRD 388 to FRD 3885 415V/3ph/50Hz

Inlet Pressure (C3)

Pressure bar g	3	4	5	6	7	8	9	10	11	12
Pressure bar psi g	44	58	73	87	100	116	131	145	160	174
Correction Factor	0.74	0.84	0.90	0.96	1.00	1.04	1.06	1.09	1.11	1.1

Dewpoint (C4)

Deg C	3	5	7	10
Deg F	38	41	45	50
Correction Factor	1.00	1.14	1.25	1.35

Maximum ambient temperature 50°C (122°F)
Maximum inlet temperature 60°C (140°F)
Minimum ambient temperature 5°C (41°F)

Options:

Water Cooled Condenser : on models FRD 789 to FRD 3885





FLUIDAIR
INTERNATIONAL

Compressed Air Technology

Rotary Screw Air Compressors

RS 4-11
RS 15-45
RS 55-75
RS 90-110
RS 132-160
RSV 15-250

Air Purification Products

FRD Refrigerant Dryers
FDD Desiccant Dryers
FP Purification Filters
FCC Condensate Cleaners
FZD Drains

Sales and Service

UK National Coverage
Maintenance & Service
Surveys & Installation

Research and Development

High-Tech Products
Customer Focused Design
Specified Industry Requirements

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www.fluidair.co.uk

Fluidair International Limited.
Kent Street,
Bolton,
Greater Manchester.
United Kingdom
BL1 2LN.
Telephone: +44 (0) 1204 559955
Fax: +44 (0) 1204 559966
Email: sales@fluidair.co.uk

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