FPS AIR COMPRESSORS

FNA UK by Belair family

YOUR AIR QUALITY SOLUTION

Direct expansion refrigerated compressed air dryers

F-DRY SERIES



0.7m3/min - 47.5 m3/min
24 CFM = 1677 CFM)

Operating principle

Our F-Dry range of dryers uses the principle of direct expansion refrigeration in order to effectively dry compressed air produced upstream in the network. Thanks to its efficient refrigeration system and our patented 3-in-1 heat exchanger, the compressed air is dried by an optimal exchange of heat in counterflow over the entire contact surface.

Our aluminium plate heat exchanger consists of an air/ air exchanger, which pre-cools the moist, water-saturated air, and an air/ refrigerant fluid exchanger, which cools the compressed air down to a temperature of +3°C, thus ensuring the evacuation of moisture through an integrated separator. This patented heat exchanger, resulting from a collaboration between F-DRY and the world's largest equipment manufacturers, provides efficient cooling whatever the air intake conditions and ambient temperature, and lowers resistance to circulation of the compressed air to a very limited level, generating a low pressure drop within the air.

The compressed, hot, moisture-saturated air is subjected to preliminary cooling at the inlet of the refrigeration dryer, within the air/air heat exchanger. As a result, the cooling requirement within the air/refrigerant zone is reduced and energy efficiency is optimized by more than 40%. The refrigeration circuit is perfectly sized to reduce the compression ratios of the refrigeration compressor through limited approaches within the heat exchangers and continuous stability of evaporation pressure. Beyond offering high energy efficiency to the air dryer, this also allows for a wide operating range, enabling it to cope with the most demanding temperatures.

The moisture droplets formed within the separator are separated and carried by gravity to the condensate drain. The resulting condensate is then purged through a fully configurable, high-performance sequential drain, or through a level-detection drain for increased energy savings (available as an option from the F-Dry 0040 model).

The compressed air, dried and cooled in the air/refrigerant gas exchanger, is then heated up again in the air/air exchanger before continuing through the compressed air network, ensuring a continuous supply of dry air to your process.



Streamline your processes with **simplicity and efficiency**



The refrigeration diagram of the unit revolves around a hermetic compressor operating at a low compression ratio for increased durability, a copper/aluminium condenser designed to withstand the most corrosive environments and meet the most demanding processes, a constant pressure valve to ensure a stable dew point regardless of the compressed air flow rate, and a high-performance aluminium heat exchanger providing optimal separation. With intelligence, robustness, and simplicity, the unit offers numerous assurances for your process.

Furthermore, the entire range features an intelligent controller as standard, which provides various functionalities, including dew point visualization under pressure, condensate purge timing (opening duration and frequency), compressor and exchanger freeze protection with electronic safeguards before mechanical activation by the LP pressure switch, and additional features that enhance security and optimize unit performance.

Ecology at the heart of F-DRY's concerns

ENVIRONMENTAL ISSUES

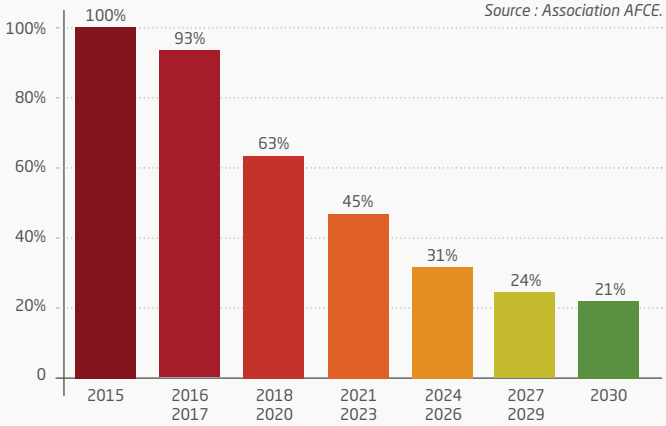
The Global Warming Potential (GWP) comes from the translation of Global Warming Potential (GWP) and this designates, as its name suggests, the global warming potential over a period of 100 years for 1 kg of refrigerant emitted into the atmosphere. If the GWP value is large and greater than 1 then the impact of the gas is harmful to the environment.

The F-GAS legislation (517-2014) in force aims to reduce the ecological footprint under three decisive axes:

- The inability to use refrigeration appliances powered by gases with a GWP (Global Warming Potential > 2500) by 2020. In this sense, the integrated solutions of R410a are strongly challenged.
- The overall reduction of the European GWP with a decrease from 2017 of 7% compared to 2015, then of 37% from 2018 compared to 2015.
- The introduction of a right to pollute and quota systems to frame Europe's global GWP

AVERAGE F-GAS OBJECTIVES

Source : Association AFCE.



At the dawn of 2024, the strengthening of quotas, providing for a 69% decrease in overall GWP consumption compared to the reference years, induces the necessary use of low GWP refrigerants. In this sense, F-DRY, leader and pioneer of ecological refrigeration solutions is working in this direction with the implementation of the F-Dry range with high performance and low environmental nuisance.

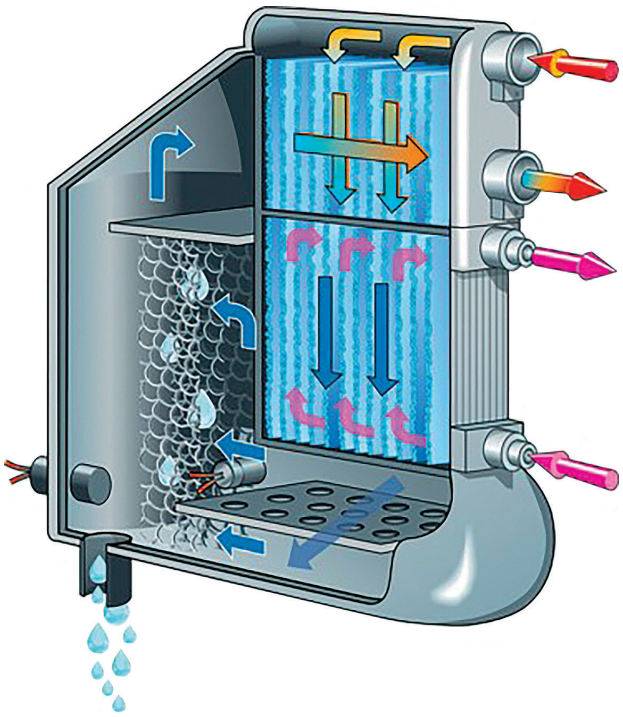
High Efficiency
Combination Heat Exchangers

HEAT EXCHANGERS

The air-to-air and air-to-refrigerant heat exchangers, along with the demister type condensate separator, are contained within a single and unique module. This module features a vertical flow design that promotes the natural downward flow of wet compressed air to the condensate drain. The counterflow of compressed air maximizes heat transfer efficiency and helps to reduce input power energy.

The economizer pre-cools the air entering the dryer, reducing the cooling power needed as the air moves into the evaporator. Similarly, the air leaving the dryer is heated to prevent condensation from forming on the factory pipes. The ample dimensions of the air-to-refrigerant heat exchanger, combined with the counterflow gas streams, ensure the complete evaporation of the refrigerant, preventing any liquid from returning to the compressor. The high-efficiency condensate separator is integrated within the heat exchanger module, requiring no maintenance. Its coalescing effect achieves a high degree of moisture separation. Condensate water is expelled through a timed purge located at the bottom of the heat exchanger.

Thanks to its generous dimensions and optimized airflow design, the aluminium heat exchanger offers limited pressure drops, ensuring a low total operating cost while providing dry, high-purity air.



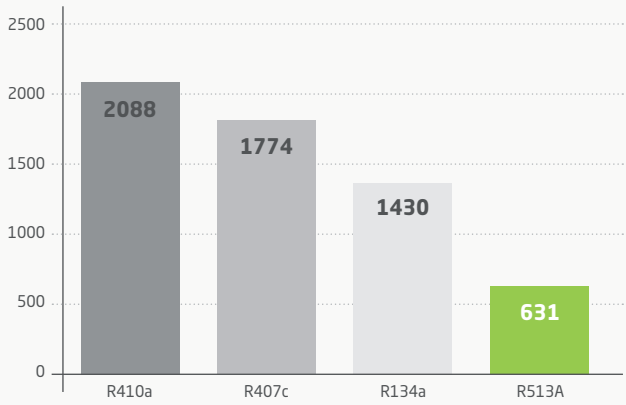
A UNIQUE REFRIGERANT FOR ALL MODELS

R513a refrigerant is an excellent fluid with regard to the expectations of the F-Gas 517/2014 regulation since it has a GWP value equal to 631. The latter well below the average of refrigerants available on the market and used in the case of refrigeration dryers allows a serene projection for the years to come."

For comparison, in the event of a refrigerant leak, on a dryer equipped with 4 kilograms, the pollution induced for a dryer fed with an HFC R410A fluid will be 8,352 kg of CO_2 equivalence, while it will be only 2,524 kg of CO_2 equivalence for an F-Dry R513A dryer.

LOW GWP

REFRIGERANT GWP VALUES



Product features

TECHNICAL FEATURES

3-IN-1 HEAT EXCHANGER

Composed of aluminium brazed plates, it allows for significant energy savings through its economizer pre-exchanger, low pressure drop, and high-performance separator. The brazed aluminium plates offers a significant heat transfer capacity, ensuring energy efficiency and stable dew point under pressure.

COMPRESSORS

Hermetic refrigeration compressors (pistons, rotary & scroll) that allow adequate cold production to maintain the dew point in all circumstances and whatever the conditions of use.



OPTIMIZED DESIGN

Dryers in the F-Dry range are compact, making them easy to install under work platforms or in small compressor rooms. The device's feet ensure adequate ground clearance to protect all internal components.

PLUG AND PLAY PRODUCTS

Direct expansion refrigeration dryer ready to use with all components directly integrated and which allow great simplicity of use. F-Dry dryers come with a power cable, which allows commissioning without having to open the dryer.



ELECTRONIC CONTROLLER

Dryers in the F-Dry range feature an electronic digital controller on all models, enabling reliable control and display of the dew point for effective dryer management.

ADVANTAGES

LIMITED ENERGY COSTS

High performance design through its 3-in-1 exchanger that ensures an extremely limited pressure drop of 0.15 bar at the nominal flow rate expressed.

POSITIVE ENVIRONMENTAL IMPACT

This new range of refrigeration dryers works with R513a refrigerant. This refrigerant of group A1 (non-harmful, non- flammable) is listed in the alternatives acclaimed by the European regulation F-Gas 517/2014 thanks to its low GWP value (631) compared to its predecessor R134a (1430). It is part of the desire to revise the European directive where refrigerants with a GWP greater than 750 will be abandoned and prohibited, for refrigeration equipment, for industrial use.

RECORD DURABILITY AND HIGH STRENGTH

Its reinforced body painted in baked epoxy ensures a long life over time even in the most corrosive and dusty environments. Its high-efficiency condenser, equipped with robust fins, swept by air without any obstacle allows the possibility of cleaning and great durability.

SIMPLIFIED MAINTENANCE

Easy access for maintenance with the opening of a single panel that allows the maintenance of the dryer device in an optimal and fast way. The refrigeration design of F-Dry dryers ensures direct access to all components. The technical diagnosis is facilitated by the presence of pressure taps within the refrigeration circuit, as well as the presence of a low-pressure gauge on the condenser side.

Technical specifications

DESCRIPTION	PART NO	CAPACITY		POWER SUPPLY	DIMENSIONS			WEIGHT	Ø FITTINGS	REFRIGERANT	FILTRATION
MODEL	Code	m³/min	cfm	V/Ph/F	A	B	C	kg	G	Refrigerant	Grade
F-DRY 006	CT-DRY6	0.6	21	230/1/50	511	362	760	24	¾"	R513a	FX-006 M + S
F-DRY 009	CT-DRY9	0.9	32	230/1/50	511	362	760	26	¾"	R513a	FX-006 M + S
F-DRY 012	CT-DRY12	1.2	42	230/1/50	511	362	760	29	¾"	R513a	FX-012 M + S
F-DRY 018	CT-DRY18	1.8	64	230/1/50	511	362	760	32	1"	R513a	FX-012 M + S
F-DRY 025	CT-DRY25	2.5	88	230/1/50	511	362	760	35	1"	R513a	FX-030 M + S
F-DRY 030	CT-DRY30	3.0	106	230/1/50	511	362	760	40	1"	R513a	FX-030 M + S
F-DRY 032	CT-DRY32	3.2	113	230/1/50	511	362	760	45	1"	R513a	FX-030 M + S
F-DRY 043	CT-DRY43	4.3	152	230/1/50	610	445	880	55	1½"	R513a	FX-030 M + S
F-DRY 052	CT-DRY52	5.2	184	230/1/50	610	445	880	62	1½"	R513a	FX-045 M + S
F-DRY 063	CT-DRY63	6.3	222	230/1/50	730	445	940	66	1½"	R513a	FX-045 M + S
F-DRY 080	CT-DRY80	8.0	281	230/1/50	730	445	940	73	1½"	R513a	FX-072 M + S
F-DRY 105	CT-DRY105	10.5	371	230/1/50	800	550	1000	95	2"	R513a	FX-072 M + S
F-DRY 135	CT-DRY135	13.5	477	230/1/50	800	550	1000	115	2"	R513a	FX-130 M + S
F-DRY 180	CT-DRY180	18.0	636	230/1/50	904	652	1048	145	2½"	R513a	FX-130 M + S
F-DRY 190	CT-DRY190	19.0	671	230/1/50	904	652	1048	160	2½"	R513a	FX-130 M + S
F-DRY 240	CT-DRY240	24.0	847	400/3/50	904	652	1048	180	2½"	R513a	FX-170 M + S
F-DRY 320	CT-DRY320	32.0	1118	400/3/50	800	750	1300	200	3"	R513a	FX-225 M + S
F-DRY 400	CT-DRY400	40.0	1412	400/3/50	800	750	1300	225	3"	R513a	FX-300 M + S
F-DRY 475	CT-DRY475	47.0	1677	400/3/50	800	750	1300	255	4"	R513a	FX-300 M + S

The technical specifications mentioned above refer to the following operating conditions: Ambient temperature +25°C, air inlet temperature +35°C, compressed air pressure 7 bar(g), pressure dew point +3°C, in line with quality class ISO 8573.1, humidity standard class 4.

Weights are listed net (without packaging). Refrigerant fluids used is: R513A, class A1, non-flammable, non-harmful, GWP 631. Equipment not subject to leakage checks of refrigeration equipment because it is less than 5Teq CO_2.

The voltages used are as follows: 230/1/50 for dryers F-Dry 0040 to F-Dry 1300, 400/3/50 for dryers F-Dry 1500 to F-Dry 2850. The distribution voltage of electric motors is grounded and without neutral. This range of products is also available in versions 115/1/60, 230/1/60, 460/3/60 according to the model. Please contact our sales department for more details.

Maximum operating pressure is 13bar(g) on all models. Ambient operating temperature should be between +5°C and +50°C.
Maximum compressed air inlet temperature is +75°C.

Working pressure (barg)	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Correction factor (K1)	0.57	0.72	0.82	0.92	1	1.06	1.08	1.11	1.14	1.18	1.19	1.21	1.24	1.26

Ambient temperature (°C)	20	25	30	35	40	45	50
Correction factor (K2)	1.04	1	0.96	0.9	0.84	0.76	0.71

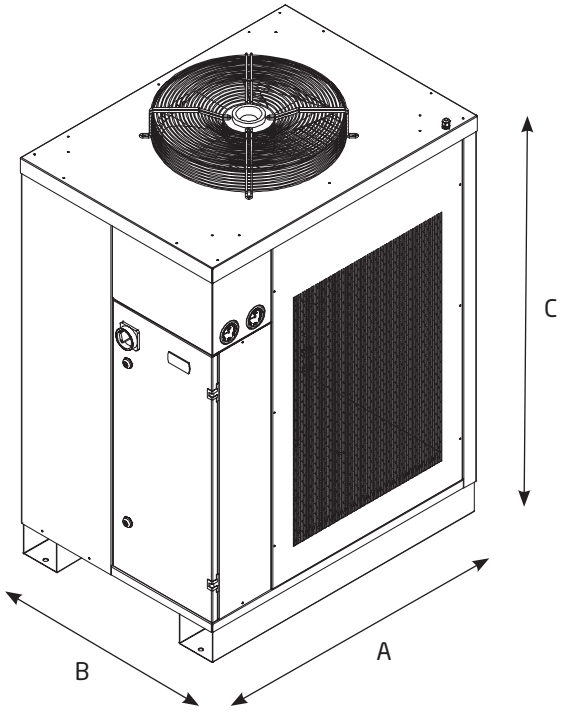
Air inlet temperature (°C)	30	35	40	45	50	55	60	65	70	75
Correction factor (K3)	1.18	1	0.85	0.7	0.61	0.56	0.49	0.43	0.39	0.34

Dew Point (°C)	3	4	5	6	7	8	9	10
Correction factor (K4)	1	1.03	1.07	1.16	1.19	1.22	1.24	1.27

The values indicated should be taken as an indication.

For more precise adjustment and in connection with your installation, please contact our sales department.

The values should be used as follows: Relative nominal value.



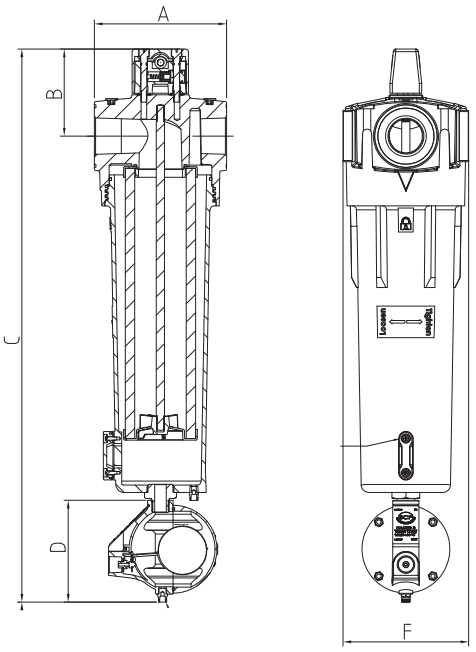
Technical specifications

MODEL	Filter Part No.	Type	G	Capacity		Dimensions & Weight						Filter Element
				Airflow (m3/ min)	Airflow (cfm)	Height (mm)	External Drain system (mm)	Depth (mm)	Width (mm)	Height indicator (mm)	Weight (kg)	
						C	D	F	A	B		
FX-006 Pre Filter	CT-F-006M	Standard	½"	1.0	35	200.5	--	79	89	33.2	1.0	CT-18153
FX-006 Final Filter	CT-F-006S	Standard	½"	1.0	35	200.5	--	79	89	33.2	1.0	CT-18154
FX-012 Pre Filter	CT-F-012M	Standard	¾"	2.0	71	234.6	--	79	89	33.2	1.2	CT-18158
FX-012 Final Filter	CT-F-012S	Standard	¾"	2.0	71	234.6	--	79	89	33.2	1.2	CT-18159
FX-030 Pre Filter	CT-F-030M	Standard	1"	4.8	169	408.7	--	110	120	33.2	3.5	CT-18163
FX-030 Final Filter	CT-F-030S	Standard	1"	4.8	169	408.7	--	110	120	33.2	3.5	CT-18164
FX-045 Pre Filter	CT-F-045M	Standard	1"½	7.2	254	408.7	--	110	120	33.2	3.8	CT-18168
FX-045 Final Filter	CT-F-045S	Standard	1"½	7.2	254	408.7	--	110	120	33.2	3.8	CT-18169
FX-072 Pre Filter	CT-F-072M	Standard	2"	12.0	424	531.5	145	148.5	160	81.2	5.3	CT-18173
FX-072 Final Filter	CT-F-072S	Standard	2"	12.0	424	531.5	145	148.5	160	81.2	5.3	CT-18174
FX-130 Pre Filter	CT-F-130M	Standard	2"½	22.0	777	811.5	145	148.5	160	81.2	6.5	CT-18178
FX-130 Final Filter	CT-F-130S	Standard	2"½	22.0	777	811.5	145	148.5	160	81.2	6.5	CT-18179
FX-170 Pre Filter	CT-F-170M	Standard	3"	28.0	989	577	145	188	200	81.2	8.0	CT-18183
FX-170 Final Filter	CT-F-170S	Standard	3"	28.0	989	577	145	188	200	81.2	8.0	CT-18184
FX-225 Pre Filter	CT-F-225M	Standard	3"	37.2	1314	839	145	188	200	81.2	8.8	CT-18188
FX-225 Final Filter	CT-F-225S	Standard	3"	37.2	1314	839	145	188	200	81.2	8.8	CT-18189
FX-300 Pre Filter	CT-F-300M	Standard	4"	48.0	1695	850	145	184	221	81.2	9.5	CT-18193
FX-300 Final Filter	CT-F-300S	Standard	4"	48.0	1695	850	145	184	221	81.2	9.5	CT-18194

M grade filters and cartridges = 1 Micron
S grade filters and cartridges = 0.01 Micron,
Note: Other grades including AC are available on upon request

The technical data specified below refers to the following operating conditions: inlet air temperature +20 °C (68 °F), compressed air pressure 7 bar(g) (102 psi), in accordance with ISO 8573-1 quality class. The maximum operating pressure is 16 bar(g).

Operating pressure (barg)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Correction factor (K1)	0.38	0.53	0.65	0.6	0.85	0.93	1	1.07	1.13	1.19	1.23	1.31	1.6	1.1	1.46	1.51





NEW

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