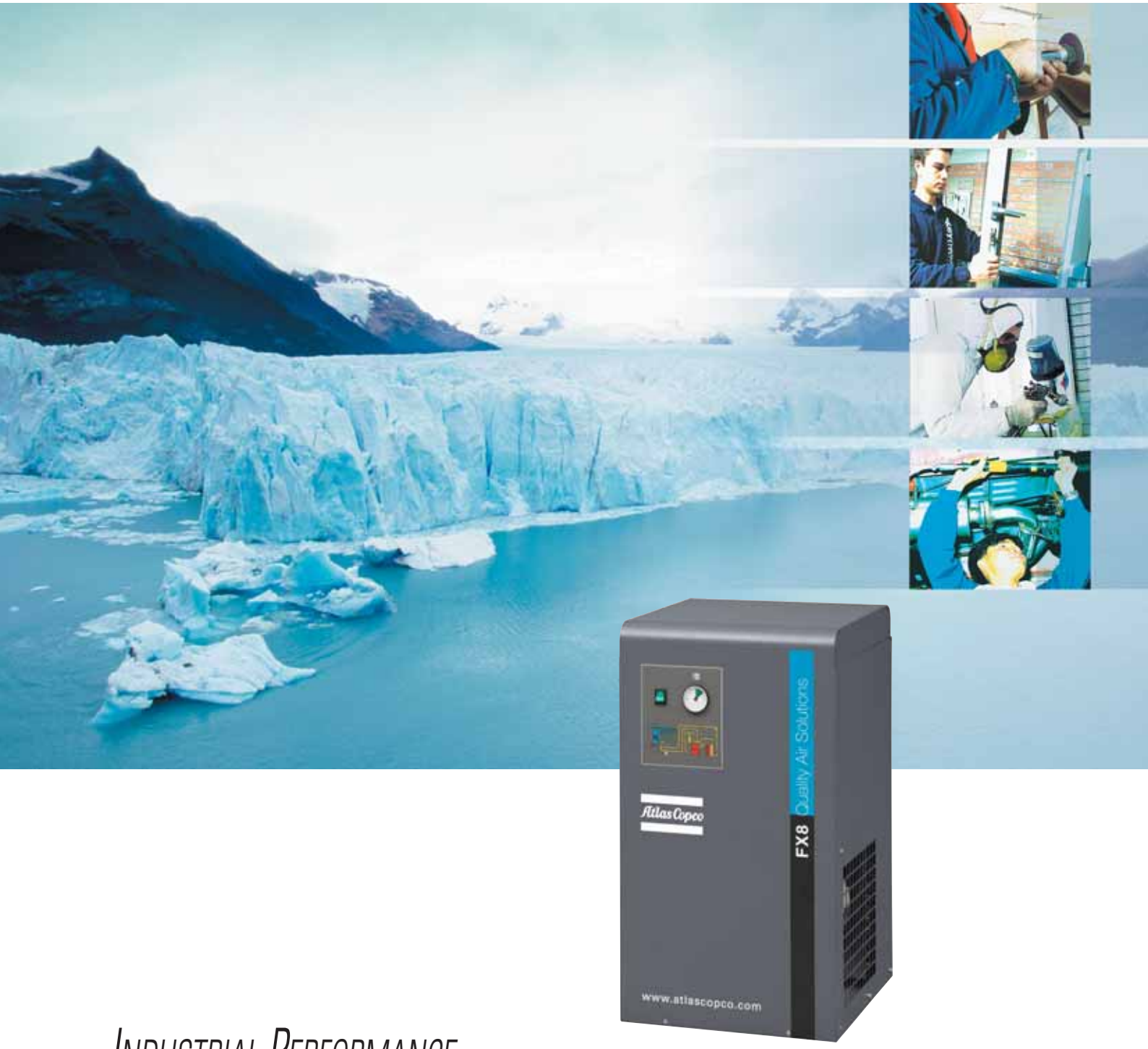
Atlas Copco Air Dryers

FX refrigeration air dryer series – 50 Hz



Industrial Performance
Simple Reliability

Atlas Copco

Air treatment - a smart investment

The hidden danger of untreated air

When the air that surrounds us is compressed, its vapour and particle concentration increases dramatically. The compression process causes the oil and water vapours to condense into droplets, and then mix with the high concentration of particles. The resulting mixture is an abrasive oily sludge that in many cases is also acidic.

Without air treatment equipment, much of this corrosive sludge will enter the compressed air system, corroding the pipe work, damaging pneumatic tools and equipment as well as potentially compromising final product quality.

Poor air quality costs you money

If the corrosive sludge is allowed to enter the compressed air system, it will not be long before problems start to appear. These are some of the most common, and most expensive problems:

- Tools and equipment break down more regularly, experience a shorter lifetime and reduced power.
- The end product, or other materials that come into contact with the contaminated air, can suffer spoilage and quality degradation.
- The compressed air pipe work will corrode, leading to leaks and a loss of valuable compressed air.

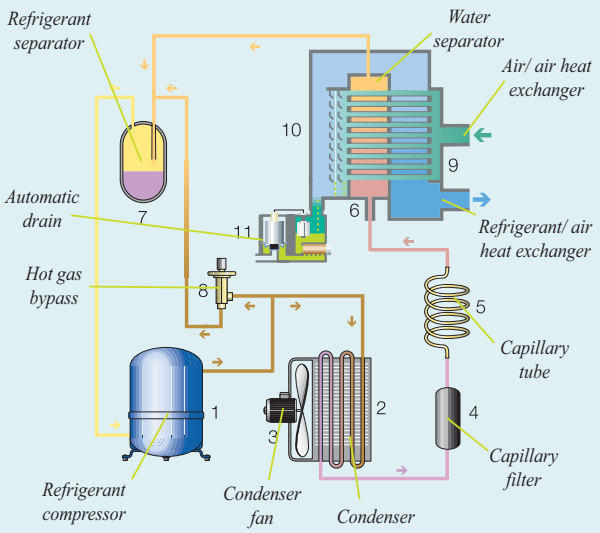
As an example, a small leak of just 3 mm is roughly equivalent to wasting 3.7 kW of electricity. In a year, this would cost around €1800 in wasted energy alone.

The simple solution for a costly problem

The FX range of refrigerant dryers offer a reliable, cost effective and simple solution.
To avoid condensation and therefore all chance of corrosion and damage, the compressed air needs to be dried, which is exactly what the FX units are designed to do.
These simple reliable units remove water from the air and the risk from your system, ensuring that your money doesn't just disappear into thin air !!

FX refrigerant dryers
Industrial performance - simple reliability

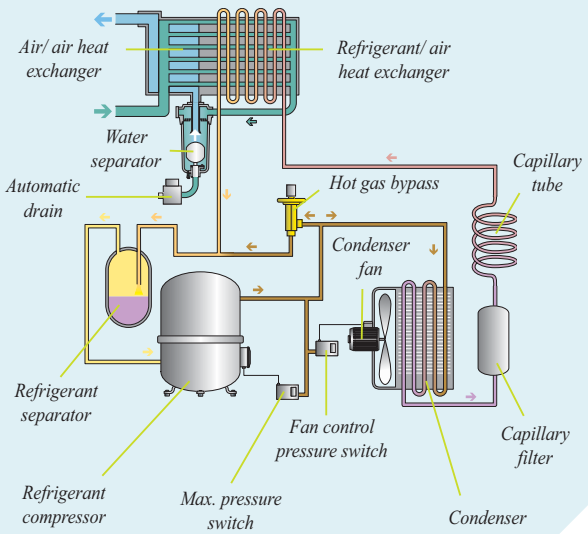
FX1-5 Brazed plate heat exchanger **FX 1-12**
FX6-12 Aluminium plate heat exchanger



Refrigerant circuit

- **Refrigerant compressor**
  brings the gaseous refrigerant to a high pressure and a high temperature.
- **Condenser**
  cools the refrigerant slightly so that it changes from gas to liquid; refrigerant is more effective in the liquid state.
- **Capillary filter**
  protects the expansion device from harmful particles.
- **Capillary tube**
  reduces the refrigerant's pressure, thereby lowering its temperature and increasing its cooling capacity; the refrigerant is now almost all liquid, with some residual gas.
- **Separator**
  ensures that only refrigerant gas can enter the compressor, as liquid would cause damage.
- **Hot gass bypass**
  regulates the amount of refrigerant passing through the air-to-refrigerant heat exchanger, ensuring a stable pressure dewpoint, and eliminating the chance of the condensate freezing.

Plate heat exchanger **FX 13-15**



Air circuit

- **Air inlet**
  hot saturated air enters the dryer and is cooled by the outgoing air via the air-to-air heat exchanger. Reducing the temperature of the inlet air reduces the load on the refrigerant circuit.
- **Air outlet**
  re-heats the outgoing air to prevent condensation on the factory's pipework.
- **Air-to-refrigerant heat exchanger**
  transfers heat from the compressed air to the cold refrigerant, forcing water vapour in the compressed air to condense. The more effective the heat transfer, the cooler the air becomes and the more water vapour condenses.
- **Water separator**
  collects and drains off condensate from the cooled air flow. The more efficient the separation, the better the pressure dewpoint, as droplets which are not collected revapourise and degrade the pressure dewpoint. The collected droplets are reliably evacuated from the separator through an electronic drain.

FX refrigerant dryers
The benefits add up

Solid performance
- Steady pressure dew point
- No freezing of condensed moisture
- No chance of moisture entering the compressed air system

Simple reliability
- Quality components, generously sized
- Simple and proven design
- Effective control system (hot gas bypass)

Easy installation
- Plug and play concept
- Single electrical connection
- All units pre-commissioned
- Self regulating

Minimal maintenance
- Long service intervals
- Few component replacements
- Ergonomic design for fast access to key components

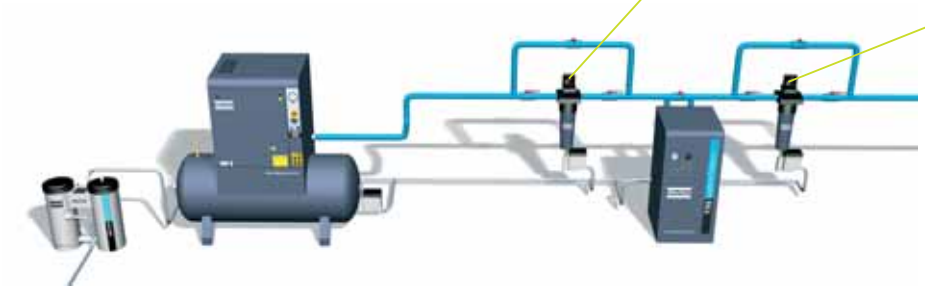
Significant cost savings
- Increased reliability and lifetime of tools and equipment
- Reduced pipe work leaks, meaning reduced energy bill
- Fewer repairs to tools, machines and pipe work
- Less inconvenient breakdowns and stoppages
- Minimal chance of product spoilage through moisture carryover

No installation is complete without filtration

Adding filtration to the installation will further increase the quality of the air, resulting in even less chance that tools and machines will be damaged and final product quality compromised.

The prefilter will not only protect the dryer, but also remove free water, particles to 1 micron and oil to 0.1 mg/m³.

The final filter will remove particles to 0.01 micron and oil to 0.01mg/m³.



- *The final result will be dry clean air, which will allow you to concentrate on your business, and not on fixing problems.*

Technical data

FX refrigerant dryer range - 50 Hz

Model	Outlet pressure dewpoint +5°C/41°F				Outlet pressure dewpoint +3°C/37°F				Maximum working pressure		Electrical supply	Dimensions						Weight		Compr. air connec-tions
	Inlet capacity		Pressure drop		Inlet capacity		Pressure drop					Length		Width		Height				
Type	l/s	cfm	bar	psi	l/s	cfm	bar	psi	bar	psi		mm	inch	mm	inch	mm	inch	kg	lb	
FX1	7	14	0.20	2.88	6	13	0.15	2.18	13	189	230/1/50Hz	500	19.69	350	13.78	484	19.06	19	42	3/4" M
FX2	12	24	0.33	4.79	10	21	0.25	3.63	13	189	230/1/50Hz	500	19.69	350	13.78	484	19.06	19	42	3/4" M
FX3	16	35	0.33	4.79	14	30	0.25	3.63	13	189	230/1/50Hz	500	19.69	350	13.78	484	19.06	20	44	3/4" M
FX4	23	49	0.33	4.79	20	42	0.25	3.63	13	189	230/1/50Hz	500	19.69	350	13.78	484	19.06	25	55	3/4" M
FX5	35	74	0.40	5.75	30	64	0.30	4.35	13	189	230/1/50Hz	500	19.69	350	13.78	484	19.06	27	60	3/4" M
FX6	45	95	0.42	6.14	39	83	0.32	4.64	13	189	230/1/50Hz	500	19.69	370	14.57	804	31.65	51	112	1" F
FX7	58	122	0.50	7.29	50	106	0.38	5.51	13	189	230/1/50Hz	500	19.69	370	14.57	804	31.65	51	112	1" F
FX8	69	146	0.24	3.45	60	127	0.18	2.61	13	189	230/1/50Hz	560	22.05	460	18.11	829	32.64	61	135	1 1/2" F
FX9	79	167	0.33	4.79	68	144	0.25	3.63	13	189	230/1/50Hz	560	22.05	460	18.11	829	32.64	68	150	1 1/2" F
FX10	100	211	0.24	3.45	87	184	0.18	2.61	13	189	230/1/50Hz	560	22.05	460	18.11	829	32.64	73	161	1 1/2" F
FX11	125	264	0.26	3.84	108	229	0.20	2.90	13	189	230/1/50Hz	560	22.05	580	22.83	939	36.97	90	198	1 1/2" F
FX12	148	313	0.36	5.18	128	271	0.27	3.92	13	189	230/1/50Hz	560	22.05	580	22.83	939	36.97	90	198	1 1/2" F
FX13	190	403	0.26	3.77	165	350	0.20	2.90	16	232	230/1/50Hz	990	38.98	795	31.30	925	36.42	173	381	2 1/2" GM
FX14	230	488	0.33	4.79	200	424	0.25	3.63	16	232	230/1/50Hz	975	38.39	795	31.30	925	36.42	178	392	2 1/2" GM
FX15	267	566	0.46	6.67	232	492	0.35	5.08	16	232	400/3/50Hz	975	38.39	795	31.30	925	36.42	183	404	2 1/2" GM

Notes:

Refrigerant types: R134a for FX1-5
R404a for FX6-15

Limitations:

Max. ambient temp.:	43°C
Min. ambient temp.:	5°C
Max. inlet temp.:	55°C

Reference conditions:

Ambient temperature:	25°C
Inlet temperature:	35°C
Working pressure:	7 bar (g)

Filter selection

Model	Outlet pressure dewpoint +5°C/41°F			Outlet pressure dewpoint +3°C/37°F		
	Inlet capacity	Pre filter	After filter	Inlet capacity	Pre filter	After filter
	l/s			l/s		
FX1	7	DD9	PD9	6	DD9	PD9
FX2	12	DD17	PD17	10	DD17	PD17
FX3	16	DD17	PD17	14	DD17	PD17
FX4	23	DD32	PD32	20	DD32	PD32
FX5	35	DD44	PD44	30	DD32	PD32
FX6	45	DD44	PD44	39	DD44	PD44
FX7	58	DD60	PD60	50	DD60	PD60
FX8	69	DD120	PD120	60	DD60	PD60
FX9	79	DD120	PD120	68	DD120	PD120
FX10	100	DD120	PD120	87	DD120	PD120
FX11	125	DD120	PD120	108	DD120	PD120
FX12	148	DD150	PD150	128	DD150	PD150
FX13	190	DD280	PD280	165	DD175	PD175
FX14	230	DD280	PD280	200	DD280	PD280
FX15	267	DD280	PD280	232	DD280	PD280

Capacity calculation

Ambient temperature

°C	25	30	35	40	45
K1 (corr. factor)	1	0.92	0.84	0.8	0.74

Inlet temperature

°C	25	30	35	40	45	50	55
K2 (corr. factor)	1.57	1.24	1	0.82	0.69	0.58	0.45

Inlet pressure

bar(g)	5	6	7	8	9	10	11	12	13
K3 (corr. factor)	0.9	0.96	1	1.03	1.06	1.08	1.1	1.12	1.13

Example:

What is the capacity of an FX6 (for a PDP of +5°C) at the following conditions:

Ambient temperature: 35°C
Inlet temperature: 45°C
Inlet pressure: 10 bar (g)

Correction factors from the table are: $\mathbf{K_1}$ = 0.84 / $\mathbf{K_2}$ = 0.82 / $\mathbf{K_3}$ = 1.08:

Q_{actual} = $\mathbf{K_1}$ x $\mathbf{K_2}$ x $\mathbf{K_3}$ x $Q_{nominal}$
= 0.84 x 0.82 x 1.08 x 45 l/s
= 33.48 l/s

What sets Atlas Copco apart as a company is our conviction that we can only excel in what we do if we provide the best possible know-how and technology to really help our customers produce, grow and succeed.

There is a unique way of achieving that - we simply call it the Atlas Copco way. It builds on **interaction**, on long-term relationships and involvement in the customers' process, needs and objectives. It means having the flexibility to adapt to the diverse demands of the people we cater for.

It's the **commitment** to our customers' business that drives our effort towards increasing their productivity through better solutions. It starts with fully supporting existing products and continuously doing things better, but it goes much further, creating advances in technology through **innovation.**
Not for the sake of technology, but for the sake of our customer's bottom line and peace-of-mind.

That is how Atlas Copco will strive to remain the first choice, to succeed in attracting new business and to maintain our position as the industry leader.

Never use compressed air as breathing air without prior purification in accordance with local legislation and standards.

Service competence
Atlas Copco is committed to provide the levels of after-sales care that you require. Our highly trained engineers offer the best possible support and assistance in operating your equipment with the most modern diagnostic tools available.

Global capability
Global capability with local presence means that we can respond rapidly to any situation anywhere in the world. Our world class logistics ensures timely delivery of our range of guaranteed quality spare parts.

ISO 9001
From design to production and delivery of compressors, Atlas Copco adheres to the ISO 9001 management system.

ISO 14001
Atlas Copco's Environmental Management System forms an integral part of each business.

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