

Atlas Copco

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# Refrigerant air dryers

FD VSD 100-300, FD 5-95 and FX 1-16  
(5-300 l/s/11-636 cfm)

## Why dry your compressed air?

Compressed air contains oil, solid particles and water vapors. It is the inherent result of the compression process, which concentrates the natural water vapors and particles in the air that surrounds us. This untreated compressed air poses a substantial risk to your air system and end products. Its moisture content alone can cause corrosion in pipe work, premature failure of pneumatic equipment, product spoilage and more. An air dryer is therefore essential to protect your systems and processes.

## Refrigerant dryers by Atlas Copco

Atlas Copco's refrigerant dryers provide the clean, dry air you need to expand the life of your equipment and ensure the quality of your products. Our FD and FX dryers are designed in-house and tested using the most stringent methods. They meet or exceed the international standards for compressed air purity and are tested according to ISO 7183:2007.



### FX 1-16

#### Quality Performance

- Available in 16 sizes from 7 to 300 l/s/15 to 636 cfm.
- Pressure dew point as low as +3°C/+37.4°F.
- Electronic no-loss drain with safety function.
- Controller with pressure dew point display.
- Easy installation.
- Minimal maintenance.

### FD 5-95

#### First-Rate Efficiency

- Available in 11 sizes from 6 to 95 l/s/13 to 201 cfm.
- Pressure dew point as low as +3°C/+37.4°F.
- Electronic no loss drain with safety function.
- Controller with pressure dew point display, energy saving option, alarm contacts, ...
- Quiet operation.
- Constant purity class -;4- according ISO 8573-1:2010.

### FD VSD 100-300

#### Unrivalled Energy Savings

- Available in 6 sizes from 100 to 300 l/s/212 to 636 cfm.
- Supreme energy savings: up to 50% on indirect energy costs and up to 70% on direct energy costs.
- Low pressure drop, typically below 0.2 bar/2.9 psi.
- Pressure dew point as low as +3°C/+37.4°F.
- Advanced touchscreen controller: visualization, alarm history, remote control, ...
- All-in-one design with very small footprint.
- Delivered ready for use.
- Quiet operation.
- Constant purity class -;4;- according ISO 8573-1:2010.



#### Extending your VSD energy savings to your quality air

The introduction of Atlas Copco's VSD (and later VSD+) compressor technology was an industry milestone. By automatically adjusting its motor speed as air demand fluctuates depending on production flow or time, a VSD compressor offers double digit reductions in energy use and in lifecycle costs. With the FD VSD, Atlas Copco is extending this energy-saving principle to your quality air equipment.

# FD VSD 100-300: Unrivalled Energy Savings



1

## VSD inverter

Controls the speed of the compressor to match your air demand and ensure the highest possible energy savings.

2

## High-efficiency heat exchanger

Counter-flow compact brazed plate or aluminum heat exchanger, with air-to-air side for optimum cooling efficiency and the lowest possible pressure drop.

3

## Integrated water separator

Low velocity with high separation efficiency, even in low flow conditions.

4

## Electronic no-loss condensate drain

Opens the drain only when needed to eliminate unnecessary loss of compressed air during timed draining.

5

## Elektronik® Touch controller

Provides advanced control and allows for remote monitoring.

6

## Single electrical connection

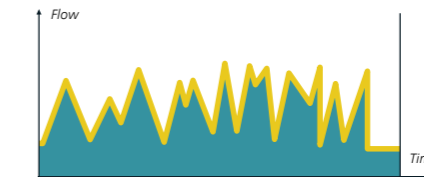
Ensures plug-and-play installation.



## VSD for superior energy savings

Atlas Copco's in-house developed VSD technology matches your FD dryer's power consumption to your production's actual air flow. While a traditional refrigerant dryer can only be turned on or off, Atlas Copco's FD VSD mirrors your production's demand for compressed air as it fluctuates during the day, week or year. This ensures supreme energy savings as well as a stable dew point.

VSD dryer



Fixed speed dryer



● Power consumption

## Minimal environmental impact

FD VSD dryers use the CFC-free R410A refrigerant, which has an ozone depletion potential (ODP) of zero. The refrigerant meets the strict F-Gas regulations and, due to its low power consumption, has an outstanding TEWI (Total Equivalent Warming Impact) performance.

## Optimum performance and safety in all conditions

- Hot gas bypass valve prevents freezing at lower loads.
- The extremely reliable R410A rotary compressor provides the best performance with minimum environmental impact. Capillary tubes cope with all conditions – no moving parts for extra reliability.
- Condenser with louvered fin technology for improved performance in dusty environments.

## Advanced remote monitoring and control

- High-tech Elektronik® Touch controller with warning indications, dryer shutdown and maintenance scheduling.
- Standard SMARTLINK remote monitoring to maximize air system performance and energy savings.

## Robust and compact design

- Forklift opening for smooth transport.
- Easy front and side panel access.
- No bulky thermal mass heat exchanger needed to save on energy.

## Filters

If your production requires higher levels of air quality and filtration, UD+ filters can be added on to your FD VSD dryer.

# FD 5-95: First-Rate Efficiency



**1**  
**Low-noise compressor with liquid separator**

Lasts longer thanks to limited vibrations, minimal moving parts, and reduced risk of leakage.

**2**  
**High-efficiency heat exchanger**

Counter-flow compact brazed plate or aluminum heat exchanger, with air-to-air side for optimum cooling efficiency and the lowest possible pressure drop.

**3**  
**Integrated water separator**

Low velocity with high separation efficiency even in low flow conditions.

**4**  
**Electronic no-loss condensate drain**

With level sensor, backup manual drain and drain alarm.

**6**  
**Hot gas bypass valve**

Ensures stable pressure dew point and prevents freezing at lower loads.

**5**  
**Fan switch**

Reduces energy consumption and optimizes the pressure dew point at very low temperatures.

**7**  
**Refrigerant separator**

Eliminates the chance of moisture entering the compressed air system.

**8**  
**Single electrical connection**

Allows for plug-and-play installation.

### Supreme energy efficiency

- The FD offers a low pressure drop – typically below 0.2 bar/2.9 psi – and minimal energy consumption.
- The compact brazed plate or aluminum heat exchanger was designed specifically to provide optimal pre-cooling and the lowest possible pressure drop.
- The electronic no-loss condensate drain comes with a level sensor to open the drain only when needed, preventing unnecessary loss of compressed air.

### Comprehensive control and monitoring options

- The Elektronikon® Alpha controller displays the pressure dew point and relative humidity.
- Remote alarm and start/stop control through voltage-free contact.
- Additional features such as alarm history and standard remote visualization.

### Easy installation and long maintenance intervals

- Small footprint thanks to an innovative all-in-one design.
- Delivered ready for use, minimizing costly production downtime.

### Low environmental impact

FD dryers use CFC-free refrigerants (R134A and R410A) with an ozone depletion potential (ODP) of zero.

### Reliable performance in tough conditions

- Hot gas bypass valve prevents freezing at lower loads.
- R134A piston compressor with high coefficient of performance (extremely reliable R410A rotary compressor for models FD 60-FD 95) provides the best performance with minimum environmental impact. Capillary tubes cope with all conditions – no moving parts for extra reliability.
- Condenser with louvered fin technology for improved performance in dusty environments.

# FX 1-16: Quality Performance



**1 Refrigerant separator**  
No chance of moisture entering the compressed air system.

**2 Hot gas bypass**  
Ensures stable pressure dew point and eliminates the possibility of condensate freezing.

**3 Digital display**  
Provides peace of mind through precise monitoring of pressure dew point.



**4 Single electrical connection**  
Allows for plug-and-play installation.

**6 Water separator**  
Offers high efficiency for better pressure dew point.

**5 Easy access to key components**  
For straightforward servicing.

**7 Compact design**  
For a small footprint.

**8 Low-noise rotary compressor with integrated liquid separator**  
Lasts longer thanks to limited vibrations, minimal moving parts, and reduced risk of leakage.



## Pressure dew point precision

The FX comes in a wide range of sizes (7-300 l/s or 15-636 cfm) to offer a steady pressure dew point as low as +3°C/+37.4°F. Its easy to use digital display precision-measures and monitors the pressure dew point and dryer performance.

## Digital display

- Pressure dew point: exact measurement and visual monitoring.
- Status: refrigerant compressor and fan.
- Alarms: high/low pressure dew point and probe failure.
- Service warning.

## Reliable

Built according to the stringent Atlas Copco standards, the FX is made of high quality, generously sized components.

## Hot environments

High ambient temperatures can put your equipment to the test. The FX range offers several high temperature models that ensure dependable performance in conditions up to 46°C/115°F.

## Significant cost savings

- Increased reliability and lifetime of tools and equipment.
- Reduced pipe work leaks and thus a lower energy bill.
- Less equipment breakdowns and operational interruptions.
- Minimal chance of product damage as a result of moisture carryover.

## Sustainable refrigerant

The FX range comes with refrigerant that is compliant with F-Gas regulations to ensure the lowest possible carbon footprint and energy consumption.

# VSD: a game-changer in energy savings

When purchasing a refrigerant dryer, the main focus is usually on the initial cost. However, this only represents approximately 10% of the lifecycle cost of the dryer. Energy, maintenance and installation make up the bulk of your actual dryer costs. Direct and indirect (pressure drop) energy costs are the most important.



## Indirect energy costs

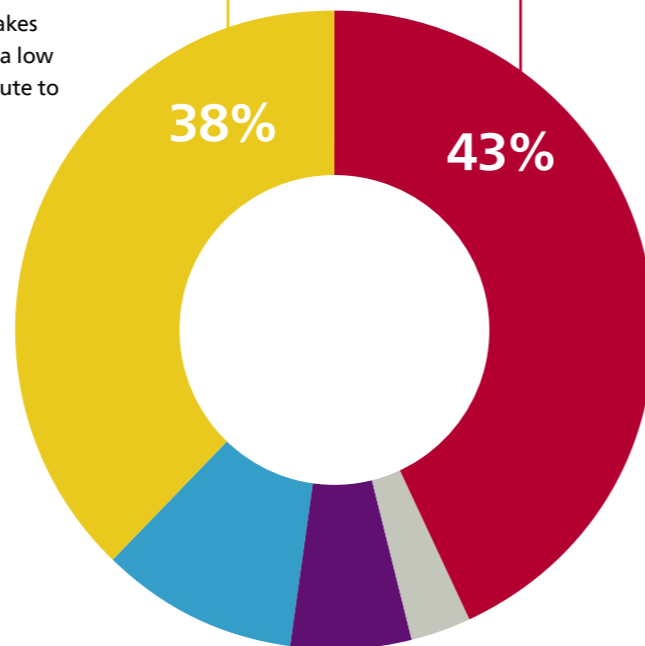
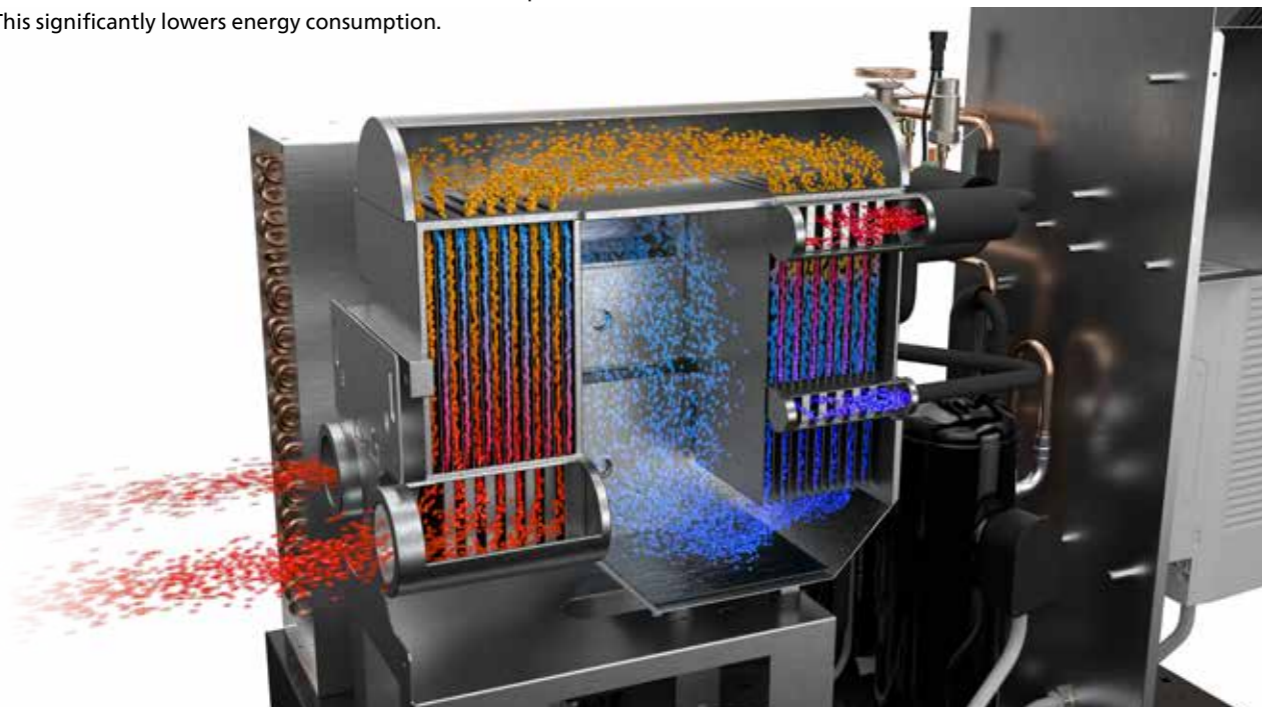
Indirect energy costs are related to the extra energy your air compressor must consume to overcome the pressure drop that takes place in the air dryer. By design, Atlas Copco FD VSD dryers offer a low pressure drop and efficient heat transfer – both of which contribute to a reduction of the indirect energy costs.

## Low pressure drop

If a refrigerant dryer has a high internal pressure drop, the compressor needs to run at a higher pressure. This wastes energy and increases operating costs. Atlas Copco has designed our refrigerant dryers to minimize pressure drop. A pressure drop typically below 0.2 bar/2.9 psi at full flow is ensured by the heat exchanger technology, an integrated low velocity water separator, and generously sized components.

## Efficient heat exchanger technology

Atlas Copco's refrigerant dryers use a counter flow heat exchanger on both the air-to-air and air-to-refrigerant side. Compared to a cross flow heat exchanger, the counter flow design results in a more efficient heat transfer and stable temperatures. This significantly lowers energy consumption.



## Lifecycle cost

- Direct energy costs
- Indirect energy costs
- Investment
- Maintenance
- Installation



## Direct energy costs

Direct energy costs are related to the power that the dryer consumes. Atlas Copco's FD VSD dryers match their energy usage to the actual compressed air demand. This reduces energy consumption by as much as 70% compared to conventional dryers.



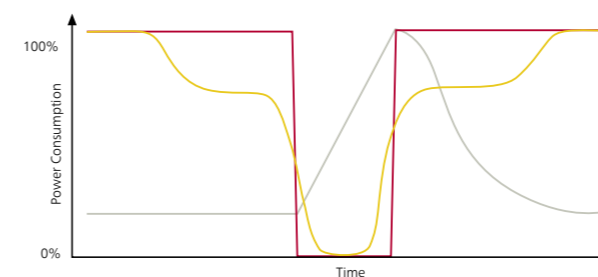
## Reduce your total lifecycle cost by up to 50% with Atlas Copco's VSD dryers

- Up to 50% savings on indirect energy costs
- Up to 70% savings on direct energy costs

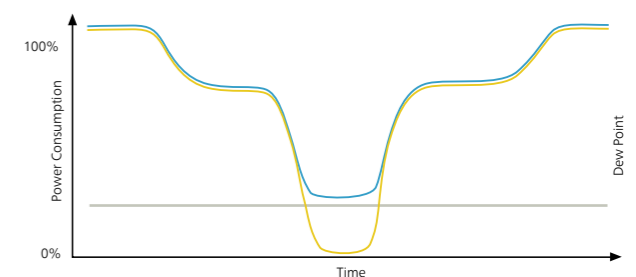
## VSD outperforms thermal mass technology

Many conventional dryers rely on thermal mass technology to reduce energy costs. Also called cycling dryers, these units come with thermal mass storage which can be used to dry the air with the dryer's compressor temporarily switched off. While thermal mass technology certainly generates energy savings, these are offset by the additional energy these dryers require to cool the thermal mass. In addition, as the refrigerant compressor's operation is controlled by the thermal mass, the compressed air dew point rises and falls significantly. This can compromise your air quality by up to 2 purity classes. Finally, thermal mass dryers offer only limited or no energy savings in environments with high ambient temperatures. VSD technology has proven to deliver superior results in terms of energy use, dew point stability and service costs.

### Thermal mass: some energy savings and unstable dew point



### VSD: superior energy savings and stable dew point



- Flow
- Power Consumption thermal mass
- Power Consumption VSD
- Dew point

## Advanced control

Atlas Copco's refrigerant dryers are built to reliably and efficiently deliver quality air. But in the end, it's all about how they perform on your work floor, meeting your individual needs and responding to your specific conditions. That is why the FD VSD, FD and FX come with comprehensive control options to allow you to get the best performance from your Atlas Copco dryer.



### FD VSD 100-300: Elektronikon® Touch controller

- 4.3-inch high-definition color display with clear pictograms and service indicator.
- Internet-based dryer visualization using a simple Ethernet connection.
- Automatic restart after voltage failure.
- Built-in SMARTLINK online monitoring.
- More flexibility: four different week schedules.
- Graphical service plan indication.
- Remote control and connectivity functions.

### FD 5-95: Elektronikon® Alpha controller

- Exact measurement and visual monitoring of pressure dew point and ambient temperature.
- High/low pressure dew point alarm.
- Relative humidity indicator.
- Energy saving mode.
- Switch off at freezing alarm.
- Alarm history and standard remote visualization.



### FX 1-16: Digital display

- Pressure dew point: exact measurement and visual monitoring.
- Energy saving mode.
- Alarms: high/low pressure dew point and probe failure.
- Service warnings.

## Remote monitoring



### SMARTLINK: Data Monitoring Program

SMARTLINK captures live data from your compressed air equipment and translates it in clear insights. At a glance, you can check uptime, energy efficiency and machine health.

- Remote monitoring that helps you optimize your compressed air system and save energy and costs.
- Provides a complete insight in your compressed air network.
- Anticipates potential problems by warning you upfront.
- Efficient service planning and parts handling to give you improved uptime.



### SMARTLINK & Total Responsibility

Get the most out of SMARTLINK as part of a Total Responsibility Plan. Step back, relax, and let our service engineers monitor your compressed air system. We know exactly when to service your machines, diagnose any issues and be there on time to fix them.

## Technical specifications FD 100-300 VSD

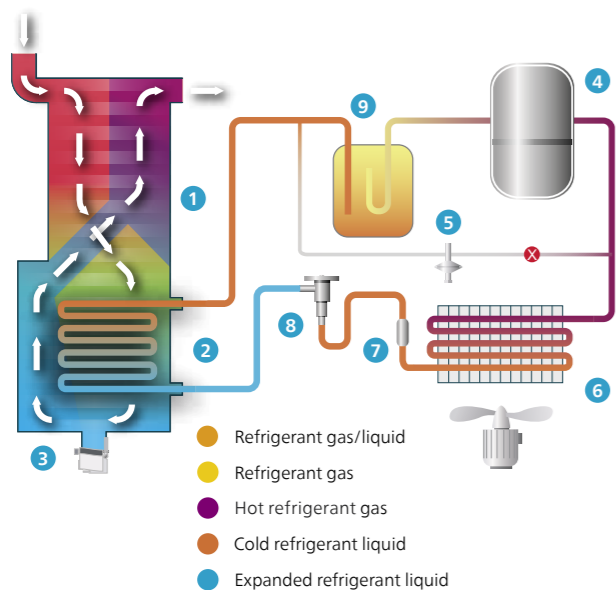
Model	Maximum inlet conditions at full flow (ambient/inlet) °C	Inlet flow with a pressure dew point of 3°C/37.4°F		Pressure drop at full flow		Power consumption		Max. working pressure		Compressed air connections	Dimensions						Weight	
											Length		Width		Height			
											mm	in	mm	in	mm	in		
FD 100 VSD	46	100	212	0.16	2.3	0.66	0.90	14.5	210	G 1 1/2 F (NPT for UL version)	805	31.69	962	37.87	1040	41	130	287
FD 140 VSD	46	140	297	0.11	1.6	1.04	1.41	14.5	210	G 2 F (NPT for UL version)	805	31.69	962	37.87	1040	41	130	287
FD 180 VSD	46	180	381	0.18	2.6	1.54	2.09	14.5	210	G 2 F (NPT for UL version)	805	31.69	962	37.87	1040	41	134	295
FD 220 VSD	46	220	466	0.14	2	1.77	2.41	14.5	210	G 2 1/2 F (NPT for UL version)	805	31.69	962	37.87	1040	41	143	315
FD 260 VSD	46	260	551	0.1	1.5	1.9	2.58	14.5	210	G 2 1/2 F (NPT for UL version)	805	31.69	962	37.87	1040	41	150	331
FD 300 VSD	46	300	636	0.18	2.6	2.64	3.59	14.5	210	G 2 1/2 F (NPT for UL version)	805	31.69	962	37.87	1040	41	165	364

## Technical specifications FD 5-95 50 Hz & 60 Hz

Model	Maximum inlet conditions at full flow (ambient/inlet) °C	Inlet flow with a pressure dew point of 3°C/37.4°F		Pressure drop at full flow		Power consumption		Max. working pressure		Compressed air connections	Dimensions						Weight	
											Length		Width		Height			
											mm	in	mm	in	mm	in		
FD 5	60	6	13	0.07	1.02	0.2	0.27	16 (1)	233 (1)	R 3/4	525.5	20.7	390	15.4	530	20.9	27	60
FD 10	60	10	21	0.11	1.6	0.2	0.27	16 (1)	233 (1)	R 3/4	525.5	20.7	390	15.4	530	20.9	27	60
FD 15	60	15	32	0.12	1.75	0.33	0.45	16 (1)	233 (1)	R 3/4	525.5	20.7	390	15.4	530	20.9	32	70
FD 20	60	20	42	0.12	1.75	0.41	0.56	16 (1)	233 (1)	R 3/4	525.5	20.7	390	15.4	530	20.9	34	75
FD 25	60	25	53	0.17	2.47	0.41	0.56	16 (1)	233 (1)	R 3/4	525.5	20.7	390	15.4	530	20.9	34	75
FD 30	60	30	64	0.25	3.64	0.41	0.56	16 (1)	233 (1)	R 3/4	525.5	20.7	390	15.4	530	20.9	34	75
FD 40	60	40	85	0.2	2.91	0.57	0.76	16 (1)	233 (1)	R 1	716	28.2	389	15.3	679	26.8	57	125
FD 50	60	50	106	0.2	2.91	0.54	0.72	16 (1)	233 (1)	R 1	716	28.2	389	15.3	679	26.8	58	128
FD 60	60	60	127	0.22	3.2	0.63	0.84	13	189	R 1	795	31.3	482	19.0	804	31.7	80	176
FD 70	60	70	148	0.22	3.2	0.87	1.17	13	189	R 1	795	31.3	482	19.0	804	31.7	81	178
FD 95	60	95	201	0.22	3.2	1.18	1.58	13	189	R 1	795	31.3	482	19.0	804	31.7	87	192

### How refrigerant dryers work

A refrigerant dryer uses a refrigerant circuit and heat exchanger(s) to pre-cool air, refrigerate it to condense out moisture vapor, and then re-heat the air to prevent pipe sweating downstream.



### Air circuit

- 1 Air-to-air heat exchanger: Incoming air is cooled down by the outgoing dry, cold air
- 2 Air-to-refrigerant heat exchanger: The air is cooled to the required dew point by the refrigerant circuit. The water vapor condenses into water droplets
- 3 Integrated water separator: The moisture is collected and evacuated by the electronic drain

### Refrigerant circuit

- 4 Refrigerant compressor: Compresses the gaseous refrigerant to a higher pressure
- 5 Regulation device: The hot gas bypass valve regulates the dryer to prevent freezing at lower load conditions
- 6 Refrigerant condenser: Cools the refrigerant so that it changes from a gas to a liquid
- 7 Refrigerant filter: Protects the expansion device from harmful particles
- 8 Thermostatic expansion valve: The expansion process reduces the pressure and cools the refrigerant further
- 9 Liquid separator: Ensures that only refrigerant gas enters the compressor

## Technical specifications FX 1-16 50 Hz

Model	Outlet pressure dew point +5°C/41°F				Outlet pressure dew point +3°C/37°F				Maximum working pressure		Electrical supply	Dimensions						Weight		Compressed air connections
	Inlet capacity		Pressure drop		Inlet capacity		Pressure drop					Length		Width		Height				
	l/s	cfm	bar	psi	l/s	cfm	bar	psi				bar	psi	mm	inch	mm	inch			
FX 1	7	14	0.20	2.88	6	13	0.15	2.18	16	232	230/1/50Hz	500	19.69	350	13.78	484	19.06	19	42	3/4" M
FX 2	12	24	0.33	4.79	10	21	0.25	3.63	16	232	230/1/50Hz	500	19.69	350	13.78	484	19.06	19	42	3/4" M
FX 3	16	35	0.33	4.79	14	30	0.25	3.63	16	232	230/1/50Hz	500	19.69	350	13.78	484	19.06	20	44	3/4" M
FX 4	23	49	0.33	4.79	20	42	0.25	3.63	16	232	230/1/50Hz	500	19.69	350	13.78	484	19.06	25	55	3/4" M
FX 5	35	74	0.40	5.75	30	64	0.30	4.35	16	232	230/1/50Hz	500	19.69	350	13.78	484	19.06	27	60	3/4" M
FX 6	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
FX 7	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
FX 8	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
FX 9	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
FX 10	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
FX 11	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
FX 12	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
FX 13	192	407	0.33	4.79	167	354	0.25	3.63	13	189	400/3/50Hz	898	35.35	735	28.94	1002	39.45	128	282	2" F
FX 14	230	488	0.40	5.80	200	424	0.30	4.35	13	189	400/3/50Hz	898	35.35	735	28.94	1002	39.45	146	322	2" F
FX 15	288	611	0.40	5.80	250	530	0.30	4.35	13	189	400/3/50Hz	898	35.35	735	28.94	1002	39.45	158	348	2" F
FX 16	345	731	0.40	5.80	300	636	0.30	4.35	13	189	400/3/50Hz	898	35.35	735	28.94	1002	39.45	185	408	2" F

## Technical specifications FX 1-16 60 Hz

Model	Outlet pressure dew point +5°C/41°F				Outlet pressure dew point +3°C/37°F				Maximum working pressure		Electrical supply	Dimensions						Weight		Compressed air connections
	Inlet capacity		Pressure drop		Inlet capacity		Pressure drop					Length		Width		Height				
	l/s	cfm	bar	psi	l/s	cfm	bar	psi				bar	psi	mm	inch	mm	inch			
FX 1	7	14	0.20	2.88	6	13	0.15	2.18	16	232	115-230/1/60Hz	500	19.7	350	13.8	484	19.1	19	42	3/4" NPT
FX 2	12	24	0.33	4.79	10	21	0.25	3.63	16	232	115-230/1/60Hz	500	19.7	350	13.8	484	19.1	19	42	3/4" NPT
FX 3	16	35	0.33	4.79	14	30	0.25	3.63	16	232	115-230/1/60Hz	500	19.7	350	13.8	484	19.1	20	44	3/4" NPT
FX 4	23	49	0.33	4.79	20	42	0.25	3.63	16	232	115-230/1/60Hz	500	19.7	350	13.8	484	19.1	25	55	3/4" NPT
FX 5	35	74	0.40	5.75	30	64	0.30	4.35	16	232	115-230/1/60Hz	500	19.7	350	13.8	484	19.1	27	60	3/4" NPT
FX 6	45	95	0.42	6.14	39	83	0.32	4.64	13	189	115-230/1/60Hz	500	19.7	370	14.6	804	31.7	51	112	1" NPT
FX 7	58	122	0.50	7.29	50	106	0.38	5.51	13	189	115-230/1/60Hz	500	19.7	370	14.6	804	31.7	51	112	1" NPT
FX 8	69	146	0.24	3.45	60	127	0.18	2.61	13	189	115-230/1/60Hz	560	22.0	460	18.1	829	32.6	61	135	1 1/2" NPT
FX 9	79	167	0.33	4.79	68	144	0.25	3.63	13	189	115-230/1/60Hz	560	22.0	460	18.1	829	32.6	68	150	1 1/2" NPT
FX 10	100	211	0.24	3.45	87	184	0.18	2.61	13	189	115-230/1/60Hz	560	22.0	460	18.1	829	32.6	73	161	1 1/2" NPT
FX 11	125	264	0.26	3.84	108	229	0.20	2.90	13	189	230/1/60Hz	560	22.0	580	22.8	939	37.0	90	198	1 1/2" NPT
FX 12	148	313	0.36	5.18	128	271	0.27	3.92	13	189	230/1/60Hz	560	22.0	580	22.8	939	37.0	90	198	1 1/2" NPT
FX 13	192	407	0.26	3.77	167	354	0.20	2.90	13	189	460/3/60Hz	898	35.35	735	28.9	1002	36.4	173	381	2" NPT
FX 14	230	488	0.33	4.79	200	424	0.25	3.63	13	189	460/3/60Hz	898	35.35	735	28.9	1002	36.4	178	392	2" NPT
FX 15	288	611	0.46	6.67	250	530	0.35	5.08	13	189	460/3/60Hz	898	35.35	735	28.9	1002	36.4	183	404	2" NPT
FX 16	345	731	0.46	6.67	300	636	0.35	5.08	13	189	460/3/60Hz	898	35.35	735	28.9	1002	36.4	183	404	2" NPT

## Reference conditions

Ambient temperature:	38°C/100°F
Inlet temperature:	38°C/100°F
Working pressure:	7 bar (g)/102 psi (g)

## Limitations

Maximum ambient temperature:	46°C/115°F
Minimum ambient temperature:	5°C/41°F
Maximum inlet temperature:	55°C/131°F

## Notes

Refrigerant types:	R134a for FX 1-7, FD 5-50 R410A for FX 8-16, FD 60-95, FD VSD
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