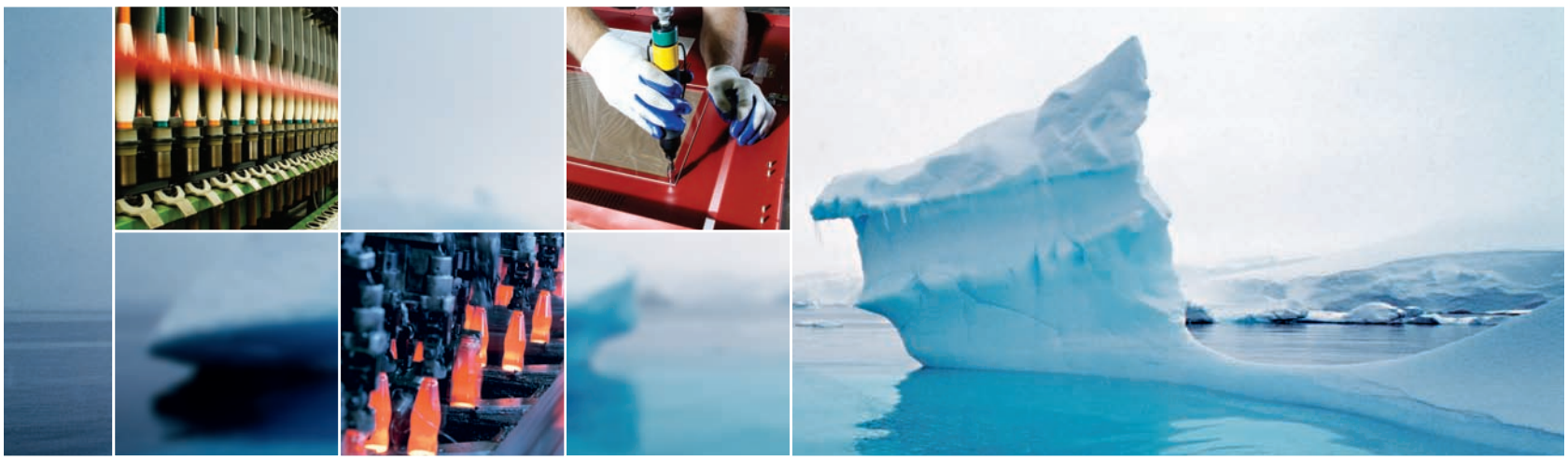
Atlas Copco

Refrigerant Air Dryers
FD series (6-4000 l/s, 13-8480 cfm)



Sustainable Productivity

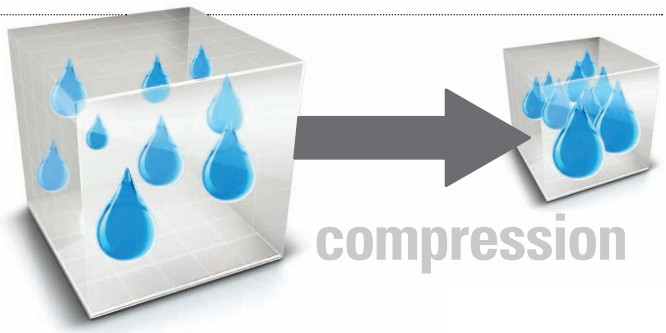
Atlas Copco

Why dry your compressed air?

Compressed air is used in a wide variety of industrial applications. Wherever it is used, compressed air must be clean and dry. Containing solid, liquid and gaseous contaminants, untreated compressed air poses a substantial risk as it can damage your air system and end product. Moisture, one of the main components of untreated air 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.

Limit the risks of moisture

When the air that surrounds us is compressed, its water vapor and particle concentration increases dramatically. For example, compressing ambient room air to 7 bar(e)/100 psig increases the vapor content or humidity by a factor of around 8, and subsequent cooling forms liquid water. The amount of water depends on the specific application. Compressed air can actually contain three forms of water: liquid water, aerosol (mist) and vapor (gas). An efficient means of removing water from compressed air is therefore vital.



Moisture in the air can be particularly problematic, causing:

- Corrosion of compressed air piping.
- Damages & malfunction of air powered equipment.
- Compressed air leakages due to corroded pipes.
- Poor paint quality, deterioration of electrostatic painting processes.
- Deteriorated end product quality.

ISO quality air standard (ISO 8573-1:2010)

The quality of compressed air used in industrial processes is specified in the international standard ISO 8573-1. Untreated compressed air typically contains 3 types of contaminants: dirt, water and oil. The Quality Classes specify the maximum allowed limits.

ISO 8573-1:2010	Dirt				Water		Oil
	Maximum number of particles per m³			Mass concentration mg/m³	Vapor pressure dewpoint	Liquid g/m³	Total oil (aerosol liquid and vapor) mg/m³
	0.1 - 0.5 micron	0.5 - 1 micron	1 - 5 micron				
0	As specified by the equipment user or supplier and more stringent than Class 1						
1	≤ 20000	≤ 400	≤ 10	-	≤ -70°C/-94°F	-	0.01
2	≤ 400000	≤ 6000	≤ 100	-	≤ -40°C/-40°F	-	0.1
3	-	≤ 90000	≤ 1000	-	≤ -20°C/-4°F	-	1
4	-	-	≤ 10000	-	≤ +3°C/+37.4°F	-	5
5	-	-	≤ 100000	-	≤ +7°C/+44.6°F	-	-
6	-	-	-	≤ 5	≤ +10°C/+50°F	-	-
7	-	-	-	5 - 10	-	≤ 0.5	-
8	-	-	-	-	-	0.5 - 5	-
9	-	-	-	-	-	5 - 10	-
X	-	-	-	> 10	-	> 10	> 10

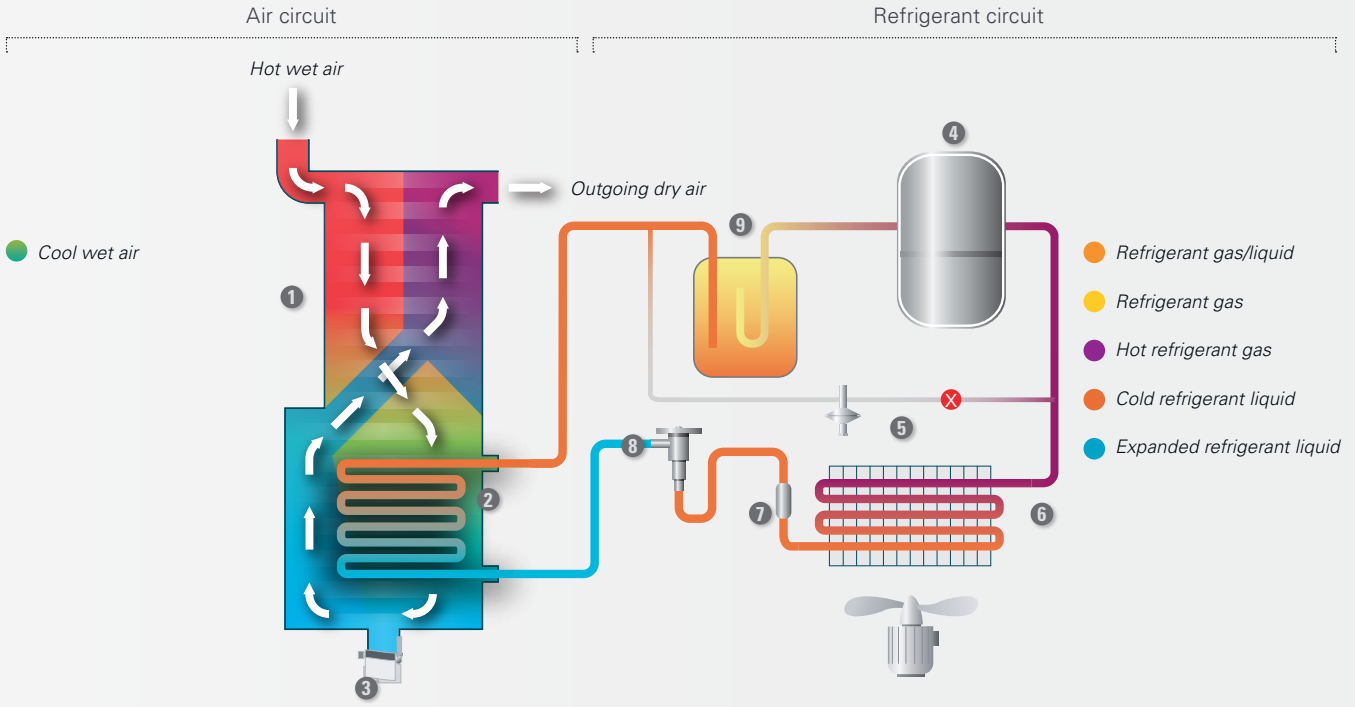
What is a refrigerant dryer?

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. Refrigerant dryers can lead to a pressure dewpoint (PDP) as low as +3°C/+37.4°F for many applications where there is a need for dry air. They can be used at different pressures and consume no processed compressed air.

Main types of refrigerant dryers on the market

- **Direct expansion dryers**
  - *Fixed speed non-cycling dryers* run continuously irrespective of varying load conditions.
  - *Fixed speed cycling dryers* shut down at lower loads to save energy and restart when required.
  - *Variable speed dryers* are on the cutting edge of energy efficiency. They automatically change the speed of the refrigerant compressor to adapt to varying loads.
- **Thermal mass dryers** have a heat exchanger which typically contains a liquid thermal mass to store cold energy. Thermal mass dryers shut down when there is no or little air, or at low loads to save energy.
- **Digital scroll dryers** have a refrigerant compressor that loads/unloads according to the demand.

Typical working principle of direct expansion dryers



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 dewpoint 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

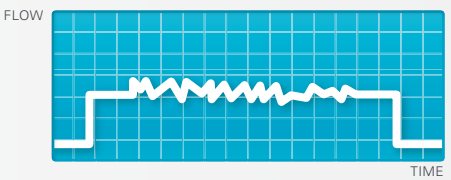
The refrigerant removes the heat from the compressed air and cools down to the desired dewpoint.

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.

Atlas Copco's FD refrigerant dryers

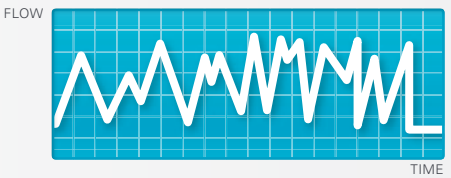
Based on years of experience in the industry, Atlas Copco has chosen to incorporate direct expansion technology with cycling, non-cycling and Variable Speed variants in its range.

Direct expansion dryers without Saver Cycle Control (non-cycling)



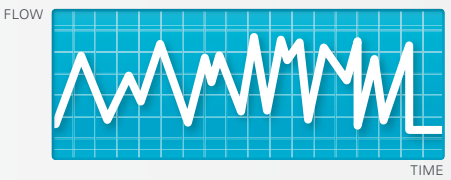
- Applications: stable dewpoint, full load applications.
- Key advantage: fixed speed dryers run continuously to ensure a stable dewpoint by design (irrespective of varying load conditions).
- Range: FD 5-2000.

Direct expansion dryers with Saver Cycle Control (cycling)



- Applications: varying temperatures, varying flows.
- Key advantage: cycling dryers shut down the refrigerant compressor at lower load conditions which leads to significant energy savings.
- Range: FD 5-1010.

Variable speed dryers (VSD = Variable Speed Drive)



- Applications: varying temperatures, varying flows.
- Key advantage: VSD dryers match the energy consumed to the actual compressed air used. This ensures supreme energy savings as well as a stable dewpoint across the whole spectrum of temperature and flow.
- FD 760-4000 VSD.

Protecting your reputation and production

Compressed air entering the air net is always 100% saturated. When it cools, this moisture will condense, causing damage to your air system and finished products. Removing moisture from compressed air with a dewpoint as low as +3°C/+37.4°F, Atlas Copco's FD refrigerant dryers provide the clean, dry air you need to expand the life of your equipment and ensure the quality of your end product. In addition, FD dryers comply with the most stringent environmental regulations.

Keeping your production up and running

Atlas Copco's FD refrigerant dryers are designed in-house, tested using the most stringent methods (at ambient temperatures up to 50°C/122°F) and manufactured on a very advanced production line. Separate components undergo severe endurance tests while the unique design of the heat exchanger significantly improves the dryer lifetime. Advanced control functions ensure dry air at all conditions and prevent freezing at low loads. FD dryers meet or exceed the international standards for compressed air purity and are tested according to ISO 7183:2007.

Driving down energy costs

Atlas Copco's refrigerant dryers incorporate a range of energy-saving features that will cut your carbon footprint and reduce costs. Incorporating unique heat exchanger technology and Saver Cycle Control, the FD ensures a low pressure drop of typically below 0.2 bar/2.9 psi and minimal energy consumption. The integrated Variable Speed Drive (VSD) technology offers extra energy savings by automatically tuning the energy input to the precise demand. All this ensures a low lifecycle cost.

Easy installation and long maintenance intervals

FD dryers have a small footprint thanks to an innovative all-in-one design. Delivered ready for use, installation is straightforward, minimizing costly production downtime. FD dryers come as all-in-one packages including an electronic no-loss drain, integrated OSD condensate treatment (optional) and spin-on DD/PD filters (optional). For easy installation against the wall, the in- and outlet connections on some models are positioned on top of the unit.

Assuring your peace of mind

Through continuous investment in our competent, committed and efficient service organization, Atlas Copco ensures superior customer value by maximizing productivity. With a presence in over 170 countries, we offer professional and timely service through interaction and involvement. Uptime is ensured by dedicated technicians and 24/7 availability.

Low environmental impact

Fully compliant with ISO 14001 standards and Montreal Protocol regulations, FD dryers use CFC-free refrigerants (R134a, R410A, R404A) to prevent any damage to the earth's ozone layer. FD dryers have an ozone depletion potential (ODP) of zero and are enclosed in a sound suppression canopy to reduce the noise levels, making FD dryers among the most environmentally friendly and quietest in their class.

FD 5-95 & FD 120-285: Superior productivity

1 Electronic no-loss condensate drain

- Level sensor senses the level of the condensate and opens the drain, preventing any loss of compressed air when condensate is drained.
- Equipped with backup manual drain as standard and drain alarm (FD 120-285).

2 High-efficiency heat exchanger

- Counter-flow compact brazed plate (FD 5-50) or aluminum (FD 60-285) heat exchanger, with air-to-air side for optimum cooling efficiency.

3 Fan switch

- Reduces energy consumption and optimizes the pressure dewpoint at very low temperatures.

4 Robust and compact design

- Forklift opening for easy transport.
- Inlet and outlet located at the top (can be optional) for easy installation.
- Easily removed front and side panels for full access.
- Optional: IP54, DD/PD filters (with pressure drop monitoring for FD 120-285) and OSD (FD 60-285 only) integrated condensate treatment.

6 Optimum performance and safety in all conditions

- Hot gas bypass valve prevents freezing at lower loads.
- R134a piston compressor with high coefficient of performance (FD 5-95) or extremely reliable R410A rotary compressor (FD 120-285) provide the best performance for each size while having minimum environmental impact. Capillary tubes cope with all conditions – no moving parts for extra reliability.
- FD 120-285 also offer condenser with louvered fin technology for improved performance in dusty environments.

** Only for FD 120-285.*

5 Advanced control and monitoring system

- The controller displays the pressure dewpoint (PDP) and relative humidity.
- Setting allows dryer to cycle or not (Saver Cycle Control algorithm) and restart or not after power failure.
- Remote alarm through voltage-free contact.
- The controller offers additional features such as energy-saving flow switch algorithm, alarm history, standard remote visualization (Ethernet plug) and communication extension possibility (FD 120-285).

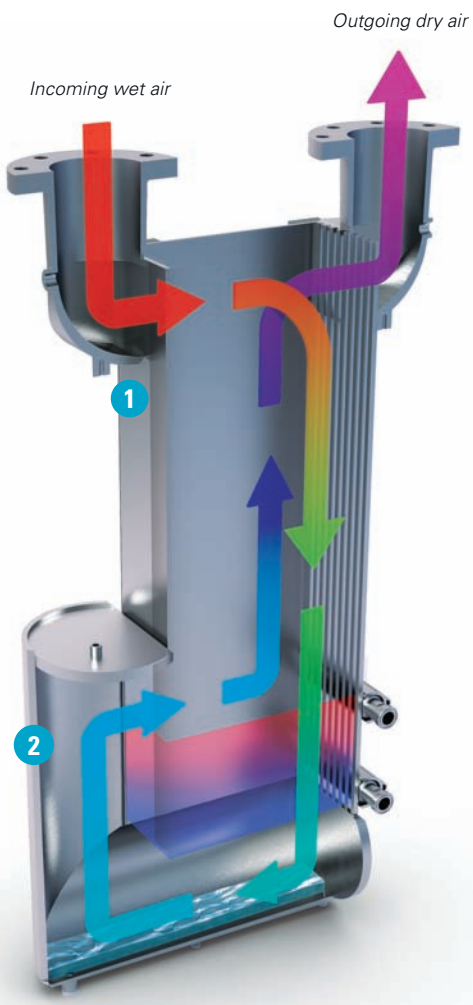
FD 310-4000: Superior productivity

1 High-efficiency heat exchanger

- Counter-flow on both air-to-air and air-to-refrigerant sides for efficient heat transfer. As the outgoing air is reheated, it protects the outlet piping against pipe sweating.
- Unlike some other dryer designs, a separate pre-filter is not required. This results in a low pressure drop. The design ensures a smooth air flow which makes the dryer less sensitive to contamination.

2 Integrated water separator

- Low velocity condensate separator with high separation efficiency even in low flow conditions.
- Reliable and effective condensate evacuation from the separation chamber via the no-loss condensate drain.



3 Electronic no-loss condensate drain

- Level sensor senses the level of the condensate and opens the drain, preventing any loss of compressed air when condensate is drained, which is the case with timer-based drains.

7 User-friendly state-of-the-art Elektronikon® controller

- Monitoring of all parameters to ensure maximum reliability for your installation.
- Fitted inside a real IP54 cubicle for easy cabling and safety.

** The type of controller may vary depending on the model.*

6 Filters

- For processes requiring higher levels of filtration, Atlas Copco offers integrated DD and PD filters (optional on FD 310-510).

5 Hot gas bypass valve

- Prevents freezing at lower loads.

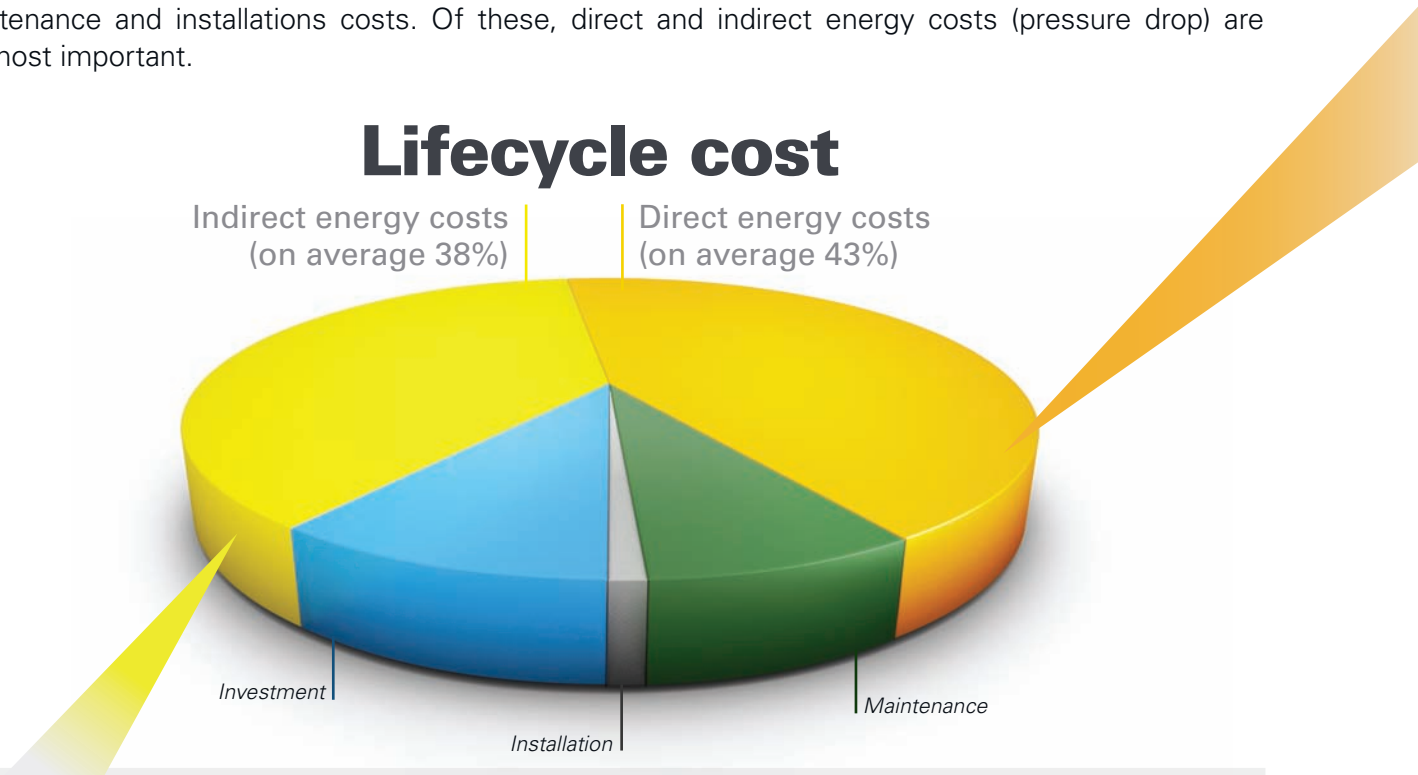
4 Refrigerant circuit

- Designed to perform reliably under extreme conditions of 50°C/122°F ambient temperatures and 60°C/140°F inlet temperatures*. This is due to the sizing of key components such as the heat exchanger, refrigerant compressor, valves etc.

** Some models might require flow correction.*

Supreme energy efficiency

When purchasing a refrigerant dryer, the main focus is usually on the initial cost. What is mostly overseen is that this only represents approximately 10% of the lifecycle cost, the rest being taken up by energy, maintenance and installations costs. Of these, direct and indirect energy costs (pressure drop) are the most important.



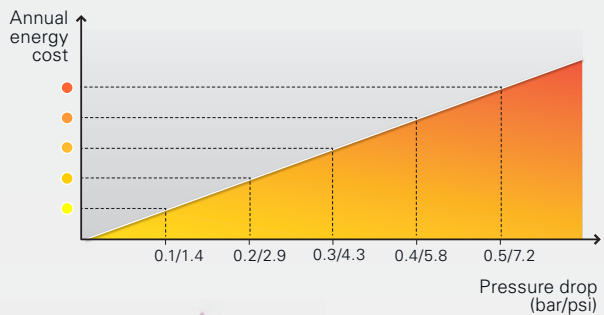
Indirect energy costs

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

Low pressure drops

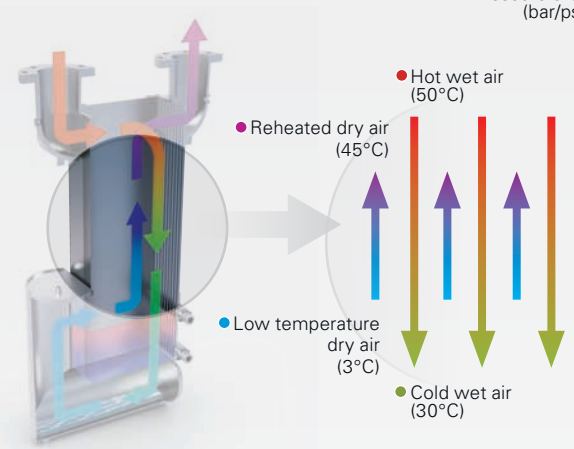
If a refrigerant dryer has a high internal pressure drop, the compressor needs to run at a higher pressure. As illustrated in the example, this wastes energy and increases operating costs. Atlas Copco has therefore put considerable efforts into minimizing pressure drops in its dryers. A low pressure drop of 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.

Example of the costs related to high pressure drop



Efficient heat transfer through unique heat exchanger technology

The FD dryer uses 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.



Direct energy costs

Direct energy costs are related to the power that the dryer consumes. Atlas Copco's FD dryers incorporate a variety of state-of-the-art technologies such as Saver Cycle Control and Variable Speed Drive. These features result in further savings on energy costs, depending on your air consumption profile.

Saver Cycle Control

To help you save energy, Atlas Copco FD dryers are able to adapt their working cycle to the real load by continuously monitoring and comparing the ambient temperature and the pressure dewpoint. When there is less heat load, the refrigerant compressor stops and power consumption is significantly reduced.

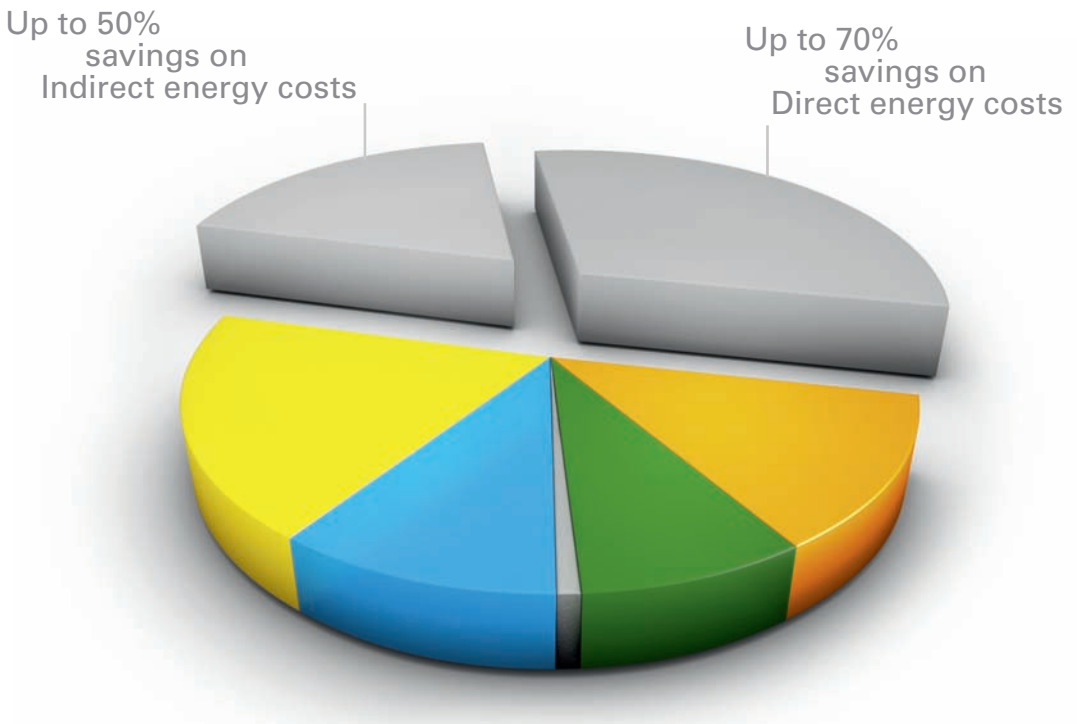
Variable Speed Drive (VSD)

The VSD controller incorporated in certain FD refrigerant dryers matches the energy consumed to the actual compressed air used. This significantly reduces energy consumption – by as much as 70% compared to conventional dryers. It works by varying the speed of the compressor and ensuring a stable dewpoint. In this way the speed of the refrigeration compressor can be matched to inlet conditions, resulting in lower energy consumption at reduced loads.

Flow switch

If the compressor is unloaded for some time, the flow switch shuts down the refrigerant compressor automatically, typically after ten minutes, saving energy.

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



A step ahead in control and monitoring

Atlas Copco's Elektronikon® controls and monitors your FD refrigerant dryers to ensure optimal productivity and efficiency at your site.

User-friendly interface

Available in 32 languages, this graphical 3.5-inch high-definition color display with pictograms and LED indicators for key events is easy to use. The keyboard is durable to resist tough treatment in demanding environments.

Comprehensive maintenance display

Valuable items of information displayed include the ServicePlan indicator and preventive maintenance warnings.

Control and monitoring

Internet-based visualization*

The Elektronikon® system monitors and displays key parameters such as dewpoint and inlet temperature, etc. Internet-based visualization of your dryer is possible by using a simple Ethernet connection.

AIRConnect™*

AIRConnect™ is an optional advanced remote monitoring package that offers complete analysis and accurate management. It is fully customizable to meet specific customer needs, from simple alarm notification via email or SMS to visualization via fieldbus, LAN or internet, including advanced reporting services.

** Not applicable for the lower range controllers.*

Optimize your system

With the FD, Atlas Copco provides an all-in-one standard package incorporating the latest technology in a built-to-last design. To further optimize your FD's performance or to simply tailor it to your specific production environment, optional features are available.

Scope of supply

Cooling circuit

- Integrated electronic no-loss drain

Electrical components

- Elektronikon® control
- Voltage-free contacts for remote alarm signal
- Digital pressure dewpoint readout

Mechanical components

- Counter-flow air-to-air heat exchanger
- Counter-flow air-to-refrigerant heat exchanger

Additional features & options

Options	FD 5-95	FD 120-285	FD 310-510	FD 610	FD 760-1010	FD 1250-2000	FD 2400-4000
GENERAL							
High efficiency coalescing filters	●(1)	●(2)	●(3)	-	-	-	-
General purpose coalescing filters	●(1)	●(2)	●(3)	-	-	-	-
Integrated OSD oil/water condensate separator	●(4)	●	-	-	-	-	-
Anchor pads	●	●	●	●	●	●	●
MOTOR							
VSD control	-	-	-	-	●	●	■
Saver Cycle Control	■	■	■	■	■	-	-
Control panel protection to IP23	■	■	■	-	-	-	-
Control panel protection to IP54	●	●	●	■	■	■	■
OTHER OPTIONS							
Flow switch	-	■	■	■	■	-	-
Smart pressure dewpoint alarm	■	■	■	■	■	■	■
Automatic hot gas bypass valve	■	■	-	-	-	-	-
Electronic hot gas bypass valve	-	-	■	■	■	■	■
Automatic expansion valve	-	■	■	■	■	■	■

■ *Standard* ● *Optional* - *Not available*

(1) FD 5-50: spin-on filters - FD 60-95: integrated filters
(2) Integrated filters
(3) Spin-on filters
(4) OSD is only an option for FD60-95

Technical specifications

50 Hz versions

MODEL	Maximum inlet conditions at full flow (ambient/inlet)	Inlet flow with a pressure dewpoint (PDP) of 3°C/37.4°F		Pressure drop at full flow		Power consumption		Maximum working pressure		Compressed air connections	Dimensions						Weight	
											L		W		H			
	°C	l/s	cfm	bar	psi	kW	hp	bar	psi		mm	in	mm	in	mm	in	kg	lb
AIR-COOLED VERSIONS																		
FD 5	50/60	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	50/60	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	50/60	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	50/60	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	50/60	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	50/60	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	50/60	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	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	50/60	60	127	0.22	3.2	0.63	0.84	13	189	R 1	795	28.2	482	19.0	804	31.7	80	176
FD 70	50/60	70	148	0.22	3.2	0.87	1.17	13	189	R 1	795	28.2	482	19.0	804	31.7	81	178
FD 95	50/60	95	201	0.22	3.2	1.18	1.58	13	189	R 1	795	28.2	482	19.0	804	31.7	87	192
FD 120	50/60	120	254	0.11	1.6	1	1.3	14	203	1 1/2	1015	40	675	26.6	881	34.7	170	375
FD 150	50/60	150	318	0.15	2.18	1	1.3	14	203	1 1/2	1015	40	675	26.6	881	34.7	170	375
FD 185	50/60	185	392	0.22	3.19	1.4	1.9	14	203	2 1/2	1024	40.3	816	32.1	943	37.1	185	408
FD 220	50/60	220	466	0.12	1.74	1.9	2.5	14	203	2 1/2	1024	40.3	816	32.1	943	37.1	197	434
FD 245	50/60	245	519	0.18	2.61	2.1	2.8	14	203	2 1/2	1024	40.3	816	32.1	943	37.1	197	434
FD 285	50/60	285	604	0.22	3.19	2.2	2.9	14	203	2 1/2	1024	40.3	816	32.1	943	37.1	197	434
FD 310	40/50	310	657	0.23	3.3	2.8	3.75	14	203	G 3	986	38.8	850	33.5	1190	46.9	198	437
FD 310	46/56	310	657	0.23	3.3	2.8	3.75	14	203	G 3	986	38.8	850	33.5	1190	46.9	200	441
FD 310	50/60	310	657	0.23	3.3	2.9	3.89	14	203	G 3	986	38.8	850	33.5	1190	46.9	202	445
FD 410	40/50	410	869	0.21	3	3	4.02	14	203	G 3	986	38.8	850	33.5	1375	54.1	220	485
FD 410	46/56	410	869	0.21	3	4.6	6.17	14	203	G 3	1250	49.2	850	33.5	1375	54.1	240	529
FD 410	50/60	410	869	0.21	3	4.8	6.44	14	203	G 3	1525	60	850	33.5	1375	54.1	290	639
FD 510	40/50	510	1081	0.20	2.9	4.5	6.03	14	203	G 3	1250	49.2	850	33.5	1375	54.1	260	573
FD 510	46/56	510	1081	0.20	2.9	6.4	8.58	14	203	G 3	1525	60	850	33.5	1375	54.1	310	683
FD 510	50/60	510	1081	0.20	2.9	6.9	9.25	14	203	G 3	1525	60	850	33.5	1375	54.1	315	694
FD 610	40/50	610	1293	0.17	2.47	4.8	6.4	14	203	DIN100	1040	40.9	1060	41.7	1580	62.2	320	705
FD 760	40/50	760	1611	0.17	2.47	5.3	7.1	14	203	DIN100	1245	49	1060	41.7	1580	62.2	380	838
FD 760 VSD	40/50	760	1611	0.17	2.47	5.3	7.1	14	203	DIN100	1245	49	1060	41.7	1580	62.2	380	838
FD 870	40/50	870	1844	0.14	2.03	6.6	8.8	14	203	DIN150	1245	49	1060	41.7	1580	62.2	400	882
FD 870 VSD	40/50	870	1844	0.14	2.03	5.8	7.8	14	203	DIN150	1245	49	1060	41.7	1580	62.2	400	882
FD 1010	40/50	1010	2141	0.17	2.47	7.4	9.9	14	203	DIN150	1580	62.2	1060	41.7	1580	62.2	460	1014
FD 1010 VSD	40/50	1010	2141	0.17	2.47	6.6	8.8	14	203	DIN150	1580	62.2	1060	41.7	1580	62.2	460	1014
FD 1250	40/50	1250	2650	0.24	3.5	8.3	11.13	13	189	DIN200	1640	64.6	1350	53.1	1880	74	860	1896
FD 1250 VSD	40/50	1250	2650	0.24	3.5	10	13.41	13	189	DIN200	1640	64.6	1350	53.1	1880	74	860	1896
FD 1400	40/50	1400	2968	0.24	3.5	8.5	11.4	13	189	DIN200	1640	64.6	1350	53.1	1880	74	940	2072
FD 1400 VSD	40/50	1400	2968	0.24	3.5	9.3	12.47	13	189	DIN200	1640	64.6	1350	53.1	1880	74	940	2072
FD 1600	40/50	1600	3392	0.13	1.9	13.6	18.24	13	189	DIN200	2660	104.7	1350	53.1	1880	74	1280	2822
FD 1600 VSD	40/50	1600	3392	0.13	1.9	13.3	17.84	13	189	DIN200	2660	104.7	1350	53.1	1880	74	1300	2866
FD 2000	40/50	2000	4240	0.22	3.2	20	26.82	13	189	DIN200	2660	104.7	1350	53.1	1880	74	1345	2965
FD 2000 VSD	40/50	2000	4240	0.22	3.2	19.5	26.15	13	189	DIN200	2660	104.7	1350	53.1	1880	74	1325	2921
WATER-COOLED VERSIONS																		
FD 310	50/60	310	657	0.23	3.3	2	2.68	14	203	G 3	986	38.8	850	33.5	1190	46,9	180	397
FD 410	50/60	410	869	0.21	3	2.4	3.22	14	203	G 3	1250	49.2	850	33.5	1375	54,1	240	529
FD 510	50/60	510	1081	0.2	2.9	4.1	5.5	14	203	G 3	1250	49.2	850	33.5	1375	54,1	260	573
FD 610	40/50	610	1293	0.17	2.47	3.1	4.2	14	203	DIN100	1245	49	1060	41.7	1580	62.2	350	772
FD 760	40/50	760	1611	0.17	2.47	3.6	4.8	14	203	DIN100	1245	49	1060	41.7	1580	62.2	360	794
FD 760 VSD	40/50	760	1611	0.09	1.31	3.3	4.4	14	203	DIN100	1580	62.2	1060	41.7	1580	62.2	410	904
FD 870	40/50	870	1844	0.14	2.03	4.5	6	14	203	DIN150	1245	49	1060	41.7	1580	62.2	370	816
FD 870 VSD	40/50	870	1844	0.12	1.74	4.2	5.6	14	203	DIN150	1580	62.2	1060	41.7	1580	62.2	410	904
FD 1010	40/50	1010	2141	0.17	2.47	5.1	6.8	14	203	DIN150	1245	49	1060	41.7	1580	62.2	380	838
FD 1010 VSD	40/50	1010	2141	0.17	2.47	5.6	7.5	14	203	DIN150	1580	62.2	1060	41.7	1580	62.2	410	904
FD 1250	40/50	1250	2650	0.24	3.5	8.1	10.86	13	189	DIN200	1300	51.2	1350	53.1	1880	74	750	1653
FD 1250 VSD	40/50	1250	2650	0.24	3.5	9.7	13.01	13	189	DIN200	1300	51.2	1350	53.1	1880	74	750	1653
FD 1400	40/50	1400	2968	0.24	3.5	7.3	9.79	13	189	DIN200	1300	51.2	1350	53.1	1880	74	820	1808
FD 1400 VSD	40/50	1400	2968	0.24	3.5	8.5	11.4	13	189	DIN200	1300	51.2	1350	53.1	1880	74	820	1808
FD 1600	40/50	1600	3392	0.13	1.9	11.8	15.82	13	189	DIN200	2120	83.5	1350	53.1	1880	74	1090	2403
FD 1600 VSD	40/50	1600	3392	0.13	1.9	9.3	12.47	13	189	DIN200	2120	83.5	1350	53.1	1880	74	1110	2447
FD 2000	40/50	2000	4240	0.22	3.2	17	22.8	13	189	DIN200	2120	83.5	1350	53.1	1880	74	1155	2546
FD 2000 VSD	40/50	2000	4240	0.22	3.2	13.5	18.1	13	189	DIN200	2120	83.5	1350	53.1	1880	74	1135	2502
FD 2400 VSD	40/50	2400	5088	0.23	3.3	18.3	24.54	13	189	DIN200	2000	78.7	1350	53.1	1880	74	1155	2546
FD 4000 VSD	40/50	4000	8480	0.22	3.2	27.9	37.41	13	189	DIN250	2200	86.6	2300	90.6	1910	75.2	2010	4431

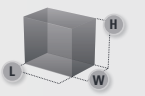
(1) 20 bar(g)/290 psi(g) variant available

Reference conditions:

Performance data per ISO 7183:2007
- *Ambient temperature: 25°C, 77°F*
- *Inlet compressed air temperature: 35°C, 95°F*
- *Inlet pressure: 7 bar(e)/102 psig*

Refrigerant types:

FD 5-95: R134a
FD 120-1010: R410A
FD 1250-4000: R404A



60 Hz versions

MODEL	Maximum inlet conditions at full flow (ambient/inlet)	Inlet flow with a pressure dewpoint (PDP) of 4°C/37.4		Pressure drop at full flow		Power consumption		Maximum working pressure		Compressed air connections	Dimensions						Weight	
											L		W		H			
		l/s	cfm	bar	psi	kW	hp	bar	psi		mm	in	mm	in	mm	in	kg	lb
AIR-COOLED VERSIONS																		
FD 5	122/140	6	13	0.07	1.02	0.23	0.31	16 (1)	233 (1)	NPT 3/4	496	19.5	377	14.8	461	18.1	27	60
FD 10	122/140	10	21	0.11	1.6	0.23	0.31	16 (1)	233 (1)	NPT 3/4	496	19.5	377	14.8	461	18.1	27	60
FD15	122/140	15	32	0.12	1.75	0.34	0.46	16 (1)	233 (1)	NPT 3/4	496	19.5	377	14.8	461	18.1	32	70
FD 20	122/140	20	42	0.12	1.75	0.53	0.71	16 (1)	233 (1)	NPT 3/4	496	19.5	377	14.8	461	18.1	34	75
FD 25	122/140	25	53	0.17	2.47	0.53	0.71	16 (1)	233 (1)	NPT 3/4	496	19.5	377	14.8	461	18.1	34	75
FD 30	122/140	30	64	0.25	3.64	0.53	0.71	16 (1)	233 (1)	NPT 3/4	496	19.5	377	14.8	461	18.1	34	75
FD 40	122/140	40	85	0.2	2.91	0.73	0.98	16 (1)	233 (1)	NPT 1	688	27.1	389	15.3	604	23.8	57	125
FD 50	122/140	50	106	0.2	2.91	0.79	1.06	16 (1)	233 (1)	NPT 1	689	27.1	389	15.3	604	23.8	58	128
FD 60	122/140	60	127	0.22	3.2	0.63	0.84	13	189	NPT 1	726	28.6	482	19.0	804	31.7	80	176
FD 70	122/140	70	148	0.22	3.2	0.87	1.17	13	189	NPT 1	726	28.6	482	19.0	804	31.7	81	178
FD 95	122/140	95	201	0.22	3.2	1.18	1.58	13	189	NPT 1	726	28.6	482	19.0	804	31.7	87	192
FD 120	122/140	120	254.4	0.11	1.6	1.73	2.3	14	203	NPT 1 1/2	836	32.9	661	26.0	802	31.6	170	375
FD 150	122/140	140	296.8	0.14	2.03	2.35	3.2	14	203	NPT 1 1/2	836	32.9	661	26.0	802	31.6	170	375
FD 185	122/140	170	360.4	0.22	3.19	2.32	3.1	14	203	NPT 2 1/2	1024	40.3	816	32.1	943	37.1	185	408
FD 220	122/140	220	466.4	0.12	1.74	2.58	3.5	14	203	NPT 2 1/2	1024	40.3	816	32.1	943	37.1	197	434
FD 245	122/140	230	487.6	0.18	2.61	2.85	3.8	14	203	NPT 2 1/2	1024	40.3	816	32.1	943	37.1	197	434
FD 285	122/140	285	604.2	0.22	3.19	3.09	4.1	14	203	NPT 2 1/2	1024	40.3	816	32.1	943	37.1	197	434
FD 310 (1)	104/122	310	657	0.23	3.3	4.3	5.77	14	203	NPT 3	986	38.8	850	33.5	1190	46.9	198	437
FD 310 (1)	115/133	310	657	0.23	3.3	4.6	6.17	14	203	NPT 3	986	38.8	850	33.5	1190	46.9	200	441
FD 310 (1)	122/140	310	657	0.23	3.3	4.6	6.17	14	203	NPT 3	986	38.8	850	33.5	1190	46.9	202	445
FD 410 (1)	104/122	410	869	0.21	3	4.5	6.03	14	203	NPT 3	986	38.8	850	33.5	1375	54.1	220	485
FD 410 (1)	115/133	410	869	0.21	3	6.1	8.18	14	203	NPT 3	1250	49.2	850	33.5	1375	54.1	240	529
FD 410 (1)	122/140	410	869	0.21	3	7.3	9.79	14	203	NPT 3	1525	60	850	33.5	1375	54.1	290	639
FD 510 (1)	104/122	510	1081	0.2	2.9	7.3	9.79	14	203	NPT 3	1250	49.2	850	33.5	1375	54.1	260	573
FD 510 (1)	115/133	510	1081	0.2	2.9	9.1	12.2	14	203	NPT 3	1525	60	850	33.5	1375	54.1	310	683
FD 510 (1)	122/140	510	1081	0.2	2.9	10.4	13.95	14	203	NPT 3	1525	60	850	33.5	1375	54.1	315	694
FD 610	104/122	610	1293	0.17	2.47	7.6	10.2	14	203	ANSI 4	1040	40.9	1060	41.7	1580	62.2	320	705
FD 760	104/122	760	1611	0.17	2.47	8.1	10.9	14	203	ANSI 4	1245	49	1060	41.7	1580	62.2	380	838
FD 760 VSD	104/122	760	1611	0.17	2.47	9.1	12.2	14	203	ANSI 4	1245	49	1060	41.7	1580	62.2	380	838
FD 870	104/122	870	1844	0.14	2.03	10.2	13.7	14	203	ANSI 6	1245	49	1060	41.7	1580	62.2	400	882
FD 870 VSD	104/122	870	1844	0.14	2.03	11.1	14.9	14	203	ANSI 6	1580	62.2	1060	41.7	1580	62.2	450	992
FD 1010	104/122	1010	2141	0.17	2.47	11.9	16	14	203	ANSI 6	1580	62.2	1060	41.7	1580	62.2	460	1014
FD 1010 VSD	104/122	1010	2141	0.17	2.47	11.4	15.3	14	203	ANSI 6	1580	62.2	1060	41.7	1580	62.2	460	1014
FD 1250	104/122	1250	2650	0.24	3.5	13.6	18.24	13	189	ANSI 8	1640	64.6	1350	53.1	1880	74	750	1653
FD 1250 VSD	104/122	1250	2650	0.24	3.5	8.5	11.4	13	189	ANSI 8	1640	64.6	1350	53.1	1880	74	750	1653
FD 1400	104/122	1400	2968	0.24	3.5	14.1	18.91	13	189	ANSI 8	1640	64.6	1350	53.1	1880	74	940	2072
FD 1400 VSD	104/122	1400	2968	0.24	3.5	8.6	11.53	13	189	ANSI 8	1640	64.6	1350	53.1	1880	74	940	2072
FD 1600	104/122	1600	3392	0.13	1.9	18.4	24.67	13	189	ANSI 8	2660	104.7	1350	53.1	1880	74	1280	2822
FD 1600 VSD	104/122	1600	3392	0.13	1.9	16.1	21.59	13	189	ANSI 8	2660	104.7	1350	53.1	1880	74	1300	2866
FD 2000	104/122	2000	4240	0.22	3.2	26	34.87	13	189	ANSI 8	2660	104.7	1350	53.1	1880	74	1345	2965
FD 2000 VSD	104/122	2000	4240	0.22	3.2	24.9	33.39	13	189	ANSI 8	2660	104.7	1350	53.1	1880	74	1325	2921
WATER-COOLED VERSIONS																		
FD 310	122/140	310	657	0.23	3.3	2.5	3.35	14	203	NPT 3	986	38.8	850	33.5	1190	46.9	180	397
FD 410	122/140	410	869	0.21	3.0	3.2	4.29	14	203	NPT 3	1525	60.0	850	33.5	1375	54.1	240	529
FD 510	122/140	510	1081	0.20	2.9	5.0	6.71	14	203	NPT 3	1525	60.0	850	33.5	1375	54.1	260	573
FD 610	104/122	610	1293	0.17	2.47	3.9	5.2	14	203	ANSI 4	1245	49	1060	41.7	1580	62.2	350	772
FD 760	104/122	760	1611	0.17	2.47	4.5	6	14	203	ANSI 4	1245	49	1060	41.7	1580	62.2	360	794
FD 760 VSD	104/122	760	1611	0.09	1.31	4.3	5.8	14	203	ANSI 4	1580	62.2	1060	41.7	1580	62.2	410	904
FD 870	104/122	870	1844	0.14	2.03	5.8	7.8	14	203	ANSI 6	1245	49	1060	41.7	1580	62.2	370	816
FD 870 VSD	104/122	870	1844	0.12	1.74	5.6	7.5	14	203	ANSI 6	1580	62.2	1060	41.7	1580	62.2	410	904
FD 1010	104/122	1010	2141	0.17	2.47	6.2	8.3	14	203	ANSI 6	1245	49	1060	41.7	1580	62.2	380	838
FD 1010 VSD	104/122	1010	2141	0.17	2.47	6.1	8.2	14	203	ANSI 6	1580	62.2	1060	41.7	1580	62.2	410	904
FD 1250	104/122	1250	2650	0.24	3.5	9.8	13.14	13	189	ANSI 8	1300	51.2	1350	53.1	1880	74	750	1653
FD 1250 VSD	104/122	1250	2650	0.24	3.5	5	6.71	13	189	ANSI 8	1300	51.2	1350	53.1	1880	74	750	1653
FD 1400	104/122	1400	2968	0.24	3.5	9.5	12.74	13	189	ANSI 8	1300	51.2	1350	53.1	1880	74	820	1808
FD 1400 VSD	104/122	1400	2968	0.24	3.5	5.1	6.84	13	189	ANSI 8	1300	51.2	1350	53.1	1880	74	820	1808
FD 1600	104/122	1600	3392	0.13	1.9	12	16.09	13	189	ANSI 8	2120	83.5	1350	53.1	1880	74	1100	2425
FD 1600 VSD	104/122	1600	3392	0.13	1.9	8.1	10.86	13	189	ANSI 8	2120	83.5	1350	53.1	1880	74	1110	2447
FD 2000	104/122	2000	4240	0.22	3.2	19	25.48	13	189	ANSI 8	2120	83.5	1350	53.1	1880	74	1155	2546
FD 2000 VSD	104/122	2000	4240	0.22	3.2	12.9	17.3	13	189	ANSI 8	2120	83.5	1350	53.1	1880	74	1155	2546
FD 2400 VSD	104/122	2400	5088	0.23	3.3	9.8	13.14	13	189	ANSI 8	2000	78.7	1350	53.1	1880	74	1180	2601
FD 4000 VSD	104/122	4000	8480	0.22	3.2	13.2	17.7	13	189	ANSI 10	2200	86.6	2300	90.6	1910	75.2	2010	4431

(1) 20 bar(g)/290 psi(g) variant available

Reference conditions:

- *Ambient temperature: 38°C, 100°F*
- *Inlet compressed air temperature: 38°C, 100°F*
- *Inlet pressure: 7 bar(e)/100 psig*

Refrigerant types:

FD 5-95: R134a
FD 120-1010: R410A
FD 1250-4000: R404A

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