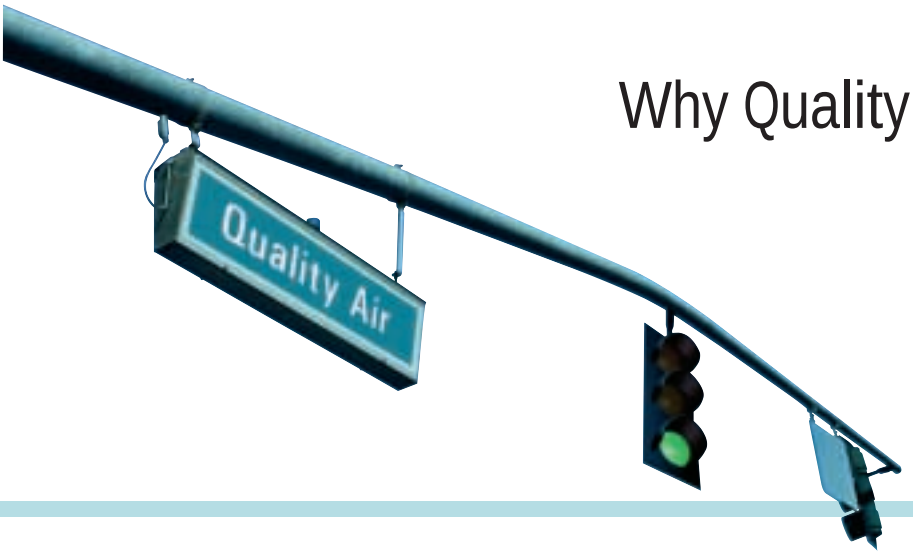
Atlas Copco Air dryers

FD refrigeration air dryer series – 50-60 Hz

QUALITY
DRY AIR

Atlas Copco



Why Quality Air?

When the air that surrounds us is compressed, its vapor and particle concentration increases dramatically. The compression process causes the oil and water vapors to condense into droplets, and then mix with the high concentration of particles. The result is an abrasive oily sludge that in many cases is also acidic. Without quality air equipment, much of this corrosive sludge will enter the air net.

Effective air treatment equipment is an investment with a solid return: it efficiently reduces the contamination in the air that would otherwise produce corrosion in the pipework, lead to premature pneumatic equipment failure and cause product spoilage.

The high cost of low quality air

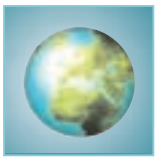
When it comes to tools, machines and instruments, poor air quality will cause more breakdowns, repairs and replacements. In addition to the remedial costs, the resulting downtime and production delays are often far more expensive than any repair.

The threat to an impeccable reputation

Where the compressed air comes in contact with the product, the stability, scrap rate and final quality of the product can be significantly affected by contamination. Aside from the costs to correct the situation, the potential damage to your product's reputation can not be underestimated.

Money disappearing into thin air

The pipe work that carries the compressed air is often forgotten when calculating the potential cost of poor quality air. Aggressive condensate will cause corrosion, leading to air leaks and a costly waste of energy. A leak of 1/8 inch (.125 inches) is roughly equivalent to an energy waste of 3.7 kW. After one year, this can add up to $1,800.



Persistent pressure on the environment

The energy waste caused by leaks and the unsafe disposal of untreated condensate will adversely affect our environment. Apart from the stringent legislation that imposes heavy fines in case of non-compliance, every waste of energy negatively influences the bottom line. Caring for the environment can be smart business!

From products to total solutions

Based on years of experience, Atlas Copco has the know-how to determine the exact requirements and offers the right equipment from an extensive range of air treatment products. In addition to providing total solutions, Atlas Copco has built an aftermarket organization to support your complete installation… from a local point of contact, around the globe.

From compressor to dryer and down to the last filter, Atlas Copco can be your single source partner for total quality compressed air solutions.

Selection guide

Quality Air process
=
End user satisfaction

Particles / dust

Water

filtration

filter
PD, DD, DDp & QD

1 2

drying

adsorption dryer
MD
(for ZR/ZT/ZE/ZA Compressors)

2 3

adsorption dryer
BD

1 2 3

refrigerant dryer
FD/ID

4

draining

electronic water drain
EWD

oil/water separation

OSW/OSD/OSM

Oil

filtration

1

filter
PD, DD & QD

adsorption dryer CD

1 2

air compression

oil-free compressors
ZH/ZR/ZT/ZE/ZA/LF/SF/LXF/H/
S/P/HX-HN/PETPACK®

oil-injected compressors
GA/GR/GX/LE/LT

Quality classes
ISO 8573-1

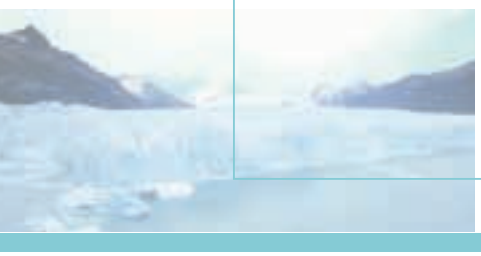
1	1	1
2	2	2
	3	
	4	

Air quality classes	Dirt (solid particles)				Water		Oil
	Maximum number of particles per m³ particle diameter (d) size, µm				Max. pressure dewpoint		Max. concentration
	≤ 0.10	0.1 < d ≤ 0.5	0.5 < d ≤ 1.0	1.0 < d ≤ 5.0	°C	°F	mg/m³
1	*	100	1	0	-70	-94	0.01
2	*	100 000	1000	10	-40	-40	0.1
3	*	*	10000	500	-20	-4	1
4	*	*	*	1000	3	+ 37.4	5
5	*	*	*	20000	7	+ 44.6	> 5

* Not specified

A well designed compressed air system ensures that the air quality demands of the process are closely met. With the desired ISO class as a guide, the appropriate components can be selected.
Atlas Copco offers a complete product range that never requires a customer to compromise.

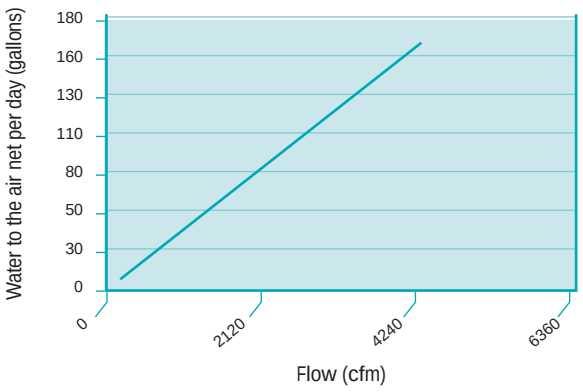
FD dryers - moisture doesn't stand a chance



Moisture: an avoidable threat ?

Compressed air entering the air net is always 100% saturated with water vapor. When cooling down, this moisture will condense, causing damage to your air system… and to your finished products. The amount of water is directly proportional to the flow and although an aftercooler will eliminate 2/3 of the moisture, the remaining third can still be very destructive.

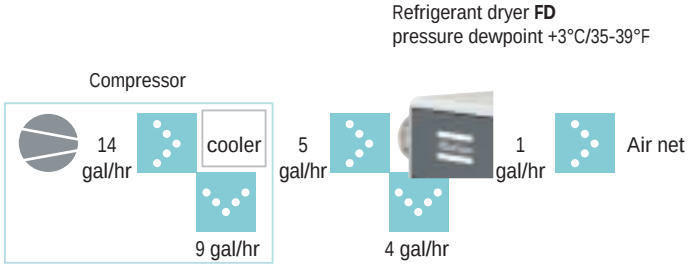
WATER TO THE AIR NET IF NO DRYER INSTALLED



FD adds dryness to the equation

Atlas Copco FD refrigerant dryers eliminate the moisture before it can cause any damage. They ensure a reliable process and impeccable end products by offering quality dry air to your compressed air system, with a pressure dewpoint of +3°C/35-39°F.

WATER ENTERING AND LEAVING THE COMPRESSOR & DRYER (EXAMPLE)

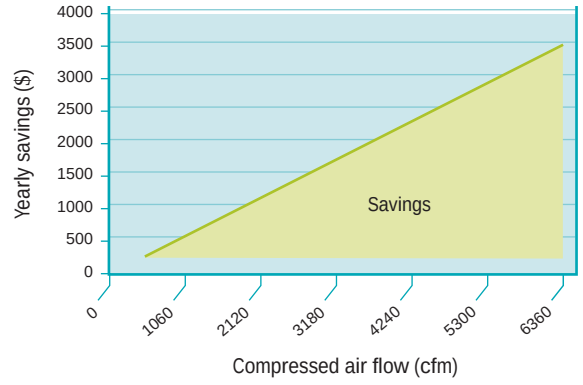


Reference conditions
Compressor flow 2225 cfm – Compressed air temp. 100 °F
Ambient air temp. 80 °F – Ambient relative humidity 60% – Pressure: 100 psig

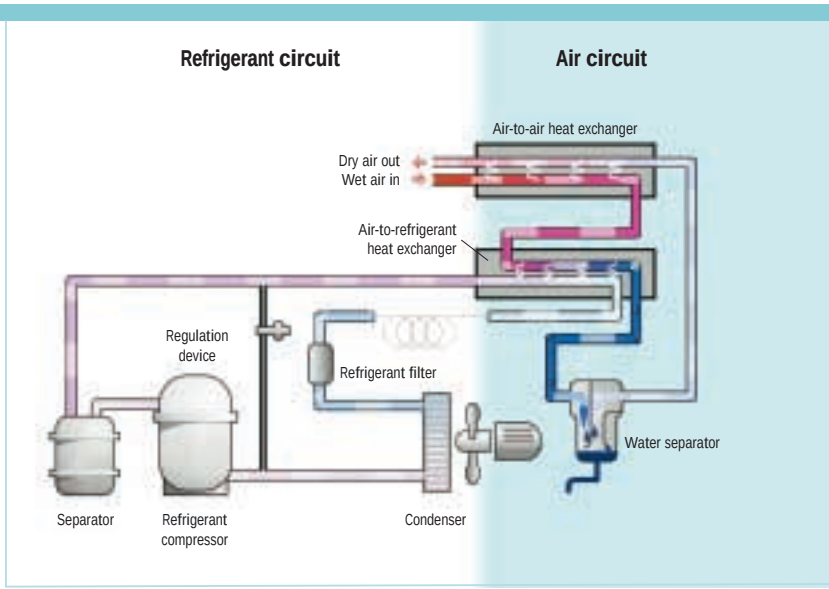
Low pressure drop, big savings

Large pressure drops can add thousands of dollars in energy costs. The FD Dryer was designed to give the smallest pressure drop, approximately 2.9 psig, to ensure the lowest operating costs.

POSSIBLE SAVINGS FOR EACH 0.1 BAR (1.5 PSI) PRESSURE DROP



Proven principle - cost effective technology



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.
- **Refrigerant filter**
  protects the expansion device from harmful particles.
- **Expansion device**
  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.
- **Regulation device**
  the hot gas bypass or automatic expansion valve regulates the amount of refrigerant passing through the air-to-refrigerant heat exchanger, ensuring a stable pressure dewpoint.

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 vapor in the compressed air to condense.
  The more effective the heat transfer, the cooler the air becomes and the more water vapor condenses.
- **Water separator**
  collects and drains off condensate from the cooled air flow.
  The more efficient the separation the better the pressure dewpoint; droplets, which are not collected, revaporize and degrade the pressure dewpoint.

FD benefits from experience

Stable performance at every flow - without freezing

- *hot gas bypass on FD7-280*
- *automatic expansion valve on FD300-1600*
- *electronic hot gas bypass on FD750 VSD/FD1000 VSD*

Minimal energy consumption

- *extremely low pressure drop, reduced air compressor costs*
- *high efficiency fan motors*
- *aluminium heat exchanger with highest possible heat transfer*
- *VSD models' energy consumption proportional to water load*

First class performance, first class air quality

- *oversized compressor & condenser provide extra capacity*
- *innovative heat exchanger enables excellent air cooling*
- *high efficiency water separation ensures low pressure dewpoint*
- *air heated on exit to avoid pipe work condensation*

Reliable performance in difficult conditions

- *cooling provided by oversized refrigerant circuit guaranteeing low pressure dewpoint*
- *water separator remains efficient at higher loads*

Minimal maintenance downtime

- *long service intervals*
- *few component replacements*
- *ergonomic design for fast removal & refit of components*

User friendliness

- *simple control panel*
- *self regulating*
- *minimal routine maintenance*
- *optional remote signals*

Operating reliability

- *oversized quality components*
- *unit operating well within design limits*

Environment conscious

- *low energy consumption*
- *compliant to the strictest environmental regulations*
- *CFC free refrigerant*
  - *FD7-95: R134a*
  - *FD110-1600: R404a*

Options

- ☐ Integrated electronic water drain
- ☐ Pressure dewpoint alarm
- ☐ Pressure dewpoint alarm with voltage free contact
- ☐ Anchor pads
- ☐ Special customized engineered options

Excellence by design

- First rate air quality -
  a stable pressure dewpoint of 35-39°F
- Reduced energy costs through low pressure drop and efficient heat exchanger
- Designed and tested for operation in harsh climates
- Operating reliability through quality components and manufacturing
- Minimal maintenance cost and downtime due to service friendly design
- Environmentally friendly refrigerants – compliant with all international regulations
- Small footprint and forklift slots for fast, simple installation
- Operator friendly through a simple, comprehensive control panel
- Complete range to match all application and ambient requirements; air and water cooled versions
- Available as an integrated dryer with Full Feature compressor models

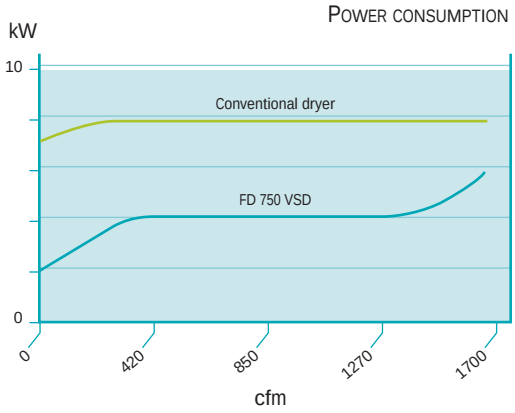
Save 25% or more on your energy bill

FD750 VSD / FD 1000 VSD

Variable load, variable energy = maximum savings

The VSD (Variable Speed Drive) controlled FD refrigerant compressor exactly matches the energy input to the need defined by the water load to the dryer. When the water load decreases, so will the speed of the refrigerant compressor… and the energy consumption of the FD dryer. Energy will no longer be wasted at less than full load, which results typically in more than 25% savings when compared to conventional dryers.

η-drive



Technical data

FD refrigerant dryer range - 50 Hz

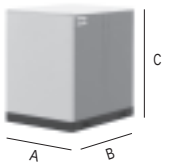
FD	Air flow at outlet with a PDP of +3°C / 35-39°F		Pressure drop		Maximum working pressure		Electrical supply	Dimensions						Weight		Compressed air connections
								A		B		C				
Type	l/s	cfm	bar(e)	psig	bar(e)	psig		mm	in	mm	in	mm	in	kg	lb	
FD7 (A)	7	15	0.10	1.45	13.0	189	230V	496	19.53	370	14.57	435	17.13	27	60	R 1/2
FD16 (A)	16	34	0.17	2.47	13.0	189	230V	496	19.53	370	14.57	435	17.13	28	62	R1/2
FD35 (A)	35	74	0.10	1.45	13.0	189	230V	469	18.46	657	25.87	919	36.18	60	132	R1
FD45 (A)	45	95	0.15	2.18	13.0	189	230V	469	18.46	657	25.87	919	36.18	60	132	R1
FD65 (A)	63	134	0.14	2.03	13.0	189	230V	469	18.46	657	25.87	919	36.18	75	165	R1 1/2
FD95 (A)	93	197	0.26	3.77	13.0	189	230V	469	18.46	657	25.87	919	36.18	80	176	R1 1/2
FD110 (A)	110	233	0.15	2.18	13.0	189	230V	877	34.53	696	27.40	810	31.89	122	269	R1 1/2
FD130 (A)	130	276	0.21	3.05	13.0	189	230V	877	34.53	696	27.40	810	31.89	122	269	R1 1/2
FD170 (A)	170	360	0.19	2.76	13.0	189	230V	973	38.31	804	31.65	820	32.28	143	315	R2 1/2
FD230 (A)	230	488	0.19	2.76	13.0	189	230V	973	38.31	804	31.65	820	32.28	157	346	R2 1/2
FD280 (A/W)	280	594	0.24	3.48	13.0	189	230-415V/3	850	33.46	985	38.78	920	36.22	185	408	R3
FD300 (A/W)	314	666	0.15	2.18	14.5	210	230-415V/3	937	36.89	1227	48.30	1125	44.29	265	584	R3
FD380 (A/W)	380	806	0.09	1.31	14.5	210	230-415V/3	937	36.89	1227	48.30	1125	44.29	305	673	R3
FD450 (A/W)	450	954	0.15	2.18	14.5	210	230-415V/3	937	36.89	1227	48.30	1125	44.29	315	695	R3
FD560 (A/W)	585	1240	0.21	3.05	14.5	210	230-415V/3	911	35.87	1491	58.70	1011	39.80	350	772	NW100
FD700 (A/W)	775	1643	0.23	3.34	14.5	210	230-500V/3	1220	48.03	1633	64.30	1234	48.58	440	970	NW100
FD750 VSD (A)	750	1590	0.29	4.21	13.0	189	380-460V/3	1070	42.13	1750	68.90	1500	59.06	450	992	NW100
FD850 (A/W)	850	1802	0.16	2.32	10.5	152	230-500V/3	1481	58.31	1656	65.20	1414	55.67	750	1654	NW150
FD950 (A/W)	942	1997	0.19	2.76	10.5	152	230-500V/3	1481	58.31	1656	65.20	1414	55.67	750	1654	NW150
FD1000 VSD (A)	1000	2120	0.17	2.47	10.5	152	380-460V/3	970	38.30	1500	59.10	1800	70.80	500	1102	NW150
FD1200 (W)	1150	2438	0.24	3.48	10.5	152	230-500V/3	1481	58.31	1540	60.63	1414	55.67	750	1654	NW150
FD1600 (W)	1663	3526	0.22	3.19	10.5	152	230-500V/3	1500	59.06	1887	74.30	1673	65.87	1150	2536	NW150

Reference conditions

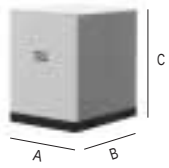
Air inlet temperature :	35°C / 95°F
Ambient temperature :	25°C / 77°F
Working pressure :	7 bar(e) / 102 psig
Max. inlet temperature :	55°C / 131°F
Max. ambient temperature :	45°C / 113°F

20 bar(e)/290 psig version available
14.5 bar(e)/210 psig version available

(A) Air cooled version
(A/W) Air and water cooled versions
(W) Water cooled version
VSD Variable Speed Drive



FD7 - FD230



FD280 - FD1600

For other compressed air inlet temperatures and pressure dewpoint temperatures, multiply the dryer air flow by the following factors K_1 :

FD 7-230	Pressure dewpoint temperature					
Inlet temperature	37°F	39°F	45°F	50°F	59°F	64°F
77°F	1.00	1.20	1.41	1.72	2.20	2.46
86°F	1.00	1.17	1.32	1.54	1.96	2.25
95°F	1.00	1.15	1.25	1.38	1.74	2.00
104°F	0.98	1.08	1.14	1.28	1.54	1.76
113°F	0.85	0.92	1.00	1.09	1.37	1.53
122°F	0.70	0.75	0.80	0.92	1.15	1.33
131°F	0.57	0.60	0.65	0.75	0.94	1.12

FD 280-1600	Pressure dewpoint temperature			
Inlet temperature	37°F	39°F	45°F	60°F
77°F	1.00	1.20	1.41	1.72
86°F	1.00	1.17	1.32	1.54
95°F	1.00	1.15	1.25	1.38
104°F	0.85	0.95	1.05	1.15
113°F	0.72	0.79	0.85	1.00
122°F	0.60	0.67	0.74	0.86
131°F	0.49	0.56	0.62	0.70

For other compressed air inlet pressures, multiply the dryer air flow by the following factors K_2 :

psig	58	87	102	116	145	174	218	290
	0.80	0.95	1.00	1.05	1.15	1.25	1.35	1.45

For other cooling medium temperatures, multiply the dryer air flow by the following factors K_3 :

°F	77	86	95	104	113
	1.00	0.95	0.88	0.81	0.74

Example:
What is the inlet capacity for an FD45 at the following conditions :
Inlet temp. : 115°F - Pressure dewpoint : 50°F - Inlet pressure : 145 - Ambient temp. : 95°F

Retrieve the correction factors from the tables :
K_1 = 1.09 / K_2 = 1.15 / K_3 = 0.88 / $Q_{nominal}$ for FD45 = 95 cfm at reference conditions

Q_{actual} = K_1 x K_2 x K_3 x $Q_{nominal}$
= 1.09 x 1.15 x 0.88 x 95 cfm
= 105 cfm

Technical data

FD refrigerant dryer range - 60 Hz

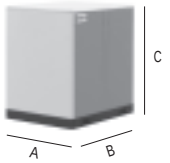
FD	Air flow at outlet with a PDP of +3°C / 35-39°F		Pressure drop		Maximum working pressure		Electrical supply	Dimensions						Weight		Compressed air connections
								A		B		C				
Type	l/s	cfm	bar(e)	psig	bar(e)	psig		mm	in	mm	in	mm	in	kg	lb	
FD16 (A)	19	40	0.21	3.05	13.0	189	115-230V	496	19.53	370	14.57	435	17.13	28	62	NPT 1/2
FD35 (A)	35	74	0.10	1.45	13.0	189	200-230V	469	18.46	657	25.87	919	36.18	60	132	NPT 1
FD45 (A)	45	95	0.15	2.18	13.0	189	200-230V	469	18.46	657	25.87	919	36.18	60	132	NPT 1
FD65 (A)	63	134	0.14	2.03	13.0	189	200-230V	469	18.46	657	25.87	919	36.18	75	165	NPT 1 1/2
FD95 (A)	93	197	0.26	3.77	13.0	189	200-230V	469	18.46	657	25.87	919	36.18	80	176	NPT 1 1/2
FD110 (A)	113	240	0.15	2.18	13.0	189	200-230V	877	34.53	696	27.40	810	31.89	122	269	R 1 1/2 *
FD130 (A)	135	286	0.21	3.05	13.0	189	200-230V	877	34.53	696	27.40	810	31.89	122	269	R 1 1/2 *
FD170 (A)	175	371	0.25	3.63	13.0	189	230-575V/3	973	38.31	804	31.65	820	32.28	143	315	R 2 1/2 *
FD230 (A)	235	498	0.22	3.19	13.0	189	230-575V/3	973	38.31	804	31.65	820	32.28	157	346	R 2 1/2 *
FD280(A/W)	265	562	0.22	3.19	13.0	189	230-440V/3	850	33.46	985	38.78	920	36.22	185	408	R3 *
FD300(A/W)	314	666	0.09	1.3	14.5	210	230-440V/3	937	36.89	1227	48.30	1125	44.29	305	673	R3 *
FD380(A/W)	380	806	0.15	2.18	14.5	210	230-440V/3	937	36.89	1227	48.30	1125	44.29	315	695	R3 *
FD450(A/W)	450	954	0.21	3.05	14.5	210	230-440V/3	911	35.87	1491	58.70	1011	39.80	350	772	R3 *
FD700(A/W)	705	1494	0.21	3.05	14.5	210	230-575V/3	1220	48.03	1663	64.30	1234	48.58	440	970	NW100 **/4"
FD750 VSD (A)	750	1590	0.29	4.21	13.0	189	440-460V/3	1070	42.13	1750	68.90	1500	59.06	450	992	NW100 **/4"
FD850 (A/W)	850	1802	0.16	2.32	10.5	152	230-575V/3	1481	58.31	1656	65.20	1414	55.67	750	1654	NW150 **/6"
FD1000 VSD (A)	1000	2120	0.17	2.47	10.5	152	440-460V/3	970	38.30	1500	59.10	1800	70.80	500	1102	NW150**/6"
FD1200 (W)	1150	2195	0.18	2.61	10.5	152	230-575V/3	1481	58.31	1540	60.63	1414	55.67	750	1654	NW150 **/6"
FD1600 (W)	1663	3526	0.23	3.34	10.5	152	230-575V/3	1500	59.06	1887	74.30	1673	65.87	1150	2536	NW150 **/6"

Reference conditions

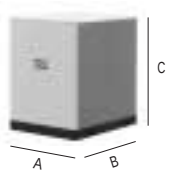
Air inlet temperature :	100°F / 38°C
Ambient temperature :	100°F / 38°C
Working pressure :	102 psig / 7 bar(e)
Max. ambient temperature :	113°F / 45°C
Max. inlet temperature :	131°F / 55°C

290psig/20 bar(e) version available
210 psig/14.5 bar(e) version available

*	CSA/UL variants supplied with NPT thread
**	CSA/UL variants supplied with ANSI flange
(A)	Air cooled version
(A/W)	Air and water cooled versions
(W)	Water cooled version
VSD	Variable Speed Drive



FD16 - FD230



FD280 - FD1600

For other compressed air inlet temperatures and pressure dewpoint temperatures, multiply the dryer air flow by the following factors K_1 :

FD 16-230	Pressure dewpoint temperature				
Inlet temperature	39°F	45°F	50°F	59°F	64°F
86°F	1.09	1.30	1.55	1.85	2.10
95°F	1.03	1.22	1.40	1.63	1.83
100°F	1.00	1.15	1.30	1.49	1.66
113°F	0.91	1.02	1.11	1.21	1.30
122°F	0.76	0.83	0.93	1.06	1.12
131°F	0.61	0.68	0.75	0.87	0.95

FD 280-1600	Pressure dewpoint temperature		
Inlet temperature	39°F	45°F	50°F
86°F	1.09	1.30	1.55
95°F	1.03	1.22	1.40
100°F	1.00	1.15	1.30
113°F	0.80	0.96	1.07
122°F	0.66	0.76	0.84
131°F	0.54	0.63	0.69

For other compressed air inlet pressures, multiply the dryer air flow by the following factors K_2 :

psig	58	87	102	116	145	174	218	290
	0.80	0.95	1.00	1.05	1.15	1.25	1.35	1.45

For other cooling medium temperatures, multiply the dryer air flow by the following factors K_3 :

°F	77	86	95	100	113
	1.10	1.06	1.02	1.00	0.93

Example:
What is the inlet capacity for an FD45 at the following conditions :
Inlet temp. : 113°F - Pressure dewpoint : 50°F - Inlet pressure : 145 psi(e) - Ambient temp. : 95°F

Retrieve the correction factors from the tables :
K_1 = 1.11 / K_2 = 1.15 / K_3 = 1.02 / $Q_{nominal}$ for FD45 = 95 cfm at reference conditions

Q_{actual} = K_1 x K_2 x K_3 x $Q_{nominal}$
= 1.11 x 1.15 x 1.02 x 95 cfm
= 123.7 cfm

What sets Atlas Copco apart? Our belief that, to excel, we must provide the best possible know-how and technology in ways that our customers value. Whether we're fully supporting existing products or advancing technology through innovation, we constantly focus on customer needs.

The Atlas Copco way of doing business grows from ongoing interaction, long-term relationships, and a commitment to understanding each customer's process and objectives. As a result, every compressed air solution we create helps a customer operate with greater efficiency, economy, and productivity.

Satisfying customer needs effectively has made Atlas Copco the number one compressor manufacturer in the world. We will continue to attract new business through our unwavering conviction to creating products and ideas that help our customers succeed.

Member:

Danger: Compressed air should never be supplied as breathing air unless air is properly purified for breathing. Atlas Copco assumes no responsibility or liability related to the purchaser's/user's breathing air system.

The information contained herein is general in nature and is not intended for specific construction, installation or application purposes

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