

VALUE THROUGH PERFORMANCE

DELTECH

F SERIES
PYRAMID 2000[®]
REFRIGERATED
COMPRESSED AIR DRYERS



Pyramid 2000®: The best of Deltech's drying, filtering and condensate draining techniques



Every compressed air system needs a dryer and filter. When you need clean dry air, why not buy a prepackaged system? With the **Pyramid 2000®** compressed air treatment system, Deltech combines the best of its drying, filtering and condensate draining techniques in one package. Deltech's unique **810 Series** coalescing filter has been integrated into the refrigerated drying circuit and functions as a moisture separator, particulate filter and high efficiency

The Pyramid 2000 Provides:

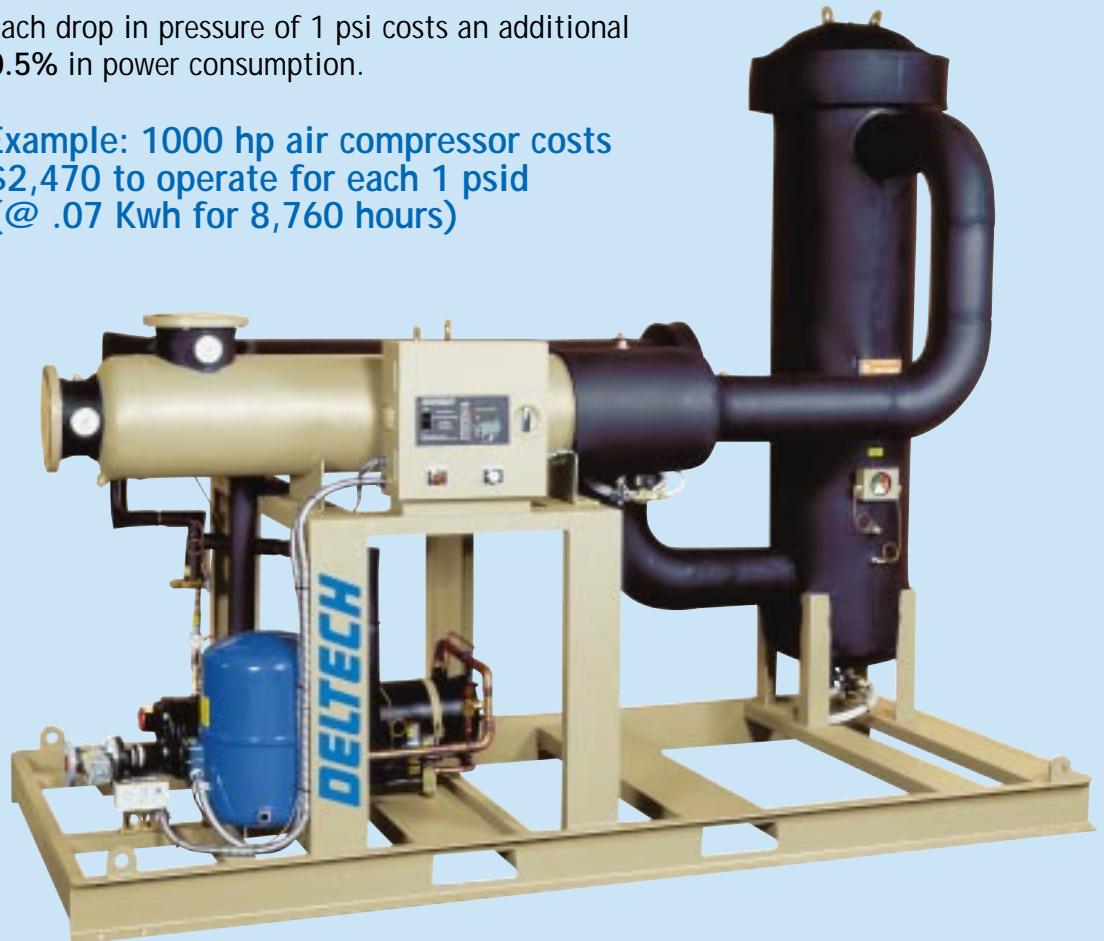
- ⦿ Highest air quality - contains virtually no condensable hydrocarbons
- ⦿ Lowest pressure drop - less than one-third of competitive system
- ⦿ Simple installation - single point air, electrical and drain connections

Reduction in Pressure Drop For Increased Efficiency

The **Pyramid 2000** filter-dryer arrangement eliminates the need for a standalone moisture separator as well as accessory filters. The additional components not only add to initial and installation costs, but also increase overall pressure loss. Loss in pressure adds to operating costs by reducing efficiency at the point of use or by requiring additional power at the compressor to overcome the pressure loss.

Each drop in pressure of 1 psi costs an additional 0.5% in power consumption.

Example: 1000 hp air compressor costs \$2,470 to operate for each 1 psid (@ .07 Kwh for 8,760 hours)



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Specifications

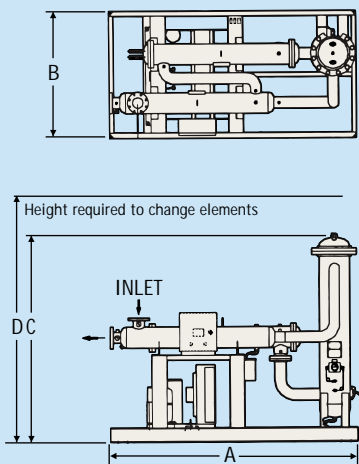
Model ^a	Flow Capacity ^b		Maximum Operating Pressure		Inlet-Outlet Flange Connections inches	Compressor hp	Power Input kW	Approx. Ship Wt.	
	scfm	Nm ³ /min	psig	barg				lbs	kg
F126A/P1260A	1,250	35	200	13.8	4	5½	7.2	2,000	909
F126W/P1260W	1,250	35	200	13.8	4	5½	6.5	1,700	773
F151A/P1510A	1,500	42	200	13.8	4	7½	9.6	2,400	1,091
F151W/P1510W	1,500	42	200	13.8	4	7½	7.0	1,950	886
F206A/P2060A	2,050	58	200	13.8	6	12½	13.3	2,650	1,205
F206W/P2060W	2,050	58	200	13.8	6	12½	11.8	2,350	1,068
F251A/P2510A	2,500	71	200	13.8	6	16	16.3	2,900	1,318
F251W/P2510W	2,500	71	200	13.8	6	14	12.5	2,650	1,205
F326A/P3260A	3,250	92	200	13.8	6	20	20.1	3,500	1,591
F326W/P3260W	3,250	92	200	13.8	6	16	12.3	3,050	1,386
F401W/P4010W	4,000	113	200	13.8	8	20	15.7	5,500	2,500
F501W/P5010W	5,000	142	200	13.8	8	25	20.8	6,500	2,955
F626W/P6260W	6,250	177	200	13.8	8	30	23.3	7,450	3,386
F826W/P8260W	8,250	234	175	12.1	8	40	34.3	9,100	4,136
F1001W/P10010W	10,000	283	150	10.3	10	50	44.3	11,400	5,182
F1201W/P12010W	12,000	340	150	10.3	12	60	47.3	13,650	6,205

a "A" suffix denotes air-cooled condenser; "W" denotes water-cooled condenser.

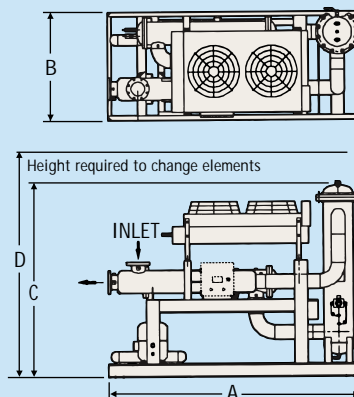
b Performance data obtained and presented in accordance with Compressed Air and Gas Institute Standard No. ADF 100 "Refrigerated Compressed Air Dryers - Methods for Testing and Rating". Rating conditions for 33°F-39°F (1-4°C) pressure dew point are 100°F (37.8°C) inlet temperature, 100 psig (6.9 barg) inlet pressure, 100% relative humidity, 100°F (37.8°C) ambient temperature and 5 psi (0.35 barg) pressure drop for F Series. For Pyramid 2000 systems ("P" prefix), where filter is included, pressure drop may be higher. Pressure drop may exceed 5 psi (0.35 barg) when the dryer is sized for a dew point higher than 33°F-39°F (1-4°C).

Dimensions inches (cm)

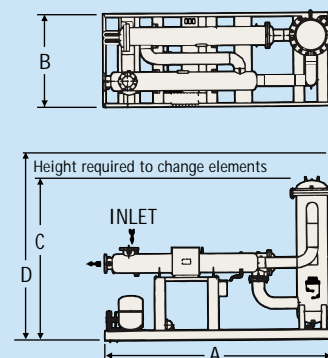
Model	A		B		C		D	
P1260A	105.0	(266)	53.5	(136)	82.0	(208)	124.0	(315)
P1510A	123.0	(312)	53.5	(136)	82.0	(208)	133.0	(338)
P2060A	122.0	(310)	53.6	(136)	93.5	(237)	135.5	(344)
P2510A	133.0	(337)	52.0	(131)	99.0	(251)	141.5	(359)
P3260A	129.0	(328)	54.0	(136)	96.0	(244)	138.0	(350)
P1260W	105.0	(266)	49.0	(124)	82.0	(208)	124.0	(315)
P1510W	123.0	(312)	45.0	(114)	91.0	(231)	133.0	(338)
P2060W	110.0	(279)	52.0	(131)	93.0	(236)	135.5	(344)
P2510W	134.0	(339)	57.0	(144)	96.0	(244)	138.0	(350)
P3260W	131.0	(332)	53.5	(136)	96.0	(244)	138.0	(350)



P1260A and P1510A



P2060A through P3260A



P1260W through P12010W

Note: For models not shown consult factory for details.

Electronic Technology for Refrigerated Compressed Air Drying

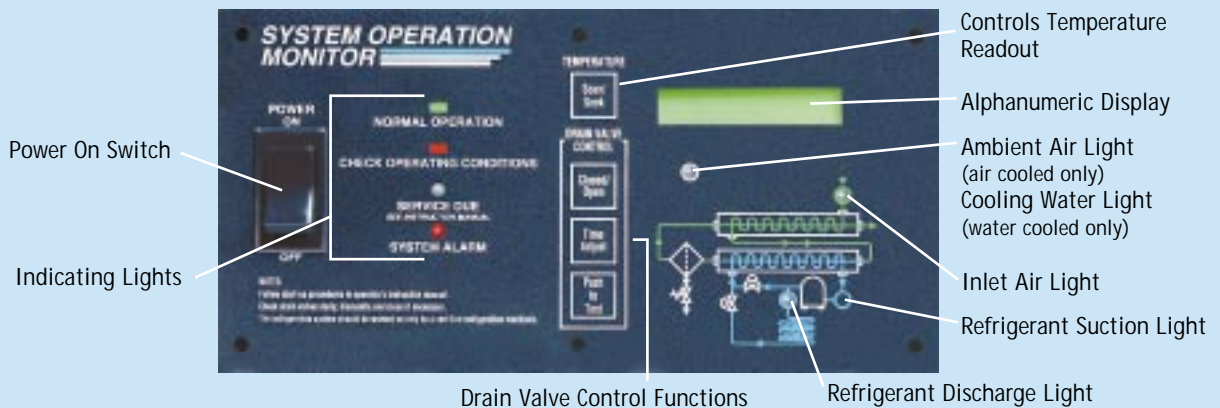


Deltech Pyramid 2000 and F Series dryers are high capacity refrigerated dryers that use technology to provide better performance with greater operator convenience. Standard on every dryer is the System Operation Monitor.

The System Operation Monitor measures and displays critical air and refrigerant temperatures and controls the removal of condensate from the dryer. It indicates whether the dryer is operating at specified performance levels and signals air system conditions, such as high inlet air temperature.

The System Operation Monitor includes a schematic of the dryer with LEDs that correspond to the location of the temperature sensors in the system. Digital display of these temperatures is provided in either a scanning or step-advance mode.

The System Operation Monitor also enables panel adjustment of the open and closed times for the automatic drain valves. There is even a light to indicate the need for routine service such as condenser coil or drain valve cleaning, or filter element replacement on Pyramid 2000 models.



Standard Features and Controls

- ⊙ RS232 Connection
- ⊙ ON/OFF switch
- ⊙ Compressor "ON" light
- ⊙ Power "ON" light
- ⊙ System Operation Monitor with initial diagnostics reading the following temperatures (°F) and appropriate alarms for the following:
 - inlet air
 - ambient air (air cooled)
 - cooling water (water cooled)
 - intermediate air
 - refrigerant suction
 - refrigerant discharge
- ⊙ Automatic electronic drain valves
 - Isolation valve and strainer
- ⊙ NEMA Type 1 enclosure
- ⊙ High inlet temperature alarms
- ⊙ Low refrigeration suction temperature alarm
- ⊙ Inlet air pressure gauge
- ⊙ Outlet air pressure gauge
- ⊙ Efficient centrifugal moisture separator
- ⊙ Refrigerant filter/dryer
- ⊙ Thermostatic expansion valve
- ⊙ Hot gas bypass valve(s)
- ⊙ Refrigerant compressor overload protection
- ⊙ Low suction pressure cutout
- ⊙ High discharge pressure cutout
- ⊙ Crankcase heater
- ⊙ 460/3/60 electrical service; optional 230/3/60, 575/3/60 and 50 Hz operation

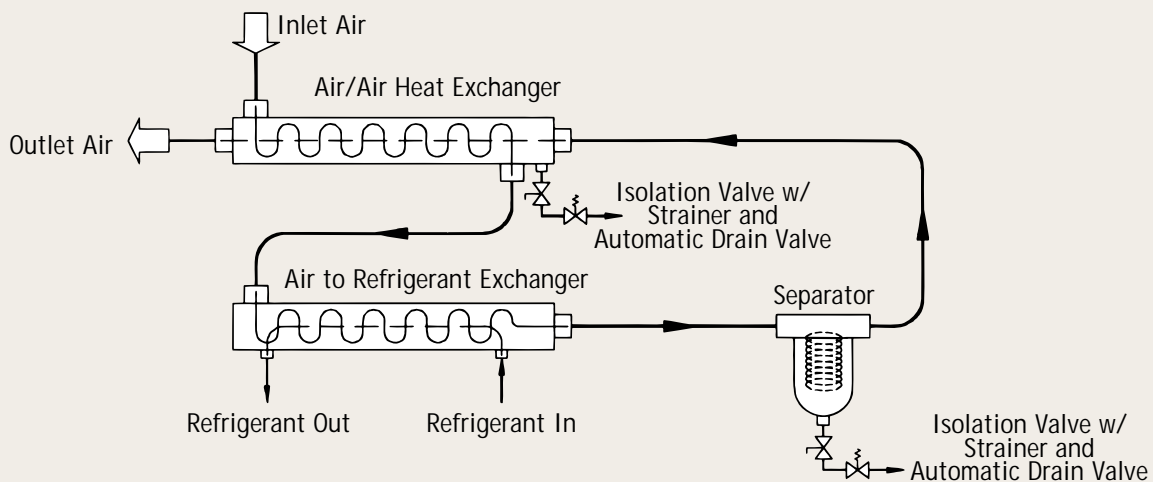
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How it Works

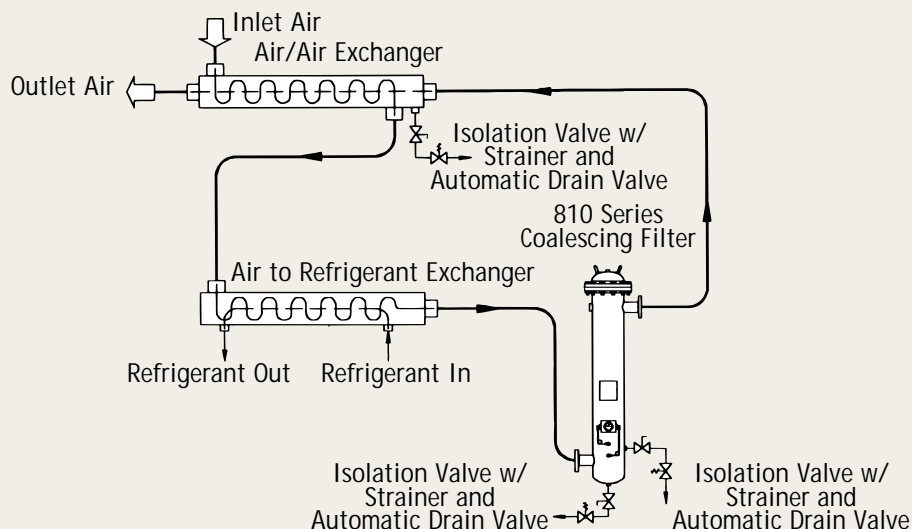
Saturated compressed air enters an air-to-air heat exchanger, where it is cooled by outgoing cold air. Up to 50% of the moisture in the inlet air is condensed and reliably discharged from the dryer by an automatic drain valve. By partially cooling the air before it reaches the refrigerated chiller, the cooling load on the refrigerant compressor is greatly reduced, permitting the use of a smaller compressor for reduced operating costs.

Pre-cooled air enters an air-to-refrigerant heat exchanger (chiller), where further cooling condenses residual moisture. The condensate is removed from the airstream by a centrifugal separator (810 Series coalescing filter on Pyramid 2000 Units) and a second automatic drain valve. The dried air passes back through the air-to-air heat exchanger, where it is reheated by hot inlet air to prevent condensation on the outside surfaces of the piping system. As long as air lines are exposed to temperatures higher than the dew point rating of the dryer, no moisture will condense inside the compressed air system, protecting equipment, processes and controls from damage.

F Series Flow Diagram



Pyramid 2000 Flow Diagram



How to Select Your Pyramid 2000 System or F Series Dryer

Sizing Information

Inlet temperature, inlet pressure, ambient air temperature, required air flow and pressure dew point and cooling medium (air or water) must be established before a dryer can be specified for your application.

Example: Select a dryer for 2900 scfm at 125 psig (8.6 barg) and 110°F (43°C) inlet air temperature, and 39°F (4°C) pressure dew point.

Step 1. On the Dryer Sizing chart locate the inlet air temperature, 110°F (43°C).

Step 2. At 110°F (43°C) read across the chart to 125 psig (8.6 barg) inlet air pressure. The correction factor is 0.90.

Step 3. To adjust the required flow, divide the required flow by 0.90.

$$\frac{2900 \text{ scfm}}{0.90} = 3222 \text{ scfm}$$

Step 4. Using the Specifications chart select a dryer which has a rated capacity of 3222 scfm or larger. Select Model F326A or W.

Dryer capacity will also be affected if a dew point higher than 39°F (4°C) is specified. For accurate dryer sizing, divide the adjusted dryer flow determined in Step 3 by the appropriate correction factor from the dew point correction factor table below. For a 50°F (10°C) dew point, required dryer capacity is 3222 divided by 1.3 or 2478 scfm.

Using the Specifications chart select Model F251A or W.

Dryer Sizing Chart

Inlet Air Temperature °F (°C)	Inlet Air Pressure psig (barg) Correction Factor										
	20 (1.4)	40 (2.8)	60 (4.1)	80 (5.5)	90 (6.2)	100 (6.9)	110 (7.6)	125 (8.6)	150 (10.3)	175 (12.1)	200 (13.8)
70* (21)	0.83	1.17	1.41	1.55	1.65	1.72	1.77	1.86	1.96	2.02	2.08
80* (27)	0.70	0.99	1.20	1.31	1.40	1.46	1.50	1.58	1.66	1.72	1.77
90* (32)	0.59	0.84	1.01	1.11	1.18	1.23	1.27	1.33	1.40	1.45	1.49
100** (38)	0.48	0.68	0.82	0.90	0.96	1.00	1.03	1.08	1.14	1.18	1.21
110** (43)	0.40	0.56	0.68	0.75	0.80	0.83	0.85	0.90	0.95	0.98	1.00
120** (49)	0.33	0.46	0.56	0.61	0.65	0.68	0.70	0.73	0.78	0.80	0.82
130** (55)	0.28	0.40	0.48	0.53	0.57	0.59	0.61	0.64	0.67	0.69	0.71

Correction Factors

Pressure Dew Point °F (°C)	Correction Factor	Ambient Air Temp °F (°C)	Correction Factor
33-39** (1-4)**	1.0	80* (27)*	1.12
40-44* (5-7)*	1.1	90* (32)*	1.06
45-49* (8-9)*	1.2	100** (38)**	1.00
50-54* (10-12)*	1.3	110** (43)**	0.94

* Data applies to F Series dryers only.

** Data applies to F Series and Pyramid 2000 dryers.

Note: Pyramid 2000 systems must be sized for 33-39°F (1-4°C) pdp only.

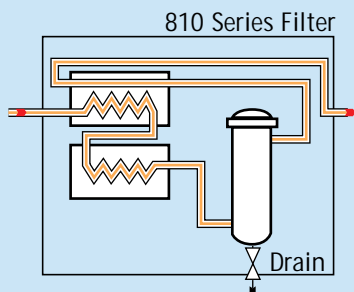
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Example Comparison of Theoretical Filtration Efficiency at 100°F and 35°F

Filtration Temperature	Hydrocarbon Concentration (ppm)						Actual Efficiency
	At Filter Inlet			At Filter Outlet			
	Liquid	Vapor	Total	Liquid	Vapor	Total	
100°F (37.8°C)	2	0.62	2.62	0.0004	0.62	0.6204	76.3%
35°F (2°C)	2.616	0.004	2.62	0.00052	0.004	0.00452	99.8%

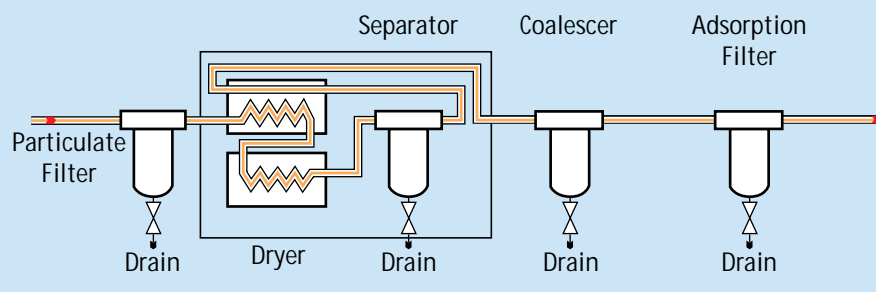
Compressor manufacturers generally agree that typical liquid oil (hydrocarbon) carryover from their equipment is 2 ppm. Compressed air at 100°F (37.8°C) will also contain 0.62 ppm of hydrocarbon vapor, for a total carryover of 2.62 ppm. Cooling the air to 35°F (2°C) (as in refrigerated drying) causes some of the vapor, 0.616 ppm, to condense, increasing the liquid hydrocarbon content to 2.616 ppm and reducing the vapor content to 0.004 ppm. Coalescing filters can remove oil only as a liquid or an aerosol. Oil vapors pass right through. Assuming a 99.98% filtration efficiency, at 100°F (37.8°C), effluent air will contain 0.0004 ppm liquid oil plus all the vapor for an actual filtration efficiency of 76.3%. At 35°F (2°C), effluent air will contain 0.00052 ppm liquid oil plus the total inlet vapor, for an actual efficiency of 99.8%.

Pyramid 2000 System



7-10 psid

Alternative Installation



5-7 psid

5-7 psid

7-10 psid

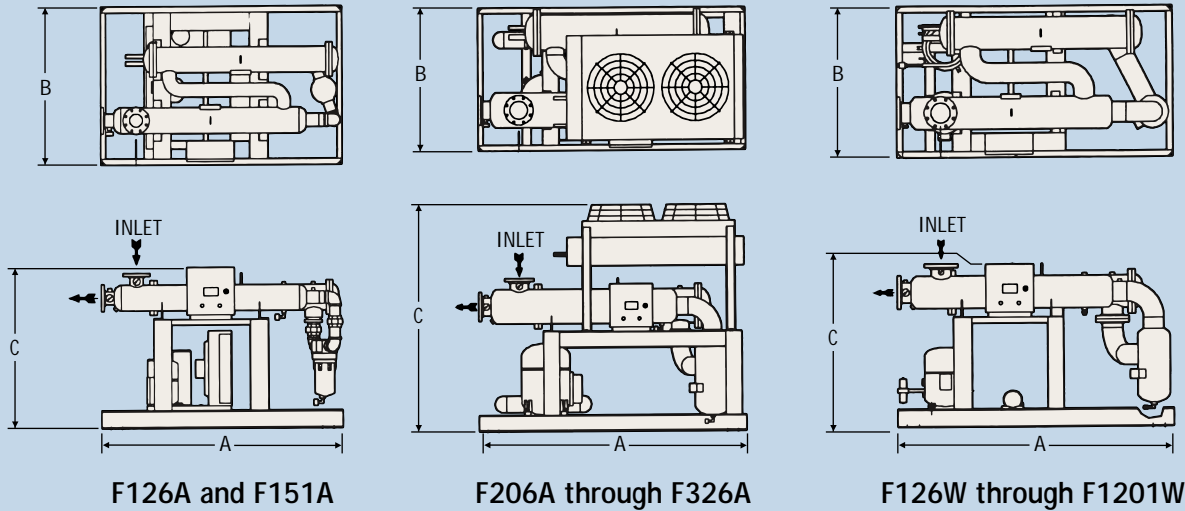
1-2 psid

TOTAL
18-26 psid

- Single engineered compressed air treatment system
- Single point installation
- Average pressure drop, 7-10 psid
- Refrigerated dryer with three accessory filters, drains and pressure gauges
- Installation of four separate components
- Average overall pressure drop, 18-26 psid

Dimensions inches (cm)

Model	A		B		C	
F126A	82.0	(208)	53.5	(136)	55.0	(140)
F151A	105.0	(266)	62.8	(159)	65.0	(165)
F206A	98.0	(249)	53.5	(136)	84.0	(213)
F251A	94.0	(239)	52.5	(133)	84.0	(213)
F326A	100.0	(254)	52.5	(133)	84.0	(213)
F126W	82.0	(208)	44.0	(112)	55.0	(140)
F151W	105.0	(266)	44.0	(112)	55.0	(140)
F206W	92.0	(233)	50.5	(128)	55.0	(140)
F251W	91.0	(231)	50.5	(128)	55.0	(140)
F326W	95.0	(241)	52.5	(133)	57.0	(145)
F401W	108.0	(274)	64.0	(162)	75.0	(190)
F501W	125.0	(317)	66.5	(169)	72.0	(183)
F626W	155.0	(392)	70.0	(178)	75.0	(190)
F826W	161.0	(409)	73.0	(185)	82.0	(208)
F1001W	159.0	(403)	88.0	(224)	87.0	(221)
F1201W	188.0	(477)	87.0	(221)	95.0	(241)



Note: For models not shown consult factory for details.



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