

Cycling Refrigerated Air Dryers

Secotec®
20 - 885 cfm



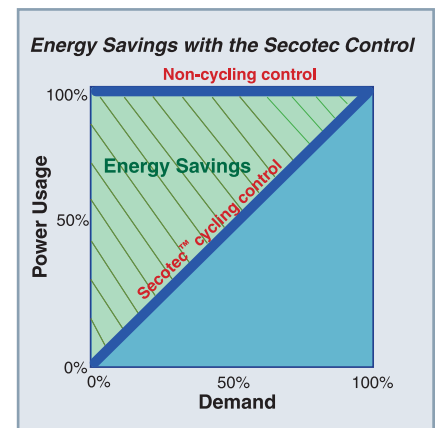
Secotec® Series

Why do we need dry air?

As atmospheric air is drawn into a compressor, water vapor is introduced as well. During compression, air heats up and is able to hold more water vapor. Mechanical separators and filters are used to remove liquid water, yet air remains saturated with water vapor. As air travels through the piping, the vapor cools, condenses, and may pass into production tools and equipment. Refrigerated dryers condense water vapor and remove the condensed liquid from the air system.

Why Secotec?

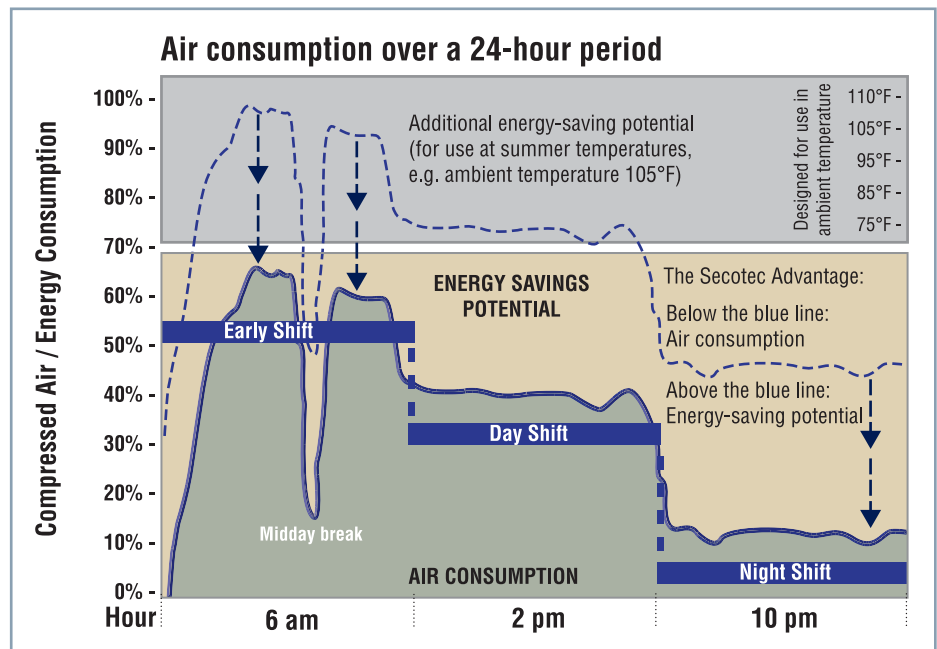
The Secotec cycling control reduces electrical consumption by operating the refrigerant compressor only when necessary. This is achieved by utilizing a thermal storage. The refrigerant system cools the medium to a certain temperature, cuts off, and then stands by until the temperature rises to a predetermined level before switching on again. Therefore, the dryer is not wasting energy when the demand is low. A non-cycling dryer continues to operate even during low demand periods.



Energy Savings

The Secotec cycling control provides the greatest savings during low demand periods such as evening and night shifts. As shown in the chart, significant savings are possible on a daily basis. During breaks, low demand periods, and shut down, the Secotec dryers save energy because the refrigerant system is shut off.

In a three-shift operation with 100%, 75% and 50% loads respectively, and power costs of \$.08 per kWh, the Secotec TF 203 costs under \$1500 per year to operate. A similarly sized non-cycling dryer costs nearly \$2400. The Secotec solution's 40% power savings pays back in 3 years.



The graph shows a typical compressed air consumption profile. Secotec dryers save energy because the refrigerant system is shut down during breaks, periods of low demand and downtime; the control system operates without fixed run-on periods. The integrated thermal mass ensures that the system is always ready for operation.

Convenient Features and Operation

Dryer Construction

All components such as heat exchangers, refrigerant circuit, condensate separator, and drain are conveniently accessible when the side panels are removed. Service connections are provided at the suction and discharge lines to check the refrigerant circuit easily. The dryer construction and component arrangement minimize the floor space required for installation.

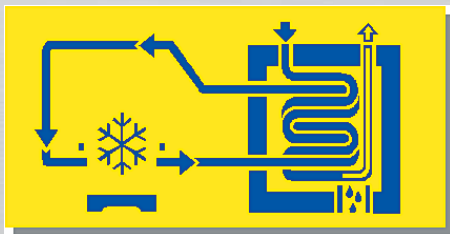
Easy and Reliable Controls

Control panel includes dew point indicator, on/off switch, and LED's indicating "power on" (active thermal storage) and "compressor on." LED's for "high dew point" are standard on models TE 91 and up and drain alarm LED is standard on TE 121 thru TF 251.



Electronic Demand Drain

Once condensate fills the collection chamber, a level sensor opens a diaphragm valve to drain the condensate. The valve then shuts before costly air can escape.



Heat Exchangers

Air-to-air and thermal storage-to-refrigerant heat exchangers are fitted with oversized copper tubing that provides low pressure drop. The smooth inner walls of the tubing also prevent fouling.

Thermal Storage

Solid media acts as storage for efficient cooling and eliminates the possibility of leakage, thereby eliminating the need for "top-off" and additives.



Separator

Highly efficient multi-stage, stainless steel separator uses centrifugal force and a stainless steel wire mesh to separate 99.9% of liquid water.

Operation

Warm compressed air entering the dryer is initially cooled in the air-to-air heat exchanger by the cold compressed air leaving the evaporator. This increases efficiency by reducing the heat load on the refrigeration system.



The air is then cooled to the dew point temperature by a refrigerant* circuit with a thermal storage medium. The chilled air leaving the evaporator is reheated in the air-to-air heat exchanger before exiting the dryer. Reheating the compressed air recovers energy and eliminates pipe sweating downstream.

The condensate formed by the cooling action is collected by a multi-stage stainless steel moisture separator. Then an automatic condensate drain reliably removes the water without wasting valuable compressed air.

* All Kaeser Secotec dryers use environmentally-friendly R 134a refrigerant.

Specifications

Model	Rated Capacity* (scfm)	Power Supply (V / Ph / Hz)	Full Load Power Consumption (kW)	Inlet / Outlet Connections (in.)	Dimensions W x D x H (in.)	Weight (lb.)		
TA 5	20	115 / 1 / 60	0.33	1/2	20 x 25 x 30	175		
TA 8	30			3/4	20 x 25 x 35	176		
TA 11	45			3/4	20 x 25 x 35	176		
TB 19	70	115 / 1 / 60	0.62	1	22 x 25 x 40	255		
TB 26	95						1.06	
TC 31	115							
TC 36	135	230 / 1 / 60	1.22	1-1/4	26 x 31 x 45	342		
TC 44	170				26 x 37 x 45	440		
TD 51	200				230 / 3 / 60	1.32	1-1/2	31 x 44 x 52
TD 61	240	460 / 3 / 60	31 x 44 x 52	632				
TD 76	285	575 / 3 / 60			2.10			2
TE 91	360	208 / 3 / 60	1.56	1.98		1455		
TE 121	460	230 / 3 / 60						
TE 141	520	460 / 3 / 60	2.38	2-1/2	42 x 70 x 83	1455		
TF 173	600	460 / 3 / 60						
TF 203	720	575 / 3 / 60					2.80	3
TF 251	885	575 / 3 / 60						

Selecting the Proper Dryer

To correct Rated Capacity for actual operating conditions, refer to "Capacity Correction Factors for Operating Conditions" and "Capacity Correction Factors for Ambient Temperature". Find the capacity correction factors corresponding to the inlet and ambient conditions. Multiply these factors to find the "overall" capacity correction factor, then multiply any dryer's rated capacity by the overall correction factor to determine its capacity at your operating conditions. Capacity correction factors for conditions not shown may be interpolated.

*Rated capacity: Based on compressed air saturated at 100°F and 100 psig and operation in a 100°F ambient.

- Maximum inlet temperature: 130°F
- Maximum/minimum ambient air temperature:
Air-cooled dryers: 110/40°F
Water-cooled dryers: 130/40°F
- Maximum allowable working pressure: 230 psig

Capacity Correction Factors for Operating Conditions

Pressure (psig)	Temperature (°F)										
	75	80	85	90	95	100	105	110	115	120	130
20	1.03	0.89	0.79	0.70	0.67	0.64	0.53	0.48	0.45	0.40	0.33
40	1.19	1.02	0.91	0.81	0.77	0.74	0.60	0.55	0.51	0.46	0.38
60	1.37	1.18	1.05	0.93	0.88	0.85	0.69	0.64	0.59	0.53	0.44
75	1.47	1.26	1.12	1.00	0.95	0.91	0.75	0.68	0.64	0.56	0.47
100	1.61	1.39	1.23	1.10	1.04	1.00	0.82	0.75	0.70	0.62	0.52
110	1.65	1.42	1.26	1.12	1.06	1.02	0.84	0.77	0.71	0.63	0.53
125	1.72	1.48	1.31	1.17	1.11	1.06	0.87	0.80	0.74	0.66	0.55
145	1.77	1.53	1.36	1.21	1.14	1.10	0.90	0.83	0.77	0.68	0.57
175	1.85	1.60	1.42	1.26	1.20	1.15	0.94	0.86	0.80	0.71	0.60
200	1.92	1.65	1.47	1.31	1.24	1.19	0.98	0.90	0.83	0.74	0.62
230	1.99	1.71	1.52	1.36	1.29	1.23	1.01	0.93	0.86	0.77	0.64

Specifications are subject to change without notice.

Capacity Correction Factors for Ambient Temperature

Factor	Ambient Air Temperature (°F)							
	75	80	85	90	95	100	105	110
	1.15	1.12	1.09	1.06	1.03	1.00	0.97	0.94



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