

Refrigerated Air Dryers

Dual Control and Demand Manager Series

600 - 3000 scfm



Energy Saving Refrigerated Dryers

A Choice of Two

Because compressed air demand fluctuates in some applications and is relatively constant in others, Kaeser offers both Dual Control and Demand Manager refrigerated dryers. The Dual Control dryer offers energy savings in applications with varying air demands, while the Demand Manager is designed to efficiently handle more consistent air flows.

Models with Dual Control offer a direct expansion, load/unload refrigeration system. The Dual Control series uses a digital scroll refrigeration system to match energy usage to air demand. This reduces energy consumption across a wide range of flows while ensuring a consistent dew point.

Demand Manager models employ a non-cycling, direct expansion refrigeration system with a rapid response by-pass, ensuring tight temperature control. The Demand Manager's controller has a

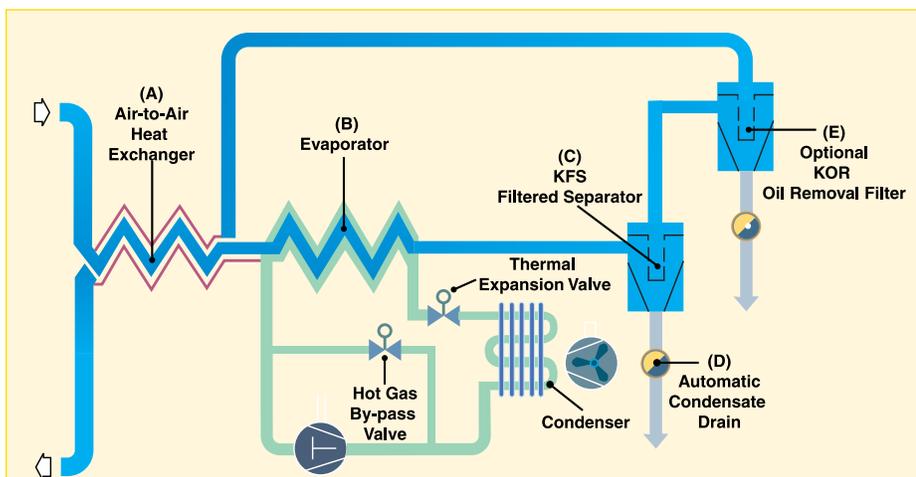
scheduling feature to match production air flow demands with no-load periods.

Demand Manager and Dual Control dryers are equipped with fully hermetic refrigeration compressors. Each maintains a nominal 38°F pressure dew point and uses environmentally friendly refrigerant. R-134A is used in the 600 and 750 scfm Demand Manager models, while R-404A is used in all other models.

Energy Efficiency

All dryer components are designed for maximum efficiency and performance:

- Low pressure drop heat exchanger
- Low pressure drop filtered separators
- No air loss drains
- Load/unload digital scroll refrigeration compressor (Dual Control Models only)
- Microprocessor controlled filter monitor (optional)



Basic Operation

Compressed air, saturated with water vapor, is pre-cooled by the outgoing chilled air in the air-to-air heat exchanger (A) and is further cooled in the evaporator (B). As the air cools, water vapor condenses into droplets. These are removed by the Filtered Separator (C) and are discharged from the dryer at the drain (D). Air then flows through an optional KOR Oil Removal Filter (E). As it exits the dryer, the air is reheated by incoming air in the air-to-air heat exchanger (A).

Note: Dual Control models do not employ hot gas by-pass valves.

1 Controller

The controller for both the Dual Control and Demand Manager control panels includes programmable start and stop timers to save energy during down time. It monitors the dryer



for overload or fault conditions and features programmable maintenance intervals as well as remote operator alert capabilities. The Dual Control model displays energy savings during low air demand. The panels also include an RS-232 communication port for remote monitoring and problem alerts.

2 Non-Fouling Heat Exchangers

Dual Control and Demand Manager dryers feature non-fouling 316 stainless steel, copper brazed, plate heat exchangers. The heat exchanger surface is stamped with a chevron pattern for extremely efficient heat transfer and durability. It also creates a smooth flow and has a self-cleaning effect, eliminating the need for pre-filtration in most applications. This advanced design offers superior performance and reliability.





3 Scroll Refrigeration Compressor

The Dual Control dryer series is equipped with energy efficient scroll refrigeration compressors. With fewer moving parts and no valves, scroll compressors are very reliable, durable, and maintenance friendly.

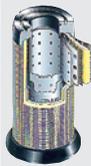
Digital Scroll compressors unload during reduced or low air demand. This results in one-to-one energy savings at all loads down to 10% of the dryer's total capacity.



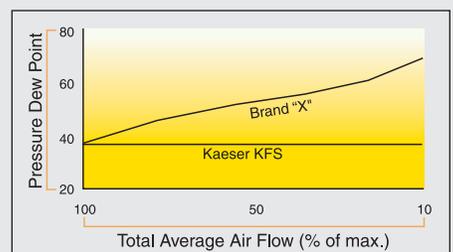
4 Integrated Coalescing Filtered Separator

Once compressed air is cooled, the condensed moisture must be removed from the air stream. To save space and reduce your installation costs, the Kaeser Filtered Separator (KFS) is standard.

The KFS has two stages to remove bulk liquid and solid particles. The first stage uses two perforated stainless steel tubes for mechanical



separation. The second stage uses in-depth fiber media to capture solid particles and liquid droplets. Unlike many other separators, the KFS is effective over a wide range of velocities/air flows. The Kaeser Filter Monitor is available as an option.



5 Automatic Condensate Drain

Each dryer is equipped with a “no loss” Eco-



Drain to remove condensed moisture from the KFS. This electronic drain only activates when liquid is present, elimi-

nating compressed air consumption. The condensate discharge circuit includes a 3-way valve to allow easy by-passing of the drain to perform routine maintenance.

6 Integrated Cold Coalescing Oil Removal Filter (optional)

For even cleaner compressed air, we offer the



integrated coalescing Kaeser Oil Removal (KOR) filter as an option. This highly effective filter uses in-depth fiber media in two stages to capture oil aerosols and

solid particles meeting ISO Class 2 for both. The KOR filter is located at the coldest point in the system to take maximum advantage of condensed oil vapors and oil aerosols. This option is incorporated inside the dryer cabinet and further reduces your space requirements and installation costs.

Optional Filter Monitor

Available for the KFS and KOR, the digital filter monitor indicates optimum element replacement time based on operating time, differential pressure, and filter type.



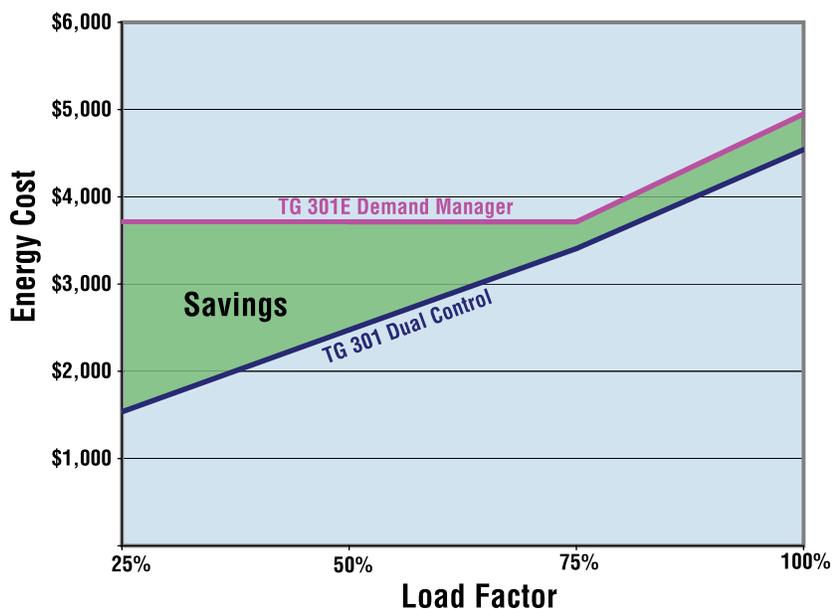
Selecting the Best Control Solution for Your Application

Dual Control and Demand Manager dryers are each suited for certain operating scenarios. The Dual Control dryer matches energy consumption to demand and is recommended when demand will vary significantly in continuous operation. Depending on your power costs, it may even be cost effective in one or two-shift operations.

When air demand is uniform and closely matches dryer capacity, the Demand Manager may be preferred. This is especially true for single shift operation with weekend shut-downs, since the Demand Manager allows the user to pre-program dryer on-off times for each day in a week.

If you are not sure which dryer is most cost effective for you, your Kaeser distributor can provide an energy cost analysis for your particular application.

Additional Energy Savings with Dual Control Dryers



This example compares the energy costs of two TG 301 1000 cfm dryers, one Dual Control and the other Demand Manager. Assuming continuous operation and a mixed load profile (25%, 50%, 75% and 100% for six hours each), the Dual Control saves \$1032 annually and the simple payback is less than 25 months with electricity costs of \$0.08/kWh.

Dryer Sizing and Correction Factors

Selecting the Proper Dryer

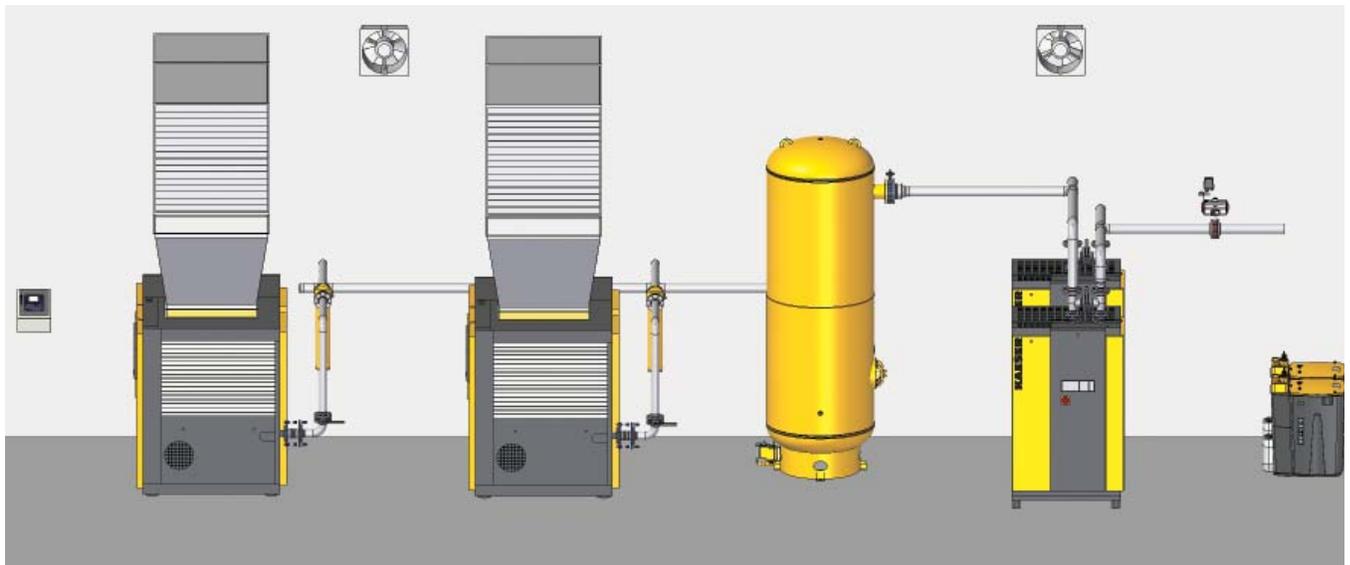
To correct Rated Capacity for actual operating conditions, refer to “Capacity Correction Factors for Operating Conditions” and “Capacity Correction Factors for Ambient Temperature”. Find the capacity correction factors corresponding to the inlet and ambient conditions. Multiply these factors to find 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. Contact the factory if assistance is needed.

Table 1
Capacity Correction Factors for Operating Conditions

Pressure (psig)	Temperature (°F)								
	80	85	90	95	100	105	110	115	120
80	1.50	1.34	1.17	1.06	0.95	0.87	0.79	0.73	0.66
100	1.55	1.39	1.23	1.12	1.00	0.91	0.82	0.76	0.70
110	1.58	1.42	1.26	1.15	1.03	0.94	0.86	0.79	0.72
125	1.63	1.47	1.31	1.19	1.07	0.99	0.91	0.83	0.74
145	1.69	1.52	1.36	1.24	1.12	1.03	0.94	0.87	0.79
175	1.75	1.59	1.42	1.30	1.18	1.09	0.99	0.92	0.84
200	1.80	1.64	1.47	1.35	1.22	1.13	1.03	0.96	0.89
230	1.82	1.66	1.49	1.37	1.24	1.15	1.05	0.98	0.91

Table 2
Capacity Correction Factors for Ambient Temperature

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



Dual Control Specifications

Model	Air-cooled Rated Capacity* (scfm)	Power Supply (V / Ph / Hz)	Inlet/Outlet Connections (in.)	Dimensions W x D x H (in.)	Weight (lb.)	
					Air-cooled	Water-cooled
TG 301	1000	208-230 / 3 / 60 460 / 3 / 60 380-420 / 3 / 50 575 / 3 / 60	3 Flg	50 x 41 x 83 ¹ / ₈	1146	1068
TH 371	1300		4 Flg	50 x 51 x 83 ¹ / ₈	1521	1406
TH 451	1500				1563	1423
TI 521	1750		6 Flg	57 x 60 x 83 ¹ / ₈	1940	1755
TI 601	2000				1997	1812
TI 751	2500				2315	2091
TI 901	3000				2646	2370

Demand Manager Specifications

Model	Air-cooled Rated Capacity* (scfm)	Power Supply (V / Ph / Hz)	Inlet/Outlet Connections (in.)	Dimensions W x D x H (in.)	Weight (lb.)	
					Air-cooled	Water-cooled
TF 171E	600	208-230 / 3 / 60 460 / 3 / 60 380-420 / 3 / 50 575 / 3 / 60	2½ NPT(M)	32 x 42 x 58	691	631
TF 210E	750				734	674
TG 301E	1000		3 Flg	50 x 41 x 83 ¹ / ₈	1146	1068
TH 371E	1300		4 Flg	50 x 51 x 83 ¹ / ₈	1521	1406
TH 451E	1500				1547	1446
TI 521E	1750		6 Flg	57 x 60 x 83 ¹ / ₈	1940	1755
TI 601E	2000				1986	1801
TI 751E	2500				2315	2091
TI 901E	3000				2646	2370

*Air-cooled rated capacity: Based on compressed air saturated at 100°F and 100 psig and operation in a 100°F ambient. For water-cooled capacity (with cooling water temperatures less than or equal to 95°F) multiply the air-cooled capacity by 1.15.

- 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

Specifications are subject to change without notice.

KAESER COMPRESSORS

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