

# 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

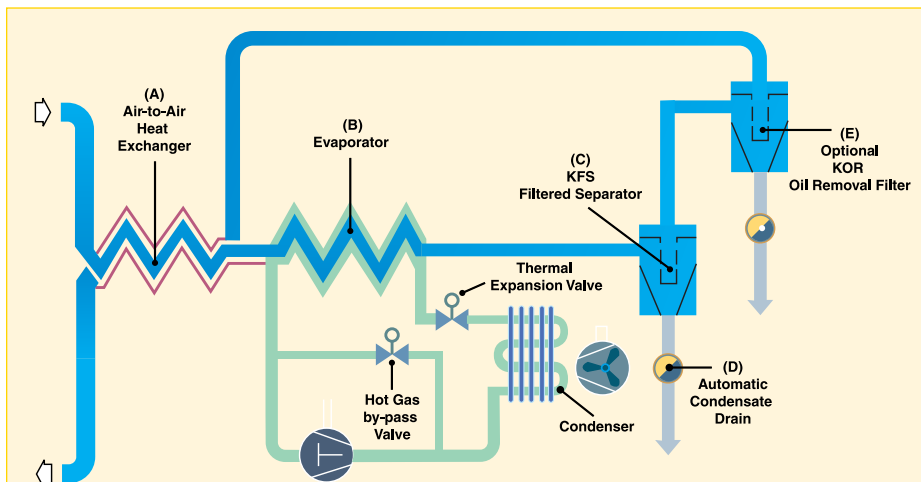
scheduling feature to match production air flow demands with no-load periods.

Demand Manager dryers are equipped with fully hermetic reciprocating refrigeration compressors while Dual Control dryers are supplied with the revolutionary Digital Scroll type. Each maintain a nominal 38°F pressure dew point and use 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 it cools, water vapor condenses into droplets. These are removed by the Filtered Separator (C), and 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

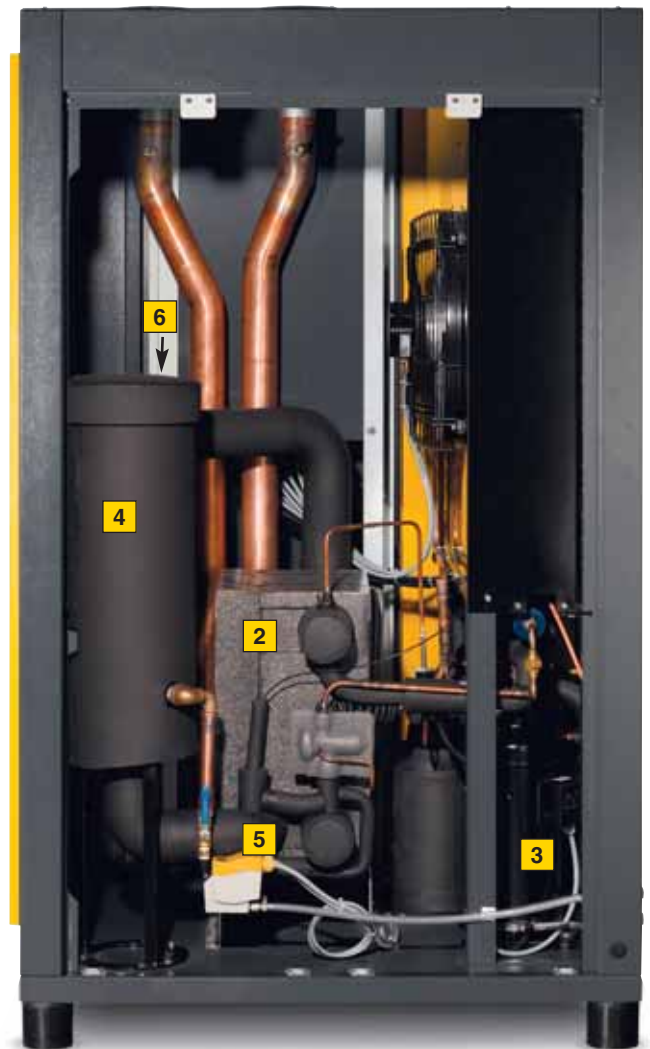


for overload or fault conditions and features programmable maintenance intervals as well as remote operator alert capabilities. The Dual Control model also features a bar graph that displays energy savings during low air demand. The panels also include an RS-232 communication port for remote monitoring 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, self-cleaning effect, eliminating the need for pre-filtration. 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.

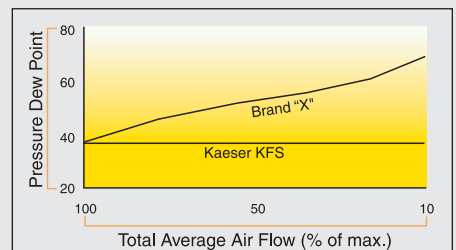


### 4 Integrated Coalescing Filtered Separator

Once compressed air is cooled, the condensed moisture must be removed from the air stream. To save space and reduce installation costs, the Kaeser Filtered Separator (KFS) is standard in each dryer. 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 down to 3 microns in size. The Separator is properly designed to prevent moisture from re-entering the compressed air stream. It consistently removes moisture over a wide range of velocities/air flow. The Kaeser Filter Monitor is available as an option.



## 5 Automatic Condensate Drain

Each dryer is equipped with our Eco-Drain to



remove condensed moisture from the KFS. This easily accessible “no loss” electronic drain employs a

capacitance sensor that only activates when liquid is present, minimizing the consumption of compressed air. A patented 3/2 way valve ensure that control air is contaminant free.

## 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 trap

and reduce oil aerosols to 0.01 ppm<sub>w</sub> and solid particles down to 0.01 micron. 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 space requirements and installation. The Kaeser Filter Monitor is available as an option.



Optional filter monitor

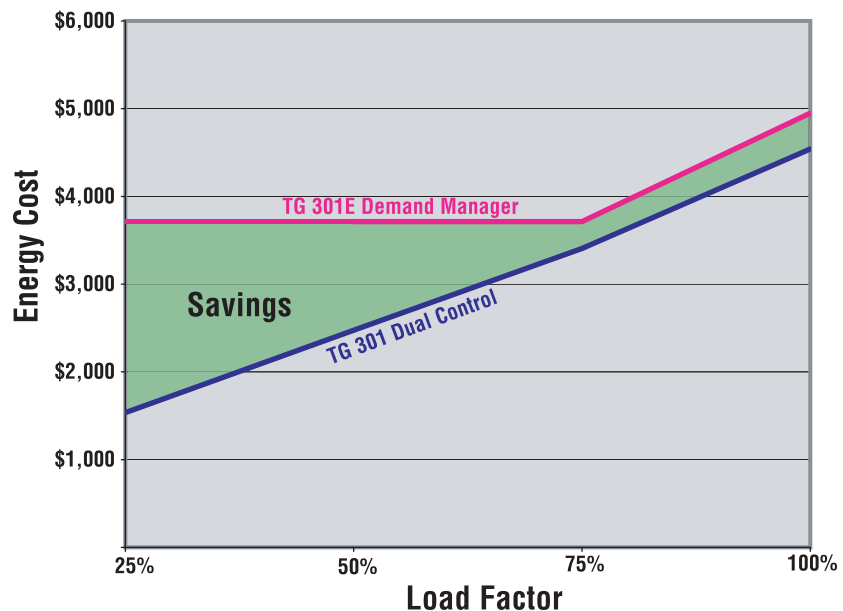
## Selecting the Best Control Solution for Your Application

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 operation.

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

**Table 1**  
Pressure and Temperature

Pressure (psig)	Temperature (°F)									
	80	85	90	95	100	105	110	115	120	
20	1.00	0.87	0.80	0.71	0.65	0.59	0.53	0.49	0.45	
40	1.30	1.16	1.01	0.91	0.80	0.73	0.66	0.59	0.53	
60	1.40	1.25	1.09	1.98	0.88	0.80	0.72	0.66	0.59	
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**  
Ambient Air / Cooling Water 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	

**Table 3**  
Outlet Dew Point Capacity Correction Factors

Outlet Dew Point (°F)	38	39	40	41	42	43	44	45	50
Factor	1.00	1.03	1.06	1.09	1.11	1.14	1.17	1.20	1.30

### Dryer Sizing

To select a dryer for your application, first find the capacity correction factors that correspond to your compressed air pressure and temperature from Table 1 and the ambient air temperature or cooling water temperature from Table 2. Multiply the two factors together to find the overall capacity correction factor. Multiply a dryer's rated capacity by the overall capacity correction factor to determine the dryer's capacity at your operating conditions. Outlet dew point correction factors may be used when the required dew point is greater than 38°F.



## Dual Control Specifications

Model	Rated Capacity @ 38°F (scfm)	Rated Capacity @ 50°F (scfm)	Max. Working Pressure (psig)	Available Voltages	Inlet/Outlet Connections (in.)	Dimensions H x W x D (in.)	Weight (lb.)	
							Air Cooled	Water Cooled
TG 301	1000	1300	232	208-230/3/60 460-3-60 380-420/3/50 575/3/60	3 Flg	85 x 50 x 41	1146	1068
TH 371	1300	1690			4 Flg	85 x 50 x 51	1521	1323
TH 451	1500	1950			6 Flg	85 x 57 x 60	1563	1406
TI 521	1750	2275					1940	1755
TI 601	2000	2600					1997	1812
TI 751	2500	3250					2315	2091
TI 901	3000	3900					2646	2370

## Demand Manager Specifications

Model	Rated Capacity @ 38°F (scfm)	Rated Capacity @ 50°F (scfm)	Max. Working Pressure (psig)	Available Voltages	Inlet/Outlet Connections (in.)	Dimensions H x W x D (in.)	Weight (lb.)	
							Air Cooled	Water Cooled
TF 171E	600	780	232	208-230/3/60 460-3-60 380-420/3/50 575/3/60	3 NPT	58 x 28 x 65	691	662
TF 210E	750	975					734	661
TG 301E	1000	1300					3 Flg	85 x 50 x 41
TH 371E	1300	1690			4 Flg	85 x 50 x 51	1521	1323
TH 451E	1500	1950					1547	1406
TI 521E	1750	2275			6 Flg	85 x 57 x 60	1940	1755
TI 601E	2000	2600					1986	1812
TI 751E	2500	3250					2315	2091
TI 901E	3000	3900					2646	2370

Maximum inlet air temperature: 120°F. Minimum/Maximum ambient temperature: 45°F/110°F.  
Capacities are per CAGI standards ADF 100 conditions.

*Specifications are subject to change without notice.*



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## The Air Systems Specialist

With over 85 years of experience, Kaeser is the air systems specialist. Our extensive 100,000 square foot facility allows us to provide unequalled product availability. With service centers nationwide and our 24-hour emergency parts guarantee, Kaeser customers can rely on the best after-sales support in the industry. Kaeser stands committed to providing the highest quality air system for your specific compressed air needs.