KAESER COMPRESSORS

Built for a lifetime.™

Refrigerated Air Dryers

Dual Control and Demand Manager Series

800 - 3000 scfm @ 100 psig

Energy Saving Refrigerated Dryers

A Choice of Two

Depending on the application, the compressed air demand can remain steady or fluctuate. To meet these varying needs Kaeser offers two refrigerated air dryers: the Dual Control and Demand Manager refrigerated dryer series. The Dual Control (800 to 3000 cfm) is ideally suited for applications with varying air demands, while the Demand Manager (1000 to 3000 cfm) is designed to efficiently handle a constant and steady air demand.

Energy Efficiency

All dryer components are designed for maximum efficiency and performance.

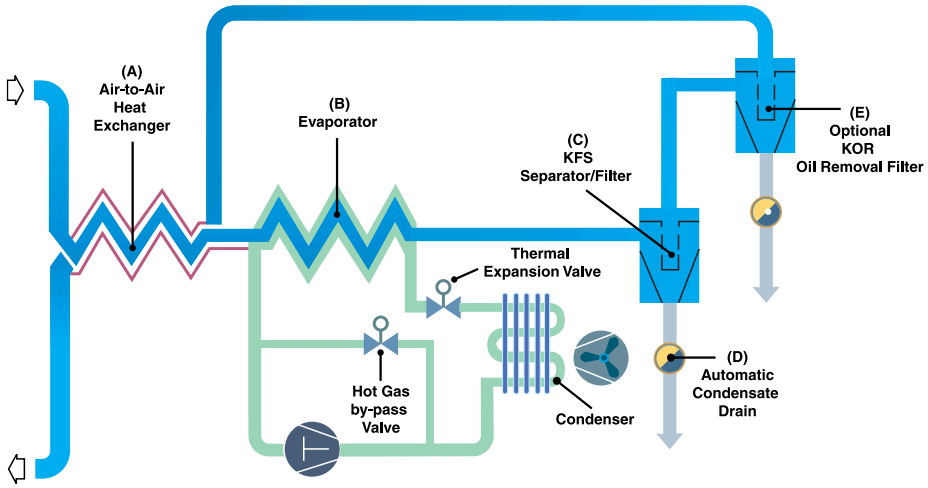
- On/off load digital scroll refrigeration compressor (Dual Control Models only)
- Low pressure drop heat exchanger
- Low pressure drop filtered separators
- Microprocessor controlled filter monitor
- No air loss drains

The Dual Control series uses a digital scroll refrigeration system to match energy usage to air demand.

The Demand Manager uses a scheduling feature to match production air flow demands with off-load periods.

Operation Basics

Compressed air, saturated with water vapor, enters the air-to-air heat exchanger (A), is precooled by the outgoing chilled air. It is directed to the air-to-refrigerant (evaporator) heat exchanger (B) and is further cooled by the refrigeration system. As the air is cooled, water vapor condenses into liquid droplets, is removed by the Separator/Filter (C), and discharged from the dryer by a "no air loss" drain (D). Air then flows through an optional KOR Oil Removal Filter (E). The dry, oil-free, air enters the air-to-air heat exchanger and is reheated before exiting the dryer.



Demand Manager Diagram shown

1 Refrigeration scroll compressor

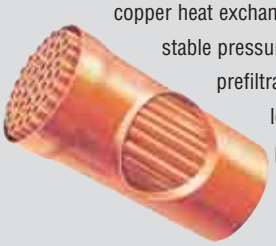
Both dryer series are equipped with energy efficient refrigeration scroll compressors. With fewer moving parts and no valves, scroll compressors are very reliable, durable and maintenance friendly. The Dual Control series is supplied with a "digital" scroll compressor featuring unloading capability during low air demand. This results in energy savings of up to 91%.

2 Controls

State-of-the-art control system features timed auto start and stop 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.

3 Heat exchanger

Kaeser's traditional, non-fouling, smooth-tube, copper heat exchangers provide stable pressure dewpoints. No prefiltration required for low total system pressure drop.



4 Filter monitor

Microprocessor provides detailed information for optimal filter change intervals. The filter monitor is standard with KFS filter and with the optional KOR filter.

5 Filtered separator

Standard Filter/Separator (KFS) with filter monitor removes bulk liquids and particulates to 3 microns.

6 Optional filter

Space-saving optional Cold Coalescing Oil Removal (KOR) Filter eliminates oil aerosols to 0.008 ppm (0.01/mg/m³).

7 Drain traps are easy to reach

Easily accessible “no air loss” electronic demand drains with time delay feature reduce cycle frequency.

The Refrigeration System

Models with Dual Control offer a direct expansion, on/off load refrigeration system ensuring a consistent dew point across a wide range of flows. The heart of the system is the digital scroll refrigeration compressor that precisely matches the amount of drying energy (kW) to the heat load.

Demand Manager models are supplied with a non-cycling, direct expansion refrigeration system with a rapid response by-pass ensuring tight temperature control.

Both models employ a superior scroll compressor and maintain a stable 38°F dew point and use environmentally friendly R404a refrigerant.

Non-Fouling Heat Exchangers

Kaeser's heat exchangers feature non-fouling, smooth-tube, copper heat exchange surfaces. This allows for lower pressure drops and eliminates the need for prefiltration.

An advanced multi tube-in-tube design offers three times more surface than other designs. Splitting the air flow into multiple tubes enhances the heat transfer rate and provides proper compressed air cooling.

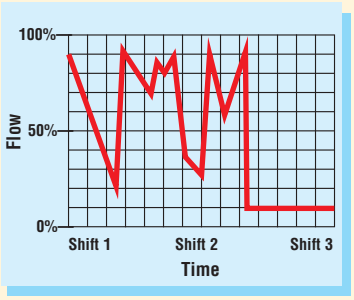
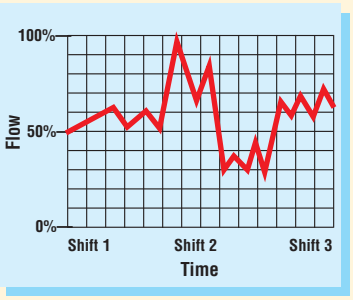
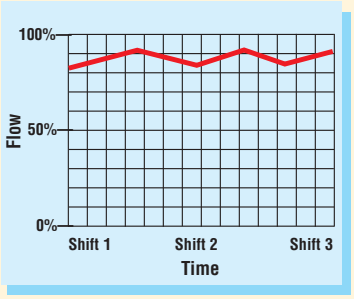
Control Panels

Standard features for both the Dual Control and Demand Manager control panels include programmable start and stop timers and maintenance intervals. The panels also include an RS-232 communication port for remote monitoring and problem alerts. The Dual Control panel offers an additional LED bar graph that displays dryer load in comparison to energy used.

Available Digital Scroll Technology

The heart of the Dual Control system is the digital scroll refrigeration compressor. The Dual Control perfectly matches energy consumption to demand and then determines the amount of cooling energy needed to be sent back to the heat exchanger. For example, with a 60% air demand, the controller tells the digital scroll compressor to operate loaded at 60% of the time. The compressor is off loaded the remaining time, saving 40% energy.

The Best Control Solution for Your Application

			
Air Demand Profile	**Varying Demand** 1 or 2 shifts	**Varying Demand** 3 shifts	**Steady, High Flow Demand** 3 shifts 24/7
Best Return on Investment	**Dual Control**	**Dual Control**	**Demand Manager in schedule mode**

Note: Always perform a plant audit to determine the best long term solution. Statistics show that most applications will benefit from dryers equipped with Dual Control

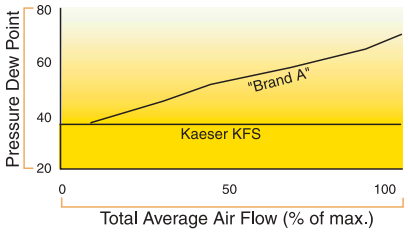
Separation/Filtration

Integrated KFS Coalescing Separator/Filter

Once compressed air is cooled, the condensed moisture must be effectively removed. The KFS Separator/Filter uses two stages to remove bulk liquid and solid particulates to 3 microns in size.

- First stage - two stainless steel orifice tubes provide 10-micron mechanical separation
- Second stage - in-depth fiber media captures solid and liquid particles to 3 microns in size

The KFS Separator / Filter is properly designed to prevent moisture from re-entering the compressed air stream, and consistently remove moisture at lower velocities (lower loads). The Kaeser Filter Monitor is standard with all KFS Separator / Filters.

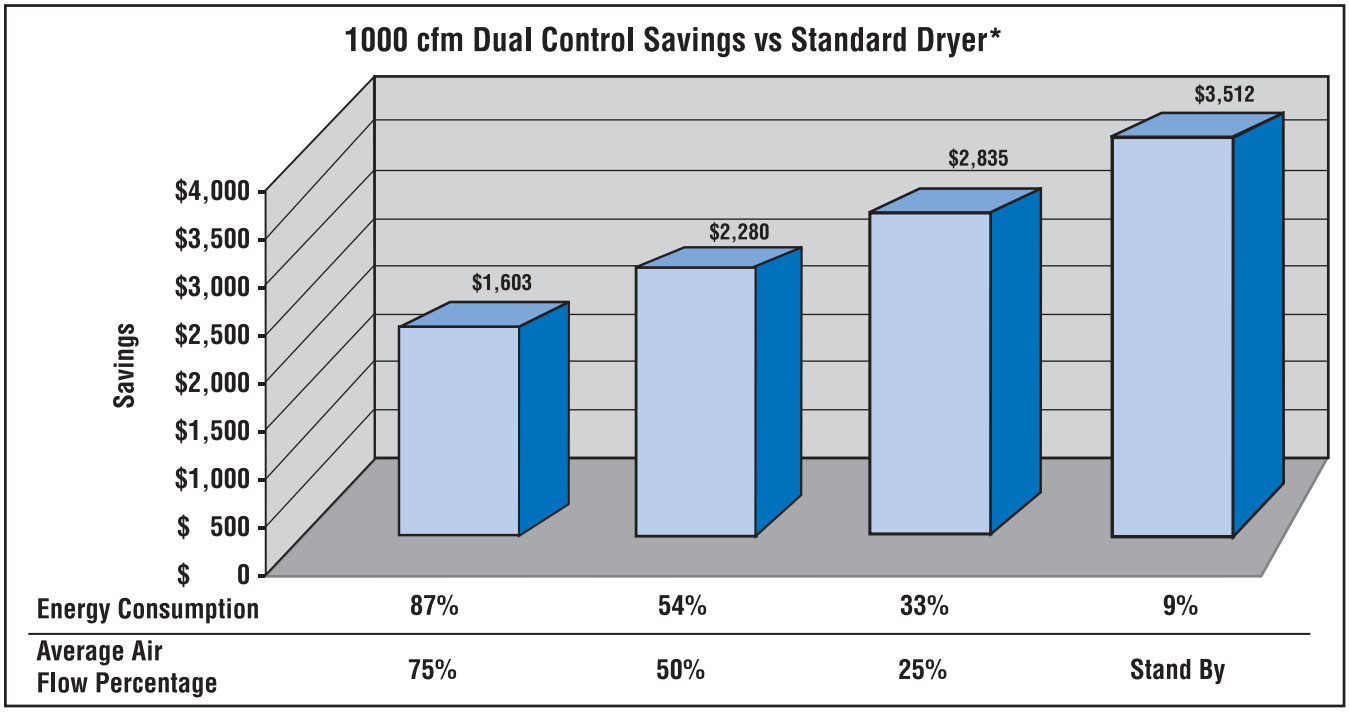


Integrated KOR Coalescing Oil Removal Filter (optional)

The KOR high efficiency oil removal filter can be integrated into the refrigerated dryer and eliminate the need for a separate filter vessel and piping outside of the dryer. The KOR filter is located at the coldest point in the system to take maximum advantage of condensed oil vapors and oil aerosols. The KOR effectively uses two stages to remove oil aerosols to 0.008 ppm (0.01 mg/m3) and solid particulates to 0.01 micron in size.

- First stage - multiple layers of fiber media and media screen remove larger particles, pre-filtering the air for the second stage
- Second stage - multiple layers of bonded, blended fiber media for fine coalescence capture fine oil aerosols and solid particles.

Kaeser filter monitor is standard with KOR option.



Compared to non-cycling dryer with 100°F inlet and ambient temperature, 100 psig operating pressure and 8760 working hours per year, kW is $0.08 per hour.

Dual Control Specifications

Model	Flow @ 38°F (scfm)	Flow @ 50°F (scfm)	Max. Working Pressure (psig)	Nominal Refrigeration (hp)	Input Power (kW) (1)	Available Voltages (2)	Inlet/Outlet Connections (in.)	Dimensions H x W x D (in.)	Weight (lb.)
TG 241	800	1040	200	4.0	4.28	208-230/3/60 460-3-60 380-420/3/50 575/3/60	3 Flg	85 x 49 x 41	1475
TG 301	1000	1300		6.0	4.68				1545
TH 371	1300	1690		6.0	6.34		4 Flg	85 x 50 x 51	1610
TH 451	1500	1950		8.0	8.68				1655
TI 521	1750	2275		8.0	10.35		6 Flg	85 x 57 x 60	2250
TI 601	2000	2600		10.0	11.27				2250
TI 751	2500	3250		12.0	14.00				2390
TI 901	3000	3900		14.0	18.33				2500

Demand Manager Specifications

Model	Flow @ 38°F (scfm)	Flow @ 50°F (scfm)	Max. Working Pressure (psig)	Nominal Refrigeration (hp)	Input Power (kW) (1)	Available Voltages (2)	Inlet/Outlet Connections (in.)	Dimensions H x W x D (in.)	Weight (lb.)
TF 171E	600	780	200	3.0	2.6	208-230/3/60 460-3-60 380-420/3/50 575/3/60	3 NPT	58 x 28 x 65	885
TF 210E	750	975		3.0	3.6				920
TG 301E	1000	1300		6.0	5.83		4 Flg	85 x 50 x 51	1540
TH 371E	1300	1690		7.5	6.73				1600
TH 451E	1500	1950		9.0	7.52				1650
TI 521E	1750	2275		10.0	9.89		6 Flg	85 x 57 x 60	2200
TI 601E	2000	2600		12.0	10.70				2240
TI 751E	2500	3250		15.0	12.81				2300
TI 901E	3000	3900		17.5	16.92				2500

Maximum inlet air temperature: 120°F. Minimum/Maximum ambient temperature: 45°F/110°F.
Maximum operating pressure: 200 psig. (1) Input kW @ 35°F ambient, 460/3/60 nominal voltage.
(2) Other voltages available - contact Kaeser.
Capacities are per CAGI standards ADF 100 conditions.
Specifications are subject to change without notice.

Correction Factors

Inlet Air Pressure		Inlet Air Temperatures		Ambient Temperature	
psig	Factor	°F	Factor	°F	Factor
20	1.54	75	0.57	75	0.86
40	1.25	80	0.65	80	0.89
60	1.12	85	0.75	85	0.92
75	1.07	90	0.81	90	0.96
100	1.00	95	0.91	95	0.97
110	0.97	100	1.00	100	1.00
125	0.96	105	1.11	105	1.03
145	0.94	110	1.22	110	1.06
175	0.81	115	1.33	—	—
195	0.90	120	1.43	—	—
250	0.87	—	—	—	—
300	0.85	—	—	—	—

Dryer sizing

Kaeser refrigerated dryers are rated for 100°F inlet air at 100 psig and 100°F ambient temperature. To select a dryer for your application, first correct the actual system conditions for these "rated" conditions. Using the chart to the right, multiply your inlet air flow by each factor to get the Minimum Required Rated Capacity for your dryer.

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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 unequaled 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.

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