

Adsorption Desiccant Air Dryer

KAD Series

40 to 5400 scfm @ 100 psig



Reliable Heatless Regenerative Desiccant Air Dryer

Kaeser Low Dew Point Adsorption Desiccant Dryers (KAD) produce consistent dew points with minimum purge air and pressure drop while maximizing service time and desiccant life.

Superior design

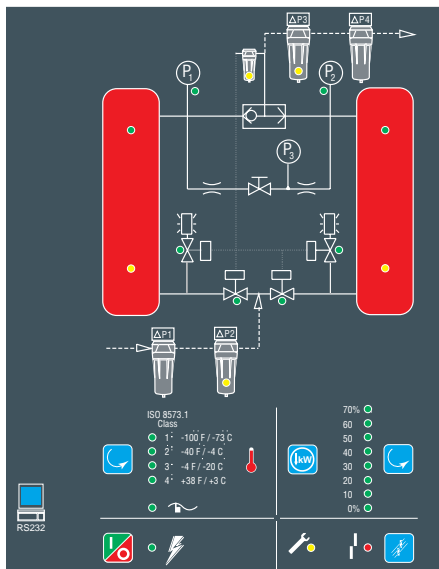
KAD Dryers are designed for energy-efficient operation with high-quality components for optimal performance.

Controlling the velocity through the desiccant bed is key to a dryer's efficiency. Precise amounts of Kaeser's proprietary desiccant beads combined with premium valves, control the air's velocity to prevent fluidization and desiccant breakdown. Up-flow drying coupled with down-flow desiccant regeneration provides the driest air possible.

The KAD is designed for a minimum of 4.8 seconds of contact time to ensure that the saturated inlet air is dried. Each tower is pressurized slowly at the end of each purge cycle to prevent desiccant bed movement.

The KAD is equipped with the latest in valve design, offering low pressure drop and reliability.

Standard controller



Reducing the amount of time the dryer spends purging in the regeneration cycle saves energy. Eight settings (0% to 70% in 10% increments) allow the customer to reduce regeneration requirements by matching reduced air flows to lower purge flows. Each energy-saving setting has an LED that illuminates when selected. Simply select the desired energy saving setting with the supplied switch. The controller has four fixed cycle operating modes corresponding to ISO 8573.1 Air Quality Classes (see chart below).

Other features include:

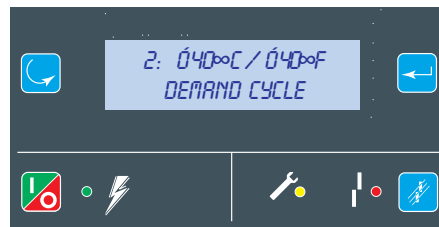
- Switches for ISO Class dew point, On/Off, Alarm and Service reminder reset
- Service reminder LED lights for filters, drains, valves, and desiccant
- Normal and severe service intervals setting
- Valve switching failure LED alarm
- RS232 communications port

Standard instrumentation

Features:

- Left and right tower pressure gauges
- Purge pressure gauge
- Moisture indicator — alerts operator of elevated dew point
- KAD Series or KAD-PS Series electronic control panel

Optional Purge Saver Controller



The Purge Saver controller minimizes purge air usage when operating at reduced loads. At full load, the desiccant tower contains five minutes of drying capacity. At less than full load, the controller monitors temperature changes in the desiccant beds, and keeps the towers on-line until the full drying capacity is reached. For example at 50% load the tower is able to stay on-line for 10 minutes instead of the usual 5 minutes, reducing average purge by about 50%. This controller has four fixed cycle operating modes corresponding to ISO 8573.1 Air Quality Classes (see chart).

Four Dew Point Options per ISO 8573.1 Air Quality Standards

KAD Series dryers designs are optimized to match four pressure dew point classes of the ISO 8573.1 Air Quality Standard. Select Dew Point per ISO 8573.1 Quality Classes

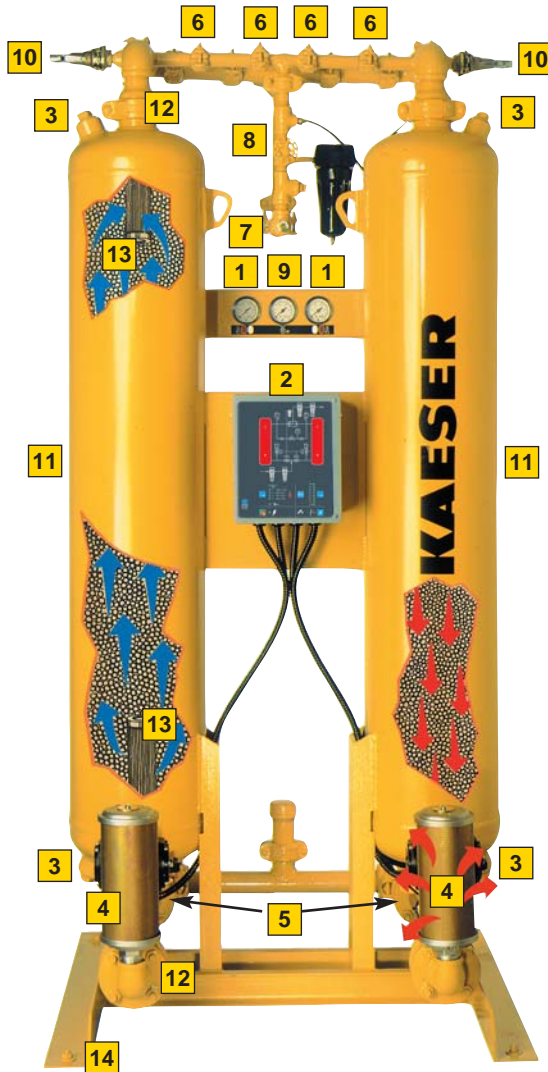
| ISO 8573.1 Class | Dew Point | Remaining Moisture** | | Cycle Time and Mode | |
|------------------|-----------------|----------------------|-------------------|---------------------|------------------------------------|
| | | ppmw | mg/m ³ | KAD Series | KAD-PS Series*** Energy Savings |
| 1 | -100°F (-73°C)* | 0.12 | 0.15 | 4 min. fixed | -- |
| 2 | -40°F (-40°C) | 10 | 12 | 10 min. fixed | Demand |
| 3 | -4°F (-20°C) | 81 | 97 | 16 min. fixed | Demand |
| 4 | +38°F (+3°C) | 610 | 730 | 24 min. fixed | Demand |

* This performance exceeds Quality Class 1 set at -94°F (-70°C)

** At 100 psig (7 bar)

*** The KAD Series controller also offers fixed cycle settings

An inside look at an outstanding air dryer



590-5400 cfm design shown

- 1 Standard tower pressure gauges**
- 2 Standard easy access front control panel**
 - Power on light
 - On-off switch
- 3 Separate fill and drain ports standard**
 - Easy desiccant replacement

- 4 Standard heavy-duty purge exhaust mufflers**
 - Quiet operation
- 5 Non-lubricated inlet control valve(s) standard**
 - Requires less maintenance
 - Long lasting
- 6 Standard Teflon® seated check valves**

- 7 Standard moisture indicator**
 - Color change indicates elevated outlet dew point
- 8 Standard purge flow valve**
 - Convenient purge rate adjustment
- 9 Standard purge flow indicator**
 - Visual indicator of purge rate
- 10 Standard pressure relief valves**
- 11 ASME code constructed and stamped pressure vessels**
- 12 Grooved pipe connections on pipe sizes 2" and larger are standard**
 - Prevents leaking
- 13 Standard stainless steel support screens and air diffusers (top and bottom of vessels)**
 - Easy to remove and clean
 - Efficiently filters out large contaminants and protects valves
 - Effectively prevents channeling
- 14 Structural steel frame is complete with floor stand**
 - Easy installation
 - Dryer is completely assembled, piped and wired at factory
 - Optional factory mounting of pre- and after-filters
 - Shipped with full charge of desiccant
 - Only utility hook-up is required
 - Lifting lugs for easy handling

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Operation

Models KAD 40 through KAD 5400:

The main air stream enters drying Tower I (see Figure 1) through inlet switching valve (A), is dried by the adsorptive capacity of the desiccant, and is directed by a system of check valves (B) to the air outlet.

A portion of dried air is expanded to near atmospheric pressure by means of an adjustable purge rate valve (C) and purge orifice (D).

This extremely dry, low pressure purge air flows through the wet desiccant and regenerates the desiccant in Tower II by absorbing the moisture.

The now moisture-laden purge air is exhausted through purge/repressurization valve (E) and exhaust muffler (F) to the atmosphere.

After a predetermined period, the timer closes the purge/repressurization valve (E) which allows Tower II to slowly repressurize. Inlet switching valve (A) then closes and inlet switching valve (G) and purge/repressurization valve (H) open.

The main air flow is now dried by Tower II (see Figure 2) while Tower I is being reactivated. Purge flow is now exhausted through purge/repressurization valve (H) and muffler (J).

Filtration

Filtration is essential to maintaining dryer performance. Optional space-saving integrated pre-filter and after-filter packages featuring Kaeser coalescing filters are pre-installed on custom brackets within the dryer's footprint. This option requires no additional floor space for models 40 to 450 scfm. Filtration options are as follows:

- KFS and KOR pre-filters are recommended for -40°F to $+38^{\circ}\text{F}$ dew points
- KPF and KOX pre-filters are recom-

mended for -100°F dew points

- KPF-RF (reverse flow) and KVF are recommended after-filters

Options

- Purge saver controller
- Filter monitors and bypass piping are available for required filtration.
- Other options include: high humidity alarm, digital dew point monitor, other power supplies, high pressure models, severe environment finishes and special applications, such as offshore drilling. Consult factory for NEMA 7 and 12.



Optional filtration shown for 40 to 450 cfm models.

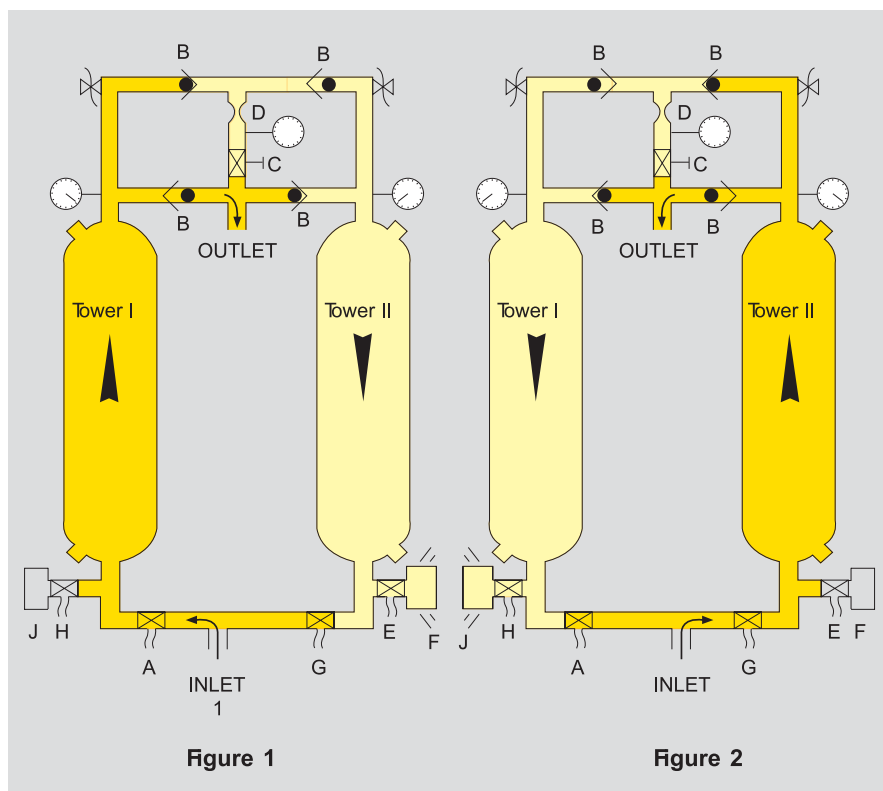


Figure 1

Figure 2

Flow Capacities

Maximum inlet flow capacities at various pressures:

To determine maximum inlet flow at inlet pressures other than 100 psig, multiply inlet flow from Table 1 by multiplier from

Table 2 that corresponds to system pressure at dryer inlet.

Outlet flow capacities

To determine outlet flow capacity subtract maximum purge flow from inlet flow. For dryers operating at less than maximum flow and using the Purge Economizer

feature and/or operating at pressures above 100 psig, contact factory for correct purge flow.

High flow models:

For applications requiring flow rates greater than listed in Table 1, please contact Kaeser.

Table 1 - Kaeser Desiccant Dryers

| Model | Inlet Flow (scfm) @ 100 psig | Purge Rate (scfm) 50 to 100 psig | | Air Available Avg. (scfm) | Down-stream Min. (scfm) | Electrics | Dimensions L x W x H (in.) | In/Out Connections (in.) | Weight (lbs.) |
|----------|------------------------------|----------------------------------|------|---------------------------|-------------------------|--|----------------------------|--------------------------|---------------|
| | | Avg. | Max. | | | | | | |
| KAD 40 | 40 | 6.5 | 7.9 | 33.5 | 32.1 | 120-1-60 NEMA 4 Standard Other Voltages Available | 26 x 26 x 74 | ½ NPT | 365 |
| KAD 60 | 60 | 8.6 | 10.5 | 51.4 | 49.5 | | 26 x 26 x 76 | ¾ NPT | 445 |
| KAD 90 | 90 | 11.5 | 14.0 | 78.5 | 76.0 | | 33 x 33 x 76 | ¾ NPT | 575 |
| KAD 115 | 115 | 16.6 | 20.1 | 98.4 | 94.9 | | 33 x 33 x 76 | 1 NPT | 650 |
| KAD 165 | 165 | 23.8 | 28.9 | 141.2 | 136.1 | | 33 x 33 x 76 | 1 NPT | 685 |
| KAD 260 | 260 | 37.4 | 45.5 | 222.6 | 214.5 | | 44 x 44 x 80 | 1½ NPT | 1010 |
| KAD 370 | 370 | 53.3 | 64.8 | 316.7 | 305.2 | | 44 x 44 x 81 | 1½ NPT | 1215 |
| KAD 450 | 450 | 64.8 | 78.8 | 385.2 | 371.2 | | 44 x 44 x 82 | 1½ NPT | 1350 |
| KAD 590 | 590 | 85 | 103 | 505 | 487 | | 52 x 48 x 95 | 2 NPT | 2205 |
| KAD 750 | 750 | 108 | 131 | 642 | 619 | | 52 x 48 x 97 | 2½ NPT | 2705 |
| KAD 930 | 930 | 134 | 163 | 796 | 797 | | 58 x 56 x 102 | 2½ NPT | 3228 |
| KAD 1130 | 1130 | 163 | 198 | 967 | 932 | | 62 x 57 x 104 | 3 FLG | 3740 |
| KAD 1350 | 1350 | 194 | 236 | 1156 | 1114 | | 63 x 57 x 109 | 3 FLG | 4252 |
| KAD 1550 | 1550 | 223 | 271 | 1327 | 1279 | | 77 x 68 x 109 | 4 FLG | 4796 |
| KAD 2100 | 2100 | 302 | 368 | 1798 | 1732 | | 85 x 75 x 106 | 4 FLG | 5100 |
| KAD 3000 | 3000 | 432 | 525 | 2569 | 2475 | | 80 x 89 x 121 | 6 FLG | 8500 |
| KAD 4100 | 4100 | 590 | 718 | 3510 | 3382 | | 91 x 85 x 105 | 6 FLG | 9900 |
| KAD 5400 | 5400 | 778 | 945 | 4623 | 4455 | | 102 x 92 x 122 | 6 FLG | 12000 |

Note 1: "Performance data obtained and presented in accordance with ANSI/B93.45M—1982, Pneumatic Fluid Power—Compressed Air Dryers—Methods for rating and testing." Conditions for rating above dryers are: 100 psig and 100°F (37.8°C) saturated inlet air, and a maximum 5 psi (.35 bar) pressure drop. Actual pressure drop for all units is less than 3 psi at rated conditions.

Note 2: The purge flow rate of any pressure swing (heatless) desiccant dryer is not constant throughout the purge cycle. The purge cycle consists of a maximum purge flow period when the purge valve is open and a reduced flow period during repressurization. The total purge flow during the purge flow cycle is the product of the average purge flow times the purge cycle time.

Note 3: Maximum Working Pressure: 150 psig Standard; 250 psig Optional

Specifications are subject to change without notice.

Table 2 - Inlet Pressure Correction Factor

| Inlet Pressure (psig) | Multiplier | Inlet Pressure (psig) | Multiplier |
|-----------------------|------------|-----------------------|------------|
| 60 | 0.65 | 130 | 1.12 |
| 70 | 0.74 | 140 | 1.16 |
| 80 | 0.83 | 150 | 1.20 |
| 90 | 0.91 | 175 | 1.29 |
| 100 | 1.00 | 200 | 1.37 |
| 110 | 1.04 | 225 | 1.45 |
| 120 | 1.08 | 250 | 1.52 |



Kaeser's U.S. Headquarters in Fredericksburg, Virginia

Mission Statement

We strive to earn our customers' trust by supplying high quality Kaeser air compressors, related compressed air equipment and premium blower systems. Our products are designed for reliable performance, easy maintenance, and energy efficiency. Prompt and dependable customer service, quality assurance, training, and engineering support contribute to the value our customers have come to expect from Kaeser. Our employees are committed to implementing and maintaining the highest standards of quality to merit customer satisfaction. We aim for excellence in everything we do.

Our engineers continue to refine manufacturing techniques and take full advantage of the newest machining innovations. Extensive commitment to research and development keeps our products on the leading edge of technology to benefit our customers.

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Built for a lifetime.™

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The Air Systems Specialist

With over 80 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.

