KTA Series
Heatless Desiccant Air Dryers
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Parker Zander KTA Series heatless desiccant air dryers

... remove water vapor from compressed air through a process known as Pressure Swing Adsorption. A pressure dewpoint of -40°F (-40°C) is attained by directing the flow of saturated compressed air over a bed of desiccant.

... desiccant

The most commonly used desiccant is activated alumina, a spherical shaped, hygroscopic material, selected for its consistent size, shape and extreme surface to mass ratio. This physically tough and chemically inert material is contained in two separate but identical pressure vessels commonly referred to as “dual” or “twin” towers.

As the saturated compressed air flows up through the “on line” tower, its moisture content adheres to the surface of the desiccant. The dry compressed air is then discharged from the chamber into the distribution system.

... how it works - controller

A solid state controller automatically cycles the flow of compressed air between the towers, while the “on line” tower is drying, the “off line” tower is regenerating. Regeneration, sometimes referred to as purging, is the process by which moisture accumulated during the “on line” cycle is stripped away during the “off line” cycle. As low pressure dry purge air flows gently through the regenerating bed, it attracts the moisture that had accumulated on the surface of the desiccant during the drying cycle and exhausts it to the atmosphere.

To protect the desiccant bed from excess liquid, all Parker Zander KTA Series Heatless Air Dryers are designed to work with the natural pull of gravity. By directing the saturated air into the bottom of the “on line” tower and flowing up through the bed, liquid condensate caused by system upset, is kept away from the desiccant and remains at the bottom of the tower where it can be easily exhausted during the regeneration cycle. Counter flow purging ensures optimum performance by keeping the driest desiccant at the discharge end of the dryer.

Moisture load, velocity, cycle time, and contact time determine tower size and the amount of desiccant. To ensure design dewpoint, each tower is carefully sized to allow a minimum of 5.5 seconds of contact. To prevent desiccant dusting and bed fluidization, air flow velocities are kept below 50 feet per minute. The dryer can cycle for years without changing the desiccant.

Heatless dryers in general are the most reliable and least expensive of all desiccant type dryers. Parker Zander KTA Series Heatless Desiccant Air Dryers are the most energy efficient thanks to standard features like, “Variable Cycle control”, compressor inter-lock and purge flow regulator.
Parker Zander’s sequence annunciator ...

... is a solid state visual display panel that shows exactly what is happening in the dryer. The panel lights signal which tower is “on line” drying, and whether the “off line” tower is purging, repressurizing or in compressor inter-lock. It will also annunciate optional equipment operation and function alarms. The panel is integral with the NEMA 4 Master Control and is conveniently mounted for easy monitoring.

Total dryer operation is managed by Parker Zander’s NEMA 4 automatic control center. The solid state module controls all dryer functions including the Sequence Annunciator.

... variable cycle control

Additional energy savings can be achieved by adjusting the amount of purge to the actual moisture load. When demand is expected to be less than maximum, Parker Zander’s Variable Cycle Control provides a means to adjust the purge cycle time to reduce the total amount of purge used for regeneration. As a result of less frequent cycling, the desiccant will last longer and the switching valves will require less maintenance. The Variable Cycle Control incorporates a short cycle position that can be employed to provide dewpoints as low as -80°F (-62°C).

... compressor inter-lock

Significant energy savings and reduced air compressor demand are achieved by cycling the dryer with the air compressor. When the air compressor unloads or shuts off, the compressor inter-lock automatically stops the purge and holds the dryer’s cycle position until load is resumed. The compressor inter-lock function is activated by the air compressor’s relay or pressure switch. Contacts are provided in the dryer’s NEMA 4 control panel. A panel mounted light indicates compressor interlock activation.

... anti-surge control

To accommodate the unique requirements of centrifugal compressors, all Parker Zander desiccant dryers are now programmed with a special anti-surge control. A sequenced timing circuit eliminates potential compressor surge by preventing momentary flow restrictions from occurring at tower switch over.
Heatless Desiccant Air Dryers
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ecotronic ...

The Sequence Annunciator is designed to accommodate Parker Zander’s optional ecotronic. ecotronic automatically adjusts energy use to actual moisture load. Moisture loading is affected by inlet temperature, pressure, relative humidity, and flow. These conditions vary throughout the day and rarely combine in such a manner as to produce maximum moisture loads.

An inlet temperature reduction of just 20°F (-7°C) will reduce the moisture load by almost 50%. Desiccant dryers are normally sized for “worst case” operation with the cycle fixed to accommodate maximum moisture loads. Because the fixed cycle does not compensate for fluctuating loads, dryers not equipped with ecotronic waste energy by regenerating more often than necessary. ecotronic eliminates this unnecessary use of energy by delaying regeneration until the total design moisture load is achieved. The system monitors actual moisture loading and limits the number of purge cycles accordingly. Digital dewpoint control provides for additional energy savings by allowing the operator to select higher dewpoints when appropriate. At $0.08 per KWH, ecotronic would save $10,116 annually when used with a 1000 scfm heatless dryer operating at 75% load for 8,000 hours, at an average inlet temperature of +80°F (27°C). The moisture probe is contained in and protected by a rugged, stainless steel housing with a 80 micron sintered metal guard and a pressure rating of 3000 psi g. This housing increases the sensor’s ability to withstand reasonable shock and vibration.

The housing also contains an electronics package for continuous self calibration, temperature compensation, and signal stabilization. Due to less frequent cycling, switching valves and desiccant will last longer and require less maintenance.

The ecotronic ceramic sensor is made from state-of-the-art metallized ceramic and replaces traditional materials such as aluminum, silicon and hydroscopic salts. This fast response sensor is made from a ceramic tile that is plated and vapor deposited to form a surface that is very sensitive to small changes in water vapor pressure.

The proprietary coating processes make the ceramic sensor inherently faster to respond than other impedance or capacitive sensors currently available. The ceramic sensor features the latest digital technology with calibration data stored directly in the sensor’s memory, and is equipped with a built-in thermistor for automatic temperature compensation. ecotronic is traceable to the National Institute of Standards and Technology. A certificate of traceability is available.
Heatless Desiccant Air Dryers
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Without proper filtration, desiccant air dryers will not work. Desiccant dryers are designed to adsorb vapor from compressed air; they are not designed for liquid. When liquid, especially oil, is allowed to enter the desiccant chamber, it coats the desiccant material preventing any further adsorption. Oil coated desiccant can not be regenerated, and must be replaced.

The coalescing pre-filter is installed at the dryer inlet. It protects the dryer by removing liquids and reducing the contamination level of the compressed air to .01 PPM by weight. The element is DOP rated at 99.9+% efficient in the 0.3 to 0.6 micron range. An integrated digital indicator is provided to determine element condition. A float is provided on all systems to ensure proper drainage.

To protect downstream equipment from desiccant dust a particulate after-filter is installed at the dryer discharge. The after-filter element is designed to remove solid particulates from compressed air. The hybrid pleated filter media provides high dirt retention, low pressure drop, and long element life. The element is 99+% effective in removing particles 1.0 micron and larger. An integrated digital element condition indicator is also provided.

Most field problems experienced with desiccant air dryers are the result of improper filter selection, installation, maintenance, and/or draining of condensate. Considering the importance of filtration to dryer performance, Parker Zander recommends that all desiccant dryers be ordered as a complete, factory assembled Air Treatment System. The Parker Zander package includes: properly sized, factory installed coalescing pre-filter and particulate after-filter (Automatic Float Drain standard), and color change indicators.

In-line cast filters are used on systems 200 through 800 scfm and two stage fabricated severe duty filters are used on systems 1000 scfm and larger. Mist eliminators are available as extra protection.

Features

- Electric 120V/1Ph/60Hz
- Solid State Controller
- Centrifugal Compressor Surge Protection (Models KTA200 - KTA6000)
- System Sequence Annunciator
- Compressor Inter-Lock Demand Control
- Variable Cycle Control (Models KTA200 - KTA6000)
- Purge Flow Indicator
- Purge Flow Regulator (Models KTA200 - KTA3000)
- Repressurization Circuit
- Control Air Filter

- ASME Coded Pressure Vessels (Models KTA1000 - KTA6000)
- 5 Year Warranty on Butterfly Valves 3" and Larger (Models KTA1000 - KTA6000)
- Separate Tower Pressure Gauges
- Safety Valves
- Cushioned Seat, Check Valves
- Separate Fill / Drain Ports
- NEMA 4 Dryer
- Stainless Steel Diffuser Screen
- Pressure Equalization
- 150 psi g (10.3 bar g) Design Standard (200 - 1200 scfm)
- 135 psi g (9.3 bar g) Design Standard (1500 - 6000 scfm)
- Structural Steel Base
- Moisture Indicator (KTA200 - KTA6000)
- CSA / UL Approved Controller
- Filter Packaging with ΔP Gauges
- ecotronic*
- Low Ambient Package*
- Pneumatic Controls*
- All NEMA Classifications*
- Pressure to 1000 psi g (69 bar g)*
- Switch Failure Alarm*
- Contacts for Remote Alarms*
- Electric 120V/1Ph/60Hz

*Optional Equipment

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# Heatless Desiccant Air Dryers

## KTA Series

## -40°F (-40°C) with Activated Alumina Desiccant

<table>
<thead>
<tr>
<th>Model</th>
<th>Flow Rate @ 100 psi g scfm (m³/min)</th>
<th>Approx Purge (scfm)</th>
<th>Dimensions in (mm)**</th>
<th>Weight</th>
<th>Dryer Air In/Out</th>
<th>Pre-Filter</th>
<th>After-Filter</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Height (H)</td>
<td>Width (W)</td>
<td>Depth (D)</td>
<td>lbs</td>
<td>kg</td>
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<tr>
<td>KTA200A1E</td>
<td>200 (5.7)</td>
<td>30</td>
<td>82 (2083)</td>
<td>37 (940)</td>
<td>22 (559)</td>
<td>692</td>
<td>314</td>
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<td>KTA250A1E</td>
<td>250 (7.1)</td>
<td>38</td>
<td>80 (2032)</td>
<td>40 (1016)</td>
<td>22 (559)</td>
<td>776</td>
<td>352</td>
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<td>KTA300A1E</td>
<td>300 (8.5)</td>
<td>45</td>
<td>80 (2032)</td>
<td>40 (1016)</td>
<td>22 (559)</td>
<td>796</td>
<td>361</td>
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<td>KTA400A1E</td>
<td>400 (11.3)</td>
<td>60</td>
<td>85 (2159)</td>
<td>43 (1092)</td>
<td>27 (686)</td>
<td>1626</td>
<td>738</td>
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<td>KTA500A1E</td>
<td>510 (14.4)</td>
<td>77</td>
<td>84 (2134)</td>
<td>45 (1143)</td>
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<td>787</td>
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<td>87 (2210)</td>
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<td>28 (711)</td>
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<td>KTA1000A1E</td>
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<td>41 (1041)</td>
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<td>180</td>
<td>103 (2616)</td>
<td>74 (1880)</td>
<td>41 (1041)</td>
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<td>2089</td>
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<td>1500 (42.5)</td>
<td>225</td>
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<td>2000 (54.6)</td>
<td>300</td>
<td>96 (2438)</td>
<td>78 (1981)</td>
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<td>2600 (73.4)</td>
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<td>CF</td>
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<td>CF</td>
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<td>CF</td>
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<td>KTA6000A1E</td>
<td>6000 (160)</td>
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<td>CF</td>
<td>CF</td>
<td>CF</td>
<td>1010</td>
<td>CF</td>
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*Referenced to 68°F (20°C) and 14.5 psi a (1 bar a).

**Dimensions for Models KTA200 to KTA770 include mounted filters. Dimensions for KTA1000 to KTA6000 do not include filters.

Notes:
1. *Grade XL & ZL filters ARE included in base unit price. Filters supplied mounted on Models KTA200 - KTA770. Models KTA1000 to KTA6000 have filters shipped loose.
2. **ecotronic includes: energy saving purge cycle control with high humidity alarm and digital dewpoint display.
   - When ordering ecotronic, use /DS as suffix. (Example: KTA6000DL)
3. Above information should be used as a guideline. Flows are at 100 psi g inlet pressure, 100°F inlet temperature and 100°F ambient temperature.
4. Weight includes desiccant (shipped loose Models KTA200 and up).
5. For sizing at other temperatures and pressures, please consult Parker Zander Engineering Department at fafquotes@parker.com.
6. CRN desiccant vessels standard.
# Heatless Desiccant Air Dryers
## KTA Series

### Technical Data

- **Flow Range @ 100 psi g (7 bar g):** 200 scfm to 6000 scfm
- **Dewpoint:** -40°F (-40°C) Standard, -100°F (-70°C) Optional
- **Maximum operating pressure:** Models: KTA200 - KTA1500: 150 psi g (10.3 bar g) Models: KTA2000 - KTA6000: 135 psi g (9.3 bar g) 80 psi g (5.5 bar g) [Lower minimum pressures available. Consult factory.]
- **Minimum operating pressure:** Models: KTA200 - KTA1500: 150 psi g (10.3 bar g) Models: KTA2000 - KTA6000: 135 psi g (9.3 bar g) 80 psi g (5.5 bar g) [Lower minimum pressures available. Consult factory.]
- **Maximum inlet temperature:** 120°F (49°C)
- **Minimum inlet temperature:** 50°F (10°C)
- **Dewpoint control optional**
- **Standard electrical supply:** 120V/1Ph/60Hz

### Correction Factors

To obtain dryer capacity at new conditions, multiply nominal capacity x C1 x C2 x C3.

#### Temperature Correction Factor CFT

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<th>Maximum Inlet Temperature (C1)</th>
<th>°F</th>
<th>80</th>
<th>85</th>
<th>90</th>
<th>95</th>
<th>100</th>
<th>105</th>
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<tr>
<td>°C</td>
<td>27</td>
<td>29</td>
<td>32</td>
<td>35</td>
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<td>41</td>
<td>43</td>
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<tr>
<td>CFT</td>
<td>1.17</td>
<td>1.17</td>
<td>1.17</td>
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#### Pressure Correction Factor CFP

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<th>Minimum Inlet Pressure (C2)</th>
<th>psi g</th>
<th>80</th>
<th>85</th>
<th>90</th>
<th>95</th>
<th>100</th>
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<th>110</th>
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<td>bar g</td>
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<td>5.86</td>
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<td>CFP</td>
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#### Dewpoint Correction Factor CFD

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<th>Required Dewpoint (C3)</th>
<th>PDP °F</th>
<th>-40</th>
<th>-100</th>
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<tr>
<td>°C</td>
<td>-40</td>
<td>-70</td>
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<tr>
<td>CFD</td>
<td>1.00</td>
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</table>
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