FOCUSED ON COMPRESSION AIR TREATMENT
Heatless Dessicant Dryers | TW Series
Parker Airtek TW 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.

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.

An Allen-Bradley® PLC 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 dry low pressure 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 TW 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.

Heatless dryers in general are the most reliable and least expensive of all desiccant type dryers. Parker Airtek TW Series Heatless Desiccant Air Dryers are more energy efficient than competitors thanks to standard features such as: variable cycle control, CycleLoc® and regulated purge flow.

Flow Schematic
Basic Controller
[Standard on Models TW76 - TW801]
- Allen-Bradley® PLC
- Nema 4X enclosure
- LCD user interface
- Four line digital display features:
  - Tower drying indication
  - Tower regenerating indication
  - Run status
  - Time remaining in cycle
- Selectable cycle settings
- Programmable drain timer (drain on, time and test)
- Compressor demand via external dry contact (CycleLoc®)
- Power ON/OFF switch
- Step-through regeneration for maintenance
- Cycle counter
- Hours of operation

Advanced Controller
[Standard on Models TW1001 & Larger. Optional on Models TW76-801]
- Allen-Bradley® PLC
- Powerloc® Energy Demand System
  - Energy savings percentage
  - Hours in power save
- Nema 4X enclosure
- 3.5” LCD user interface
- Dew point sensor input (-148 to 68°F)
- Optional 4-20 mA output for remotely monitoring dew point
- Tower pressure sensors
- Inlet pressure and temperature sensors
- Compressor demand via external dry contact (CycleLoc®)
- Modbus/TCP communications via standard ethernet port
- Modbus RTU communications via optional RS232/485 port (Using external gateway device)
- SD card slot for accessing historical data and alarm information
- Selectable cycle settings
- Programmable drain timer (drain on, time and test)
- User selectable alarms with common alarm relay
  - High inlet temperature
  - Low inlet pressure
  - Tower failed to blow down (switch failure)
  - Tower failed to pressurize
  - High dew point
  - Sensor failure for all sensors
- Filter maintenance timer & alarm
- Clogged muffler maintenance and alarm
- Power ON/OFF switch
- Alarm log stores most recent alarms
- Flashes green when in energy savings mode
- Flashes red when an alarm is present
- Dry contact for common alarm

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FOCUSED ON
FILTRATION

Without proper filtration, desiccant air dryers will not operate properly. 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 absorption. 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. A differential pressure gauge is provided to determine element condition. An drain valve is provided on systems 75 through 1000 scfm to ensure proper drainage. On systems 1200 scfm and larger, a zero air loss demand drain is provided. The drain is controlled via the PLC, which includes a test function and user settings for time open and delay.

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. A differential pressure gauge is provided to determine element condition.

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 Airtek recommends that all desiccant dryers be ordered as a complete, factory assembled Air Treatment System.

Factory packaging, with matched components and single point connections reduces installation costs, ensures performance and allows Parker Airtek to assume total responsibility for system integrity.

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Filter Package Schematic

**Package “B”**
(Standard TW76 - TW801)
(Optional for TW1001 and larger)
Includes dryer with factory installed pre-filter and after-filter with system bypass

**Package “F”**
(Standard TW1001 & Larger)
Includes dryer with factory installed pre-filter and after-filter

**Package “D”**
(Optional for all TW models)
Includes dryer with factory installed dual selectable pre and after-filters with system bypass
Compressed Air Quality to ISO 8573.1:2010
The Industry Standard Method for Specifying Compressed Air Cleanliness

The ISO 8573.1:2010 international standard for compressed air quality provides a simple system of classification for the three main contaminants present in any compressed air system - dirt, water, and oil. To specify the quality class required for a particular application, simply list the class for each contaminant.

<table>
<thead>
<tr>
<th>CLASS</th>
<th>Dirt</th>
<th>Water</th>
<th>Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum number of particles per m³</td>
<td>Pressure Dewpoint °F (°C)</td>
<td>(incl. vapor) mg/m³</td>
</tr>
<tr>
<td>0.1 - 0.5 micron</td>
<td>0.5 - 1 micron</td>
<td>1 - 5 micron</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>100</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>100,000</td>
<td>1,000</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
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<td>1,000</td>
<td>1,000</td>
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<tr>
<td>5</td>
<td>-</td>
<td>-</td>
<td>50 (10)</td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**PowerLoc® Energy Management System**
(Standard on Models TW1001 & Larger; Optional on Models TW76-801)

Energy savings of up to 80% can be achieved with the proven PowerLoc™ energy management system. Regeneration requirements are dependent on flow, pressure and temperature. The PowerLoc system allows the cost of drying compressed air to be matched exactly to your plant conditions. PowerLoc® controls the drying cycle by continuously reacting to the loading under which the dryer is operating and minimizes the energy input required.

As dryers rarely operate at full rated capacity all of the time (e.g. during shift work and periods of low demand), this energy management system can provide considerable savings.

The Advanced Controller is designed to accommodate Parker Airtek's PowerLoc Energy Management System. Flashes green when in energy saving mode.

**High Performance Components**

### Poppet Valve
**TW76 - TW801**
- Stainless steel body
- Stainless steel internals
- PTFE seal
- Air activated, spring return
- Visual position indicator on exhaust valves
- ANSI Class VI shutoff
- Long service life
- Repair kits available
- 5 year valve warranty

### Butterfly Valve
**TW1001 & Larger**
- Non-lubricated
- Carbon steel body
- Stainless steel internals
- RTFE seat
- Double offset stem and disc design for reduced seatwear and zero leakage
- Repair kits available
- 5 year valve warranty

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Standard Equipment

- Allen-Bradley® PLC
  - Two year dryer warranty (parts and labor)
  - 4 line display
  - NEMA 4X enclosure
  - Selectable cycles

Switching Valves

- Valve(s) may be serviced without opening electrical enclosure
- No hard wiring required
- Visual indication of valve activation
- Valve labeling

Factory Installed Filtration

- Single point connection for system integrity
- Differential pressure gauges for element condition
- Filter drains

Regulated Purge

- Factory set
- Optimum purge regardless of operating pressure
- Repressurization circuit

Additional Features

- Separate tower pressure gauges
- OSHA approved mufflers with safety relief
- ASME/CRN vessels (TW101 and larger)
- Desiccant fill and drain ports
- Safety relief valves
- Stainless steel diffuser screens
- CycleLoc® demand control
- Control air line filter
- ETL listed (UL/CSA standards)
- LED din connector(s) all solenoid valves
- 120 VAC power (other options available - consult factory)
- Power cord with basic controller
- Power din connector with advanced controller
- Power On/Off switch with advanced controller
- Steel base TW1001 and larger

Options

- Custom filter packaging
- PowerLoc Energy Demand Control (TW76 - TW801)
- All NEMA classifications
- Control air tubing - stainless steel
- Low ambient package [-20°F to +40°F air temperature]
- Instrumentation
  - Locally mounted pressure and temperature gauges at inlet and outlet
  - Pneumatic controls
  - ASME B31.3 piping
  - Corrosion allowance
- High pressure applications: 200 psig design & 250 psig design adders are available
## Product Selection

<table>
<thead>
<tr>
<th>Package</th>
<th>Model</th>
<th>Flowrate @ 100 psig (scfm)</th>
<th>Approx Purge (scfm)</th>
<th>Standard Packaged Dimensions ins (mm)</th>
<th>Weight</th>
<th>Dryer Air In/Out</th>
<th>Pre-Filter</th>
<th>After-Filter</th>
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<tbody>
<tr>
<td>B</td>
<td>TW76</td>
<td>75</td>
<td>11</td>
<td>80 (2083) 34 (864) 29 (660)</td>
<td>384</td>
<td>174</td>
<td>3/4&quot; NPT</td>
<td>AAP025DNFI</td>
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<tr>
<td></td>
<td>TW101</td>
<td>100</td>
<td>15</td>
<td>79 (2007) 36 (914) 30 (666)</td>
<td>448</td>
<td>212</td>
<td>1&quot; NPT</td>
<td>AAP025ENFI</td>
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<td></td>
<td>TW131</td>
<td>130</td>
<td>20</td>
<td>79 (2007) 36 (914) 30 (762)</td>
<td>496</td>
<td>225</td>
<td>1&quot; NPT</td>
<td>AAP025ENFI</td>
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<tr>
<td></td>
<td>TW201</td>
<td>200</td>
<td>30</td>
<td>81 (2032) 42 (1143) 34 (889)</td>
<td>692</td>
<td>314</td>
<td>1 1/2&quot; NPT</td>
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<td></td>
<td>TW251</td>
<td>250</td>
<td>38</td>
<td>81 (2032) 45 (1143) 36 (889)</td>
<td>776</td>
<td>352</td>
<td>1 1/2&quot; NPT</td>
<td>AAP035DNFI</td>
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<td>TW301</td>
<td>300</td>
<td>45</td>
<td>81 (2057) 45 (1092) 36 (864)</td>
<td>796</td>
<td>341</td>
<td>1 1/2&quot; NPT</td>
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<td>TW401</td>
<td>400</td>
<td>60</td>
<td>83 (2134) 48 (1321) 41 (960)</td>
<td>1626</td>
<td>728</td>
<td>2&quot; NPT</td>
<td>AAP040DNFI</td>
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<td>TW501</td>
<td>500</td>
<td>75</td>
<td>83 (2134) 51 (1448) 43 (940)</td>
<td>1735</td>
<td>787</td>
<td>2&quot; NPT</td>
<td>AAP045DNFI</td>
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<td></td>
<td>TW601</td>
<td>600</td>
<td>90</td>
<td>84 (2134) 50 (1473) 44 (813)</td>
<td>1740</td>
<td>789</td>
<td>2&quot; NPT</td>
<td>AAP045GNFI</td>
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<tr>
<td></td>
<td>TW801</td>
<td>800</td>
<td>120</td>
<td>88 (2164) 56 (1499) 45 (1118)</td>
<td>2120</td>
<td>942</td>
<td>2&quot; NPT</td>
<td>AAP050DNFI</td>
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<tr>
<td>F</td>
<td>TW1001</td>
<td>1000</td>
<td>150</td>
<td>94 (2413) 78 (1981) 48 (1651)</td>
<td>3676</td>
<td>1667</td>
<td>3&quot; Flg</td>
<td>AAP055JNFI</td>
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<tr>
<td></td>
<td>TW1201</td>
<td>1200</td>
<td>180</td>
<td>105 (2639) 80 (2062) 56 (1430)</td>
<td>4605</td>
<td>2089</td>
<td>3&quot; Flg</td>
<td>AAP055JNFI</td>
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<tr>
<td></td>
<td>TW1501</td>
<td>1500</td>
<td>225</td>
<td>117 (2972) 94 (2438) 60 (1524)</td>
<td>4985</td>
<td>2211</td>
<td>3&quot; Flg</td>
<td>JZ-C01501NXX</td>
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<tr>
<td></td>
<td>TW2001</td>
<td>2000</td>
<td>300</td>
<td>99 (2560) 114 (2938) 60 (1778)</td>
<td>5206</td>
<td>2361</td>
<td>4&quot; Flg</td>
<td>JZ-C02001NXX</td>
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<tr>
<td></td>
<td>TW2601</td>
<td>2600</td>
<td>450</td>
<td>111 (2870) 144 (3653) 72 (1930)</td>
<td>7600</td>
<td>3447</td>
<td>4&quot; Flg</td>
<td>JZ-C03001OXX</td>
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<td>TW3001</td>
<td>3000</td>
<td>450</td>
<td>111 (2870) 144 (3658) 78 (2022)</td>
<td>8300</td>
<td>3765</td>
<td>6&quot; Flg</td>
<td>JZ-C03001OXX</td>
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</tbody>
</table>

- Flowrates at the following climatic conditions -
  - Inlet Temperature: 100°F (38°C), Inlet Pressure: 100 psi g (7 bar g).
- Dimensions shown on Models TW76 — TW801 are with Package B.
- Dimensions shown on Models TW1001 — TW3001 are with Package F.

### Description

<table>
<thead>
<tr>
<th>TW76- TW1501</th>
<th>Flow Range @ 100 psi g (7 bar g)</th>
<th>Dewpoint</th>
<th>Design Pressure</th>
<th>Pressure Relief Valve Setpoint</th>
<th>Max Operating Pressure</th>
<th>Min Operating Pressure</th>
<th>Max Inlet Temp</th>
<th>Min Inlet Temp</th>
<th>Controls</th>
<th>Electrical Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>TW76- TW1501</td>
<td>10 – 1500 scfm</td>
<td>-40°F [-40°C] Standard</td>
<td>145 psig (10.3 barg)</td>
<td>145 psig (11.4 barg)</td>
<td>150 psig (10.3 barg)</td>
<td>80 psig (5.5 barg)</td>
<td>120°F (48°C)</td>
<td>50°F (10°C)</td>
<td>Allen-Bradley® PLC</td>
<td>120V/1Ph/60Hz</td>
</tr>
<tr>
<td>TW2001 - TW3001</td>
<td>2000 – 3000 scfm</td>
<td>-40°F [-40°C] Standard</td>
<td>150 psig (10.3 barg)</td>
<td>150 psig (10.3 barg)</td>
<td>135 psig (9.3 barg)</td>
<td>80 psig (5.5 barg)</td>
<td>120°F (48°C)</td>
<td>50°F (10°C)</td>
<td>Allen-Bradley® PLC</td>
<td>120V/1Ph/60Hz</td>
</tr>
</tbody>
</table>

### Notes:
- Above information should be used as a guideline. Flows are at 100 psi inlet pressure, 100°F inlet temperature and 100°F ambient temperature. For specific applications, please consult Parker Airtek Applications Engineering.
- Weight includes desiccant (shipped loose Models TW2001 and up).
- Dryer with basic controller FLA is 2 Amp, Advanced controller FLA is 3 Amp
- Pressure relief valve variance +/- 10%.

### Correction Factors

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

<table>
<thead>
<tr>
<th>Temperature Correction Factor</th>
<th>Minimum Inlet Pressure (C2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>°F</td>
<td>psi g</td>
</tr>
<tr>
<td>°C</td>
<td>bar g</td>
</tr>
<tr>
<td>CF</td>
<td></td>
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</tbody>
</table>

### Pressures at Different Temperatures and Pressures

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Temperature Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>psi g</td>
<td>°F</td>
</tr>
<tr>
<td>80</td>
<td>90</td>
</tr>
<tr>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td>100</td>
<td>110</td>
</tr>
<tr>
<td>110</td>
<td>120</td>
</tr>
<tr>
<td>120</td>
<td>130</td>
</tr>
</tbody>
</table>
Worldwide Filtration Manufacturing Locations

North America

**Compressed Air Treatment**
- Industrial Gas Filtration and Generation Division
  Lancaster, NY
  716 686 6400
  www.parker.com/igfg
- Haverhill, MA
  978 858 0505
  www.parker.com/igfg

**Engine Filtration**
- Racor
  Modesto, CA
  209 521 7860
  www.parker.com/racor
- Holly Springs, MS
  662 252 2656
  www.parker.com/racor

**Hydraulic Filtration**
- Hydraulic & Fuel Filtration
  Metamora, OH
  419 644 4311
  www.parker.com/hydraulicfilter
- Laval, QC Canada
  450 629 9594
  www.parkerfarr.com
- Velcon
  Colorado Springs, CO
  719 531 5855
  www.velcon.com

**Process Filtration**
- domnick hunter Process Filtration
  Oxnard, CA
  805 604 3400
  www.parker.com/processfiltration

**Water Purification**
- Village Marine, Sea Recovery, Horizon Reverse Osmosis
  Carson, CA
  310 637 3400
  www.parker.com/watermake

Europe

**Compressed Air Treatment**
- domnick hunter Filtration & Separation
  Gateshead, England
  +44 (0) 191 402 9000
  www.parker.com/dhfn
- Parker Gas Separations
  Etten-Leur, Netherlands
  +31 76 508 5300
  www.parker.com/dhfn
- Hiross Airtrek
  Essen, Germany
  +49 2054 9340
  www.parker.com/hzfd
- Padova, Italy
  +39 049 9712 111
  www.parker.com/hzfd

**Engine Filtration & Water Purification**
- Racor
  Dewsbury, England
  +44 (0) 1924 487 000
  www.parker.com/rfde
- Racor Research & Development
  Stuttgart, Germany
  +49 (0) 711 7071 290-10

**Hydraulic Filtration**
- Hydraulic Filter
  Arnhem, Holland
  +31 26 3760376
  www.parker.com/hfde
- Urjala, Finland
  +358 20 753 2500

**Condition Monitoring**
- Parker Kittiwake
  West Sussex, England
  +44 (0) 1903 731 470
  www.kittiwake.com

**Process Filtration**
- domnick hunter Process Filtration
  Parker Twin Filter BV
  Birtley, England
  +44 (0) 191 410 5121
  www.parker.com/processfiltration

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  www.parker.com/china

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  www.parker.com/japan

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  +82 31 359 0852
  www.parker.com/korea

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  +65 6887 6300
  www.parker.com/singapore

**Thailand**
- Bangkok, Thailand
  +66 2186 7000
  www.parker.com/thailand

**Latin America**
- Parker Comercio Ltda.
  Filtration Division
  Sao Paulo, Brazil
  +55 12 4009 3500
  www.parker.com/br

**Pan American Division**
- Miami, FL
  305 470 8800
  www.parker.com/panam

**Africa**
- Aeroport Kempton Park, South Africa
  +27 11 961 0700
  www.parker.com/africa