FOCUSED ON
COMPRESSED AIR TREATMENT

Heatless Dessicant Dryers | TW Series

Parker Airtek

ENGINEERING YOUR SUCCESS.

FOCUSED ON
SYSTEM INTEGRITY

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.

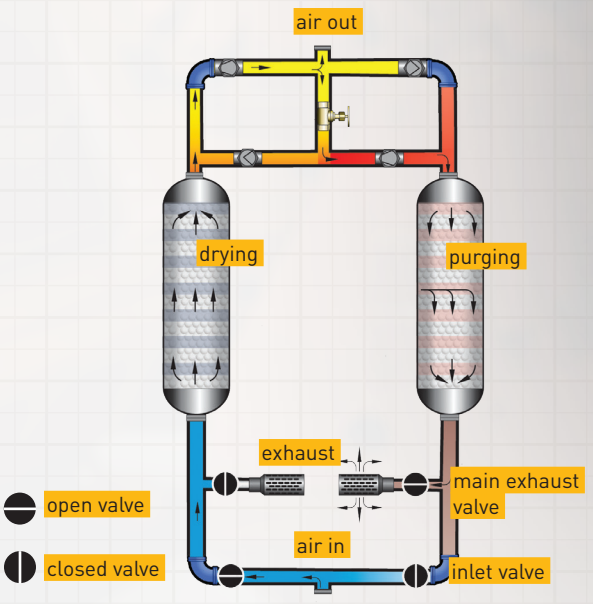
As the saturated compressed air flows up through the "on-line" tower, its moisture content adheres to the surface of the desiccant. The dry compressed air is then discharged from the chamber into the distribution system.

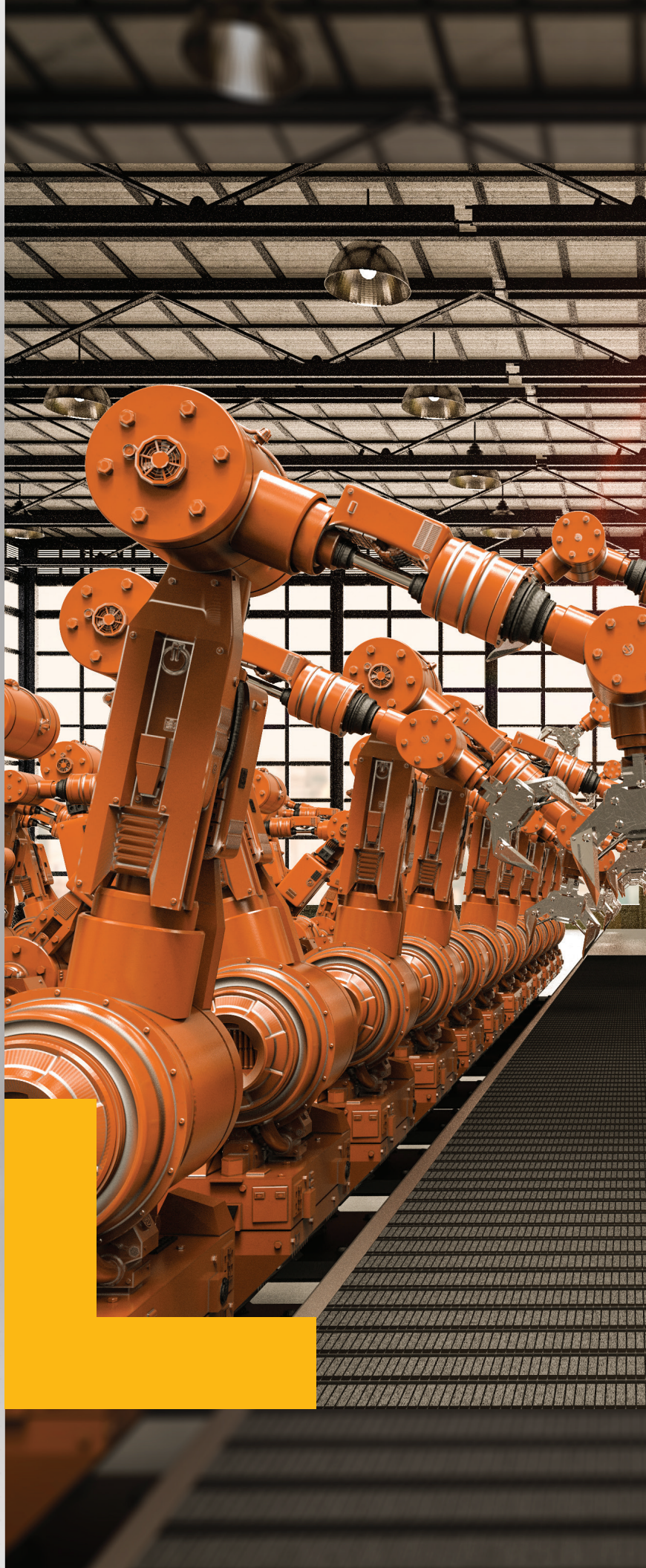
An Allen-Bradley® PLC controller automatically cycles the flow of compressed air between the towers while the "on-line" tower is drying, the "off-line" tower is regenerating. Regeneration, sometimes referred to as purging, is the process by which moisture accumulated during the "on-line" cycle is stripped 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 TW41 - 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 TW41-801)

- 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
  - Switch failure
  - Inlet filter pressure
- 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

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.

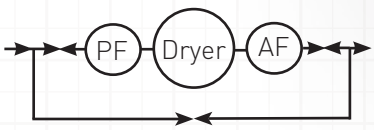
The coalescing pre-filter is installed at the dryer inlet. It protects the dryer by removing liquids and reducing the contamination level of the compressed air. A differential pressure gauge is provided to determine element condition. An drain valve is provided on systems 75 through 1000 scfm to ensure 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.

Filter Package Schematic

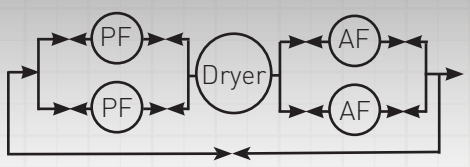


Package "B"
(Standard TW41 - TW801)
(Optional for TW1001 and larger)

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

PowerLoc® Energy Management System

(Standard on Models TW1001 & Larger.
Optional on Models TW41-801)

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 (eg. during shift work and periods of low demand), this energy management system can provide considerable savings.

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

High Performance Components

Poppet Valve

TW41 - 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**

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.

CLASS	Dirt			Water	Oil
	Maximum number of particles per m^3			Pressure Dewpoint °F (°C)	(incl. vapor) mg/m^3
	0.1 - 0.5 micron	0.5 - 1 micron	1 - 5 micron		
1	100	1	0	-94 (-70)(-70°C)	0.01
2	100,000	1,000	10	-40 (-40) (-40°C)	0.1
3	-	10,000	500	-4 (-20)	1
4	-	-	1,000	37.4 (3)	5
5	-	-	20,000	44.6 (7)	-
6	-	-	-	50 (10)	-

Standard Equipment

Allen-Bradley® PLC

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

Switching Valves

- Five year switching valve warranty from manufacturer's defects (see warranty policy)

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

Model TW

LED Din Connectors

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

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 (TW41 - 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

Intertek

Product Selection

Package	Model	Flowrate @ 100 psig (scfm)	Approx Purge (scfm)	Standard Packaged Dimensions ins (mm)			Weight		Dryer Air In/Out	Pre-Filter	After-Filter
				Height (H)	Width (W)	Depth (D)	lbs	kg			
B	TW41	40	6	49 (1245)	21 (533)	25 (635)	190	86	1/2" NPT	AAP015CFNI	AOP015CNFI
	TW56	55	8	67 (1701)	22 (559)	34 (864)	230	104	3/4" NPT	AAP020DFNI	AOP020DNFI
	TW76	75	11	80 (2083)	34 (864)	29 (660)	384	174	3/4" NPT	AAP025DNFI	AOP25DNMI
	TW101	100	15	79 (2007)	36 (914)	30 (686)	468	212	1" NPT	AAP025ENFI	AOP25ENMI
	TW131	130	20	79 (2007)	36 (914)	30 (762)	496	225	1" NPT	AAP025ENFI	AOP25ENMI
	TW201	200	30	81 (2032)	42 (1143)	34 (889)	692	314	1 1/2" NPT	AAP030GNFI	AOP30GNMI
	TW251	250	38	81 (2032)	45 (1143)	36 (889)	776	352	1 1/2" NPT	AAP035GNFI	AOP35GNMI
	TW301	300	45	81 (2057)	45 (1092)	36 (864)	796	361	1 1/2" NPT	AAP035GNFI	AOP35GNMI
	TW401	400	60	83 (2134)	48 (1321)	41 (940)	1626	728	2" NPT	AAP040HNFI	AOP40HNMI
	TW501	500	75	83 (2134)	51 (1448)	43 (940)	1735	787	2" NPT	AAP045INFI	AOP45INMI
	TW601	600	90	84 (2134)	50 (1473)	44 (813)	1740	789	2" NPT	AAP045INFI	AOP45INMI
	TW801	800	120	88 (2184)	56 (1499)	45 (1118)	2120	962	2" NPT	AAP050INFI	AOP50INMI
F	TW1001	1000	150	94 (2413)	78 (1981)	48 (1651)	3676	1667	3" Flg	AAP055JNFI	AOP55JNMI
	TW1201	1200	180	105 (2692)	78 (1981)	60 (1219)	4605	2089	3" Flg	AAP055JNFI	AOP55JNMI
	TW1501	1500	225	117 (2972)	96 (2438)	60 (1524)	4985	2261	3" Flg	JZ-C01501NXX	JZ-F02500NXX
	TW2001	2000	300	99 (2540)	114 (2438)	60 (1778)	5206	2361	4" Flg	JZ-C02001OXX	JZ-F02500OXX
	TW2601	2600	390	111 (2870)	144 (3353)	72 (1930)	7600	3447	4" Flg	JZ-C03001OXX	JZ-F03320OXX
	TW3001	3000	450	111 (2870)	144 (3658)	78 (2032)	8300	3765	6" Flg	JZ-C03001OXX	JZ-F03320PXX

- Flowrates at the following climatic conditions -
  Inlet Temperature: 100°F (38°C), Inlet Pressure: 100 psi g (7 bar g).
- Dimensions shown on Models TW41 — TW801 are with Package B.
- Dimensions shown on Models TW1001 — TW3001 are with Package F.

Description	Flow Range @ 100 psi g (7 bar g)	Dewpoint	Design Pressure	Pressure Relief Valve Setpoint	Max Operating Pressure	Min Operating Pressure	Max Inlet Temp	Min Inlet Temp	Controls	Electrical Supply
TW41- TW1501	40 – 1500 scfm	-40°F (-40°C) Standard	165 psig (10.3 barg)	165 psig (11.4 barg)	150 psig (10.3 barg)	80 psig (5.5 barg)	120°F (49°C)	50°F (10°C)	Allen-Bradley® PLC	120V/1Ph/60Hz
TW2001 - TW3001	2000 – 3000 scfm	-40°F (-40°C) Standard	150 psig (10.3 barg)	150 psig (10.3 barg)	135 psig (9.3 barg)	80 psig (5.5 barg)	120°F (49°C)	50°F (10°C)	Allen-Bradley® PLC	120V/1Ph/60Hz

Notes:

- Above information should be used as a guideline. Flows are at 100 psig 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).
- For sizing at other temperatures and pressures, please consult factory.
- 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.

Temperature Correction Factor								
Maximum Inlet Temperature (C1)	°F	90	95	100	105	110	115	120
	°C	32	35	38	41	43	46	49
	CF	1.17	1.15	1.00	.87	.76	.66	.58

Pressure Correction Factor							
Minimum Inlet Pressure (C2)	psi g	80	90	100	110	120	130
	bar g	5.5	6.2	6.9	7.6	8.3	9.0
	CF	.83	.91	1.00	1.09	1.17	1.26

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
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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

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SciLog
Oxnard, CA
805 604 3400
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Water Purification

Village Marine, Sea Recovery, Horizon Reverse Osmosis
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310 637 3400
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