TW Series

Heatless Desiccant Air Dryers

Parker Airtek

ENGINEERING YOUR SUCCESS.

TW Series Heatless Desiccant Air Dryers

Parker Airtek TW Series Heatless Desiccant Air Dryers remove water vapor from compressed air through a process known as Pressure Swing Adsorption. A pressure dew point of -40°F (-40°C) is attained by directing the flow of saturated compressed air over a bed of desiccant.

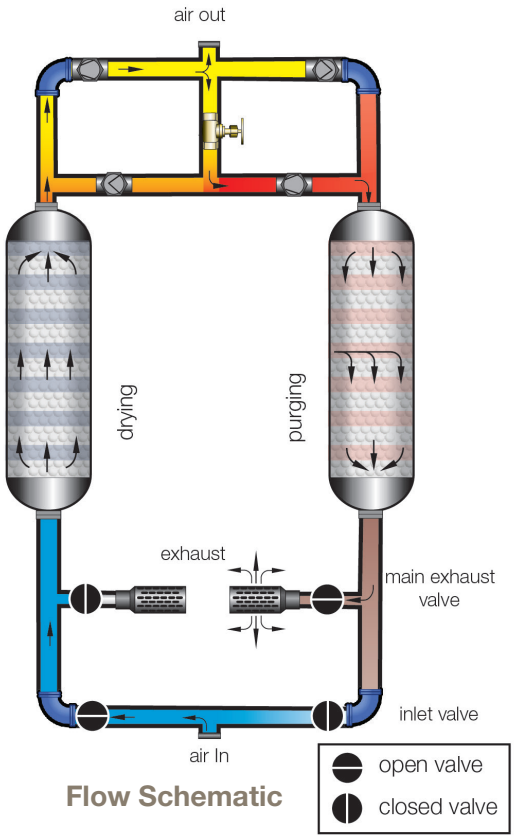
The most commonly used desiccant is activated alumina, a spherical shaped, hygroscopic material, selected for its consistent size, shape and extreme surface to mass ratio. This physically tough and chemically inert material is contained in two separate but identical pressure vessels commonly referred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

Controllers

Basic Controller Features:

- 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

Basic Controller
(Standard on Models TW10 - TW800)

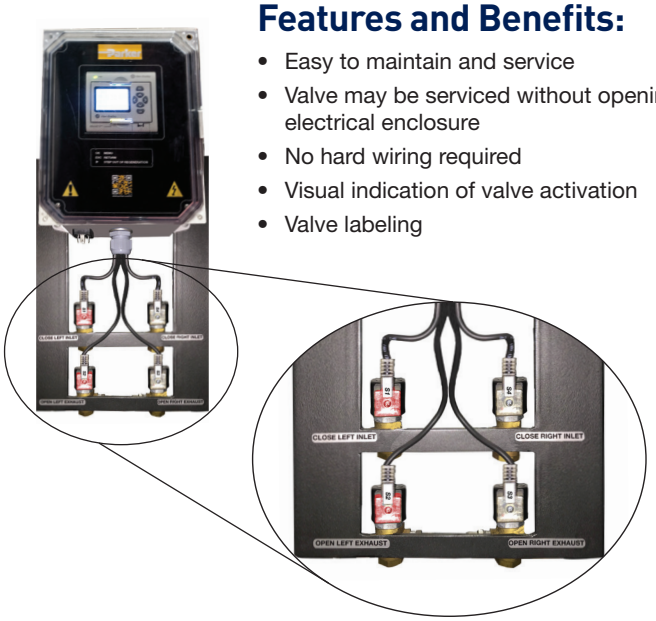
Advanced Controller Features:

- Allen Bradley® PLC
- Powerloc™ Energy Demand System
- 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 & 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

LED Din Connectors

Features and Benefits:

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



Advanced Controller
(Standard on Models TW1000 - TW6000
or TW10 - TW800 with PowerLoc™ Option)

PowerLoc™ Energy Management System

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.

PowerLoc standard on models TW 1000 - TW 6000.

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

Valves

Features and Benefits:

TW10 - TW55	TW75 - TW800	TW1000 & Larger
• CERAM valve • 4-way valve • Long life • Low sensitivity to air quality changes • Low friction switching, low wear of valve/seal assembly • **5 year valve warranty**	• High performance poppet valve • 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**	• High performance butterfly valve • 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**

Complete Air Treatment System

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. A differential pressure gauge is provided to determine element condition. An electronic drain valve is provided on systems 10 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.

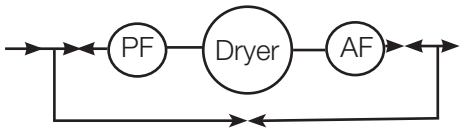
Most field problems experienced with desiccant air dryers are the result of improper filter selection, installation, maintenance, and/or draining of condensate. Considering the importance of filtration to dryer performance, Parker Airtek recommends that all desiccant dryers be ordered as a complete, 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.

In-line Filter
(TW10 - TW1000)

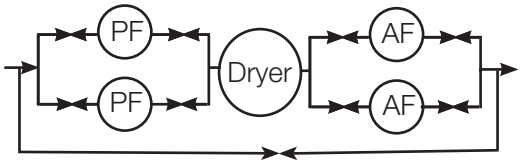
Fabricated Filter
(TW1200 and Larger)

Package Schematic



Package "B" (Standard TW10 - TW800)
Includes dryer with factory installed pre-filter and after-filter with system bypass

Package "F" (Standard TW1000 & Larger)
Includes dryer with factory installed pre-filter and after-filter



Package "D" (Optional)
Includes dryer with factory installed dual selectable pre and after-filters with system bypass

Compressed Air Quality to ISO 8573.1 - the industry standard method for specifying compressed air cleanliness

The ISO 8573.1 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 Dew point °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)	-

Engineering Data Specifications

Product Selection

Package	Model	Flowrate @ 100 psig (scfm)	Approx Purge (scfm)	Standard Packaged Dimensions ins (mm)			Weight		Dryer Air In/Out
				Height (H)	Width (W)	Depth (D)	lbs	kg	
B	TW10	10	2	45 (1143)	21 (533)	25 (635)	113	51	3/8" NPT
	TW15	15	2	45 (1143)	21 (533)	25 (635)	117	53	3/8" NPT
	TW25	25	4	64 (1626)	21 (533)	27 (686)	161	73	1/2" NPT
	TW40	40	6	50 (1270)	21 (533)	28 (711)	196	89	1/2" NPT
	TW55	55	9	65 (1651)	22 (559)	35 (889)	235	107	3/4" NPT
	TW75	75	11	82 (2083)	34 (864)	26 (660)	390	177	3/4" NPT
	TW100	100	15	79 (2007)	36 (914)	27 (686)	485	220	1" NPT
	TW130	130	20	79 (2007)	36 (914)	30 (762)	511	232	1" NPT
	TW200	200	30	80 (2032)	45 (1143)	35 (889)	712	323	1 1/2" NPT
	TW250	250	38	80 (2032)	45 (1143)	35 (889)	796	361	1 1/2" NPT
	TW300	300	45	81 (2057)	43 (1092)	34 (864)	816	370	1 1/2" NPT
	TW400	400	60	84 (2134)	52 (1321)	37 (940)	1656	751	2" NPT
	TW500	500	75	84 (2134)	57 (1448)	37 (940)	1765	801	2" NPT
	TW600	600	90	84 (2134)	58 (1473)	32 (813)	1770	803	2" NPT
	TW800	800	120	86 (2184)	59 (1499)	44 (1118)	2150	975	2" NPT
F	TW1000	1000	150	95 (2413)	78 (1981)	65 (1651)	3826	1735	3" Flg
	TW1200	1200	180	106 (2692)	78 (1981)	48 (1219)	4755	2157	3" Flg
	TW1500	1500	225	117 (2972)	96 (2438)	60 (1524)	4965	2252	3" Flg
	TW2000	2000	300	100 (2540)	96 (2438)	70 (1778)	5406	2452	4" Flg
	TW2600	2600	390	113 (2870)	132 (3353)	76 (1930)	7975	3617	4" Flg
	TW3000	3000	450	113 (2870)	144 (3658)	80 (2032)	8675	3935	6" Flg
	TW4000	4000	600	CF	CF	CF	CF	CF	6" Flg
	TW5000	5000	750	CF	CF	CF	CF	CF	6" Flg
	TW6000	6000	900	CF	CF	CF	CF	CF	6" Flg

*Flowrates at the following climatic conditions - Inlet Temperature: 100°F (38°C), Inlet Pressure: 100 psig (7 barg).
Dimensions shown on Models TW10—TW800 are with Package B.
Dimensions shown on Models TW1000—TW6000 are with Package F.

Description	Flow Range @ 100 psi g (7 bar g)	Dew point	Design Pressure	Max Operating Pressure	Min Operating Pressure	Max Inlet Temp	Min Inlet Temp	Controls	Electrical Supply
TW10 - TW1500	10 – 1500 scfm	-40°F (-40°C) Standard	150 psig (10.3 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
TW2000 - TW6000	2000 – 6000 scfm	-40°F (-40°C) Standard	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:
1. 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 Technical Services.
2. Weight includes desiccant (shipped loose Models TW2000 and up).
3. For sizing at other temperatures and pressures, please consult factory.
4. Dryer with basic controller FLA is 2 Amp, Advanced controller FLA is 3 Amp
5. 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)	psig	80	90	100	110	120	130
	barg	5.5	6.2	6.9	7.6	8.3	9.0
	CF	.83	.91	1.00	1.09	1.17	1.26

Standard Equipment

Allen Bradley® PLC

- 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 (TW75 & larger)

- 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 (TW100 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
- Two year dryer warranty (parts and labor)
- 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 TW1000 and larger

Options

- Custom filter packaging
- PowerLoc Energy Demand Control (TW10 - TW800)
- 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
- -100°F pressure dew point (See Parker Airtek TL literature)
- High pressure applications (See Parker Airtek TX literature)

Contact Factory for additional options, customization, and specifications

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