aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

DTA Series

Heatless Desiccant Air Dryers

Parker domnick hunter

ENGINEERING YOUR SUCCESS.

DTA series heatless desiccant air dryers

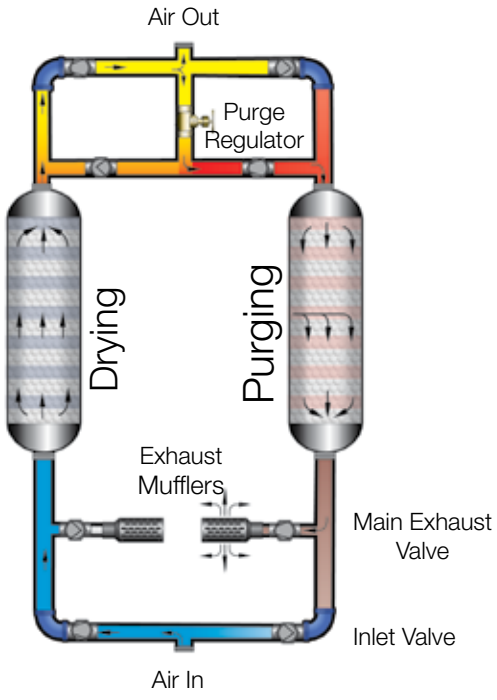
Parker domnick hunter DTA Series Heatless Desiccant Air Dryers remove water vapor from compressed air through a process known as Pressure Swing Adsorption. Pressure dewpoints ranging from -40°F (-40°C) to -100°F (-70°C) are attained by directing the flow of saturated compressed air over a bed of desiccant.

The physically tough and chemically inert desiccant 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.

A solid state controller automatically cycles the flow of compressed air between 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 domnick hunter DTA Series 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 dewpoint, each tower is carefully sized to allow a minimum of 5.5 seconds of contact. To prevent desiccant dusting and bed fluidization, airflow velocities are kept below 50 feet per minute. The dryer can cycle for years without changing the desiccant. In general, heatless dryers are the most reliable and least expensive of all desiccant type dryers. domnick hunter DTA Series are the most energy efficient thanks to standard features like,“Variable Cycle Control”, compressor inter-lock and purge flow regulator.



Flow Schematic

Benefits:

Highest quality air
- Clean, oil-free and dry compressed air in accordance with all editions of ISO8573-1, the international standard for compressed air quality

Energy efficient
- Giving maximum savings

Dry air eliminates microbiological growth
- Preventing product spoilage, recall and litigation

Dry air means zero corrosion
- Preventing product spoilage and damage

Smaller, more compact and lightweight
- Small footprint means less than half the size of conventional dryers

OIL-X EVOLUTION pre & after filtration as standard
- PED, CE, CSA (US+Canada), CRN

DTA dryers - sequence annunciator

Parker domnick hunter'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 mode. 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 domnick hunter'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 domnick hunter'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 (-60°C).

Compressor Inter-Lock
Significant energy saving and reduced air compressor demand are achieved by cycling the dryer with the air compressor. When the air compressor unloads or shuts off, 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 inter-lock activation.

To accommodate the unique requirements of centrifugal compressors, all Parker domnick hunter 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.

Energy management systems

The Control Center is designed to accommodate domnick hunter's optional Dewpoint Dependent Switching Controller (DDS) or DDS Light.

DESIGNED FOR AIR QUALITY & ENERGY EFFICIENCY

Dewpoint dependent switching (DDS)

DDS 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 DDS waste energy by regenerating more often than necessary. DDS 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. 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 DDS 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. DDS is traceable to the National Institute of Standards and Technology. A certificate of traceability is available.

DDS Light

Parker domnick hunter's DDS Light is optional equipment on all Heatless Air Dryers. It is an advanced "Proportional Demand Controller" that saves energy by automatically regulating the purge cycle in response to actual loads. Moisture loads fluctuate throughout the day and rarely reach maximum moisture levels, and therefore, waste energy by regenerating more often than is necessary. DDS Light monitors actual compressed air moisture levels and prevents cycle advancement until the designed saturation is read.
(continued on following page)

At $0.08 per KWH, DDS 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).

LED Display Panel

The DDS Light Panel lights indicate:

- Power Saver Mode/Demand Control active "ON" LED.
- "OFF" LED indicates the DDS Light Demand Control is deactivated and the dryer is functioning in the fixed cycle default mode.

High Dewpoint Alarm

The High Dewpoint Alarm is activated when dew points rise above -20°F (-28°C). It would also activate in the event of a short circuit or should the sensor become disconnected. Dry contacts for an external alarm are provided.

Features

- Electric 120V/1PH/60Hz
- Solid State Controller
- Centrifugal Compressor Surge Protection (Models DTA200 - DTA6000)
- System Sequence Annunciator
- Compressor Inter-Lock Demand Control
- Variable Cycle Control (Models DTA200 - DTA6000)
- Purge Flow Indicator
- Purge Flow regulator (Models DTA200 - DTA3000)
- Repressurization Circuit (Models DTA200 - DTA6000)
- Control Air Filter (Models DTA200 - DTA6000)
- 5 Year Warranty on Butterfly Valves 3" and Larger (Models DTA1000 - DTA6000)
- ASME Coded Pressure Vessels (Models DTA200 - DTA6000)
- 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
- Structural Steel Base (Models DTA1000-DTA6000)
- Moisture Indicator (DTA200 - DTA6000 scfm)
- CSA/UL Approved Controller
- Filter Packaging with ΔP Gauges*
- Dewpoint Dependent Switching (DDS)*
- DDS Light Automatic Demand Control Includes*:
  - Solid State Controller
  - Digital Dewpoint Read Out
  - High Humidity Alarm with Dry Contacts
  - Self Calibrating
  - Ambient Compensation
  - Signal Stabilizer
  - 4-20 mA Output
- 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

DTA series dryers

Product Selection -40°F (-40°C) with Activated Alumina Desiccant

Model	Flowrate @ 100 psi g (scfm)	Approx Purge (scfm)	Dimensions ins (mm)			Weight		Dryer Air In/Out	Pre-Filter	After-Filter
			Height (H)	Width (W)	Depth (D)	lbs	kg			
DTA200A1E	200	30	82 (2083)	37 (940)	22 (559)	692	314	1 1/2" NPT	AO030GNFI	AR030GNFI
DTA250A1E	250	38	80 (2032)	40 (1016)	22 (559)	776	352	1 1/2" NPT	AO035GNFI	AR035GNFI
DTA300A1E	300	45	80 (2032)	40 (1016)	22 (559)	796	361	1 1/2" NPT	AO035GNFI	AR035GNFI
DTA400A1E	400	60	85 (2159)	43 (1092)	27 (686)	1626	738	2" NPT	AO040HNFI	AR040HNFI
DTA500A1E	510	77	84 (2134)	45 (1143)	27 (686)	1735	787	2" NPT	AO045HNFI	AR045HNFI
DTA600A1E	650	98	84 (2134)	47 (1194)	27 (686)	1740	789	2" NPT	AO045HNFI	AR045HNFI
DTA770A1E	770	120	87 (2210)	50 (1270)	28 (711)	2120	962	2" NPT	AO045HNFI	AR045HNFI
DTA1000A1E	1000	150	92 (2337)	74 (1880)	41 (1041)	3676	1667	3" Flg	AO055JNFI	AR055JNFI
DTA1200A1E	1200	180	103 (2616)	74 (1880)	41 (1041)	4605	2089	3" Flg	AO055JNFI	AR055JNFI
DTA1500A1E	1500	225	113 (2870)	74 (1880)	41 (1041)	4985	2261	4" Flg	DH-AO2250ODFI-1	DH-AR2250ODFI-1
DTA2000A1E	2000	300	96 (2438)	78 (1981)	48 (1219)	5206	2361	4" Flg	DH-AO2250ODFI-1	DH-AR2250ODFI-1
DTA2600A1E	2600	390	112 (2845)	96 (2438)	60 (1524)	7600	3447	4" Flg	DH-AO2300ODFI-1	DH-AR2300ODFI-1
DTA3000A1E	3000	450	112 (2845)	96 (2438)	60 (1524)	8300	3765	6" Flg	DH-AO2350PDFI-1	DH-AR2350PDFI-1
DTA4000A1E	4000	600	CF	CF	CF	CF	CF	6" Flg	DH-AO2350PDFI-1	DH-AR2350PDFI-1
DTA5000A1E	5000	750	CF	CF	CF	CF	CF	6" Flg	DH-AO2400QDFI-1	DH-AR2400QDFI-1
DTA6000A1E	6000	900	CF	CF	CF	CF	CF	6" Flg	DH-AO2400QDFI-1	DH-AR2400QDFI-1

*Flowrates at the following climatic conditions - Ambient Temperature: 100°F (38°C), Inlet Temperature: 100°F (38°C), Inlet Pressure: 100 psi g (7 bar g).
**Recommended filters are based on flowrate not flange size.

Description	Flow Range @ 100 psi g (7 bar g)	Nominal Dewpoint	Max Operating Pressure	Min Operating Pressure	Max Inlet Temp	Min Inlet Temp	Controls	Dewpoint Control	Standard Electrical Supply
DTA200 - DTA1500	200 - 1500 scfm	-40°F (-40°C) Standard -100°F (-70°C) Optional	150 psi g (10.3 bar g)	80 psi g (5.5 bar g)	120°F (49°C)	50°F (10°C)	Solid State	Optional	120V/1Ph/60Hz
DTA2000 - DTA6000	2000 - 6000 scfm	-40°F (-40°C) Standard -100°F (-70°C) Optional	135 psi g (9.3 bar g)	80 psi g (5.5 bar g)	120°F (49°C)	50°F (10°C)	Solid State	Optional	120V/1Ph/60Hz

Notes

1. *Grade AA & AR filters ARE included in base unit price. Filters supplied mounted on Models DTA200 - DTA770.
2. **DDS LIGHT (Dewpoint Dependent Switching) includes: energy saving purge cycle control with high humidty alarm and indicator light. When ordering DDS LIGHT, use DL as suffix. (Example: DTA6000DL)
3. **DDS (Dewpoint Dependent Switching) includes: energy saving purge cycle control with high humidity alarm and digital dewpoint display. When ordering DDS, use DS as suffix. (Example: DTA6000DS)
4. 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. For specific applications, please consult Parker domnick hunter Technical Services at fafquotes@parker.com.
5. Weight includes desiccant (shipped loose Models DTA1500 and up).
6. For sizing at other temperatures and pressures, please consult factory.

Correction Factors

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

Temperature Correction Factor CFT										
Maximum Inlet Temperature (C1)	°F	80	85	90	95	100	105	110	115	120
	°C	27	29	32	35	38	41	43	46	49
	CFT	1.17	1.17	1.17	1.15	1.00	0.87	0.76	0.66	0.58

Pressure Correction Factor CFP													
Minimum Inlet Pressure (C2)	psi g	80	85	90	95	100	105	110	115	120	125	130	135
	bar g	5.51	5.86	6.21	6.55	6.89	7.24	7.58	7.93	8.27	8.62	8.96	9.31
	CFP	0.83	0.87	0.91	0.96	1.00	1.04	1.09	1.13	1.17	1.22	1.26	1.31

Dewpoint Correction Factor CFD		Standard	Option 1
Required Dewpoint (C3)	PDP °F	-40	-100
	PDP °C	-40	-70
	CFD	1.00	1.43

Worldwide Filtration Manufacturing Locations

North America

Compressed Air Treatment

Filtration & Separation/Balston
Haverhill, MA
978 858 0505
www.parker.com/balston

Finite Airtek Filtration
Airtek/domnick hunter/Zander
Lancaster, NY
716 686 6400
www.parker.com/faf

Finite Airtek Filtration/Finite
Oxford, MI
248 628 6400
www.parker.com/finitefilter

Engine Filtration & Water Purification

Racor
Modesto, CA
209 521 7860
www.parker.com/racor

Holly Springs, MS
662 252 2656
www.parker.com/racor

Beaufort, SC
843 846 3200
www.parker.com/racor

Racor – Village Marine Tec.
Gardena, CA
310 516 9911
desalination.parker.com

Parker Sea Recovery
Carson, CA
310 637 3400
www.searecovery.com

Hydraulic Filtration

Hydraulic Filter
Metamora, OH
419 644 4311
www.parker.com/hydraulicfilter

Laval, QC Canada
450 629 9594
www.parkerfarr.com

Process Filtration

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

Madison, WI
608 824 0500
www.scilog.com

Phoenixville, PA
610 933 1600
www.parker.com/processfiltration

Aerospace Filtration

Velcon Filtration
Colorado Springs, CO
719 531 5855
www.velcon.com

Europe

Compressed Air Treatment

domnick hunter Filtration & Separation
Gateshead, England
+44 (0) 191 402 9000
www.parker.com/dhfns

Parker Gas Separations
Etten-Leur, Netherlands
+31 76 508 5300
www.parker.com/dhfns

Hiross Zander
Padova Business Unit
Padova, Italy
+39 049 9712 111
www.parker.com/hzd

Hiross Zander
Essen Business Unit
Essen, Germany
+49 2054 9340
www.parker.com/hzd

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
www.parker.com/rfde

Hydraulic Filtration

Hydraulic Filter
Arnhem, Holland
+31 26 3760376
www.parker.com/hfde

Urjala Operation
Urjala, Finland
+358 20 753 2500
www.parker.com/hfde

Condition Monitoring Centre
Norfolk, England
+44 (0) 1842 763 299
www.parker.com/hfde

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

Parker Procal
Peterborough, England
+44 (0) 1733 232 495
www.kittiwake.com

Process Filtration

domnick hunter Process Filtration
Birtley, England
+44 (0) 191 410 5121
www.parker.com/processfiltration

Parker Twin Filter BV
Zaandam, Netherlands
+31(0)75 655 50 00
www.twinfilter.com

Asia Pacific

Australia
Castle Hill, Australia
+61 2 9634 7777
www.parker.com/australia

China
Shanghai, China
+86 21 5031 2525
www.parker.com/china

India
Navi Mumbai, India
+91 22 651 370 8185
www.parker.com/india

Parker Fowler
Bangalore, India
+91 80 2783 6794
www.johnfowlerindia.com

Japan
Tokyo, Japan
+81 45 870 1522
www.parker.com/japan

Parker Techno
Osaka, Japan
+81 66 340 1600
www.techno.taiyo-ltd.co.jp

Korea
Hwaseon-City
+82 31 359 0852
www.parker.com/korea

Singapore
Jurong Town, Singapore
+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 9610700
www.parker.com/africa

Publication: DTA Series Rev 005 NA 08/2014

Parker Hannifin Corporation
Finite Airtek Filtration Division
4087 Walden Avenue
Lancaster, NY 14086
phone 716 686 6400
www.parker.com/faf