

# PURESTREAM

HDT DRYERS



BY FRIULAIR

## HEATLESS DESICCANT AIR DRYERS 170-5200 SCFM



**CRN APPROVED**

ULTIMATE  
ENERGY SAVING  
TECHNOLOGY



# HEATLESS ADSORPTION DRYER

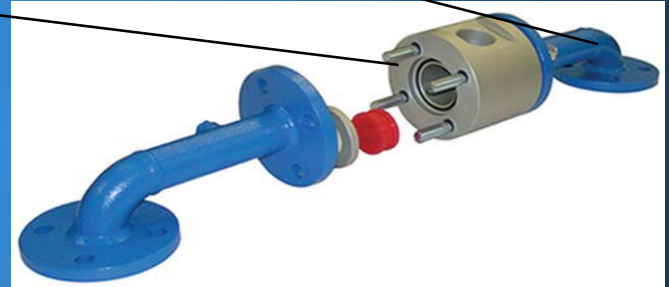
In many industries such as electronics, pharmaceutical, food preparation, pneumatic conveying, automotive paint finishing or for installations with outdoor pipe work, a pressure dew point of +3 °C from a refrigerant dryer is not sufficient. For these applications, a HDT heatless adsorption dryer is required supplying compressed air at a pressure dew point of -20 °C, -40 °C or -70 °C.

The HDT heatless adsorption dryers consist of two parallel vessels filled with adsorption material (molecular sieve). While compressed air is dried in one tower, the second saturated tower, having just come off the line, is regenerated. A small amount of dried compressed air is used for this purpose.

The change over spool valve designed by FRIULAIR is simple and reliable. Access to the valves is extremely easy and they have a large cross sectional area designed for low pressure drop. The aluminum valve bodies are anodized internally and externally to prevent corrosion and sticking. The low maintenance valves can be quickly and easily disassembled and reassembled if required. From model HDT 1000 and up, the dryers are supplied with butterfly valves with spheroidal graphite cast iron body and stainless steel selector lens, controlled by a pneumatic actuator.

The HDT carbon steel towers are designed to operate in an up-flow design. The compressed air travels upwards through the desiccant bed in order to protect the beds from contamination. Particles and water droplets which stay at the bottom of each tower are discharged during the regeneration process. The volume for each vessel is designed to allow for optimum velocity over the desiccant bed in order to maintain a low pressure drop and provide energy savings. The carbon steel towers are built to ASME Section VIII Div.1 and are CRN approved. Each tower is painted with our standard blue powder coat paint finish.

The upper and lower manifolds are designed for quick and simple removal which allows for ease of maintenance and replacement of desiccant.



Each tower is fitted with an approved safety pressure relief valve.

Eye bolts are welded to each tower, designed to allow for easy movement of the dryer.

The operation phase of each tower, is indicated by an easy to read pressure gauge fitted on each tower.

All HDT tower dryers are mounted on a steel construction base frame with fork lift slots.

Dryers are supplied with 0.01 micron oil removal filter (with electric drain) on the inlet and a 1 micron dust filter with manual drain on the outlet. Both filters are fitted with a pressure differential gauge, offer easy access for maintenance and are contained within the dryer footprint.



The silencers are placed in the lower part of the dryer for ease of access and for easy disassembling and/or replacement. Made of aluminum material, they ensure maximum performance during depressurization phase. They can be easily cleaned with soap and hot water.

Each adsorption tower has an inner and outer stainless steel diffuser which ensures maximum distribution of the compressed air over the desiccant materials.



The HDT dryers utilize molecular sieve adsorbent material that is resistant to high inlet temperatures and will not deteriorate when in contact with water. The molecular sieve also has a strong surface hardness for better abrasion resistance that provides longer desiccant bed and dust filter element life. The large desiccant bed combined with long contact time (4.8 seconds) guarantees constant performance and long operating life of the desiccant. The molecular sieve is ideal for achieving all dew point temperatures down to -70 °C.

# DDC 15 ELECTRONIC CONTROLLER

The operation of the dryer is constantly controlled and monitored by our custom designed **DDC 15** controller.

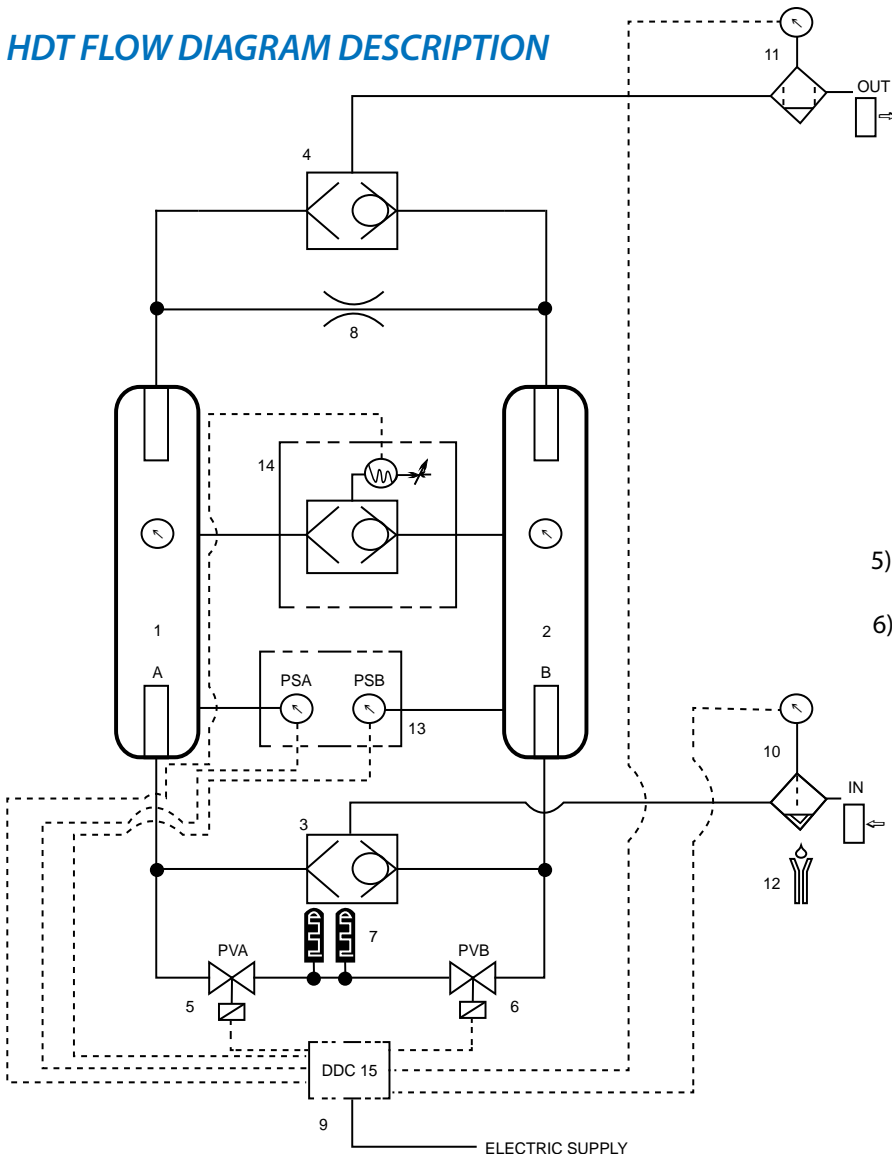
All model dryers are fitted with our **DDC 15** micro-processor controller. The controller permits the selection of working pressure dew point (-20 °C, -40 °C, -70 °C) while the synoptic panel informs the operator of the working cycle of the dryer.

This new controller, has been upgraded from a previous model and performs precise management of the dryer through the following functions:

- Selection of working pressure dew point (-20 °C, -40 °C or -70 °C).
- Detailed information of dryer function and possible faults are displayed on the synoptic panel.
- Indication of the load factor settings and/or the real dew point (if optional dew point probe is installed) via the ten LED display bar.
- Selection of dryer operation mode (FIX: with cycle time, DPD: with cycle time proportional to effective working load if optional dew point probe is installed, TEST: for diagnostic cycle-the dryer runs step-by-step in order to insure easy troubleshooting in order to assist repairs).
- Control and management of three different energy savings levels (the load factor set by the operator, dryer operation according to air compressor load, or the load depending on real dew point, if optional dew point is installed)
- Diagnostics of possible fault/alarm: maintenance required, tower cycle has not functioned correctly (if optional pressure -switch kit is installed), the pressure dew point is too high (if optional dew point probe is installed).
- Control of programmed maintenance operation.

**DDC 15** includes a RJ45 serial port (RS 232 standard) allowing for a connection to a network managed by a PC or PLC.

## HDT FLOW DIAGRAM DESCRIPTION



- 1) Desiccant tower A
- 2) Desiccant tower B
- 3) Inlet shuttle spool valve
- 4) Outlet shuttle spool valve
- 5) PVA-Regeneration drain solenoid valve tower A
- 6) PVB-Regeneration drain solenoid valve tower B
- 7) Silencers
- 8) Regeneration nozzle
- 9) DDC 15 Electric Controller
- 10) Inlet oil filter (0.01 micron)
- 11) Outlet dust filter (1 micron)
- 12) Inlet filter condensate drain
- 13) Pressure switches
- 14) Dew point meter (optional)

# HDT DRYER TECHNICAL DATA

## Air quality according to ISO 8573.1

Compressed air treated with HDT dryer series guarantees high quality standards, conforming to ISO 8573.1. Below are the compressed air quality air classes, according to the contents of main residual contaminants:

### Oil

Quality class 1 (max. residual oil concentration 0.01 mg/m<sup>3</sup>) achieved by inlet oil removal filter XA (0.01 micron)

### Solids Particle

Quality class 2 (max. size of residual solid particle 1 micron-1 mg/m<sup>3</sup>) achieved by outlet dust removal filter RX1 (1 micron)

Flow rates are based on the following operating conditions:  
100 F° inlet compressed air temp; 100 F° ambient temp;  
100 psig operating pressure and -40 C° dew point.

Maximum operating conditions:

121 F° inlet compressed air temp; 121 F° ambient temp;  
and 150 psig operating pressure

Quality Class	Pressure Dew Point	Residual Moisture at 7 barg		Function Mode and Cycle Time
	(C°)	(ppmw)	(mg/m <sup>3</sup> )	
1	-70	0.27	0.348	2 + 2 min FIX
2	-40	11.7	14.88	5 + 5 min FIX o DPD
3	-20	86.5	110.25	7.5 + 7.5 min FIX o DPD

Model	SCFM	Power Supply	Pre-filter	After Filter	Pipe Size	Dimensions In Inches			
						A	B	C	LBS
HDT170U	170	115/1/60	A106XA	A106RX1	1-1/4" NPT	40	28	85	510
HDT210U	210	115/1/60	A126XA	A126RX1	1-1/4" NPT	40	28	85	620
HDT250U	250	115/1/60	A126XA	A126RX1	1-1/4" NPT	42	28	79	670
HDT300U	300	115/1/60	A153XA	A153RX1	1-1/2" NPT	43	28	78	750
HDT420U	420	115/1/60	A203XA	A203RX1	2" NPT	49	34	82	890
HDT540U	540	115/1/60	A205XA	A205RX1	2" NPT	51	34	85	1070
HDT680U	680	115/1/60	A250XA	A250RX1	2-1/2" NPT	58	41	86	1550
HDT850U	850	115/1/60	A250XA	A250RX1	2-1/2" NPT	60	41	86	1790
HDT1000U	1000	115/1/60	A306XA	A306RX1	3" NPT	60	44	90	2450
HDT1200U	1200	115/1/60	A306XA	A306RX1	3" NPT	64	45	93	2760
HDT1400U	1400	115/1/60	A308XA	A308RX1	3" NPT	67	47	94	4080
HDT1600U	1600	115/1/60	FW1600UXA	FW1600URX1	4" #150FL	76	61	98	5290
HDT2200U	2200	115/1/60	FW2400UXA	FW2400URX1	5" #150FL	78	63	98	6170
HDT2800U	2800	115/1/60	FW3200UXA	FW3200URX1	6" #150FL	89	69	105	7060
HDT3600U	3600	115/1/60	FW4000UXA	FW4000URX1	6" #150FL	89	69	105	8670
HDT4300U	4300	115/1/60	FW4800UXA	FW4800URX1	6" #150FL	104	87	113	10900
HDT5200U	5200	115/1/60	FW5600UXA	FW5600URX1	8" #150FL	110	90	117	12600

Correction factor for operating pressure changes:												
Inlet air pressure	psig	60	70	80	90	100	110	120	125	130	140	150
Inlet air pressure	barg	4.1	4.8	5.5	6.2	7	7.6	8.3	8.6	9	9.7	10
Factor	F 1	0.65	0.76	0.85	0.93	1.00	1.05	1.11	1.13	1.15	1.20	1.24
Correction factor for inlet air temperature changes:												
Air temperature	°F	80	90	100	105	110	115	120				
Air temperature	°C	27	32	38	41	43	46	49				
Factor	F 2	1.13	1.08	1.00	0.96	0.90	0.85	0.79				