

# HEATED REGENERATIVE DESICCANT DRYERS



# Nortec Heated Desiccant Dryers

## Why use Regenerative Heated Dryers?

Atmospheric air that is pulled into the compressor is laden with moisture and other contaminants. During compression only the air volume is reduced resulting in a higher proportion of contaminants. In addition hydrocarbons and compressor lubricants also get mixed into compressed air. These contaminants are very harmful and are responsible for frequent equipment breakdown, shortened life and moisture condensation in the air supply lines that lead to scaling, leaks and breakdown.

In today's technology driven world, this is not acceptable. The need for absolutely dry air in processes/applications is more than ever before. To comply with these stringent and zero-tolerance conditions, Nortec has introduced the new range of Heated Desiccant Regenerative Dryers. These dryers are designed and manufactured to provide a continuous source of dry air with pressure dew points (PDP) up to -100 Deg F.

The use of highest quality components and state of the art control system ensures continuous and reliable operations for years to come.

Nortec offers a range of Heat Reactivated Desiccant Dryers to suit all your applications –

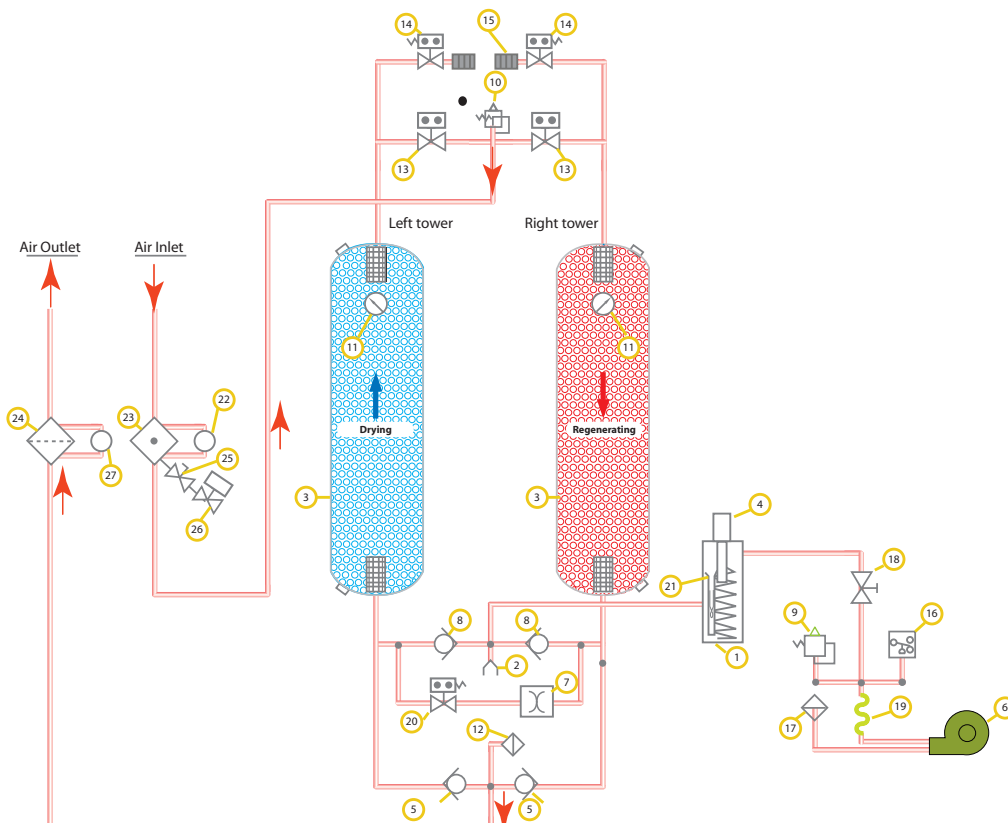
**BPD – Blower Purge Regenerative Desiccant Dryers**

**EHD – Externally Heated Regenerative Desiccant Dryers**

## Blower Purge Dryer (BPD Series)

### Principle of Operation

A centrifugal blower and a high efficiency heater eliminates the use of valuable compressed dry air to be used for desiccant regeneration. The completely automatic drying system uses the blower to pull ambient air and pass it through the heater. This hot air stream flows opposite to the drying flow direction. Hot air above 400° F regenerates the moisture laden desiccant bed and strips it completely of all moisture. The advanced control system monitors the dew point and adjusts the heating/regeneration accordingly thereby providing valuable energy savings. The heater circuit is completely insulated ensuring maximum heating efficiency.



ITEM	DESCRIPTION
1	Heater housing
2	Purge air thermocouple
3	Desiccant tower
4	Heater
5	Swing check valve
6	Blower
7	Repressurization metering valve
8	Purge check valve
9	Blower pressure relief valve
10	Tower pressure relief valve
11	Tower pressure gauge
12	Control air filter
13	Inlet valve
14	Purge exhaust valve
15	Purge exhaust muffler
16	Blower safety pressure switch
17	Blower intake filter silencer
18	Blower-purge adjustment globe valve
19	Blower flex connector
20	Repressurization ball valve
21	Heater high limit thermocouple 'j' type,
22	Press. Diff. Indicator (coalescer prefilter)
23	Coalescer inlet prefilter
24	Particulate outlet afterfilter
25	Drain isolation ball valve
26	Timer drain
27	Press. Diff. Indicator (part. Afterfilter)

# Nortec Heated Desiccant Dryers

## STANDARD FEATURES



- 1 Safety pressure relief valve for each tank
- 2 Completely insulated regenerating circuit
- 3 Optimal twin towers with pressure gauges
- 4 PLC controls with simple user interface
- 5 On/Off switch
- 6 Dry-air cool mode
- 7 Completely automatic operation
- 8 User step mode for emergencies
- 9 Visual alarm lights
- 10 Field adjustable regeneration cycles
- 11 Multiple temperature monitoring points with constant temperature display
- 12 NEMA 4 electrical enclosure
- 13 High quality centrifugal blower
- 14 High efficiency angle body piston purge valve
- 15 Spring load check valves
- 16 Field adjustable timer cycle, 4, 10 or 15 minutes
- 17 Stainless steel inlet/outlet diffusers
- 18 Structural steel frame with floor stand
- 19 Non-lubricated inlet valve
- 20 ASME code construction and stamped pressure vessels
- 21 Full charge of desiccant
- 22 High efficiency long lasting Heater
- 23 Pre piped and mounted pre-filter and after filter
- 24 Fail safe design in case of power failure

## Optional Features

- ▶ Energy saver demand cycle control
- ▶ NEMA 4x and explosion proof NEMA 7
- ▶ High pressure up to 10,000 PSIG
- ▶ Switching failure alarm
- ▶ Pneumatic control timer. Eliminates need for control electric power
- ▶ Optional voltage (380/3/60)
- ▶ High dew point alarm
- ▶ Dew point indicator
- ▶ Special finishes for severe environments, process industries, offshore drilling rigs, etc.
- ▶ -100° F pressure dew point

# Nortec Heated Desiccant Dryers

Model	Inlet Flow Capacity @100 PSIG CFM	Voltage	Inlet/Outlet Connections (inches)	Dimensions L x W x H (inches)	Weight (Lbs)	Pre-filter	After filter
500-BPD	500	230/460/3/60	2" NPT	90x42x90	2890	CF	CF
650-BPD	650	230/460/3/60	2" NPT	90x42x90	3500	CF	CF
800-BPD	800	230/460/3/60	3" FLG	95x55x105	4500	CF	CF
1000-BPD	1000	230/460/3/60	3" FLG	95x55x105	5600	CF	CF
1250-BPD	1250	230/460/3/60	3" FLG	110x70x109	6400	CF	CF
1500-BPD	1500	230/460/3/60	3" FLG	110x70x109	8200	CF	CF
2000-BPD	2000	230/460/3/60	3" FLG	140x75x110	9800	CF	CF
2500-BPD	2500	230/460/3/60	4" FLG	140x75x110	12500	CF	CF
3000-BPD	3000	230/460/3/60	4" FLG	140x89x120	15000	CF	CF
4000-BPD	4000	230/460/3/60	6" FLG	160x94x122	21000	CF	CF
5000-BPD	5000	230/460/3/60	6" FLG	180x94x140	27000	CF	CF
6000-BPD	6000	230/460/3/60	6" FLG	CF	CF	CF	CF
7500-BPD	7500	230/460/3/60	8" FLG	CF	CF	CF	CF
9000-BPD	9000	230/460/3/60	8" FLG	CF	CF	CF	CF

## How to find air flow capacity:

Air flow capacity = Nominal capacity of dryer x Factor F1 x Factor F2

**Example:** A 500-BPD has a nominal capacity of 500 SCFM. What is the maximum allowable flow through the dryer at following operating conditions?

Air Inlet Pressure: 110 PSIG (7.6 BARG)      F1 = 1.04  
 Air Inlet Temperature: 105° F (40.5° C)      F2 = 0.93

Air flow capacity = 500 x F1 x F2  
 Air flow capacity = 500 x 1.04 x 0.93 = 483.6 SCFM.

This is the maximum air flow rate that dryer can accept under those operating conditions.

## How to select a suitable dryer for a given capacity:

Minimum std. air flow = Design air flow / Factor F1 / Factor F2

**Example:** Given the operating parameters below, find a suitable dryer.

Design flow rate:                      950 SCFM  
 Inlet Air Pressure:                      110 PSIG                      F1 = 1.04  
 Inlet Air Temperature:                      105° F                      F2 = 0.93

Minimum std. air flow = 950/1.04/0.93 = 982.22

Therefore the model suitable for the conditions above is 1000-BPD.

## Correction factor for Inlet Air Temperature

°F	70	80	90	100	105	110	115	120
°C	21	27	32	38	40	43	46	49
Factor F2	1.12	1.01	1.06	1	0.93	0.86	0.80	0.75

## Correction factor for Inlet Air Pressure

Inlet Pressure	PSIG	50	60	70	80	90	100	110	120	130	140	150	175	200	225	250
	BARG	3.5	4.1	4.8	5.5	6.2	6.9	7.6	8.3	9.0	9.7	10.3	12.1	13.8	15.5	17.3
Factor F1		0.56	0.65	0.74	0.83	0.91	1.00	1.04	1.08	1.12	1.16	1.20	1.29	1.37	1.45	1.52

# Nortec Heated Desiccant Dryers

## Nortec Advantages:

The performance of any desiccant dryer depends on the quality of its key components. Nortec uses the best available valves, controllers and desiccant. With accurately designed and sized components, the dryers are manufactured to provide you with years of trouble free operation.

### Electronic Controller



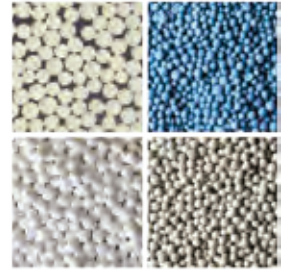
All Nortec heated desiccant regenerative dryers are equipped with the state of the art PLC controllers that regulates and monitors the functioning of the dryer. Using its simple user interface, the operator is able to take advantage of all the features that the versatile controller has to offer – selection of dewpoint, monitoring the dryer, choosing the energy cycle, diagnostic operations and much more. In addition, the optional RS-232 serial port can be used to connect to a PC.

### Dewpoint Meter



The digital dewpoint transmitters are compact, reliable and continuously monitor the dryer performance. With its available options, these monitors can be used as indicators, alarm units or as controllers. Its simple yet powerful interface, permits the user to choose between multiple units, output the data to a PC via the serial interface, set alarm levels and do field calibration of the sensor.

### Desiccant



Nortec uses a mixture of adsorption media in its heatless range of desiccant dryers to achieve consistent dewpoint. Activated Alumina, Molecular Sieve and Silica Gel are used in varying ratios depending on the application. The long lasting, high crush strength media has a very high surface/volume ratio.

### Butterfly Valve



These versatile valves are used by Nortec to provide you with precision control and complete bubble-tight shut off. The digitally controlled actuators provide easy PLC interface and feature fast response times. The tongue-and-groove seat design feature ensures complete isolation of flowing media from the body and stem. Rugged and reliable, these valves are designed to provide years of trouble free service.

### High Efficiency Blower



The centrifugal blower is sized optimally to provide a continuous stream of air to the heater for regeneration. The blower is equipped with an intake filter, a muffler for quieter operation, a safety belt guard and check and relief valves for high pressure safety.

### Angle Body Piston Valve



These high-performance 2-way direct acting valves are designed for reliability and durability. It uses a profiled disc in conjunction with a high resolution compact positioner and linear feedback potentiometer to provide precise proportional flow. The stainless steel internals and a tough fiber composite actuator body, along with the use of oversized bearing and Viton seals makes it possible to consistently provide smooth piston movement for an extended time period.

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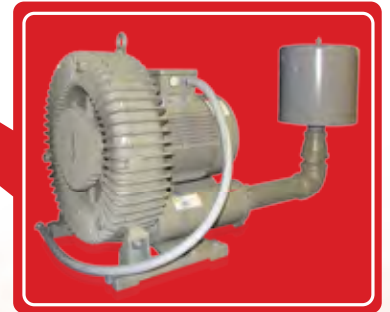
High Efficiency Heater



NEMA 4, 4x, 7 Electrical Enclosures



Zero Purge Loss Drains



High Efficiency Blower

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