



# Externally Heated Desiccant Compressed Air Dryers

*RP Series*



**SPX Air Treatment**

## RP Series Dryers Reduce Purge Air Energy Costs

For decades, compressed air users have relied on Deltech to deliver technology that reduces the cost of operation and improves the reliability of air driven processes. The RP Series is engineered to deliver ISO 8573.1 Air Quality and reduce purge air consumption. In combination with our advanced Ambient Air Amplification (A<sup>3</sup>) Purge Technology™, we offer externally heated purge desiccant dryers with dew point performance guaranteed from 250 to 3,200 scfm.



Model RP 1050

### The Deltech Guarantee

Deltech guarantees that RP Series dryers will produce the design dew point while operating continuously at maximum rated flow (100% duty cycle) at CAGI ADF 200 inlet standards of 100°F inlet temperature and 100% relative humidity at 100 psig.

### RP Series Dryers: -4°F to -40°F Pressure Dew Points

Applications that simply want seasonal protection against freezing are exactly what the standard RP Series dryers are designed to address. ISO 8573.1 dew points between Class 2 and Class 3 are delivered automatically with the standard design. Class 2 (-40°F) dew points protect usage points from freezing during winter. Class 3 (-4°F) dew points keep air systems nice and dry all summer long. Applications that require Class 2 (-40°F) dew points year round simply need to select the Jet Blower option package.

### ISO 8573.1 Air Quality Standards

Quality Classes	Solids max. particle size in microns	Moisture Dew Point		Oil Liquid & Gas	
		°C	°F	mg/m <sup>3</sup>	ppmw/w
0	as specified	as specified	as specified	as specified	as specified
1	0.1	-70	-94	0.01	0.008
2	1	-40	-40	0.1	0.08
3	5	-20	-4	1	0.8
4	15	3	38	5	4
5	40	7	45	>5	>4
6	—	10	50	—	—



## Purge Air Operating Cost Comparison

Annual Cost of Compressed Purge Air (constant operation at average air demand)				
Average Air Demand (flow) (scfm)	Regeneration Cost by Technology <sup>1</sup>			RP Series (w/Optional Jet Blower 6% purge)
	Heatless Design (industry average 15% purge)	RP Series (standard 7% purge)	RP Series (w/Optional Jet Blower 6% purge)	
100%	1050	\$20,585	\$9,606	\$8,234
90%	945	\$20,585	\$9,606	\$7,411
75%	788	\$20,585	\$9,606	\$6,176
50%	525	\$20,585	\$9,606	\$4,117
35%	368	\$20,585	\$9,606	\$2,882
20%	210	\$20,585	\$9,606	\$1,647

<sup>1</sup>Assumes 8760 hours, 10 cents per kWh, 5 scfm per HP

### Dew Point Performance Table

Controller	Pressure Dew Point		EMS Energy Savings
	-40°F	-4°F	Automatic
Standard	S	G	—
Jet Blower Option	G	—	✓

S – seasonal    G – guaranteed    ✓ – included

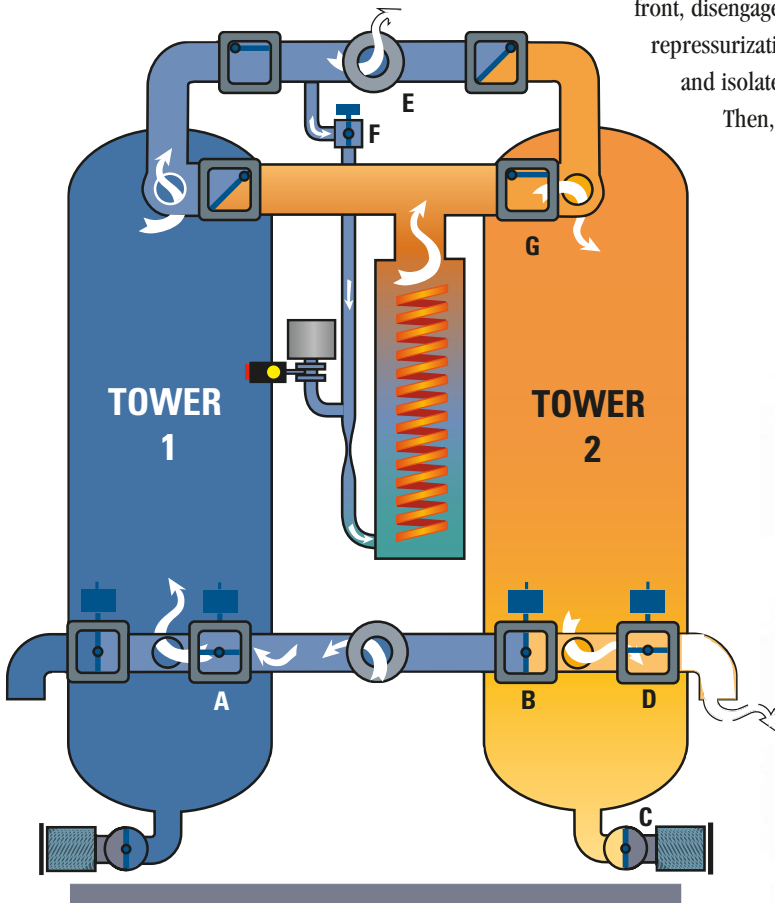
## How It Works

### Standard Design:

Moist, filtered compressed air enters the pressurized on-line desiccant-filled drying Tower 1 through valve (A). Up-flow drying enables the desiccant to strip the air stream of moisture. Clean, dry compressed air exits through valve (E) to feed the air system. Tower 2 (when in regeneration mode) closes valve (B), then depressurizes to atmosphere through muffler (C). Valves (D & G) open and the heater turns on. A portion of dry compressed air (purge air) is diverted before exiting (E) and passes through the heater. Hot dry purge air desorbs the moisture from the desiccant as it flows down through Tower 2 to exit at valve (D). Once desorbed, the heater turns off and cool dry purge air continues to pass until the desiccant bed is cooled. Finally, valve (D) closes and Tower 2 is repressurized. At a fixed time interval, valve (B) will open and Tower 2 will be placed on-line to dry the bed and valves (A & D) will close. Operations will switch and Tower 1 will be regenerated.

### Jet Blower Option Package:

Whereas the standard design operates on a fixed time interval basis, Jet Blower versions manage the drying and regeneration cycles with precision for systems with variable air demands. The on-line Tower will continue to dry the air stream until the “moisture front” is detected. Only then will the switchover sequence begin. In regeneration mode the Jet Blower is engaged and a portion of dry purge air exits valve (F) to be injected into the Y-axis of the Jet Blower. A<sup>3</sup> Purge Technology™ draws ambient air into the X-axis to desorb the desiccant at better than 1:1 amplification. Sensors detect the retreat of the moisture front, disengages the Jet Blower, eliminates the purge air usage and, initiates the repressurization cycle. The dry, pressurized off-line Tower will remain ready and isolated until sensors detect that the on-line drying Tower is saturated. Then, the switchover will occur and the process will repeat.



Shown with optional Jet Blower

## Energy-Efficient Design

Soft-seated check valves for tight shutoff and durability

High-quality pressure gauges display left tower, right tower, and purge pressure

Function indicator LEDs for easy monitoring

Easy-view vacuum fluorescent text display is visible under any condition

**Energy Management System** – advanced microprocessor-based control

Premium quality inlet switching/purge exhaust butterfly valves for long life on 3" and larger (Quality pneumatic angle-seated valves for smaller sizes)

Towers filled with extra, high-grade activated alumina to deliver superior performance

Low-watt density heater saves energy and prevents premature desiccant aging

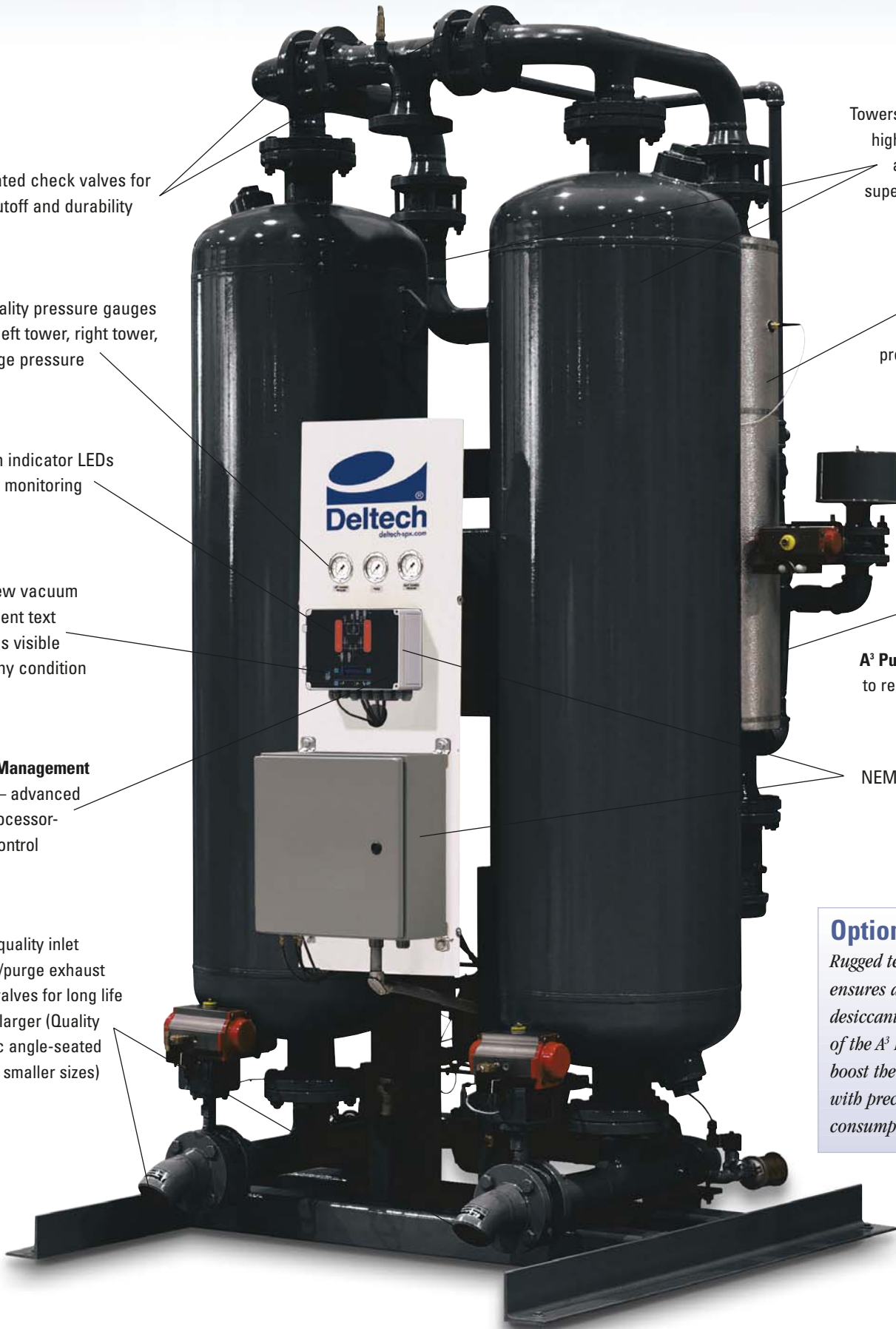
Heavy-duty air intake filter

Optional **EMS** controlled **Jet Blower** uses **A<sup>3</sup> Purge Technology™** to reduce purge costs

NEMA 4 Construction

### Optional Jet Blower

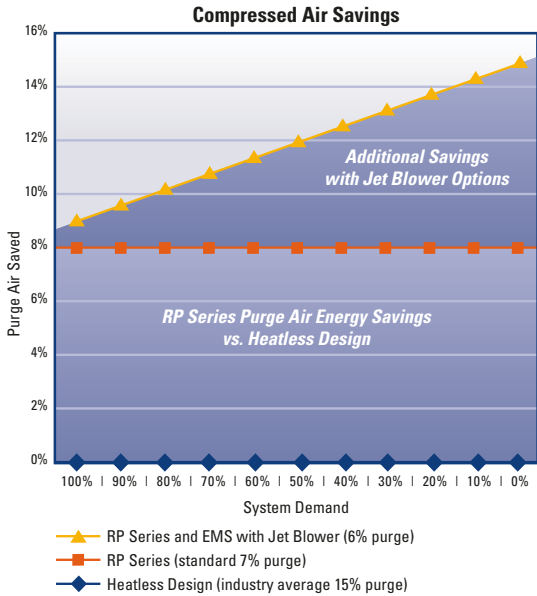
*Rugged temperature- & humid ensures dew point stability with desiccant bed monitoring uses of the A<sup>3</sup> Purge Technology™. This boost the airflow through the c with precision to deliver -40°F, consumption to 6% or less.*



## Maximum Savings and -40°F Pressure Dew Points

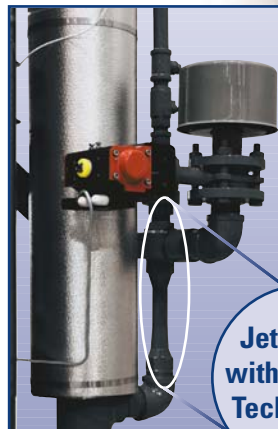
Select a Jet Blower (option A or B) option package to realize fast returns-on-investment. The A<sup>3</sup> Purge Technology™ is controlled by the engagement cycles of the Jet Blower. Energy consumption to regenerate the desiccant bed mirrors your plant air demands. This process is governed by algorithmic logic embedded into the EMS Controller. Consistent -40°F pressure dew points are delivered while saving at least 9% on compressed purge air costs.

In many applications, the Jet Blower's compressed purge air requirements (6% or less) afford the selection of a smaller air compressor. System efficiencies become linear to the energy-saving potential of the dryer. Once the off-line desiccant bed has been regenerated, zero compressed purge air is required. This represents compressed air savings of up to 15% as compared to typical heatless designs.



## Energy Management System

Intelligent sensing technology embedded in the EMS control system allows for precise control without the need for periodic recalibration. Constant monitoring and algorithm-based protocols to deliver precise control ensure the Jet Blower is engaged and disengaged as needed to maintain a constant off-line tower. Bed regeneration cycles are managed to maintain a Class 2 dew point, and reduce compressed purge air



Jet Blower with A<sup>3</sup> Purge Technology™

## Annual Purge Savings vs. Heatless Design

(1050 scfm System Profile Comparison)

Air Capacity Percent	Air Demand (scfm)	Time (per year) Percent	Time (per year) Hours	Standard Design	RP Series Savings Includes Option A or B	Savings with A or B
100	1050	40	3,504	\$4,391	\$4,940	\$549
90	945	5	438	\$549	\$659	\$110
75	788	15	1,314	\$1,647	\$2,161	\$515
50	525	15	1,314	\$1,647	\$2,470	\$823
35	368	20	1,752	\$2,196	\$3,541	\$1,345
20	210	5	438	\$549	\$947	\$398
<b>Average</b>	<b>555</b>	<b>100</b>	<b>8,760</b>	<b>\$10,979</b>	<b>\$14,718</b>	<b>\$3,740</b>

Annual savings (optional EMS with Jet Blower vs. standard RP) . . . . . \$3,740  
 EMS option A – payback within 8.2 months



## RP Series – Externally Heated Desiccant Compressed Air Dryers

### Product Features

Controller Model	Pressure Dew Point per ISO 8573.1		Jet Blower Venturi Blower	EMS Control Automatic Energy Savings	Vacuum Fluorescent Text Digital Dew Point Monitoring	Languages English Spanish French	Power Recovery Automatic Restart after Power Loss	Dry Contacts Power Heater On Heater On	Overlay with Circuit Graphics and LED Indicators Alarm LEDs with Text Display					
	ISO Class 3 -4°F (-20°C)	ISO Class 2 -40°F (-40°C)							Tower Status (drying switchover heat, cool, etc.)	Tower Switch Switchover, Failure (low heater temp/high heater temp)	Sensor Over-range and Under-range (temp, humidity, dew point)	Service Reminder		
Standard	G	S	—	—	—	✓	✓	✓	✓	✓	✓	✓	✓	✓
Option A	—	G	✓	✓	—	✓	✓	✓	✓	✓	✓	✓	✓	✓
Option B	—	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

S – seasonal G – guaranteed ✓ – included

### Engineering Data – 250 thru 3200 scfm\*

Model	Inlet Flow <sup>1</sup> @ 100 psig 100°F scfm	Heater Rated Output kW	Average kW	Dimensions inches			Approx. Weight lbs.	Inlet/Outlet Connections inches	D Series Prefilter Grade 5	DTA Series Afterfilter Particulate	
				H	W	D					
RP-250	250	3.0	1.67	98	48	59	1400	1-1/2" NPT	D-0250-CF	DTA400	
RP-300	300	4.5	2.00	98	48	59	1400		D-0400-CF	DTA400	
RP-400	400	6.0	2.67	105	53	67	1800		D-0400-CF	DTA400	
RP-500	500	6.0	3.34	105	53	70	1800	2" NPT	D-0600-CF	DTA600	
RP-600	600	8.0	4.01	108	55	71	2000		D-0600-CF	DTA600	
RP-750	750	10.0	5.01	114	60	87	2400	3" FLG	D-0750-CF	DTA1200	
RP-900	900	12.0	6.01	114	60	87	2400		D-1000-CF	DTA1200	
RP-1050	1050	14.0	7.01	113	64	84	2900		D-1200-CF	DTA1200	
RP-1300	1300	16.0	8.68	118	66	85	3400		D-1500-CF	DTA1800	
RP-1500	1500	19.0	10.0	116	88	97	5100		D-1500-CF	DTA1800	
RP-1800	1800	23.0	12.0	116	88	97	5100		D-2000-CF	DTA1800	
RP-2200	2200	27.5	14.7	124	85	110	7800		4" FLG	D-2400-CF	DTA2400
RP-2600	2600	32.0	17.4	124	85	110	7800			D-3000-CF	DTA3000
RP-3200	3200	39.0	21.4	121	97	126	9000		6" FLG	D-4000-CF	DTA4800

<sup>1</sup>Performance data per CAGI Standard ADF 200 for Dual-Stage Regenerative Desiccant Compressed Air Dryer. Rating conditions are 100°F (37.8°C) inlet temperature, 100 psig (6.9 bar) inlet pressure, 100% relative humidity, 100°F (37.8°C) ambient temperature, and 5 psi (0.35 bar) pressure drop. \* Consult factory for larger models.

### Inlet Flow

Inlet Flow capacities shown in the Specifications Table have been established at an inlet pressure of 100 psig (7kgf/cm<sup>2</sup>) and a saturated inlet temperature of 100°F (38°C). To determine maximum inlet flow at other conditions, multiply the inlet flow from the Specifications Table by the multiplier from Table 1 that corresponds to your operating conditions.

Table 1

Pressure psig (kgf/cm <sup>2</sup> )	Inlet Temperature °F (°C)						
	60 (15.6)	70 (21.1)	80 (26.7)	90 (32.2)	100 (37.8)	110 (43.3)	120 (48.9)
60 (4.2)	1.03	1.01	0.99	0.80	0.58	0.43	0.32
70 (4.9)	1.10	1.08	1.07	0.94	0.68	0.50	0.37
80 (5.6)	1.17	1.15	1.14	1.08	0.79	0.58	0.43
90 (6.3)	1.24	1.22	1.20	1.18	0.89	0.66	0.49
100 (7.0)	1.30	1.28	1.26	1.24	1.00	0.74	0.55
110 (7.7)	1.36	1.34	1.32	1.30	1.11	0.82	0.61
120 (8.4)	1.42	1.40	1.38	1.36	1.22	0.90	0.67
130 (9.1)	1.48	1.46	1.44	1.42	1.33	0.99	0.74
140 (9.8)	1.53	1.51	1.49	1.47	1.44	1.07	0.80
150 (10.6)	1.58	1.56	1.54	1.52	1.50	1.16	0.87

### Operating Conditions

RP Models	maximum working pressure	minimum operating pressure	maximum inlet air temp.	minimum inlet air temp.	maximum ambient temp.	minimum ambient temp.
250-3200	150 psig	60 psig	120°F	40°F	120°F	40°F

### Dew Point

Outlet pressure dew point at rated inlet conditions of 100 psig (7kgf/cm<sup>2</sup>) and 100°F (38°C) saturated. Dew point varies slightly at other conditions. Consult the factory to determine exact outlet pressure dew point at your operating conditions.



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Bulletin DRP-3100-NA-1