Deltech

AN SPX BRAND

# Externally Heated Desiccant Air Dryer

***RP Series***


## Reduce Purge Air Energy Costs

For decades, compressed air users have relied on Deltechto 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 (A3) Purge Technology™, we offer externally heated purge desiccant dryers with dew point performance guaranteed from 250 to 3,200 scfm.

### 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.

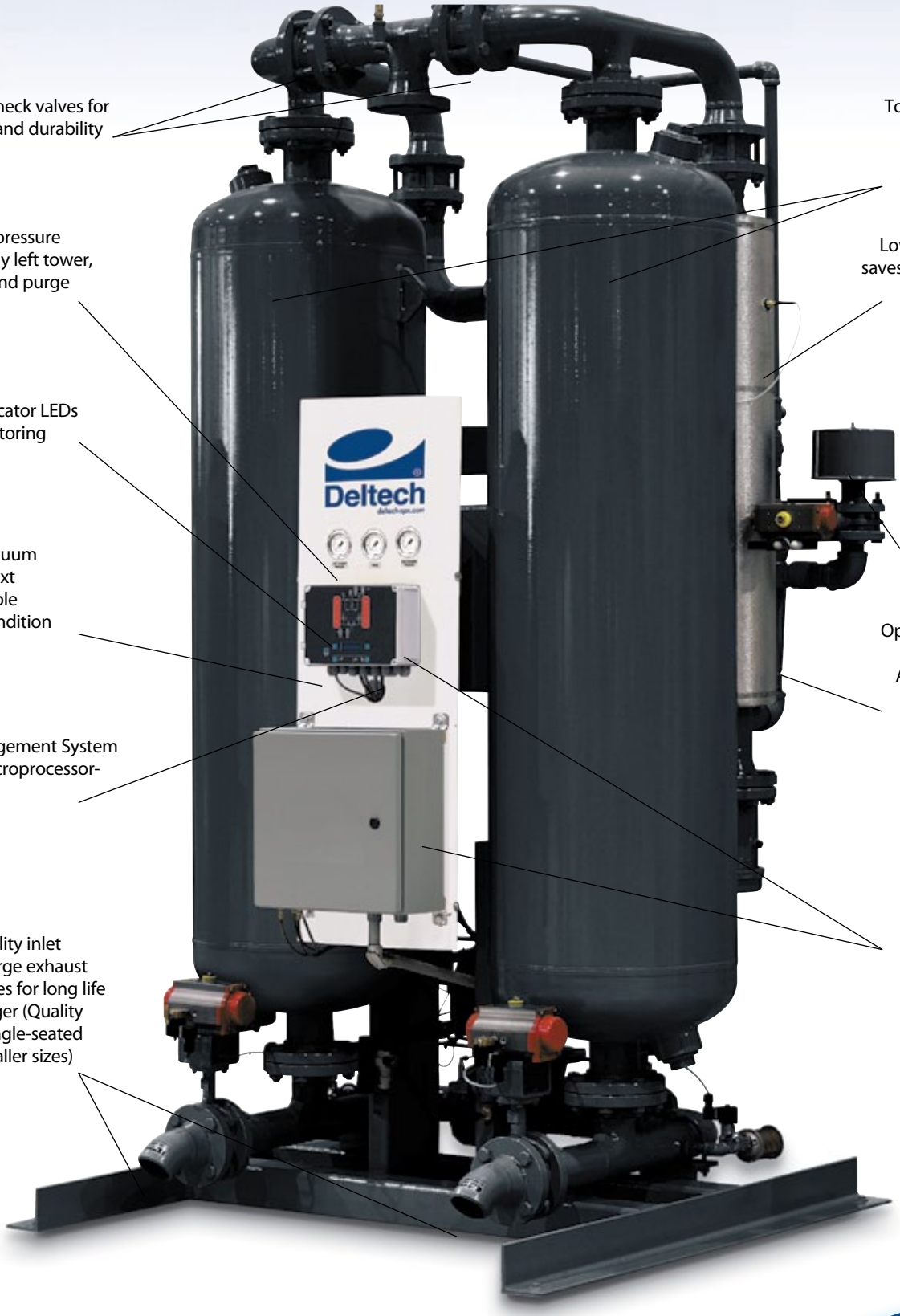
### *Benefit from Quality Class 2 to 3 Dew Points*

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 Quality Classes*

| Class | Solid Particles, ( d $\mu$m) | | | Pressure Dew Point | | Oil, Aerosol, Liquid Vapor | |
|---|---|---|---|---|---|---|---|
| | 0.10 < d ≦ 0.5 | 0.5 < d ≦ 1.0 | 1.0 < d ≦ 5.0 | °C | °F | mg/m³ | ppm w/w |
| 0 | As Specified | | | As Specified | | As Specified | |
| 1 | 100 | 1 | 0 | ≦ -70 | -94 | ≦ 0.01 | 0.008 |
| 2 | 100,000 | 1,000 | 10 | ≦ -40 | -40 | ≦ 0.1 | 0.08 |
| 3 | – | 10,000 | 500 | ≦ -20 | -4 | ≦ 1 | 0.8 |
| 4 | – | – | 1,000 | ≦ +3 | 38 | ≦ 5 | 4 |
| 5 | – | – | 20,000 | ≦ +7 | 45 | > 5 | > 4 |
| 6 | | | | ≦ +10 | 50 | | |
| | | | | Liquid Water g/m³ | | | |
| 7 | | | | $C_w$ ≦ 0.5 | | | |
| 8 | | | | 0.5 < $C_w$ ≦ 5 | | | |
| 9 | | | | 5 < $C_w$ ≦ 10 | | | |
| Per ISO 8573-1: 2001(E) | | | | | | | |

# RP Series Dryers – Energy Efficient Design




Soft-seated check valves for tight shutoff and durability

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

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

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

Function indicator LEDs for easy monitoring

Heavy-duty air intake filter

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

Optional EMS controlled Jet Blower uses $A^3$ Purge Technology™ to reduce purge costs

Energy Management System advanced microprocessor-based control

NEMA 4 Construction

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

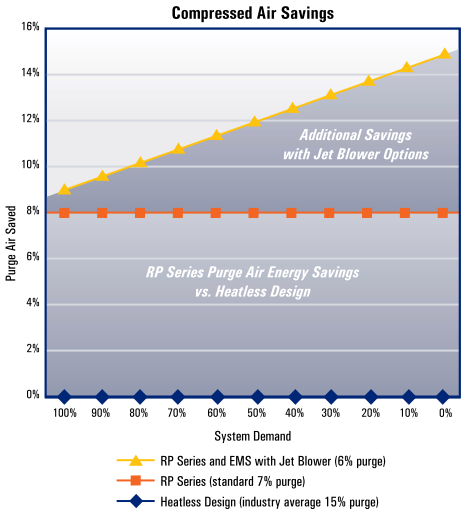
# Optional Jet Blower Energy Management System

Rugged temperature and humidity-sensing technology embedded in the EMS control ensures dew point stability without the need for periodic recalibration. Constant desiccant bed monitoring uses algorithm-based protocols to deliver precise control of the A³ Purge Technology™. The Jet Blower is engaged and disengaged as needed to boost the airflow through the off-line tower. Bed regeneration cycles are managed with precision to deliver, Class 2 (-40°F/-40°C) dew point, and reduce compressed purge air consumption to 6% or less.


## *Maximum Savings and Class 2 Pressure Dew Points*

Select a Jet Blower (option A or B) option package to realize fast returns-on-investment. The A3 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 Class 2, (-40°F/-40°C) 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.




## *Annual Purge Savings vs. Heatless Design*

### *(1050 scfm System Profile Comparison)*

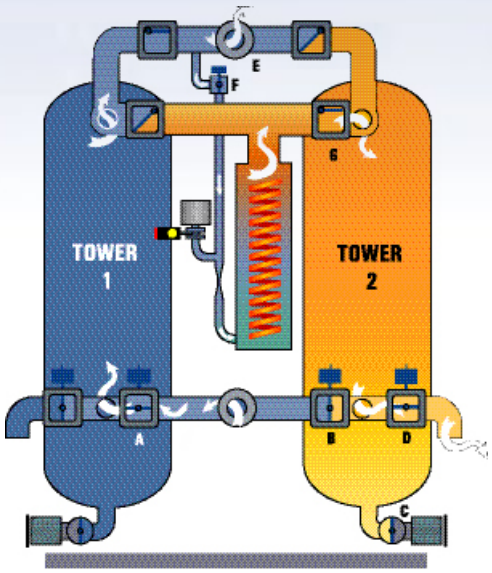
| Air Capacity % | Air Demand (scfm) | Time (per year) % | Time (per year) Hours | RP Series Savings Standard Design | RP Series Savings Includes Option A or B | RP Series Savings Savings with A or B |
|---|---|---|---|---|---|---|
| 100 | 1050 | 40 | 3,504 | $4,391 | $4,940 | $549 |
| 90 | 945 | 5 | 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 |
| Average | 555 | 100 | 8,760 | $10,979 | $14,718 | $3,740 |

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

# 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.



Shown with optional Jet Blower

## *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. A3 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.

## *Purge Air Operating Cost Comparison*

| Annual Cost of Compressed Purge Air (constant operation at average air demand) | | | | |
|---|---|---|---|---|
| Average Air Demand | | Regeneration Cost by Technology [1] | | |
| | | Heatless Design (industry average | RP Series (standard | RP Series (w/Optional Jet |
| (flow) | (scfm) | 15% purge) | 7% purge) | 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 |

[1] 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 | — | 3 |

# RP Series Product Specifications

## RP Series Product Features

| Controller | Pressure Dew Point per ISO 8573.1 | | Jet Blower | EMS Control | Vacuum Fluorescent Text | | Languages | Power Recovery | | Dry Contacts | | Overlay with Circuit Graphics & LED Indicators Alarm LEDs with Text Display | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | ISO Class 3 -4°F (-20°C) | ISO Class 2 -40°F (-40°C) | Venturi Blower | Automatic Energy Savings | Digital Dew Point Monitoring | 2 Line, 16 Characters (high-visibility in darkness or sunlight | English Spanish French | Automatic Restart after Power Loss | Remote Indication of Alarm | Power On | Heater On | Tower Status (drying switchover heat, cool, etc.) | Tower Switch Switchover Failure (low heater temp/ high heater temp) | Sensor Over-range & Under-Range (temp, humidity, dew point) | Service Reminder |
| Standard | G | S | – | – | – | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Option A | – | G | 3 | 3 | – | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Option B | – | G | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

S=Seasonal G=Guaranteed 3=Included

## RP Series Engineering Data – 250 thru 3200 scfm*

| Model | Inlet Flow [1] @ 100 psig 100°F scfm | Heater Rated Output kW | Average kW | Dimensions H | W inches | D | Approx. Weight lbs. | Inlet/Outlet Connections inches |
|---|---|---|---|---|---|---|---|---|
| RP-250 | 250 | 3.0 | 1.67 | 98 | 48 | 59 | 1400 | 1½" NPT |
| RP-300 | 300 | 4.5 | 2.00 | 98 | 48 | 59 | 1400 | 1½" NPT |
| RP-400 | 400 | 6.0 | 2.67 | 105 | 53 | 67 | 1800 | 1½" NPT |
| RP-500 | 500 | 6.0 | 3.34 | 105 | 53 | 70 | 1800 | 2" NPT |
| RP-600 | 600 | 8.0 | 4.01 | 108 | 55 | 71 | 2000 | 2" NPT |
| RP-750 | 750 | 10.0 | 5.01 | 114 | 60 | 87 | 2400 | 3" FLG |
| RP-900 | 900 | 12.0 | 6.01 | 114 | 60 | 87 | 2400 | 3" FLG |
| RP-1050 | 1050 | 14.0 | 7.01 | 113 | 64 | 84 | 2900 | 3" FLG |
| RP-1300 | 1300 | 16.0 | 8.68 | 118 | 66 | 85 | 3400 | 3" FLG |
| RP-1500 | 1500 | 19.0 | 10.0 | 116 | 88 | 97 | 5100 | 3" FLG |
| RP-1800 | 1800 | 23.0 | 12.0 | 116 | 88 | 97 | 5100 | 3" FLG |
| RP-2200 | 2200 | 27.5 | 14.7 | 124 | 85 | 110 | 7800 | 4" FLG |
| RP-2600 | 2600 | 32.0 | 17.4 | 124 | 85 | 110 | 7800 | 4" FLG |
| RP-3200 | 3200 | 39.0 | 21.4 | 121 | 97 | 126 | 9000 | 6" FLG |

[1] 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.

## Inlet Flow

Inlet Flow capacities shown in the Specifications Table
have been established at an inlet pressure of 100 psig (7kgf/cm²) 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.

## Dew Point

Outlet pressure dew point at rated inlet conditions of 100 psig (7 bar) 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.

## 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 |

## Table 1

| Pressure | Inlet Temperature °F (°C) | | | | | | |
|---|---|---|---|---|---|---|---|
| psig (bar) | 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 |

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## The Deltech Commitment

Deltech sets the standard of excellence in technology for today's growing industries.

We build relationships by understanding the requirements of our customers. As a result, the compressed air solutions we develop enable end users of Deltech products to meet their objectives of improved productivity and optimized efficiency. We will continue to dedicate our research and development resources in providing new and innovative air treatment products, inspired by our valued customers.

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