Aircel

Compressed Air & Gas
Purification for Every Application

Heated Blower Purge Desiccant Dryer

ABP Series
with Energy Management

ABP Series

800 - 15,000 SCFM

The **ABP Series** is Aircel's new blower purge heat reactivated dual tower regenerative air dryer with standard Energy Management System (EMS) for solid peace-of-mind energy savings and consistent operation automatically controlled via an Allen Bradley PLC and a 6" LCD Color Touch Screen.

Superior Control with Energy Management System

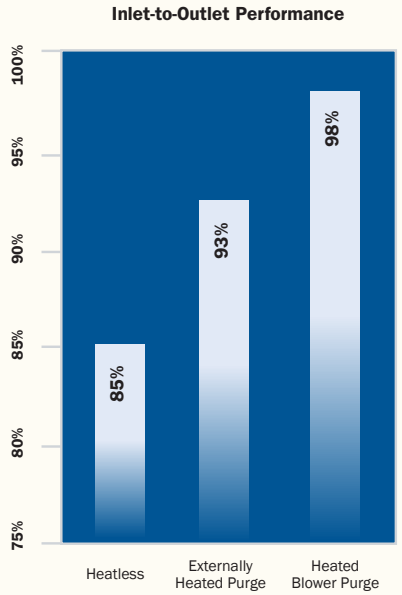
The standard **Energy Management System (EMS)** control incorporates an integral air outlet dew point sensor to continually monitor the outlet moisture content and to display on the system color touch screen. The EMS control extends the drying time if the outlet dew point is below a preset adjustable set point saving a tremendous amount of energy, valve wear and tear (less switching) during low loading conditions. Energy saving is achieved since the overall regeneration time and dry air cooling time is reduced. The EMS control also provides an Outlet High Humidity Alarm.

Why is the ABP Series different?

For added energy savings, the ABP Series uses a high-efficiency blower to take in ambient air required during the heat regeneration cycle to desorb moisture from the desiccant. **No compressed air is used during this phase.**

Dry compressed air is used during the dry air cooling regeneration period for reduced heat and dew point spike at tower switchover. This amounts to an **average process air use of 2% of the rated capacity of the dryer**.

Aircel's unique parallel cooling mode further reduces the heat and dew point spike prior to tower switchover. During the parallel cooling mode both inlet valves are open for a 10 minute period and divert half-load to each tower further cooling the previously regenerated desiccant bed with a larger volume of air.



Supply-Side Efficiencies with Aircel Desiccant Dryers

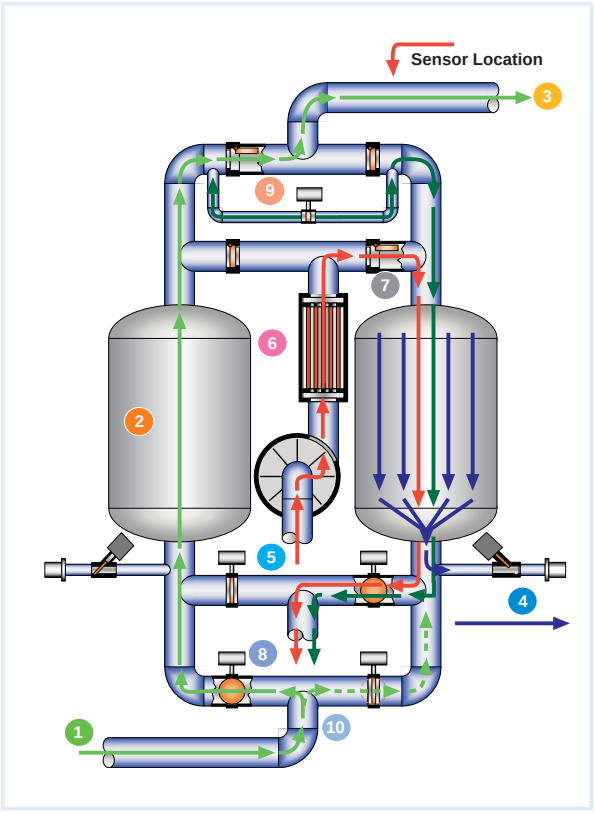
Even more energy savings are realized with the early Heat Regeneration Termination Feature. This feature terminates the heat regeneration early if the temperature at the regeneration outlet reaches a specified temperature, then automatically switches to cooling mode. This feature eliminates the unnecessary heater and blower on-time saving energy.

Aircel has many other features built into the new ABP Series controls such as Backup Heatless Mode Operation, Heater Safety Backup Contactor, High Performance Butterfly Valves, Angle Body Piston Valves, Failure-to-Switch Alarm using pressure transducers and many other unique features.

ABP Series

How it Works

1. Pre-filtered wet compressed air enters the bottom of the on-line vessel.
2. Compressed air passes upward through the desiccant bed; moisture is removed, lowering the dew point to -40° F.
3. Dry compressed air exits the top of the vessel and flows downstream to the after-filter, monitored constantly via standard dew point sensor. This EMS feature extends the drying period until the target dew point occurs. This greatly reducing energy costs.
4. Prior to regeneration, saturated online vessel goes off-line and depressurizes to ambient through an angle seat valve and muffler.
5. After the off-line vessel has depressurized, a blower draws in ambient air for regeneration.
6. This air passes thru an immersion heater, check valve, and enters top of regenerating vessel.
7. As the hot ambient air passes downward through the desiccant bed, water molecules are released from the surface of the desiccant.
8. Hot regeneration air passes through a butterfly valve and exhausts to atmosphere. Heating phase may terminate early due to low load conditions; this energy savings is automatically passed onto the customer and allows for earlier cooling process to begin.



9. At the end of the heating phase of the cycle, the desiccant bed, although regenerated, remains hot. The temperature of the bed must be lowered to reduce dew point and temperature spikes in the process air when the bed goes back on-line. This is accomplished by allowing a slipstream of dry process air, controlled by an automatic valve, to flow from the on-line vessel into the off-line vessel. This slipstream is also used to repressurize the offline vessel after it has been cooled placing the unit into standby. The EMS control continues to save by extending the drying period through outlet dew point monitoring until the target dew point is reached.
10. Unique to the Aircel ABP is our parallel running period 10 minutes after vessel switchover. During this period, the incoming flow of wet compressed air is directed through both vessels. This step further reduces the dew point and temperature spikes associated with heated dryers. This parallel cooling mode requires no purge air.

ABP Series

Controls & Energy Management System

Maximum Savings with Accurate Dew Point Control

The **Aircel Programmable Controller (APC)** and **Energy Management System (EMS)** is standard on the new Aircel ABP Series. This energy-saving control reduces purge air and optimizes dryer performance by monitoring the dry air outlet dew point with a sensor. This control panel automatically adjusts the regeneration cycle maintaining dew point and extending the drying cycle. Switching is less frequent, reducing dryer maintenance and fully utilizing desiccant capacity. This addition will improve reliability and performance while sustaining a constant dew point. The end result is an overall purge reduction and significant energy savings.

NEMA 4 Steel Enclosure

Standard Control Features

- NEMA 4 Steel Enclosure
- UL/cUL-508a Control Assembly
- Allen Bradley MicroLogix 1100E PLC Controller
- 6" LCD Color Touch Screen
- Outlet Dew Point Reading (using EMS Sensor)
- On-Screen Display of Dryer Operation Status
- Service Mode of Operation
- 10/100 MB/s Ethernet with Built-in Peer-to-Peer Messaging
- Communication Through RS-232/RS-485 Combo Port
- UL/CUL, CE, C-Tick and Class1-Div2 Certified
- Data Logging - Time Based or Event Triggered
- Supports DHCP
- Up to 4 Add on 1762 I/O Modules

MicroLogix 1100 Expansion Modules

Standard Control Alarms

- Backup Heatless Mode Operation
- Failure-to-Switch (pressure control safety)
- High Dew Point
- Dew Point Sensor Failure
- Regeneration Thermocouple Failure
- Loss of System Pressure
- Blower Not Running
- Blower Motor Overload
- Early Heat/Cool Termination
- Heater Backup Safety Contactor
- Heater Outlet Low Temperature
- Heater Outlet High Temperature
- Heater Over Temperature
- Heater Sheath Thermocouple(s) Failure
- Vessel 1 Repressurization Failure
- Vessel 2 Repressurization Failure
- Vessel 1 Depressurization Failure
- Vessel 2 Depressurization Failure
- Pressure Sensor Vessel 1 Failure
- Pressure Sensor Vessel 2 Failure

Standard Control Readout

- Heater Sheath Temperature (°F)
- Regeneration Outlet Temperature (°F)
- Heater Outlet Temperature (°F)
- Vessel 1 Pressure
- Vessel 2 Pressure
- Outlet Dew Point

Outlet Dew Point Sensor

ABP Series

Controls & Energy Management System

Exceptional Operational Controls & Components

The Aircel ABP Series utilizes the Allen Bradley MicroLogix 1100E PLC Controller for automatic control and flexible programming. This addition sets a higher standard of configurations and capabilities that exceeds other blower purge dryers in the market. With built-in Ethernet connection, you can access, monitor and program from any available connection. An embedded web server is also included to configure controller data easily on a web page.

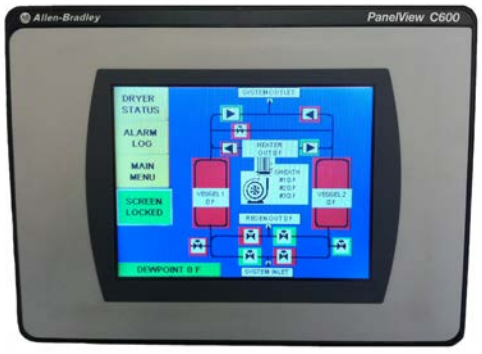
MicroLogix 1100 Controller

Standard On-Screen Features

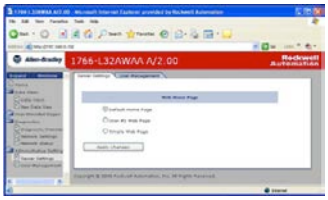
Main Control Menu	Provides easy road map for on-screen navigation
Flow Diagram	Visual P&ID with real time data: active objects, temp, pressure, and dew point readout
Interactive Service Menu	User step-by-step service screens
Operation Screens	Step-by-step real time process data
Alarm Banner	Provides immediate pop-up display
History Log	Captures triggered alarm with time/date stamp
Alarm Status Screen	Indicates all alarm states
Settings Screens	Provides user access to various control set points
Control Push Buttons	Touch system control, EMS Off/On
Dryer Status	Days of operation, hours of energy savings, system timers and mode of operation

Optional Controls (consult factory)

- Digital Flow Meter
- Valve Inlet Position Switches
- Valve Regeneration Outlet Position Switches
- Condensate Drain Alarm
- Inlet Temperature
- Vessel Bed Thermocouple Temperature (°F)
- Filter Differential Pressure Alarm

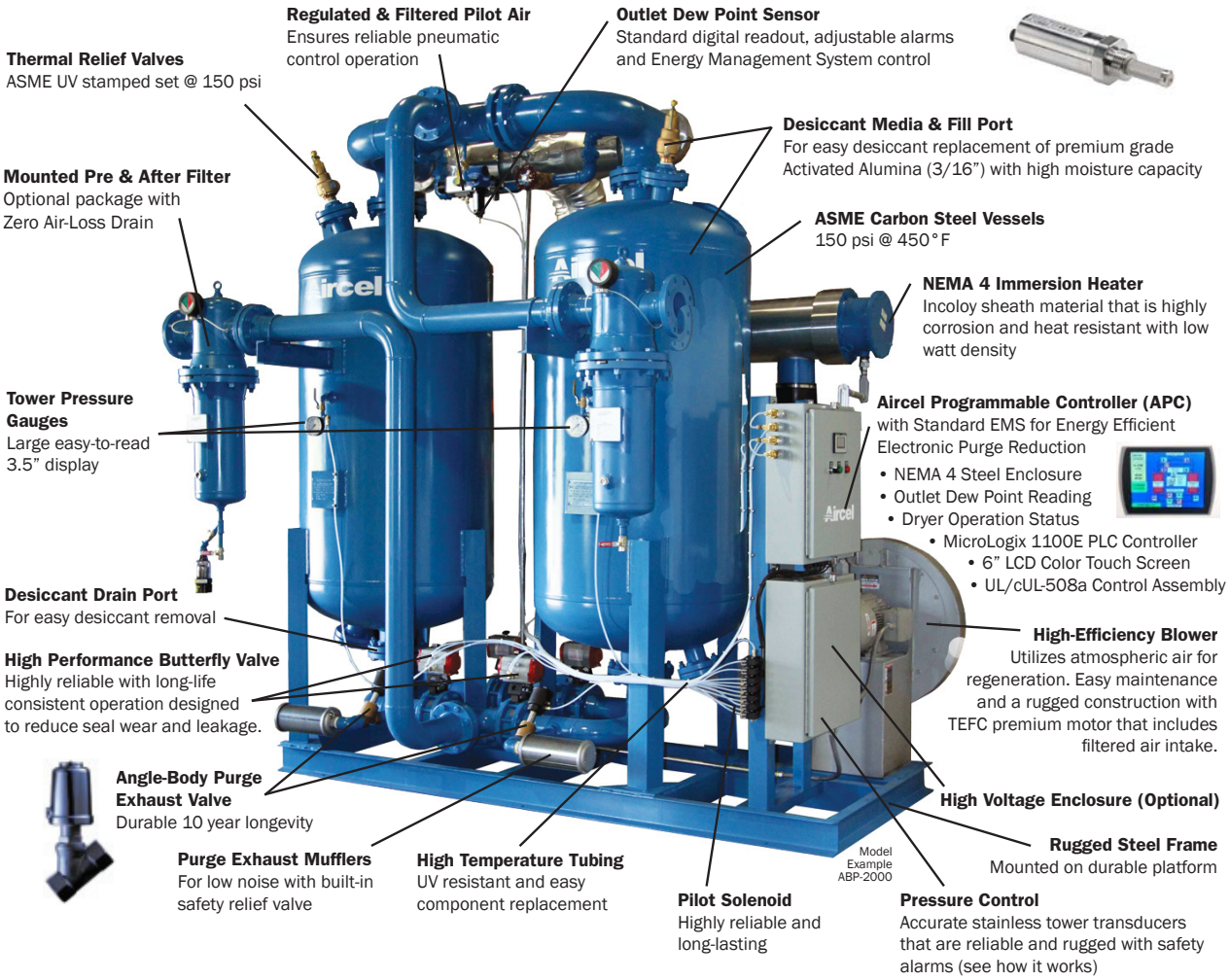


Easy to Read
6" LCD Color Touch Screen



ABP Series

Standard Features & Benefits



Additional Standard Features

- Remote start/stop control
- Purge air consumption reduced down to an average of 2%
- Fail-safe design: failure of power causes the purge exhaust valves to close, drying air flow is uninterrupted
- Stainless steel desiccant supports and air diffusers to prevent channeling
- Counter-current regeneration, upflow drying, and downflow depressurization
- Ambient air used for heat regeneration, no compressed air used
- 10 minutes of parallel flow with both desiccant chambers online at switch-over to reduce the temperature and moisture spikes

Optional Equipment

- Pre-piped & mounted Package "B" pre & after filter
- Low ambient temperature with heated pre-filter drain
- 3-valve dryer block and bypass package
- Special filtration and valving packages
- -100°F pressure dew point for critical applications
- Class I, Division II, Group C & D, Z-Purge Enclosure
- Vessel insulation to optimize efficiency of regeneration
- Aircel's Zero Purge AZP Series air dryer

Consult factory for optional equipment information.

ABP Series

Model Comparison & Specifications

Model	Capacity[1] (scfm)	Connection (in.)	Heater kW	Blower HP	Full Load Amps	Dimensions (in.) L	W	H	Weight (lbs)
ABP-800	800	3" FLG	18	5	34	93	50	95	3,500
ABP-1000	1,000	3" FLG	22	5	39	95	52	100	4,500
ABP-1200	1,200	3" FLG	27	7.5	48	98	60	100	5,100
ABP-1400	1,400	3" FLG	32.5	10	55	100	70	110	6,800
ABP-1600	1,600	4" FLG	37	10	60	115	71	112	7,500
ABP-2000	2,000	4" FLG	45	10	70	117	73	112	8,850
ABP-2500	2,500	4" FLG	52	15	86	119	73	122	9,800
ABP-3000	3,000	6" FLG	64	15	101	138	79	122	12,800
ABP-3500	3,500	6" FLG	78	15	119	161	82	132	13,500
ABP-4000	4,000	6" FLG	90	15	140	163	86	135	15,600
ABP-5000	5,000	6" FLG	110	20	165	174	93	147	17,900
ABP-6000	6,000	8" FLG	120	20	178	174	93	147	22,377
ABP-7000	7,000	8" FLG	140	20	203	C/F	C/F	C/F	26,852
ABP-8000	8,000	8" FLG	160	25	235	C/F	C/F	C/F	31,327
ABP-10000	10,000	8" FLG	200	30	291	C/F	C/F	C/F	44,755

[1]Capacity rated in accordance with CAGI ADF 200 @ 100 psig, 100°F Inlet, 100°F Ambient and a PDP of -40°F.

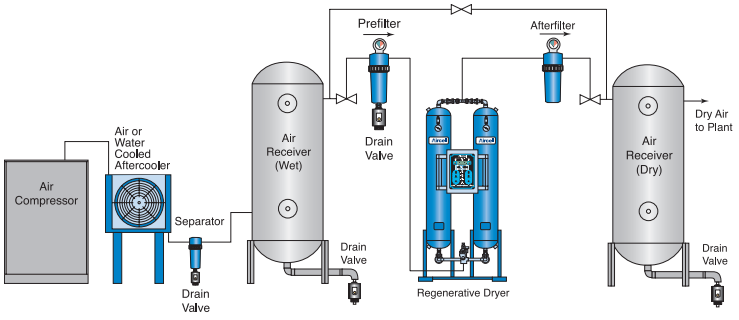
Operating Pressure: 60-135 psig.
Ambient Air Temperature: 38°-120°F.
Inlet Air Temperature: 40°F-120°F.

Standard Voltage: 460V/3Ph/60Hz

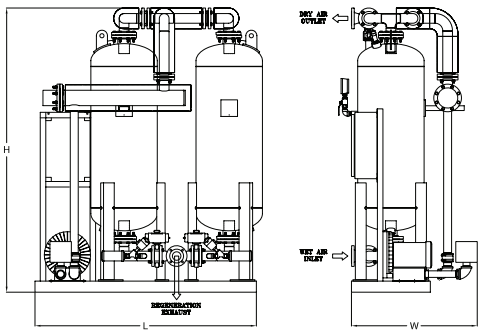
* C/F Consult Factory

For larger capacities and custom dryer options, please contact an Aircel factory representative.

Recommended Installation



Dimensional Drawing



Capacity Correction Factors

The Compressed Air and Gas Institute (CAGI)has developed standards to protect users of compressed air & gas equipment. ADF200 the current standard for desiccant compressed air dryers, specifies the dryers performance to be rated at 100°F inlet temperature, 100°F ambient temperature, and 100 psig system pressure. To adjust the dryer capacity from these "CAGI conditions" to your specific application, please use the correction factors below for differing system pressures (C1) and inlet air temperatures (C2).

To Size the Dryer Capacity for Actual Conditions

Adjusted Capacity = scfm x C1 x C2

To calculate the capacity of a given dryer based on non-standard operating conditions, multiply the standard capacity by the appropriate correction factor(s).

EXAMPLE: Dryer Model: ABP-1200
Standard Capacity: 1200 scfm
Actual Operating Conditions: 80°F ambient temperature: C1 = 1.15
90 psig system pressure: C2 = 0.91
Adjusted Capacity = 1200 scfm x 1.15 x 0.91 = **1256 scfm**

To Select the Dryer Model for Actual Conditions

Adjusted Capacity = scfm/C1/C2

To choose a dryer based on a given flow at non-standard operating conditions, divide the given flow by the appropriate correction factor(s).

EXAMPLE: Given Flow: 1200 scfm
Actual Operating Conditions: 80°F ambient temperature: C1 = 1.15
130 psig system pressure: C2 = 1.27
Adjusted Capacity = 1200 scfm/ 1.15 / 1.27 = **822 scfm**

Capacity correction factors for inlet air temperature (C1)

Ambient Temperature (°F)	70	80	90	**100**	105	110	120
Correction Factor	1.2	1.15	1.10	**1**	0.9	0.8	0.6

Capacity correction factors for system air pressure (C2)

System Pressure (psig)	60	70	80	90	**100**	110	120	130	140	150
Correction Factor	0.65	0.73	0.82	0.91	**1**	1.09	1.18	1.27	1.35	1.44

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