

ECLIPSE™
Desiccant Air Dryers

90-8000 scfm



ZPA Heatless Regeneration

ZHA Heated Regeneration

ZBA Heated Blower Regeneration

Reliable Performance.

Design Innovation.

Before compressed air is used in production, finishing or sensitive research or manufacturing processes, it must be treated to remove moisture and contaminants. Without proper treatment, air may damage equipment and tools, reduce productivity and adversely affect the quality of finished goods.

Regardless of air compressor type, the compression process itself causes concentrations of water and airborne particulate to increase to damaging levels. Eclipse™ desiccant dryers from ZEKS effectively and reliably dry compressed air to extremely low moisture levels for use in applications where the presence of even minimal moisture can't be tolerated or where environmental conditions demand it.

Eclipse™ desiccant dryers are engineered to deliver the operating and service benefits needed most:

- **High Performance Valves -**
Reliable operation plus reduced maintenance
- **Advanced Controls Group -**
Digital performance control; Solid state heater control
- **Options For Energy Savings -**
Minimize operating cost and optimize air system operation
- **Convenient Service Access -**
Minimizes maintenance time requirement
- **Remote Communication Ready -**
Multiple communication options
- **Low Profile Design -**
Reduces shipping cost and simplifies installation
- **Comprehensive Warranty Coverage -**
*Standard warranty PLUS five years
on flow valves and heater*



Three Eclipse™ models enable air treatment selection based on the unique requirements of the application:

ZPA Heatless Regeneration
ZHA Heated Regeneration
ZBA Heated Blower Regeneration

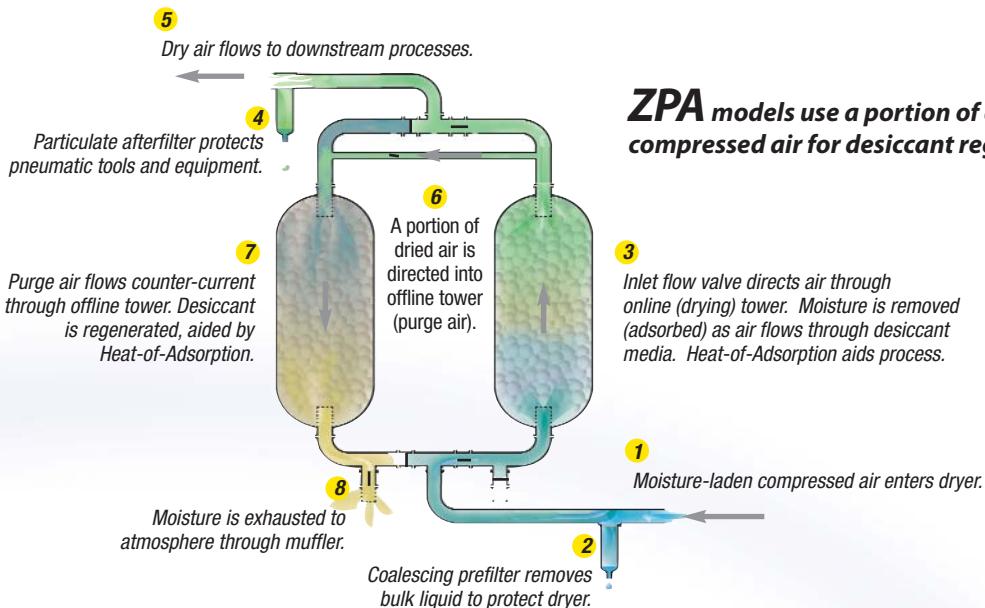
Authorized ZEKS Distributors are trained to assist selection of the Eclipse™ model that will satisfy all application requirements and provide the most favorable energy use profile and long-term reliability.



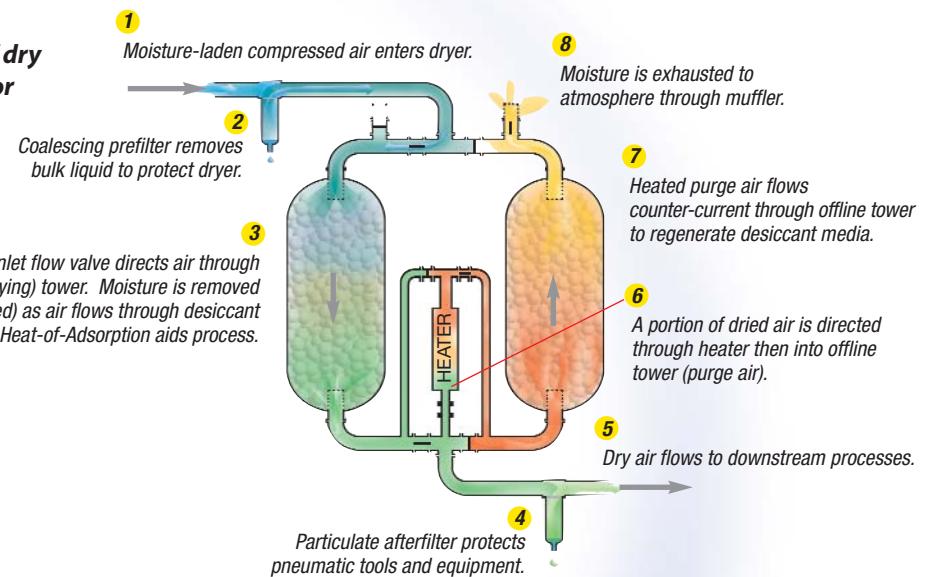
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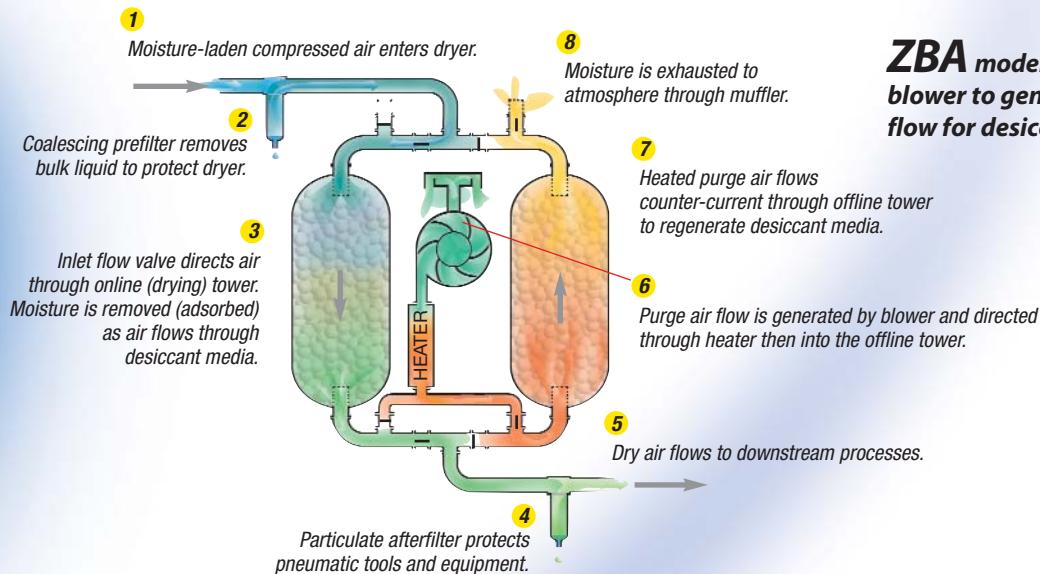
ECLIPSE™ DRYER OPERATION



ZHA models use a portion of dry compressed air that is heated for desiccant regeneration.



ZBA models use a dedicated blower to generate atmospheric air flow for desiccant regeneration.



ZPA

Heatless Regeneration

Eclipse™ ZPA models utilize a portion of the dried compressed air volume for regeneration of the desiccant media. Standard ZPA dryers deliver -40°F pressure dew point air while an optional -80°F or -100°F dew point is available for extremely critical applications. Dryers ordered with the NEMA 4/DPC™ option can be equipped with features that provide significant energy savings and optimize air system operation. ZPA models are available in a flow range from 90-5000 SCFM.



1200ZPA in NEMA 4/DPC™ Configuration

STANDARD FEATURES:



- **Dependable Valves:** Non-lubricated diaphragm valves engineered for trouble-free operation deliver higher flows with lower pressure drop than alternate valves. Internal components are easily accessed for routine maintenance without disconnection from pipework.
- **Reliable Solid State Timer:** Field-proven over time, this design and technology maintain precise control over all switching and purge valve functions.
- **Illuminated Status Indication:** All dryers feature Left and Right Tower operation lights, and Power On indication.
- **Prominent Purge Pressure Gauge:** Visual indication aids adjustment of purge flow rate for regeneration.
- **High Strength Desiccant:** Minimizes dusting, increases afterfilter element life and is unaffected by liquid water exposure.
- **Blue Moisture Indicator:** Continuously monitors outlet airstream for excessive moisture. Indicator turns from blue to gray in the presence of an elevated moisture content.
- **Control Air Filtration:** Particulate filter protects dryer operating controls.
- **ASME Coded Pressure Vessels:** Carbon steel towers constructed for 150 psig MAWP operation meet ASME Section VIII, Div. 1 requirements. Towers are sized to provide low air flow velocity and high contact time.
- **Tower Pressure Gauges:** Accurate indication of pressure within each tower.
- **Pressure Relief Valves:** Standard fire-rated relief valves per API RP-520. Optional flow-rated valves available.
- **Accessible Fill and Drain Ports:** Port locations on each vessel enable easy service access.
- **Removable Stainless Steel Diffuser Screens:** Distribute air evenly through desiccant beds.
- **Sound Attenuating Purge Mufflers:** Large mufflers minimize noise and include built-in relief valves to enhance safety.



OPTIONAL FEATURES:

• **NEMA 4/DPC™ Package:** Premium electrical package provides increased protection of electrical components and enhanced digital dryer controls and displays. The following features are included:

– **NEMA 4 Electrical Enclosure:** Type 4 enclosure protects against splashing, falling, and hose-directed water as well as severe external condensation.

– **UL/ULC Panel:** Electrical panel constructed in accordance with UL/ULC 508A.

– **DPC Controller:** Provides instant access to adjustable performance controls, executes all valve switching functions and monitors dryer operation. This fully-featured PLC with keypad interface includes the following:

- MODBUS Compatibility
- Remote Alarm Contact
- Failure Code Storage
- Backlit LCD Display



– DynOptic™ Schematic:

- Dryer On
- Dryer Alarm
- Left/Right Tower Drying
- Left/Right Tower Regeneration

– Enhanced Dryer Operation Functions:

- **SelectDry™** - Permits user to select -40°F, -4°F or +38°F pressure dew point air.
- **PurgeMizer™** - Allows the user to reduce the amount of purge air used for regeneration. Settings ranging from 30% -100% of purge flow in 10% increments can be selected. Ideally suited to low flow applications.
- **PurgeSync™** - Enables dryer operation to "mirror" that of the main air compressor. When the air compressor either unloads or is turned off, **PurgeSync™** automatically completes the current drying cycle and closes the purge valves until the compressor indicates the need for more air. Allows dryer to use purge air from downstream storage, reducing compressor cycling when air demand is low.

Eclipse™ dryers are engineered to provide a high ratio of premium desiccant per SCFM of compressed air for high operating efficiency.

• **Dew Point Display:** Monitors dryer dew point with a high accuracy ceramic-type moisture sensor. Reading is displayed on DPC Controller (required). A visual alarm is activated if a high dew point condition occurs.

• **Failure-to-Shift Alarm:** Monitors tower pressure for proper valve sequencing and operation.

• **High Humidity Alarm:** Monitors humidity level of the compressed air.

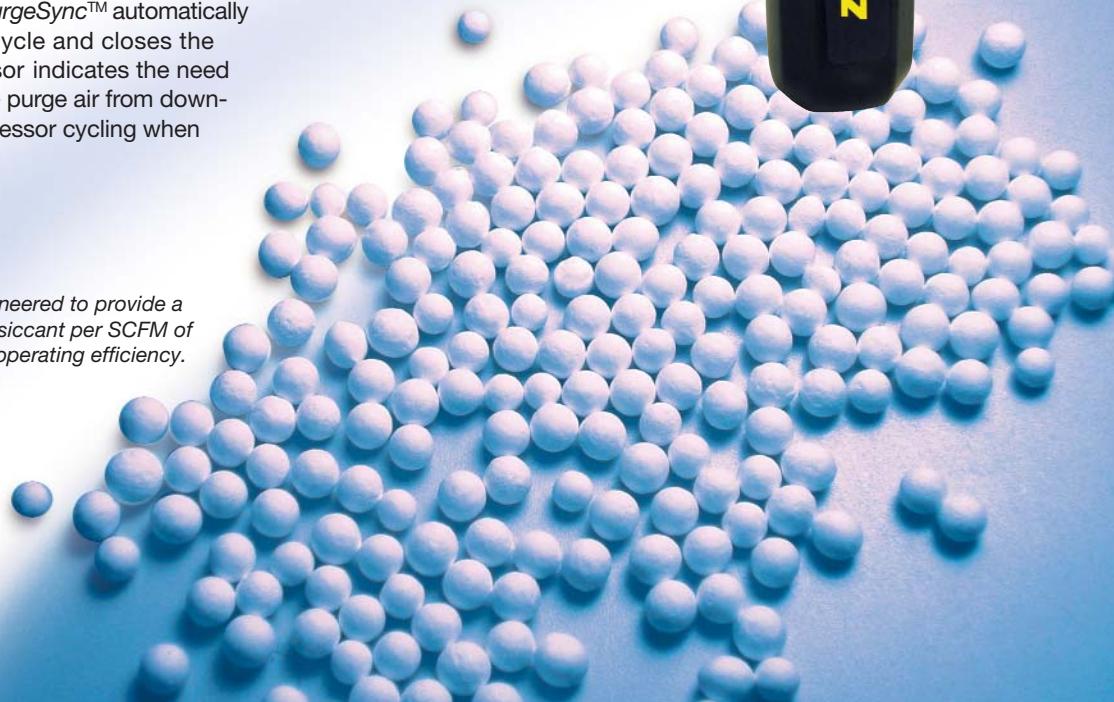
• **Moisture Load Control:** During periods of low air demand or low moisture loading, the purge valves remain closed while flow control valves cycle normally. When moisture loading increases, the purge valves automatically open and begin sequential desiccant regeneration. Minimizes purge air consumption and operating cost.

• **Downstream Purge:** Uses dry air from downstream storage, as well as from the drying tower for desiccant regeneration. This reduces compressor starts when air demand is low.

• **-80°F and -100°F Dew Points:** Specially designed dryers provide extremely low dew point air for critical applications.

• **250 psig and 300 psig MAWP:** High pressure dryer design for applications above 150 psig.

• **Filter Packages:** Factory installed prefilter and afterfilter available in several configurations. Also available with filter and dryer bypasses for ease of service.



ZHA Heated Regeneration

Eclipse™ ZHA models include an external heater to heat dry purge air for desiccant regeneration. Heating allows the dryers to consume only 7% of the dried compressed air volume for this purpose – significantly less than is required for heatless pressure swing type dryers. Available in sizes ranging from 150–8000 SCFM, ZHA dryers deliver -40°F pressure dew point air for critical drying applications.

ZBA Heated Blower Regeneration

Eclipse™ ZBA models include a dedicated blower and external heater to produce purge air for desiccant regeneration. The blower develops atmospheric air flow through the heater, then through the desiccant media thereby regenerating it. With this design, no dried compressed air is consumed for regeneration, which maximizes the amount delivered to the air system. Dryer sizes from 150–8000 SCFM are available with each delivering -40°F pressure dew point air.



2100ZBA in standard configuration

STANDARD FEATURES:

- **High Performance Valves:** Non-lubricated ball and butterfly valves are designed specifically for high temperature applications and feature stainless steel internals and filled PTFE seats.
- **NEMA 4 Electrical Enclosure:** Protects electrical components against falling or hose-directed water and severe external condensation.
- **DPC™ Controller and DynOptic™ Display:** PLC Controller executes all dryer functions and monitors and displays dryer status. DynOptic™ Display provides schematic depiction of dryer status. This control panel with keypad interface includes the following:
 - MODBUS Compatibility
 - Remote Alarm Contact
 - Failure Code Storage
 - Illuminated Display of:
 - Dryer Alarm Annunciation/Cancellation
 - Heater Operation & Temperature Control
 - High Heater Temperature and Failure Alarm
 - Blower Operation Control
 - Regeneration Sequencing
 - Failure-to-Shift Alarm
- **Failure-to-Shift Alarm:** Monitors tower pressure for proper valve sequencing and operation.
- **Bi-Mode Operation:** Dryer can be switched to heatless regeneration mode if the heater or blower become inoperative.

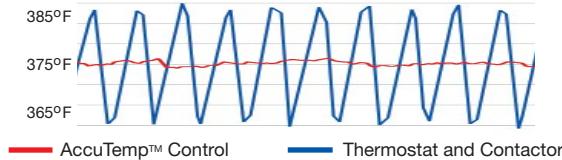


ECLIPSE™
Desiccant Air Dryers

*Reliable Performance.
Design Innovation.*

OPTIONAL FEATURES:

- **AccuTemp™ Heater Control:** Unlike heater contactors that permit wide temperature swings, Solid State AccuTemp™ relay precisely monitors and controls heater temperature.



The result is longer valve life and extended heater life.

- **Incloy Sheath on Heater Element:** Sheathing increases element life. External mounting outside of desiccant bed eliminates potential for desiccant scorching while low watt density design provides long service life.

- **Heater High Temperature with Interlock Alarm:** Provides continuous monitoring of heater sheath temperature. The heater will de-energize in a high temperature condition.

- **Compressed Air cooldown:** For blower purge (ZBA) dryer applications requiring tighter dew point control and lower air temperature at switchover. Unheated, dry compressed air is used for the final stage of regeneration, thereby cooling the desiccant bed prior to tower switch over.

- **High Efficiency Blower** (ZBA Only): Reliable, quiet generation of purge air. Intake filter is positioned for convenient access to facilitate filter element changeout.



• Pressure & Temperature Gauges:

Stainless steel gauges, located on each tower, provide visual indication of pressure and temperature during drying and regeneration processes.

- **High Strength Desiccant:** Minimizes dusting, increases afterfilter element life and is unaffected by liquid water exposure.

- **Control Air Filtration:** Particulate filter protects dryer operating controls.

- **ASME Coded Pressure Vessels:** Carbon steel towers constructed for 150 psig MAWP operation meet ASME Section VIII, Div. 1 requirements. Towers are sized to provide low air flow velocity and high contact time.

- **Pressure Relief Valves:** Standard fire-rated relief valves per API RP-520. Optional flow-rated valves available.

- **Accessible Fill and Drain Ports:** Port locations on each vessel enable easy service access for scheduled change of desiccant media.

- **Removable Stainless Steel Diffuser Screens:** Distribute air evenly through desiccant beds.

- **Sound Attenuating Purge Mufflers:** Large mufflers minimize noise and include built-in safety relief valves.

- **High Humidity Alarm:** Monitors humidity level of the compressed air.

• **Moisture Load Control with Dew Point Display:**

Provides fully automated dryer operation based on continuous monitoring of outlet air moisture content. Timing of the regeneration sequence is adjusted to match the moisture loading. Includes dew point display, highly accurate ceramic dew point sensor and high dew point alarm.



- **Power Saver:** Reduces energy consumption by matching the regeneration heating cycle to the actual moisture loading of the regenerating bed. A sensor monitors the temperature of the outlet purge air stream and stops the heater when full regeneration of the offline tower is detected. Especially effective during times of low moisture loading.

- **-100°F Dew Point** (ZHA Only): Specially designed dryers provide extremely low dew point air for critical applications.

- **300 psig MAWP:** High pressure dryer design for applications above 150 psig.

- **Filter Packages:** Factory installed prefilter and afterfilter available in several configurations. Also available with filter and dryer bypasses for ease of service.

- **Tower Insulation:** Contains heat within towers to optimize regeneration efficiency. Provides contact barrier for safety.



800ZHA with factory installed filters

ECLIPSE™ SPECIFICATIONS

| | | FLOW CAPACITY SCFM | | HEATER KW | BLOWER HP | AIR CONNECTION IN/OUT | DIMENSIONS** INCHES | | | SHIPPING WEIGHT LBS |
|---|----------------|-----------------------|-------------|--------------|--------------|-----------------------------|------------------------|-------|--------|---------------------------|
| MODEL | | -40°F* PDP | -100°F* PDP | | | | WIDTH | DEPTH | HEIGHT | |
| ZPA Heatless Regeneration | 90ZPA | 90 | 72 | — | — | 1.0" NPT | 40.5 | 30.0 | 63.0 | 475 |
| | 120ZPA | 120 | 96 | — | — | 1.0" NPT | 40.5 | 30.0 | 63.0 | 563 |
| | 160ZPA | 160 | 128 | — | — | 1.5" NPT | 44.5 | 32.0 | 66.0 | 707 |
| | 200ZPA | 200 | 160 | — | — | 1.5" NPT | 44.5 | 32.0 | 66.0 | 731 |
| | 250ZPA | 250 | 200 | — | — | 1.5" NPT | 48.5 | 32.0 | 67.0 | 869 |
| | 300ZPA | 300 | 240 | — | — | 2.0" NPT | 48.5 | 32.0 | 67.0 | 924 |
| | 400ZPA | 400 | 320 | — | — | 2.0" NPT | 52.5 | 32.0 | 68.0 | 1115 |
| | 500ZPA | 500 | 400 | — | — | 2.0" NPT | 56.5 | 33.0 | 82.0 | 1564 |
| | 600ZPA | 600 | 480 | — | — | 2.0" NPT | 56.5 | 33.0 | 82.0 | 1664 |
| | 800ZPA | 800 | 640 | — | — | 3.0" NPT | 64.0 | 42.0 | 88.0 | 2017 |
| | 1000ZPA | 1000 | 800 | — | — | 3.0" NPT | 64.0 | 42.0 | 88.0 | 2237 |
| | 1200ZPA | 1200 | 960 | — | — | 3.0" NPT | 64.0 | 42.0 | 88.0 | 2424 |
| | 1500ZPA | 1500 | 1200 | — | — | 4.0" FLG | 78.5 | 55.0 | 81.0 | 2974 |
| | 1800ZPA | 1800 | 1440 | — | — | 4.0" FLG | 84.0 | 61.0 | 92.0 | 3905 |
| ZHA Heated Regeneration | 2100ZPA | 2100 | 1680 | — | — | 4.0" FLG | 84.0 | 61.0 | 92.0 | 4279 |
| | 2700ZPA | 2700 | 2160 | — | — | 4.0" FLG | 84.0 | 61.0 | 92.0 | 4926 |
| | 3300ZPA | 3300 | 2640 | — | — | 6.0" FLG | 96.0 | 66.0 | 100.0 | 6950 |
| | 4000ZPA | 4000 | 3200 | — | — | 6.0" FLG | 96.0 | 66.0 | 100.0 | 7250 |
| | 5000ZPA | 5000 | 4000 | — | — | 6.0" FLG | 102.0 | 72.0 | 92.0 | 9550 |
| | 150ZHA | 150 | 150 | 2.0 | — | 1.0" NPT | 44.5 | 32.0 | 66.0 | 758 |
| | 200ZHA | 200 | 200 | 3.0 | — | 1.5" NPT | 48.5 | 32.0 | 67.0 | 913 |
| | 250ZHA | 250 | 250 | 3.0 | — | 1.5" NPT | 52.5 | 32.0 | 68.0 | 1119 |
| | 300ZHA | 300 | 300 | 3.0 | — | 1.5" NPT | 52.5 | 32.0 | 68.0 | 1191 |
| | 400ZHA | 400 | 400 | 4.5 | — | 2.0" NPT | 56.5 | 34.0 | 82.0 | 1539 |
| | 500ZHA | 500 | 500 | 4.5 | — | 2.0" NPT | 56.5 | 34.0 | 82.0 | 1707 |
| | 600ZHA | 600 | 600 | 6.0 | — | 3.0" NPT | 64.0 | 42.0 | 86.0 | 2369 |
| | 800ZHA | 800 | 800 | 9.0 | — | 3.0" NPT | 64.0 | 42.0 | 86.0 | 2681 |
| | 1000ZHA | 1000 | 1000 | 9.0 | — | 3.0" NPT | 78.5 | 46.5 | 80.0 | 3043 |
| | 1200ZHA | 1200 | 1200 | 12.0 | — | 3.0" NPT | 78.5 | 46.5 | 80.0 | 3285 |
| | 1500ZHA | 1500 | 1500 | 15.0 | — | 3.0" NPT | 84.0 | 55.0 | 92.0 | 4480 |
| | 1800ZHA | 1800 | 1800 | 18.0 | — | 4.0" FLG | 84.0 | 60.0 | 92.0 | 4956 |
| | 2100ZHA | 2100 | 2100 | 18.0 | — | 4.0" FLG | 84.0 | 60.0 | 92.0 | 5350 |
| | 3000ZHA | 3000 | 3000 | 30.0 | — | 4.0" FLG | 96.0 | 68.0 | 100.0 | 7750 |
| | 4000ZHA | 4000 | 4000 | 36.0 | — | 6.0" FLG | 102.0 | 80.0 | 92.0 | 10950 |
| ZBA Heated Blower Regeneration | 5000ZHA | 5000 | 5000 | 50.0 | — | 6.0" FLG | CF | CF | CF | CF |
| | 6000ZHA | 6000 | 6000 | 60.0 | — | 6.0" FLG | CF | CF | CF | CF |
| | 8000ZHA | 8000 | 8000 | 75.0 | — | 8.0" FLG | CF | CF | CF | CF |
| | 150ZBA | 150 | — | 3.0 | 1.0 | 1.0" NPT | 44.5 | 33.5 | 66.0 | 874 |
| | 200ZBA | 200 | — | 4.5 | 1.0 | 1.5" NPT | 48.5 | 32.0 | 67.0 | 1136 |
| | 250ZBA | 250 | — | 6.0 | 1.5 | 1.5" NPT | 52.5 | 32.0 | 68.0 | 1379 |
| | 300ZBA | 300 | — | 6.0 | 1.5 | 1.5" NPT | 52.5 | 32.0 | 68.0 | 1477 |
| | 400ZBA | 400 | — | 9.0 | 2.0 | 2.0" NPT | 56.5 | 33.0 | 82.5 | 1897 |
| | 500ZBA | 500 | — | 12.0 | 2.0 | 2.0" NPT | 56.5 | 33.0 | 82.5 | 2111 |
| | 600ZBA | 600 | — | 12.0 | 5.0 | 3.0" NPT | 64.0 | 47.0 | 88.0 | 2804 |
| | 800ZBA | 800 | — | 18.0 | 5.0 | 3.0" NPT | 64.0 | 47.0 | 88.0 | 3198 |
| | 1000ZBA | 1000 | — | 24.0 | 7.5 | 3.0" NPT | 78.5 | 49.0 | 80.0 | 3767 |
| | 1200ZBA | 1200 | — | 24.0 | 7.5 | 3.0" NPT | 78.5 | 49.0 | 80.0 | 4091 |
| | 1500ZBA | 1500 | — | 30.0 | 15.0 | 3.0" NPT | 98.0 | 55.0 | 92.0 | 5515 |
| | 1800ZBA | 1800 | — | 36.0 | 15.0 | 4.0" FLG | 98.0 | 68.0 | 92.0 | 6113 |
| | 2100ZBA | 2100 | — | 45.0 | 15.0 | 4.0" FLG | 98.0 | 68.0 | 92.0 | 6911 |
| | 3000ZBA | 3000 | — | 60.0 | 20.0 | 6.0" FLG | 120.0 | 78.0 | 100.0 | 9730 |
| | 4000ZBA | 4000 | — | 80.0 | 25.0 | 6.0" FLG | 126.0 | 83.0 | 92.0 | 12167 |
| | 5000ZBA | 5000 | — | 100.0 | 30.0 | 6.0" FLG | CF | CF | CF | CF |
| | 6000ZBA | 6000 | — | 125.0 | 30.0 | 6.0" FLG | CF | CF | CF | CF |
| | 8000ZBA | 8000 | — | 175.0 | 40.0 | 8.0" FLG | CF | CF | CF | CF |

Performance data obtained and presented in accordance with CAGI Standard 200.

* Dimensions shown are for base models only. Optional equipment may alter dryer dimensions. Dimensions and weights are approximate.

* Pressure dew point (PDP) at 100 psig, 100°F inlet air, 100°F ambient air.

All ZPA dryers are supplied as 115V-1Ph-60Hz.

Pressure vessels are designed and constructed in accordance with ASME and CRN requirements.

All ZHA and ZBA dryers are supplied as 460V-3Ph-60Hz.

Maximum working pressure is 150 psig.

CF = Consult Factory

Minimum working pressure is 75 psig.

Desiccant is factory-installed on models 90-2700 ZPA and 150-2100 ZHA/ZBA.

Desiccant ships loose on all other models.



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