

# **ECLIPSE™**

**DESICCANT AIR DRYERS**

90-8000 scfm

**ZPA** Heatless Regeneration

**ZHA** Heated Regeneration

**ZBA** Heated Blower Regeneration



2100ZHA



# RELIABLE PERFORMANCE INNOVATIVE DESIGN

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 can damage tools and equipment, reduce productivity and adversely affect the quality of finishing processes and precision operations.

While the use of oil free compressors can reduce the amount of contaminants in a compressed air system, the compression process itself causes concentrations of water and airborne particulate to increase to harmful levels. ZEKS Eclipse™ desiccant dryers effectively dry compressed air to extremely low moisture levels for use where the presence of even minimal amounts of moisture can not be tolerated. In addition, with ZEKS Eclipse desiccant dryers, installations where compressed air piping is exposed to extremely low ambient temperatures won't encounter the detrimental effects of moisture that freezes inside compressed air lines.

## A MODEL FOR EVERY NEED

ZEKS Eclipse desiccant dryers have been engineered from the ground up to include the most desirable operating and service benefits. Each component has been selected to provide long-term durability as well as energy efficiency. In addition, Eclipse's low profile design permits easy viewing of critical dryer indicators while allowing for easy access to all serviceable parts.

Three models are available to enable air treatment selection to suit the requirements of each installation:

**ZPA Heatless Regeneration**

**ZHA Heated Regeneration**

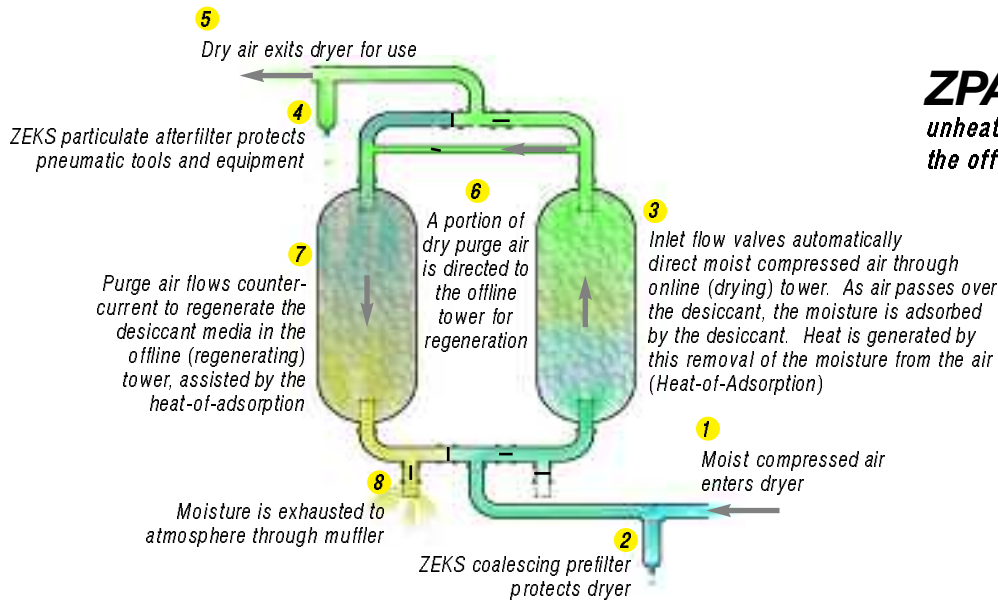
**ZBA Heated Blower Regeneration**

Your authorized ZEKS Distributor will help you select the best dryer model to meet the application requirements and provide the most favorable energy use profile.

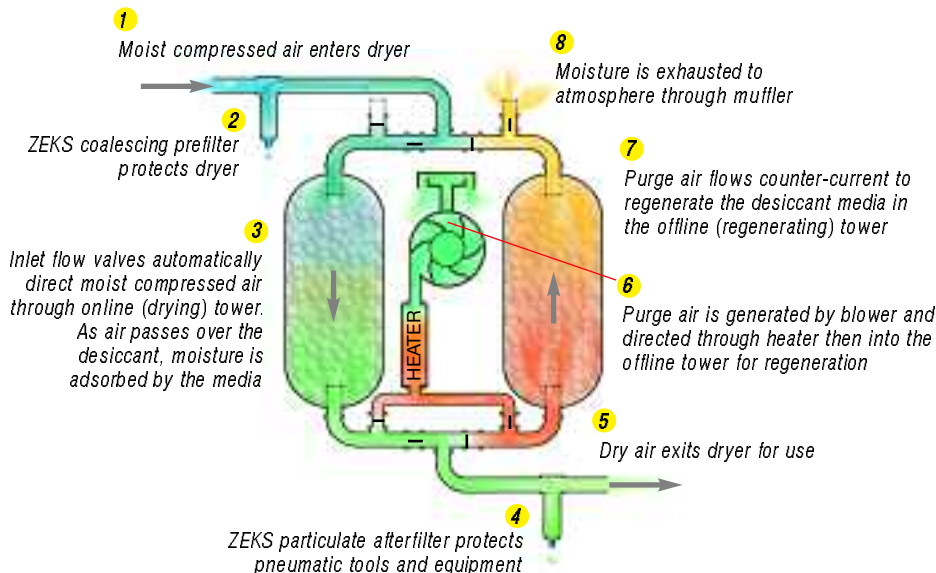
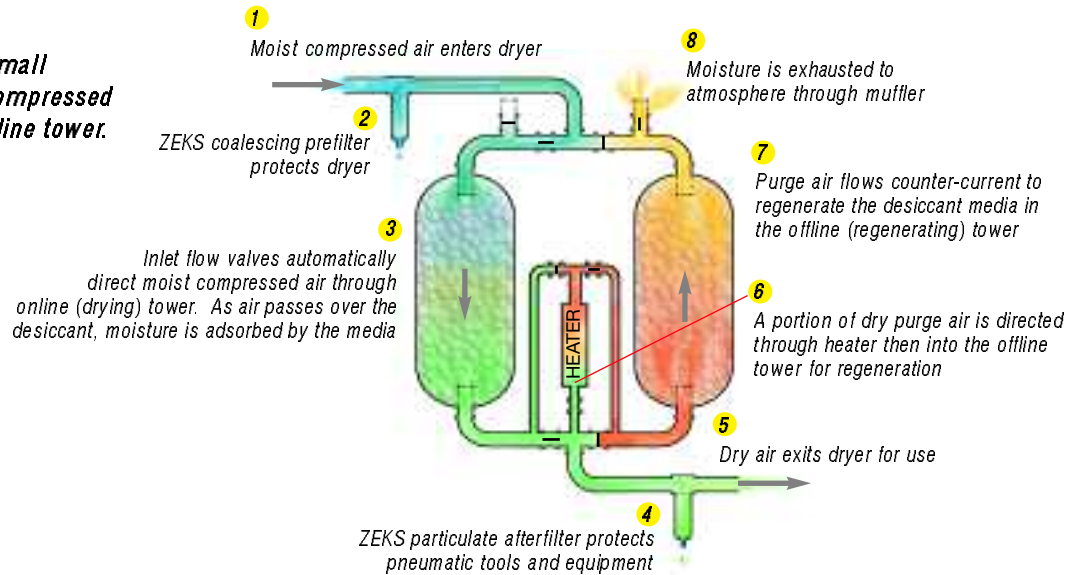


- **Heated & Heatless Regeneration Models –**  
*Designs for all drying requirements*
- **Options for Energy Savings -**  
*Minimize operating cost*
- **Low Profile Design -**  
*Reduces shipping costs and simplifies installation*
- **High Performance Valves -**  
*Reliable operation plus reduced maintenance*
- **Convenient Service Access -**  
*Minimizes maintenance time requirement*
- **Remote Communication Ready -**  
*Multiple communication options*
- **Comprehensive Warranty Coverage -**  
*Standard dryer warranty  
PLUS five years on flow  
valves and heater*





**ZHA** models use a small amount of dry, heated compressed air to regenerate the offline tower.



**ZBA** models use air from a dedicated blower that passes through a heater to regenerate the offline tower.

# ZPA

## Heatless Regeneration

ZEKS' ZPA desiccant dryers are available in flow ranges from 90 SCFM to 5000 SCFM. ZPA dryers require the use of no more than 15% of the compressed air volume for regeneration of the desiccant beds. Standard ZPA dryers deliver -40°F pressure dew point air. For critical applications, ZPA dryers can be equipped to deliver -80°F and -100°F pressure dew point air. With the optional DPC™ Controller, dew points ranging from -40°F to +38°F may be selected using the SelectDry™ feature for increased energy savings. In addition, the DPC Controller's PurgeMizer™ feature permits the user to reduce the amount of purge air for applications where the dryer is operated below full flow conditions. All ZPA dryers are supplied as 115V-1Ph-60Hz.



1200ZPA in NEMA 4 configuration with Purge Saver™, Failure-to-Shift Alarm and High Humidity Alarm options

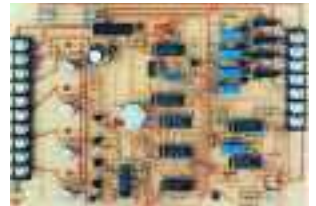


**WARRANTY COVERAGE  
ON FLOW VALVES**

Contact your ZEKS distributor for details

## STANDARD FEATURES:

- **Dependable Diaphragm Switching and Purge Valves:** Non-lubricated valves engineered for trouble-free operation. Design allows for higher flows with lower associated pressure drop than alternate valves. Internal valve components are easily accessed for routine maintenance without disconnecting valves from pipework. ZEKS dryers are designed so that the switching valves fail “open” and the purge valves fail “closed”, insuring continuous air delivery even in the event of power loss.
- **Reliable Solid State Timer:** Used on ZEKS heatless dryers for over ten years, this design and technology delivers precise control over all switching and purge valve functions.
- **Dryer Status Indication Lights:** Standard NEMA 1 dryers feature lights to indicate Left and Right Tower operation and Power On.
- **Purge Pressure Gauge:** Visual indication of purge reactivation flow rate.
- **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 air moisture content.
- **Control Air Filtration:** ZEKS ZTF™ 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:** Indicate pressure within each tower.
- **Pressure Relief Valves:** Standard fire-rated relief valves per API RP-520. Optional flow-rated valves available.
- **Sound Attenuating Purge Mufflers:** Large mufflers minimize noise and include built-in relief valves to enhance safety.
- **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:** Evenly distribute air through desiccant beds.



## OPTIONAL FEATURES:

• **NEMA 4/DPC™ Package:** This premium electrical package provides increased protection of electrical components as well as enhanced digital dryer controls and displays and includes the following features:

– **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:** PLC Controller with integrated keypad interface provides instant access to dryer performance controls. The DPC controller is specifically programmed to execute all valve switching functions as well as monitor dryer operation. This fully-featured controller includes the following:



- **Backlit LCD Display:** Permits viewing of critical dryer parameters in all lighting conditions.
- **Human-Machine Interface (HMI):** Integrated keypad provides user with access to all internal functions and selectable displays.
- **MODBUS Compatible:** A port permits connection of the controller to MODBUS-capable networks.
- **Remote Alarm Contact**
- **Failure Code Storage**

– **DynOptic™ Panel:** Schematic depiction of dryer provides visual indication of current operating status including:

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

– **Enhanced Dryer Operation Functions:** ZPA dryers with the NEMA 4/DPC Package provide the following operating functions:

- **SelectDry™**– Permits user to select between -40°F, -4°F or +38°F pressure dew point air. Selecting a higher dew point means lower energy costs for applications that do not require consistent -40°F pressure dew point air.
- **PurgeMizer™**– *PurgeMizer* allows the user to reduce the amount of purge air used for regeneration. Settings ranging from 30% to 100% of purge flow in 10% increments may be selected. Ideally suited to low flow applications.
- **PurgeSync™**– *PurgeSync* permits operation of the ZPA dryer 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. For applications with downstream (dry) storage, ZEKs recommends the Downstream Purge Option, sold separately, to maximize *PurgeSync* effectiveness.

• **Dew Point Display:** Highly accurate monitoring of dryer dew point performance with an Aluminum Oxide-type moisture sensor. Pressure dew point reading is displayed on DPC controller screen. Should a high dew point condition occur, a visual alarm will be activated. *Requires DPC Controller.*

• **Failure-to-Shift Alarm:** Automatically monitors tower pressure for proper sequencing and operation of valves. Should a valve be out of position, a visual alarm will be activated.

• **High Humidity Alarm:** Accurately monitors humidity levels of the compressed air. Should a malfunction occur and a high humidity condition exist, a visual alarm will be activated.

• **Moisture Load Control:** Reduces purge air consumption by monitoring moisture loading in both towers. During low air demand periods or low water loading (i.e. dry ambient conditions) the purge valves remain closed while flow control valves cycle as normal. By keeping purge valves closed, a significant reduction in purge air consumption can occur, with subsequent savings in operating costs. When the moisture loading increases, the purge valves will open and begin reactivation of both towers sequentially.

• **Downstream Purge:** Enables dryer to use dry purge air from downstream storage, as well as from the drying tower. Use of downstream purge in conjunction with properly sized storage can reduce 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:** High quality, factory installed coalescing prefilter and particulate afterfilter packages are available in a wide variety of configurations. Filter packages, featuring ZEKs ZTF filters, are available with filter and dryer bypasses for ease of service.



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

# ZHA

Heated Regeneration

# ZBA

Heated Blower Regeneration



ZHA heated desiccant dryers include an external heater to heat dry purge air for regeneration. This allows the dryers to use 7% purge air – 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. ZHA dryers are designed for a Maximum Allowable Working Pressure (MAWP) of 150 psig and are provided in 460V-3Ph-60Hz electrical configuration.

ZBA heated blower desiccant dryers are provided with a dedicated blower to provide purge air for regeneration. With this design, the dryer does not rely on the dry compressed air for regeneration. Instead, the blower directs ambient air through an external heater, thereby regenerating the offline tower. Using no compressed air for purge means more air available for critical compressed air applications. 150 – 8000 SCFM models are available with each delivering -40°F pressure dew point air. A MAWP of 150 psig and 460V-3Ph-60Hz electrics are standard.



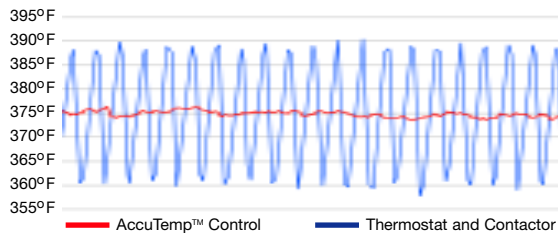
150ZBA in standard configuration  
and 500ZHA with factory  
installed filters

## STANDARD FEATURES:

- **High Performance Switching & Purge Valves:** Dryers are equipped with reliable Jamesbury high performance ball and butterfly valves. These non-lubricated valves are designed specifically for high temperature applications and feature stainless steel internals and filled PTFE seats. Valves include double-acting pneumatic actuators.
- 
- **NEMA 4 Electrical Enclosure:** Provides protection of electrical components against falling or hose-directed water and severe external condensation. Enclosure is suitable for indoor and outdoor use.
  - **DPC™ Controller and DynOptic™ Panel:** PLC Controller with integrated keypad interface along with a schematic representation of the dryer provide instant access to dryer performance controls and visual depiction of current operating status. The controller is specifically programmed to execute all valve switching functions as well as monitor dryer operation. This fully-featured panel includes the following:
    - *Backlit LCD Display:* Permits viewing of critical dryer parameters in all lighting conditions.
    - *Human-Machine Interface (HMI):* Integrated keypad provides user with access to all internal functions and selectable displays.
    - *DynOptic™ Panel:* Schematic depiction of dryer provides visual indication of current operating status.
    - *MODBUS Compatible:* DPC Controller permits connection to MODBUS-capable networks.
    - *Remote Alarm Contact*
    - *Failure Code Storage*
    - *Displays:*
      - Dryer On/Off Control
      - Dryer Alarm Annunciation/Cancellation
      - Heater Operation & Temperature Control
      - High Heater Temperature Alarm Indication
      - Heater Failure Alarm Indication
      - Blower Operation Control (ZBA Only)
      - Left/Right Tower Drying Indication
      - Left/Right Tower Regeneration Indication
      - Failure-to-Shift Alarm Indication
      - Regeneration Sequence Status
- 
- **Failure-to-Shift Alarm:** Automatically monitors tower pressure for proper sequencing and operation of valves and provides visual indication of alarm condition.
  - **Bi-Mode Operation:** ZEKS' Bi-Mode provides system redundancy should a heater (ZHA & ZBA) or blower (ZBA only)-related failure occur, keeping potential downtime to a minimum. Should the heater and/or blower become inoperative, the Bi-Mode feature allows the dryer to be switched to a heatless pressure swing operating mode.

## OPTIONAL FEATURES:

- **AccuTemp™ Heater Control:** Innovative Solid State Relay heater control. Unlike heater contactors that permit wide swings of heater temperature, ZEKs' AccuTemp™ controller precisely monitors and controls heater temperature.



The result is longer valve life and extended heater life.

- **Incoloy Sheath External Heater:** Heaters include Incoloy sheath for increased element life. External mounting outside of desiccant bed eliminates potential for desiccant scorching while low watt density design provides long, reliable service life.
- **Heater High Temperature with Interlock Alarm:** Provides continuous monitoring of heater sheath temperature. If the sensor indicates a high temperature condition, the heater is de-energized and an alarm routine is initiated.
- **High Efficiency Blower (ZBA Only):** Blower provides quiet, reliable operation. Intake filter is positioned for convenient access to facilitate filter element changeout. 
- **Pressure & Temperature Gauges:** Stainless steel temperature and pressure gauges, located on each tower, provide visual indication of pressure and temperature during the drying and regeneration processes.
- **High Strength Desiccant:** Minimizes dusting, increases afterfilter element life and is unaffected by liquid water exposure.
- **Control Air Filtration:** ZEKs ZTF™ 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.
- **Sound Attenuating Purge Mufflers:** Large mufflers minimize noise and include built-in relief valves to enhance safety.
- **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:** Evenly distribute air through desiccant beds.

- **High Humidity Alarm:** Accurately monitors humidity levels of the compressed air. Should a malfunction occur and a high humidity condition exist, a visual alarm is activated.
- **Moisture Load Control with Dew Point Display:** Provides fully automated dryer operation based on continuous monitoring of outlet air moisture content. Timing of the dryer regeneration sequence is adjusted to match the moisture loading on the dryer. Includes dew point display, highly accurate Aluminum Oxide dew point sensor and high dew point alarm.
- **Compressed Air Cooldown (ZBA Only):** For blower purge dryer applications requiring tighter dew point control and lower air temperature at switchover. Control and piping configuration uses unheated, dry compressed air for the final stage of regeneration, thereby cooling bed prior to tower switchover.
- **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.
- **Filter Packages:** High quality, factory installed ZTF™ coalescing prefilter and particulate afterfilter packages are available in a wide variety of configurations. Available with filter and dryer bypasses for ease of service.
- **-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.

**RELIABILITY  
&  
INNOVATION**

**WARRANTY COVERAGE  
ON FLOW VALVES  
AND HEATER**

Contact your ZEKs distributor for details

**ECLIPSE™ SPECIFICATIONS**

	MODEL	FLOW CAPACITY SCFM		HEATER KW	BLOWER HP	AIR CONNECTION IN/OUT	DIMENSIONS** INCHES			SHIPPING WEIGHT LBS
		-40°F* PDP	-100°F* PDP				WIDTH	DEPTH	HEIGHT	
<b>ZPA</b> Heatless Regeneration	90 ZPA	90	72	-	-	1.0"NPT	40.5	30.0	63.0	531
	120 ZPA	120	96	-	-	1.0"NPT	40.5	30.0	63.0	563
	160 ZPA	160	128	-	-	1.5"NPT	44.5	32.0	66.0	707
	200 ZPA	200	160	-	-	1.5"NPT	44.5	32.0	66.0	731
	250 ZPA	250	200	-	-	1.5"NPT	48.5	32.0	67.0	869
	300 ZPA	300	240	-	-	2.0"NPT	48.5	32.0	67.0	924
	400 ZPA	400	320	-	-	2.0"NPT	52.5	32.0	68.0	1115
	500 ZPA	500	400	-	-	2.0"NPT	56.5	34.0	82.0	1564
	600 ZPA	600	480	-	-	2.0"NPT	56.5	34.0	82.0	1664
	800 ZPA	800	640	-	-	3.0"NPT	64.0	42.0	88.0	2017
	1000 ZPA	1000	800	-	-	3.0"NPT	64.0	42.0	88.0	2237
	1200 ZPA	1200	960	-	-	3.0"NPT	64.0	42.0	88.0	2424
	1500 ZPA	1500	1200	-	-	4.0"FLG	78.5	55.0	81.0	2974
	1800 ZPA	1800	1440	-	-	4.0"FLG	84.0	61.0	94.0	3905
	2100 ZPA	2100	1680	-	-	4.0"FLG	84.0	61.0	94.0	4279
	2700 ZPA	2700	2160	-	-	4.0"FLG	84.0	61.0	94.0	4926
	3300 ZPA	3300	2640	-	-	6.0"FLG	96.0	66.0	98.0	6737
4000 ZPA	4000	3200	-	-	6.0"FLG	96.0	66.0	98.0	7206	
5000 ZPA	5000	4000	-	-	6.0"FLG	102.0	72.0	90.0	8932	
<b>ZHA</b> Heated Regeneration	150 ZHA	150	150	2.0	-	1.0"NPT	44.5	32.0	66.0	758
	200 ZHA	200	200	3.0	-	1.5"NPT	48.5	32.0	67.0	913
	250 ZHA	250	250	3.0	-	1.5"NPT	52.5	32.0	68.0	1119
	300 ZHA	300	300	3.0	-	1.5"NPT	52.5	32.0	68.0	1191
	400 ZHA	400	400	4.5	-	2.0"NPT	56.5	34.0	82.0	1539
	500 ZHA	500	500	4.5	-	2.0"NPT	56.5	34.0	82.0	1707
	600 ZHA	600	600	6.0	-	3.0"NPT	64.0	47.0	86.0	2369
	800 ZHA	800	800	9.0	-	3.0"NPT	64.0	47.0	86.0	2681
	1000 ZHA	1000	1000	9.0	-	3.0"NPT	78.5	48.0	80.0	3043
	1200 ZHA	1200	1200	12.0	-	3.0"NPT	78.5	48.0	80.0	3285
	1500 ZHA	1500	1500	15.0	-	3.0"NPT	84.0	55.0	92.0	4480
	1800 ZHA	1800	1800	18.0	-	4.0"FLG	84.0	60.0	92.0	4956
	2100 ZHA	2100	2100	18.0	-	4.0"FLG	84.0	60.0	92.0	5350
	3000 ZHA	3000	3000	30.0	-	4.0"FLG	96.0	66.0	98.0	7750
4000 ZHA	4000	4000	36.0	-	6.0"FLG	102.0	76.0	90.0	9578	
5000 ZHA	5000	5000	50.0	-	6.0"FLG	CF	CF	CF	CF	
6000 ZHA	6000	6000	60.0	-	6.0"FLG	CF	CF	CF	CF	
8000 ZHA	8000	8000	75.0	-	8.0"FLG	CF	CF	CF	CF	
<b>ZBA</b> Heated Blower Regeneration	150 ZBA	150	-	3.0	1.0	1.0"NPT	44.5	32.0	66.0	874
	200 ZBA	200	-	4.5	1.0	1.5"NPT	48.5	32.0	67.0	1136
	250 ZBA	250	-	6.0	1.5	1.5"NPT	52.5	32.0	68.0	1379
	300 ZBA	300	-	6.0	1.5	1.5"NPT	52.5	32.0	68.0	1477
	400 ZBA	400	-	9.0	2.0	2.0"NPT	56.5	34.0	82.0	1897
	500 ZBA	500	-	12.0	2.0	2.0"NPT	56.5	34.0	82.0	2111
	600 ZBA	600	-	12.0	5.0	3.0"NPT	64.0	47.0	86.0	2804
	800 ZBA	800	-	18.0	5.0	3.0"NPT	64.0	47.0	86.0	3198
	1000 ZBA	1000	-	24.0	7.5	3.0"NPT	78.5	48.0	80.0	3767
	1200 ZBA	1200	-	24.0	7.5	3.0"NPT	78.5	48.0	80.0	4091
	1500 ZBA	1500	-	30.0	15.0	3.0"NPT	84.0	55.0	92.0	5515
	1800 ZBA	1800	-	36.0	15.0	4.0"FLG	84.0	60.0	92.0	6113
	2100 ZBA	2100	-	45.0	15.0	4.0"FLG	84.0	60.0	92.0	6911
	3000 ZBA	3000	-	60.0	20.0	6.0"FLG	96.0	66.0	98.0	9730
4000 ZBA	4000	-	80.0	25.0	6.0"FLG	102.0	76.0	90.0	12167	
5000 ZBA	5000	-	100.0	30.0	6.0"FLG	CF	CF	CF	CF	
6000 ZBA	6000	-	125.0	30.0	6.0"FLG	CF	CF	CF	CF	
8000 ZBA	8000	-	175.0	40.0	8.0"FLG	CF	CF	CF	CF	

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

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

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

Maximum working pressure is 150 psig.

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.

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

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

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

CF = Consult Factory



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