

ECLIPSE™

DESICCANT AIR DRYER

90-600 scfm

ZPA

Heatless Regeneration

ZHA

Heated Regeneration

ZBA

Heated Blower Regeneration



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 air-borne 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

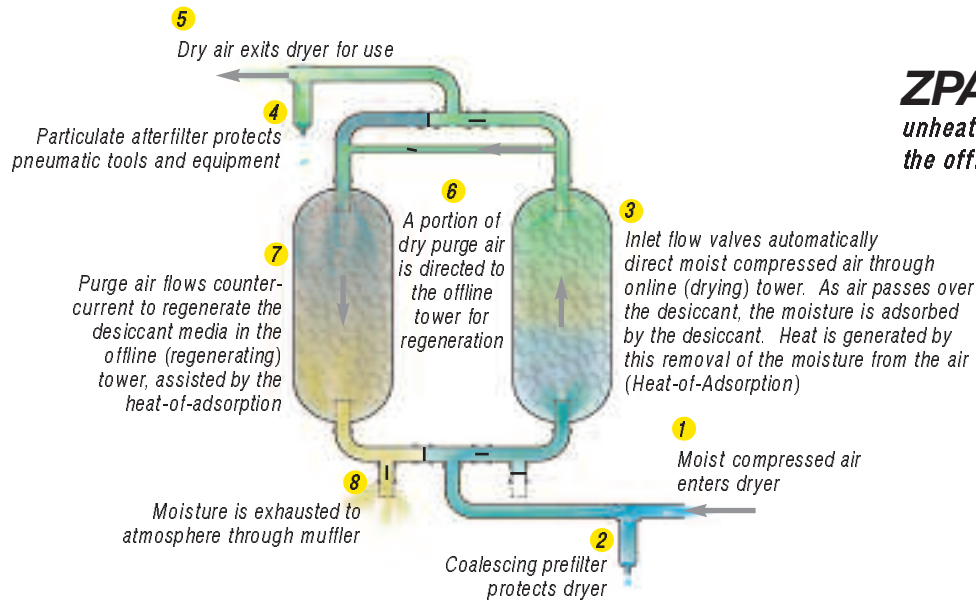
ZBA Heated Blower Regeneration

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.



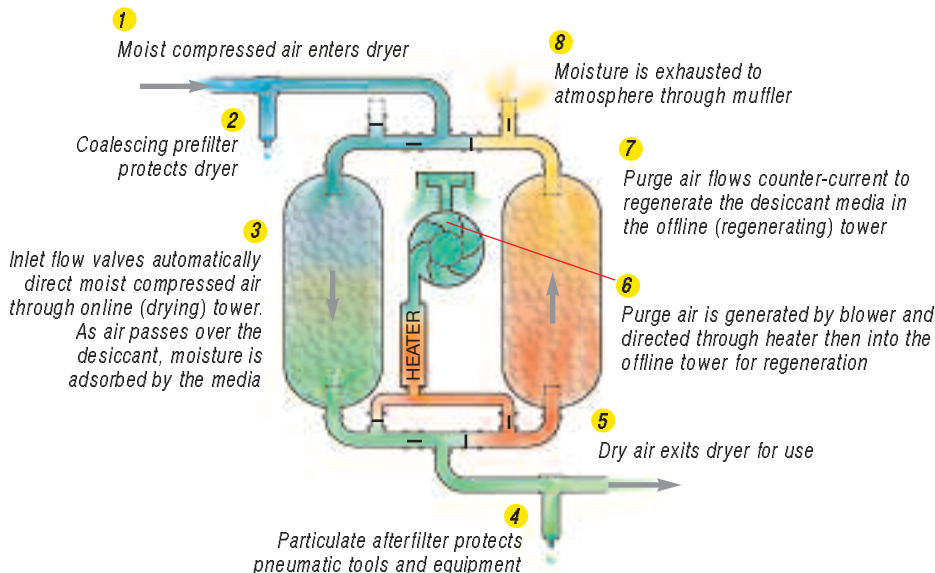
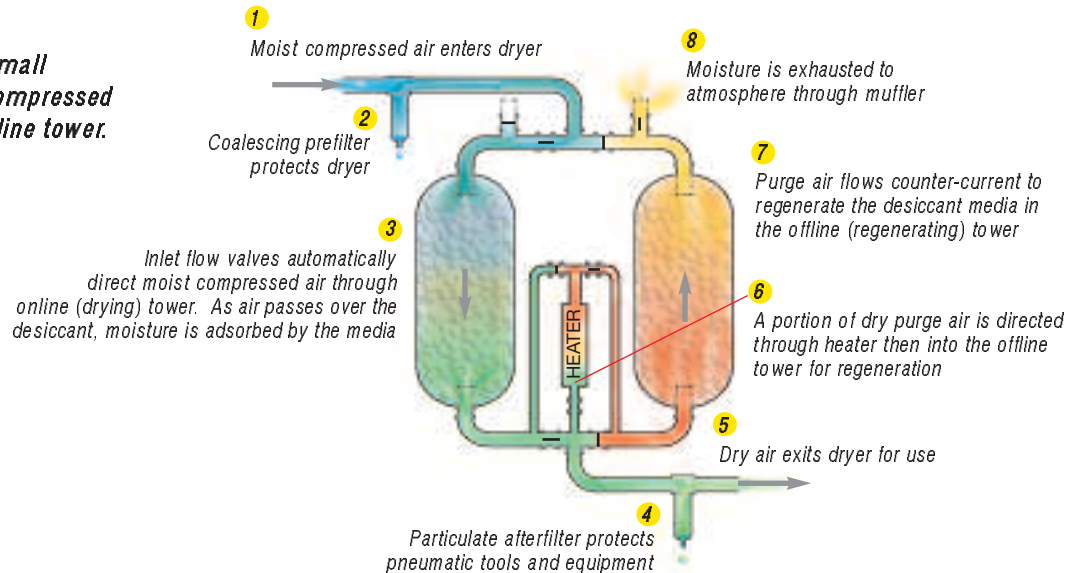
- **Heated & Heatless Regeneration Models -**
Designs for all drying requirements
- **Options for Energy Savings -**
Minimize operating cost
- **Low Profile Design -**
Reduces shipping costs and simplifies installation
- **High Performance Valves -**
Reliable operation plus reduced maintenance
- **Convenient Service Access -**
Minimizes maintenance time requirement
- **Remote Communication Ready -**
Multiple communication options





ZPA models use a portion of dry, unheated compressed air to regenerate the offline tower.

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 600 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 +37°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.



400ZPA in NEMA 1 configuration with Moisture Load Control, Failure-to-Shift Alarm and High Humidity Alarm options.

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 +37°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 – 500 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 – 500 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.

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
- **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 lower energy consumption, lower temperature spikes at switchover and extended heater life.



150ZBA and 150ZHA shown in standard configuration

OPTIONAL FEATURES:

- **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.
 - **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.
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- **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**

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	
90 ZPA	90	72	-	-	1.0"NPT	30.0	40.5	63.0	531
120 ZPA	120	96	-	-	1.0"NPT	30.0	40.5	63.0	563
160 ZPA	160	128	-	-	1.5"NPT	32.0	44.5	66.0	707
200 ZPA	200	160	-	-	1.5"NPT	32.0	44.5	66.0	731
250 ZPA	250	200	-	-	1.5"NPT	32.0	48.5	67.0	869
300 ZPA	300	240	-	-	2.0"NPT	32.0	48.5	67.0	924
400 ZPA	400	320	-	-	2.0"NPT	32.0	52.5	68.0	1115
500 ZPA	500	400	-	-	2.0"NPT	34.0	56.5	82.0	1564
600 ZPA	600	480	-	-	2.0"NPT	34.0	56.5	82.0	1664
<hr/>									
150 ZHA	150	150	1.5	-	1.0"NPT	32.0	44.5	66.0	758
200 ZHA	200	200	1.5	-	1.5"NPT	32.0	48.5	67.0	913
250 ZHA	250	250	2.0	-	1.5"NPT	32.0	52.5	68.0	1119
300 ZHA	300	300	2.5	-	1.5"NPT	32.0	52.5	68.0	1191
400 ZHA	400	400	3.0	-	2.0"NPT	34.0	56.5	82.0	1539
500 ZHA	500	500	4.5	-	3.0"NPT	34.0	56.5	82.0	1707
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150 ZBA	150	-	3.0	1.0	1.0"NPT	32.0	44.5	66.0	874
200 ZBA	200	-	4.5	1.5	1.5"NPT	32.0	48.5	67.0	1136
250 ZBA	250	-	4.5	2.0	1.5"NPT	32.0	52.5	68.0	1379
300 ZBA	300	-	6.0	2.0	1.5"NPT	32.0	52.5	68.0	1477
400 ZBA	400	-	7.5	3.0	2.0"NPT	34.0	56.5	82.0	1897
500 ZBA	500	-	12.0	3.0	3.0"NPT	34.0	56.5	82.0	2111

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.

Weights and dimensions are approximate.

Desiccant is factory-installed on all of the models noted above.



90-600 scfm

ZPA
Heatless Regeneration

ZHA
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ZBA
Heated Blower Regeneration



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