INNOVATIVE COMPRESSED AIR SOLUTIONS

ZEKS
COMPRESSED AIR SOLUTIONS®

HeatSink™

TRUE-CYCLING™ REFRIGERATED COMPRESSED AIR DRYERS

200–1,600 SCFM

Independently Verified Performance *(200-1000 scfm models)*

CFX® ***Stainless Steel Heat Exchangers***

www.zeks.com

ZEKS Compressed Air Solutions Meets The Needs Of Compressed Air Users

Compressed air is a versatile energy resource, ideal for many production processes, for powering tools and equipment, and actuating valves, among other uses. For processes and devices to operate at peak efficiency, the compressed air supply must be clean and dry. Contaminants present at the intake of the air compressor can effect the operation of compressed air equipment. The compression process causes concentrations of water, compressor lubricant and airborne particulate to increase to levels that can damage tools, increase maintenance requirements or spoil finished product. ZEKS HeatSink™ dryers economically and reliably dry compressed air, thereby ensuring efficient operation of downstream equipment and processes.

HeatSink™

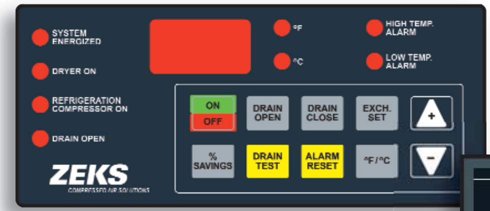
True-Cycling™ Refrigerated Compressed Air Dryers

Energy Savings – The True-Cycling™ Advantage

Common manufacturing practices, process machinery cycling and changing production requirements all result in variable compressed air volume use. This, combined with periods of low ambient and inlet air temperatures, results in reduced load on an air dryer. ZEKS HeatSink™ dryers are designed to take advantage of these factors to reduce the cost of drying compressed air. HeatSink™ dryers use a refrigeration system to cool a thermal mass, which in turn cools the compressed air that flows through the dryer. Cooling causes moisture and contaminants present in the air to condense, enabling removal in a high efficiency separator within the dryer. Because HeatSink™ dryers have the capacity to store cool energy in the thermal mass fluid, the refrigeration system automatically cycles off during periods of low demand while the dryer continues to remove moisture and contaminants from the air stream. This True-Cycling™ operation typically consumes far less energy than the equivalent non-cycling dryer that operates the refrigeration system continuously.

The Original Energy Saving Compressed Air Dryer:

- ***Energy Savings As High As 80%*** - resulting from True-Cycling™ operation in variable moisture load conditions (see Annual Energy Savings Chart)
- ***99% Moisture Separation Efficiency*** - provided by the exclusive ZEKS moisture separator design
- ***Consistent Dew Point*** - dryer components are sized to enable consistent dew point at full or partial moisture loading in all industrial environments
- ***Reliable Digital Performance Control*** - enhanced user interface for dryer performance monitoring and adjustment
- ***CFX® Based Precooler/Reheater*** - Conditions the compressed air to minimize energy consumption and eliminate pipe sweating
- ***Rated Performance Even In Elevated Ambient Temperatures*** - resulting from generously sized refrigeration condenser
- ***Optimum Cycling Efficiency*** - from active circulation of thermal storage media



Compustat™ *- Standard on 200-800*

DPC™ *- Standard on 1000-1600*

The Standard of Excellence For Heat Exchanger Design

ZEKS patented CFX® stainless steel heat exchangers, engineered exclusively for compressed air drying, include industry-leading low pressure drop and a high heat transfer coefficient. A multi-path flow area that is 3 –5 times that of the equivalent copper tube exchanger combined with continuous self-cleaning action minimize fouling potential. All-welded CFX® Corrugated, Folded heat eXchangers provide durability in environments where copper or other metals are not suitable.

- ***100% Stainless Steel Construction*** - Resists corrosion and provides long-lasting durability
- ***Industry-Leading Low Pressure Drop*** - Minimizes energy consumption and the need for more air compressor horsepower
- ***Less Prone To Fouling Than Copper Or Aluminum Exchangers*** - Maintains optimal performance
- ***ZEKS Exclusive 10-Year Warranty*** - A testament to the durability and efficiency of this robust component

Protected under U.S. Patent Nos. 6,186,223 and 6,244,333

Electronic Performance Control

HeatSink™ dryer operation is automatically controlled to optimize air treatment and manage energy consumption. In addition, both the Compustat™ and DPC™ controllers enable the user to adjust the operating parameters based on specific application requirements, optimizing energy usage.

Compustat™ – Digital controller standard on 200-800 models. Includes LED display to communicate operating status and energy savings.

DPC™ Controller – Enhanced version standard on 1000-1600 models. Includes backlit LCD to communicate operating status and refrigeration system parameters.

DPC™ Plus Controller – Optional on 200-1600 models. Provides all the features of the DPC™ Controller, with the addition of air temperature and pressure displays.

	Dryer Model	
Display of:	**200-800**	**1000-1600**
• Chiller Temperature	S	S
• % Energy Savings	S	S
• Refrigerant Suction Pressure	+	S
• Refrigerant Suction Temperature	+	S
• Refrigerant Discharge Pressure	+	S
• Dryer Compressor Running Time	+	S
• Dryer Running Time	+	S
• Diagnostic Memory	+	S
• Inlet Air Pressure	+	+
• Outlet Air Pressure	+	+
• Inlet Air Temperature	+	+
• Outlet Air Temperature	+	+
Condensate Drain Time Adjustment	S	S
Automatic Dryer RESTART	S	S
Remote START/STOP-Ready	S	S
Remote Alarm Contact	S	S
MODBUS Communication-Ready	+	S

S - Standard feature with either Compustat™ or DPC™
O - Option provided by DPC™
NA - Not Applicable
\+ - Included with DPC™ Plus Option

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COMPRESSED AIR SOLUTIONS®

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Standard Features:

- **Stainless Steel CFX® Heat Exchangers**
- **Fully Hermetic Refrigeration Compressor**
- **High Efficiency Moisture Separator**
- **Electronic Performance Control**
- **Timed Electric Condensate Drain**
- **Water-Cooled or Air-Cooled Condensers**
- **Environmentally Friendly R-404 Refrigerant**
- **Thermal Mass Circulation Pump**
- **NEMA 1 Electrics**
- **Full Powder-Coated Cabinet**
- **Galvanized Internal Structure**

Optional Features:

- **Digital Display of Compressed Air Inlet and Outlet Temperatures and Pressures** (200-1600 only)
- **Complete Stainless Steel Air Circuit**
- **Prefilter and Afterfilter To Meet Application Needs**
- **CME™ Cold Mist Eliminator– 99% removal of air compressor lubricant carryover** (available on 200-400)
- **High Condensate Level Alarm** (200-1600 only)
- **Refrigeration Condenser Filter**
- **NEMA 4/12 Electrics**
- **No Air Loss Drain**

Exclusive Warranty

In addition to the standard warranty on all HeatSink™ dryers, the refrigeration compressor is warranted for five years and the CFX® Heat Exchangers for ten years.

Refer to ZEKS Product Warranty Policies and Procedures.

ZEKS 5/10 COVERAGE

Independently Verified Performance!

Through participation in the Compressed Air and Gas Institute (CAGI) Performance Verification Program, actual performance and energy consumption of 200-1000 scfm ZEKS HeatSink™ dryers have been independently validated against CAGI Data Sheets. Visit www.zeks.com to view ZEKS refrigerated dryer Data Sheets.

HeatSink™

REFRIGERATED COMPRESSED AIR DRYERS

200 – 1,600 scfm

Reliability. Efficiency. Innovation.

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Annual Energy Savings

The example below calculates the annual energy savings of a HeatSink™ dryer compared to a non-cycling design. The factors can be replaced with those of any compressed air system.

A. ***Determine Maximum Capacity of The Dryer***
Assume a maximum capacity of 1,000 scfm for this example.

B. ***Determine Weekly Compressed Air Volume***
Multiply the number of hours worked per week on all shifts times the compressed air volume (scfm x 60 min.) used on each shift. Total all shift numbers to determine the actual compressed air volume used per week:

Shift	Hours		(60 min.)		scfm		Air Volume
FIRST	35	x	60	x	800	=	1,680,000
SECOND	35	x	60	x	600	=	1,260,000
THIRD	35	x	60	x	400	=	840,000
SATURDAY	7	x	60	x	200	=	84,000
Weekly Compressed Air Volume							**3,864,000**

C. **Calculate Weekly Air Treatment Potential of The Dryer**
Multiply the total number of hours per week (168 assuming the equipment is ON, 24/7) times the maximum capacity of the dryer:

Weekly Air Treatment Potential = 168 hrs. x 1,000 scfm x 60 min. = 10,080,000

D. ***Calculate The Plant Operation Factor***
Divide the total compressed air volume used per week by the total weekly air treatment potential to determine the plant operation factor:

$$\textbf{Plant Operation Factor} = \frac{3{,}864{,}000}{10{,}080{,}000} = .383$$

E. ***Select Ambient Air Temperature Reduction Factor***
The factor varies based on geographic location and takes into account the impact of lower ambient temperatures on energy consumption. Typical factors are:

Northern US Climate –.24 Central US Climate –.31 Southern US Climate –.34

F. ***Calculate Utilization Factor***
This incorporates all of the above:

Plant Operation Factor x Ambient Air Temperature Reduction Factor

If we assume the plant is in the Southern US, the Utilization Factor will be:

Utilization Factor = .383 x .34 = .13 (13%)

G. ***Estimate Annual Savings***
Refer to the following table for a 1,000 scfm dryer and interpolate between a 10% and 20% utilization factor:

Estimated Annual Savings ($) From True-Cycling Operation* (Based on $.10/kWh)

Dryer Size	Utilization Factor					
(scfm)	10%	20%	30%	40%	50%	60%
200HSG	1393	1209	1025	841	657	473
250HSG	1375	1174	972	771	569	368
300HSG	1857	1612	1367	1121	876	631
400HSG	2865	2575	2286	1997	1708	1419
500HSF	2803	2365	1927	1489	1051	613
600HSF	3592	3154	2716	2278	1840	1402
700HSF	4634	4100	3565	3031	2497	1962
800HSF	4581	3995	3408	2821	2234	1647
1000HSF	5703	4923	4143	3364	2584	1805
1200HSF	7402	6482	5563	4643	3723	2803
1600HSF	8751	7604	6456	5309	4161	3013

*Consult factory for calculation details   Results shown for air-cooled models

Heat load on a refrigerated compressed air dryer is based on the combination of inlet air flow volume, inlet air temperature, ambient air temperature, and compressed air pressure. Of these, inlet air flow volume (scfm) and inlet air temperature have the greatest effect. Even a slight reduction of inlet air temperature will greatly reduce the heat load on the dryer. Dryer model selection is based on capacity sufficient to handle the heat load during the hottest months of the year. Cycling operation provides the greatest way to realize energy savings as inlet air temperature drops.

HeatSink™
REFRIGERATED COMPRESSED AIR DRYERS

Reliability
Efficiency
Innovation

HeatSink™ Sizing and Selection

HeatSink™ dryer performance is rated per ISO 7183, Table 2, Option A2, for air with 38°F pressure dew point (PDP) at the following conditions: 100°F inlet air temperature; 100 psig inlet air pressure; 100°F ambient air temperature. Select a model that has the required treatment capacity (scfm) from the Technical Specifications Chart below.

For applications that deviate from the standard rating conditions, use the following Correction Factors to select a model that will provide 38°F PDP (selection example provided):

Dryer Selection Example

- Air Volume Requirement: **375 scfm**
- Inlet Air Temperature: **110° F**
- Inlet Air Pressure: **150 psig**
- Ambient Air Temperature: **90° F**

Inlet Air Temperature	*Correction Factor*
80° F	.61
90° F	.79
100° F	1.00
110° F	**1.23**
120° F	1.51

Inlet Air Pressure	*Correction Factor*
50 psig	1.29
75 psig	1.10
100 psig	1.00
125 psig	.92
150 psig	**.86**
250 psig	.79

Ambient Air Temperature	*Correction Factor*
80° F	.80
90° F	**.89**
100° F	1.00
110° F	1.16
113° F	1.27

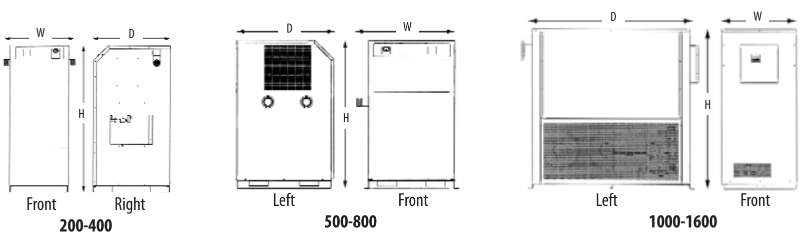
With the correction factors selected, corrected scfm can be calculated:

1.23 x .86 x .89 x 375 scfm = 353 scfm corrected

Select the HeatSink™ model that matches or exceeds the corrected treatment capacity (scfm). For the example given, it is a model 400 HSG delivering 38°F PDP.

Overall dimensions indicated.

Air, electric service, and drain connection configurations vary per model. Contact factory for details.



Technical Specifications

MODEL	CAPACITY* SCFM 38°F	PRESSURE DROP**	DIMENSIONS W IN.	D IN.	H IN.	SHIP WT. AIR-COOL LBS.	WATER-COOL LBS.	AIR CONNECT IN/OUT	DRAIN CONNECT	REFRIG COMP AIR-COOL HP	WATER-COOL HP	OPERATING KW*** AIR-COOL	WATER-COOL	REFRIG TYPE	MAX WORKING PRESSURE	VOLTAGES§
200HSG	200	1.6	28	30	58	620	540	1 1/2"MPT	1/4"	1.0	1.0	2.1	1.1	R404	300 psig	
250HSG	250	2.7	28	30	58	670	570	1 1/2"MPT	1/4"	1.5	1.5	2.3	1.4	R404	300 psig	
300HSG	300	2.9	28	30	58	735	630	2"MPT	1/4"	2.0	2.0	2.8	1.7	R404	300 psig	
400HSG	400	2.9	28	30	58	745	670	2"MPT	1/4"	2.5	2.5	3.3	2.2	R404	300 psig	
500HSF	500	2.9	42	40	62	1105	1120	3"MPT	1/4"	4.0	4.0	5.0	3.2	R404	300 psig	208-3-60 230-3-60 220-3-50 460-3-60 380-3-50 575-3-60
600HSF	600	3.0	42	40	62	1275	1270	3"MPT	1/4"	4.0	4.0	5.0	3.2	R404	300 psig	
700HSF	700	2.7	42	40	62	1320	1300	3"MPT	1/4"	4.5	4.5	6.1	3.6	R404	300 psig	
800HSF	800	2.9	42	40	62	1415	1300	3"MPT	1/4"	5.0	5.0	6.7	4.2	R404	300 psig	
1000HSF	1,000	2.5	32	72	69	2315	2355	4" FLG	1/4"	6.5	5.0	8.9	5.5	R404	220 psig	
1200HSF	1,200	3.1	32	72	69	2435	2435	4" FLG	1/4"	8.0	6.0	10.5	6.9	R404	220 psig	
1600HSF	1,600	3.3	32	72	69	2785	2615	4" FLG	1/4"	10.5	8.0	13.1	7.7	R404	220 psig	

* Performance data obtained as per ISO 7183, Table 2, Option A2.
Pressure dew point at 100 psig inlet air pressure, 100°F inlet air temperature, 100°F ambient air temperature.

** Pressure drop ± .5 psi

*** Average kilowatts per hour of dryer operation at full rated capacity

200-400 scfm units equipped with CME™ Cold Mist Eliminator limited to drain rating of 230 psi.

‡ Air-cooled dimension. Water-cooled dimension 76.12"

§ 200HSG also available in 208-1-60 and 230-1-60 voltages

NEMA 1 electrical enclosures standard.

Dimensions subject to change without notice.

Standard 150-800 scfm models ETL-Certified
1000-1600 models UL 508 Panels.

NA indication = Not Applicable

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