

MultiPlex™

3,250 – 19,200 scfm Models

**LARGE CAPACITY
REFRIGERATED COMPRESSED AIR DRYERS
WITH TRUE-CYCLING™ OPERATION
AND REDUNDANT OPERATING SYSTEMS**



Multiple, Independent, Air Treatment Modules Within A Single Large Capacity True-Cycling™ Dryer

Compressed air contains moisture, oil, and other contaminants that must be removed to avoid damage to pneumatic valves, tools, and instruments. Failure to remove these impurities can compromise critical manufacturing and finishing processes as well. MultiPlex™ dryers remove these contaminants in large volume compressed air applications while consuming only the electricity necessary to meet the actual air treatment demand.

True-Cycling™ – The ZEKS Advantage

True-Cycling™ is not just a catchy phrase, it is the foundation of the MultiPlex™ design. Common manufacturing practices, process machinery cycling, and changing production requirements result in variable compressed air volume use. This, combined with lower ambient and inlet air temperatures, results in a variable, reduced load on the dryer. ZEKS pioneered the thermal mass dryer design that efficiently stores cold energy. This allows the refrigeration compressor to cycle OFF during periods of reduced load while the dryer continues to remove moisture and contaminants from the air stream. The result is a truly energy efficient dryer design that provides the tight dew point control that world-class processes demand.



3-Module 7200HSFMA with air cooled refrigeration condensers and NEMA 1 electrics.

Reliable Operation

MultiPlex™ dryers are designed to endure the extreme conditions that can exist in a typical manufacturing facility. While some competitive dryers are rated to more lenient conditions, ZEKS dryers are rated to provide 38°F pressure dew point compressed air with fully saturated, 100°F inlet air temperatures in 100°F ambient environments. The refrigeration system of each module includes a high quality, fully hermetic compressor to insure long service life. Water cooled and air cooled refrigeration condensers are generously sized to maintain efficiency in all environments.

Since ZEKS invented True-Cycling™ dryers in 1959, there have been many attempts to duplicate its superior performance. Whereas ZEKS dryers use a very efficient thermal mass solution, other companies have utilized sand, refrigerant, aluminum, etc. for the storage media. Since the specific heat of these mediums is much less than the ZEKS thermal mixture, they require as much as five times the weight of the media to approach the performance of the ZEKS design. If the thermal storage capacity of the media is limited or inefficient, the result will be varying dew points and/or excessive refrigeration compressor cycling. True-Cycling™ has been proven to maintain dew point and reduce wear and tear on the dryer refrigeration systems.

Energy Savings Up To 80%

True-Cycling™ operation enables MultiPlex™ air dryers to provide significant energy savings when compared to non-cycling dryers. Air treatment cost is not wasted through continuous operation of the dryer refrigeration system as it is with non-cycling dryers. Changes in compressed air consumption resulting from variable shift and process demands as well as daily and seasonal fluctuations in ambient temperature enable a MultiPlex™ dryer to provide energy savings as high as 80%.

Best-In-Class For High

ZEKS engineering has incorporated Best-In-Class features for the highest level of value and quality. Expect superior performance.

Redundancy—Eliminate The Need For Multiple Air Dryers

MultiPlex™ dryers contain multiple air treatment modules, each with a cycling refrigeration system, stainless steel heat exchangers and a high efficiency vortex separator and no-air loss drain. The modules are integrated and configured in eleven dryer models with air treatment capacities from 3,250–19,200 scfm. This modular approach provides inherent redundancy of critical dryer components.

The unique MultiPlex™ design enables users to maintain dryer operation even when one of the independent refrigeration systems is taken off-line for service or maintenance. Properly sized, the outlet pressure dew point will not be compromised should a single module be de-energized. In addition, the thermal mass loop of the dryer is common to all modules. This design feature maintains thermal mass circulation to all modules should the pump of a single module be disabled.

Versatility and Expandability

All MultiPlex™ modules share a single INLET air header and a single OUTLET air header, each with dual connection capability. This permits connection to either side of the dryer to best suit the user's specific site conditions.

In addition, MultiPlex™ dryers are engineered to address the ever-changing manufacturing environment. The header centerline position is common among all MultiPlex™ models. This feature, along with the modular design, allows additional modules to be bolted on to increase your air treatment capacity as operations expand. All refrigeration components are configured for convenient access to minimize downtime for service or maintenance.

Consistent Pressure Dew Point

The Sentinel™ circulation system, exclusive to ZEKs, optimizes the efficiency of the True-Cycling™ operation of MultiPlex™ dryers. A pump on each air treatment module circulates a thermal storage solution throughout the dryer to evenly distribute the stored cold energy produced by the independent refrigeration systems. Because of this active circulation through the thermal mass loop, pressure dew point remains consistent throughout the full range of air flow. It also enables MultiPlex™ dryers to continue to provide clean dry air even if a single module is isolated for maintenance or service.



CFX®—The Standard Of Excellence For Heat Exchanger Design

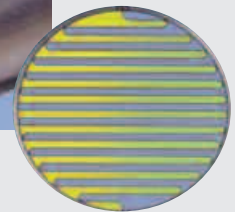
ZEKS patented CFX® stainless steel Corrugated, Folded heat exchangers have been engineered exclusively for compressed air drying. This unique design features a high heat transfer coefficient, low pressure drop, multi-path flow area, and continuous self-cleaning action that minimizes fouling potential. Even well maintained compressed air systems can contain corrosive impurities introduced at the air compressor intake. Corrosion resistant 304L stainless steel is used in all air circuit exchangers. CFX® provides durability in environments where copper or other metals are not suitable.

CFX® = Benefits

- 100% Stainless Steel Construction
- Less Prone To Fouling Than Copper Or Aluminum Exchangers
- Flow Area That Is 3–5 Times That Of Competitive Exchangers
- Industry-Leading Low Pressure Drop
- Higher Energy Efficiency Than That Of Competitive Exchangers
- ZEKs Exclusive 10-Year Warranty



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



(Diagram depicts exchanger cross section)

MultiPlex™

Your Safeguard Against Disruption
Of Compressed Air Treatment

Volume Applications

atures that enable MultiPlex™ dryers to provide the operating efficiency and long reliable service life.

Digital Performance Control

MultiPlex™ operation is automatically controlled to optimize air treatment and manage energy consumption. A digital performance controller (DPC™) combines PLC technology with an integrated backlit LCD display and keypad. DPC™ Controllers are conveniently located on the front of each dryer module, allowing the user to monitor critical dryer parameters and adjust performance to suit varying demand and ambient conditions. The DPC™ Controller provides the following functions and features:



- **Digital Display Of:**
 - Chiller Temperature
 - % Energy Savings
 - Refrigerant Suction Pressure
 - Refrigerant Suction Temperature
 - Refrigerant Discharge Pressure
 - Dryer Compressor Running Time
 - Dryer Running Time
 - Diagnostic Memory
 - Compressed Air INLET and OUTLET Pressure and Temperature
- **Automatic Dryer RESTART**
- **Remote START/STOP**
- **Remote Communication-Ready**
- **Condensate Level Alarm-Ready**
- **Automatic Refrigerant Compressor Crankcase Heater Delay**

Low Pressure Drop

The unique CFX® design has allowed ZEKs to provide air treatment with an extremely low pressure drop. This minimizes the overall compressed air energy requirement and the need for greater air compressor capacity.

- ...**Redundant Refrigeration Circuits**
- ...**Redundant Electrical Circuits**
- ...**Redundant Digital Controls**
- ...**Redundant Thermal Storage Circulation Pumps**
- ...**Stainless Steel Heat Exchangers**
- ...**Energy Saving Performance**
- ...**Expandable, Modular Construction**

STANDARD FEATURES

- **Stainless Steel Heat Exchangers**
Patented CFX® stainless steel heat exchangers used in all precooler/reheater and chiller assemblies.
- **Multiple Electrical Disconnects**
Individual module electrical disconnects safely isolate each module, permitting maintenance or repair without de-energizing entire dryer.
- **Sentinel™ Circulation System**
Dedicated circulation pump on each dryer module circulates shared thermal storage fluid and provides inherent redundancy.
- **Savair™ No Air-Loss Condensate Drain**
Pneumatically operated demand drain wastes no compressed air. Large discharge port resists clogging.
- **Digital Performance Controller**
Enables performance modification and real-time monitoring of complete dryer and individual modules.
- **Water Cooled Refrigeration Condensers**
Multiple water cooled condensers provided with single INLET and OUTLET water connections to reduce installation costs.
- **Closed Frame Construction**
Full powder coated cabinetry protects internal components.
- **Environmentally Friendly Refrigerant**
MultiPlex dryers use environmentally friendly R-404A refrigerant.
- **Air Circuit Precooler/Reheater**
Reduces refrigeration load requirements as well as eliminates condensation of outlet air piping.
- **Fully Hermetic Refrigeration Compressors**
Includes lubricant level site glass, thermal overload protection, and vibration isolation mounting.
- **Single Point Electric Service Connection**
Minimizes installation cost.
- **Exclusive Warranty**
In addition to the standard dryer warranty, the refrigeration compressors are warranted for five years and the CFX® heat exchangers for ten years.

OPTIONAL FEATURES

- **Complete Stainless Steel Air Circuit**
Complete corrosion protection.
- **NEMA 4/12 Electrics**
Water tight and dust tight enclosures for protection against rain, falling water, and washdown. Indoor and outdoor use.
- **Semi-Hermetic Refrigeration Compressors**
Fully serviceable compressors include oil failure protection and vibration eliminators.
- **Air Cooled Refrigeration Condensers**
Air cooled condensers maintain individual module efficiency in all ambient conditions.
- **Cold Coalescing Piping**
Single INLET and OUTLET flanges enable connection of a Mist Eliminator or flanged filter for removal of oil aerosols at the coldest temperature.
- **Removable Head Condensers**
Permits cleaning of the condenser in applications where water has high concentrations of silt or particulate. Units are top-mounted for convenient access.

Annual Energy Savings of MultiPlex™ Dryers

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

A. Determine Maximum Capacity of Dryer

Assume a maximum capacity of 7,200 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 6,800	=	14,280,000
SECOND	35	x 60	x 5,600	=	11,760,000
THIRD	35	x 60	x 3,000	=	6,300,000
SATURDAY	7	x 60	x 1,800	=	756,000
Weekly Compressed Air Volume					33,096,000

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 7,200 scfm x 60 min. = 72,576,000

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:

Plant Operation Factor = $\frac{33,096,000}{72,576,000} = .46$

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:

Climate (United States)	Air Cooled	Water Cooled
Northern	.24	.41
Central	.31	.49
Southern	.34	.53

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 Northern US, the Utilization Factor will be:

Utilization Factor = .46 x .41 = .19 (19%)

G. Estimate Annual Savings

Refer to the following table (water cooled) for a 7,200 scfm dryer and interpolate between a 10% and 20% utilization factor:

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

Dryer Size (scfm)	Water Cooled MultiPlex™ Utilization Factor					
	10%	20%	30%	40%	50%	60%
3250 HSFM	2690	2399	2108	1816	1525	1233
4000 HSFM	2436	2085	1733	1382	1030	679
4800 HSFM	3265	2819	2374	1928	1482	1036
6000 HSFM	3654	3127	2600	2072	1545	1018
7200 HSFM	4898	4229	3560	2892	2223	1555
8000 HSFM	4872	4169	3466	2763	2060	1357
9600 HSFM	6530	5639	4747	3856	2964	2073
12000 HSFM	8163	7048	5934	4820	3705	2591
14400 HSFM	9795	8458	7121	5784	4447	3109
16800 HSFM	11428	9868	8308	6748	5188	3628
19200 HSFM	13060	11277	9494	7712	5929	4146

Dryer Size (scfm)	Air Cooled MultiPlex™ Utilization Factor					
	10%	20%	30%	40%	50%	60%
3250 HSFM	17502	15207	12912	10617	8322	6027
4000 HSFM	21725	19272	16819	14366	11914	9461
4800 HSFM	25614	22846	20078	17310	14542	11773
6000 HSFM	32587	28908	25229	21550	17870	14191
7200 HSFM	38421	34269	30117	25965	21812	17660
8000 HSFM	43450	38544	33638	28733	23827	18922
9600 HSFM	51228	45692	40156	34620	29083	23547
12000 HSFM	64036	57115	50195	43274	36354	29434
14400 HSFM	76843	68538	60234	51929	43625	35320
16800 HSFM	89650	79961	70273	60584	50896	41207
19200 HSFM	102457	91384	80312	69239	58166	47094

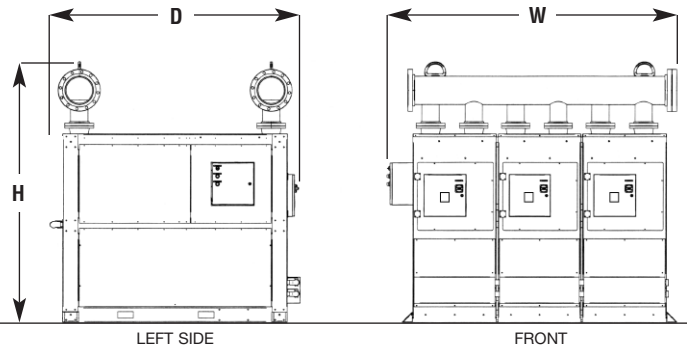
*Consult factory for calculation details

MultiPlex™ Handles The Load...

Heat load on refrigerated compressed air dryers 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 a 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.

MultiPlex™

LARGE CAPACITY, REFRIGERATED
COMPRESSED AIR DRYERS



Overall dimensions indicated.

Air INLET and OUTLET header centerline remains consistent throughout the MultiPlex™ model range.

Module number varies depending on model. See last column in Technical Specifications chart to identify modules per model. 3-module model depicted in this illustration.

Technical Specifications

MODEL	CAPACITY* SCFM 38°F PDP	PRESSURE DROP**	OVERALL DIMENSIONS			SHIP WT. LBS.	CONNECT SIZE IN/OUT	DRAIN (QTY) SIZE FPT	REFRIG COMP AIR COOLED (QTY) HP	REFRIG COMP WATER COOLED (QTY) HP	H ₂ O FLOW GPM @85°F	H ₂ O CONN	OPERATING KW*** AIR COOLED	OPERATING KW*** WATER COOLED	NO. OF MODULES
			W IN.	D IN.	H IN.										
3250HSFM	3,250	3.4	80	99	98	6,520	8" FLG	(2) 1/2"	(2) 10.5	(2) 8.0	38	1.5 NPT	26.2	16.8	2
4000HSFM	4,000	3.5	80	99	98	6,720	8" FLG	(2) 1/2"	(2) 13.0	(2) 10.5	54	1.5 NPT	28.0	22.0	2
4800HSFM	4,800	3.5	80	99	98	6,880	8" FLG	(2) 1/2"	(2) 13.0	(2) 10.5	54	1.5 NPT	31.6	26.0	2
6000HSFM	6,000	3.5	112	100	100	9,700	10" FLG	(3) 1/2"	(3) 13.0	(3) 10.5	81	2.0 NPT	42.0	33.0	3
7200HSFM	7,200	3.5	112	100	100	9,950	10" FLG	(3) 1/2"	(3) 13.0	(3) 10.5	81	2.0 NPT	47.4	39.0	3
8000HSFM	8,000	3.5	148	100	102	13,020	12" FLG	(4) 1/2"	(4) 13.0	(4) 10.5	108	2.5 NPT	56.0	44.0	4
9600HSFM	9,600	3	148	100	102	13,350	12" FLG	(4) 1/2"	(4) 13.0	(4) 10.5	108	2.5 NPT	63.2	52.0	4
12000HSFM	12,000	3	176	101	104	16,400	14" FLG	(5) 1/2"	(5) 13.0	(5) 10.5	135	3.0 FLG	79.0	65.0	5
14400HSFM	14,400	3	209	101	104	19,600	14" FLG	(6) 1/2"	(6) 13.0	(6) 10.5	162	3.0 FLG	94.8	78.0	6
16800HSFM	16,800	3	242	104	106	23,000	16" FLG	(7) 1/2"	(7) 13.0	(7) 10.5	189	4.0 FLG	110.6	91.0	7
19200HSFM	19,200	3	275	104	106	26,400	16" FLG	(8) 1/2"	(8) 13.0	(8) 10.5	216	4.0 FLG	126.4	104.0	8

* Performance data obtained and presented in accordance with CAGI Standard No. ADF 100, "Refrigerated Compressed Air Dryers – Methods for Testing and Rating." Pressure dew point at 100 psig, 100°F inlet air, 100°F ambient air.

** Pressure drop ±.5 psi

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

460/3/60; 380/3/50; 575/3/60 voltages available.

220 psig maximum working pressure.

Dimensions subject to change without notice.

Shipping weights shown are for air cooled models. Water cooled model weight is less.

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

ZEKS meets stringent high volume air treatment requirements for continuous duty and consistent dew point and exceeds them with built-in redundancy, low operating cost and rugged reliability. MultiPlex™ dryers are the world's most advanced large capacity refrigerated air dryers.

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LARGE CAPACITY, REFRIGERATED
COMPRESSED AIR DRYERS

3,250 – 19,200 scfm



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COMPRESSED AIR SOLUTIONS®

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