



Cycling
Refrigerated
Compressed Air
Dryers
FLEX Series

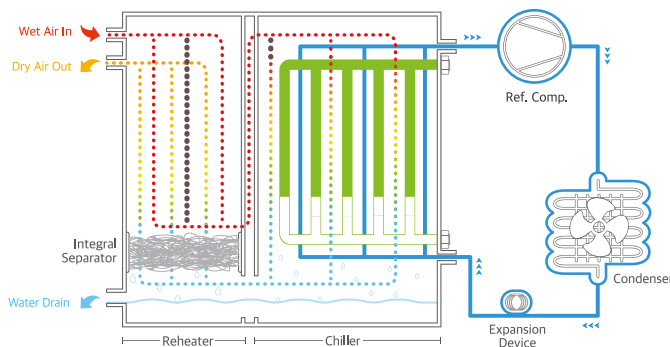
The FLEX Advantage

Utilizing the latest advancements in heat transfer technology, FLEX Series refrigerated dryers offer an innovative approach to efficiently remove liquid contamination from compressed air.

FLEX Series dryers are designed with 4-in-1 heat exchangers and a phase change material (PCM) encapsulated between the refrigeration and compressed air circuits, serving as a highly effective reservoir for thermal storage.

The PCM possesses high latent heat properties which enables it to thaw or freeze at a constant temperature. The phase change material will absorb heat from warm, moisture laden compressed air without a significant rise in temperature.

The phase change material stays colder for longer periods of time, cycling the refrigerant compressor less often than conventional energy saving designs.



Operating Principles

1. The FLEX Series utilizes a phase change material (PCM) heat transfer medium between the refrigeration and compressed air circuits that serves as a reservoir for thermal storage.

2. The thermal reservoir is comprised of a patent pending heat exchanger filled with a phase change material that efficiently transfers heat energy through a “change of state”.

The PCM changes from liquid to solid back to liquid in a continuous cycle.

3. The refrigeration circuit operates to cool down the PCM until it forms into a solid at which time the refrigeration system cycles off.

4. As the compressed air enters the PCM to air section of the heat exchanger, the PCM media absorbs heat from the airstream and begins to thaw the PCM media at a constant temperature.

5. When most of the PCM media has turned to liquid the refrigeration system cycles on to again cool down the PCM media turning it back into a solid.

6. This cycle repeats as required to meet the corresponding compressed air load on the FLEX dryer.

The FLEX Series provides cost-effective energy savings by matching electrical power consumed in direct proportion to air demand.

Energy Saving Solutions

The FLEX Series lowers air system power costs and improves productivity by matching power consumption to compressed air demand. In addition, the dryer utilizes low-global-warming-potential (GWP) refrigerants, including R-513A and R-454C, helping facilities reduce environmental impact while supporting sustainability objectives. In a typical manufacturing facility, up to 30% of electricity consumed is for generating and treating compressed air. To reduce total cost of operation and qualify for utility company incentive programs, proper air treatment equipment selection and application is required.

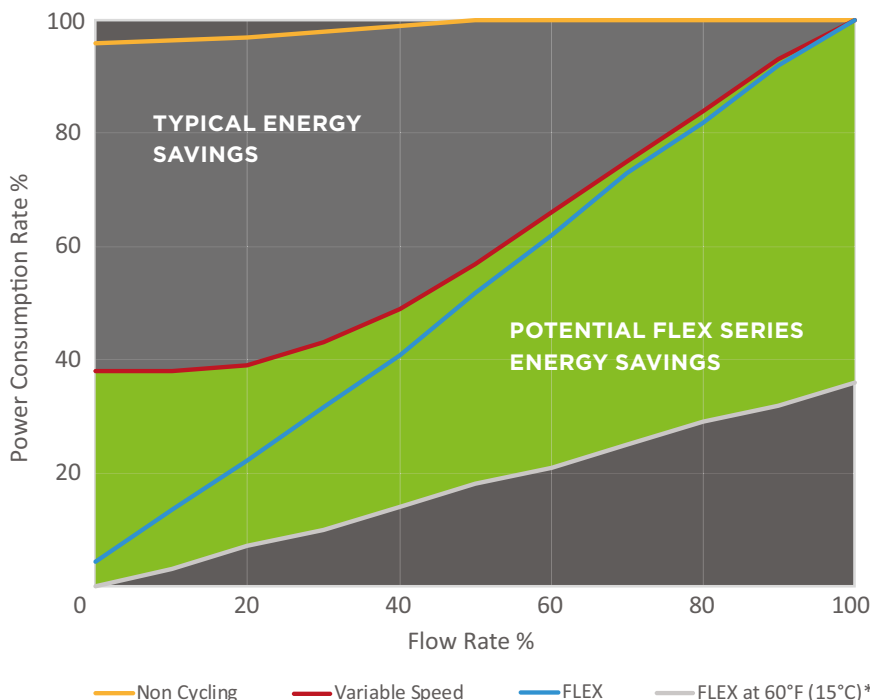
Load Matching Performance

Compressed air load profiles in most manufacturing facilities fluctuate. The FLEX Series provides cost-effective energy savings by matching electrical power consumed in direct proportion to air demand. Linear load matching is achieved from 0% up to 100% demand.

Non-cycling dryers operate with the refrigeration compressor running continuously, regardless of inlet load conditions. Minimal energy savings are realized from 100% down to 0% inlet air load.

Linear Energy Savings

FLEX Series dryers automatically cycle (on/off) the refrigeration compressor in response to inlet load conditions. As the inlet air load is reduced, the power requirement to dry the air is matched in proportion to the demand. For example, at 60% inlet air load, a non-cycling dryer consumes 96% of the full load power consumption, a 4% energy savings. By comparison, at 60% inlet air load, the FLEX Series consumes only 60% of the full load power, a 40% energy savings.



Dryers are rated in accordance to ISO 7183 standard rating conditions A2. (38°C / 100°F ambient)

** FLEX Series also shown at an ambient temperature of 60°F (15°C)*

The power consumption data set forth above for non cycling dryers and variable speed dryers was obtained from an article titled "Cycling Refrigerated Dryers - Are Savings Significant?" published in Compressed Air Best Practices in November 2011. The power consumption data set forth above for the FLEX dryer is based on laboratory testing performed on a FLEX 1.2 model dryer. We expect that power consumption data between non cycling, variable speed and the FLEX dryer would be consistent regardless of the size of the dryer.

Efficient by Design

FLEX Series 75 to 2000 scfm



1. Heat Exchange Coil

High-efficiency condenser lowers refrigerant temperature for stable system performance.

- PCM Thermal Reservoir stores and releases energy to maintain stable dew point and reduce compressor cycling.
- Braze Plate Heat Exchanger
 - compact design delivers efficient heat transfer with low pressure drop.
- Refrigeration Circuit - optimized flow path supports efficient operation with low-GWP refrigerants.
- Cycling Compressor adjusts to demand for energy-efficient, reliable performance.
- Condensate System separates and removes moisture to protect downstream equipment

2. Solenoid drain (1.1-5.5) and No-air-loss drain (8.1-20.1).

- Condensate drain lines terminate at discharge connections conveniently located on the side of the dryer
- Failure to discharge alarm on the operator interface enhances system reliability

3. High efficiency, up-flow aluminum air-cooled condenser

- Pulls ambient air through the condenser and releases from the top of the dryer condenser
- Provides cooler condensing air and greater efficiency

4. Reliable, semi-hermetic refrigerant compressors

- Low GWP refrigerant enhances sustainability
- Environmentally friendly, globally accepted refrigerants
- Rugged design, for long-term operation

5. Moisture Separator

- Stainless steel mesh design for the highest separation rates, independent of the flow, volume and speed

6. Controller with backlit LCD display provides ease of monitoring and operating status (FLXA 3.1 and larger)

- Energy saving (%), dryer operating time, refrigeration compressor operating time, active fault message, dew point status, air inlet temperature display, alarm history and USB connection port for data logging
- Remote monitoring capability - Modbus RTU via RS485 communications port





International Air Quality Class Standards

FLEX Series refrigerated air dryers offer the perfect balance between technology and simplicity to dry compressed air systems to ISO 8573-1 Air Quality Class 4-5 pressure dew points.



Third Party Performance Certification

Hankison is a member of the Compressed Air and Gas Institute (CAGI), a non-profit organization that develops and publishes standards serving the compressed air industry.



Standard Filtration Packages



Pre-Filtration

HF Grade 5 filtration – provides high efficiency oil removal protecting downstream equipment.

ISO Air Quality Class:

- Solids – Class 1
- Remaining Oil – Class 1
- Removes solid particulate to 0.01 micron and larger
- Remaining oil content 0.008 ppm/w



After-Filtration

HF Grade 7 filtration – provides high efficiency oil removal protecting downstream equipment.

ISO Air Quality Class:

- Solids – Class 2
- Remaining Oil – Class 4
- Removes solid particulate to 1.0 micron and larger
- Remaining oil content 1.0 ppm/w

As an extra measure of protection, Hankison offers additional coverage beyond the standard 2-year warranty. Purchase a dryer with Filtration Package and the annual purchase of a maintenance kit and receive 3 years additional protection, parts and labor, a total of 5 years. All major components are covered.



Product Specifications

Air Cooled

DRYER MODEL	INLET FLOW		PRESSURE DROP PSID	VOLTAGES	INLET/ OUTLET IN	POWER CONSUMPTION KW	REFRIGERANT	OVERALL DIMENSIONS (W x D x H)	SHIP WEIGHT LBS. (KG)
	SCFM*	NM ³ /H						IN. (MM)	
FLXA1.1-A	75	127.42	3.4	115/1/60	NPT 1"	0.48	R513A	18.5 x 27.9 x 32.3 (469.9 x 708.7 x 820.4)	148 (67.1)
FLXA1.2-A	100	169.9	2.9	115/1/60	NPT 1"	0.60	R513A	18.5 x 34.6 x 35.0 (469.9 x 878.8 x 889.0)	168 (76.2)
FLXA1.5-A	150	212.38	1.8	115/1/60	NPT 2"	1.11	R513A	21.7 x 40.6 x 36.6 (551.2 x 1031.2 x 929.6)	240 (108.9)
FLXA2.1-A	200	339.8	2.3	460/3/60	NPT 2"	1.28	R513A	21.7 x 42.9 x 36.6 (551.2 x 1089.7 x 929.6)	269 (122)
FLXA3.1-A	300	509.7	2.1	460/3/60	NPT 2"	1.86	R513A	23.6 x 48.8 x 42.5 (599.4 x 1239.5 x 1079.5)	353 (160.1)
FLXA4.5-A	450	764.6	3.0	460/3/60	NPT 2"	2.75	R513A	23.6 x 54.3 x 47.2 (599.4 x 1379.2 x 1198.9)	443 (200.9)
FLXA5.5-A	550	934.4	3.3	460/3/60	NPT 2"	2.91	R513A	23.6 x 54.3 x 47.2 (599.4 x 1379.2 x 1198.9)	474 (215)
FLXA8.1-A	800	1359.2	4.4	460/3/60	FLG 3"	4.90	R454C	63.5 x 27.6 x 53.5 (1612.9 x 701.0 x 1358.9)	1012 (459)
FLXA10.1-A	1000	1699	4.3	460/3/60	FLG 3"	5.70	R454C	63.5 x 27.6 x 53.5 (1612.9 x 701.0 x 1358.9)	1135 (514.8)
FLXA12.5-A	1250	2123.8	4.6	460/3/60	FLG 4"	7.60	R454C	63.5 x 27.6 x 59.4 (1612.9 x 701.0 x 1508.8)	1290 (585.1)
FLXA15.1-A	1500	2548.5	5.3	460/3/60	FLG 6"	7.70	R454C	90.8 x 33.9 x 87.9 (2306.3 x 861.1 x 2232.7)	2469 (1119.9)
FLXA20.1-A	2000	3398	5.8	460/3/60	FLG 6"	10.10	R454C	90.8 x 33.9 x 87.9 (2306.3 x 861.1 x 2232.7)	2535 (1149.9)

Water Cooled

DRYER MODEL	INLET FLOW		PRESSURE DROP PSID	VOLTAGES	INLET/ OUTLET IN	POWER CONSUMPTION KW	REFRIGERANT	DIMENSIONS (W x D x H)	SHIP WEIGHT LBS. (KG)
	SCFM*	NM ³ /H						IN. (MM)	
FLXA8.1-W	800	1359.2	4.4	460/3/60	FLG 3"	3.5	R454C	58.3 x 27.6 x 53.5 (1480.8 x 701.0 x 1358.9)	1014 (459.9)
FLXA10.1-W	1000	1699	4.3	460/3/60	FLG 3"	4.2	R454C	58.3 x 27.6 x 53.5 (1480.8 x 701.0 x 1358.9)	1149 (521.2)
FLXA12.5-W	1250	2123.8	4.6	460/3/60	FLG 4"	6.1	R454C	58.3 x 27.6 x 59.4 (1480.8 x 701.0 x 1508.8)	1296 (587.9)
FLXA15.1-W	1500	2548.5	5.3	460/3/60	FLG 6"	6.2	R454C	72.5 x 33.9 x 87.9 (1841.5 x 861.1 x 2232.7)	2624 (1190.2)
FLXA20.1-W	2000	3398	5.8	460/3/60	FLG 6"	9.3	R454C	72.5 x 33.9 x 87.9 (1841.5 x 861.1 x 2232.7)	2690 (1220.2)

Performance data presented in accordance with ISO 7183 (Option A2) conditions: 100°F inlet temperature, 100°F ambient temperature and 100 psig conditions.



Capacity Correction Factors

To adjust the dryer capacity for non-standard conditions, use the Capacity Correction Factors (multipliers) from Tables 1, 2 and 3.

Table 1: Inlet Air Pressure

INLET AIR PRESSURE	75 PSIG 5.2 BAR	100 PSIG 6.9 BAR	120 PSIG 8.3 BAR	150 PSIG 10.3 BAR	225 PSIG 15.5 BAR
Multiplier	0.86	1.00	1.04	1.09	1.15

Table 2: Inlet Air Temperature

INLET AIR TEMPERATURE	80° F/27° C	90° F/32° C	100° F/38° C	110° F/43° C	120° F/49° C
Multiplier	1.46	1.23	1.00	0.82	0.68

Table 3: Ambient Air Temperature

AMBIENT AIR TEMPERATURE	80° F/27° C	90° F/32° C	100° F/38° C	110° F/43° C	120° F/49° C
Multiplier	1.12	1.06	1.00	0.83	0.68





Cycling Refrigerated Compressed Air Dryers **FLEX Series**

75 to 2000 scfm (127 to 3400 m³/h)

Design features, materials of construction and dimensional data, as described in this bulletin, are provided for your information only and should not be relied upon unless confirmed in writing. Please contact your local sales representative for product availability in your region.



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