

HIGH-VOLUME REFRIGERATED COMPRESSED AIR DRYERS

HV AND HES SERIES

HV & HES SERIES...

IMPROVE OPERATIONS

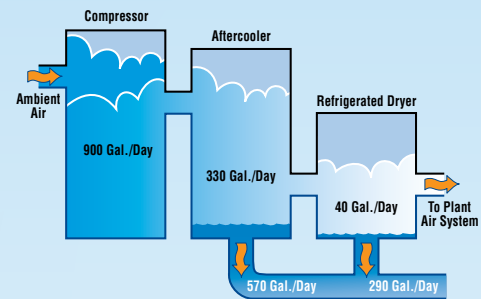
Liquid water in a compressed air stream increases the cost of operation. Product rejects mount and countless hours are wasted on unscheduled maintenance. Highly acidic, condensed water corrodes air motors and valves and, damages finished goods on contact.

LOW COST SOLUTION

Refrigerated dryers are a wise investment. With low initial cost and low cost of operation, they pay dividends for many years to come. Refrigerated drying technologies excel where the ambient temperature remains higher than the pressure dew point. Ideal candidates for this technology are most indoor, climate-controlled areas, where temperatures comfortable to people are maintained.

HOW MUCH CONDENSATE CAN THERE BE?

At an ambient of 75°F and 75% relative humidity, a typical 1,000 HP (5,000 scfm) air compressor inhales 900 gallons of water vapor every 24 hours. Discharging air at 100°F and 100 psig, a well-maintained aftercooler may remove about 570 gallons. That leaves you with 330 gallons left inside your air system. At the CAGI ADF100 standard of 38°F pressure dew point (ISO 8573.1 Class 4), a refrigerated dryer removes an additional 290 gallons. The remaining 40 gallons safely pass through the system as water vapor.



ISO 8573.1 QUALITY CLASSES

Air Quality Classes ISO 8573.1	Solid Particles			Humidity and Water		Oil	
	Maximum number of particles per m ³ Particle size (d), μm			Maximum Pressure Dew Point		Maximum Concentration, Aerosol, Liquid and Vapor	
	0.10 < d ≤ 0.5	0.5 < d ≤ 1.0	1.0 < d ≤ 5.0	°C	°F	mg / m ³	ppm w/w
0	As specified by the equipment user or supplier and more stringent than class 1						
1	≤ 20,000	≤ 400	≤ 10	≤ -70	≤ -94	≤ 0.01	≤ 0.008
2	≤ 400,000	≤ 6,000	≤ 100	≤ -40	≤ -40	≤ 0.1	≤ 0.08
3	-	≤ 90,000	≤ 1,000	≤ -20	≤ -4	≤ 1	≤ 0.8
4	-	-	≤ 10,000	≤ +3	≤ +37	≤ 5	≤ 4
5	-	-	≤ 100,000	≤ +7	≤ +45		
	Mass Concentration C _p (mg/m ³)						
6	0 < C _p ≤ 5			≤ +10	≤ +50		
				Liquid Water Content, C_w g/m³			
7	5 < C _p ≤ 10			C _w ≤ 0.5			
8				0.5 < C _w ≤ 5			
9				5 < C _w ≤ 10			
x	C _p > 10			C _w > 10		> 5	> 4

* Not Specified
Per ISO 8573.1: 2009

...HIGH-VOLUME REFRIGERATED AIR DRYERS

Hankison crafts high-volume dryers by leveraging two distinct designs to satisfy the requirements of large air users. Each open-frame, high-capacity style refrigerated dryer is engineered to match the specific air demands of your compressed air system.

HV SERIES - NON CYCLING DRYERS

4,000 thru 20,000 scfm

HV Series "High-Volume" dryers combine economy and performance. Dry compressed air and energy savings result from traditional non-cycling refrigeration systems incorporated into a space saving design. HV Series dryers feature:

- Continuous-duty refrigeration systems for reliable 38°F dew points
- Integral head-unloaders save energy during times of reduced air demand
- Integral Grade 9 filter elements remove contaminants to 3 micron

HES SERIES - CYCLING DRYERS

4,000 thru 12,000 scfm

HES Series "Hankison Energy Saver" cycling dryers automatically match energy savings to your air demands. A simple refrigeration system chills a large volume of thermal storage fluid that possesses exceptional heat transfer characteristics. Much like your refrigerator at home, we start-and-stop the refrigeration compressor as needed. Cold thermal storage fluid circulates continuously through durable shell type heat exchangers and around the all copper tubes to provide 33°F - 39°F pressure dew points. HES Series dryers feature:

- Energy efficient cycling operation to match energy savings to plant air demands
- Text display delivers Percentage-of-Energy savings, Process Control Temperature, Preset or Adjustable Dew Point value.
- Trip-L-Traps, the original air-operated demand drains, are included as standard



HV SERIES - NON-CYCLING DRYERS 4,000 THRU 20,000 SCFM

HV Series refrigerated air dryers deliver economical operation and competitive pricing through traditional non-cycling technology.

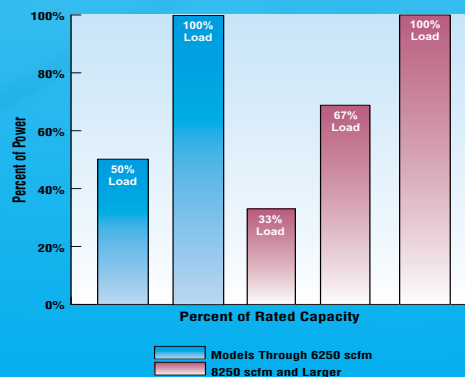
Continuous-duty operations, are ideal candidates for these precision engineered dryers. Simplicity and dependability provide large volume compressed air users with maximum value in terms of initial purchase price and cost of operation.

Environmentally friendly refrigerants deliver consistent 38°F pressure dew point performance to protect your critical, pneumatically powered operations.

CONTROLLED COMPRESSION RATIO ADVANTAGE

The cold energy is harnessed through a combination of carefully selected components and the compressor runs continuously. Energy saving unloaders control the compression ratio inside the cylinders to adapt to air demand. Energy savings of up to 67% result under part load conditions. State-of-the-art logic controls manage the process.

Controlled Compression Energy Savings Vs. Load



Automatic Energy Savings

- Continuous-duty, semi-hermetic compressors include energy saving capacity unloaders

Central Controls

- Inlet/Outlet Air Pressure Gauges & Easily Accessible Refrigeration Circuit Controls

Automatic Moisture Removal

- Three (3) Automatic time-actuated solenoid valves are standard. Upgrade to Trip-L-Traps, the original air-operated demand drains to maximize energy efficiency. (Not Shown)

38F Dew Points and Low Pressure Drop

- Non-fouling, smooth copper tubes, and shell type heat exchangers, deliver 38F dew points and low pressure drop.

Small Footprint

- Streamlined packaging requires minimal floor space

System Operation Monitor (SOM)

- Measures and displays critical air and refrigerant temperatures, signals operating conditions which may affect performance, and enables panel adjustment of the automatic drain valve

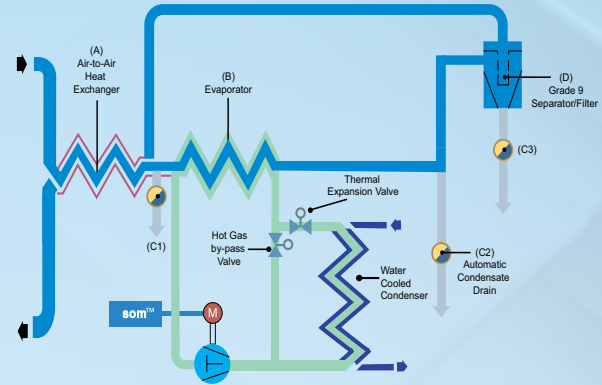


HV SERIES SPECIFICATIONS

HOW IT WORKS

Refrigerant is compressed and circulated through the refrigeration system. Evaporator temperature sensors control the operation of a dependable Hot Gas Bypass Valve (HGBV) and a Thermal Expansion Valve (TEV) to deliver stable dew points. In conjunction with capacity unloaders on the compressor, fully automatic and energy efficient operation is achieved. Potential for freeze-ups are eliminated.

Saturated incoming compressed air is quickly chilled in the air-to-air heat exchanger (A) by the cold compressed air as it exits the evaporator (B). Here, the cold, dry air is reheated to prevent pipeline sweating and reduce compressor energy before exiting the dryer. Next, automatic drain (C1) removes the condensate. In the evaporator, the air temperature is reduced to that of the cold refrigerant, where a second automatic drain (C2) removes moisture. A Grade 9 filter/separator lowers the velocity, mechanically separates the condensate from the air stream, and captures the particulate matter. A third automatic drain (C3) removes the condensate. The air-to-air heat exchanger re-heats the air and clean, dry compressed air exits the dryer.



HV Series Product Specifications

Model ³	Capacity ¹		Compressor 38°F pressure dew point	Power ²	Required Cooling Water Flow @ 85°F	Water Conn In/Out		Dimensions ⁴						Inlet/Outlet 150# Flange		Weight ⁵	
	scfm	nm ³ /h				hp	kW	gpm	FLG/MPT	H	W	L	in	mm	in	mm	in
HV4000	4000	6796.1	20	13.9	41.9	1.5	38.1	85	2159	94.1	2390.1	63.4	1610.4	8	203.2	5,200	2,359
HV5000	5000	8495.1	22	16.4	53.5	1.5	38.1	90.1	2288.5	107.3	2725.4	63.4	1610.4	8	203.2	6,000	2,722
HV6250	6250	10618.8	30	22.5	66.9	2	50.8	97.5	2476.5	141.8	3601.7	63.4	1610.4	8	203.2	7,000	3,175
HV8250	8250	14016.8	35	28.9	85.6	2.5	63.5	102	2590.8	143	3632.2	72.8	1849.1	10	254	8,100	3,674
HV10000	10000	16990.1	50	39.6	121.6	2.5	63.5	110	2794	148.8	3779.5	76.4	1940.6	10	254	9,300	4,218
HV12000	12000	20388.1	60	49.6	146.8	2.5	63.5	110.3	2801.6	166.4	4226.5	76.4	1940.6	12	304.8	9,500	4,309
HV15000	15000	25485.2	70	57.6	205.3	Consult Factory											
HV20000	20000	33980.2	80	54.6	204.5												

Maximum Operating Pressure 150 psig (10.3 bar). Maximum Inlet Temperature: 120°F (49°C). Higher pressure and temperature rated models available - consult factory.

¹ Rated Flow Capacity - Conditions for rating dryers are in accordance with CAGI (Compressed Air and Gas Institute) Standard ADF100 working conditions: inlet air at 100 psig (7 bar) and 100°F (38°C) saturated, ambient air at 100oF (38°C), cooling water at 85oF (29°C), operating on 60Hz power supply. At rated conditions, outlet pressure dew points is 38°F (3°C).

² At 35°F (2°C) evaporator and 100oF (38°C) ambient

³ R404a refrigerant standard

⁴ Dimensions and weights are for reference only. Request certified drawings for construction purposes.

⁵ Weight shown is approximate for 38°F dew point water-cooled models only

CORRECTION FACTORS

Example: What is the capacity of a 6,250 scfm model when the compressed air at the inlet to the dryer is at 150 psig and 100oF (38oC)? The max cooling water temperature is 85oF (29.4oC) and a 50oF (10oC) dew point is desired.

Answer: 6,250 scfm (rated flow from Specifications Table) x 1.13 (correction factor for inlet temperature and pressure from Table 1) x 1.3 (correction factor for dew point from Table 2) = 9181 scfm.

Correction Factors for Inlet Air Temperature and Pressure

Inlet Pressure psig	bar	Inlet Temperature				
		80°F 27°C	90°F 32°C	100°F 3°C	110°F 43°C	120°F 49°C
50	3.45	1.35	1.05	0.84	0.69	0.56
80	5.52	1.50	1.17	0.95	0.79	0.66
100	6.89	1.55	1.23	1.00	0.82	0.70
125	8.62	1.63	1.31	1.07	0.91	0.74
150	10.34	1.70	1.37	1.13	0.95	0.80

Correction Factors for Dew Point Temperatures

Dew Point Temperature	38°F	45°F	50°F
	3°C	7°C	10°C
Multiplier	1.0	1.2	1.3

To adjust dryer capacity for conditions other than rated. Use Correction Factors (multipliers) from Tables 1 and 2.

HES SERIES - CYCLING DRYERS

4,000 THRU 12,000 SCFM

PERFORMANCE & ENERGY SAVINGS

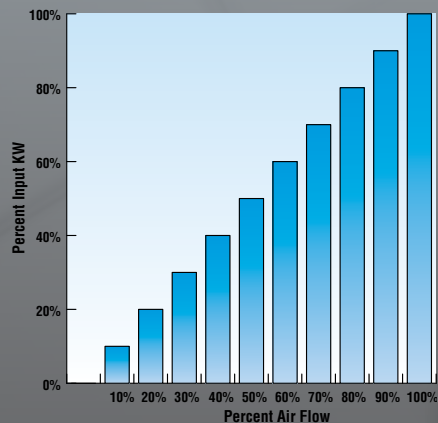
Hankison energy saving "cycling" type refrigerated dryers leverage technology that has served generations of compressed air users. Energy savings mirror plant air demands to maintain a 33°F - 39°F range of dew point integrity.

High-capacity, HES Series "Energy Saver" cycling dryers, proudly carry on the Hankison tradition of delivering reliability consistent dew point control and, clean, dry compressed air. Pay the absolute minimum for electricity to realize fast returns-on-investment

THERMAL FLUID STORAGE SYSTEM ADVANTAGE

High Capacity HES Series dryers use a Thermal Fluid Storage system to save energy. Cold energy is stored and released as needed to offer tremendous energy savings under part-load conditions. Operational simplicity is similar to your home refrigerator. The refrigeration compressor is turned "on" and "off" (cycled), to match the actual air demand in your facility. Savings on electricity are provided in linear proportion to air demands.

Thermal Fluid Storage Energy Savings



Thermal Fluid Storage

- Cold energy is stored and released as needed to save energy

Consistent Dew Points

- Non-fouling, smooth copper tubes, and shell type heat exchangers, deliver 33°F - 39°F dew points and low pressure drop.

Superior Moisture Removal

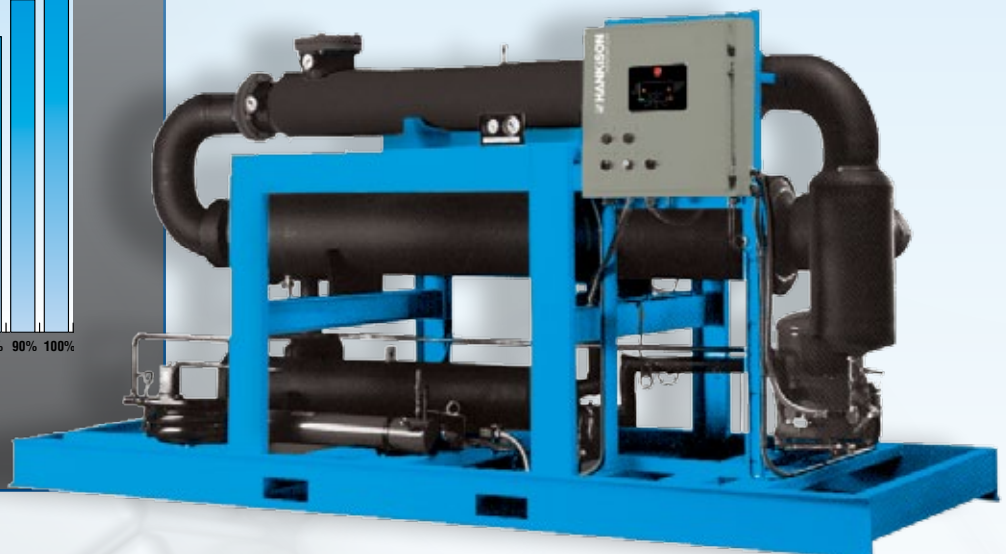
- Mechanical separator designed to remove 99+% of condensed moisture. Trip-L-Traps, the original air-operated demand drains are standard to maximize energy efficiency.

Automatic Energy Savings

- Compressor uses no energy once optimal thermal fluid storage system temperature is achieved

Energy Saving EMC Controller

- Text display delivers Percentage-of-Energy savings, Process Control Temperature, Preset or Adjustable Dew Point value, and more

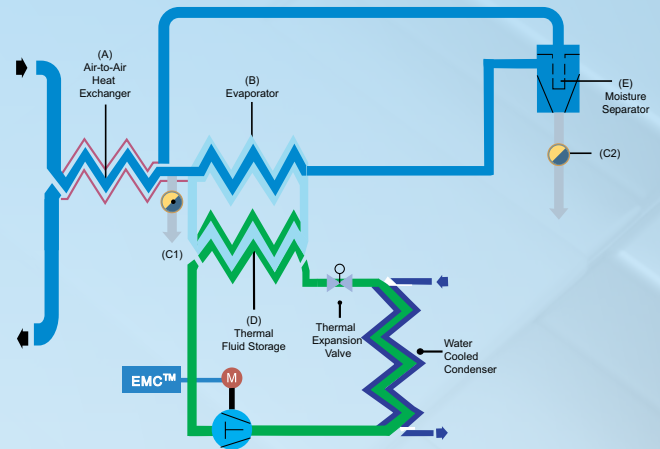


HES SERIES SPECIFICATIONS

HOW IT WORKS

Environmentally friendly NO CFC refrigerant is compressed and circulated through the refrigeration system. Cold liquid energy is transferred from the refrigerant to the thermal fluid in the Thermal Fluid Storage heat exchanger. Here, the large volume of thermal fluid is prepared and controlled. Temperature sensing thermocouple outputs are used to turn the refrigeration compressor on or off to maintain a 1°F hysteresis. A small pump circulates the cold thermal fluid in a loop.

Saturated incoming compressed air is quickly chilled in the air-to-air heat exchanger (A) by the cold compressed air as it exits the evaporator (B). Here, the cold, dry air is reheated to prevent pipeline sweating and reduce compressor energy before exiting the dryer. Next, automatic drain (C1) removes the condensate. In the evaporator, the air temperature is reduced to that of the cold thermal fluid delivered from thermal fluid storage (D). Finally, moisture separator (E) lowers the velocity and mechanically separates the condensate from the air stream. A second automatic drain (C2) removes the condensate. The air-to-air heat exchanger re-heats the air and clean, dry compressed air exits the dryer.



HES Series Product Specifications

Model ³	Capacity ¹		Compressor 38°F pressure dew point	Power ²	Required Cooling Water Flow @ 85°F	Water Conn In/Out		Dimensions ⁴						Inlet/Outlet 150# Flange		Weight ⁵	
	scfm	nm ³ /h				hp	kW	gpm	FLG/MPT		H	W	L	in	mm	lbs	kg
									in	mm							
HES4000	4000	6796.1	20	11.8	36.0	1.5	38.1	79	2006.6	60	1524	125	3175	8	203.2	10,100	4,591
HES5000	5000	8495.1	22	14.2	44.2	1.5	38.1	79	2006.6	60	1524	154	3911.6	8	203.2	12,400	5,637
HES6250	6250	10618.8	30	19.2	53.6	2	50.8	90	2286	66	1676.4	160	4064	8	203.2	15,150	6,886
HES8250	8250	14016.8	35	24.4	71.4	2.5	63.5	95	2413	68	1727.2	160	4064	10	254	16,000	7,273
HES10000	10000	16990.1	50	33.5	98.6	2.5	63.5	106	2692.4	77	1955.8	172	4368.8	10	254	23,000	10,455
HES12000	12000	20388.1	60	41.5	118.5	2.5	63.5	111	2819.4	81	2057.4	196	4978.4	12	304.8	28,800	13,091
HES15000	15000	25485.2	70	48.5													
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2 At 35oF (2oC) evaporator and 100oF (38oC) ambient

3 R22 refrigerant standard

4 Dimensions and weights are for reference only. Request certified drawings for construction purposes.

5 Weight shown is approximate for 38oF dew point water-cooled models only

CORRECTION FACTORS

Example: What is the capacity of a 6,250 scfm model when the compressed air at the inlet to the dryer is at 150 psig and 100oF (38oC)? The max cooling water temperature is 85oF (29.4oC) and a 50oF (10oC) dew point is desired.

Answer: 6,250 scfm (rated flow from Specifications Table) x 1.13 (correction factor for inlet temperature and pressure from Table 1) x 1.3 (correction factor for dew point from Table 2) - 9181 scfm.

Correction Factors for Inlet Air Temperature and Pressure

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Dew Point Temperature	38°F	45°F	50°F
	3°C	7°C	10°C
Multiplier	1.0	1.2	1.3

To adjust dryer capacity for conditions other than rated. Use Correction Factors (multipliers) from Tables 1 and 2.

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