



HANKISON

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HPR SERIES

REFRIGERATED

COMPRESSED

AIR DRYERS

SPX Air Treatment

HPR Series Refrigerated Air Dryers - Improving Productivity

Hankison HPR Series Refrigerated Air Dryers Improve Productivity

Since 1948, people around the globe have relied on Hankison to deliver the right solutions to efficiently meet the needs of today's applications for compressed air treatment. HPR Series non-cycling refrigerated compressed air dryers offer the right combination of technology and simplicity to keep your air system at a dry, 38°F (+3°C) pressure dew point, from 5 through 500 scfm.

Gain Efficiency

Air-powered products and processes operate best with clean and dry compressed air. Productivity improves. Rejects decrease. Maintenance personnel are able to be proactive and work from their schedule. The entire facility runs smoothly and contributes to financial stability and competitiveness.

Built-in Durability and Reliability

All HPR Series dryers are built for durability, in a space-saving design. Sturdy sheet steel is formed and protected by an epoxy-based powder coat finish. Reliable reciprocating refrigeration systems use environmentally friendly R-134a refrigerant. R-134a is known for its ability to maintain stable temperatures to protect the integrity of the 38°F (+3°C) pressure dew point. HPR Series can handle the pressure.

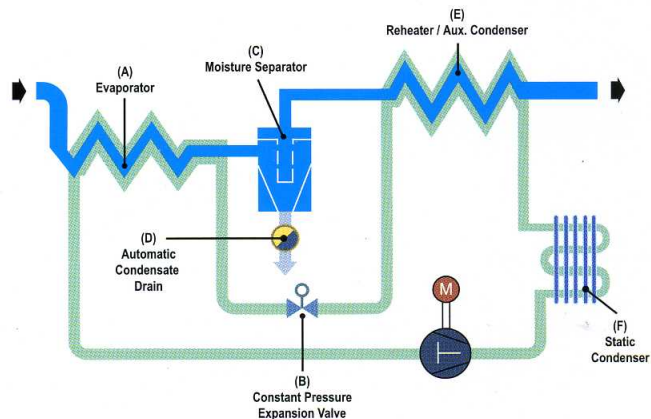
Dry Compressed Air - Pure & Simple

Research indicates that many customers want reliability and dry compressed air at an affordable price. No fancy bells and whistles - just dry air, pure and simple. The HPR Series non-cycling dryers were designed to meet these demands.

How it Works

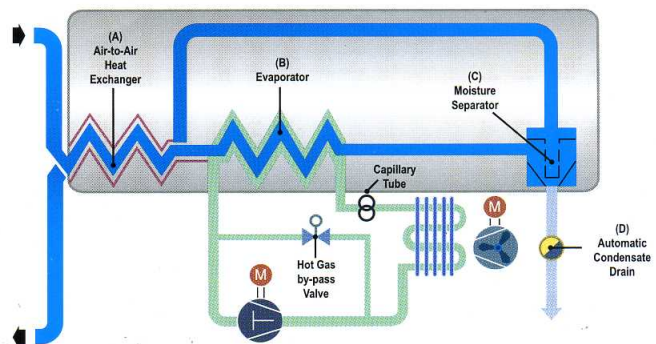
Models HPR5-10 through HPR50

Warm saturated air enters the Evaporator (A) where it is cooled by refrigerant being controlled by a Constant Pressure Expansion Valve (B). Water vapor condenses into a liquid for removal at the moisture separator (C) by an Automatic Drain (D). The cold, dry air is reheated as it passes through the Reheater (E). This prevents pipeline sweating. The Static Condenser (F) eliminates the need for a cooling fan and simplifies the system.



Models HPR75 through HPR500

Warm saturated air enters the air-to-air heat exchanger (A) where it is pre-cooled by the outgoing chilled air, and then passes through the air-to-refrigerant (evaporator) heat exchanger (B) where it is further cooled by the refrigeration system. Water vapor condenses into liquid droplets to be removed by the Moisture Separator (C) then, discharged from the dryer by an automatic drain (D). Chilled dry air returns through the air-to-air heat exchanger (A) where it is reheated before exiting the dryer.



HPR Series - Standard Features

- Easy to install package saves time. Simply connect the pipes and plug in the power cord (models HPR200-500 are hard-wired)
- Adapts to system needs without complicated controls. Fully automatic operation saves money.
- Every unit comes pre-assembled with quality components. Long service life.
- Steady 38°F pressure dew point. Ensures maximum moisture removal every day.
- On/off switch illuminates when compressor is on
- At-a-glance control panel dew point indication verifies performance (HPR25-HPR500)

HPR Series - Models through 50 scfm

- Static condenser recycles waste heat to eliminate cold, sweaty pipes
- Integral Moisture Separator
- Timer operated drain with isolation valve/strainer (float drain on HPR5-10)
- Models HPR5-10 and HPR15 designed to adapt to legacy Hankison HVAC installations
- On/off switch illuminates when compressor is on

HPR Series - Models 75 to 500 scfm

- Integral 304 stainless steel heat exchanger, mesh demister and, moisture separator for long life
- Timer operated drain includes isolation valve/strainer to protect valve from rust and scale
- Panel mounted drain timer controls (HPR200-500)
- LED style dew point indicator (HPR200-500)
- Panel filter captures ambient dirt and dust to keep condenser clean (HPR100-500)



HPR Series Product Features and Specifications

HPR Series Product Features

Models	Lighted Compressor on/off switch	Dew point indicator	115v/60/1 grounded, 8 foot, power cord	Timer operated drain valve, insulation valve, strainer	Panel mounted drain valve adjustments	Refrigeration System							High Pressure Cut-out Switch	CSA Approved
						R-134a, HFC Refrigerant	Reciprocating Compressors	Copper tube-on-tube heat exchanger	Constant Pressure Expansion Valve	304ss heat exchanger, demister and moisture separator	Capillary Tube & Hot Gas Bypass Valve	Fan Cycling		
5-10 & 15	S	—	S	S*	—	S	S	S	S	—	—	—	—	S
25-50	S	S	S	S	—	S	S	S	S	—	—	—	—	S
75-150	S	S	S	S	—	S	S	—	—	S	S	S	—	S
200-500	S	S	—	S	S	S	S	—	—	S	S	S	S	S

* Float Drain is standard of model HPR5-10

HPR Series Product Specifications

Model	Capacity ¹		Inlet/Outlet npt. male	Power Supply	Input Power ² kW	Refrigerant	Height		Width		Depth		Shipping Weight	
	scfm	Nm ³ /min					in	mm	in	mm	in	mm	lbs.	kg.
HPR5-10	10	28	3/8	115/1/60	0.20	R134a	15	381	13	320	13	320	64	29
HPR15	15	42	3/8		0.24		15	381	13	320	13	320	69	31
HPR25	25	71	3/4		0.41		22	569	15	368	15	368	88	40
HPR35	35	99	3/4		0.46		22	569	15	368	15	368	92	42
HPR50	50	142	3/4		0.57		22	569	20	500	20	500	101	46
HPR75	75	212	3/4		0.72		20	510	19	480	21	526	110	50
HPR100	100	283	1		0.74		21	525	13	330	30	761	123	56
HPR125	125	354	1		0.76		21	525	13	330	30	761	133	60
HPR150	150	425	1		1.11		21	525	13	330	30	761	153	69
HPR200	200	566	1-1/2		1.42		30	762	17	437	36	904	183	83
HPR250	250	708	1-1/2	1.98	30	762	17	437	36	904	211	96		
HPR300	300	850	1-1/2	460/3/60	2.05	30	759	20	518	38	953	218	99	
HPR400	400	1133	2		2.50	30	759	21	541	38	953	232	105	
HPR500	500	1416	2		3.06	32	800	25	640	41	1052	262	119	

¹ Rated Flow Capacity - Conditions for rating dryers are in accordance with CAGI (Compressed Air and Gas Institute) Standard ADF 100: Refrigerated Compressed Air Dryers - Methods for Testing and Rating. Conditions for rating above dryers are: compressed air at dryer inlet: 100 psig (7kgf/cm²) and 100°F (38°C) saturated; ambient temperature: 100°F (38°C); operating on 60 Hz power supply.

² At rated conditions, pressure drop is less than 5 psi.
³ At 35°F (2°C) evaporator and 100°F (38°C) ambient

Capacity Correction Factors

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

Example: What is the capacity of a 200 scfm model when the compressed air at the inlet to the dryer is 150 psig and 100°F (38°C), and the ambient temperature is 90°F (32°C)?

Answer: 200 scfm (rated flow from Specifications Table) x 1.13 (correction factor for inlet temperature and pressure from Table 1) x 1.06 (correction factor for ambient temperature from Table 2) = 240 scfm

Table 1: Dryer Sizing Chart

Inlet Air Temp.	Inlet Air Pressure psig (bar) Correction Factor						
	80	100	125	150	175	200	250
°F (°C)	(5.5)	(6.9)	(8.6)	(10.3)	(12.1)	(13.8)	(17.2)
90 (32)	1.17	1.23	1.31	1.37	1.42	1.47	1.49
100 (38)	0.95	1.00	1.07	1.13	1.18	1.22	1.24
110 (43)	0.79	0.82	0.91	0.95	0.99	1.03	1.05
120 (49)	0.66	0.70	0.74	0.80	0.84	0.89	0.91

Table 2: Correction Factor

Ambient Air Temperature	Correction Factor
°F (°C)	
80 (27)	1.12
90 (32)	1.06
100 (38)	1.00
110 (43)	0.94

Operating Conditions

Models	Max. Inlet Air Press.	Min. Inlet Air Press.	Max. Inlet Air Temp.	Min. Inlet Air Temp.	Max. Ambient Temp.	Min. Ambient Temp.
	psig	psig	°F	°F	°F	°F
5-10 - 50	250	30	120°F	40°F	110°F	45°F
75-500	232	10	120°F	40°F	110°F	45°F

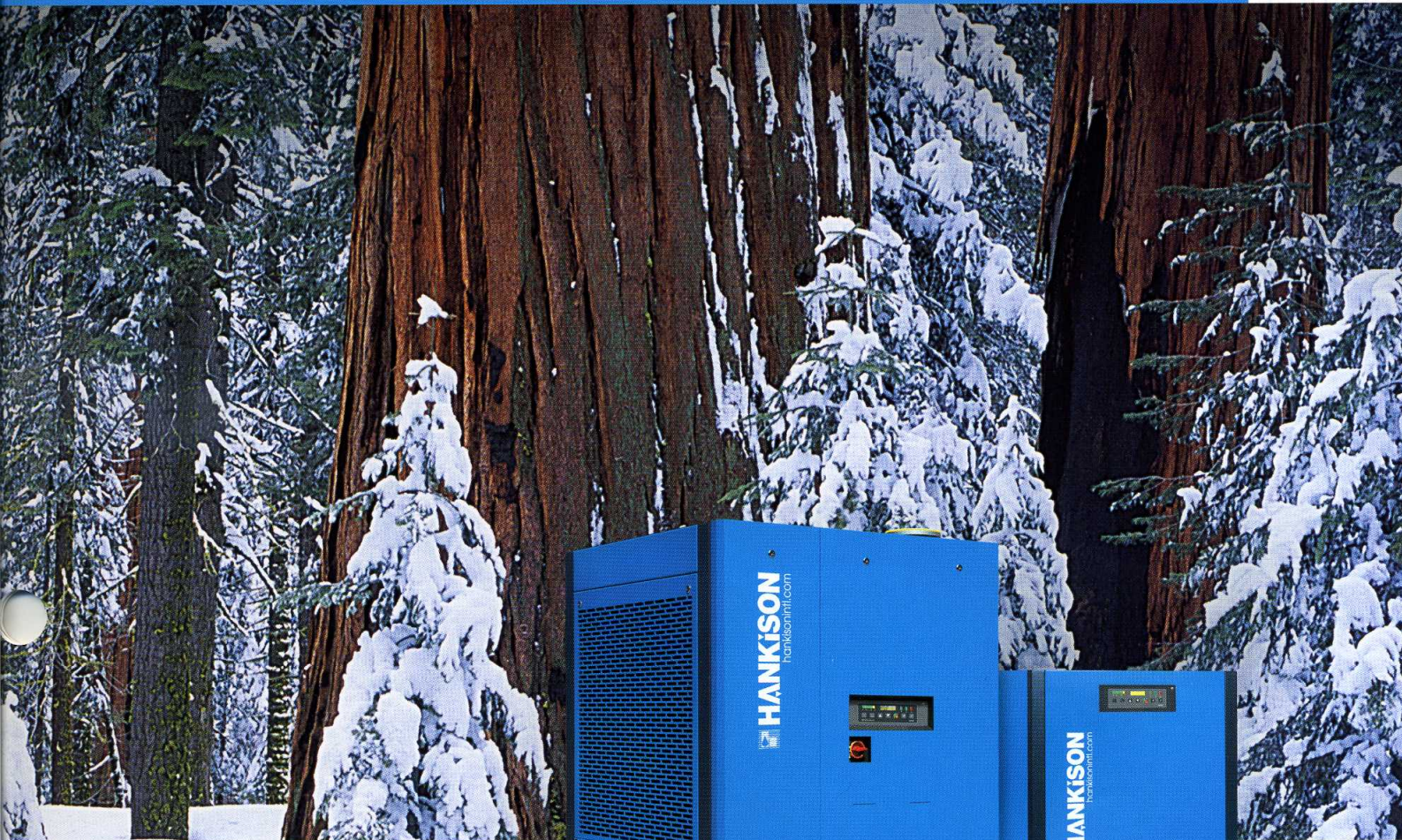


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Improvements and research are continuous at SPX Hankison
 Specifications may change without notice.





ColdWave™ Refrigerated Compressed Air Dryers
HPRplus SERIES AND HES SERIES

COLDWAVE™ REFRIGERATED COMPRESSED AIR DRYERS HPRplus SERIES & HES SERIES

Hankison ColdWave™ refrigerated dryers feature our most advanced heat exchanger technology. Being the global leader in compressed air treatment is what continues to set the Hankison brand apart. Since L.E. Hankison patented the Condensifilter™, (forerunner to the refrigerated air dryer) in 1943, Hankison engineers have set the industry standard for refrigerated dryer technology. ColdWave™ heralds the next generation of Hankison high performance refrigerated dryers designed for quality and reliability.



COLDWAVE DRYERS REDUCE OPERATING COSTS Manufacturing Energy Efficient Solutions.

For more than half-a-century, Hankison quality, performance and reliability set the standard for global compressed air treatment products. The tradition continues. Industry leading ColdWave™ Technology infuses the latest generation of refrigerated dryers with rugged durability, energy-efficiency and long service life. It's no wonder that leaders of industry specify Hankison products to protect their critical products and processes from contaminants.

Our mission is to reduce the operating expenditures of compressed air users by removing impurities from their air systems. Utilizing environmentally friendly refrigerants, Hankison ColdWave™ dryers deliver stable ISO8573.1 Quality Class 4 and Class 5 pressure dew points and, remove solid particulates, and oil from compressed air systems across all operating flows.

COMPRESSED AIR SYSTEM IMPURITIES

Impurities	HPRplus & HES Series Air Treatment Stations	Reduce General Plant Operations Costs
Moisture (Water)	ISO 8573.1 Quality Class 4 and Class 5 pressure dew points	<ul style="list-style-type: none"> • Reduce wear and maintenance costs of pneumatic devices • Reduce product spoilage
Particles (Rust & Dust)	HF Series Grade 9 Separator/Filter 3 micron particulate	<ul style="list-style-type: none"> • Reduce work stoppages • Reduce rust, scale and leaks in air lines
Oil (Liquid)	HF Series Grade 5 Oil Removal Filter 0.008 ppm (0.01 mg/m ³)	<ul style="list-style-type: none"> • Reduce malfunctions of control and air logic instruments



ISO 8573.1 CLASS 4 AND CLASS 5 DEW POINT SPECIFICATIONS SAVE ENERGY

All compressed air systems must be evaluated individually to develop a specification for compressed air treatment. The majority of compressed air users benefit from Quality Class 4 and Class 5 moisture control due to the low overall cost of operation and low initial purchase price. This technology is ideal for pressure dew point requirements above freezing. Systems with more stringent dew point requirements benefit from desiccant or membrane technologies that offer dew points to ISO8573.1 Quality Class 1.

DEW POINT CONTROL IMPROVES PRODUCTIVITY

At 1000 scfm, the difference between a 38°F (3°C) and 60°F (16°C) pressure dew point can result in 75 gallons of liquid water going downstream....every week. That is why Hankison strongly recommends high-performance products for maximum contamination removal at the lowest overall operating cost.

DEVELOP AN AIR DEMAND PROFILE TO SAVE ENERGY

Compressed air demand in most plants fluctuates significantly. Hankison offers compressed air users who specify ISO 8573.1 Quality Class 4 and Class 5 pressure dew points, two refrigerated drying technologies to choose from. High performance HPRplus Series and HES Series dryers include integral 3 micron Grade 9 filtration to deliver high-quality air. Add the integral 0.008 ppm (0.01 mg/m3) w/w Grade 5 Cold Coalescing filtration option to gain premium air quality, simplify installation and benefit from true, Air Treatment Stations. Both optimize energy saving opportunities for various compressed air demand profiles. The chart below will help you determine which solution is best for your application

MATCH AIR DEMAND PROFILES WITH THE OPTIMUM COLDWAVE SOLUTION TO SAVE ENERGY

ColdWave HES Series, 800-3,000 scfm

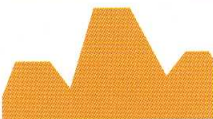

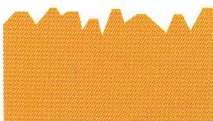
Energy Saving Air Treatment

- Optimize energy savings for variable air demand profiles that range from 0% to 100% capacity.
- Digital control PLC allows user to track cumulative energy savings.
- Digital Evaporator coupled with an innovative Digital Scroll refrigeration system.

ColdWave HPRplus Series, 100-3,000 scfm

Continuous Demand Air Treatment

- Rugged reliability and value for steady demand profiles with 75% to 100% total average air flows.
- Energy Management Monitor (emm™) PLC comes with "schedule mode" which turns dryer on and off to optimize energy savings in one or two shift operations. (Models HPRp200 and larger)

Air Demand Profile	Hankison Solution
 <p data-bbox="1034 1205 1187 1249">Fluctuating Demands (1 to 3 shifts)</p>	<p data-bbox="1283 1214 1369 1236">HES Series</p>
 <p data-bbox="1034 1335 1187 1379">Reduced Demands (1 to 3 shifts)</p>	<p data-bbox="1267 1312 1385 1402">HES Series or HPRplus Series in schedule mode</p>
 <p data-bbox="1050 1464 1171 1509">Peak Demands (1 to 3 shifts)</p>	<p data-bbox="1267 1442 1385 1532">HES Series or HPRplus Series in schedule mode</p>

THREE HANKISON TECHNOLOGY PLATFORMS FOR PURE, CLEAN, DRY AIR

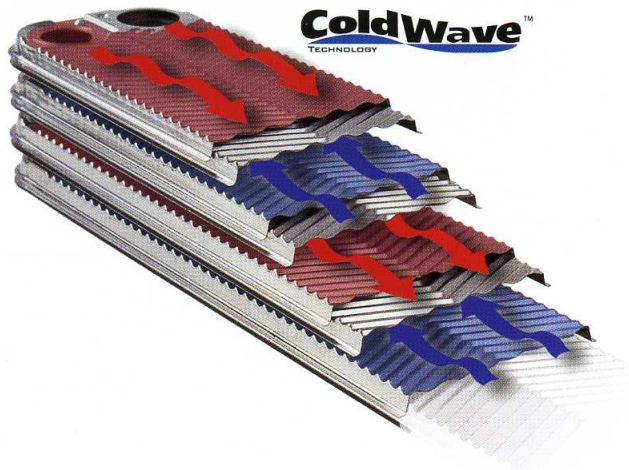
1. HANKISON COLDWAVE™ HEAT EXCHANGER TECHNOLOGY

The ability to select and tailor the most reliable and efficient heat transfer systems for the application of compressed air has been a Hankison tradition for decades. Hankison only uses environmentally-friendly HFC R-134a and R-404a refrigerants that comply with the Montreal Protocol of 1989, for all HPR*plus* and HES Series ColdWave™ dryers. Each features Hankison's most advanced heat exchanger designs.

Featuring non-fouling, large-bore, smooth heat exchange surfaces, ColdWave™ heat exchangers shrug off airborne contaminants. Dirt, rust and scale have no place to get trapped and are swept through these heat exchangers by the compressed air. Unlike many competitive designs, these do not require pre-filtration thereby, reducing capital, installation and operating costs.

ColdWave™ Technology

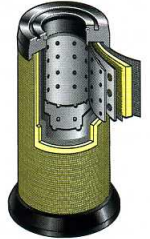
Advanced metal forming and bonding techniques produce industry leading ColdWave™ heat exchangers. Crafted from premium grade 316SS, layers of sinusoidal flow paths form large, smooth channel flow cavities that provide low-pressure drop, unparalleled performance and superior reliability. These are the most advanced high-performance heat exchangers in the industry, and are standard equipment on all HPR*plus* Series and HES Series ColdWave™ dryers.



2. FILTRATION TECHNOLOGY

The Integrated HF Series Grade 9 Coalescing Separator/Filter

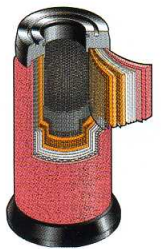
Once compressed air is cooled thermally, the condensed moisture must be effectively removed. A poorly designed separator can allow moisture to re-entrain itself into the compressed air stream. It is particularly challenging to consistently remove moisture at lower velocities (lower loads). The HF Series Grade 9 Separator/Filter effectively solves these challenges by utilizing two stages of filtration to remove bulk liquid and solid particulates to 3 micron in size.



- **First stage** – two stainless steel orifice tubes provide 10 micron mechanical separation
- **Second stage** – in-depth fiber media captures solid and liquid particles to 3 micron in size

Make it an Air Treatment Station Integrated HF Series Grade 5 Coalescing Oil Removal Filter - Optional

Space and time savings can be achieved by integrating an oil removal coalescing filter into all HPR*plus* and HES Series ColdWave™ refrigerated dryers. Instead of having a separate filter vessel and piping installed outside of the dryer... simply integrate it into the refrigerated dryer. This concept is what we call an "Air Treatment Station." The HF Series Grade 5 high efficiency oil removal filter effectively uses two stages of filtration to remove oil aerosols to 0.008 ppm (0.01 mg/m³) and solid particulates to 0.01 micron in size.



- **First stage** – multiple layers of fiber media and media screen remove larger particles, pre-filtering the air for the second stage
- **Second stage** – multiple layers of bonded, blended fiber media for fine coalescence captures fine oil aerosols and solid particles



3. DESIGN TECHNOLOGY

ColdWave™ dryers feature user friendly designs to empower you with a better solution. It begins with compressed air Inlet/Outlet connections located on one side (models through 750 scfm) or out the top (models 800 scfm and larger) to reduce piping complexity and to allow the back of the dryer to be positioned close to a wall so you have a more efficient use of floor space. Improved cabinet construction channels cooling air flow and reduces fan noise for quieter operation and better performance. Lift-out cabinet panels are designed for easy removal to provide easy and complete access to the interior for general maintenance.

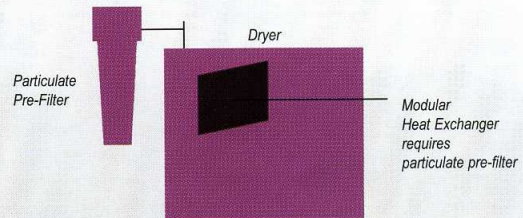
- Compact Footprint: back-side of dryer can be placed against the wall
- Less Complex: Optional Grade 5 – premium air quality without piping complexity
- Easy Access: Lift-out panels provide easy access to the interior
- Quiet: Flow path for better ventilation and noise reduction
- Durable: proven reciprocating or scroll refrigeration compressors
- Environmentally Friendly Refrigerants: Complying with the Montreal Protocol of 1989, HFC refrigerants R-134a and R-404a, provide long-term availability at a reasonable cost
- Informative Controls: simple user interface, indicator lights and LCD text readouts (200 scfm and larger) keep you informed
- Energy Efficient Drains: electric demand operated drain valves operate automatically without wasting any valuable compressed air
- Clean air: standard Grade 9 moisture separator/filter provides two-stage contaminant removal effective to 3 micron
- Cleaner air: add Grade 5 cold coalescing filtration to remove oil aerosols to 0.008 ppm w/w and 0.01 micron

Better Quality, Lower Costs

Hankison designs integral Grade 9 filtration into the air-side circuit of each ColdWave™ dryer. This minimizes costly system pressure drop, and delivers improved air quality – all without adding complexity or ancillary installation costs to your air system.

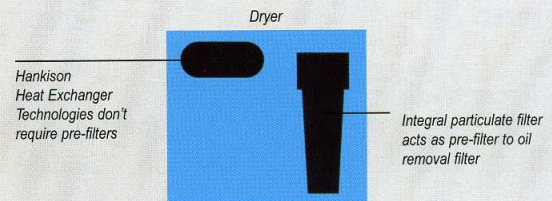
“Pre-Filter Required” Method

4 psi Δp + 5 psi Δp = 9 psi pressure drop



Energy Saving Hankison Method

5 psi Δp = 5 psi pressure drop



Hankison Heat Exchangers Eliminate the Pre-Filter: Calculate First-Year Savings

Air Flow		Pre-Filter Capital Cost	Pre-Filter Pressure Drop Cost*	Total First Year Cost of Pre-Filter
scfm	m ³ /h			
100	172	\$ 429	\$ 292	\$ 720
250	429	762	729	1,490
500	859	1,310	1,456	2,765
1000	1717	1,905	2,912	4,817
2000	3434	3,214	5,825	9,039
3000	5151	4,405	8,737	13,142

* Assuming a 4 psi (0.27 bar) pressure drop, 8,760 hours per year operation and \$ 0.10 / kWh energy cost.

COLDWAVE™ ENERGY SAVING REFRIGERATED DRYERS **HES SERIES, 800 TO 3,000 SCFM**

The Hankison Energy Saving (HES) Series is one of the world's most commonly installed refrigerated air dryers for plants with varying levels of air demands. The Hankison technology platforms of precision design, engineered heat exchangers, quality filtration, and energy efficient digital evaporator refrigeration technology (see pgs 4-5), which are UL/CSA and wired to CE standards, represent the best value solution available for inconsistent heavy-duty air demand profiles.



DIGITAL EVAPORATOR TECHNOLOGY

The HES Series features groundbreaking technologies for the refrigerated dryer industry. The Digital Evaporator continues the Hankison tradition of low, stable dew point control – while providing tremendous energy savings for a rapid return-on-investment. Unlike most anything in the industry, the HES Series, with proprietary Digital Evaporator Technology offers energy saving advantages over traditional non-cycling, cycling, and variable speed designs.

RAPID RETURN ON INVESTMENT (ROI)

The HES Series is designed to provide a rapid return on investment by:

- Reducing the dryer's energy consumption down to 9% (91% savings) at 0% load
- Precise matching of average air flow (heat load) with the required input kW power....No More....No Less
- Qualifying for energy rebates offered by utility companies
- Maintaining stable Class 4 and Class 5 dew points with no dew point spikes which send water downstream and cause high maintenance and downtime costs

HES SERIES ENERGY SAVINGS PER YEAR

Average Air Flow	Energy Consump.	HES Series Energy Savings per Year by Model							
		800	1000	1250	1500	1750	2000	2500	3000
100%	100%	-	-	-	-	-	-	-	-
75%	78%	1,275	1,604	1,210	261	1,073	804	1,065	1,408
50%	54%	1,907	2,280	2,189	1,690	2,729	2,704	3,330	4,373
25%	33%	2,426	2,835	3,002	2,893	4,112	4,298	5,226	6,855
0%	9%	3,058	3,512	3,981	4,323	5,768	6,200	7,490	9,820

Compared to non-cycling dryers: Assuming 100°F (37°C) inlet and ambient temperature, 100 psig (6.9 bar) operating pressure, 8,760 working hours per year, \$ 0.10 / kWh energy cost.

THE HES REFRIGERATION SYSTEM

Digital Evaporator Technology controls the actions of the three core components in the refrigeration system (Digital Evaporator, Digital Control board, Digital Scroll refrigeration compressor) to provide true load-matching energy savings while maintaining low, stable dew point control.



DIGITAL EVAPORATOR

Technology embedded in the Digital Evaporator recognizes varying heat loads between 0-100%, which result from the ever-changing Air Demand Profiles of compressed air users, and communicates dew point status to the Digital Control Board.

The air-to-air and air-to-refrigerant (Digital Evaporator) heat exchangers are uniquely sized and custom made. Each utilizes Hankison's advanced ColdWave™ heat exchanger technology (see page 4), crafted from premium grade 316 stainless steel. Pre-filtration is not required.

DIGITAL CONTROL

The control board receives information from the Digital Evaporator and sends signals to the Digital Scroll refrigeration compressor. This determines the amount of cooling energy sent back to the Digital Evaporator. With a 60% air demand, for example, the control board tells the compressor to run loaded 60% of the time.....No More.....No Less.

The HES Series emm™ controller automatically scrolls through five LCD screens that display:

- Date/Time/Operating Status
- Hours-to-Service
- Total Compressor Operating Hours
- Instantaneous Load¹
- Cumulative Energy Savings²

In addition, this control board has all the same standard features as found on the emm™ Energy Management Monitor of the HPRplus Series (see page 8), including the "schedule mode" for automatic start-stop operation.

DIGITAL SCROLL



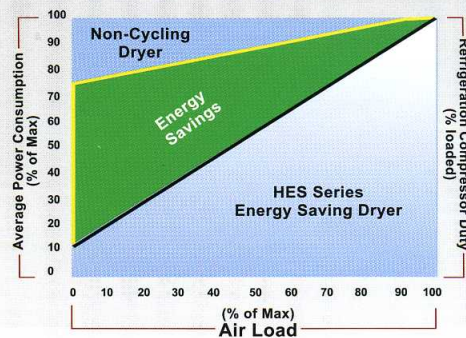
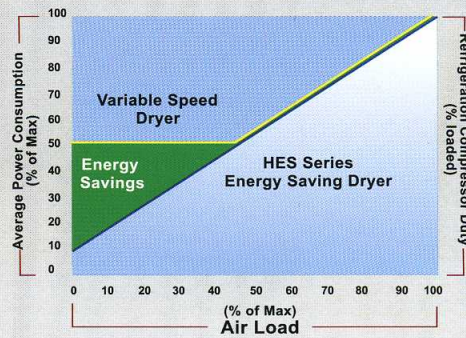
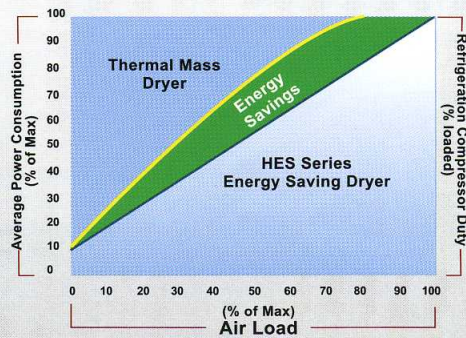
These innovative refrigeration scroll compressors are capable of running loaded or unloaded. Digital Scroll compressors unload by allowing the fixed upper scroll to move axially from the orbiting lower scroll.

¹ "Instantaneous Load" is displayed in "real time" as a percentage of design capacity. In the example above, it would display 60% load.

² "Cumulative Energy Savings" accept a cost/kWh value and projects the savings while using US Dollars or Euros for display symbols.

True Load-Matching Energy Savings

Compare the 4 major technologies that compete in the refrigerated dryer segment. HES Series (Energy Saving Dryers) are clearly the leader in energy savings, in all percentages of air demand. HES Series refrigerated dryers add more profit to your bottom line.



COLDWAVE™ NON-CYCLING REFRIGERATED DRYERS **HPRplus SERIES, 100 TO 3,000 SCFM**

The Hankison Performance and Reliability *plus* Filtration (HPR*plus*) Series is one of the world's most commonly installed refrigerated air dryers. The Hankison technology platforms of precision design, engineered heat exchangers, quality filtration, and rugged refrigeration (see pgs 4-5), which are UL/CSA and wired to CE standards, represent the best value solution available for heavy-duty air demand profiles.

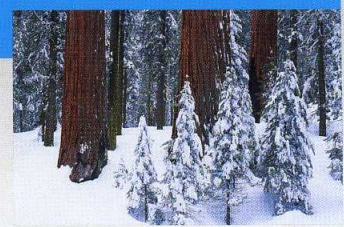


HPRplus Series **Operation and Filtration** **Models HPRP100 to 150**

- On/off switch, Power-on light, and dew point temperature indicator-alerts operator to overload condition or refrigeration system fault
- HF Series Grade 9 Filter/Separator
- Optional HF Series Grade 5 coalescing oil removal filter

Models HPRP200 to 3000 with the emm™ **Energy Management Monitor**

- This advanced 24 volt electronic control package has many user-friendly interfaces which can save energy, automate service intervals, communicate in ten languages, and add functionality
- Energy-saving "schedule mode" allows compressed air users (see page 2) with one or two-shift operations to schedule the dryer to turn on and off in accordance with their work schedule
- Automatic service intervals can be set for predictive maintenance schedules: to ensure that the condenser on air-cooled units is maintained dust-free and to advise the replacement of the standard HF Series Grade 9 Separator/Filter element every 12 months, and the optional HF Series Grade 5 cold coalescing, oil removal filter
- Operator interface with read-outs comes standard in ten languages (English, German, French, Spanish, Italian, Polish, Danish, Dutch, Norwegian and Finnish). Read-outs include current time, operating status such as manual or schedule running modes, hours to service, and total operating hours.
- Functionality features include a drain push-to-test button, power-on and compressor-on lights, an operator alert light which indicates that service is required or that there is a refrigeration system or drain fault, dew point temperature indicator
- Remote monitoring of the emm™, from your computer, possible through the RS-232 Communication Port
- Standard NO and NC voltage-free alarm contacts and RS-232 Communication Port
- Fault condition diagnostics with user-friendly text display

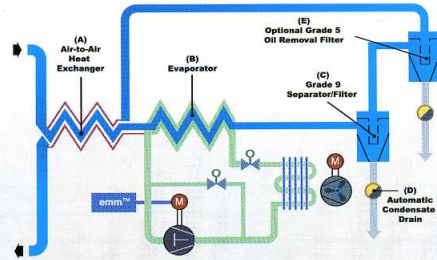


COLDWAVE™ REFRIGERATED DRYERS, HOW THEY WORK

AIR DRYING CIRCUIT - (Figure 1)

Compressed air, saturated with water vapor, enters the air-to-air heat exchanger (A), is pre-cooled by the outgoing chilled air, and then directed to the air-to-refrigerant (evaporator) heat exchanger (B) where it is further cooled by the refrigeration system. As the air is cooled, water vapor condenses into liquid droplets are removed by the Separator/Filter (C) and discharged from the dryer by an automatic drain (D). Air then goes through an Oil Removal Filter (optional) (E) and dry, oil-free, chilled air returns through the air-to-air heat exchanger where it is reheated before exiting the dryer.

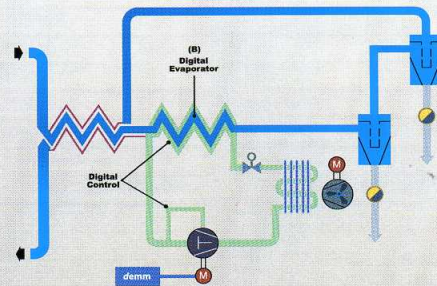
Figure 1 - Air Drying Circuit



DIGITAL EVAPORATOR REFRIGERATION CONTROL HES Series - (Figure 2)

Digital Evaporator Technology monitors the incoming heat load to determine how much cooling energy is required to maintain stable dew point control. The digital emm™ control interprets the raw data from the Digital Evaporator and translates it into the amount of cooling energy that is needed. The digital emm™ control opens or closes the scrollenoid valve in precise time blocks that load or unload the Digital Scroll refrigeration compressor to match the varying heat loads. Dew point stability is achieved using the least amount of electrical energy that is necessary. No more...no less.

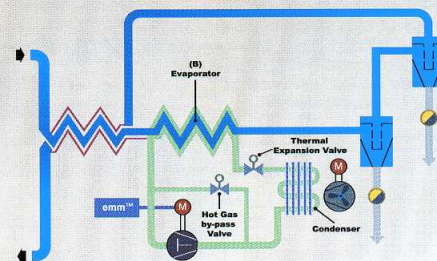
Figure 2 - Digital Evaporator Refrigeration Control



HOT GAS BYPASS VALVE REFRIGERATION CONTROL HPRp Series - (Figure 3)

Designed for rugged durability, the refrigeration compressors in HPRp dryers are the workhorses of the industry. Hot high-pressure refrigerant gas exits the compressor and changes state into a high-pressure liquid as it is cooled in the condenser. A thermal expansion valve controls the flow of cold low-pressure liquid refrigerant into the evaporator to ensure it is kept flooded for optimal heat transfer and dew point control. Warm low-pressure refrigerant gas exits the evaporator and completes the circuit as it returns to the suction-side of the refrigeration compressor. When operating at less than full design heat load conditions, the hot gas bypass valve introduces high-pressure gas into the cool low-pressure refrigerant to ensure low-pressure gas returns to the suction-side of the refrigeration compressor.

Figure 3 - Hot Gas Bypass Valve Refrigeration Control



HPRplus SERIES AND HES SERIES PRODUCT FEATURES AND SPECIFICATIONS

HPRplus SERIES PRODUCT SPECIFICATIONS

Model	Rated Flow ¹ scfm	Voltages V/ph/Hz	Power ² kW	Connection ³	Dimensions			Weight lbs.	Total Air Treatment Station Pressure Drop with Integrated Filtration			
					H	W	D		Std. 3 Micron HF Series Grade 9 Separator/Filter		Opt. 0.008 ppm Oil HF Series Grade 5 Integrated Filtration	
									psig	bar	psig	bar
HPRP100	100	100/1/50	0.93	1" NPT	38	29	20	251	3.6	0.25	5.0	0.34
HPRP125	125	115/1/60	1.28	1" NPT	38	29	20	273	4.0	0.28	5.4	0.37
HPRP150	150	208-230/1/60 220-240/1/50	1.30	1" NPT	38	29	20	279	4.7	0.32	6.3	0.43
HPRP200	200		1.26	1-1/2" NPT	39	34	32	425	3.7	0.26	5.1	0.35
HPRP250	250		1.96	1-1/2" NPT	39	34	32	463	4.6	0.32	6.6	0.46
HPRP300	300		2.00	1-1/2" NPT	46	35	32	527	5.0	0.34	6.6	0.46
HPRP400	400		2.03	2" NPT	46	35	32	571	3.7	0.26	5.1	0.35
HPRP500	500		2.68	2-1/2" NPT	58	32	42	684	4.4	0.30	6.0	0.41
HPRP600	600		2.91	2-1/2" NPT	58	32	42	691	4.6	0.32	6.6	0.46
HPRP750	750	208-230/3/60 460/3/60	4.12	2-1/2" NPT	58	32	42	734	5.3	0.37	8.1	0.56
HPRP1000	1000	380-420/3/50 575/3/60	5.83	3" ANSI Flg.	85	49	41	1146	3.4	0.23	6.9	0.48
HPRP1250	1250		6.73	4" ANSI Flg.	85	49	51	1521	3.6	0.25	8.0	0.55
HPRP1500	1500		7.52	4" ANSI Flg.	85	49	51	1547	4.7	0.32	10.0	0.69
HPRP1750	1750		9.89	6" ANSI Flg.	85	55	60	1940	3.4	0.23	6.5	0.45
HPRP2000	2000		10.70	6" ANSI Flg.	85	55	60	1986	4.4	0.30	7.9	0.54
HPRP2500	2500		12.91	6" ANSI Flg.	85	55	60	2315	3.5	0.24	7.9	0.54
HPRP3000	3000		16.92	6" ANSI Flg.	85	55	60	2646	5.0	0.34	10.3	0.71

The emm™ Energy Management Monitor control package is standard on models HPRP200-3000

Refrigerants utilized on models HPRP100-750 is R-134a, models HPRP1000-3000 utilize R-404a

Models HPRP100-150: standard internal HF Snap Trap drain [dryer MOP 250 psig (17.6 bar), optional electric timed drain (dryer MOP 200 psig (14 bar)

Models HPRP200-3000: utilize electric demand drains as standard [dryer MOP 232 psig (16 bar)]. Additional electric demand drains included when optional integrated HF Series Grade 5 oil removal filter is selected. Maximum inlet temperature: 120°F (49°C)

All models are certified to UL1995/CSA 22.2 No. 236-95.

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 100°F (38°C), operating on 60 Hz power supply.)

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

³ BSP connections and DIN flanges available



HES SERIES PRODUCT SPECIFICATIONS

Model	Rated Flow ¹ scfm	Voltages V/ph/Hz	Power ² kW	Connection ³	Dimensions			Weight lbs.	Total Air Treatment Station Pressure Drop with Integrated Filtration			
					H	W inches	D		Std. 3 Micron HF Series Grade 9 Separator/Filter ⁴		Opt. 0.008 ppm Oil HF Series Grade 5 Integrated Filtration	
									psig	bar	psig	bar
HES800	800	208-230/3/60 460/3/60 380-420/3/50 575/3/60	4.28	3" ANSI Flg.	85	49	41	1124	2.4	0.17	5.2	0.30
HES1000	1000		4.68	3" ANSI Flg.	85	49	41	1146	3.4	0.23	6.9	0.48
HES1250	1250		6.34	4" ANSI Flg.	85	49	51	1521	3.6	0.25	8.0	0.55
HES1500	1500		8.68	4" ANSI Flg.	85	49	51	1563	4.7	0.32	10.0	0.69
HES1750	1750		10.35	6" ANSI Flg.	85	55	60	1940	3.4	0.23	6.5	0.45
HES2000	2000		11.72	6" ANSI Flg.	85	55	60	1997	4.4	0.30	7.9	0.54
HES2500	2500		14.00	6" ANSI Flg.	85	55	60	2315	3.5	0.24	7.9	0.54
HES3000	3000		18.33	6" ANSI Flg.	85	55	60	2646	5.0	0.34	10.3	0.71

The Digital Control package is standard.

All models utilize R-404a refrigerant with Digital Scroll compressors.

Models HES800-3000: utilize electric demand drains as standard [dryer MOP 232 psig (16 bar)]. Additional electric demand drains included when optional integrated HF Series Grade 5 oil removal filter is selected.

Maximum Operating Pressure 232 psig (16 bar), Maximum inlet temperature: 120°F (49°C).

All models are certified UL1995/CSA 22.2 No. 236-95.

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 100°F (38°C), operating on 60 Hz power supply.

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

³ BSP connections and DIN flanges available.

CAPACITY CORRECTION FACTORS

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

Example: What is the capacity of a 1,000 scfm model when the compressed air at the inlet to the dryer is 150 psig and 100°F (38°C), and the ambient temperature is 90°F (32°C)?

Answer: 2,000 scfm (rated flow from Specifications Table) x 1.13 (correction factor for inlet temperature and pressure from Table 1) x 1.06 (correction factor for ambient temperature from Table 2) = 2,396 scfm

Table 1 - Correction Factors (multipliers) for Inlet Air Temperature and Pressure

Inlet Pressure psig	Inlet Temperature			
	90°F 32°C	100°F 38°C	110°F 43°F	120°F 49°F
50	1.05	0.84	0.69	0.56
80	1.17	0.95	0.79	0.66
100	1.23	1.00	0.82	0.70
125	1.31	1.07	0.91	0.74
150	1.37	1.13	0.95	0.80
175	1.42	1.18	0.99	0.84
200	1.47	1.22	1.03	0.89
250	1.49	1.24	1.05	0.91

Table 2 - Correction Factors for Ambient Temperature*

Ambient Temperature	80°F 27°C	90°F 32°C	100°F 38°C	110°F 49°C
Multiplier	1.12	1.06	1.00	0.94

* All models only. For water-cooled use a 1.15 multiplier if cooling water is less than 95°F (35°C).



PERFORMANCE INTEGRITY CERTIFICATION

The Compressed Air & Gas Institute (CAGI) of North America has developed a voluntary certification program to ensure you get the performance you pay for. Participating manufacturers reference these standards to generate test results and then display the performance data on their web site from which one can make a fair comparison and an informed buying decision.

Hankison is proud to support the CAGI Refrigerated Dryer Performance Verification Program. Visit www.hankisonintl.com for the most current performance data on high-performance Hankison refrigerated dryers.

ISO 8573.1 QUALITY CLASSES

Class	Solid Particles			Humidity and Liquid Water		Oil	
	Particle Size, d (micron)			Pressure Dew Point		Total 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			As Specified		As Specified	
1	100	1	0	≤ -70	≤ -94	≤ 0.01	≤ 0.008
2	100,000	1,000	10	≤ -40	≤ -40	≤ 0.1	≤ 0.08
3	Not Specified	10,000	500	≤ -20	≤ -4	≤ 1	≤ 0.8
4	Not Specified	Not Specified	1,000	≤ +3	≤ +38	≤ 5	≤ 4
5	Not Specified	Not Specified	20,000	≤ +7	≤ +45		
6				≤ +10	≤ +50		
				Liquid Water Content, C _w g/m ³			
7				C _w ≤ 0.5			
8				0.5 < C _w ≤ 5			
9				5 < C _w ≤ 10			

Per ISO8573-1: 2001(E)

SPX HANKISON

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