

## Compressed Air Treatment Reduces Operating Costs

Hankison International has designed and manufactured energy-efficient solutions for compressed air treatment since 1948. Our mission is to reduce the operating expenditures of compressed air users by removing impurities from their air systems. Utilizing environmentally friendly refrigerants, Hankison Air Treatment Stations effectively remove moisture, solid particulates, and oil from compressed air systems.

| Compressed<br>Air System<br>Impurities | HPR <i>plus</i> &<br>HES Series<br>Air Treatment<br>Stations                      | Reduce General<br>Plant Operation<br>Costs   |  |  |
|--|---|--|--|--|
| Moisture<br>(Water)                    | Refrigerated<br>Air Dryers<br>38°F (3°C)<br>Dew Point                             | Reduce wear     & maintenance     costs of     pneumatic     devices     Reduce product     spoilage |  |  |
| Particulates<br>(Rust &<br>Dust)       | HF Series<br>Grade 9<br>Sep <mark>arator/Filter</mark><br>3 micron<br>particulate | Reduce work stoppages     Reduce rust, scale, & leaks in air lines                                   |  |  |
| Oil<br>(Liquid &<br>Vapor)             | HF Series<br>Grade 5<br>Oil Removal<br>Filter 0.008 ppm<br>(0.01 mg/m³)           | Reduce     malfunctions     of control &     air logic     instruments                               |  |  |

#### A 38°F (3°C) Dew Point Specification Saves Energy

All compressed air systems must be evaluated individually to develop a specification for compressed air treatment. The majority of compressed air users specify a 38°F (3°C) dew point for plant air. This dew point provides dry compressed air at a very low energy cost. Energy costs associated with refrigerated dryers are significantly lower than costs associated with desiccant dryers which satisfy sub-zero dew point requirements.



#### Refrigerated Dryers Save Energy

| Operating Costs* for Dew Point Specifications |                                     |  |  |  |  |  |  |
|---|-------------------------------------|--|--|--|--|--|--|
| Air Flow<br>scfm (m³/h)                       | 38°F (3°C)<br>Refrigerated<br>Dryer | -40°F (-40°C)<br>Blower Purge<br>Desiccant Dryer | -40°F (-40°C)<br>Heatless<br>Desiccant Dryer |  |  |  |  |
| 250 (429)                                     | \$ 1,428                            | \$ 4,437   | \$ 5,618                                     |  |  |  |  |
| 750 (1288)                                    | 2,649                               | 9,595  | 16,292                                       |  |  |  |  |
| 1000 (1797)                                   | 4,290                               | 14,010   | 22,155                                       |  |  |  |  |
| 2000 (3434)                                   | 7,873                               | 24,658   | 45,458                                       |  |  |  |  |
| 3000 (5151)                                   | 12,450                              | 37,167   | 65,002                                       |  |  |  |  |

<sup>\*</sup> Operating costs reflects actual dryer kW consumption and Purge Air requirements where applicable. Assuming 100°F (37°C) inlet and ambient temperature, 100 psig (6.9 bar) operating pressure, 8,760 working hours per year, \$ 0.084 kW/h.

## Develop an Air Demand Profile to Save Energy

Compressed air demand in most plants fluctuates significantly. Hankison International offers compressed air users who specify a 38°F (3°C) dew point two options: the HPR*plus* Series and the HES Series Refrigerated Air Dryers. 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 Hankison Solution to Save Energy

| Air Dema | Hankison<br>Solution                      |  |
|----------|---|--|
|          | Large Demand Fluctuations (1 to 3 shifts) |  |
|          | Steady<br>Demand<br>(1 shift)             | HES Series<br>or<br>HPR <i>plus</i> Series<br>in schedule mode |
|          | Steady<br>Demand<br>(2 shifts)            | HES Series<br>or<br>HPR <i>plus</i> Series<br>in schedule mode |
|          | Steady<br>Demand<br>(3 shifts, 24/7)      | HPR <i>plus</i> Series   |

# **HES Series Energy Saving Refrigerated Dryers**

Optimize energy savings for air demand profiles from 0% to 100%.

Digital control PLC allows user to track cumulative energy savings.

Digital Evaporator\* coupled with an innovative Digital Scroll refrigeration system.

#### HPR*plus* Series Refrigerated Dryers

Rugged reliability and value for demand profiles with 75% to 100% total average air flows.

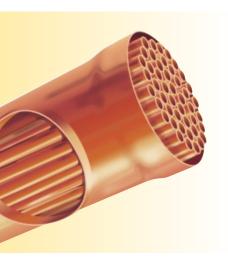
Energy Management Monitor (emm™) PLC comes with "schedule mode" which turns dryer on and off to optimize energy savings in one or two shift operations.

\* U.S. Patent Pending

# Three Hankison Technology Platforms for HPR plus and HES Series Refrigerated Dryers

Since L.E. Hankison patented the Condensifilter™, (forerunner to the refrigerated air dryer) in 1943, Hankison International's engineers have set the industry standard for refrigerated dryer technology.

## 1. Smooth-tube Heat Exchanger Technology



The ability to design and manufacture high-performance heat exchangers, tailored to the application of compressed air, has been a Hankison tradition. HPRplus and HES Series dryers feature Hankison's most advanced heat exchanger designs.

# Reduce Capital and Operating Costs by using Hankison Smooth-tube Designs

Compressed air poses a unique challenge to heat exchangers in the form of high inlet concentrations of airborne contaminants such as dirt and rust scale. These particles can potentially block the heat exchanger causing costly increases in pressure drop and require the installation of additional pre-filtration.

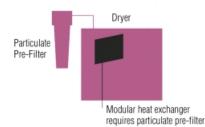
Hankison-design heat exchangers feature smooth-tube, copper heat exchange surfaces which are non-fouling. Airborne contaminants have no place to get trapped and are swept through the heat exchanger by the compressed air.

Hankison heat exchangers do not require pre-filters. Every filter added to an installation adds to pressure drop costs.

Many heat exchangers, originally designed for commercial refrigeration applications, require pre-filtration which increase capital and operating costs. This is because the narrow air paths present many surfaces to which airborne contaminants can adhere themselves to over time.

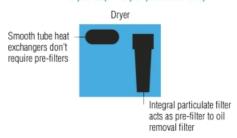
#### "Pre-Filter Required" Method

4 psi  $\triangle$ p + 5 psi  $\triangle$ p = 9 psi pressure drop



#### **Energy Saving Hankison Method**

5 psi  $\triangle p = 5$  psi pressure drop



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

| Air Flow<br>scfm (m³/h) | Pre-filter<br>Capital Cost | Pre-filter<br>Pressure<br>Drop Cost* | Total First<br>Year Cost<br>of Pre-Filter |
|-------------------------|----------------------------|--------------------------------------|---|
| 100 (172)               | \$ 360                     | \$ 245                               | \$ 605                                    |
| 250 (429)               | 640                        | 612                                  | 1,252                                     |
| 500 (859)               | 1,100                      | 1,223                                | 2,323                                     |
| 1000 (1717)             | 1,600                      | 2,446                                | 4,046                                     |
| 2000 (3434)             | 2,700                      | 4,893                                | 7,593                                     |
| 3000 (5151)             | 3,700                      | 7,339                                | 11,039                                    |

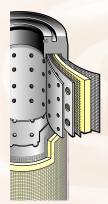
<sup>\*</sup>Assuming a 4 psi (0,27 bar) pressure drop, 8,760 hours per year operation and \$ 0.084 kW/hr

# A reliable 38°F (3°C) Pressure Dew Point-There is a Difference!

An advanced multi tubes-in-tube design offers three times more surface per unit length than other designs. Splitting the air flow into multiple tubes enhances the heat transfer rate which provides the thermal cooling necessary for consistent 38°F (3°C) dew points.

Many under-sized modular heat exchanger designs, which have been borrowed from commercial applications, do not provide sufficient thermal cooling. At 1000 scfm, the difference between a 38°F (3°C) and 60°F dew point can result in 75 gallons of liquid water going downstream....every week. Be wary of performance claims that do not guarantee a pressure dew point (vs. a "lowest air temperature" claim).

### 2. Filtration Technology

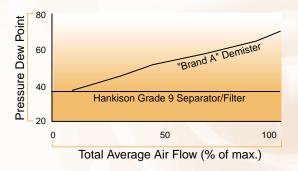


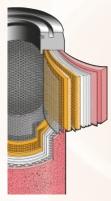
# The Integrated HF Series Grade 9 Coalescing Separator/Filter

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





#### The Integrated HF Series Grade 5 Coalescing Oil Removal Filter

Space and time-savings can be achieved by integrating an oil removal coalescing filter into larger sized Hankison 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  $\text{mg/m}^3$ ) 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

| Dryer<br>Model                            | Coalescing<br>Filter Type            | Filter Performance  |
|---|--------------------------------------|---|
| HPR <i>plus</i> 25-3000<br>HES 800-3000   | Standard Grade 9<br>Filter Separator | Bulk liquid & solid particulates     Oil aerosols to 5 ppm     (6,25 mg/m³) |
| HPR <i>plus</i> 1000-3000<br>HES 800-3000 | Optional Grade 5<br>Oil Filter       | Oil aerosols to 0.008 ppm (0,01 mg/m³)    Solid particles to 0.01 micron    |

## 3. Refrigerant Technology

Hankison selects the HFC refrigerants R-134a and R-404a for the HPRplus and HES Series dryers, designed for industrial applications, based upon the following criteria:

- Environmentally-friendly HFC refrigerants which comply with the Montreal Protocol of 1989.
- Energy efficient at "medium" evaporator temperatures of 35°F. Below 3 hp, R-134a with reciprocating compressors provide optimal performance. At 3 hp and above, scroll and digital scroll compressors utilizing R-404a provide the optimum pay-back depending upon the user's air demand profile.

| Dryer Models              | HFC Refrigerant | Refrigeration<br>Compressor-Type |
|---------------------------|-----------------|----------------------------------|
| HPR <i>plus</i> 5-750     | R-134a          | reciprocating                    |
| HPR <i>plus</i> 1000-3000 | R-404a          | scroll                           |
| HES 800-3000              | R-404a          | digital scroll                   |

- Ability to maintain stable temperatures (small glide factor) to protect the integrity of the 38°F (3°C) pressure dew point. R-407c, for example, has a difficult-to-control 9°F glide and is selected for other product lines suited for light industrial applications.
- Wide-spread, long-term availability of the refrigerant at a reasonable cost.

## **HES Series Energy Saving Refrigerated Dryers**

#### Flows from 800 to 3000 scfm

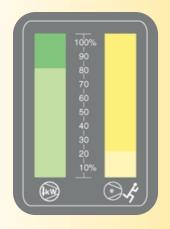
#### A New Category: Digital Evaporator Technology

The HES Series features new, ground-breaking technologies for the refrigerated dryer industry. The new Digital Evaporator continues the Hankison tradition of stable 38°F (3°C) dew points – while providing tremendous energy savings for a rapid return-on-investment. Unlike anything in the industry, the new HES Series Digital Evaporator offers energy saving advantages over traditional noncycling, 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 a stable 38°F (3°C) dew point with no dew point spikes which send water downstream and cause high maintenance and downtime costs

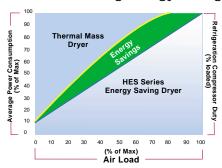


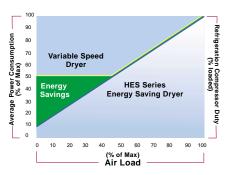
#### HES Series Energy Savings per year

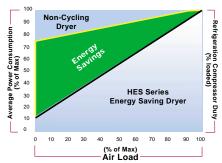
| Average<br>Air | % Energy    | HES Series Energy Savings per year by model |          |          |        |        |        |        |          |
|----------------|-------------|---|----------|----------|--------|--------|--------|--------|----------|
| Flow%          | Consumption | 800   | 1000     | 1250     | 1500   | 1750   | 2000   | 2500   | 3000     |
| 100%           | 100%        | -   | -        | -        | -      | -      | -      | -      | -        |
| 75             | 78          | \$ 1,071                                    | \$ 1,347 | \$ 1,016 | \$ 219 | \$ 901 | \$ 675 | \$ 895 | \$ 1,183 |
| 50             | 54          | 1,602                                       | 1,915    | 1,839    | 1,420  | 2,292  | 2,271  | 2,797  | 3,673    |
| 25             | 33          | 2,038                                       | 2,381    | 2,522    | 2,430  | 3,454  | 3,610  | 4,390  | 5,758    |
| 0              | 9           | 2,569                                       | 2,950    | 3,344    | 3,631  | 4,845  | 5,208  | 6,292  | 8,249    |

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, \$ 0.084 kW/h.

#### True Load-Matching Energy Savings







#### **Air Treatment Station Features**

- Space savings with dryer (no pre-filter required) and after-filters all in one cabinet.
- Integrated HF Series Grade 9 Coalescing Separator/Filter.
- Integrated HF Series Grade 5 Cold Coalescing Oil Removal Filter (optional).
- Electronic "no air-loss" demand drain(s) for integrated separator/filter and for oil removal filter (optional).
- WebAirNet Internet Remote Monitoring ready with RS-232 ports (optional).







#### The HES Series Refrigeration System

A patent-pending technology, the new Digital Evaporator\* 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 a very stable 38°F (3°C) dew point.

#### **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 for the HES Series. They utilize the core

Hankison heat exchanger technology (see page 4) of straight, smooth-tube, non-fouling copper which requires no pre-filtration.

#### **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.

which, in this case, and 40% kW energy savings. The mm Energy Management Monitor of the "schedule mode" for automatic.

**ENERGY SAVINGS** 

The display panel has two LED bar graphs which, in this case, would display 60% compressor running and 40% kW energy savings. The board also has all the features of the emm™ Energy Management Monitor of the HPRplus Series (see page 8), including the "schedule mode" for automatic start-stop operation.

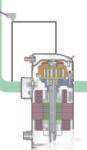
#### **Digital Scroll**

Digital

These innovative refrigeration scroll compressors are capable of running loaded or unloaded. A "power-on" signal equals no capacity (valve open-compressor unloaded) and no energy consumption while a "power-off" signal equals full capacity (valve closed-compressor loaded). Digital

Scroll compressors unload by allowing the fixed upper scroll to move axially from the orbiting lower scroll.

\*U.S. Patent Pending



### **HPR**plus Series Refrigerated Dryers

#### Flows from 5 to 3000 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 heat exchangers, filtration, and refrigeration (see pgs 4-5), which are CSA and UL certified, represent the best value solution available for heavy-duty air demand profiles.

#### HPR*plus* Series Operation and Filtration

#### Models HPR5 to 15

Power-on light

Centrifugal separator

#### Models HPRP25 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

#### 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 five 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 (HPRP1000 to 3000 include integral blow gun) and to ensure filter element replacement of the the standard HF Series Grade 9 Separator/Filter every 12 months. The HF Series Grade 5 cold coalescing, oil removal filter is available as an option on models HPRP1000 to 3000.

- Operator interface with read-outs comes standard in five languages (English, Spanish, German, French, Italian). Up to nine other languages are available. 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<sup>™</sup>, from your computer, possible through the RS-232 "smart port"
- Standard NO and NC voltage-free alarm contacts and RS-232 "smart port"
- Ready for WebAirNet Internet Remote Monitoring package
- Fault condition diagnostics with user-friendly text display
- User selectable automatic re-start feature after power outages







### The HPRplus Series Air Treatment Station

#### Flows from 1000 to 3000 scfm

Space savings can be achieved in your factory by integrating your refrigerated dryer with the required after-filters all in one cabinet.

Benefit from being able to customize your Air Treatment Station to the exact inlet compressed air conditions of your factory. Properly designed full-feature compressors with integrated dryers must, for example, default to the most demanding inlet conditions. Compare the space requirements of one Air Treatment Center with traditional installations which require a prefilter, dryer, and afterfilter.

#### **How They Work**

Compressed air, saturated with water vapor, enters the air-toair heat exchanger (A), is precooled 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 which 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 (models HPRP1000-3000)(E) and as dry, oil-free, chilled air returns through the air-to-air heat exchanger where it is reheated before exiting the dryer.

emm™ Energy Management Monitor

- programs the dryer for timed auto-start and stop. Saves energy during down time.
- monitors dryer for overload or fault conditions.
- programmable maintenance interval, visual and remote operator alert capabilities.



Refrigeration system ensures stable dewpoints with environmentally friendly R404a refrigerant, low-noise, hermetic, scroll compressors and hot gas by-pass valve automatic control system.

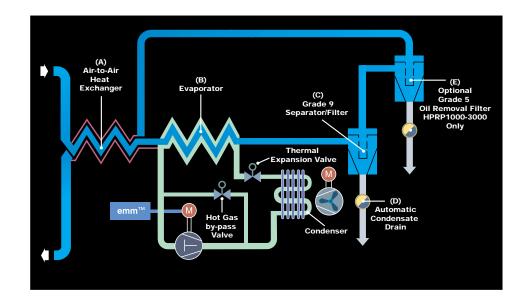


The heart of the dryer is Hankison's traditional smooth tube heat exchangers, which do not require prefiltration, therefore reducing the total system pressure drop.

Space-saving optional HF Series Grade 5 Cold Coalescing Oil Removal Filter eliminates oil aerosols to 0.008 ppm (0,01 mg/m³). This feature can save end users valuable wall space and installation costs.

Standard HF Series Grade 9 Filter/Separator removes bulk liquids and particulates to 3 micron.

Two Electronic "no air loss" Demand Drains with "time delay" feature to reduce cycle frequency.



# HPR*plus* Series Specifications

Voltages

(V/ph/Hz)

115/1/60

220-240/

1/50

115/1/60

208-230/

1/60

220-240/

1/50

208-230/

3/60

460/3/60

575/3/60

380-420/

3/50

Power

(kW)(2)

0.12

0.12

0.22

0.28

0.29

0.47

0.60

0.82

0.82

1.06

1.30

1.94

1.94

2.62

2.62

2.62

3.60

5.83

6.73

7.52

9.89

10.70

12.91

16.92

Connection

(3)

3/8" OD

3/8" OD

3/8" OD

3/4" NPT

3/4" NPT

1" NPT

1" NPT

1" NPT

1-1/2" NPT

1-1/2" NPT

2" NPT

2" NPT

2" NPT

3" NPT

3" NPT

3" NPT

3" NPT

4" ANSI Flg.

4" ANSI Flg.

4" ANSI Flg.

6" ANSI Flg.

6" ANSI Flg.

6" ANSI Flg.

6" ANSI Fla.

Dimensions (in)

W

11

11

11

17

17

17

20

20

24

24

22

22

22

28

28

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48

48

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51

51

65

65

49

49

49

56

56

56

2200

2240

2300

2500

2.1

2.7

4.0

5.0

0.14

0.19

0.28

0.34

5.2

6.2

8.4

10.3

0.36

0.43

0.58

0.71

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14

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17

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22

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40

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52

52

57

57

85

85

85

85

85

85

85

Rated

Flow (1)

Model

HPR5

HPR10

HPR15

HPRP25

HPRP35

HPRP50

HPRP75

HPRP100

HPRP125

HPRP150

HPRP200

HPRP250

HPRP300

HPRP400

HPRP500

HPRP600

HPRP750

HPRP1000

HPRP1250

HPRP1500

HPRP1750

HPRP2000

HPRP2500

HPRP3000

(scfm)

5

10

15

25

35

50

75

100

125

150

200

250

300

400

500

600

750

1000

1250

1500

1750

2000

2500

3000

**Total Air Treatment Station Pressure** Drop with Integrated Filtration With Standard With Optional 3 Micron (4) 0.008 ppm oil **HF Series HF Series** Grade 5 Grade 9 Wt. Separator/Filter Integrated Filtration (lb) psig bar psig bar 45 0.3 0.02 50 3.1 0.21 60 5.0 0.34 2.9 95 0.20 5.0 105 0.34 121 4.4 0.30 155 3.4 0.23 160 5.0 0.34 210 5.0 0.34 220 4.5 0.31 410 5.0 0.34 430 4.1 0.28 4.2 440 0.29 620 5.0 0.34 630 4.7 0.32 2.9 886 0.20 920 5.0 0.34 1540 2.3 0.16 5.8 0.40 1600 3.5 0.24 7.9 0.54 1650 4.8 0.33 10.1 0.70

#### Notes:

- a. The emm™ Energy Management Monitor control package is standard on models HPRP200-3000
- b. Refrigerants utilized on models HPRP5-750 is R-134a, models HPRP1000-3000 utilize R-404a
- c. Models HPR5-15: standard internal HF Snap Trap drain, dryer maximum operating pressure (MOP) 250 psig (17.6 bar)
- d. Models HPRP25-150: standard internal HF Snap Trap drain [dryer MOP 250 psig (17.6 bar), optional electric demand drain (dryer MOP 200 psig (14 bar)], optional electric timed drain (dryer MOP 200 psig (14 bar)
- e. Models HPRP200-3000: standard electric demand drain [dryer MOP 200 psig (14 bar)]. Second electric demand drain is standard when optional integrated HF Series Grade 5 oil removal filter is selected.
- f. Maximum inlet temperature: 120°F (49°C)
- (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. At rated conditions, outlet pressure dew point is 38°F (3°C)
- (2) At 35°F (2°C) evaporator and 100°F (38°C) ambient
- (3) BSP connections and DIN flanges available.
- (4) Models HPR5-15 use a centrifugal separator.
- (5) All models are certified to UL1995/CSA 22.2 No. 236-95.

| HES Series<br>Specifications |                   |           |          |              |     |             |     | Total Air Treatment Station Pressure  Drop with Integrated Filtration  With Standard With Optional |      |                    |                       |      |
|------------------------------|-------------------|-----------|----------|--------------|-----|-------------|-----|--|------|--------------------|-----------------------|------|
|                              |                   |           |          |              |     |             |     | 3 Mid  |      | 0.008 pp<br>HF Ser |                       |      |
|                              | Rated<br>Flow (1) | Voltages  | Power    | Connection   | Din | nensions (i | in) | Wt.  | Grad |                    | Grade<br>Integrated F | 5    |
| Model                        | (scfm)            | (V/ph/Hz) | (kW) (2) | (3)          | Н   | W           | D   | (lb)   | psig | bar                | psig                  | bar  |
| HES800                       | 800               | 208-230/  | 4.28     | 3" NPT       | 85  | 40          | 52  | 1615   | 1.6  | 0.11               | 4.4                   | 0.30 |
| HES1000                      | 1000              | 3/60      | 4.68     | 3" NPT       | 85  | 40          | 52  | 1650   | 2.3  | 0.16               | 5.8                   | 0.40 |
| HES1250                      | 1250              |           | 6.34     | 4" ANSI Flg. | 85  | 48          | 52  | 1770   | 3.5  | 0.24               | 7.9                   | 0.54 |
| HES1500                      | 1500              | 460/3/60  | 8.68     | 4" ANSI Flg. | 85  | 48          | 52  | 1890   | 4.8  | 0.33               | 10.1                  | 0.70 |
| HES1750                      | 1750              | 380-420/  | 10.35    | 6" ANSI Flg. | 85  | 54          | 56  | 2110   | 2.1  | 0.14               | 5.2                   | 0.36 |
| HES2000                      | 2000              | 3/50      | 11.72    | 6" ANSI Flg. | 85  | 54          | 56  | 2205   | 2.7  | 0.19               | 6.2                   | 0.43 |
| HES2500                      | 2500              |           | 14.00    | 6" ANSI Flg. | 85  | 54          | 56  | 2248   | 4.0  | 0.28               | 8.4                   | 0.58 |

#### Notes:

HES3000

a. The Digital Control package is standard.

3000

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

575/3/60

- c. All models utilize a standard electric demand drain.
- d. Second electric demand drain is standard when optional integrated HF Series Grade 5 oil removal filter is selected.

6" ANSI Fla.

f. Maximum Operating Pressure 200 psig (14 bar), Maximum inlet temperature: 120°F (49°C).

18.33

- (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. At rated conditions, outlet pressure dew point is 38°F (3°C).
- (2) At 35°F (2°C) evaporator and 100°F (38°C) ambient.
- (3) BSP connections and DIN flanges available.
- (4) All models are certified UL1995/CSA 22.2 No. 236-95.

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

| Inlet              | Inlet Temperature |                |                 |                 |                 |  |  |
|--------------------|-------------------|----------------|-----------------|-----------------|-----------------|--|--|
| Pressure<br>(psig) | 80°F<br>(27°C)    | 90°F<br>(32°C) | 100°F<br>(38°C) | 110°F<br>(43°C) | 120°F<br>(49°C) |  |  |
| 50                 | 1.35              | 1.05           | 0.84            | 0.69            | 0.56            |  |  |
| 80                 | 1.50              | 1.17           | 0.95            | 0.79            | 0.66            |  |  |
| 100                | 1.55              | 1.23           | 1.00            | 0.82            | 0.70            |  |  |
| 125                | 1.63              | 1.31           | 1.07            | 0.91            | 0.74            |  |  |
| 150                | 1.70              | 1.37           | 1.13            | 0.95            | 0.80            |  |  |
| 175                | 1.75              | 1.42           | 1.18            | 0.99            | 0.84            |  |  |
| 200                | 1.80              | 1.47           | 1.22            | 1.03            | 0.89            |  |  |

Table 2 - Correction Factors for Ambient Temperature\*

| Ambient     | 80°F   | 90°F   | 100°F  | 110°F  |
|-------------|--------|--------|--------|--------|
| Temperature | (27°C) | (32°C) | (38°C) | (43°C) |
| Multiplier  | 1.12   | 1.06   | 1.00   |        |

<sup>\*</sup>Air-cooled models only. For water-cooled use a 1.15 multiplier if cooling water is less than 95°F (35°C).

Table 3 - Correction Factors for Dew Point Temperature

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

2488

5.0

0.34

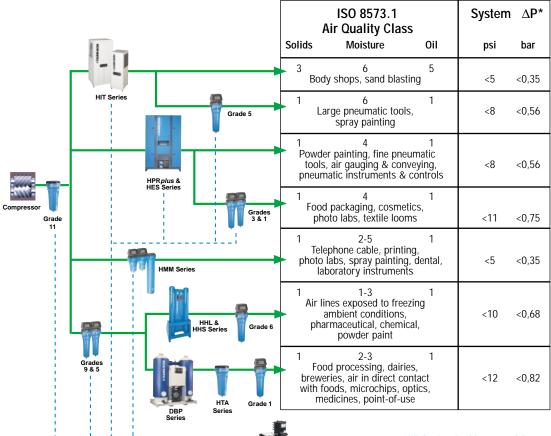
10.3

0.71

To adjust dryer capacity for conditions other than rated, use Correction Factors (multipliers) from Tables 1, 2 and 3.

**Example:** What is the capacity of a model HPRP100 when the compressed air at the inlet to the dryer is at 150 psig and 100°F (38°C), the ambient temperature is 90°F (32°C) and a 50°F (10°C) dew point is desired?

Answer: 100 scfm (rated flow from Specifications Table) x 1.13 (correction factor for inlet temperature and pressure from Table 1)  $\times$  1.06 (correction factor for ambient temperature from Table 2)  $\times$  1.3 (correction factor for dew point from Table 3) = 156 scfm



HS Series

#### ISO 8573.1 Quality Classes

| Quality<br>Classes | Solids<br>max. particle<br>size in microns | Moisture  Dew Point °C °F |         | Liquid<br>mg/m <sup>3</sup> | & Gas<br>ppm <sub>W/W</sub> |
|--------------------|--|---------------------------|---------|-----------------------------|-----------------------------|
| 0                  | as specified                               | as sp                     | ecified | as s                        | specified                   |
| 1                  | 0.1  | -70                       | -94     | 0,01                        | 0.008                       |
| 2                  | 1  | -40                       | -40     | 0,1                         | 0.08                        |
| 3                  | 5  | -20                       | -4      | 1                           | 0.8                         |
| 4                  | 15   | 3                         | 38      | 5                           | 4                           |
| 5                  | 40   | 7                         | 45      | >5                          | >4                          |
| 6                  | _  | 10                        | 50      | -                           | -                           |

#### **HIT Series Refrigerated Dryers**

Dries to 50°F (10°C) dew point, 3 micron integral filter

#### HPRplus & HES Series Refrigerated Dryers - Air Treatment Stations

Dries to 38°F (3°C) dew point, 3 micron integral filter and optional 0.008 ppm (0,01 mg/m³) oil removal filter

#### **HMM Series Membrane Dryers**

Select from 50°F (10°C) to -40°F (-40°C) dew points No Oxygen Loss

#### **HHL & HHS Series Heatless Desiccant Dryers**

Dries to -100°F (-73°C) dew point

# DBP Series Heated Blower Purge Desiccant Dryers

Dries to -40°F (-40°C) dew point, 0% purge

#### **HS Series Oil Water Separator**

Separates to 10 ppm (10 mg per liter)

#### **HF Series Filters**

Grade 11 – 99% bulk water removal

**Grade 9** – 99% bulk water removal, 3 micron particulate

**Grade 7** – 1 micron particulate

Grade 6 – 1 micron desiccant afterfilter

**Grade 5** – 0.008 ppm (0,01 mg/m³) oil removal **Grade 3** – 0.0008 ppm (0,001 mg/m³) oil removal

Grade 1 – oil vapor and 0.003 ppm (0,004 mg/m³) oil removal HTA – l micron particulate, high temperature filter

Global Leader in Efficiently Treating Compressed Air



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