SPX®

# Heatless Desiccant Air Dryers

**HHS SERIES, HHL SERIES AND HHE SERIES 40 to 5400 scfm (68 to 9175 nm³/h)**


Hankison®

# Dedicated to Excellence

Since 1948, compressed air users around the world have relied on Hankison to provide innovative compressed air treatment solutions for critical applications.

Hankison maintains a long standing reputation for manufacturing  products that deliver superior performance, time proven reliability and optimal energy savings.

Hankison today is the preferred choice for providing clean, dry compressed air for  the most challenging industries.

## Hankison's Heatless Desiccant Dryers

**The HHS, HHL & HHE Series**

Utilizing twin towers filled with premium grade activated alumina, Hankison Heatless dryers are available with three application specific control systems designed to meet the needs of specific industrial applications with economy and performance.

Industries such as pharmaceutical manufacturing, laboratories, hospitals, microelectronics, food packaging, paper, glass and powder painting with low dew point requirements, utilize heatless desiccant air dryers.

# Precision Performance

## Industry-Leading Design

- Consistent outlet pressure dew points
- Premium grade desiccant beads enhance surface area and have high crush strength
- Large desiccant beds ensure 4.8 seconds of contact time
- Large flow diffusers ensure even flow distribution through the bed and eliminate channeling
- Towers are designed to prevent fluidization of the desiccant
- Up-flow drying allows water and heavy contaminants to drop out of the air stream
- Simple discharge of contaminants
- Cleanable stainless steel flow diffusers/support screens
- Separate fill and drain ports for ease of desiccant replacement

## Integrated Filtration

- Optional pre-filter and after-filter packages, featuring Hankison NGF Series filters, can be pre-installed at the factory
  - » Grade SF and Grade HF pre-filters are recommended for –40°F to 38°F (-40°C to 3°C) dew points
  - » Grade PF and Grade UF pre-filters are recommended for –100°F (-73°C) dew points
  - » Grade PF and Grade CF are the recommended after-filters

## Precision AccuShift™ Switching Valves

- Automatically shift to the low pressure side of the circuit to control process flow
- Position memory ensures drying continues even without power
- 5 year AccuShift valve replacement warranty[1]
- Three-way pilot operated solenoid valves manage the pilot air flow to direct the purge/repressurization valves
- Purge pressure adjustment valve

[1] Dryer must be protected by properly sized Hankison prefilter. Parts and labor covered through first year of warranty, parts only in second through fifth years.

## Engineered-to-Order Options

- High dew point alarm which includes light and voltage free contacts for remote alarm
- Dew point monitor, includes digital display, voltage-free contacts and recorder output
- Low ambient packages, epoxy paint, severe environment protection
- Oil-free packages with integrated activated carbon towers

## Safety Built to Code

- Pressure vessels are CRN and ASME Certified
- Heavy-duty mufflers for quiet operation
- NEMA 4 electrical construction is standard
- Pressure relief valves are standard

# Application Specific Designs

## How it Works

### Phase 1

- Moist, filtered compressed air enters the pressurized on-line desiccant-filled drying Tower 1 through the AccuShift™ valve (A).

### Phase 2

- Up-flow drying enables the desiccant to strip the air stream of moisture. Clean, dry compressed air exits through AccuShift™ valve (B) to feed the air system.

### Phase 3

- When in regeneration mode, Tower 2 depressurizes to atmosphere through the muffler (C) when the valve (D) opens.

### Phase 4

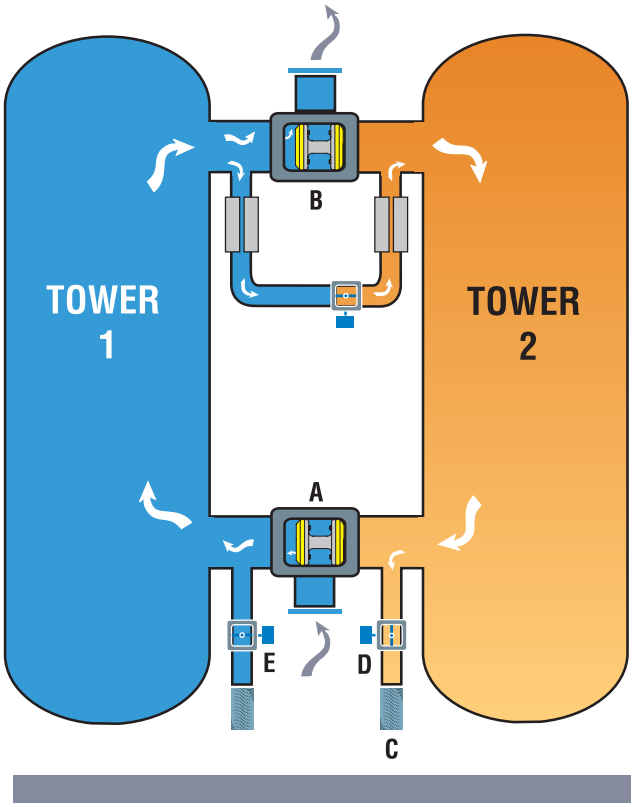
- A portion of dry compressed air (purge air) is diverted before exiting (B) and passes through off-line Tower 2 and exits at valve (D) to desorb the moisture from the desiccant. Once desorbed, valve (D) closes and Tower 2 is repressurized.

### Phase 5

- At tower shift-over, valve (E) will open, causing AccuShift™ Valves (A & B) to shift.

### Phase 6

- Tower 2 will be placed on-line to dry the bed. Operations will switch and Tower 1 will be regenerated.




## Match Performance by Demand

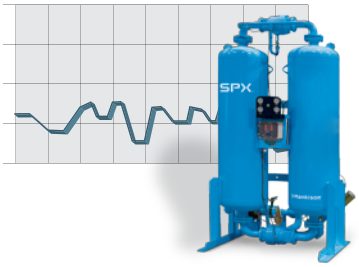
Three user selectable designs engineered to balance economy and performance.

Ideal for applications that operate with a large swing in air demands due to variations in production scheduling or shifts of operation. Some applications operate at a fraction of the flow of the compressor due to air system efficiency improvements. Some applications operate continuously at-or-near full capacity.

**HHS Series**
For Fluctuating Demands (1 to 3 shifts)

**HHS or HHE Series**
For Peak Demands (1 to 3 shifts)

**HHS or HHL Series**
For Reduced Demands (1 to 3 shifts)



# HHS Series Desiccant Dryers

## Automatic Sensatherm® Energy Savings

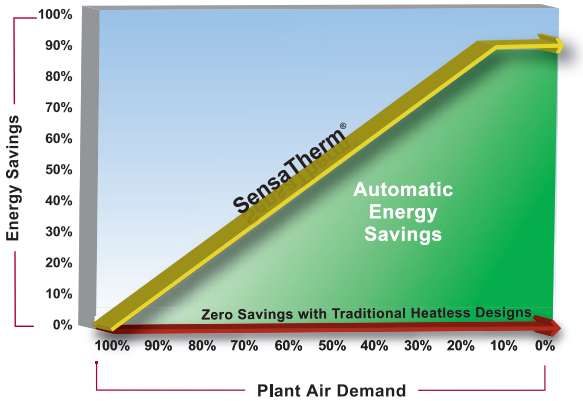
Hankison's HHS Series with patented SensaTherm automatically matches purge air to plant air demand. This ensures maximum performance as the saved energy goes right to your bottom line.

When operating at reduced capacity, the on-line drying tower remains active longer, until its full drying capacity is utilized. Desiccant bed temperature changes are constantly monitored within each tower to precisely manage drying times and reduce purge air consumption.

SensaTherm also measures the increase in desiccant bed temperature (heat of adsorption) during the drying stage and the decrease in desiccant bed temperature (heat of desorption) during the regeneration stage. These temperature changes are accurate indicators of the moisture load on the dryer. This data is interpreted by microprocessor based controls to determine how long a tower stays on-line during the drying stage.

### Advantages:

1. Temperature transducers (thermistors) are used as sensing devices. They are simpler, more reliable and rugged than those others use.
2. Sensors require no calibration.
3. The system is based on saving the heat of adsorption, towers switch before heat's lost maximizing purge air efficiency and minimizing the amount of purge air required.




*Maximize your return-on-investment automatically. HHS Series with SensaTherm® delivers energy savings in direct proportion to load variations from your plant air demands, making it the Auditor's Choice.*

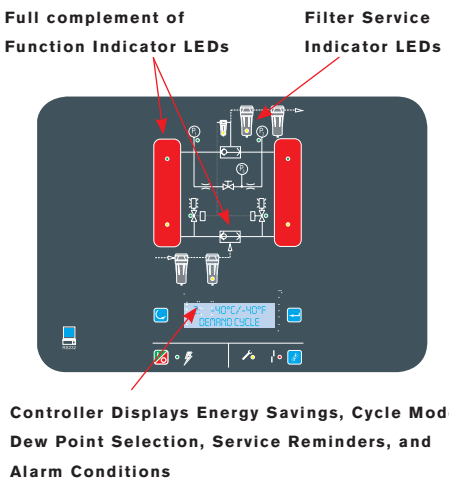
### Automatic Energy Savings

| | Energy Savings Control* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Load** | **590** | **750** | **930** | **1,130** | **1,350** | **1,550** | **2,100** | **3,000** |
| **100%** | - | - | - | - | - | - | - | - |
| **95%** | $ 741 | $ 941 | $ 1,167 | $ 1,418 | $ 1,694 | $ 1,945 | $ 2,636 | $ 3,765 |
| **90%** | 1,481 | 1,883 | 2,335 | 2,837 | 3,389 | 3,891 | 5,271 | 7,531 |
| **85%** | 2,222 | 2,824 | 3,502 | 4,255 | 5,083 | 5,836 | 7,907 | 11,296 |
| **80%** | 2,962 | 3,765 | 4,669 | 5,673 | 6,778 | 7,782 | 10,543 | 15,061 |
| **75%** | 3,703 | 4,707 | 5,836 | 7,091 | 8,472 | 9,727 | 13,179 | 18,827 |
| **70%** | 4,443 | 5,648 | 7,004 | 8,510 | 10,166 | 11,673 | 15,814 | 22,592 |
| **55%** | 6,665 | 8,472 | 10,505 | 12,764 | 15,250 | 17,509 | 23,722 | 33,888 |
| **40%** | 8,886 | 11,296 | 14,007 | 17,019 | 20,333 | 23,345 | 31,629 | 45,184 |
| **25%** | 11,108 | 14,120 | 17,509 | 21,274 | 25,416 | 29,181 | 39,536 | 56,480 |

** Assumes 5 scfm/HP, 8760 hours of operation per year, $ 0.10 kW/h*

## HHS Series Controller Features:

- Choice of four operating modes
- SensaTherm Demand mode
- Switches for On/Off, Alarm and Service reminder reset
- Operational LED lights for power-on, tower status, valve status, and tower pressure
- Service reminder LED lights for filters and drains, valves and desiccant. The user selects between a Normal and a Severe service interval
- Alarm LED for tower switching failure, filter monitor signals, electronic demand drain alarms on filters
- Vacuum fluorescent text display communicates energy savings, operating mode and service reminders
- RS-232 communications port is standard




**Controller Displays Energy Savings, Cycle Modes, Dew Point Selection, Service Reminders, and Alarm Conditions**

# HHL Series & HHE Series Desiccant Dryers

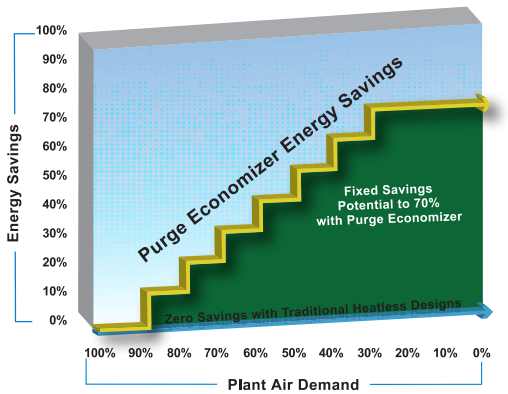
## HHL Series

### Selectable Purge Economizer Savings

HHL Series provides user selectable energy savings with tailored drying cycles designed to match your peak air demands.

Reducing the amount of time the dryer spends purging in the regeneration cycle can save energy. Eight settings (0% to 70% in 10% increments) are furnished for users to lower the purge to match reduced air loads on the dryer. Each energy saving setting has an LED light which will illuminate when it is selected. Simply flip the switch to select the desired energy saving setting.

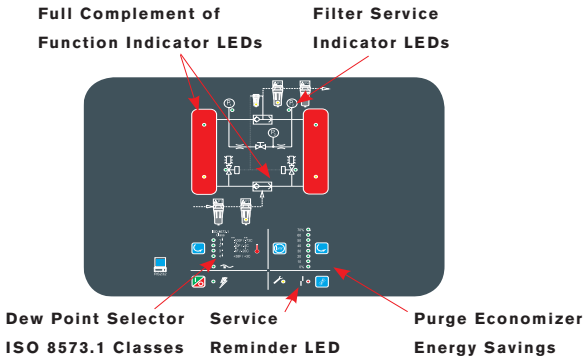
In addition, this state-of-the-art controller offers four pressure dew point settings to further tune your savings and adapt the system to your environment.




*Purge Economizer lets you align your purge costs with your air demands to optimize your return-on-investment. Tailor HHL Series dryers to take full advantage of air system efficiency improvements driven by air audit strategies.*

## HHL Controller Features:

- Choice of four fixed cycle operating modes corresponding to ISO 8573.1 Air Quality Classes
- Choice of eight Purge Economizer Energy Savings settings
- Switches for On/Off, Alarm and Service reminder reset
- Operational LED lights for power-on, tower status, valve status, and tower pressure
- Alarm LED for valve switching failure
- RS-232 communications port is standard
- Service reminder LED lights for filters and drains, valves and desiccant

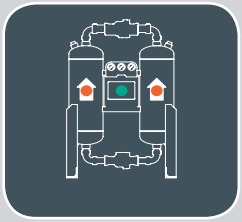



## HHE Series

### -40°F Dew Point Performance

Hankison's HHE Series is engineered to address the need for raw performance and value. This traditional design uses a simple timer to alternate the flow between the two towers filled with premium grade desiccant. These are designed to deliver maximum value to applications that operate at-or-near full capacity.

Automatic time controlled bed regeneration cycles offer consistent performance and economy of purchase. While the on-line tower is drying the air stream, the off-line tower purges a fixed amount of compressed air to dry the bed and prepares it for the next drying cycle.



## HHE Controller Features:

- Control Panel overlay with LED's indicating:
  - » Power On
  - » Left Tower Drying
  - » Right Tower Drying

# Product Specifications

| Model | Inlet Flow @ 100 psig (6.7 barg) | | Dimensions | | | Inlet / Outlet Connections [1] | Weight |
|---|---|---|---|---|---|---|---|
| | | | H | W | D | | |
| | scfm | nm³/h | | in | | in | lbs |
| **HHS/HHL/HHE-40** | 40 | 68 | 46 | 32 | 32 | 1" NPT | 365 |
| **HHS/HHL/HHE-60** | 60 | 102 | 61 | 32 | 32 | 1" NPT | 445 |
| **HHS/HHL/HHE-90** | 90 | 153 | 78 | 32 | 32 | 1" NPT | 575 |
| **HHS/HHL/HHE-115** | 115 | 195 | 54 | 44 | 38 | 1" NPT | 685 |
| **HHS/HHL/HHE-165** | 165 | 280 | 54 | 44 | 38 | 1" NPT | 685 |
| **HHS/HHL/HHE-260** | 260 | 442 | 72 | 49 | 38 | 2" NPT | 1,010 |
| **HHS/HHL/HHE-370** | 370 | 629 | 63 | 55 | 38 | 2" NPT | 1,215 |
| **HHS/HHL/HHE-450** | 450 | 765 | 71 | 55 | 38 | 2" NPT | 1,350 |
| **HHS/HHL/HHE-590** | 590 | 1,002 | 101 | 50 | 53 | 2" NPT | 1,473 |
| **HHS/HHL/HHE-750** | 750 | 1,274 | 109 | 51 | 48 | 3" ANSI FLG. | 2,134 |
| **HHS/HHL/HHE-930** | 930 | 1.580 | 113 | 56 | 56 | 3" ANSI FLG. | 2,414 |
| **HHS/HHL/HHE-1130** | 1,130 | 1,920 | 113 | 59 | 56 | 3" ANSI FLG. | 2,875 |
| **HHS/HHL/HHE-1350** | 1,350 | 2,294 | 118 | 60 | 56 | 3" ANSI FLG. | 3,722 |
| **HHS/HHL/HHE-1550** | 1,550 | 2,634 | 113 | 66 | 56 | 3" ANSI FLG. | 4,167 |
| **HHS/HHL/HHE-2100** | 2,100 | 3,568 | 116 | 73 | 56 | 4" ANSI FLG. | 4,417 |
| **HHS/HHL/HHE-3000** | 3,000 | 5,097 | 122 | 78 | 65 | 4" ANSI FLG. | 9,010 |
| **HHS/HHL/HHE-4100** [2] | 4,100 | 6,966 | 124 | 93 | 88 | 6" ANSI FLG. | 9,900 |
| **HHS/HHL/HHE-5400** [2] | 5,400 | 9,175 | 126 | 102 | 92 | 6" ANSI FLG. | 12,000 |

*Maximum Working Pressure: 150 psig (10.5 barg) standard, 250 psig (17.6 barg) optional. Units with higher Maximum Working Pressures are available.*
*Minimum Operating Pressure: 150 psig (10.5 barg) units - 60 psig (4.2 barg), 250 psig (17.6 barg) - 120 psig (8.4 barg)*
*Maximum Inlet Air or Ambient Air Temperature: 120°F (49°C)*
*Pressure Drop at Rated Flow: Less than 5 psi (0.35 barg)*
*Available Voltages: HHE - 100-120V/1ph/50-60Hz, HHL/HHS - 100-240V/1ph/50-60Hz and 12-24 VDC, NEMA 4 Standard*
*Dimensions and weights are for reference only. Request certified drawings for construction purposes.*
[1] *BSP and DIN flanges available*
[2] *Supplied with Premium Quality Butterfly Switching Valves*

## Inlet Flow

Inlet flow capacities are established in accordance with CAGI (Compressed Air and Gas Institute) standard ADF-200: Inlet air pressure 100 psig (6.7 barg), inlet temperature saturated at 100°F (38°C). To determine inlet flow at pressures other than 100 psig (6.7 barg), multiply inlet flow at 100 psig (6.7 barg) from Product Specifications by the corresponding multiplier in Table 1.

### Table 1

| Pressure | | Multiplier |
|---|---|---|
| psig | barg | |
| 60 | 4.13 | 0.65 |
| 70 | 4.83 | 0.74 |
| 80 | 5.52 | 0.83 |
| 90 | 6.21 | 0.91 |
| 100 | 6.89 | 1.00 |
| 110 | 7.58 | 1.04 |
| 120 | 8.27 | 1.08 |
| 130 | 8.96 | 1.12 |
| 140 | 9.65 | 1.16 |
| 150 | 10.34 | 1.20 |
| 175 | 12.06 | 1.29 |
| 200 | 13.78 | 1.37 |
| 225 | 15.51 | 1.45 |
| 250 | 17.24 | 1.52 |

## Four Dew Point Options per ISO 8573-1Air Quality Standards

Specifying a pressure dew point is not simple work for an engineer. Hankison Heatless dryer designs allow you to optimize performance and dew points in the field to adapt to your environment and meet the following ISO 8573-1 Classes of air quality.

| | | ISO 8573-1 Quality Class | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| Dew Point | °F | -100° | -40° | -4° | 38° |
| | °C | -73° | -40° | -20° | 3° |
| Remaining Moisture | ppmw | 0.12 | 10 | 81 | 610 |
| | mg/m³ | 0.15 | 12 | 97 | 730 |
| HHS Series | | 4 min. fixed | Demand or 10 min. fixed | Demand or 16 min. fixed | Demand or 24 min. fixed |
| HHL Series | | 4 min. fixed | 10 min. fixed | 16 min. fixed | 24 min fixed |
| HHS Series | | - | 10 min. fixed | - | - |

# HHS, HHL & HHE Series

**40 to 5400 scfm**
**(68 to 9175 nm³/h)**

## Global locations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**Based in Charlotte, North Carolina, SPX Corporation (NYSE: SPW) is a global Fortune 500 multi-industry manufacturing leader.**
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