



# Heatless Desiccant Air Dryers

## HHX, HHL & HHE Series



## Industry leading design

Heatless desiccant air dryers

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

**Hankison is dedicated to ongoing advancements in air treatment technology, providing industry and critical applications clean, dry compressed air.**

### **Clean, Dry Compressed Air Results In Significantly Lower Operating Costs.**

Solid contaminants such as dirt and dust, as well as gaseous contaminants including oil vapor and water vapor enter the compressor intake along with the ambient air. During the compression process, additional contaminants are added to the air stream such as oil aerosols and compressor wear particles. If left untreated, the contaminants travel downstream adversely affecting the air distribution system, pneumatic processes and finished product.

### **The HHX, HHL & HHE Series.**

Hankison HH series heatless desiccant dryers are designed to efficiently dehydrate compressed air to dew points as low as ISO 8573-1 Quality Class 1 (-94°F/-70°C)

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.

## Industry Leading Performance & Design.

- HH series heatless desiccant air dryers are available with three application control systems designed to meet the needs of specific industrial applications for economy, performance, and energy savings
- Comprehensive offering: Eighteen models 40 to 5400 scfm (68 to 9175 nm<sup>3</sup>/h)
- Delivers stable ISO 8573-1 Quality Class 1 (-94°F/-70°C) to Class 4 (+38°F/+4°C) outlet pressure dew points
- Single-phase, alternating current input power connection of 190-305 VAC / 50-60 Hz; pre-wired with an AC to 12 VDC external power supply
- Large diameter piping promotes low pressure drop and lower cost of operation
- Optimally sized desiccant beds ensure 4.8 seconds of contact time for complete drying
- Cleanable, stainless steel flow diffusers eliminate channeling through the bed
- Up-flow drying allows water and heavy contaminants to drop out of the air stream
- Separate fill and drain ports for ease of desiccant replacement



HHX, HHL, HHE Series  
Extended Warranty  
Protect your equipment

- As an extra measure of protection, Hankison will provide additional coverage beyond the standard 1-year warranty.
- Purchase and register a HHX, HHL or HHE dryer with filtration package to qualify for an extended warranty up to 5 years.
- Warranty will be extended yearly through the purchase and installation of a qualifying annual maintenance kit.
- Extended warranty covers up to 4 years additional protection, parts and labor, a total of 5 years. Reference the General Terms, Warranty Policies & Procedures Handbook for more details.



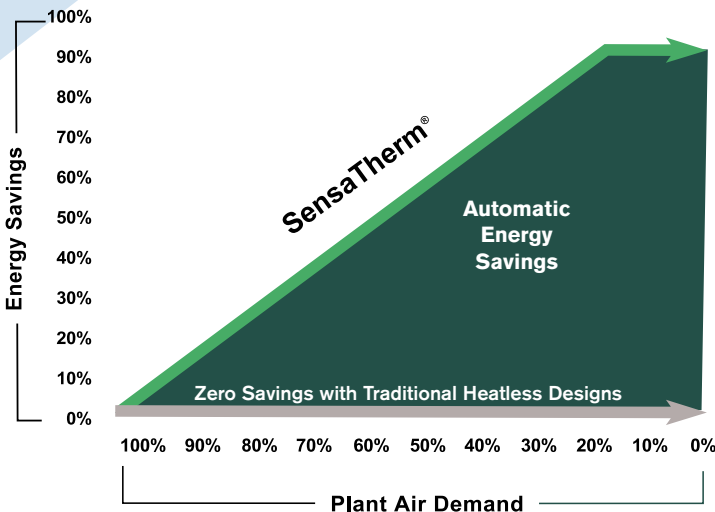
## HHX Series

### Hankison's HHX Series With Patented SensaTherm Automatically Matches Purge Air to Plant Air Demand.

SensaTherm 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 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.

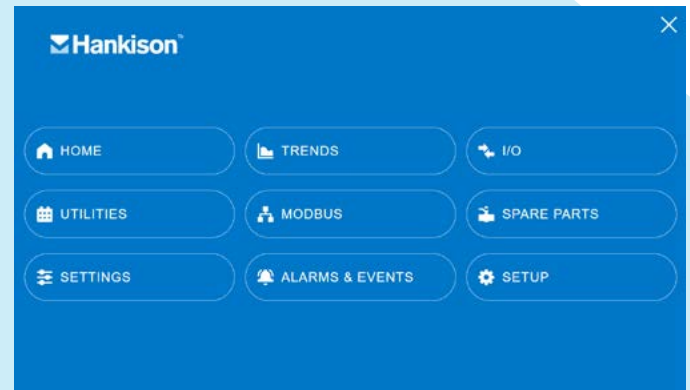


Maximize your return-on-investment automatically. HHX Series with SensaTherm® delivers energy savings in direct proportion to load variations from your plant air demands, making it the Auditor's Choice.

# HHX Series Controller Features

Featuring a 7" LCD, Capacitive Color Touchscreen for at-a Glance Monitoring and Operating Status.

- The solid-state controls are housed in a polycarbonate, NEMA Class 4X, IP66 rated electrical enclosure
- Certified for quality and safety to CSA C22.2 No.0-10, C22.2 No.14-18 & UL 508
- High visibility, color-coded steps facilitates system monitoring
- Hybrid gauges display (digital/analog) for rapid value and intuitive status

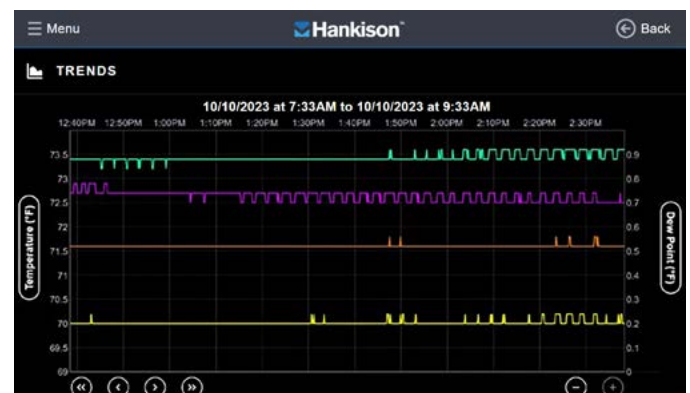


Communications to Pace With IOT Technology, for Connecting and Exchanging Data with Devices and Systems.

- Easily communicate with user's DCS systems utilizing Modbus TCP/IP communication via one of two available Ethernet ports
- Access the web interface via Ethernet with a dynamic or static IP address, selectable by the user
- Standby or Offline status initiated or exited remotely through Modbus access
- Serial RS-485 for point-to-point communication of electrical devices

Fully-Featured Controls for Troubleshooting, Performance Trending, and Fault Alarms.

- Up to 30 days of information Data logging, recorded to internal memory or USB drive (events, states, inputs, alarms, warnings)
- A trends screen allows the user to view temperature and pressure values plotted over time
- Service reminders indicate time to perform preventive maintenance on filters, drains, valves, and desiccant
- On board spare parts list and instruction manual for ease of reference



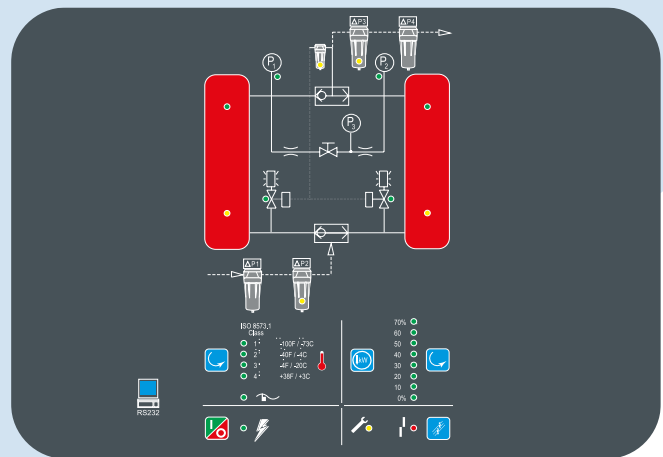


## HHL Series

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

### 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



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.

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. 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.

# HHE Series

## Hankison's HHE Series is Engineered to Address the Need for Performance and Value.

The traditional HHE 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.

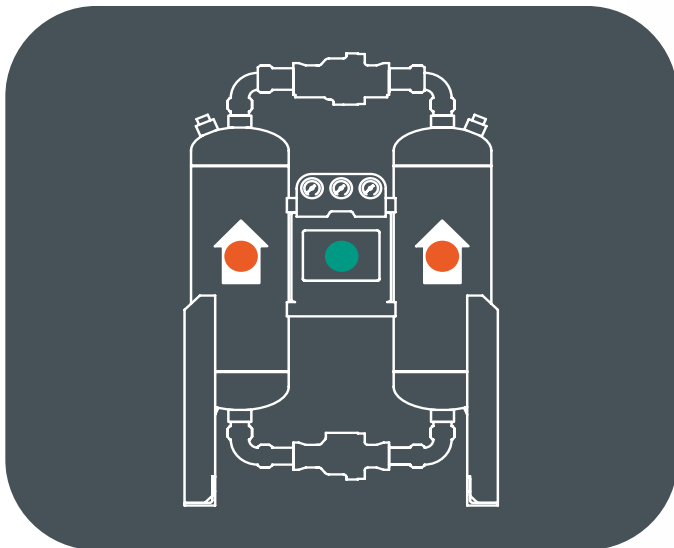
Automatic time controlled bed regeneration cycles offer consistent performance and economy of purchase. While the on-line tower is drying the air stream, the off-line tower purges a fixed amount of compressed air to dry the bed and prepares it for the next drying cycle.

- One fixed cycle mode corresponding to ISO 8573-1 Air Quality Class 2 (-40°F/-40°C)

### Controller Features

Control Panel overlay with LED's indicating:

- Power On
- Left Tower Drying
- Right Tower Drying



# Operating Principals

## Phase 1

Moisture laden, 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

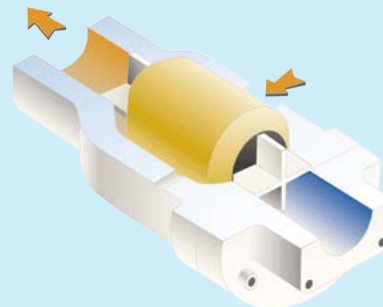
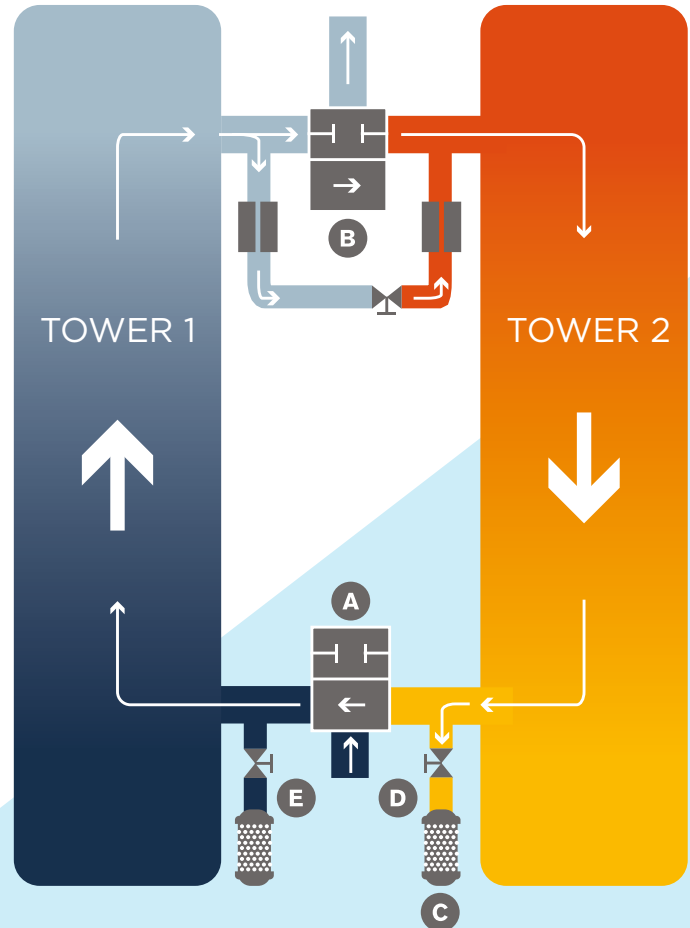
At tower shift-over, valve (E) will open, causing AccuShift™ Valves (A & B) to shift

## Phase 6

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

## Simple Operation

The AccuShift™ shuttle valve is free to move back and forth closing the inlet having the lower pressure and giving preference to the inlet with the high pressure.





# Integrated Filtration

## Base Filtration Package (Pre-filter and After-filter):

### HF Series Pre-filter:

Protect the valves and desiccant bed from oil contamination

- Removes 99.99% of oil aerosol content to 0.01 mg/m<sup>3</sup>
- ISO Quality Class remaining oil - 1

### PF Series After-Filter:

Protects down-stream components from desiccant dust

- Remove 99.999% of solids 1.0 micron and larger
- ISO Quality Class solids - 2

## Advanced Filtration Package (Dual Pre-filter and single After-filter):

### PF Series Pre-Filter:

Removes solids, protects the high-performance oil removal filter

- Remove 99.999% of solids 1.0 micron and larger
- ISO Quality Class solids - 2

### HF Series Pre-filter:

Protect the valves and desiccant bed from oil contamination

- Removes 99.99% oil aerosol content to 0.01 mg/m<sup>3</sup>
- ISO Quality Class remaining oil - 1

### PF Series After-Filter:

Protects down-stream components from desiccant dust

- Remove 99.999% of solids 1.0 micron and larger
- ISO Quality Class solids - 2



Protect Your Investment and  
Extend the Warranty with  
Factory Mounted NGF Series  
Filtration Packages



## Specifications

| Model                         | Inlet Flow @ 100 PSI<br>(6.7 BAR) |                    | Height |       | Dimensions |       |       |       | Inlet/Outlet<br>Connections <sup>1</sup> | Weight<br>LBS |
|-------------------------------|-----------------------------------|--------------------|--------|-------|------------|-------|-------|-------|--|---------------|
|                               | SCFM                              | NM <sup>3</sup> /H | IN     | MM    | Width      |       | Depth |       |  |               |
|                               |                                   |                    |        |       | IN         | MM    | IN    | MM    | IN                                       |               |
| HHX/HHL/HHE-40                | 40                                | 68                 | 46     | 1,168 | 32         | 813   | 32    | 813   | 1" NPT                                   | 365           |
| HHX/HHL/HHE-60                | 60                                | 102                | 61     | 1,549 | 32         | 813   | 32    | 813   | 1" NPT                                   | 445           |
| HHX/HHL/HHE-90                | 90                                | 153                | 78     | 1,981 | 32         | 813   | 32    | 813   | 1" NPT                                   | 575           |
| HHX/HHL/HHE-115               | 115                               | 195                | 54     | 1,372 | 44         | 1,118 | 38    | 965   | 1" NPT                                   | 685           |
| HHX/HHL/HHE-165               | 165                               | 280                | 54     | 1,372 | 44         | 1,118 | 38    | 965   | 1" NPT                                   | 685           |
| HHX/HHL/HHE-260               | 260                               | 442                | 72     | 1,829 | 49         | 1,245 | 38    | 965   | 2" NPT                                   | 1,010         |
| HHX/HHL/HHE-370               | 370                               | 629                | 63     | 1,600 | 55         | 1,397 | 38    | 965   | 2" NPT                                   | 1,215         |
| HHX/HHL/HHE-450               | 450                               | 765                | 71     | 1,803 | 55         | 1,397 | 38    | 965   | 2" NPT                                   | 1,350         |
| HHX/HHL/HHE-590               | 590                               | 1,002              | 101    | 2,565 | 50         | 1,270 | 53    | 1,346 | 2" NPT                                   | 1,473         |
| HHX/HHL/HHE-750               | 750                               | 1,274              | 109    | 2,769 | 51         | 1,295 | 48    | 1,219 | 3" ANSI FLG.                             | 2,134         |
| HHX/HHL/HHE-930               | 930                               | 1,580              | 113    | 2,870 | 56         | 1,422 | 56    | 1,422 | 3" ANSI FLG.                             | 2,414         |
| HHX/HHL/HHE-1130              | 1,130                             | 1,920              | 113    | 2,870 | 59         | 1,499 | 56    | 1,422 | 3" ANSI FLG.                             | 2,875         |
| HHX/HHL/HHE-1350              | 1,350                             | 2,294              | 118    | 2,997 | 60         | 1,524 | 56    | 1,422 | 3" ANSI FLG.                             | 3,722         |
| HHX/HHL/HHE-1550              | 1,550                             | 2,634              | 113    | 2,870 | 66         | 1,676 | 56    | 1,422 | 3" ANSI FLG.                             | 4,167         |
| HHX/HHL/HHE-2100              | 2,100                             | 3,568              | 116    | 2,946 | 73         | 1,854 | 56    | 1,422 | 4" ANSI FLG.                             | 4,417         |
| HHX/HHL/HHE-3000              | 3,000                             | 5,097              | 122    | 3,099 | 78         | 1,981 | 65    | 1,651 | 4" ANSI FLG.                             | 9,010         |
| HHX/HHL/HHE-4100 <sup>2</sup> | 4,100                             | 6,966              | 124    | 3,150 | 93         | 2,362 | 88    | 2,235 | 6" ANSI FLG.                             | 9,900         |
| HHX/HHL/HHE-5400 <sup>2</sup> | 5,400                             | 9,175              | 126    | 3,200 | 102        | 2,591 | 92    | 2,337 | 6" ANSI FLG.                             | 12,000        |

*Maximum Working Pressure: 150 psi (10.5 bar) standard; 250 psi (17.6 bar) optional. Units with higher Maximum Working Pressures are available.*

*Minimum Operating Pressure: 150 psi (10.5 bar) service - 60 psi (4.1 bar); 250 psi (17.6 bar) service - 120 psi (8.4 bar)*

*Maximum Inlet Air Temperature: 140°F (60°C)*

*Maximum Ambient Air Temperature: 120°F (49°C)*

*Pressure Drop at Rated Flow: Less than 5 psi (0.35 bar)*

*Available Voltages: HHE - 100-120V/1ph/50-60Hz, HHL/HHS - 100-240V/1ph/50-60Hz and 12-24 VDC*

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

<sup>1</sup> BSP and DIN flanges available

<sup>2</sup> Supplied with premium quality butterfly switching valves

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

## ISO 8573-1 Air Quality Standards

Hankison Heatless dryer designs allow optimized performance meeting the following ISO 8573-1 Quality Classes of Air.

|                    |                   | ISO 8573-1 Quality Class |                         |                         |              |
|--------------------|-------------------|--------------------------|-------------------------|-------------------------|--------------|
|                    |                   | 1                        | 2                       | 3                       | 4            |
| Dew Point          | °F                | -100°                    | -40°                    | -4°                     | 38°          |
|                    | °C                | -73°                     | -40°                    | -20°                    | 3°           |
| Remaining Moisture | ppm/w             | 0.12                     | 10                      | 81                      | 610          |
|                    | mg/m <sup>3</sup> | 0.15                     | 12                      | 97                      | 730          |
| HHX Series         |                   | 4 min. fixed             | Demand or 10 min. fixed | Demand or 16 min. fixed | -            |
| HHL Series         |                   | 4 min. fixed             | 10 min. fixed           | 16 min. fixed           | 24 min fixed |
| HHE Series         |                   | -                        | 10 min. fixed           | -                       | -            |

| Pressure |       | Multiplier |
|----------|-------|------------|
| PSI      | BAR   |            |
| 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       |

### Correction Factor

Inlet flow capacities are established in accordance with ISO 7183 (A2): Inlet air pressure 100 psi (6.7 bar), inlet temperature 100°F (38°C).

To determine the dryer's maximum flow capacity at pressures other than 100 psig, multiply the dryers rated flow from the Specifications chart by the corresponding multiplier.

### Example:

System pressure: 120 psig  
 Dryer flow: 750 SCFM  
 750 SCFM x 1.08 = 810 SCFM

The HH750 has a capacity of 810 SCFM operating at 120 psig



# Heatless Desiccant Air Dryers

## HHX, HHL & HHE Series

40 to 5400 SCFM (68 - 9175 NM<sup>3</sup>/H)

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



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