DH
Dehumidification Series

Keep it dry with CDI
Concepts and Designs, Inc. (CDI) originated in 1989 in Owatonna, Minnesota. CDI provides customers with a broad array of custom HVAC options. Years of HVAC industry experience established the foundation for today’s thriving company.

CDI designs and manufacturers custom air handling systems for facilities. Products include dehumidification equipment, custom air handling units, and cooling and heating products.

Our products offer indoor air quality solutions for numerous markets: Food Processing, Ice Arenas, Wastewater Treatment Plants, Pharmaceuticals, Automotive, Rental, Healthcare, Aviation and all types of facilities requiring controlled air climates. We have provided climate control products to numerous countries including Canada, Mexico, Russia, and China.

Our projects are designed utilizing internally developed “Climate by Design” software. This software is used by our sales engineers, manufacturing representatives and associates to configure and predict the performance of an air handling unit.

We understand the critical nature of our customers’ processes and are responsive by providing services and training to meet customer requirements for a favorable climate and environment. Services range from preventative maintenance to prescriptive plans for a specific application.

Our goal is to provide customers with high-quality, energy-efficient solutions for indoor air quality.
DH Dehumidification Series

Dedicated desiccant air-supply units provide low-humidity discharge conditions necessary to maintain a dry environment. It's a simple solution to an old problem. The solid desiccant rotor absorbs moisture from process air. The moisture is taken out of the rotor by a second and separate reactivating airstream. This process enables the rotor to continually take moisture out of the airstream without interruption.

DH Series units provide an excellent stand-alone solution when sensible heat gain is not a concern. To solve existing moisture problems DH Series units can be added to existing conventional HVAC systems. The fully integrated dehumidifier is complete with process and reactivation filters, fans and the complete control system for safe operation. Choose between direct gas fired, steam, or electric actively heated reactivation.

CDI offers DH units with a maximum process air volume of 1,500 to 47,000 scfm. Units are designed with custom configurations of standard components to meet unique project requirements. Total system integration is also available including heating, cooling, enthalpy recovery and special filtration.

Why Use Desiccant Technology?

Very dry air can be achieved.

Better thermodynamic efficiency: Achieved because no change of phase (condensation) is necessary.

Simple construction: Basic dehumidifier includes only two fans, a heater and the desiccant rotor assembly.

Simple maintenance: Simply replace filters regularly and performance is assured. A yearly inspection by our service technicians is recommended to head off unscheduled outages.

Better construction: Double-wall insulated casing suitable for indoor or outdoor mounting.

Modern controls: We include standard intelligent microprocessor controllers with "Fail Capable" mode and full building integration capable of using BACnet™, Modbus®, or LonWorks®.

DH Series Unit Sections

Filter

Dehumidification

Blower
Provide Dry Desiccant Air Supply

Uncontrolled humidity does not need to be a problem. By providing dry desiccant air supply you can control threats to safety, product and costs. Dry air is a solution to corrosion, bacterial, mold, and mildew growth. By using a CDI DH Series unit you can have independent control of moisture levels and temperatures. Now you can be as dry as you want at whatever temperature you want.

Schools, Hotels & Commercial Buildings

By centralizing the outdoor air and humidity control, individual conditioning units are only required to control sensible temperature. The dehumidified supply-air stream does not contribute to fungal growth in the distribution system and can actually reduce mold growth in secondary systems.

Wastewater Treatment Plants

Water filtration and wastewater treatment facilities commonly suffer from corrosion, mold, mildew, and poor reliability of electronic devices caused by condensation. This is especially true in northern climates where very cold influents are prevalent. Cold influent pipes sweat during elevated ambient humidity. By controlling the humidity of the air surrounding these cold pipes, condensation is eliminated.

Humidity control level is directly dependent upon the coldest surface temperature. CDI’s DH Series desiccant dehumidifiers actively reduce the space dew point to a level required to prevent sweating. In addition, CDI’s proprietary microprocessor prevents the room humidity from ever exceeding a set value.
Industrial/Manufacturing

Many industrial companies use chilled water to remove heat from various manufacturing processes. As the air or process is cooled below the ambient dew point, condensation can occur. Desiccant dehumidifiers can eliminate the condensation. Often, this results in a higher quality part or reduced cycle time, allowing parts to be produced faster.

Applications include industrial painting booths, glass laminating, electronics, and plastic injection or blowing molding. Processes requiring air at or below a 45° dew point can utilize CDI’s DH products to stabilize manufacturing consistency.

Cold Storage Loading Docks

By circulating dehumidified air through the loading dock or corridor, the relative humidity is lowered from 90% RH to 50% RH, reducing the latent requirements on the refrigeration system. The moisture is removed by the desiccant system, allowing the refrigeration system to control sensible temperature more efficiently. The dry dehumidified air is discharged directly over the access doorways to the storage freezer. This prevents moisture infiltration avoiding frost and ice buildup in the freezer. The dehumidifier provides a safer working environment with less maintenance costs.
The CDI Advantage

Multiple components and configurations provide a versatile unit to meet every application requirement.

Microprocessor Safeguards

CDI’s standard is a microprocessor controller for reactivation rate and safeguard functions, and for heating and cooling if those functions are present. Terminal-strip connection points are included for customer use for alarming, monitoring, and for communication with a building management system.

The user interface is included as standard equipment as part of the controller. The user-friendly display is kept from tampering in the unit control panel. The interface is an excellent tool for startup, troubleshooting, and monitoring unit operation. An optional remote located user interface panel is available when increased accessibility is an important project criterion.

The microprocessor reactivation controller maintains a constant burner-output temperature, so overheating the desiccant rotor is impossible. Modulating via a reset schedule minimizes energy use, and full-rated performance is available in cool weather because it is not necessary to limit the firing rate.

Circuitry Designed for Ease and Safety

CDI units use combination circuit breaker/overload/starters for fan motors. This eliminates the need for spare power fuses, and saves downtime. If an upset occurs, a simple reset will bring the unit back online.

Wiring to industrial terminal strips makes for easier connection and troubleshooting.

All doors are equipped with locking handles with common keyed access to prevent unauthorized access.
Stabilized silica gel is permanently bonded to a low specific-heat substrate for long-lasting dehumidification performance at maximum efficiency. The desiccant rotor rim and cassette are stainless steel for durability and strength.

CDI desiccant rotor seals are dual-contact, Viton extruded seals, designed to last for the life of the unit. This is the most durable seal in the industry.

Standard filters provided are minimum 30% efficient industrial pleated-style to insure a clean desiccant rotor. Additional filtration is available.

A full-perimeter sprocket with a #40 molly chain drives our desiccant rotor making it more durable than any other system on the market.

Our standard unit construction is G-90 galvanized steel, double-wall, and insulated. It is very rugged, and includes airtight, gasketed access doors to components.

The complete unit is ETL listed and approved. Every item shipped carries a full ETL approval including all options in compliance with the current mechanical code. We also have ETL-C listing for Canadian and country-specific C-E approvals for European projects.

Blowers

Standard blowers are backward inclined, non-overloading rated for total static pressure. Wherever possible, blowers are directly coupled to fans to eliminate belts and external bearings.
# DH Series Capacity Data

## Basic Unit Model #

|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|

## Process Air Data

<table>
<thead>
<tr>
<th>Desiccant Rotor Diameter</th>
<th>[in]</th>
<th>22</th>
<th>30</th>
<th>38</th>
<th>42</th>
<th>48</th>
<th>60</th>
<th>68</th>
<th>76</th>
<th>85</th>
<th>96</th>
<th>108</th>
<th>114</th>
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</thead>
<tbody>
<tr>
<td>Max Process Air Volume</td>
<td>[scfm]</td>
<td>1,500</td>
<td>3,000</td>
<td>5,000</td>
<td>5,800</td>
<td>7,500</td>
<td>12,000</td>
<td>15,000</td>
<td>18,000</td>
<td>24,000</td>
<td>29,000</td>
<td>38,000</td>
<td>47,000</td>
</tr>
<tr>
<td>Max External Static Pressure</td>
<td>[in W.C.]</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Max Outside Air Volume</td>
<td>[scfm]</td>
<td>300</td>
<td>600</td>
<td>1,000</td>
<td>1,160</td>
<td>1,500</td>
<td>2,400</td>
<td>3,000</td>
<td>3,600</td>
<td>4,800</td>
<td>5,800</td>
<td>7,600</td>
<td>9,400</td>
</tr>
</tbody>
</table>

## Return Air Volume

| Min | [scfm] | 1,200 | 2,400 | 4,000 | 4,640 | 6,000 | 9,600 | 12,000 | 14,400 | 19,200 | 23,200 | 30,400 | 37,600 |
| Max | [scfm] | 1,500 | 3,000 | 5,000 | 5,800 | 7,500 | 12,000 | 15,000 | 18,000 | 24,000 | 29,000 | 38,000 | 47,000 |

## Process Air Moisture Removal Rate

| Inlet Condition 1* | [lb H2O/hr] | 34 | 67 | 112 | 128 | 166 | 243 | 332 | 404 | 531 | 640 | 838 | 1,000 |
| Inlet Condition 2** | [lb H2O/hr] | 50 | 98 | 164 | 187 | 242 | 383 | 489 | 593 | 776 | 935 | 1,223 | 1,443 |

*1 based on inlet conditions of 45°F db and 44.2 gr/lb  **2 based on inlet conditions of 75°F db and 100 gr/lb

## Approximate Unit Dimensions

| Width (W) | [in] | 53.5 | 55.0 | 63.0 | 63.0 | 63.0 | 92.0 | 92.0 | 110.0 | 120.0 | 140.0 | 140.0 | 140.0 |
| Base Height (BH) | [in] | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| Height (H) | [in] | 41.0 | 42.0 | 54.0 | 54.0 | 60.0 | 72.0 | 84.0 | 99.0 | 99.0 | 123.0 | 132.0 | 138.0 |
| Length (L) | [in] | 64.0 | 86.0 | 90.0 | 94.0 | 98.0 | 112.0 | 154.0 | 160.0 | 192.0 | 192.0 | 192.0 | 192.0 |

## Approximate Unit Weight

| [lb] | 1,500 | 2,100 | 2,700 | 2,800 | 4,500 | 5,300 | 6,000 | 9,300 | 12,400 | 15,300 | 16,900 | 19,200 |

## Electrical Requirements (by reactivation type)

### Direct Fired Burner or Steam Heating Coils

| 200V 3PH 60Hz | [FLA] | 12.7 | 25.0 | 31.5 | 37.8 | 55.5 | 77.0 | 92.8 | 100.4 | 155.8 | 155.8 | 185.1 | 222.8 |
| 230V 3PH 60Hz | [FLA] | 11.4 | 21.8 | 27.4 | 32.8 | 48.2 | 66.8 | 80.4 | 86.9 | 132.3 | 132.3 | 157.3 | 190.3 |
| 460V 3PH 60Hz | [FLA] | 5.8 | 10.9 | 13.7 | 16.4 | 24.1 | 33.4 | 40.2 | 43.4 | 66.1 | 66.1 | 78.6 | 95.1 |
| 575V 3PH 60Hz | [FLA] | 4.6 | 8.7 | 10.9 | 13.1 | 19.3 | 26.7 | 32.2 | 34.8 | 54.4 | 54.4 | 64.8 | 75.1 |

### Electric Resistance Coils

| 200V 3PH 60Hz | [FLA] | Consult Factory | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 230V 3PH 60Hz | [FLA] | Consult Factory | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 460V 3PH 60Hz | [FLA] | 43.5 | 83.8 | 139.4 | 162.2 | 206.3 | 323.7 | Consult Factory | N/A | N/A | N/A | N/A |
| 575V 3PH 60Hz | [FLA] | 34.8 | 67.0 | 111.4 | 129.7 | 165.1 | 258.9 | Consult Factory | N/A | N/A | N/A | N/A |

## Reactivation Air Data

| Reactivation Air Volume | [scfm] | 400 | 791 | 1,315 | 1,529 | 1,983 | 3,132 | 3,977 | 4,886 | 6,368 | 7,670 | 10,022 | 11,712 |
| Direct Fired Burner | [Btu/h] | 107,800 | 215,600 | 359,200 | 416,700 | 538,900 | 862,200 | 1,077,800 | 1,293,300 | 1,724,400 | 2,083,600 | 2,730,300 | 3,377,000 |
| Electric Resistance Coils | [KW] | 30 | 58 | 100 | 116 | 145 | 231 | Consult Factory | N/A | N/A | N/A | N/A |
| Steam Heating Coils*** | [lb H2O/hr] | 126 | 249 | 417 | 489 | 636 | 913 | 1,166 | 1,448 | 1,868 | 2,238 | 2,959 | 3,442 |

***Based upon 100 psi steam pressure

## Max External Static Pressure

| [in W.C.] | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

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ETL-C, ETL and CE Rated

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