

HOPPER BANK OPERATING MANUAL



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DESCRIPTION & FEATURES

Dri-Air Industries' Hopper Banks are a self contained central drying system capable of being moved to any location in your facility where you might need multiple materials dried simultaneously at different temperatures, or quick changeovers to previously dried resins. Each Hopper Bank should be utilized in conjunction with one of our Arid-X/HP4-X dryers, or any other comparable desiccant dryer.

Only one dryer is needed to supply desiccated air to the hopper bank (the number of drying hoppers and sizes can vary depending on your needs). The air supply to the hopper bank is distributed to each drying hopper through the use of a multi-port manifold. Each hopper is equipped with independently adjustable valves to regulate airflow to the hopper. Care must be taken to ensure that the dryer is adequately sized for the capacity of the hopper bank. See the Dryer Selection section for further assistance on selecting a dryer.

Each hopper has its own heater assembly and dedicated digital temperature controller, allowing each hopper to operate at a different drying temperature. The recommended operating temperature range of each hopper is between 150 degrees to 350 degrees F (providing the dryer supplying the dry air to the bank is set for 150 degrees F or lower). To control the temperature for each hopper, first set the dryer to the recommended 150 degrees F (See dryer operating manual) and then set the digital controller to the desired operating temperature (See Start-up Procedure Section of this manual).

Operational Requirements

Hopper Banks are available in various voltages and electrical configurations to accommodate domestic and export requirements. (See below)

208 - 230 volt, 3 phase, 50/60 HZ

400 - 480 volt, 3 phase, 50/60 HZ

The operational temperature range is 150° to 350° F (66° to 177° C). This may vary due to operational restrictions of the dryer, as some dryers may not be able to operate at 150°F or lower.

Dryer Selection

Care must be taken when selecting the appropriate dryer size (CFM) for the Hopper Bank configuration. As the configuration and quantity of hoppers in a bank can vary, the dryer size can be determined by multiplying the total hopper capacity (listed pounds of material) by the minimum cfm/lb. factor of 0.5.

Example:

Hopper Bank Configuration – 4 60 lb. Hoppers

Total Capacity - 4 x 60 = 240

Minimum Dryer Size – 240 x 0.5 = 120 CFM

INSTALLATION PROCEDURE

The following steps must be taken to properly set up and operate this hopper bank.

Hose Connection

Place dryer next to hopper bank with controls placed for easy access.

The process air manifold on the hopper bank is designed to allow the dryer's process air hoses to be connected to either end of the manifold. This is to allow the operator greater flexibility when installing this unit. Simply choose which end of the bank is most suitable to connect the dryer to, connect the dryer, and then use the material plugs supplied with the hopper bank to plug the other ports.

Connect process air outlet hose from of dryer to the inlet port of the hopper bank located on the bottom manifold tube. Connect the dryer return air hose to the hopper bank outlet port located on the upper manifold tube. Tighten all clamps.

Electrical Connection

The hopper bank has two power supplies. The main power supply is used to operate the heaters and the secondary 110 volt power supply is used for operating the hopper bank's control system. The main power is supplied directly from the facility power distribution system, while the secondary control power is supplied through the dryer and prohibits the bank from operating unless the dryer is connected and operating.

Main Power Connection

Electrical connections and wiring must be performed by a qualified electrical technician using connecting devices and wiring suitable for this application.

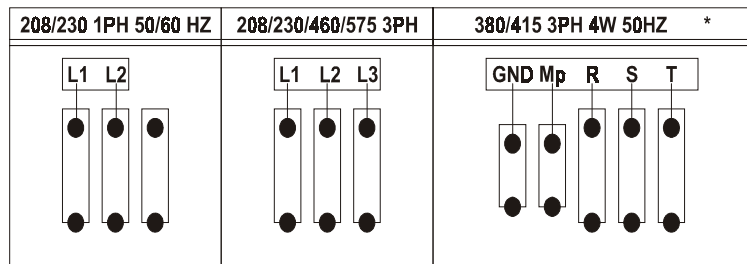
Ensure that the facility power supply is matched to the power requirements of the hopper bank and that

the supply is equipped with adequate over-current protection.

Open the electrical panel enclosure door by turning the disconnect off and loosening the retaining clamps holding the enclosure door. Slide the clamps away from the tabs and open the door. Locate the disconnect by following the shaft down to the panel. Cut a cable hole in the side of the enclosure and insert the power cable through the hole.

<<Use approved wire and fastening means>>

Wire the incoming power to the top of the disconnect as shown in the diagram below.



Secondary Control Power

The Secondary Control Power circuit is provided to ensure that the main power to the hopper bank cannot be turned on when the attached dryer is not operating (to prevent the hopper bank from heating when there is no airflow). This circuit utilizes the dryer's 110 volt power supplied the dryer's main contactor to feed the hopper bank main contactor. When the dryer is activated, power is supplied to the hopper bank main contactor, enabling the operator to actuate the hopper bank heaters.

Located on the side of the hopper bank electrical panel enclosure is a two-wire cable with a twist lock connector. This cable is connected to the main contactor in the hopper bank electrical box. If the hopper bank was purchased with a Dri-Air dryer, the dryer will have a matching connector to plug the hopper bank in to. If the dryer is not equipped with the appropriate connector, the two-wire cable from the hopper bank electrical box must be wired to the main contactor coil in

CAUTION !!!! FAILURE TO CORRECTLY WIRE THE HOPPER BANK TO THE DRYER WILL RESULT IN DAMAGE TO THE HOPPER BANK AND MOST LIKELY MATERIALS BEING DRIED.

the dryer. This can be accomplished by reconfiguring the dryer with a suitable plug wired to the 110 volt power supply used to pull in the dryer's main contactor or directly wiring the cable to the main contactor coil. Please refer to the dryer's electrical schematic for more detail on wiring. Nothing else should be connected to the cable except the hopper bank and dryer.

The Hopper Bank is now ready for operation.

START-UP PROCEDURE

Located on the hopper bank's Electrical Panel Enclosure are the controls for operating the hopper bank. Each bank is supplied with a Main Power Disconnect, Main Power Toggle Switch, Digital Controllers and their associated Power Switch.

Switches/Disconnect

The Main Power Disconnect controls power for the operation of the heaters and digital controllers.

The Main Power Toggle Switch controls the 110 volt power to actuate the Main Contactor. The Hopper Bank will not operate unless this switch is actuated.

The Digital Controller Toggle Switch controls power to the controller that actuates the associated hopper heater.

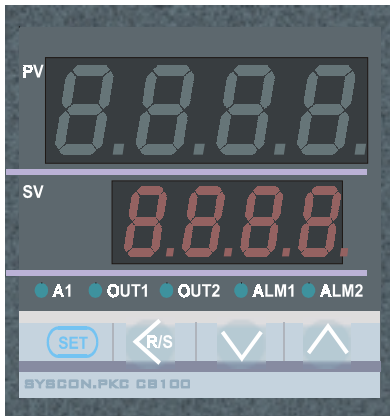
To start the Hopper Bank, open each of the hoppers' inlet and outlet port butterfly valves to allow full airflow and follow the procedures detailed below.

CAUTION !!!!! MAKE SURE IF A HOPPER TEMPERATURE CONTROLLER IS TURNED ON, THE AIRFLOW BUTTERFLY VALVE MUST BE OPEN. FAILURE TO DO SO WILL RESULT IN DAMAGE TO HEATERS AND HEATER TUBES.

1. Start the dryer in accordance with the dryer's operating manual.
2. Actuate the hopper bank Main Power Toggle Switch.
3. Actuate the Digital Controller Toggle Switch for each hopper utilized.
4. Set each digital temperature controller (using the procedure detailed below) to the desired drying temperature for the material in each respective hopper.
5. Close the air valves on the hoppers that are not in use and have the controls turned off

Setting Temperature

A dedicated digital controller controls the process air temperature for each hopper. The controller has been factory set and auto-tuned to the operational parameters of the hopper bank. Do not adjust these settings without consulting the factory. To set the process air temperature, use the buttons on the face of the digital controller and follow the procedures detailed below:



1. Press the SET button – temperature set point display (SV) will flash.
2. Press up arrow and down arrow keys to adjust setting.
3. Press left arrow key to move cursor.
4. Press the SET button again to enter the new setting.

If the upper Temperature Readout Display (PV) flashes, the temperature is out of the control range.

If the display shows 0000, the thermocouple is not connected or is faulty.

ROUTINE OPERATION

Fill each hopper to be utilized with the resin that you want to dry, ensuring that the level of the material is always above the perforated liner in the hopper base. Do not overfill the hopper as airflow may become restricted due to material blocking the outlet port. This will cause the material to not fully dry, resulting in molding problems.

If not all hoppers are in use, turn off the power to the applicable hopper controller and heater by actuating the toggle switch on the hopper bank and close the hopper's airflow butterfly valves

When shutting down the hopper bank, turn off the main power on the hopper bank and open all airflow butterfly valves.

PARTS LIST FOR HOPPER BANK

<u>PART NUMBER</u>	<u>DESCRIPTION</u>
84016	TEMPERATURE CONTROLLER
81468	SOLID STATE RELAY FOR 208-240 VOLT UNIT
81649	SOLID STATE RELAY FOR 460 VOLT UNIT
83502	250 DEGREE SNAP DISC THERMOSTAT
82174	1/8"X 6" THERMOCOUPLE
81142M	THERMOCOUPLE PLUG
84368	HEATER TUBE GASKET
82308	DISCONNECT
82270	30 AMP MAIN CONTACTOR
82904	50 AMP MAIN CONTACTOR – 208V W/RH60 – RH150 HOPPERS
82388	TRANSFORMER

HEATERS

	<u>208/240v</u>	<u>400v</u>	<u>460v</u>	<u>575v</u>
RH5 TO RH30	84399	—	84400	—
RH60 TO RH150	82343	84204	82319	84065

