

**ARID-X & HP4-X 150-300
FLOOR MOUNT DRYERS
OPERATING MANUAL**

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DRYER OPERATION/ FEATURES

The ARID-X and HP4-X 150, 200, and 300 model dryers are designed for use in high volume injection or extrusion molding applications with usage rates up to 300 lbs. per hour.

The ARID-X dryer series is a dual bed design that provides a constant supply of dry air to the material hopper. While one bed is removing moisture from the process air the other is regenerating by heating the desiccant to a high temperature. Once the regenerated bed cools down, the Zone Valve switches the airflow, and the newly regenerated bed is used to desiccate the process air stream. The saturated bed is now regenerated in the same manner, completing the regeneration cycle. The cycle is depicted Page 8.

The airflow design of the ARID-X dryers makes the regeneration cycle more efficient because we utilize a small amount of the desiccated process air rather than ambient air to regenerate the desiccant bed. This reduces the impact of the high moisture content of the ambient air, which would contaminate the desiccant bed, and allows the dryer to attain a lower dew point. Please see the Air Flow Schematic on Page 6.

HP4-X Design

Our patented HP4-X design incorporates 4 desiccant beds where two are stacked, one over the other. This nearly doubles the amount of desiccant available for drying the process air stream, and because of the tower design, the dryer is able to regenerate the desiccant in the same time as our ARID-X series. This allows the dryer to operate in very high humidity conditions without affecting the process air dew point. In fact, this design produces dew point levels of -40' to -80' C for faster more complete drying of your material. Please see the Air Flow Diagram on Page 7.

Hopper Design

Dri-Air's "all stainless" hopper design utilizes a stainless steel inner shell surrounded by a stainless steel jacketed insulation layer. The easily removable stainless steel spreader cone promotes proper material flow to ensure that the material is dried efficiently and no dried material is left at the hopper bottom that needs to be fed out prior to operating. You must ensure that your hopper is adequately sized for your usage rate and is kept filled, to ensure that you have sufficient time to dry the material.

DRYER OPERATION/ FEATURES (Cont.)

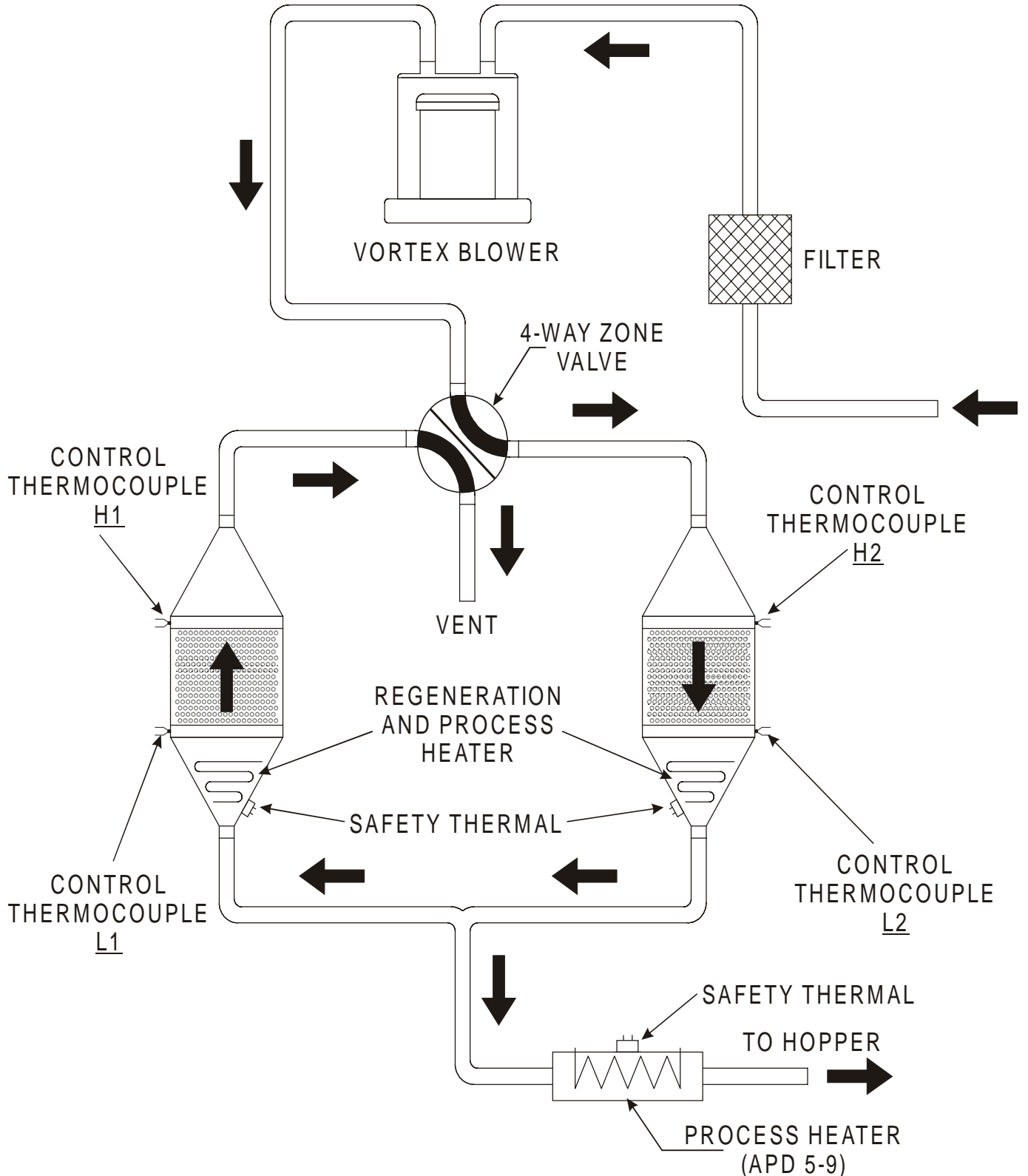
Dryer Controls

The ARID-X series can be supplied with the standard PLC Control Module or the advanced Microprocessor Control Module, while the HP4-X series is only available with the Microprocessor Control Module.

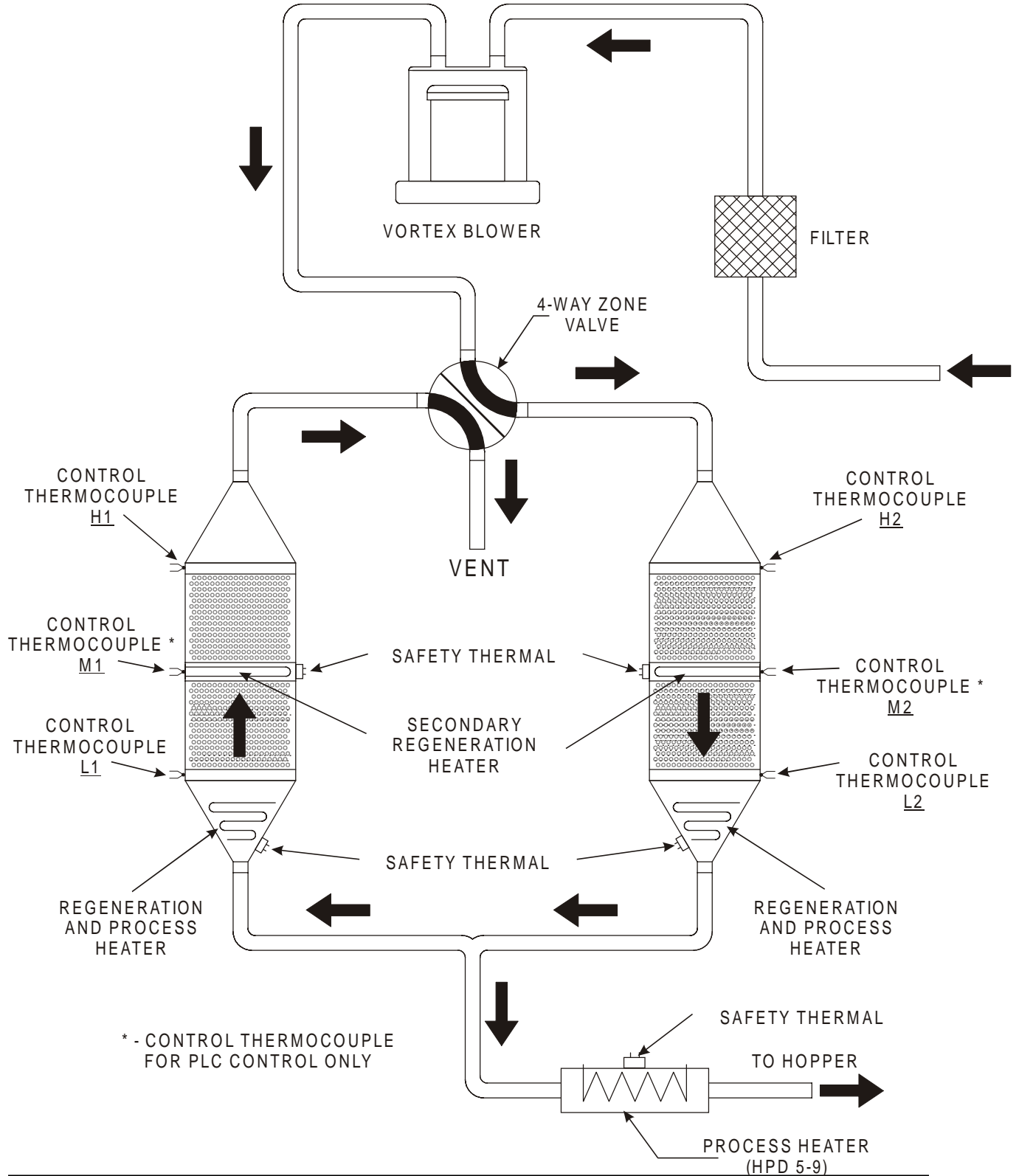
The PLC Control module includes a PLC control board, display board, temperature controller and touch pad that is programmed for the drying cycle described above. The controller, display board and touch pad indicate the machine status, alarms, set points and allow you to enter operational settings for the dryer. These are explained in more detail later in this manual.

The Microprocessor Control Module is one of the most sophisticated yet operator friendly controls on the market. It has many more features than the PLC control module that provide the operator with more control and operational flexibility with the dryer. These features and the operating instructions are covered in detail in the Microprocessor Control Instruction Manual included with your dryer.

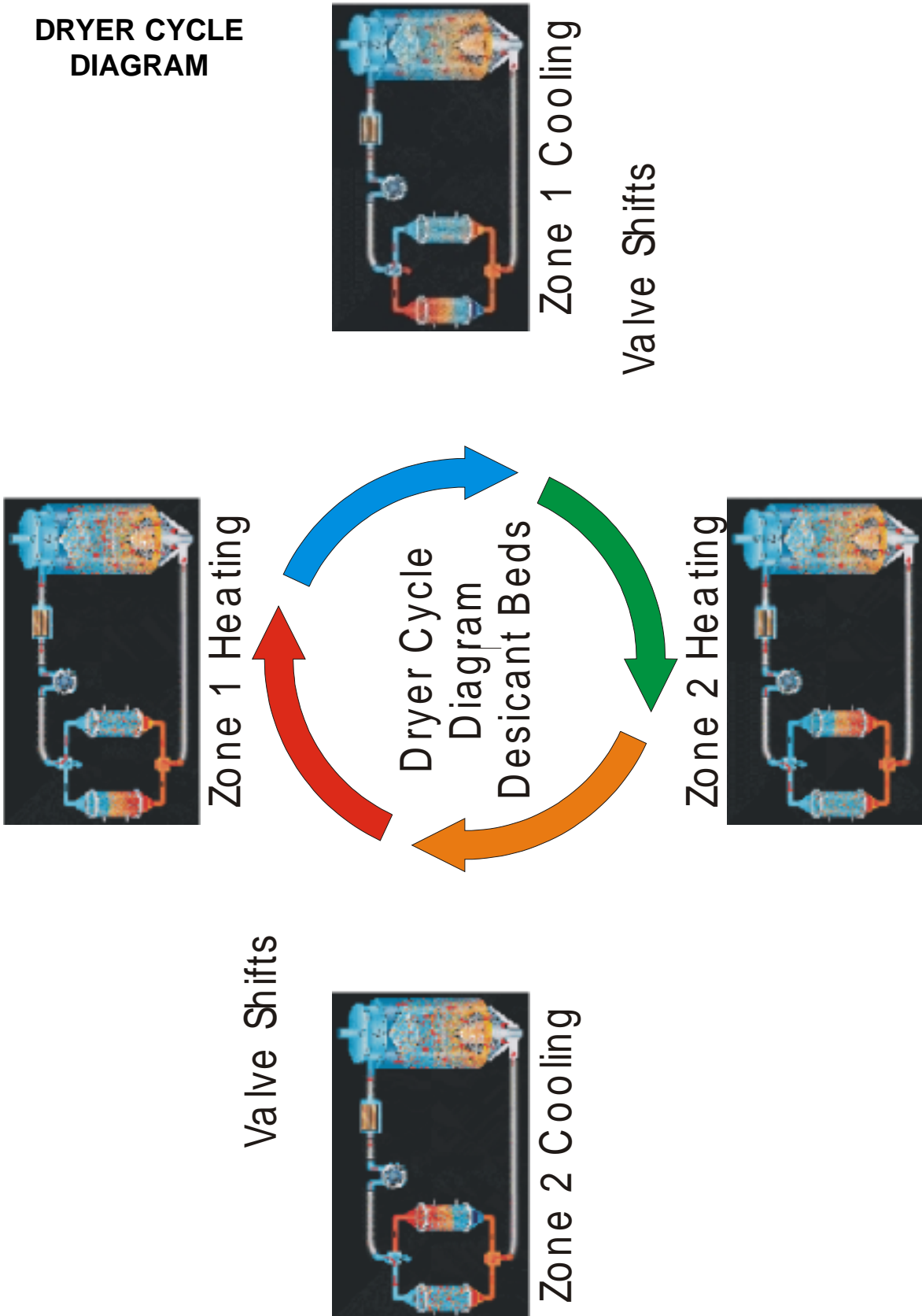
**AIR FLOW SCHEMATIC
FOR ARID-X DRYERS**



**AIR FLOW SCHEMATIC
FOR HP4-X DRYERS**



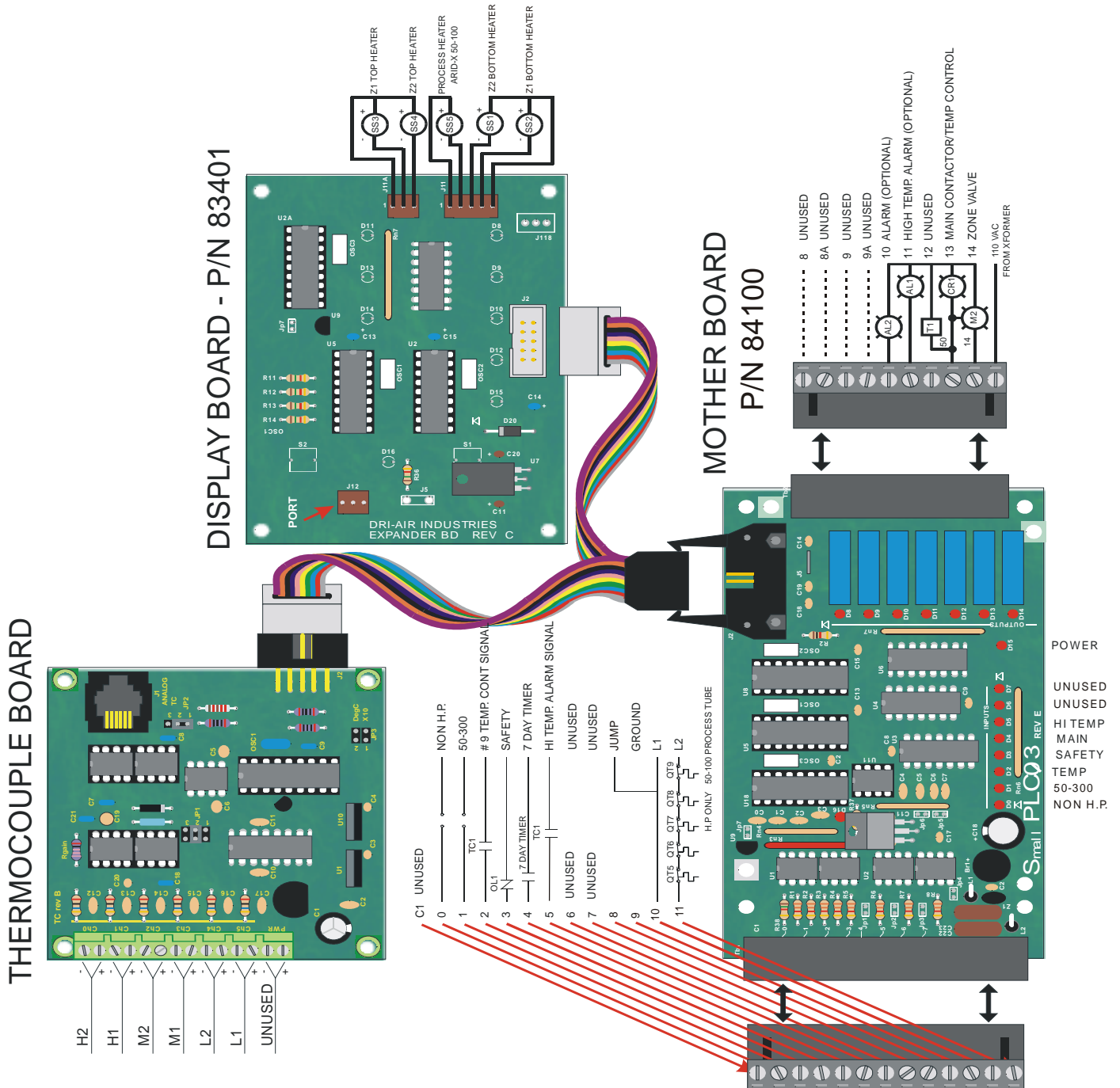
**DRYER CYCLE
DIAGRAM**



PLC STANDARD ELECTRICS

The control package includes a PLC controller which is programmed for the drying cycle previously discussed. The display board indicates the machine status, heater operation and alarms. See section on start up for details.

Below are descriptions of the inputs and outputs of the PLC which are used for trouble shooting. A lit LED indicates the input or output is actuated. All inputs are 12 volts AC and all outputs are 110 volts AC and 15 v DC to the heater relays. Refer to the electrical schematic for more detail.



INSTALLATION PROCEDURE

For all Dri-Air models except ARID-X 10, AHM-1, & PDII

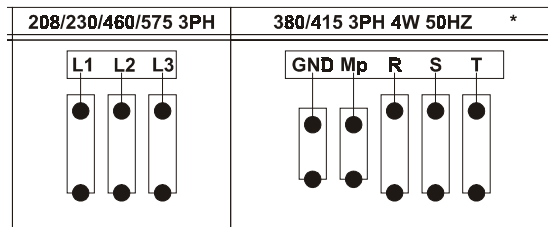
Electrical Connection:

Open electrical access door on the front of the electric panel enclosure box by turning the disconnect off, loosening the clamping screws and sliding the clamps off the door tabs. Locate the disconnect by following the operating handle down to the electrical panel.

Insert the incoming power cable or conduit through the hole provided on the side of the panel enclosure box.

« **use approved wire and fastening means** «

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



NOTE:

When 3 wire supplies are used in place of 4 wire supplies, a control transformer is required.

3 PHASE DRYER INSTALLATION
CHECK FOR CORRECT MOTOR ROTATION
BEFORE RUNNING DRYER

To check motor rotation.....

Remove front panel to Blower Cabinet (below elec. panel box) so the blower can be observed. Turn on the power to the dryer and press the **ON/START** touch pad and then immediately press the **OFF/STOP** touch pad. Observe the cooling fan on the top of the blower motor and verify the fan is turning clockwise. If the motor is not turning clockwise, switch any two adjacent supply wires.

Compressed Air Connection:

Compressed air is required for ARID-X and HP4-X 150/200/300 Floor Mount models to operate the dryer's Zone Valve.

CONNECT COMPRESSED AIR TO INLET ON DRYER SIDE PANEL. Maximum incoming pressure not to exceed 145 psi (1.0 mpa). The pressure gauge on the dryer is factory set to 60 psi.

The unit is now ready for operation.

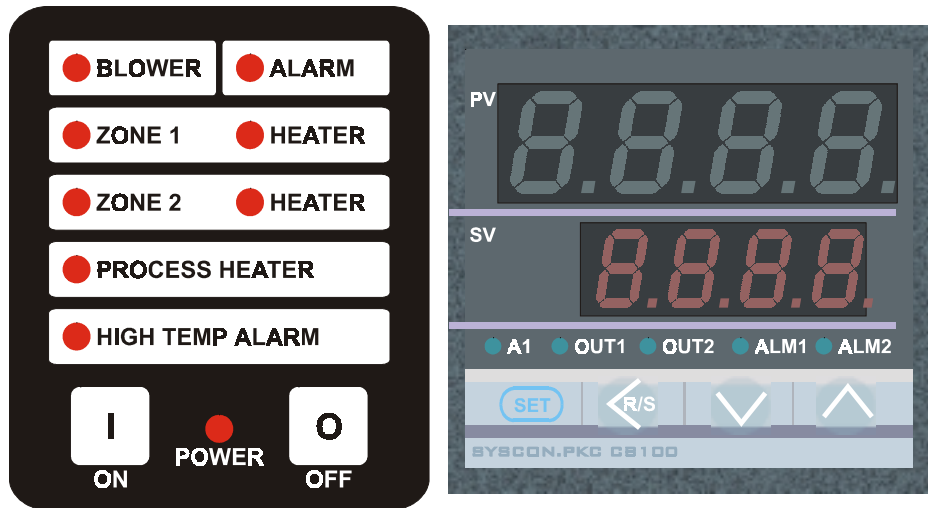
START-UP PROCEDURE Standard Electrics

Turn Power on to Dryer:

1. Power light indicates power to the unit is on.
2. Illuminated Blower Light indicates Blower is on.
3. Flashing Zone light indicates bed is in Regeneration cycle.
4. Steady Zone light means bed is in cooling cycle.
5. Illuminated Heater lights indicate heater is on.

Alarm Conditions:

6. Flashing High Temp. alarm indicates an over or under temp alarm. Unit shuts down.
7. Steady High Temp. Alarm light indicates unit has failed. Further diagnostics are required



To Set Temperature:

Press SET button - temperature set display will flash.

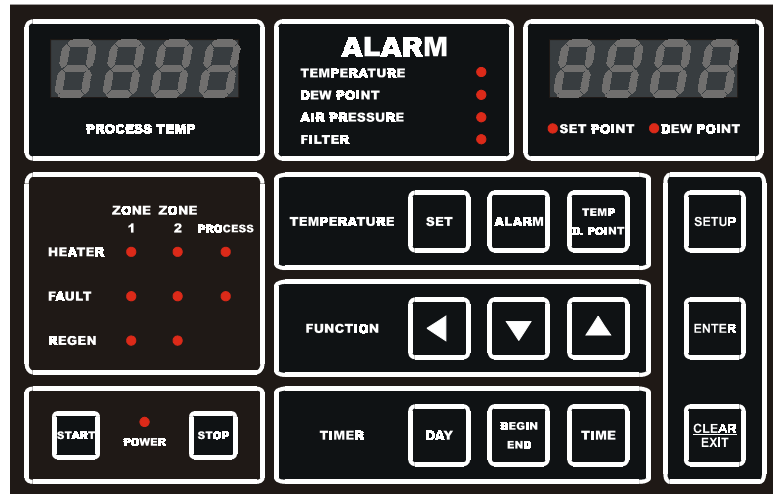
Press up arrow to increase temperature and down arrow to decrease temperature.

Press SET again to enter the new temperature.

If the display flashes, the temperature is out of the control range.

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

Microprocessor Control



1. Power light indicates there is power on.
2. After initializing, dri Air will be displayed.
3. Press START to start the dryer.
4. To set the temperature:
 - press SET - right display shows set temp
 - change setting using arrow keys
 - press ENTER to input new setting
5. Left display indicates actual temperature
6. Right display shows dewpoint or set temp
 - press TEMP D.POINT button to change
7. To set high temp alarm: (degrees over setting)
 - press ALARM - right display shows setting
 - change setting using arrow keys
 - press ENTER to input new setting
8. Status block indicates heater on or fault
9. See manual for setting 7-day timer .
10. Configuration of the dryer parameters is done using the setup button. See manual.

DRYER OPERATION TROUBLE SHOOTING

The new Dri-Air Standard PLC and MICROPROCESSOR Electrics were designed for quick diagnosis of problems.

The following steps should be done before proceeding with other diagnostic steps.

1. Check the Power Circuit:

- a. Incoming fuses or circuit breaker
- b. All dryer fuses:
Each fuse, with the exception of the main fuses, has a blown fuse indicator light that illuminates when the fuse is blown.
- c. Is power supplied to the unit?
- d. Check heater continuity using a volt ohmmeter.

2. Compressed Air:

- a. Is compressed air connected with at least 60 PSI
- b. Check water separator and drain if necessary
- c. Pressure gage should read 60 PSI

3. Air Flow Circuit:

- a. Ensure Zone Valve position corresponds to the regeneration cycle by noting the valve's zone position as detailed in the section discussing troubleshooting the Pneumatic Zone valve on page 15 of this manual.
- b. Make sure that all hoses are connected, not crushed, and free from obstructions.
- c. Inspect filter and make sure cover is tight and the filter is clean.

4. Control Circuit:

- a. Using the PLC/MICRO Display Panel ZONE indicator lights as a guide for the dryer regeneration cycle, check that all inputs/outputs are proper for the part of the regeneration cycle that the machine is in.

5. Operating Conditions:

- a. Check the process temperature. It should **not** be set below 140° F (60° C) because the unit will go into high temp alarm.

DRYER OPERATION DETAILED DIAGNOSIS (PLC Controlled Dryer)

**For Micro Controlled dryers please
see the Microprocessor Control
Instruction Manual**

Machine will not start: Power light is not on.

1. Check incoming fuses inside control box to see if they are tripped or blown. Reset circuit breakers by turning them off and then on.
2. Check small fuses (FU1 & FU2) next to contactor. The LED will be lit if they are blown. Replace if necessary by opening the fuse holder and put new fuse into holder.
3. Check that incoming power to the unit is proper.
4. Check safety snap discs.

Alarm light is flashing: Unit will not run. Main contactor is not pulling in.

1. Check the motor overload OL1 located in the panel. If it is tripped, the window will show as orange/yellow. Reset overload by pushing in the reset button.

Machine will not run: High Temp Alarm Light flashing:

This indicates that the temperature has exceeded the high limit programmed into the temperature control or the set temperature can not be reached.

Press stop and restart machine holding in the start button. Monitor the actual temperature to see if it exceeds the set point or can not reach the set point. If it can not reach set point, see section below.

Machine will not run. High Temperature Alarm on, not flashing:

1. This indicates an "open" thermocouple or the temperature in the desiccant tower exceeded 900° F.

Machine will not reach temperature:

1. If the process heater light is not lit.
 - A. Check output from temperature controller and input to PLC.
 - B. Check the thermocouple. The tip should be in the middle of the hose.
2. If the process heater light is lit.
 - A. Check fuses.
 - B. Check solid state relays.
 - C. Check that the air flow is correct.
 - D. Check blower rotation.
 - E. Check heater for continuity.

Check the limit first by pressing the SET button on the temperature control and holding until AL is displayed. The setting shown indicated the amount over set point that the alarm will be actuated. It is factory set to 50°F (30°C) and should not be set below 30°F (16°C) or it will actuate too soon.

If the temp exceeds the set point check the following:

1. Remove the hose from the top of the hopper to check air flow. There should be air flow out of the hopper with a suction on the hose. If there is little or no flow, check the inlet hose.
2. Inspect the filter to make sure that it is clean and not affecting the air flow.
3. Check the solid state relays to see if one of the solid state relays has failed on. Using an ammeter or voltmeter on the output to the heater, see if there is power when the LED is not lit which will indicate a failed relay.
4. Check the Zone Valve position.

**DRI-AIR
PNEUMATIC ZONE
VALVE
TROUBLESHOOTING**

The Dri-Air Pneumatic Zone Valve is designed to provide very little flow restriction and no leakage. It incorporates an Air-Flow Diversion Valve controlled by a single solenoid valve. The solenoid valve simultaneously actuates air cylinders on each side of the Air-Flow Valve, altering air flow through the dryer. When a new regeneration cycle begins, the valve diverts air to the newly regenerated tower and exhausts wet regeneration air from the desiccant bed being regenerated. This allows for a constant supply of dry air to flow to the material hopper. Air pressure should be kept at 60 psi to ensure reliable operation.

Trouble shooting is easy. To access the Air-Flow Diversion Valve, remove either side panel on the dryer cabinet. The valve is located in the “Blower Section”, positioned on the upright separating the blower section from the tower section of the cabinet. To determine which zone the valve is set to, locate the two ports on the top of the valve (one on each end) for exhausting wet regeneration air and place your hand over an exhaust port to feel for air flow. Air will be flowing from the port that is set to regeneration. (Note, as you face the dryer’s electrical panel enclosure, the exhaust port on the right side of the valve is for ZONE 1 and the port on the left side is for

ZONE 2.) Compare your findings to the lighted ZONE Position LED on the control panel display to ensure that they correspond with each other. If they do not correspond or if air is exhausting from both ports, the valve is not working properly. Check the following:

1. Check all air line connections to make sure they are tight.
2. Check air lines to ensure they are not cracked or broken.
3. Check incoming air pressure (60 psi min.).
4. Check operation of solenoid valve (See below).

To check operation of solenoid valve, remove front panel to blower compartment. The valve is located on the right-hand wall, directly connected to the air pressure regulator. Located on the top of the valve is a button, that when depressed will actuate the valve. With air pressure supplied to the dryer, use a small screw driver to depress the actuator button. Observe the action of the Air Diversion Valve. If the Diversion Valve operates, the solenoid valve is operating correctly.

ARID-X & HP4-X 150 - 300

	<u>DESCRIPTION</u>	<u>AX</u>	<u>HP</u>
<u>GENERAL</u>	Dryer Filter Element	81331	81331
	Zone Valve	83786	83786
	Thermocouple (Process)	82174	82174
	Thermocouple (Tower)	82175	82175
	Desiccant 80082 (Lbs/Machine)	74 lbs.	136 lbs.
	Tower Clamp	82197	82197
	Tower Gasket	83815	83815
	Pressure Switch	82813	82813
	Regulator	82995	82995
	SMC Valve	84220	84220
	Caster (Swivel)	82311	82311
	Caster (Fixed)	82312	82312

		<u>STD</u>	<u>MICRO</u>
<u>ELECTRICAL</u>	Disconnect (230v)	82714	82714
	Disconnect (460v)	82308	82308
	Temperature Control (RKC CB-100)	84016	NR
	Main Board	84100	82071
	Display Board	83401	82072
	Thermocouple Board	84049	NR
	Current Transformer	83437	84131
	Signal Transformer (230v)	NR	83817
	Signal Transformer (460v)	NR	82246
	Main Contactor (230v)	82904	82904
	Main Contactor (460v)	82270	82270
	Solid State Heater Relay	82302	82302
	IEC Contactor	80576	80576
	IEC Contactor*	84860	84860
	Single Pole Relay(Option)	82496	82496
	Double Pole Relay	80587	80587
	Four Pole Relay	81050	NR
Dual Solid State Board	NR	82870	
Toggle Switch	80466	80466	
Safety Thermal Switch	80221	80221	
Dewpoint Sensor	81908	81908	

NOTE:
TO ORDER BLOWERS OR
OVERLOAD REFER TO
PART NUMBER ON ITEM.

IEC CONTACTOR USED IN ALL
FM, PD & HM DRYERS AND CLL
POWER PACKS WITH SERIAL
NUMBERS GREATER THAN
D14650

<u>HEATERS</u>	<u>230V</u>	<u>400V</u>	<u>480V</u>	<u>575V</u>
Regeneration (Cone Style)	81091	81923	81367	81494
HP Center (Flat Style)	82722	82506	82517	84046
Process	82672	82047	82047	82696

