ARID-X & HP4-X 18-100
FLOOR MOUNT DRYERS
OPERATING MANUAL

DRI-AIR INDUSTRIES, INC.
16 THOMPSON ROAD
P.O. BOX 1020
EAST WINDSOR, CT 06088-1020

Tel. (860) 627-5110
FAX (860) 623-4477
Internet http://www.dri-air.com
e-mail: sales@dri-air.com

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DRYER OPERATION/ FEATURES

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.)

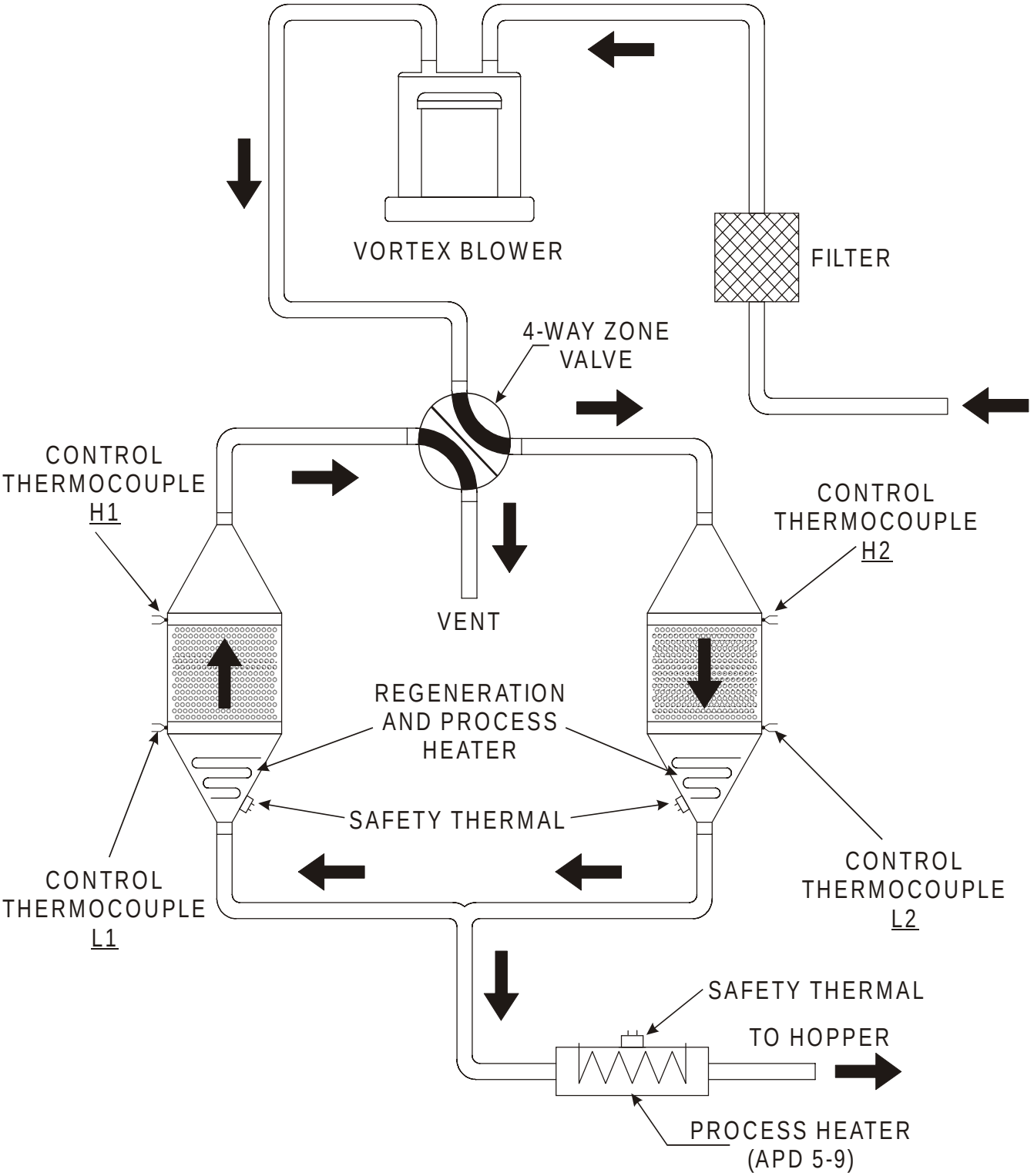
Dryer Controls

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.

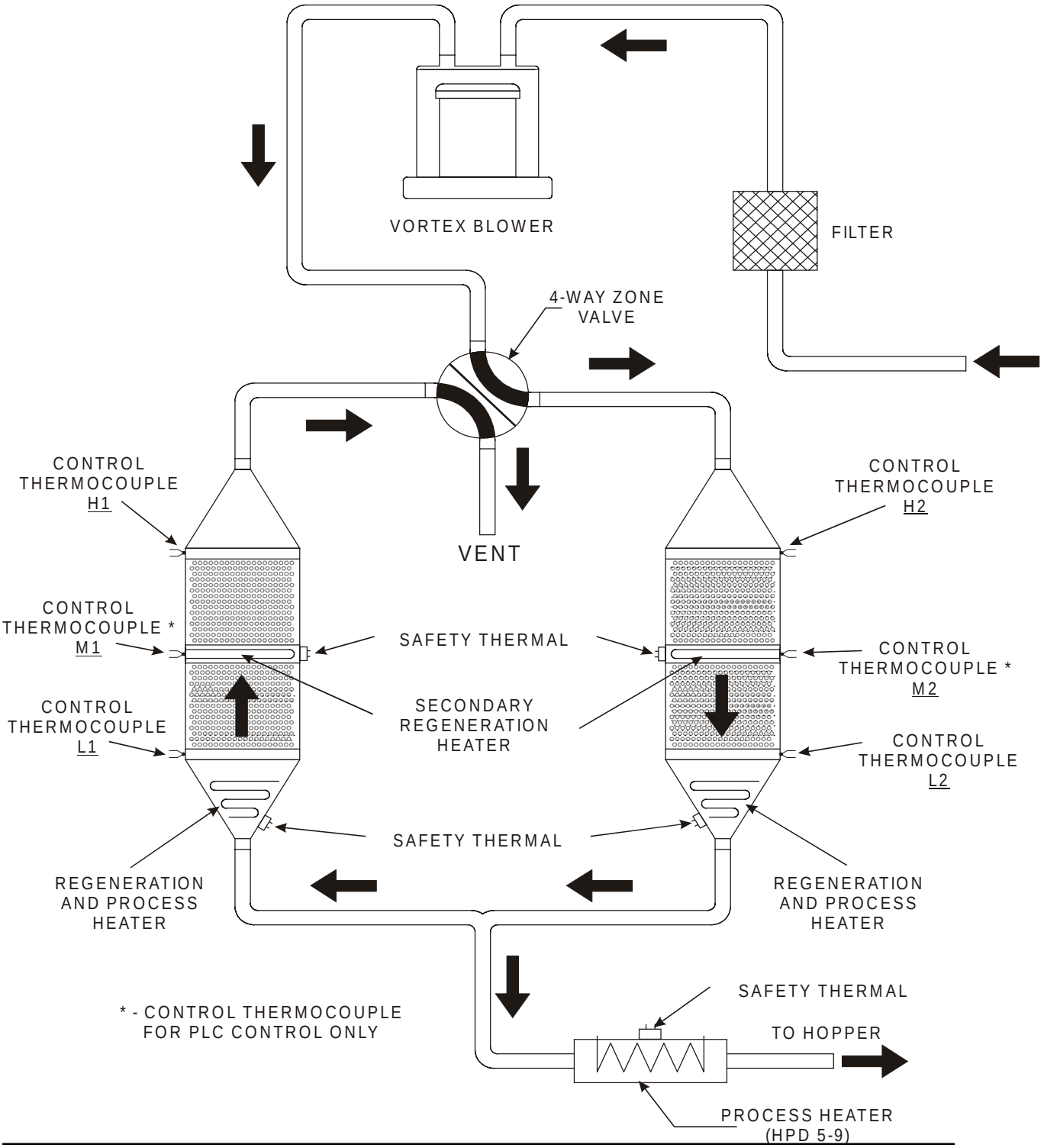
The PLC Control module includes a PLC control board, display board, temperature controller and touch pad that is programmed for the drying cycle described above. The controller, display board and touch pad indicate the machine status, alarms, set points and allow you to enter operational settings for 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.

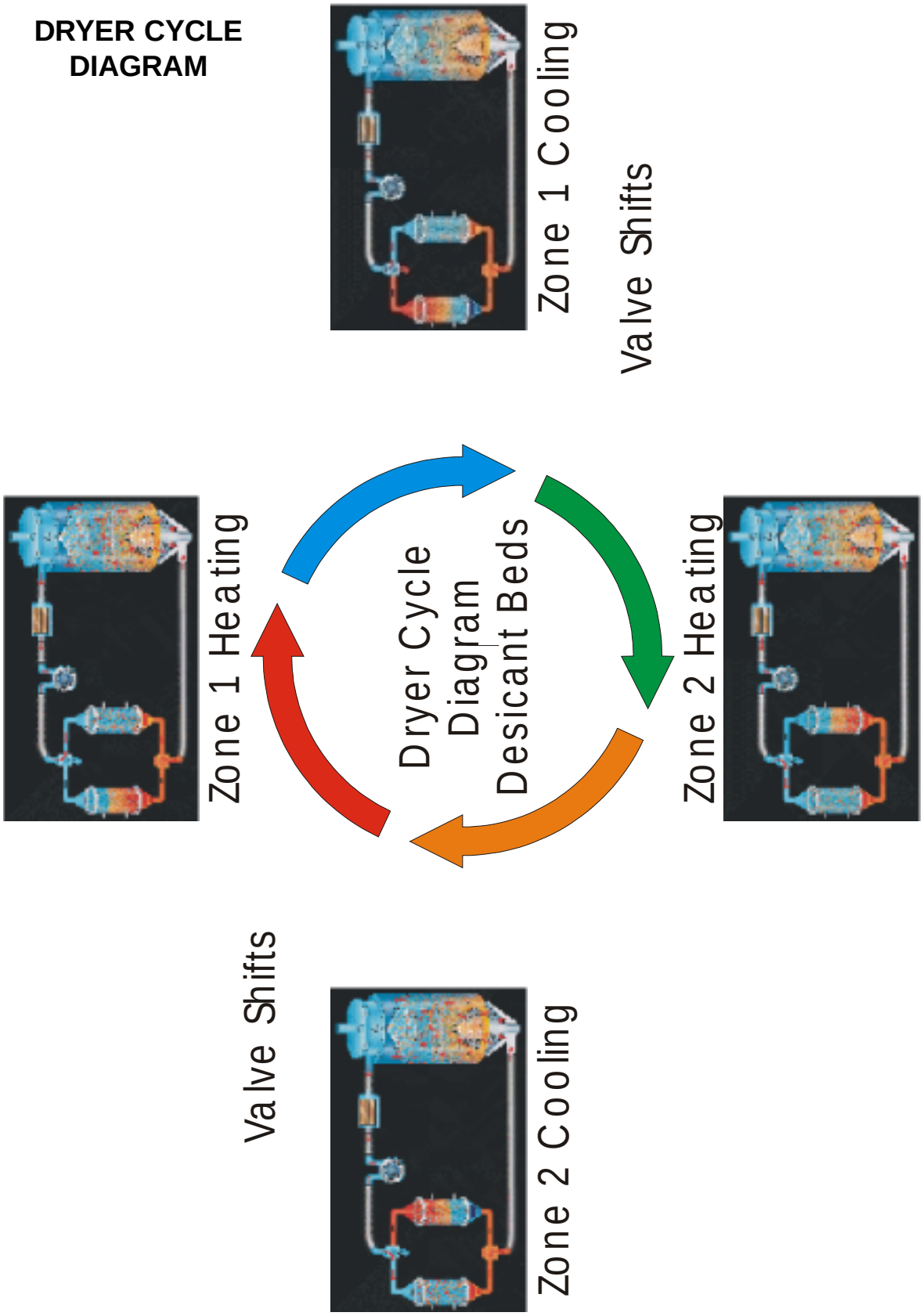
AIR FLOW SCHEMATIC FOR ARID-X DRYERS



AIR FLOW SCHEMATIC FOR HP4-X DRYERS



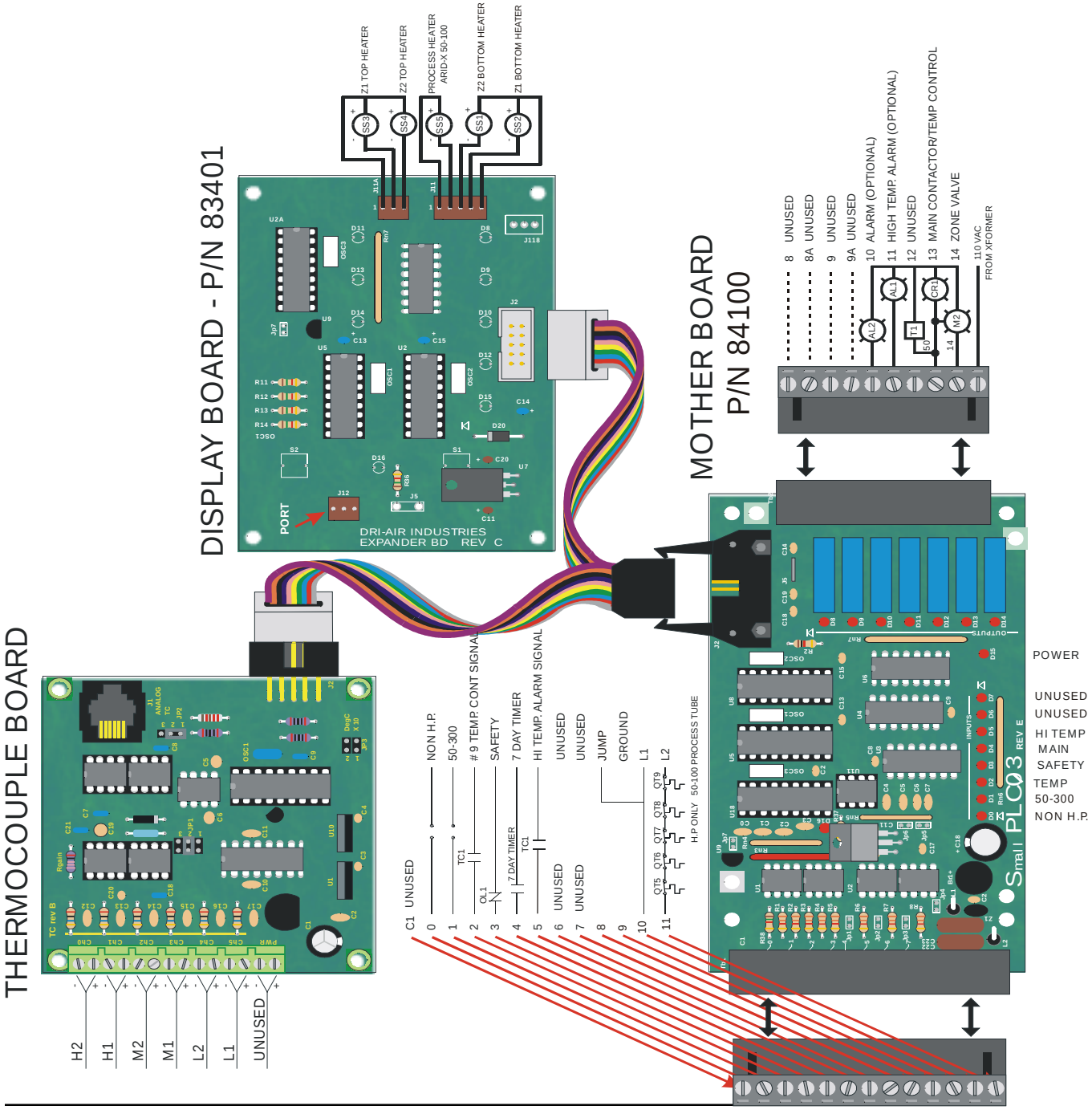
DRYER CYCLE DIAGRAM



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

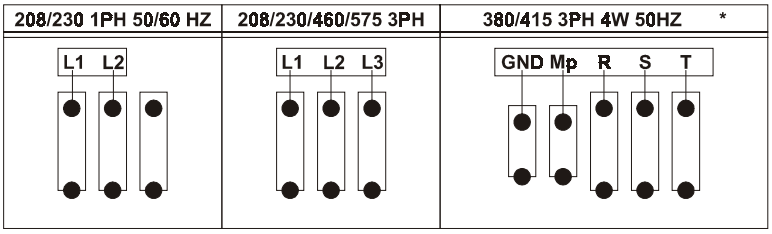
Electrical Connection:

Open electrical access door on the front of the machine by turning the disconnect off and turning the lower clamping screw 1/2 turn counterclockwise. 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 machine.

« *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.....
Leave the electrical cabinet door open 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.

The unit is now ready for operation.

Standard Electrics

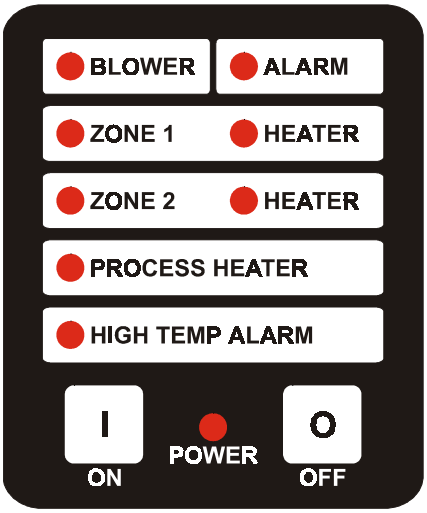
START-UP PROCEDURE

Operating this unit is very simple. Once the dryer is connected to the facility power supply, the unit can be started by turning the disconnect located on the electrical panel enclosure to the ON position and pressing the ON button on the Control Panel Key Pad. To shut the dryer off, simply push the OFF button on the Control Panel Key Pad and turn the disconnect to the OFF position.

Setting the process air temperature is done using the Digital Controller.

For a more detailed explanation, see the following sections.

Control Panel - Operating Display



Turn power on to dryer using disconnect.

1. POWER light indicates power to the unit is on.

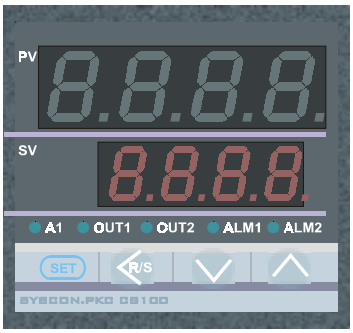
Press ON button on key pad.

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 light indicates 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 a thermocouple has failed. Further diagnostics are required.
8. Flashing ALARM light indicates a safety override condition has occured. Dryer shuts down.

Digital Controller - Setting Process Air Temperature:



Press SET button - temperature set display will flash.

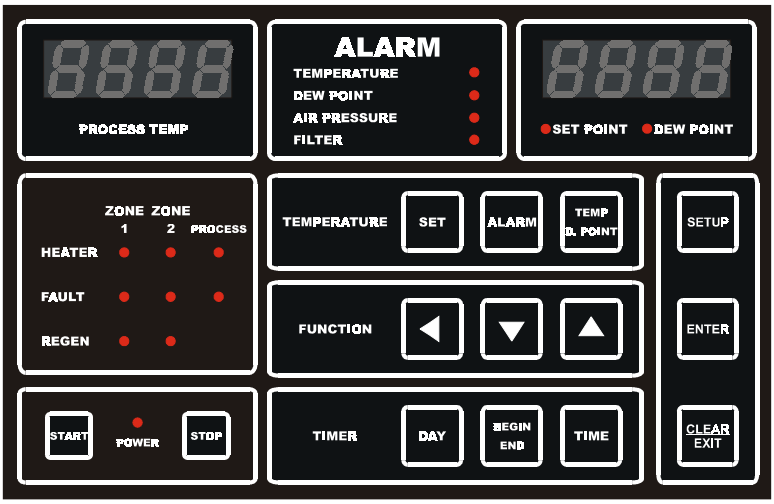
Press up arrow to increase temperature and down arrow to decrease temperature.

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.

For a more detailed explanation of the features and operation of the Microprocessor Controller, please consult the Microprocessor Control Operating manual enclosed with this unit.

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:
For those models that require 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 comparing the Zone position lights on the Zone Valve to the ZONE position lights on the dryer panel.
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.
b. Monitor the PLC output lights to ensure the corresponding LED on the power board is illuminated and there is an output voltage to the heater.

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 circuit breakers (CB1) or 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 on power board
   B. Check solid state relays on power board.
   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 power boards 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 valve position.

DRI-AIR ROTARY ZONE VALVE

The Dri-Air rotary valve is designed to provide very little flow restriction and no leakage. It incorporates high temperature, self adjusting seals for years of trouble free service. The electrical controls are built into the end of the valve and include position lights.

Trouble shooting is easy. If the lights indicating position do not match the zone displayed on the control panel, or there are no lights, the valve is not working properly. See if the cam is actuating a switch.

DO NOT PUT FINGERS INTO VALVE WITH POWER ON

Check all electrical connections to make sure they are tight.

Contact factory with the serial number of the dryer for a replacement valve.

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PARTS LISTS

GENERAL

DESCRIPTION	Arid-X	HP4-X
Dryer Filter Element	81055	81055
Zone Valve	83705	83705
Thermocouple (Process)	84054	84054
Desiccant 80082 (Lbs/Machine)	8 lbs.	14 lbs.
Tower Clamp	81017	80017
Tower Gasket	81028	81028
Regeneration Valve	NR	NR
Pressure Switch	NR	NR
Regulator	NR	NR
MAC Valve	NR	NR
Caster (Swivel)	80981	80981

ELECTRICAL

	STD	MICRO
Disconnect	82308	82308
Temperature Control (RKC CB-100)	84016	NR
Main Board	84100	82071
Display Board	83401	82072
Thermocouple Board	84049	NR
Transformer	83437	84131
Current Transformer	NR	82246
Main Contactor	82270	82270
Solid State Relay	82302	82302
IEC Contactor	80576	80576
IEC Contactor*	84860	84860
Power Board	83493	83493
Power Board (208 & 230 v Dryers)	84080	84080
Single Pole Relay	82496	82496
Double Pole Relay	80587	80587
Dual Solid State Board	NR	82870
Toggle Switch	80466	80466
Safety Thermal Switch(Tower)	80221	80221
Thermocouple (Tower)	82174	82174
TRI-Solid State Board	NR	83468
Dewpoint Sensor	81908	81908

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

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

HEATERS

	208V	230V	400V	480V	575V
Regeneration (Cone Style)	83342	83373	83982	83374	84235
HP Center (Flat Style)	82373	82373	83958	82505	84260
Process	NR	NR	NR	NR	NR

ARID-X & HP4-X 50 - 100

	DESCRIPTION	Arid-X	HP4-X
GENERAL	Dryer Filter Element	81331	81331
	Zone Valve	83705	83705
	Thermocouple (Process)	84054	84054
	Desiccant (Pounds / Machine)	30 lbs.	50 lbs.
	Tower Clamp	81172	81172
	Tower Gasket	82795	82795
	Regeneration Valve	NR	NR
	Pressure Switch	NR	NR
	Regulator	NR	NR
	MAC Valve	NR	NR
	Caster (Swivel)	80981	80981

		STD	MICRO
ELECTRICAL	Disconnect	82308	82308
	Temperature Control (RKC CB-100)	84016	NR
	Main Board	84100	82071
	Display Board	83401	82072
	Thermocouple Board	84049	NR
	Transformer	83437	84131
	Current Transformer	NR	82246
	Main Contactor	82270	82270
	Solid State Relay	82302	82302
	IEC Contactor	80576	80576
	IEC Contactor*	84860	84860
	Power Board	83493	83493
	Power Board (208 & 230 v Dryers)	84080	84080
	Single Pole Relay	82496	82496
	Double Pole Relay	80587	80587
	Dual Solid State Board	NR	82870
	Toggle Switch	80466	80466
	Safety Thermal Switch(Tower)	80221	80221
	Safety Thermal Switch(Process)	80551	80551
	Thermocouple (Tower)	82175	82175
	Transformer .050	82245	82245
	TRI-Solid State Board	NR	83468
	Dewpoint Sensor	81908	81908

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

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

		230V	400V	480V	575V
HEATERS	Regeneration (Cone Style)	81351	81766	81366	81432
	HP Center (Flat Style)	82364	83934	82493	83372
	Process	82343	84204	82319	84065

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