


**HP4-X 400 - 750
FLOOR MOUNT DRYER
OPERATING MANUAL**

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DRYER OPERATION/ FEATURES

The HP4-X 400/500/750 dryer series is a four bed dryer design that is ideal for use on large molding press or extrusion applications. This large capacity dryer combines our patented desiccant tower design and state of the art microprocessor controls to provide a constant supply of dry air to the material hopper. Material drying is controlled by utilizing one zone for removing moisture from the process air, while regenerating the other by heating the desiccant to a high temperature. Once the regenerated beds cool down, the Zone Valve switches the airflow, and the newly regenerated beds are used to desiccate the process air stream. The saturated beds are now regenerated in the same manner, completing the regeneration cycle. The cycle is depicted Page 7.

The airflow design of the HP4-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 double-stacked desiccant beds . 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.

Unique to the HP4-X 400/500/750 desiccant bed design is the use of two sets of desiccant towers per zone. The first tower in each Zone Set is the regeneration cycle “control tower”, while the second tower of the Zone Set is “slaved” off the first. Please see the Air Flow Diagram on Page 7.

Hopper Design

These dryers are designed to be used with our large capacity 1000, 1500, and 2000 lb. hoppers. 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

DRYER OPERATION/ FEATURES (Cont.)

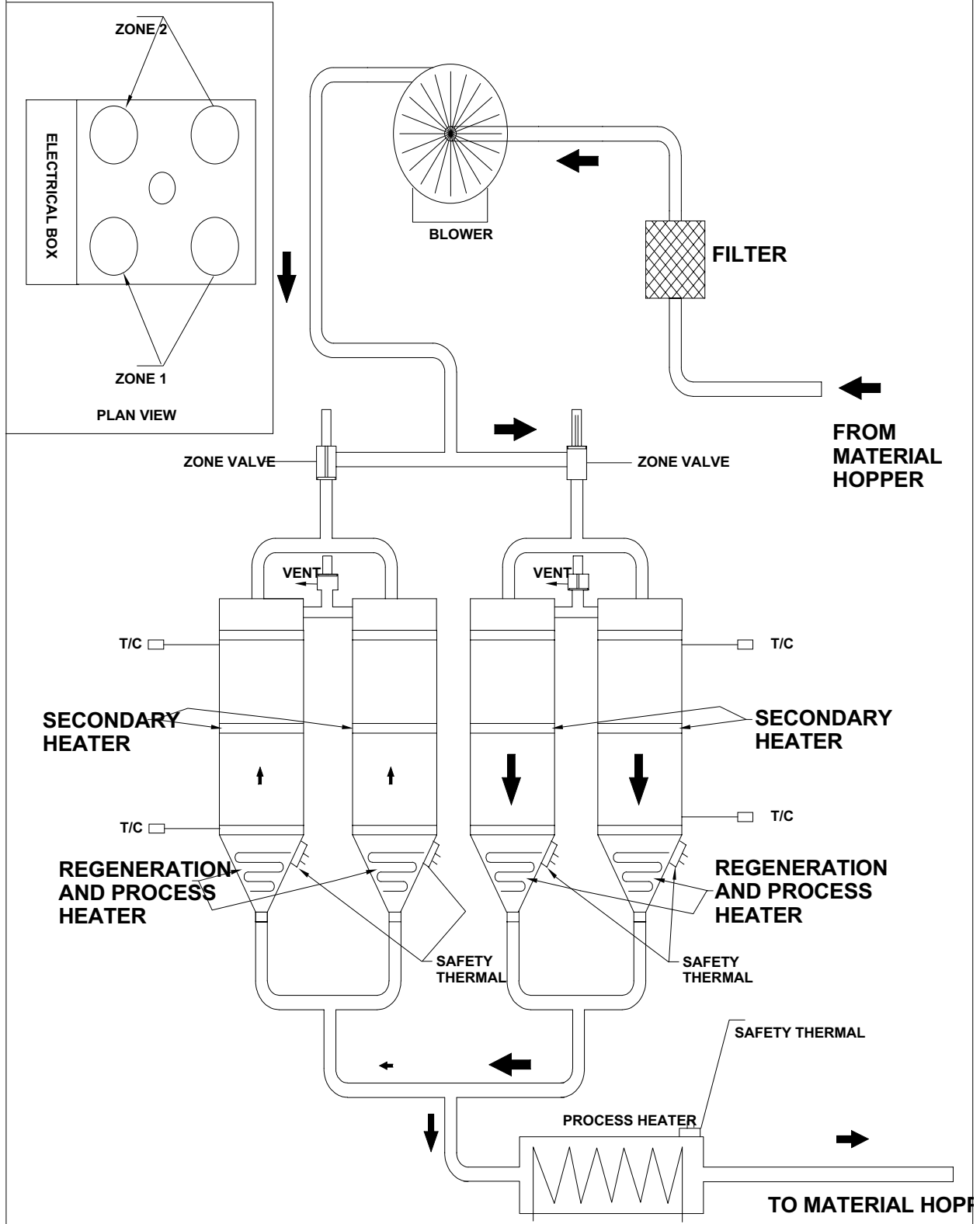
material flow to ensure that the material is dried efficiently and no undried material is left at the hopper bottom that needs to be fed out prior to operating. You must ensure that your hopper is adequately sized for your usage rate and is kept filled, to ensure that you have sufficient time to dry the material.

Dryer Controls

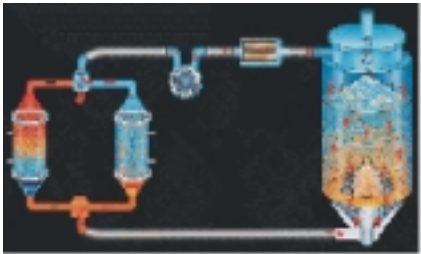
The HP4-X series is supplied with the advanced Microprocessor Control Module. The module includes a mother board, display board and key pad that allow the operator to easily monitor dryer performance and input operational settings.

The Microprocessor Control Module is one of the most sophisticated yet operator friendly controls on the market. It has many more features than other PLC and Microprocessor controls currently available. This module provides 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 400/500

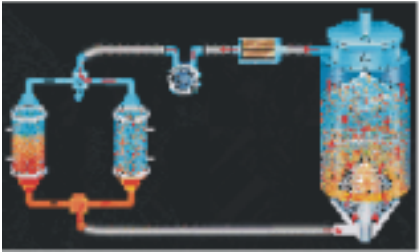


**DRYER CYCLE
DIAGRAM**

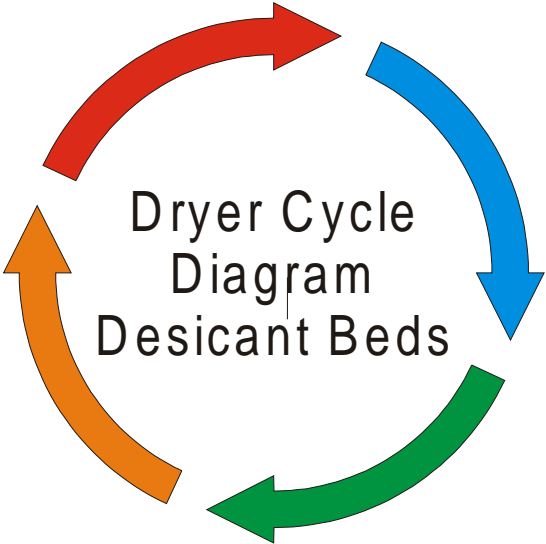


Zone 1 Cooling

Valve Shifts



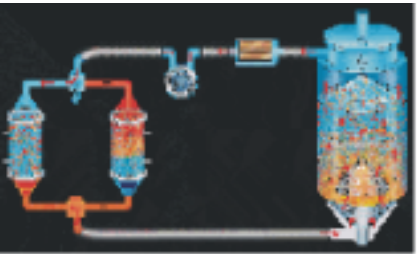
Zone 1 Heating



Zone 2 Heating



Valve Shifts



Zone 2 Cooling

INSTALLATION PROCEDURE

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

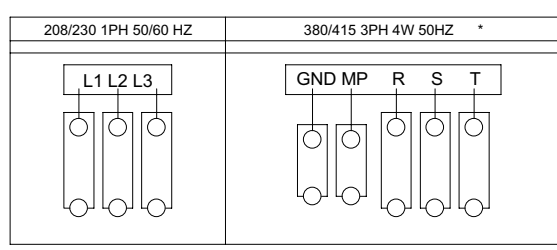
Electrical Connection:

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 blower motor rotation.....

Remove the front panel of the blower compartment so the blower can be observed. Turn on the power to the dryer and press the **START** touch pad on the dryer's control panel and quickly press the **STOP** touch pad. Observe the cooling fan on the motor. The motor should rotate in a "clockwise" direction. If the motor is rotating counterclockwise, switch any two adjacent supply wires.

Compressed Air Connection:

Compressed air is required for the HP4-X 400/500/750 Floor Mount models to operate the dryer's Zone Valve. For those units:

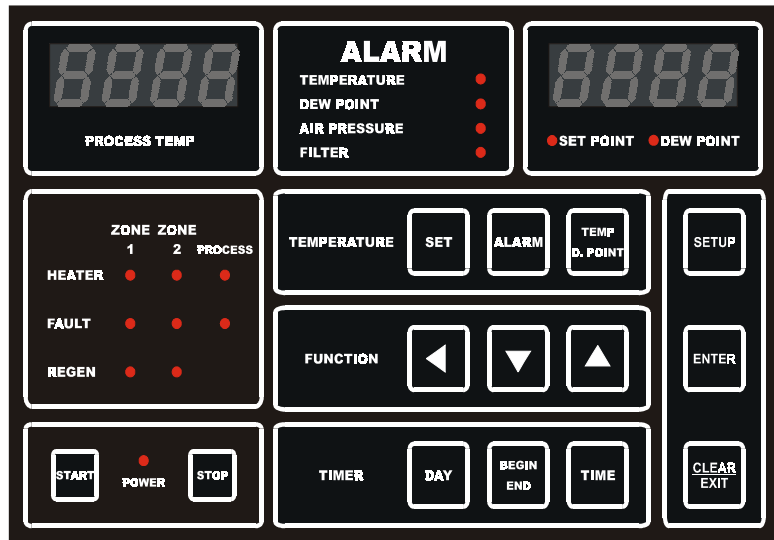
CONNECT COMPRESSED AIR TO INLET ON DRYER SIDE PANEL. Maximum incoming pressure not to exceed 100 psi (.69 MPa). The pressure gauge on the dryer is factory set to 70 psi.

The unit is now ready for operation.

START-UP PROCEDURE

Turn disconnect on electrical panel to ON position and follow the instructions below:

Microprocessor Control Panel



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 process air 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 to display process air set temp.
 - Press D.POINT to display dew point.
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 Microprocessor manual for setting 7-day timer .
10. Configuration of the dryer parameters is done using the setup button. See Microprocessor Control manual.

These instructions are covered in detail in Microprocessor Control Instruction Manual. Please read this manual before proceeding further.

DRYER OPERATION & BASIC TROUBLESHOOTING

Operating the Dryer

Our dryers are capable of operating in heavy industrial to clean room environments with no significant loss in performance. In order to maintain this high level of performance, the operator should take the following steps:

Hopper Maintenance/Material Control

1. In order to ensure that material is sufficiently dried;
 - a. The material hopper should be kept filled to a constant, predetermined level to allow sufficient dwell time in the hopper to dry the material
 - b. To ensure proper air flow through the hopper, always keep the level of material above the spreader cone on the diffuser basket, ensuring that it is completely covered.
 - c. Routinely clean the hopper and diffuser basket by removing the spreader cone assembly and blowing the basket and hopper out with compressed air.
 - d. Do not overfill the hopper, blocking the exhaust port at the top.

Filter Maintenance

1. Routinely remove and clean the filter element by blowing it out with compressed air. **DO NOT OPERATE DRYER WITHOUT FILTER ELEMENT INSTALLED.**

Basic Trouble-Shooting

The new Dri-Air MICROPROCESSOR Electrics are designed for quick diagnosis of problems. The microprocessor is designed to display error codes and faults that indicate the nature of the failure that has occurred. The most common errors and faults are discussed in the Microprocessor Control Instruction Manual and should be consulted in the event of a failure.

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

1. Check the Power Circuit:

- a. Incoming power fuses or circuit breaker
- b. Check all dryer fuses with multimeter.
- 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 70 PSI
- b. Check water separator and drain if necessary
- c. Pressure gauge should read 70 PSI

3. Air Flow Circuit:

- a. Ensure Zone Valve position corresponds to the regeneration cycle by comparing the position of the Zone Valve to the ZONE position lights on the dryer control panel (See pg. 12 for details).
- b. Make sure that all process air hoses are connected, not crushed, and free from obstructions.
- c. Inspect filter and make sure cover is tight and the filter element is clean.

4. Control Circuit:

- a. Using the MICRO Display panel ZONE indicator lights as a guide for the dryer regeneration cycle, check that all outputs to heaters are proper for the part of the regeneration cycle that the machine is in. (Output voltage to heater relays is approx 4.5v)

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.

DETAILED DIAGNOSIS & TROUBLESHOOTING

Diagnosing problems with the dryer is very easy, as the Microprocessor Control Module performs numerous internal diagnostic checks upon start-up and continually monitors critical parameters during operation. When a fault or failure is detected, the dryer shuts down and an Error Code is displayed on the dryer's control panel.

Error codes are displayed on the control panel by Err appearing in the left display and a three digit number appearing in the right display. Each code corresponds to a specific type of failure. These codes are discussed in detail in the Microprocessor Control Instruction Manual.

If the temp will not reach set point, check the following:

1. Check heater fuses with multimeter.
2. Check blower rotation by utilizing procedure detailed on page 8 of Installation Procedures.
3. Check location of process air thermocouple. Ensure that is positioned so that the tip is centered in the inlet port to the hopper.
4. Check dryer's internal air flow by the following:
 - a. Ensure that Zone Valve Air Diversion Valve is positioned correctly.
 - b. Ensure filter element is not blocked or choked with dust/material.
 - c. Ensure air flow to hopper is sufficient by removing process air hose from dryer and checking flow from dryer.

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 to see if heater relay has failed on. Using an ammeter or voltmeter, check the output lead from the relay to the heater for power to the heater when the Micro Display LED for that heater is off.
4. Check the Zone Valve position.

DRI-AIR ZONE VALVE TROUBLESHOOTING

The Dri-Air Zone Valve assembly is designed to provide very little flow restriction and no leakage. To direct the air flow for the regeneration cycle and process air, the assembly incorporates pneumatic Air-Flow Diversion Valves and Regeneration Air Exhaust Valves controlled by a single solenoid valve.

TROUBLESHOOTING is easy. The Air-Flow Diversion Valve assembly located on the top of the dryer cabinet is equipped with viewing ports to observe the assembly's operation. To check the valve, note which zone is in regeneration by observing the REGEN indicator LED on Microprocessor Control Panel and then checking that the corresponding Air Diversion Cylinder has actuated, closing the port to the towers. The Regeneration Air Exhaust Valves located in the dryer blower compartment, work in tandem with the Air-Flow Diversion Valves, by opening when the Diversion Valve is closed, to allow the wet regeneration air to exhaust. To check these valves, simply check to see if air is exhausting out the bottom of the dryer. If the valves are 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 (70 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 Valves on the top of the dryer. If the Diversion Valves operate, the solenoid valve is operating correctly.

ARID-X 400 - 750

| <u>GENERAL</u> | <u>DESCRIPTION</u> | <u>400</u> | <u>500/750</u> |
|----------------|--------------------------------|------------|----------------|
| | Dryer Filter Element | 83011 | 83011 |
| | Zone Valve Air Cylinder | 83897 | 83897 |
| | Thermocouple (Process) | 82174 | 82174 |
| | Thermocouple (Tower) | 82175 | 82175 |
| | Desiccant #80082 (Lbs/Machine) | 262 lbs | 262 lbs. |
| | Tower Clamp | 82197 | 82197 |
| | Tower Gasket | 83815 | 83815 |
| | Pressure Switch | 82813 | 82813 |
| | Regulator | 82995 | 82995 |
| | MAC Valve | 83783 | 83783 |
| | Caster (Swivel) | 82311 | 82311 |
| | Caster (Fixed) | 82312 | 82312 |

ELECTRICAL

*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>MICRO</u> | |
|---------------------------------|-------|
| Disconnect | 82714 |
| Main Board | 82071 |
| Display Board | 82072 |
| Transformer | 82245 |
| Current Transformer | 82246 |
| Main Contactor | 82904 |
| Solid State Relay | 82302 |
| IEC Contactor | 80576 |
| IEC Contactor* | 84860 |
| Solid State Heater Relay | 82302 |
| Dual Solid State Board | 82870 |
| Safety Thermal Switch(Tower) | 80221 |
| Safety Thermal Switch (Process) | 80551 |
| Transformer .050 | 84131 |
| Dewpoint Sensor | 81908 |

HEATERS

| | <u>400V</u> | <u>480V</u> | <u>575V</u> |
|---------------------------|-------------|-------------|-------------|
| Regeneration (Cone Style) | 81923 | 81367 | 81494 |
| HP Center (Flat Style) | 82506 | 82517 | 84046 |
| Process | 82047 | 83845 | 84609 |

