

**McIntire Model M300
Microwave Dehydrator**



M SERIES DEHYDRATORS

Operation Manual



McIntire™

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800-4 DRY AIR (437-9247)
www.mcintirewireless.com

Thank you for choosing a McIntire Air Dryer System for your waveguide and cable pressurization needs. All McIntire Dryer Systems have been designed to provide years of outstanding performance and reliable service with minimal maintenance.

This manual covers the installation, operation, maintenance and servicing of the Air Dryer System. Please read it carefully to better understand the dryer's operation and maintenance requirements.

About us...

Since 1963, McIntire Company has been engaged in the design, development, manufacturing and field-service support activities of pressurization air dryer systems and related accessory equipment.

The needs of the telecommunications industry have changed dramatically over the last decade and we have continued to develop our product line to better serve the requirements of this dynamic market. The acquisition of several, popular industry-related product lines make "The McIntire Companies" the single *largest* and *most complete* supplier of telecommunications pressurization equipment in the world. Our extensive catalog includes:

- ◆ Fully Automatic Air Dryer Systems with capacities from 200 SCFD to 30,000 SCFD engineered for maximum operational and servicing flexibility, minimum maintenance and high reliability
- ◆ Central Office air distribution equipment including Manifolds, Racks, Cable Transducer Panels, flow Transducer Pipe Panels, and all related fittings and tubing from the Air Dryers to the cable vault.
- ◆ Manifolds, check valves, Air Feeder Pipe and associated fittings for use in underground air distribution
- ◆ Manhole and work area protection equipment including ventilator/blowers, portable heaters, hazardous gas monitors, manhole accessories and complete traffic warning systems, all field proven and designed to provide years of dependable service.

In addition, our nationwide repair facility in Somerset, New Jersey is equipped to handle many types of repairs and maintenance including:

- ◆ Piston-type Compressor Rebuilding and Repair
- ◆ McIntire Water-seal Compressor Rebuilding and Repair
- ◆ Complete Dryer Rebuilding
- ◆ Western Progress Ventilator and Heater Repairs

For more information on any of the above products or services, call our Sales & Service office toll free at 1-800-437-9247 or visit us on the web:

***www.mcintireco.com
www.mcintirewireless.com***



**AUTOMATIC
AIR DEHYDRATION
SYSTEMS

MODEL M-300**

**INSTALLATION, OPERATING
AND MAINTENANCE MANUAL**

DRYER SYSTEM LOG

Installation Data	Operating Manual Information																																									
Model No. _____ Serial No. _____ Compressor No. _____ Installation Date _____ Location _____ Bi-Annual Maintenance Kits: Ordered Installed <table border="1" style="width: 100%; height: 100px; border-collapse: collapse;"> <tr><td style="width: 50%;"></td><td style="width: 50%;"></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table>															Manual 90547 Issue Date 1/06 ADDENDA <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Page No.</th> <th style="width: 65%;">Revision</th> <th style="width: 20%;">Date</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">4</td> <td>Revised instructions to reflect Low Flow Bypass Valve</td> <td style="text-align: center;">11/22/06</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Added Low Flow Bypass Valve drawing</td> <td style="text-align: center;">11/28/06</td> </tr> <tr> <td style="text-align: center;">7</td> <td>Changed flow diagram to reflect Low Flow Bypass Valve</td> <td style="text-align: center;">11/28/06</td> </tr> <tr> <td style="text-align: center;">8</td> <td>Revised wiring diagram to reflect new terminal block</td> <td style="text-align: center;">12/01/06</td> </tr> <tr> <td style="text-align: center;">10</td> <td>Revised Figure 5 "Inside View" to reflect PC board-mounted pressure transducer</td> <td style="text-align: center;">11/28/06</td> </tr> <tr> <td style="text-align: center;">11</td> <td>Changed Figure 6 "Front View" to reflect addition of Low Flow Bypass Valve</td> <td style="text-align: center;">11/28/06</td> </tr> <tr> <td style="text-align: center;">5</td> <td>Added Section 8, "troubleshooting alarms"</td> <td style="text-align: center;">11/28/06</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Page No.	Revision	Date	4	Revised instructions to reflect Low Flow Bypass Valve	11/22/06	4	Added Low Flow Bypass Valve drawing	11/28/06	7	Changed flow diagram to reflect Low Flow Bypass Valve	11/28/06	8	Revised wiring diagram to reflect new terminal block	12/01/06	10	Revised Figure 5 "Inside View" to reflect PC board-mounted pressure transducer	11/28/06	11	Changed Figure 6 "Front View" to reflect addition of Low Flow Bypass Valve	11/28/06	5	Added Section 8, "troubleshooting alarms"	11/28/06			
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**McINTIRE MODEL M-300
AUTOMATIC AIR DEHYDRATION SYSTEM**

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**McINTIRE MODEL M-300
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1.0 General

The McIntire M Series Dehydrators were designed to be the most efficient, cost effective dehydrator available to the microwave and wireless industry. Using the highest quality components and time proven drying technology, the M Series is a marriage of efficiency and simplicity backed by the industry best warranty and solid customer support.

2.0 Specifications

Dimensions (cm)	LxWxH 17 x 11 x 10.5 (43 x 28 x 27)
Weight	45 lbs. (21 kg)
Electrical Requirements	115 VAC/60 Hz
Capacity	Up to .3 SCFM (8.5 l/m)
Waveguide	0.1-90 Cu. Ft
Output Pressure (User Selectable)	2-4 PSI 3-5 PSI 4-8 PSI
Standard Alarms (NO/NC)	Power Excess Run Low Pressure
Optional Alarms (Factory Installed)	Humidity

3.0 Major Component Descriptions

3.1 The M-300 Dehydrator by McIntire differs from most dehydrator systems on the market because of its unique technology.

3.2 Microprocessor Controls

3.2.1 The M 300 features a custom designed Programmable Logic

Controller (PLC). Through its design, it controls the cut in and cut out pressure of the compressor, alarm reporting, hour log and displays the output pressure of the microwave system.

3.2.2 The PLC features a user interface which allows the user to select the cut-in and cut-out pressures from a pre-set list (see specifications). See paragraph 5.9 for setting instructions.

3.3 Solenoid Valve

3.3.1 The M-300 features a state of the art 4-Way solenoid valve that ports air to either desiccant tower. The solenoid valve is an industrial grade, high performance part which requires no maintenance and is designed to last the average lifetime of the dehydrator.

3.4 Air Compressor

3.4.1 The air compressor featured in the M-300 is an energy efficient, single piston, single stage, reciprocating piston compressor. It was specifically chosen for this application and designed to last the lifetime of the dehydrator.

3.5 McIntire Drying System

3.5.1 The M-300 features the very best of McIntire's 80 years of experience in the dehydration field. The two desiccant drying towers feature proprietary construction of the highest quality workmanship and material. As a result, the McIntire drying towers are guaranteed for the lifetime of the dehydrator to never

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need repacking or replacement. If it is ever warranted, McIntire will replace the towers free of charge.

3.5.2 Continued life and regeneration of the towers is achieved by the patented McIntire Air Director, described below in paragraphs 4.4-4.5.

4.0 Operation

Refer to Figure 1

4.1 Air is drawn from the ambient environment into the cylinder head of the single piston compressor. The air is then compressed by the force applied by the piston and is exhausted back through the cylinder head exhaust port.

4.2 The air then migrates through a pre-cooler which aids in dispersing some of the heat generated by compression.

4.2 The compressed air continues through the 4-way solenoid valve and, depending on its electrical state, ports the air to one of two desiccant drying towers.

4.3 The air travels through the tower pre-determined by the 4-way solenoid valve and because of the desiccant material's affinity for moisture, the air is dried to less than 1% Relative Humidity (RH) or -40°C atmospheric dew point.

4.4 Using the process known as Pressure Swing Adsorption (PSA), a small amount of dry air is diverted through the opposite drying tower, removing any moisture which may be present. This "purge flow" is

controlled by precision flow orifices that are part of the air director assembly.

4.5 When the air passes through the orifice, it is relieved and expanded to atmospheric pressure and free flows through the offline tower to purge it of moisture. This process is dependant upon "system" pressure inside the dehydrator that is greater than what is present in the microwave pressure system.

4.6 The system pressure is regulated by the check valve, which maintains adequate pressure upstream to allow PSA to take place, but regulates the downstream pressure to prevent over pressurization.

4.7 To further safeguard against over pressurization, a safety relief valve is installed in the air stream and will open in the event the output pressure should be above 10 PSI, the typical maximum operating pressure for microwave pressure windows. This prevents any damage from occurring in the event of a malfunction.

4.8 The air then flows through the moisture indicator window, and depending on the position of the low-flow bypass valve, will purge a small amount of air overboard. The moisture indicator indicates the effectiveness of the dehydrator system. The indicator features a color changing silica gel desiccant which is dark blue in color when the system is producing dry air, and pinkish in color when the RH of the output air has increased.

4.9 Air from the moisture indicator window is also plumbed to the pressure transducer, which in turn generates an electronic pressure reading and reports to the PLC. The PLC interprets the pressure reading and depending on the cut in and cut out pressure setting turns the compressor on or off. The PLC also will report a low pressure alarm, depending on the reading.

4.10 The air then flows to the air outlet where the microwave pressurization system is ported through a 1/4" bulkhead fitting.

5.0 Installation

5.1 The M-300 was designed to be easily mounted in a variety of different ways.

5.1.1 The M-300 should be installed in a suitable environment for electronic equipment and within the power cords length from a 115 VAC power source. The unit draws minimal amperage; a standard 15 amp circuit is more than suitable.

5.1.2 BEFORE continuing with the installation, carefully inspect the unit for signs of damage from shipping. Immediately notify the responsible carrier.

5.2 Locate the two (2) mounting brackets that were shipped with the unit.

5.3 Refer to Figure 2 for bracket and mounting configurations.

5.4 Mounting Options

5.4.1 Floor Mount

5.4.1.1 The M-300 features rubberized feet which allow the unit to be positioned directly on the floor without concern for it "walking" with vibration.

Note: Be aware of the possibility of collected water, rodents, insects or other undesirables in the location of any floor mounted dehydrator.

5.4.2 Wall Mount

5.4.2.1 Figure 2 shows the bracket configuration for wall mounting. For convenience, the brackets can be configured in two different ways to accommodate wall mounting; one which allows a direct mount to wall studs (16" on center) and another that allows for easy mounting to plywood or other re-enforcement.

Note: It is strongly advised to NOT wall mount directly to drywall or any other thin building material. 1/2" or 3/4" plywood is preferred.

5.4.3 Rack Mount

5.4.3.1 The M-300 is designed to also be rack mounted in either a 19" or 23" rack. Refer to Figure 2 for mounting bracket configurations to accommodate the two different sized racks.

5.5 Once the unit is installed, plug the power cord into a suitable power source (see paragraph 5.1.1).

5.6 Switch the power switch to the "on" position, the compressor should turn on immediately.

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5.7 Allow the unit to run without connecting it to the waveguide pressurization system for 5-10 minutes. This should remove any moisture that may have migrated into the system during storage and/or transport.

5.7 Inspect the moisture indicator window for evidence of moisture (pink desiccant). If moisture is present, continue to run the unit. Otherwise, if the desiccant is a dark blue color, it is ready to be put on-line. Note: The blue indicating dye in the moisture indicator reacts slowly to changes in RH. Initial dry-out time varies based on shelf time.

5.8 Plumb the waveguide pressurization system into the outlet as acceptable by standard practices.

5.8.1 Note: Some installations incorporate a flow restrictive fitting into the air inlet side of the waveguide. If your installation utilizes such a fitting it may cause the dryer to “short-cycle” accompanied by a measurable loss



LOW FLOW BYPASS

in pressure in the waveguide when the compressor stops running. If you experience the above symptoms, open the Low Flow Bypass valve on the top of the dryer by turning the knob to “ON”. Please note that the

dryer will require more time to pressurize the waveguide with this valve open as the flow has been reduced. This is normal. If your installation does not cause the dryer to short cycle, keep the valve closed in the “OFF” position.

5.9 The factory settings for On and Off pressures is 3 PSI (On) and 5 PSI (Off). To change this setting to other preset options, press the “-” and “+” Keys together, to scroll to find the appropriate settings. Other available options are 2 and 4 PSI and 4 and 8 PSI.

6.0 Service

6.1 The M-300 requires little if any service. Refurbishment services are available through McIntire’s repair services. Cal 1-800-4 DRY AIR (437-9247) for details.

6.2 Should emergency service or maintenance be performed a list of major parts is found below:

Part Number	Description
M-2270-15	Cabinet Feet
M-10129	Air Compressor
11248	Compressor Mount (x 4)
M-25427	PLC
M-25425	Dipole Relay
M-25426	Unipole Relay
M-22018	Alarm Lamp
M-20144	Power Switch
M-21024	4-Way Solenoid Valve
M-20723	Pressure Transducer
M-11070	Air Director
M-40488	Humidity Indicator

7.0 Maintenance

7.1 The McIntire M-300 dehydrator was designed to require a minimal amount of maintenance.

7.2 The only suggested maintenance is the bi-annual replacement of the air intake filter, PN M-11305. The dehydrator accessory kit that came with the original purchase contains 5 replacement filters; enough for maintenance during the warranty period.

7.3 To replace the filter, simply remove the one that is in place by turning it counter-clockwise.

7.4 Replace it with a new one by screwing the new filter into the bulkhead clockwise.

Note: Do NOT disassemble the filter or attempt to replace the filter element alone. Replace the complete assembly every time the filter is to be replaced.

8.0 Troubleshooting Alarms

8.1 The M-300 should provide years of trouble-free operation. Should an alarm condition occur, refer to the following section.

8.2 Excessive Run Alarm

8.2.1 The M-300 incorporates a compressor overload alarm, also known as excessive run. In the event of an excessive run alarm, you will get a visual indication from the alarm light and a message on the PLC display. This alarm will be generated if the compressor runs

continuously for more than two hours due to a leak in the dryer, a significant leak in the waveguide, or a weak compressor.

8.2.2 In the event that the compressor operates continuously for more than two hours the external alarm circuit will be activated and a visual indication will occur while the compressor continues to run. Once the cause of the problem has been detected and corrected, the excessive run alarm can be reset by simply pushing the “B” and “-“ keys together.

8.3 Low Pressure Alarm

8.3.1 The low output pressure alarm condition is signaled via the PLC which energizes the alarm relay. The low pressure alarm is factory set to occur when output pressure drops below two PSI. The air dryer will continue to run in the event of a low pressure alarm.

8.3.2 If a low pressure alarm occurs the following conditions may exist: A significant increase in waveguide demand caused by a leak in the waveguide or a system leak within the dryer. Other causes of a low pressure alarm may indicate a weak compressor or a faulty pressure transducer. If the display on the PLC reads a negative pressure accompanied by a low pressure alarm, the transducer is defective or the PLC is not receiving a signal from the pressure transducer. Check wiring from the transducer to the PLC and tubing from the transducer to the humidity indicator.

If wiring and tubing are correct and in place, replace the transducer.

8.4 *Power Failure Alarm*

8.4.1 In the event of a power failure, an external alarm signal is sent out and all settings on the dryer will default to the factory settings (3-5 psi pressure setting) upon restoration of power.

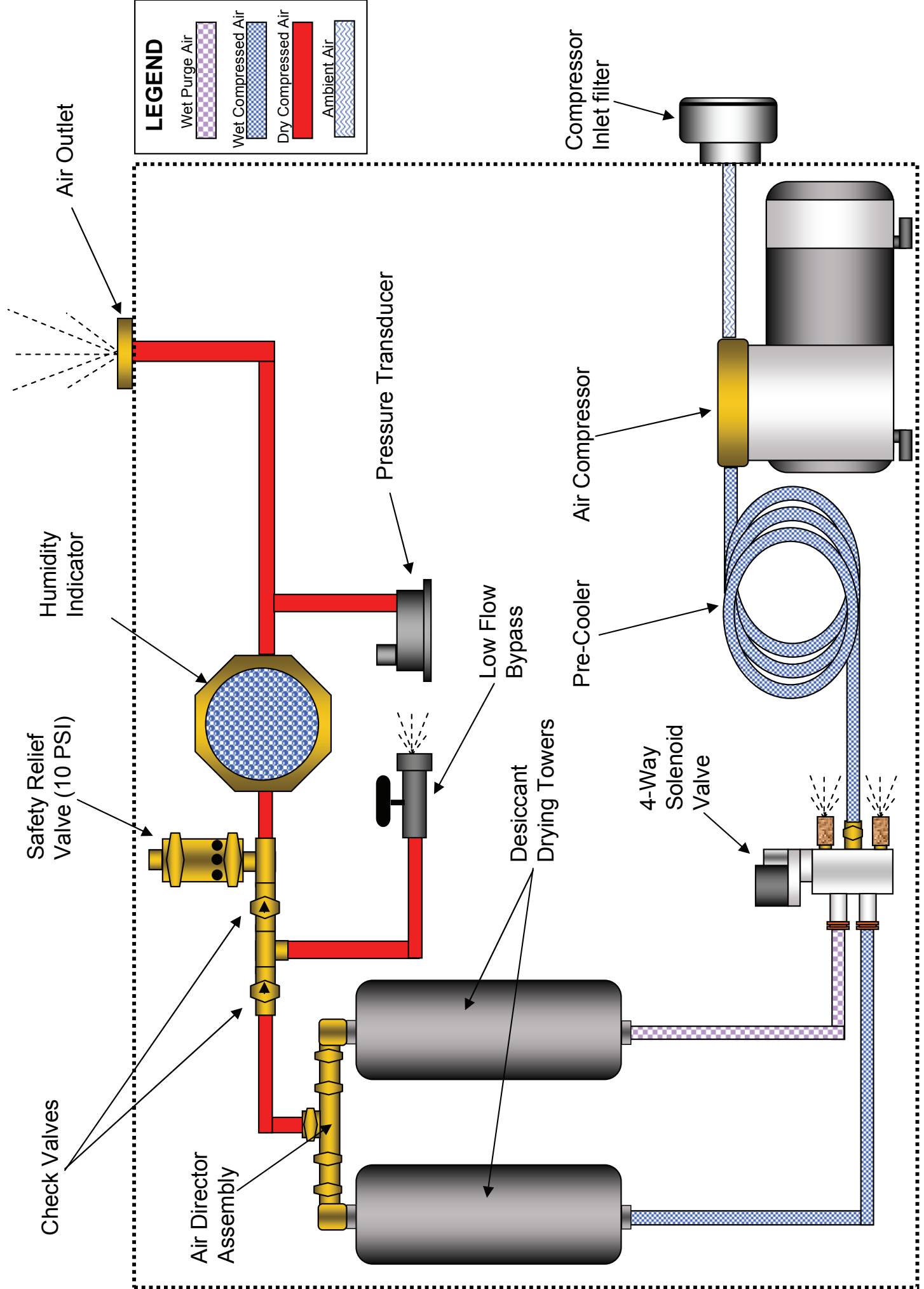
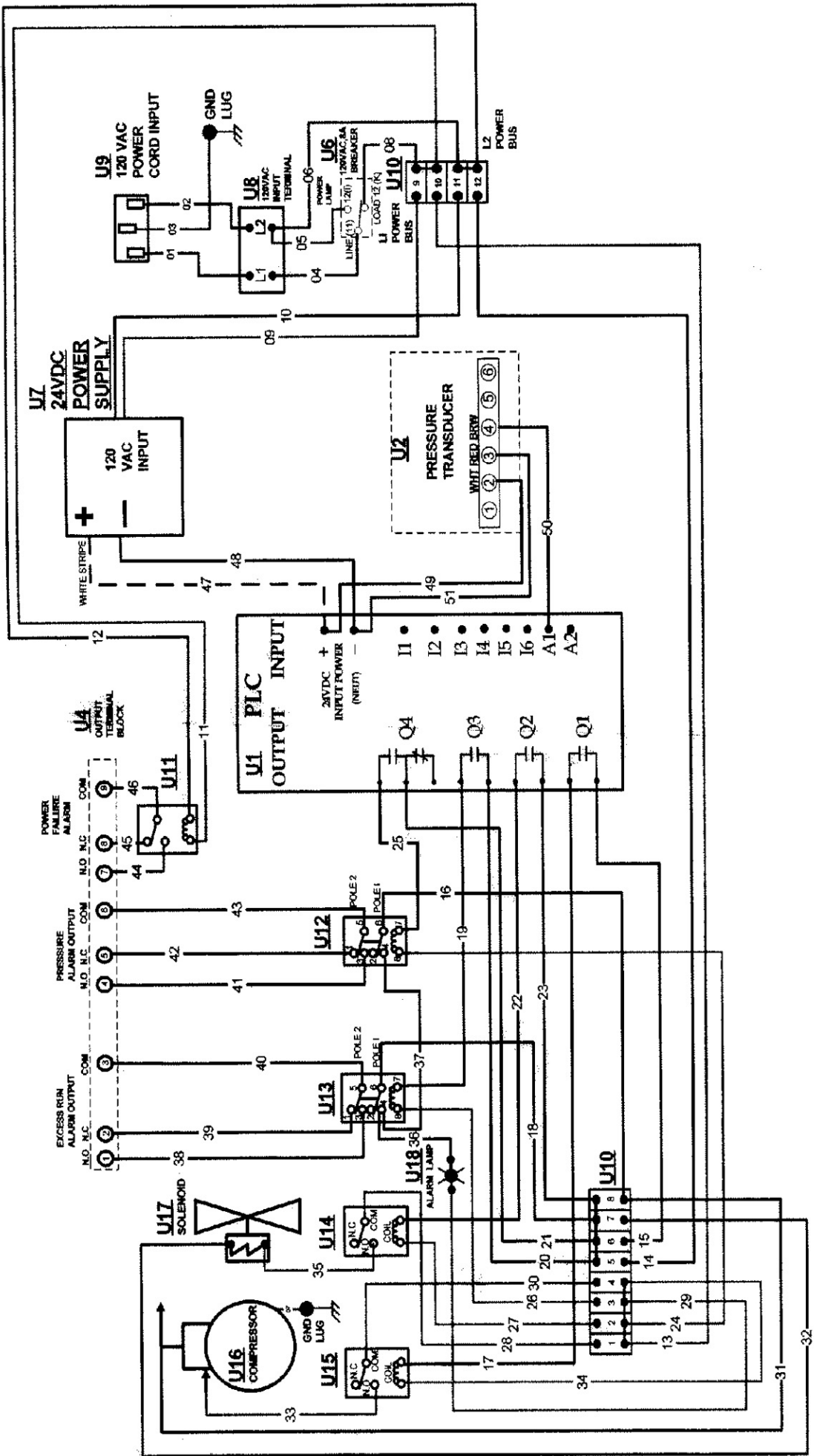
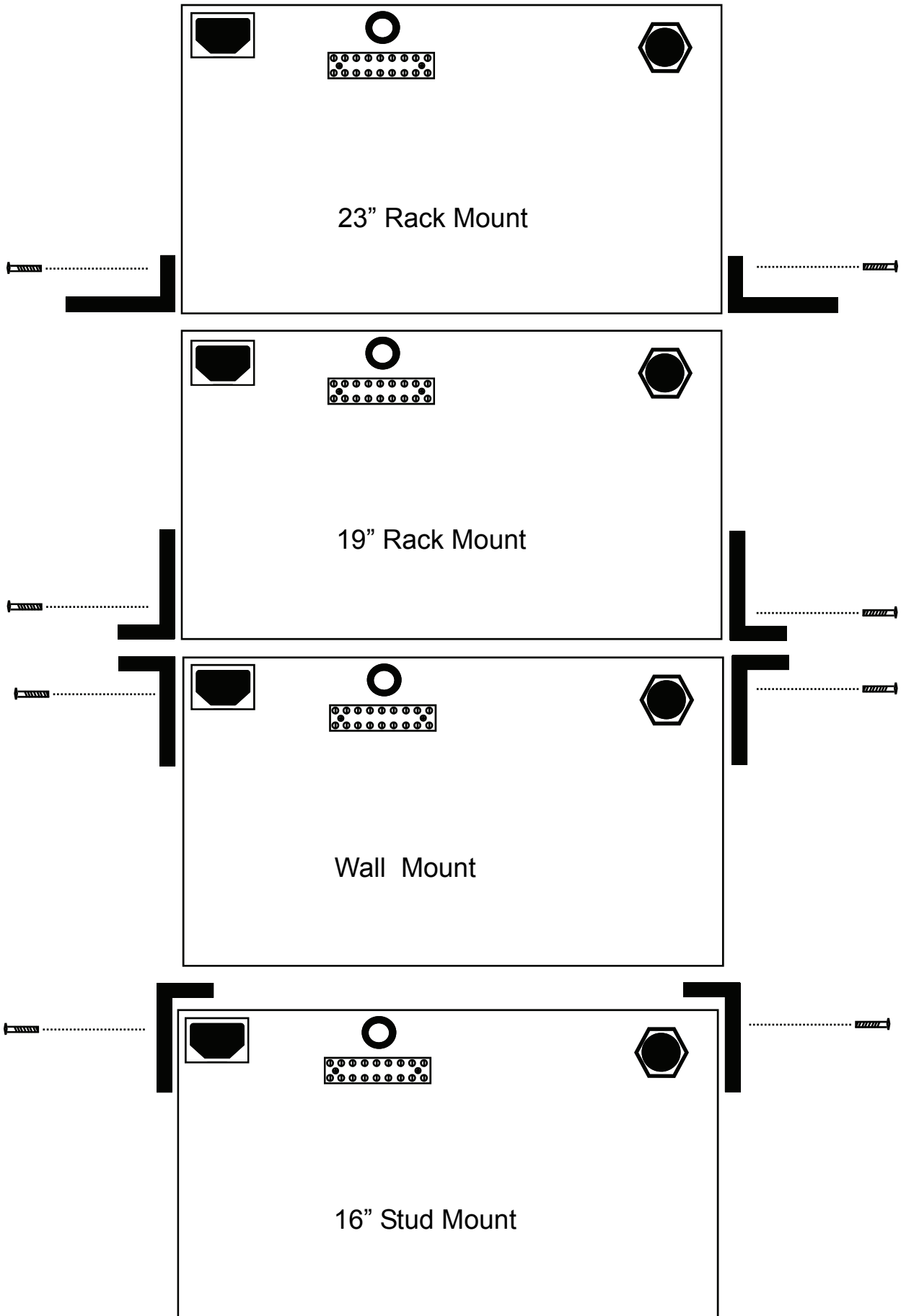


Figure 1 – M300 Pneumatic Flow Diagram





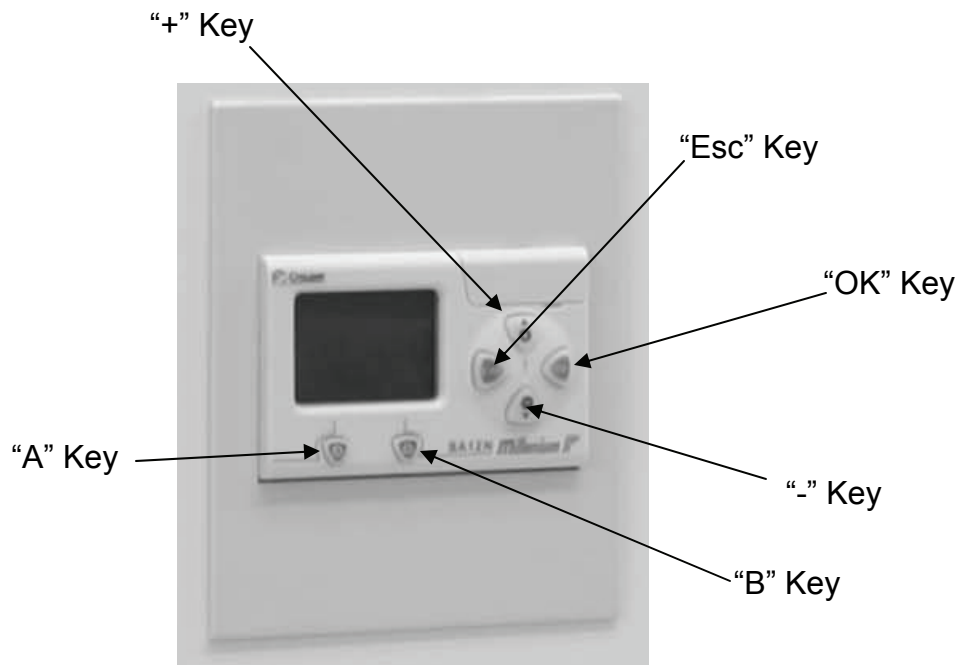
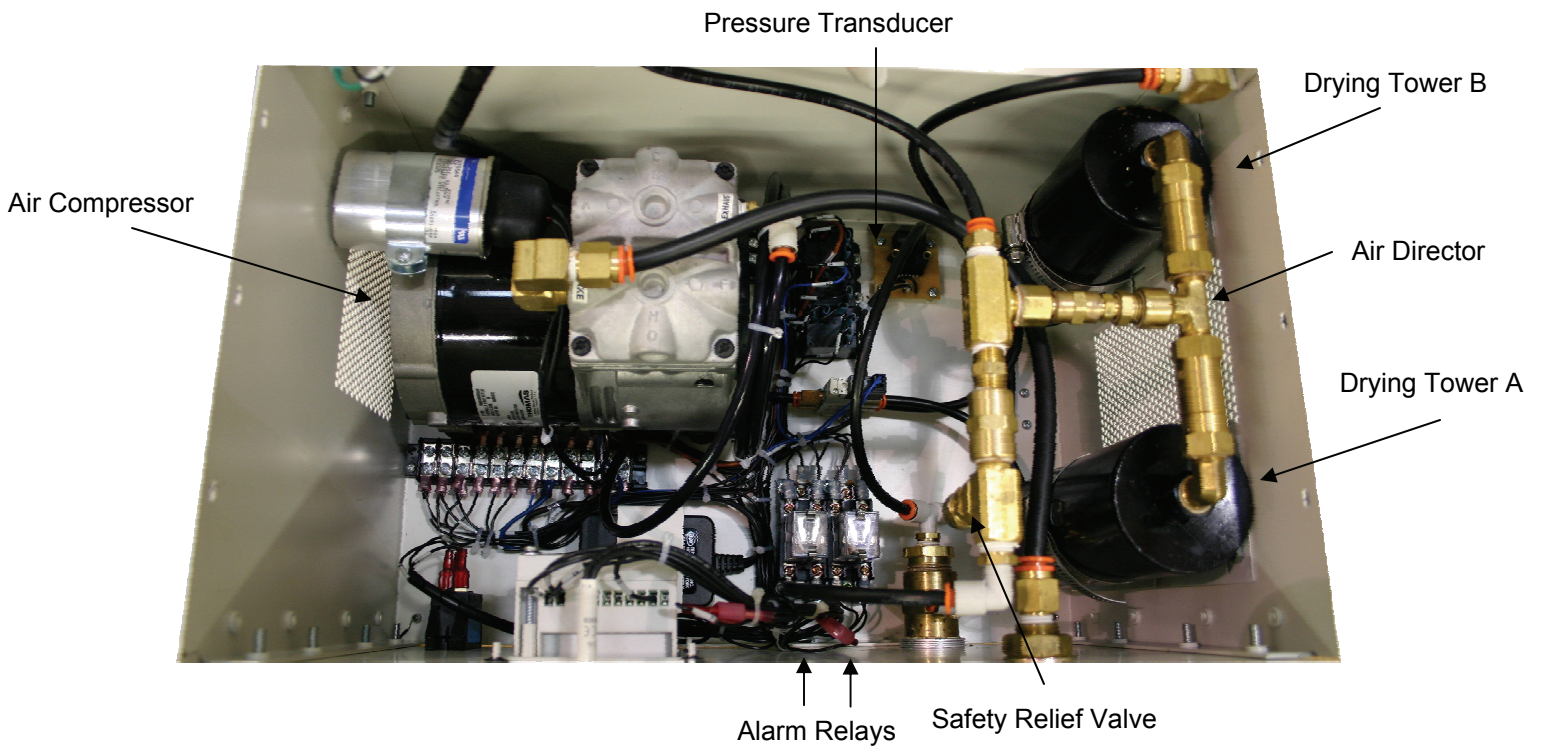


Figure 4 - PLC Interface



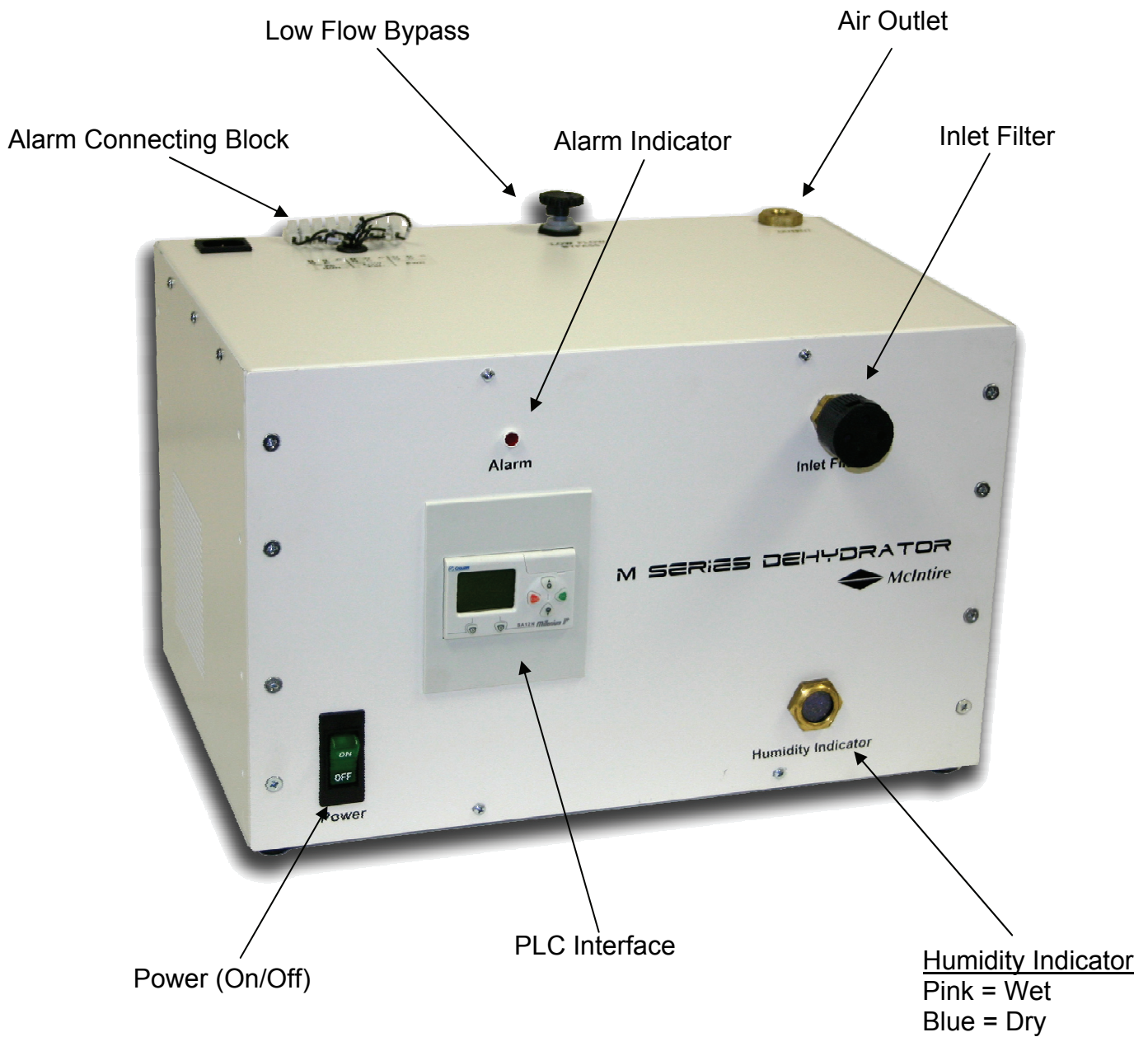


Figure 6—Front View