

# PMT200B SERIES DryLine® DEHYDRATOR

# **USER MANUAL**

Bulletin AE01B-A0552-001	Rev: L
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## Section 1 General Information

#### 1.1 Introduction

This manual contains the information you need to install, operate and maintain your PMT200B Series DryLine<sup>®</sup> dehydrator. Please take the time to read this manual before attempting to operate or service the unit.

This appliance is not intended for access by the general public.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.



#### 1.2 Description

PMT200B Series DryLine<sup>®</sup> dehydrators provide dry air for pressurizing small (up to 1700 liters (60 ft<sup>3</sup>), in volume) antenna and transmission line systems. The dehydrators produce –45° C (–50° F) dewpoint dry air at an output rate of 5.7 SLPM (0.2 SCFM).

Each dehydrator consists of an electricallydriven air compressor, a membrane dryer assembly, an automatic transmission line pressure sensing system and alarm outputs housed in a rigid metal chassis. It is designed to mount directly to the wall or as a free-standing unit. The front panel features a control interface with display for alarms and pressure. For easy serviceability, power connections, alarm output connections and all filter elements are accessible from the top or front of the unit. The PMT200B maintains transmission line pressures at 21 kPa (3.0 psig). It is intended for standard microwave antenna applications and any other transmission line pressurization requirement that supports a medium pressure limit. The output pressure is adjustable from 13.8 kPa (2.0 psig) to 41.4 kPa (6.0 psig).

#### 1.3 Operation

PMT200B Theory of operation.

The PMT200B series of DryLine<sup>®</sup> dehydrators, while similar in moisture removal technology, operates differently than some of the DryLine® series of dehydrators. In order to provide a constant supply of dry air to small air volume systems, and to maintain an acceptable dryness level in the product air stream, a highpressure reservoir tank is utilized. This reservoir tank is connected to a pressure regulator and orifice to yield a fixed output pressure of 21 kPa (3.0 psig) and a nominal flow rate of 5.7 SLPM (0.2 SCFM). In addition to supplying the output air, the reservoir tank also provides the dry air for the feedback loop. The feedback loop is necessary to maintain the dryness of the membrane cartridge.

During normal operation, the bleed air in the feedback loop will cause the pressure to slowly drop in the internal reservoir tank, and the PMT200B compressor will cycle automatically. These cycles will take place regardless of the system volume or condition of the transmission line the dehydrator is connected to. The rate of these cycles, however, will vary.

When connected to a very tight system, or the output is capped, the dehydrator will cycle approximately every 60 minutes and maintain 21 kPa (3.0 psig) system pressure. When open to atmosphere, the dehydrator will cycle approximately every 3 minutes while providing close to 5.7 SLPM (0.2 SCFM) of dry air. A system that leaks will have a cycle time somewhere in between, depending on the severity of the leaks.

The display will also reflect a pressure between 0 and 21 kPa (3.0 psig) while the output flow is between 0 and 5.7 SLPM (0.2 SCFM). The pressure sensor tracks the pressure beyond the flow control orifice and will show the actual pressure in the transmission lines (or to the distribution manifold).

During the initial pressurization of the transmission line, the dehydrator will cycle every 2 to 4 minutes with the system at 0 psig pressure. As the dehydrator pressurizes the system, the cycle times will increase and the pressure will rise until the dehydrator output is balanced with the system leak, at which point the cycle times will stabilize.

#### 1.4 Alarms

The PMT200B offers Low Pressure and Excess Run alarms as a standard feature; a summary alarm connection is provided on all units. Alarm conditions are indicated on the display. The alarms are Form C dry contacts and have connection options for normally open (NO) or normally closed (NC) configurations.

Additionally, a discrete alarm option is available with discrete connection for Low Pressure, Excess Run, High Humidity and Power Fail alarms. The discrete alarm version also includes a summary alarm contact.

The external alarm monitoring system (supplied by others) is connected to the terminal strip located on top of the cabinet. A small slotted screwdriver is necessary to make the connections.

The connections to the alarm strip are as follows; refer to Figure 1 for correct locations and colors of the wires on the terminal strip

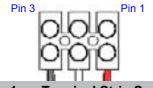
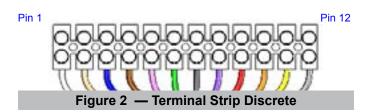


Figure 1 — Terminal Strip Summary

Summary Alarm		
WIRE	WIRE	ALARM
TERMINAL	COLOR	FUNCTION
1	RED	SUMMARY NO
2	WHITE	SUMMARY COM
3	BLACK	SUMMARY NC



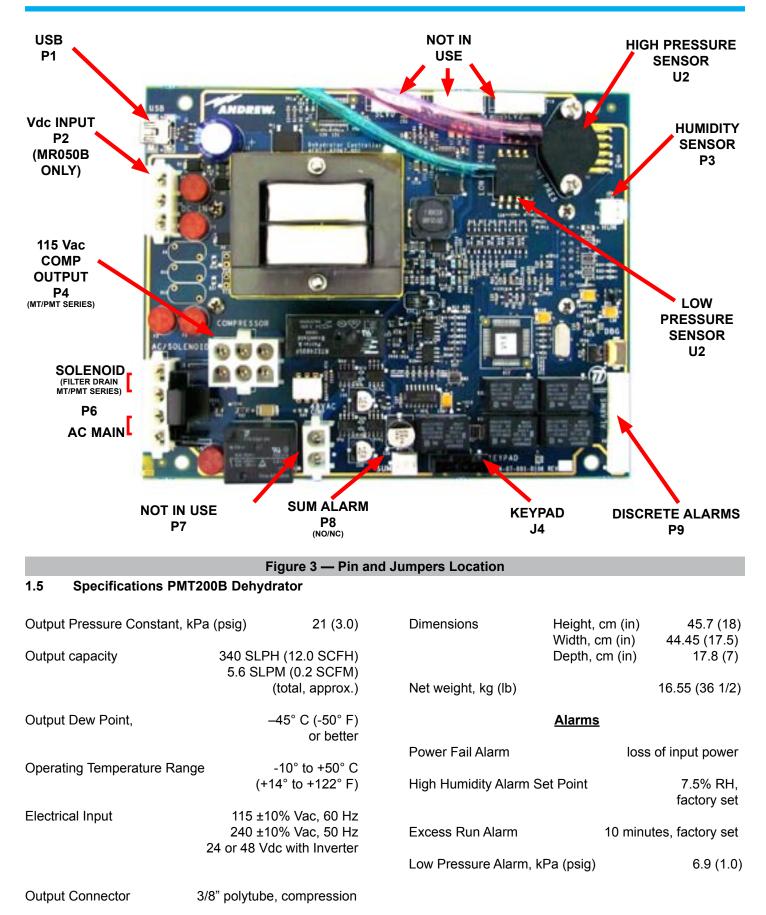
DISCRETE Alarm			
WIRE	WIRE	ALARM	
TERMINAL	COLOR	FUNCTION	
1	WHITE	EXCESS RUN NO	
2	TAN	EXCESS RUN COM	
3	BLUE	EXCESS RUN NC	
4	BROWN	HIGH HUMIDITY NO	
5	PINK	HIGH HUMIDITY COM	
6	GREEN	HIGH HUMIDITY NC	
7	BLACK	POWER FAIL NO	
8	VIOLET	POWER FAIL COM	
9	RED	POWER FAIL NC	
10	ORANGE	LOW PRESSURE NO	
11	YELLOW	LOW PRESSURE COM	
12	GRAY	LOW PRESSURE NC	

#### Alarm Definitions:

- Summary: Activates when the Excess Run, and/ or Low Pressure alarms are triggered. It will also report High Humidity if unit is equipped with full alarms. The summary alarm does not report Power Fail.
- **Power Fail:** Activates when power is removed from the dehydrator. This includes turning the power off at the switch.
- **High Humidity:** Activates when system or dehydrator output humidity rise above 7.5% relative humidity. At initial installation, this alarm will continue to alarm until the system has been properly purged.
- **Excess Run:** Factory run time set in accordance with the normal run time for the dehydrator application. Selectable times are 1, 10, 30, 120 and 240 minutes, with the 10 minute selection used on the PMT200B as the default setting.
- Low Pressure: If system pressure falls below the low–pressure trigger point (6.9 kPa (1.0 psig) on the PMT200B), the lowpressure alarm sensor will activate an alarm contact. This alarm is an indication of a significant system leak or a dehydrator failure.

Note: All of the alarms clear and reset automatically, but can be manually reset in the display menus. However, if the alarm condition still exists, the alarm will return immediately after being reset.





## Section 2 Installation

2.1 Unpacking and Inspection

Open carton.



Check the dehydrator for shipping damage such as dents or loose parts.

#### 2.1.1 Installation Kit Items

Polyethylene Tubing Kit,	(25 FT)
PTFE Tape, 1/4 Wide	(1 Roll)
Ball Valve, 3/8 Poly To 3/8 Poly	(1)
Male Conn, 3/8" Poly To 1/8 NPT Male	(2)
Street Elbow Fitting, 1/8 NPT (M-F)	(2)
Power Cord, w/Nema 515p Plug (North	
America)	(1)
Power Cord, IEC, Harm, (Stripped Leads	s) (1)
Screw Pan Head, 10-32 X .50,	
w/Plastic Washer	(8)

#### 2.2 Controls and Displays Default password is 1111

Familiarize yourself with the controls and displays prior to installing or testing the dehydrator.



#### **Keypad Controls:**



Advances display (scrolls ahead) to the next display or program mode with out changing the values in the microprocessor memory.



Enters into the microprocessor memory the values displayed in the window and advances display (scrolls ahead) to the next program or display mode.



Numerically increase displayed settings in display window. When depressed longer than 1/2 second scrolling will occur at a faster rate.



Numerically decrease displayed settings in display window. When depressed longer than 1/2 second scrolling will occur at a faster rate.



Used to allow the user quick access to the system event log.

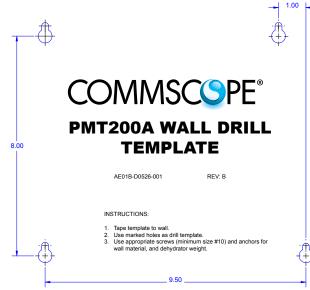
#### 2.2.1 Event Log Codes

- EV= 0 Event = Power Up
- EV= 1 Event = High Humidity Alarm
- EV= 2 Event = Excessive Run Time Alarm
- EV= 3 Event = Low Pressure Alarm
- EV= 4 Event = High Pressure Alarm
- EV= 5 Event = Compressor Fault
- EV= 6 Event = Log Cleared
- EV= 7 Event = Powering Down
- EV= 8 Event = Compressor Lifetime Eeprom Fail

#### 2.3 Installing the Dehydrator

#### 2.3.1 Wall Mounting

See drill template AE01B-D0526-001 included with installation kit.



#### **Caution:**

Check the system pressure rating before connecting the dehydrator to the transmission line system.

To insure that all internal dehydrator components are properly dried, operate the DryLine® unit for at least 45 minutes prior to connecting the output air line to the transmission line system.

#### 2.4 Power Connections

Confirm your dehydrator electrical input matches the available power.

Ensure an electrical safety ground is installed on the ground stud located adjacent to the power input connector. (It is intended to be customer installed in the field to your halo grounding system.)

PMT200B-81015 and PMT200B-81315 115 ±10% Vac, 60 Hz 24 or 48 Vdc with Inverte

PMT200B-81026 and PMT200B-81326 240 ±10% Vac, 50 Hz

#### 2.4.1 AC Power

AC units should be connected into a standard 15 A power receptacle of the proper voltage. Make sure the power circuit is properly grounded.

Two power cords are supplied, one 115 Vac American and one 240 Vac International.

#### **CAUTION:**

Proper electrical connection is required. It is suggested a licensed electrician be contracted to connect the AC wiring to the unit, if it is connected directly to the mains. Failure to properly connect the power wires could result in a dangerous electrical shock hazard.

#### **CAUTION:**

This unit is designed for connection to a single phase power source. Connection to a 3 phase power source will cause significant damage to internal components.

#### 2.4.2 DC Power

The PMT200B can operate on 24 Vdc or 48 Vdc with the addition of an optional inverter.

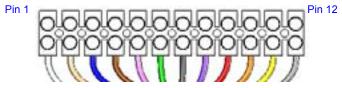
For details see section 7.

#### Test the Dehydrator

Turn the dehydrator **ON** there is about a 4 second delay and check the output ports on top of the unit to make sure air is flowing. To do this, make sure that corresponding shut-off valve is open and the plugs are removed from the ports.

#### 2.5 Connecting the Alarm Outputs

To connect the alarms, locate the terminal block (TB–1) on top of the unit.



Place alarm connection wires in proper terminals and tighten the screw on the terminal block.

(See Section 1.4 for alarm location)

The relay contacts are rated at 2 A (non-inductive), 30 Vdc.

## 2.6 Connecting Dehydrator to the Transmission Line

#### **CAUTION:**

Check the antenna and transmission line system pressure rating before connecting the dehydrator to the system.

Using supplied PTFE tape screw one of the included 3/8" compression fittings into the output bulkhead. There is an elbow and a straight compression fitting included with the unit.

Insert one end of the 3/8 in, polytube feed line tubing into the compression fitting on the dehydrator output port. Tighten securely with a 9/16 in, wrench. Be careful not to over tighten. Connect the other end of the polytube to the transmission line.

Four air outputs are provided, with individual shut–off valves on the unit. Make sure that the valve is in the open position for each transmission line connection. If one of the output connections is not used, close the valve and leave the port capped.

#### 2.7 Checking Individual Line Pressures

In order to check individual line pressures with the PMT200B, you will need to close the valves on all of the lines except for the one that you are checking. With the keypad, scroll to the "System Pressure" screen and the reading is the pressure on the isolated line. Repeat with each additional line and don't forget to re-open all of the valves when finished.

#### Note: If the transmission lines have not been purged, continue with section 2.8. Otherwise proceed to section 3.

#### 2.8 Purging the Transmission Line

Air in the transmission line system must be replaced with dry air to ensure satisfactory operation of the transmitted signal.

- 1. Determine the total system volume.
- 2. Divide the system volume by the flow rate of the dehydrator 340 SLPH (12 SCFH) to determine the number of hours needed for the purge cycle.
- 3. Open the far end of the transmission line.
- Operate the dehydrator for a minimum three purge cycles. If possible, operate for 12 purge cycles to completely dry the line.

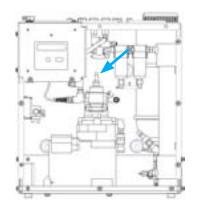
If it is not possible to open the far end of the transmission line, follow these steps:

 Connect the dehydrator to the transmission line and pressurize the system. The system pressure should reach 21 kPa (3.0 psig).

- 2. Wait 15 minutes while the air absorbs moisture in the system, then disconnect the dehydrator from the transmission line and allow the air to vent.
- 3. Repeat steps 1 and 2 twelve times to purge the system.

#### 2.9 Adjusting Output Pressure

Output pressure can be adjusted between 13.8 kPa (2.0 psig) and 41.4 kPa (6.0 psig) - adjustment outside this range will have a negative impact on the performance of the dehydrator.



## NOTE: Some components have been removed for clarity to see the regulator.

- 1. Locate regulator
- 2. Loosen lock nut
- 3. With unit running turn stem CW to increase. CCW to decrease output pressure.
- 4. Place finger on output to verify pressure setting on the front display.
- 5. Repeat step 3 and 4 until desired pressure is set.
- 6. Tighten lock nut and return unit to service.

## Section 3 Operation

#### 3.0 Maintenance

The PMT200B DryLine® Dehydrator requires relatively little maintenance to ensure satisfactory operation over long periods of time. This section outlines the recommended annual preventive maintenance for the unit and the suggested overhaul for every 6000 hours of compressor operation.

#### 3.1 Regular Maintenance

The PMT200B DryLine® Dehydrator performs at its optimum if it is routinely checked for correct performance. This checking generally consists of an annual inspection of the condition of the air intake filter and an overhaul after every 6000 hours of compressor operation. Performance of these measures is sufficient to ensure continued reliable operation.

#### 3.2 Preventive Maintenance

The annual maintenance of a PMT200B consists of a preventative maintenance inspection of the dehydrator and cleaning (or replacement) of the foam air intake filter.

These tasks can easily be performed in the field with the unit connected to the transmission line system and with only the front access door opened for maintenance.

#### 3.3 Dehydrator Filter Element Replacement

Replace the air intake filter

The air intake filter protects the compressor from contamination and dust. Periodic replacement extends the life of the compressor. To gain access to the element, push in on the cover and rotate the house approximately 1/4 turn CCW. The filter is made of a fibrous material. It should be replaced once a year (or more frequently, if the operating environment is very dusty.)

#### **CAUTION:**

Do not apply oil or other chemicals to the filter element.

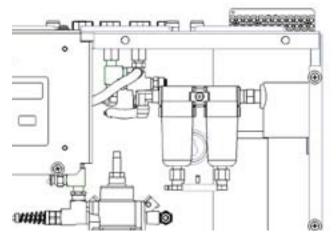
Make sure the element is seated completely in the housing and then replace the cover. If a new element is used, discard the old element.

#### 3.4 Annual Inspection

### Warning:

## Electrical Hazard! Unplug power cord before servicing unit.

Inspection includes checking for loose or damage hoses, fittings and electrical connections. Open the top panel or front door and verify that there is no water build-up in the two filter bowls located inside the front cover of the dehydrator. There may be some droplets of water in the filter bowls (the lower portion of each bowl), but there should be only a small amount of liquid in either bowl.



If there is excessive water, refer to the troubleshooting section. Replacement of the filter elements in the water filter and coalescing filter is covered in the overhaul section of this manual.Check the electrical connections.

Check the screw at the power input connector to ensure that the AC power cord is securely terminated. Check the screw-in alarm terminals to ensure that all wire connections are tight.

A loose or damaged connection may result in erratic operation and unnecessary downtime. Refer to the troubleshooting section if an electrical problem is encountered.

#### 3.4.1 Check the ground wire.

Ensure an electrical safety ground is installed on the ground stud located adjacent to the power input connector. (It is intended to be customer installed in the field to your halo grounding system.)

#### 3.4.2 Check the hour meter

Check the hour meter in the display to help to determine the duty cycle of the dehydrator.

If the dehydrator has been running for more than 20% of its installed time, check the systems for leaks. Also check the time on the meter to determine if it is time to perform the 6000–hour overhaul.

#### 3.5 Parts Replacement and Dehydrator Overhaul

CommScope PMT200B DryLine® Dehydrators are designed to give many years of trouble-free service and require very minimal maintenance. The dehydrator contains, as a standard feature, an electronic hour meter that records compressor run hours. To ensure continuous and reliable operation, the dehydrator must be overhauled every 6000 hours of compressor operation. The overhaul kit, listed below, contains all of the necessary parts to perform this overhaul. The dehydrator overhaul kit includes parts to overhaul the compressor and critical components in the dehydrator that often become worn over time.

#### 3.5.1 In Case Of Difficulty:

If the dehydrator is not operating, refer to <u>Section 2</u> on Installation and <u>Section 4</u> on Troubleshooting the unit.

#### 3.5.2 Tools

The following tools are used in the maintenance and overhaul procedures.

- Adjustable open—end wrench
- Allen wrench 5/32
- #2 Phillips screwdriver
- Small flat-blade screw-driver

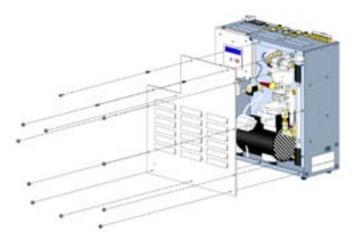
#### 3.5.3 Overhaul Procedure

When the PMT200B compressor run time reaches 6000 hours (or a multiple of 6000 hours) it is time to replace certain items in the compressor and the air path of the dehydrator. These include the piston cups, piston seals and head gaskets of the compressor, the filter elements in the water and coalescing filters, and the tube section connecting the compressor output to the coalescing filter input.

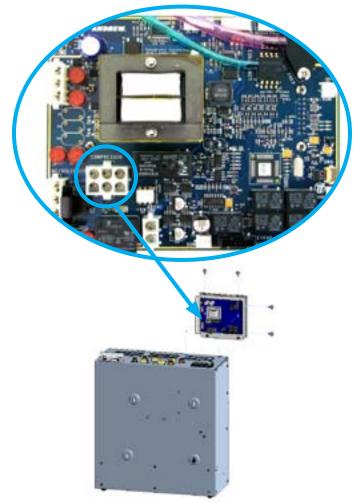
#### 3.5.4 Unit Shutdown and Removal

In order to perform an overhaul on the PMT200B, the unit must be turned off and removed from service. As this is being done, the low pressure alarm may active through a reporting alarm system. Personnel monitoring such an alarm should be notified in advance so that they are aware of the fact that service is being performed. It is also necessary to disconnect the dehydrator dry air output from the waveguide system during the overhaul.

#### 3.5.5 Remove the compressor for overhaul.

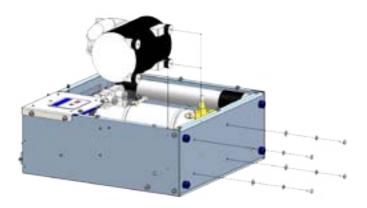


1. To remove the compressor, open the upper front panel of the unit..



2. Disconnect compressor wiring from control board.

#### (Board is shown pulled out for clarity)



- 3. Disconnect tubing from filter bowl assembly input.
- 4. Remove screws from the bottom of chassis holding the rubber isolators.

Follow the instructions included in the compressor overhaul kit. When the overhaul is complete, reinstall.

#### 3.6 Service Restoration

#### **RECOMMENDATION:**

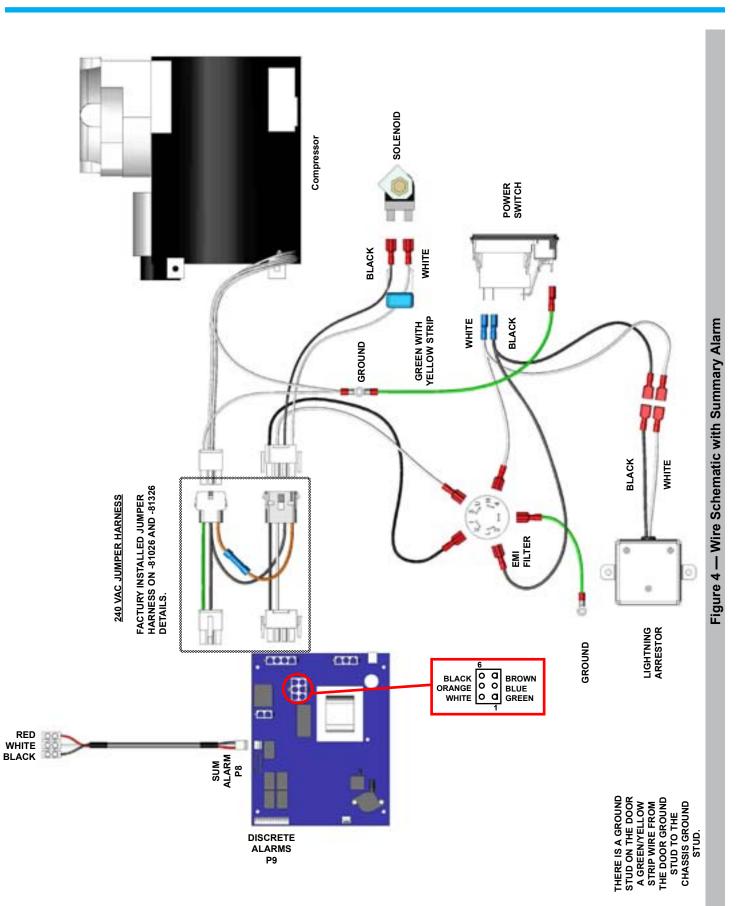
If the dehydrator overhaul process has taken more than a few hours, it is recommended that the unit be run for one hour into the room, to purge the membrane dryer and tank of any acquired moisture, before reconnecting to the transmission line system..

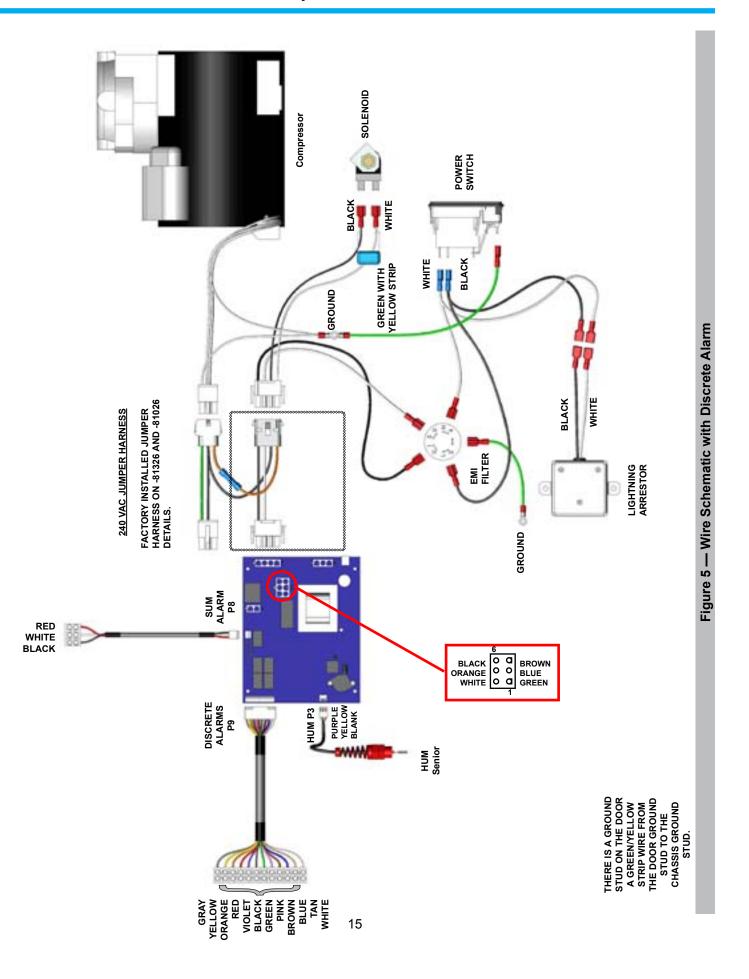
## Section 4 Troubleshooting

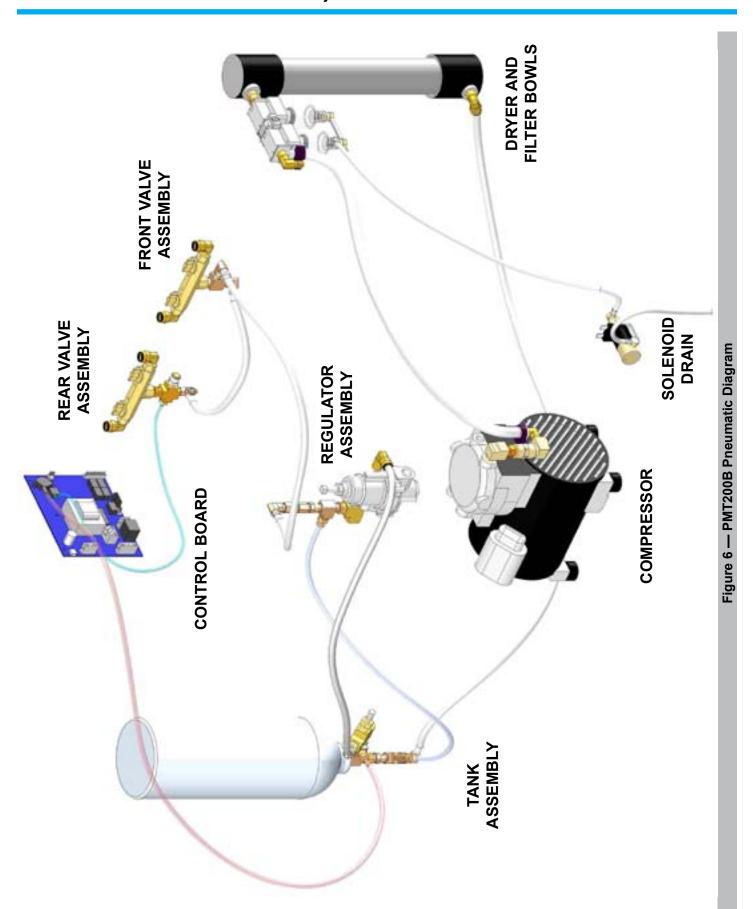
If you experience difficulty with your dehydrator, use the troubleshooting procedures described below.

## Caution: Electrical troubleshooting requires access to potentially dangerous voltages and should only be performed by a licensed electrician.

Problem/Condition	Solution
	If the display light falls to light, make sure the unit is plugged in and power outlet is operating.
Dehydrator display does not light, unit does not run.	If you still have no light, unplug the unit, remove the unit cover and check for loose connections. Refer to the wiring diagram for proper connections. Figure 4 for summary alarm unit or figure 5 for discrete alarm unit
	Check to ensure that proper AC voltage is being supplied to the input.
	Turn shut-off valve to the off position and observe pressure gauge. The pressure gauge line should read approximately 21 kPa (3.0 psig) and the alarm should clear. If alarm does not clear, remove cover and verify tubing and wiring connections are secure.
Low-pressure alarm activated.	If the pressure does not stay constant after shutting off the valve, apply leak detector to isolate the leak in the dehydrator (exercise care when applying solution not to wet wiring or electronics).
	With dehydrator isolated from transmission line, observe pressure in transmission line. If pressure drops, use a leak detector solution to locate leaks in the transmission line. Repair leaks if possible.
	If the problem persists contact CommScope Customer Service. (see section 6.0)
	Check the display on the controller. Toggle the ON/OFF switch (attached to power connection).
Compressor does not turn.	Check input voltage per wiring diagram
	If the problem persists contact CommScope Customer Service. (see section 6.0)
	Ensure that the drain line tubing (exiting the bottom of the drain solenoid) is not clogged. When the compressor cycles off, air and moisture should flow out of the drain line (into drain pan).
Filter bowls show excessive water.	If solenoid does not vent, verify proper voltage is present when compressor is running and absent when compressor is off.
	If proper voltage is present and solenoid does not shift, replace solenoid. (See section 5 for replacement parts.)







## Section 5 Replacement Parts



Filter Bowl Assemble and Dryer Tube Replacement Kit PMT200B–KIT–DRYER



Solenoid Replacement Kit PMT200B-KIT-SOLND

## Section 6 Customer Service

### 6.0 Introduction

CommScope provides in-warranty and outof-warranty repairs as well as dehydrator and compressor overhauls from several Repair Centers. Coordination of these services is provided through the nearest Sales Office or Customer Service Center. The Center is also prepared to help you with the following:

- Technical Assistance
- Troubleshooting
- Repairs
- Loaner Units
- Spare Parts
- Installation Materials
- System Accessories

### 6.1 In Case of Trouble

The first step you should take if trouble develops using a dehydrator is to read the operators manual and follow the trouble isolating procedures given in it.

#### 6.2 Initial Steps by CommScope

When your call or fax communication is received, the CommScope staff will work with you to pinpoint the possible cause of trouble. If the pressurization equipment is suspect, they will:

- ask for your unit Model Number and Serial Number
- check the warranty status of the unit
- advise the availability of a loaner unit
- provide an estimate of the cost for inspection and repairs, if the unit is out–of–warranty
- fax a Return Material Authorization Sheet to you.

#### 6.3 Repair Center Process

#### A method of Payment must be provided prior to issuing of RMA regardless of warranty status.

**IN–WARRANTY REPAIR:** Most CommScope pressurization products carry a warranty of one to three years, depending upon model number. Warranty details are available on our web page. If your unit falls within its warranty period, inspection and repairs will be performed at no charge and the unit will be promptly returned to you. If a warranty unit is deemed no problem found an inspection fee and freight will be charged to the customer.

**OUT-OF-WARRANTY REPAIR:** We will inform you with the cost of repair and obtain your approval to proceed with repairs or, if you elect not to have the unit repaired, your instructions on disposition of your unit. When repairs are complete, we will return your unit and invoice you for the inspection charge, materials used for the repair and labor applied to complete the repair. If you elected not to repair the unit, we will invoice you for the inspection and freight charge if unit is to be returned.

**LOANER UNITS:** Loaner units are available from the repair center to maintain your system while repairs are being performed. If you feel you need a loaner, please contact us at at one of the numbers listed under contact numbers. A P.O. for the full value of the unit must be issued prior to shipment. Also contact us when the loaner is ready to be returned so that we can issue a NEW RMA number to identify your return and create the appropriate credit to your account. Damages to loaner will be deducted from the P.O.

**PACKING INSTRUCTIONS:** Pack your unit securely for shipment to the Repair Center. If you received a loaner unit, we suggest you use the box and packing materials to return your unit. Otherwise we have factory packing materials available for a nominal fee. Enclose a completed copy of this form inside the box and clearly mark your Company Name and RMA: XXXXXXX on outside of the box.

Please note, Units received with Biological/ animal contamination will be returned unrepaired or scraped after notification and you will be invoiced for inspection and freight.

#### 6.4 RoHS Inquiries

For inquiries on RoHS please contact the following:

CommScope Inc. Corke Abbey, Bray Co., Dublin, Ireland Attn: Legal Department

## Section 7 DC Inverter Option

#### 7.1 Introduction

The standard 115 Vac unit can be run on an inverter with the input of 24 or 48Vdc inverter. The inverters are available in either 24 or 48 Vdc. Due to the induction of a dc motor in the compressor pulling so many amps and the cost of a dc compressor we choose to power the units with an inverter to keep the cost down and reduce the induction load on your battery systems.

#### 7.2 Installing the 24 Vdc to AC inverter

Remove the inverter from its packaging and install in desired location. The inverter can be placed on a flat surface or mounted to a wall via the flanges and slots on the bottom of the inverter.



Verify power switch is turned off on the inverter.

Connect the power cord from the dehydrator to the AC receptacle located on the left side of the inverter.



Connect the DC power to the lugs located on the right side of the inverter to the battery system. Ensure the polarity is correct. Improper connection can damage inverter and void warranty.



Turn inverter on. Only green LED's should be illuminated.

Turn on Dehydrator.

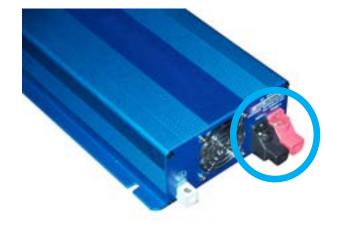
#### 7.3 Installing the 48 Vdc to AC inverter

Remove the inverter from its packaging and install in desired location. The inverter can be placed on a flat surface or mounted to a wall via the flanges and slots on the bottom of the inverter.



Verify power switch is turned off on the inverter.

Connect the power cord from the dehydrator to the AC receptacle located on the left side of the inverter.



Connect the DC power to the lugs located on the right side of the inverter to the battery system. Ensure the polarity is correct. Improper connection can damage inverter and void warranty.



Turn inverter on. Only green LED's should be illuminated.

Turn on Dehydrator.