We Manage Heat ®

Automatic Air Dehydrator with Ethernet Communications
MODEL ADH® NETCOM™ MANUAL

Installation and Operation Manual

Environmental Technology, Inc.
1850 N Sheridan Street
South Bend, Indiana 46628
(574) 233-1202 or (800) 234-4239
FAX (574) 233-2152 or (888) 234-4238
http://www.networketi.com/

Abnormal Odor or Smoke

In the event of smoke or an abnormal odor, immediately interrupt power to the ADH NETCOM with the POWER switch at the rear of the unit, unplug the unit, or trip the circuit breaker controlling the outlet.

Lethal Voltages Present

There are lethal voltages present inside the case of the ADH NETCOM. Service should be performed by qualified personnel only. There are no user serviceable components inside the chassis.

Pneumatics

The air pumps in the ADH NETCOM are capable of generating as much as 24 psig (1655 mbar). Proper safety practice requires treating all pneumatic components with care. Always vent the system to atmospheric pressure before servicing pneumatic components.

Rack Mounting

Before and after rack mounting the ADH NETCOM ensure that rack is stable. Mounting of the ADH NETCOM into the rack should be such that a hazardous condition is not created due to uneven mechanical loading. Verify adequate air flow and power supply capacity is available to the unit . Ensure that ADH NETCOM maximum operating temperature of 130°F(55°C) will not be compromised by other components in rack. Ensure reliable earthing of ADH NETCOM.

Overview

Function

Unpressurized transmission lines allow the entry of moist ambient air through leaking seals and cracks. When the line passes from one environment to another (such as entering a shelter from the antenna outside) or when there is a change in existing environmental conditions (such as a weather front or nightfall) the pressure and/or temperature changes in the air will result in the collection of water. This is normally the result of the ambient temperature dropping below the dew point. Water in transmission lines causes corrosion, voltage arcing and increased VSWR. These conditions reduce system performance.

The ADH NETCOM Automatic Dehydrator prevents the accumulation of moisture in transmission lines by maintaining the pressure and dew point of the air inside the line. Supplying low pressure dry air, the ADH NETCOM keeps waveguides, air-dielectric coaxial cable and related components used in earth station and terrestrial UHF and microwave communication systems dry.

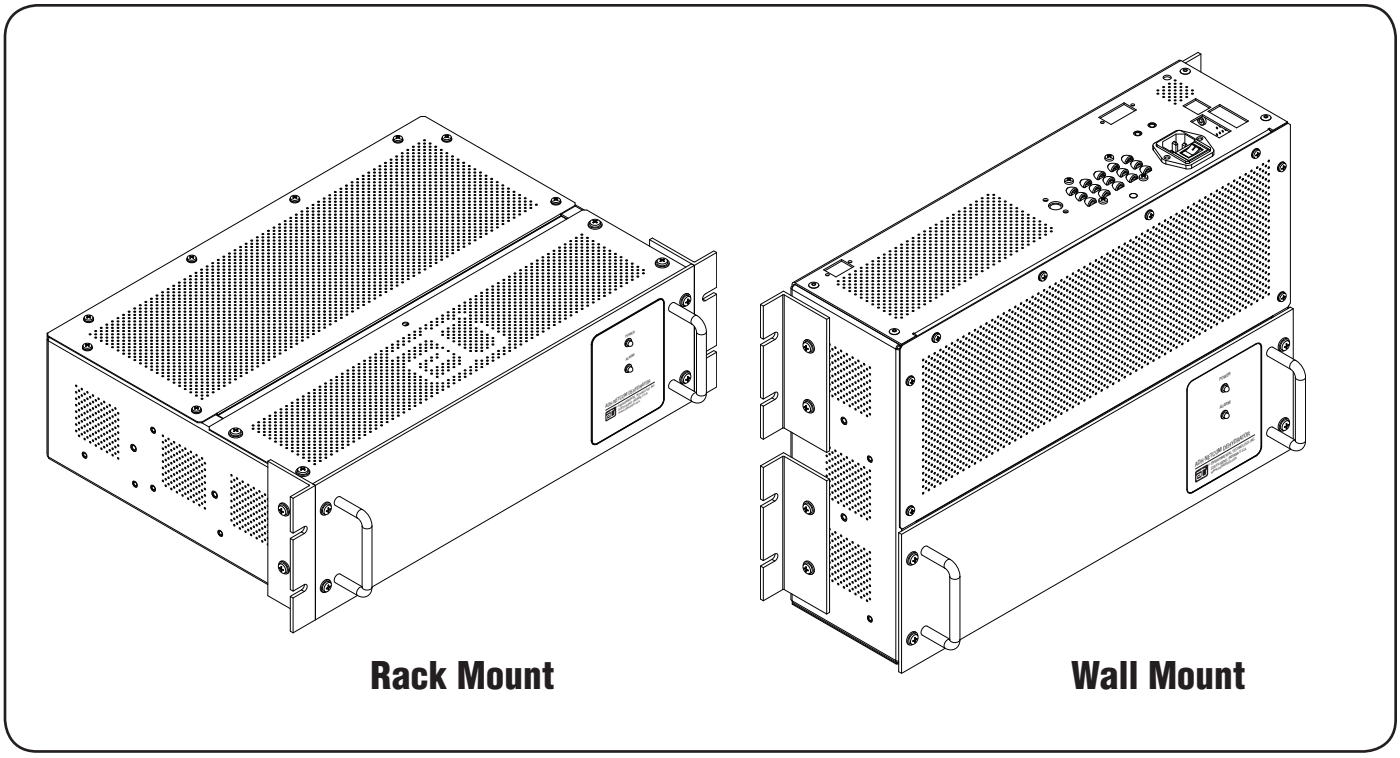

Figure 1: A standard ADH NETCOM shown configured for rack mount or wall mount installation.

Features

The ADH NETCOM is functionally equivalent to the ADH–2A COM and the ADH–3COM automatic dehydrators with regards to basic mechanical features such as air drying and pressurization. The ADH NETCOM builds on these earlier air dehydrators to improve network communications, extend product life expectancy and simplify ordering and installing. At a glance these new features include:

- A drop in replacement for previous ADH models in service and in specifications
- 15+ year maintenance-free life expectancy
- Indoor and outdoor mounting options
- 100 to 240 VAC and ± 20 to 75 VDC power options
- All operational parameters easily set by way of simple web interface or SNMP
- Communication interfaces include Ethernet networking, RS-485/422 and RS-232
- Communications protocols include HTTP, SNMP and Scientific-Atlanta (S-A)
- Master/slave functionality for automatic operations of paralleled dehydrators
- Interface for the Smart Manifold for automatic operation of one or more antennas from one or more dehydrators
- Complete set of programmable alarms including three configurable alarm relays
- Firmware can be updated remotely through the network interface permitting performance updates throughout the life of the dehydrator.

1...Drying Canister #1
2..Drying Canister #2
3..Outlet Manifold
4..Evaporator Tray
5..Power Switch
6..AC Power Supply Module
7..Dew Point Sensor
8..Outlet Solenoid #2
9..Outlet Solenoid #1
10.AC Switching Power supply
11..Dual Diaphragm Brushless Compressor
12.Inlet Solenoid

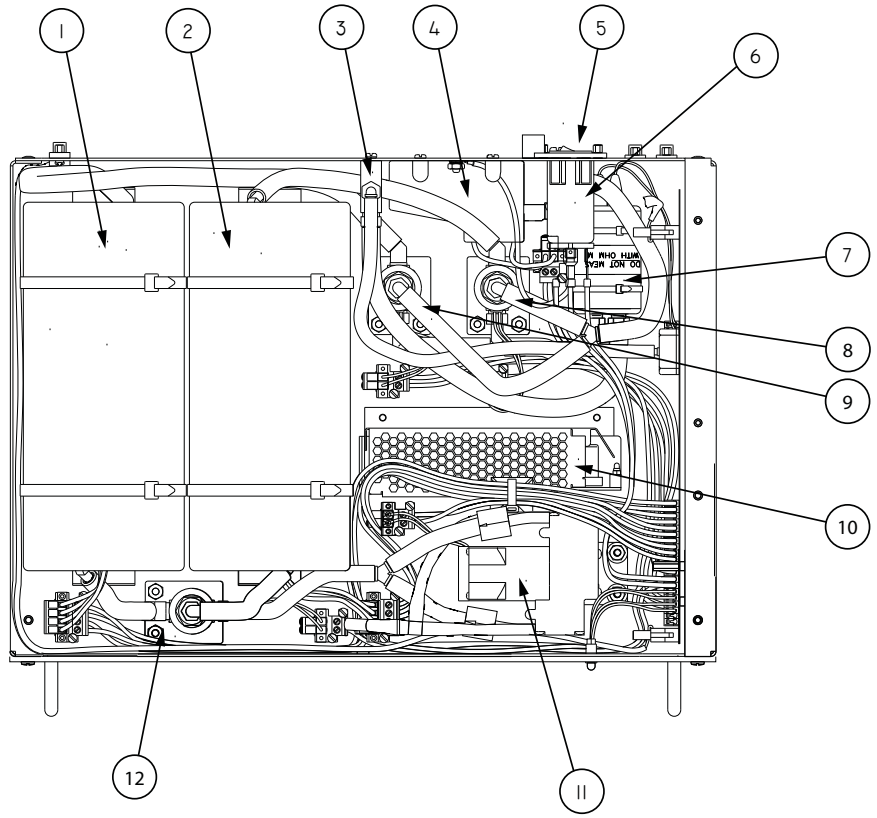

Figure 2: ADH NETCOM AC Unit Components.

Dehydration System

The ADH NETCOM is a low pressure automatic air dehydrator. Low pressure air provides personnel and equipment safety along with energy efficiency. Activated alumina is used as the drying agent. Alumina, or aluminum oxide, is an energy efficient thermal conductor with a long life expectancy.

Air is dehydrated by passing it through a drying canister containing the drying agent. The dried air is delivered to the communications equipment through a connection in the rear panel. The moisture is removed from the drying canisters by heat. The standard unit provides dry air at 0.5 psig (34.5 mbar) and is capable of delivering 26 cubic feet of air per hour (12.3 liters per minute). Output pressure is field configurable up to 7.5 psig (517 mbar).

Two drying canisters are employed to provide a continuous supply of dried air. One unit is active while the other is in standby or being regenerated. Under normal circumstances, the maximum dew point of the air is -40°C and nominally -70°C. The ADH NETCOM will operate on one of the absorption units until that unit is fully saturated, or for 200 hours, whichever condition is reached first. When this occurs, the standby drying canister is brought into service and the used unit is regenerated. The drying canister being regenerated is heated internally with a resistance heater until a temperature is attained which will convert all absorbed water into steam.

1...Drying Canister #1
2..Drying Canister #2
3..Outlet Manifold
4..Evaporator Tray
5..DC Power Terminal Block
6..Dew Point Sensor
7..Outlet Solenoid #2
8..Outlet Solenoid #1
9..DC Switching Power Converter
10.Dual Diaphragm Brushless Compressor
11..Inlet Solenoid

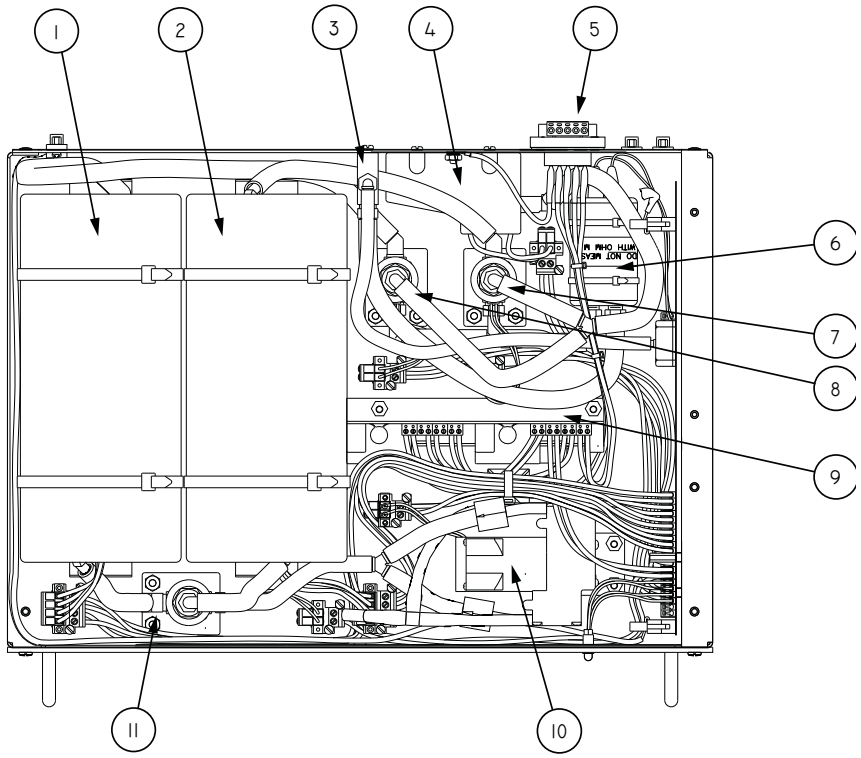

Figure 3: ADH NETCOM DC Unit Components.

The resulting vapor is purged by pumping ambient air through the drying canister and collecting the water in an evaporator where it is again heated and driven off as water vapor. No drain line or special ventilation is needed with standard units. On ADH NETCOM NEMA automatic dehydrators the purge air and steam is evacuated out of the enclosure through a moisture diffuser (supplied) or through a customer supplied drain line via the 1/8˝ NPT discharge fitting. This eliminates moisture from inside the weather tight enclosure.

Pressurization

The dual-diaphragm compressor features a brushless motor with a 15+ year life expectancy. It provides a flow rate of 26 scfh (12.3 l/m). The discharge pressure cycles between two limits. These limits are field configurable in a range between 0.10 psig and 7.50 psig (7mbar - 517 mbar) in 0.01 psig or 1 mbar increments. Factory default pressure is 0.5 psig (34.5 mbar). A safety relief valve operating at 8 psig (552 mbar) provides over pressure protection.

Communications

The ADH NETCOM automatic dehydrator includes support for both Ethernet network communications and legacy serial communications.

The Ethernet capabilities within the ADH NETCOM include support for the web interface, Simple Network Management Protocol (SNMP), User Datagram Protocol (UDP) and Trivial File Transfer Protocol (TFTP). It allows for monitoring and configuration of the dehydrator as well as providing a means for upgrading the dehydrator's software and firmware in the field.

The serial capabilities within the ADH NETCOM include legacy support for the Scientific-Atlanta (S-A) protocol used in previous ADH dehydrators. Both RS-422/485 and RS-232 ports are provided for the greatest degree of compatibility.

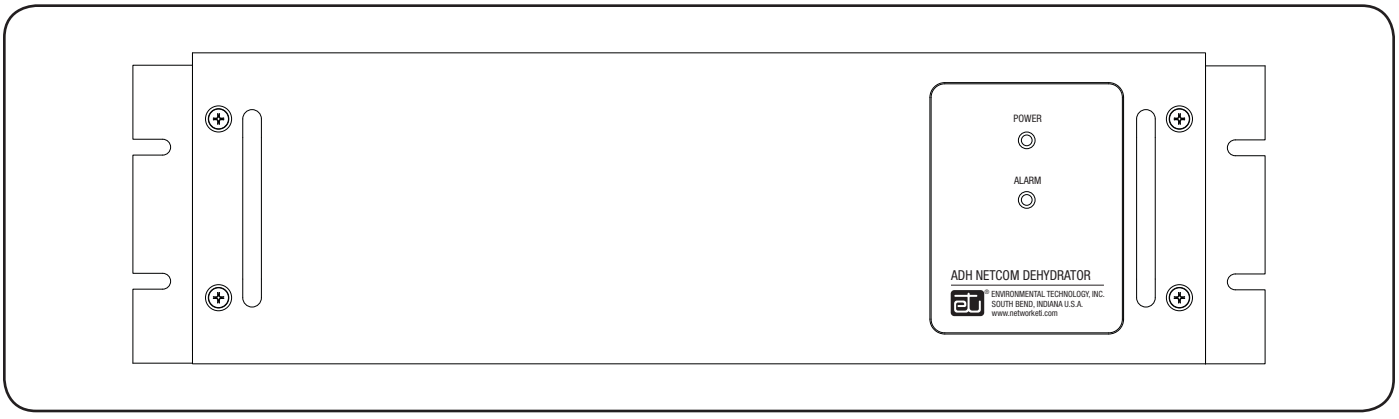

Figure 4: ADH NETCOM front panel.

The ADH NETCOM automatic dehydrator includes three alarm relays for external annunciation of alarm conditions. These are configured at the factory for SUMMARY ALARM, LOW PRESSURE ALARM and OVER PRESSURE ALARM but each alarm relay can be programmed to any of the alarm conditions tracked by the ADH NETCOM.

Displays

Standard display configuration includes two LED indicators on the front panel for POWER and ALARM. A web interface provides detailed status information display and allows for unit configuration.

Supply Power

The ADH NETCOM automatic dehydrator is available in both AC and DC supply power models. AC units have a switching power supply that operates from 100 to 240 VAC, 50/60Hz. DC units have a switching power converter that operates from 20 to 75 VDC with a positive or negative ground system. Neither the AC nor DC units require any customer adjustments to operate within the allowed supply power ranges.

Operation

User Inputs

The ADH NETCOM automatic dehydrator allows for the configuration of many of its operational parameters. User defined operational and alarm settings, with their default values, are as follows:

High Limit Target Pressure: The high set point of the operating pressure range for the dehydrator. This is the pressure the unit will target during compressor operation. The actual turn off pressure is adjusted in software every pressurization cycle after determining the rate of pressure change during that cycle. This software compensation for rate of pressure change during pressurization minimizes compressor undershoot. High Limit Target Pressure must be between 0.20 psig and 7.5 psig (14mbar and 517mbar). The factory default High Limit Target Pressure is 0.50 psig (34.5 mbar).

Low Limit Pressure: The low set point of the operating pressure range for the dehydrator. This is the pressure at which the unit will turn off the compressor during compressor operation. Low Limit Pressure must be less than the High Limit Traget Pressure by at least 0.1 psig (7mbar). The factory default Low Limit Pressure is 0.30 psig (21 mbar).

High Pressure Alarm Level: The pressure at which High Pressure will announce an alarm condition. The High Pressure Alarm must be higher than the Maximum Pressure. The factory default is 1.5 psig (103.5mbar).

Low Pressure Alarm Level: The pressure at which Low Pressure will announce an alarm condition. The Low Pressure Alarm must be less than the Minimum Pressure. The factory default Low Pressure Alarm is 0.15 psig (10 mbar).

Display Units: The pressure unit displayed by the ADH NETCOM is configurable as either English (psig) or SI (metric, millibars). The factory default is English.

Alarm Relays: There are three alarm relay outputs that may be configured to alarm for any of the ADH NETCOM dehydrator's alarm or warning conditions. All three relays are energized at power up and de-energized during an alarm condition or when power is removed from the dehydrator. The factory defaults are:

- Alarm Relay 1 – Summary Alarm
- Alarm Relay 2 – Low Pressure
- Alarm Relay 3 – Over Pressure Alarm

High Duty Cycle Alarm Level: The set point at which the ADH NETCOM will alarm for a high duty cycle. The factory default is 50%.

Pressurization

A solid state pressure transducer senses discharge pressure. The transducer's signal is digitized and processed to control the compressor. The compressor operates while the pressure is between the Maximum Pressure and Minimum Pressure. The factory default pressure range is between 0.30 psig and 0.5 psig (21 mbar and 34.5mbar).

Note: If the temperature in the ADH NETCOM automatic dehydrator is measured at less than 32°F (0°C) the dehydrator will not turn on the compressor. For NEMA units an enclosure heater will be energized any time the temperature in the dehydrator is below 40°F (4.4°C).

A High Pressure Alarm occurs if the pressure exceeds the configured High Pressure Alarm level for more than 30 seconds. The factory default High Pressure Alarm level is 1.5 psig (103.5mbar). A mechanical pressure safety relief valve provides over pressure protection independent of the electronic system. The set point of the safety relief valve is 8 psig (552 mbar).

The compressor duty cycle and the discharge pressure are available for display. Typically the system should be tight enough to limit the duty cycle to less than 20%. Dehydrator life decreases as duty cycle increases. A Duty Cycle Alarm occurs if the duty cycle exceeds the configured Duty Cycle Alarm level. The factory default Duty Cycle Alarm level is 50%.

Conditions for Regeneration

The ADH NETCOM automatic dehydrator has three conditions that will mark a drying canister for regeneration. These conditions will occur on a trigger of moisture, time or start up.

During normal operation regeneration begins when the dew point sensor determines that the discharge air from the canister is "wet." What is considered a wet condition will vary with environmental conditions.

The amount of time that a drying canister is in service is recorded by the ADH NETCOM. As a precaution, if a drying canister stays in service for 200 hours the ADH NETCOM will place that drying canister into regeneration even though sensed moisture has not reached levels that would be considered wet. This ensures that the drying agent is periodically regenerated even in low dew point conditions to extend the life of the drying agent and ensure peak operation of the dehydrator.

When power is initially applied to the ADH NETCOM automatic dehydrator operation begins with the use of one drying canister. The discharge air is monitored for moisture for a short time. The first drying canister is taken out of service and the other drying canister is brought in to service. If the first drying canister was determined to be wet it is placed in a regeneration cycle, otherwise it is placed in standby. The second absorption canister is likewise tested. If the second drying

canister is found to be wet, the first drying canister is brought back into use and the second drying canister is regenerated. The normal regeneration cycle is then entered. If both drying canisters are found to be wet the drying canister remains in service while the first is regenerated and the dew point alarm is issued.

Regeneration

In the ADH NETCOM drying canister regeneration is controlled by the main processor. A thermocouple monitors the temperature of the drying canister . The drying canister is heated until the desired temperature is obtained. The drying canister and its contents are allowed to soak at this temperature for approximately two and one-half hours. The drying canister is then purged by pressurized air into the internal evaporator tray, eliminating the need for a drain line.

If the drying canister fails to reach the desired temperature it is declared dead and an error is issued. The drying canister is allowed six (6) hours to cool. If it fails to cool to less than 18°F (10°C) above the ambient temperature then the unit is declared dead and an error is issued.

Main Control Board

The ADH NETCOM utilizes a single computer board which includes the microprocessor, the pressure sensor and I/O connection for both internal control and external communications. The microprocessor controls all internal dehydrator functions. It acts on data collected from various sensors to control operation of the compressor, absorption canister healers and solenoid valves. It monitors system operation and generates status and alarm conditions which are communicated via LED indicators (power and summary alarm), programmable alarm relays, serial I/O interfaces (RS-422 and RS-232), and through the communications module. The communications module is a plug-in board that controls Ethernet networking including SNMP, the web interface, UDP and TFTP. The main computer board includes the pressure sensor and ambient temperature sensor and has a display port for use with optional display interfaces.

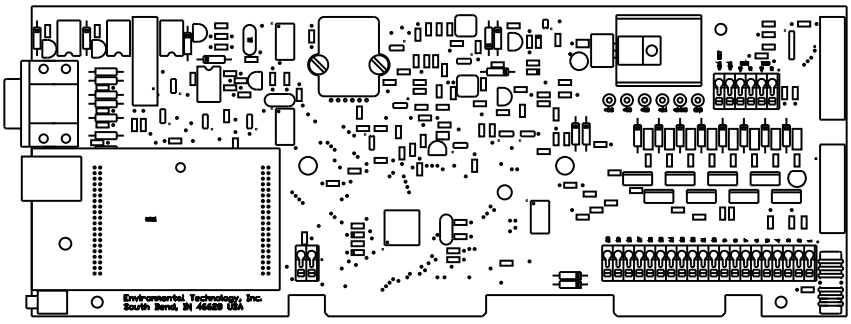

Figure 5: ADH NETCOM main control board.

Sensors

The ADH NETCOM air dehydrator has five internal sensors. There are three temperature sensors, the ambient air temperature sensor on the computer board and a temperature sensor on the housing of each drying canister. A pressure sensor located on the computer board measures the discharge air pressure. Lastly, a dew point sensor measures the moisture levels in the discharge air.

Communications

The ADH NETCOM features Ethernet network communications as well as RS-422 and RS-232 serial communications for legacy support. The primary protocols utilized by the Ethernet communications are SNMP, HTTP, UDP and TFTP. The IP address can be set via DHCP or static addressing. The factory setting is a static IP address of 192.168.52.9 and subnet 255.255.255.0. The RS-422 and RS-232 ports both support SA protocol communications.

Installation

Unpacking/Packing

Immediately inspect the container and packing material for damage. Unpack the ADH NETCOM taking care not to damage the packing materials. Save the shipping container and related materials until normal operation has been established. If the unit must be returned take care to ensure that it is repackaged as it was received.

Initial Inspection

Inspect the ADH NETCOM for electrical and mechanical damage. If any of the following problems are found contact the Customer Service department:

- Contents incomplete or incorrect
- Internal or external mechanical damage
- Defective operation

Customer Service is available between 8:00 a.m. and 5:00 p.m. Eastern Time at 574-233-1202 or 800-234-4239. In the event of shipping damage, keep the packing materials for inspection by the carrier. Normally, Environmental Technology will repair or replace the ADH NETCOM without waiting for the claims settlement.

Packing List

Verify the package contains the parts listed for the ADH NETCOM version ordered against the appropriate packing list in Tables 1 through 4.

Qty	ETI P/N	Description
1	23437	ADH NETCOM Automatic Dehydrator, AC Power Supply
1	23526	ADH NETCOM Instruction Manual (this document)
1	23617	ADH NETCOM Installation Sheet
1	18198	1/8" NPT to 1/4" Barbed Brass Fitting
1	23428	1/8" NPT to 3/8" Barbed Brass Fitting
4	23245	Mounting Bracket
8	11040	Rack-mounting screw (#8-32)
8	10641	#8 Split Washer

Table 1. Packing List for AC Power Supply version

Qty	ETI P/N	Description
1	23242	ADH NETCOM Automatic Dehydrator, DC Power Supply
1	23526	ADH NETCOM Instruction Manual (this document)
1	23229	ADH NETCOM Installation Sheet
1	18198	1/8" NPT to 1/4" Barbed Brass Fitting
1	23428	1/8" NPT to 3/8" Barbed Brass Fitting
4	23245	Mounting Bracket
8	11040	Rack-mounting screw (#8-32)
8	10641	#8 Split Washer

Table 2. Packing List for DC Power Supply version

Qty	ETI P/N	Description
1	23483	ADH NETCOM Automatic Dehydrator, NEMA, AC Power Supply
1	23526	ADH NETCOM Instruction Manual (this document)
1	23481	ADH NETCOM Installation Sheet
1	18198	1/8" NPT to 1/4" Barbed Brass Fitting
1	23428	1/8" NPT to 3/8" Barbed Brass Fitting
1	23571	Bronze Exhaust Muffler

Table 3. Packing List for NEMA AC Power Supply version

Qty	ETI P/N	Description
1	23242	ADH NETCOM Automatic Dehydrator, NEMA, DC Power Supply
1	23526	ADH NETCOM Instruction Manual
1	23229	ADH NETCOM Installation Sheet (this document)
1	18198	1/8" NPT to 1/4" Barbed Brass Fitting
1	23428	1/8" NPT to 3/8" Barbed Brass Fitting
1	23571	Bronze Exhaust Muffler

Table 4. Packing List for NEMA DC Power Supply version

Rack Mounting

Important: Before and after rack mounting the ADH NETCOM ensure that rack is stable. Mounting of the ADH NETCOM into the rack should be such that a hazardous condition is not created due to uneven mechanical loading. Verify adequate air flow and power supply capacity is available to the unit . Ensure that ADH NETCOM maximum operating temperature of 130°F(55°C) will not be compromised by other components in rack. Ensure reliable earthing of ADH NETCOM.

The ADH NETCOM automatic dehydrator can be mounted in a standard 19˝ communications rack at one of four depths utilizing two mounting locations. Mounting depths available are flush, 2˝, 6˝ and 8˝. The side panels of the chassis contain tapped holes (#8-32) to facilitate installation. The ADH NETCOM automatic dehydrator should be mounted using chassis slide rails (not supplied) or on support channels mounted on the inside of the relay rack. Since the ADH NETCOM seldom requires operator attention a location in the lower portion or extreme upper portion of the rack may be considered.

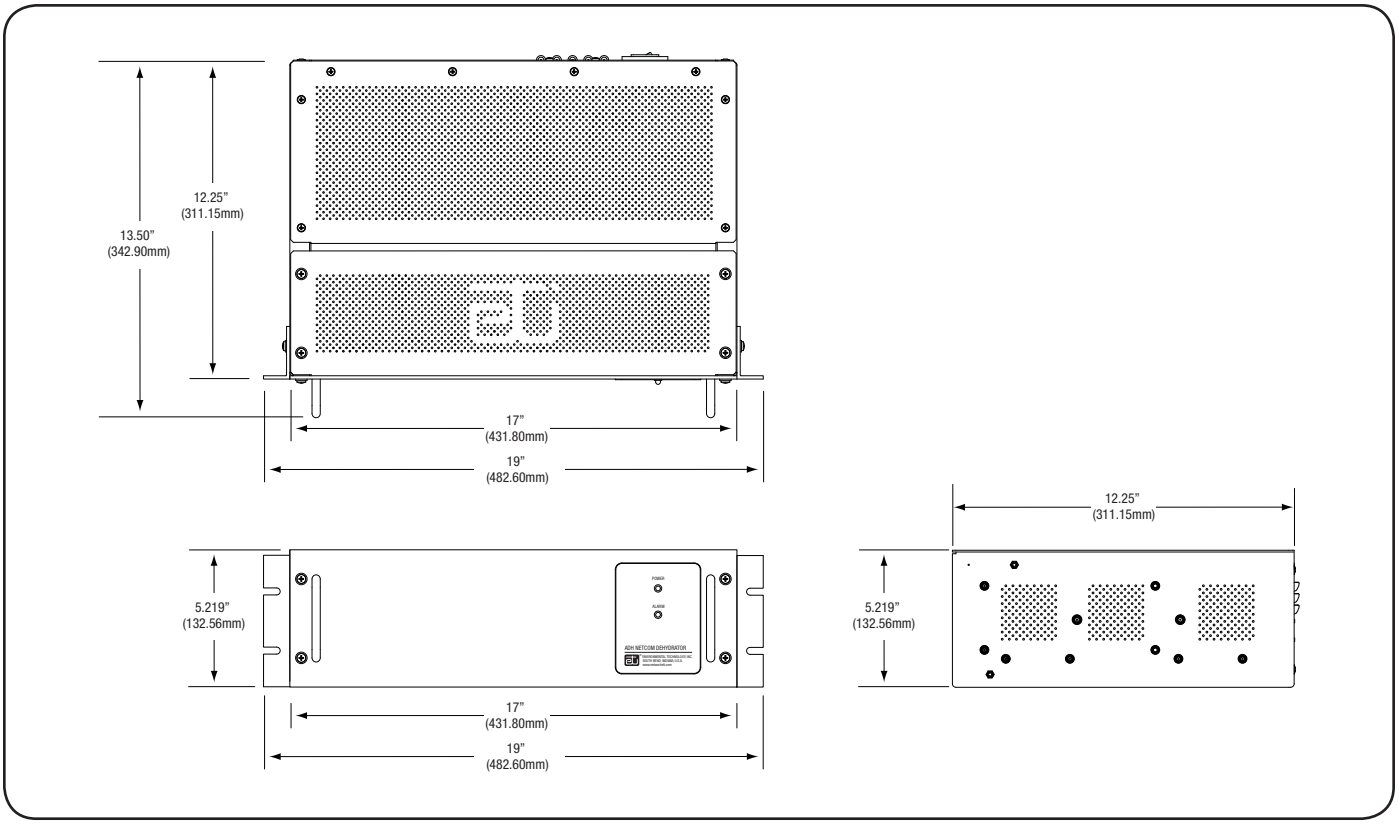

Figure 6: ADH NETCOM Rack Mount dimensional.

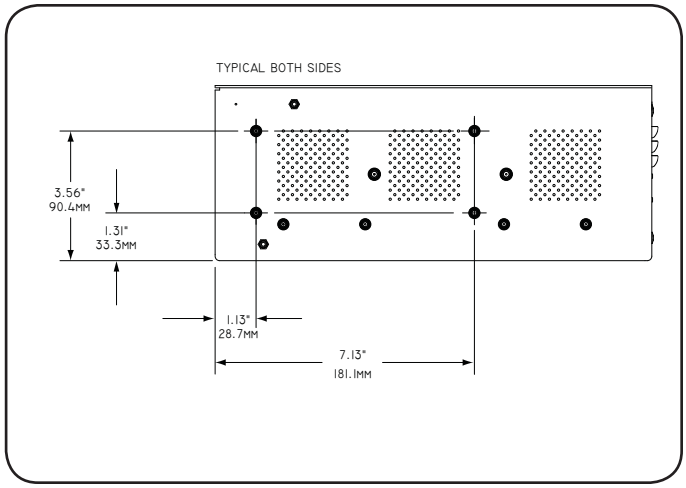

Figure 6: Rack mount hole dimensions.

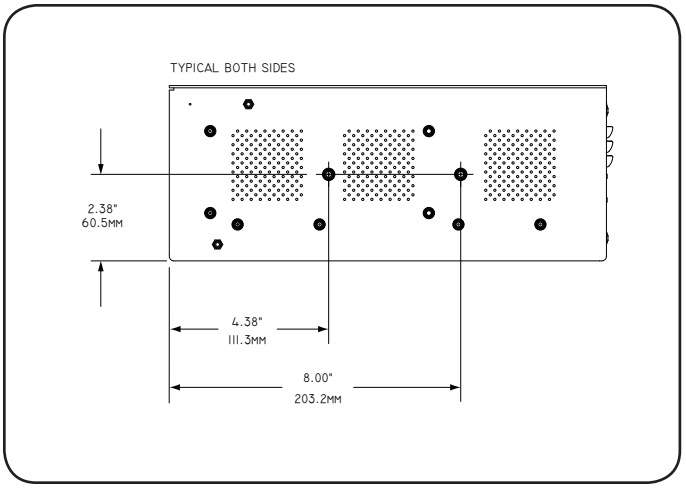

Figure 7: Rack slide rail mount hole dimensions.

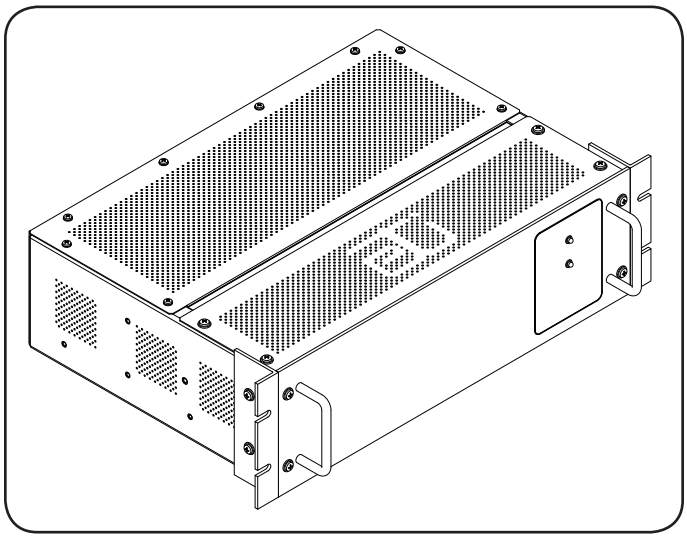

Figure 8: Mounting brackets in flush mount position.

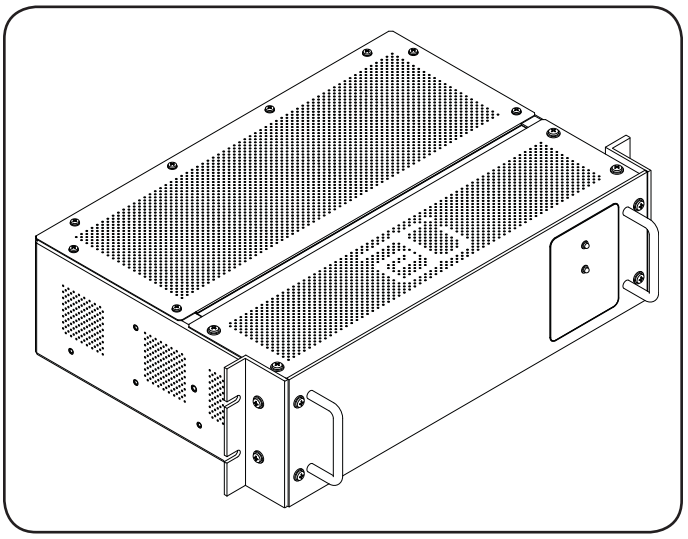

Figure 9: Mounting brackets in 2˝ depth mounting position.

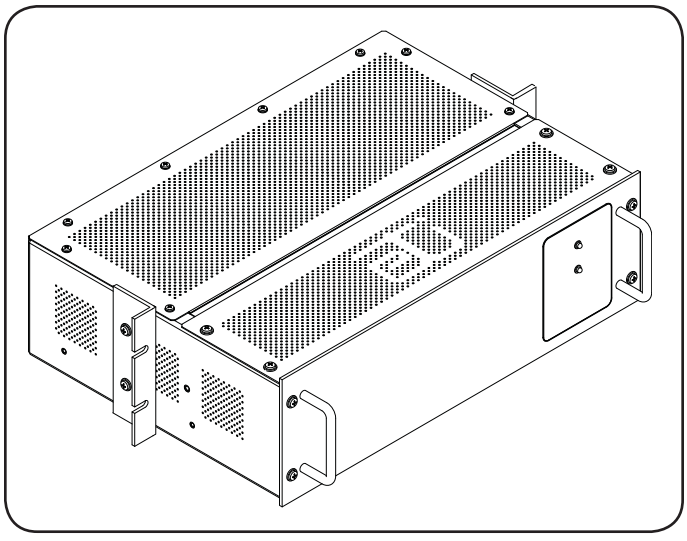

Figure 10: Mounting brackets in 6˝ depth mounting position.

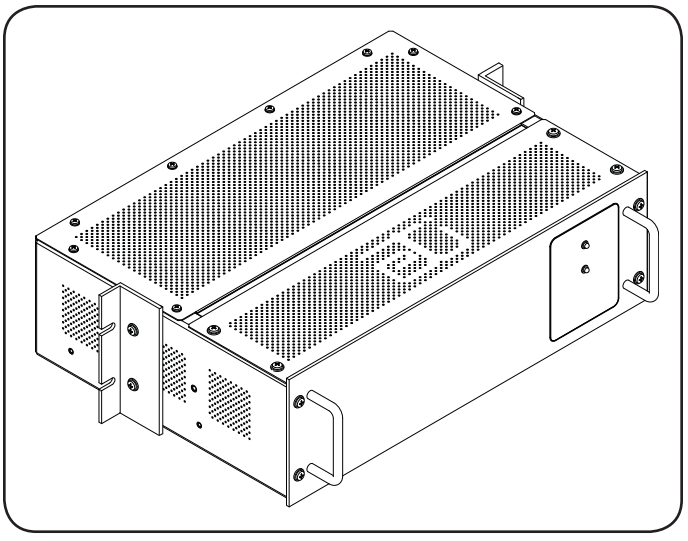

Figure 11: Mounting brackets in 8˝ depth mounting position.

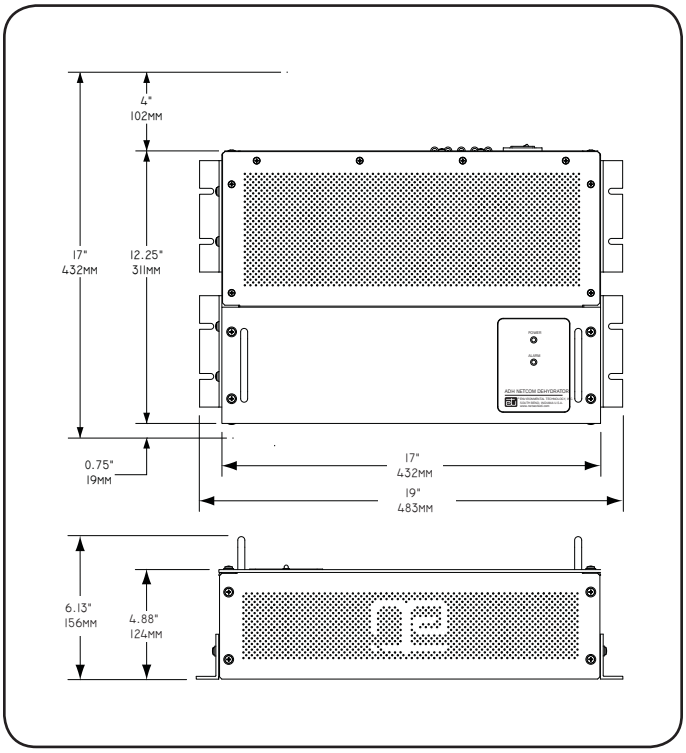

Figure 12: Wall mount over-all dimensional.

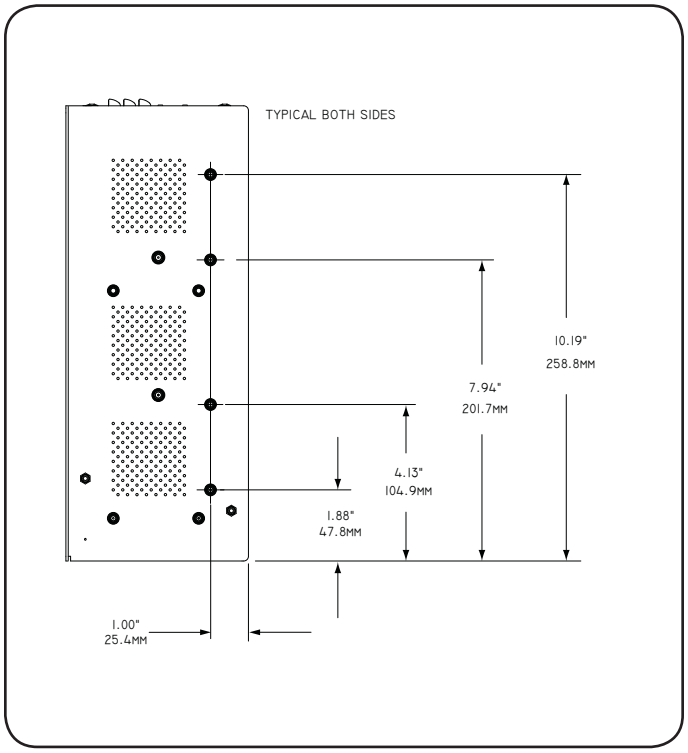

Figure 13: Wall mounting bracket hole dimensions.

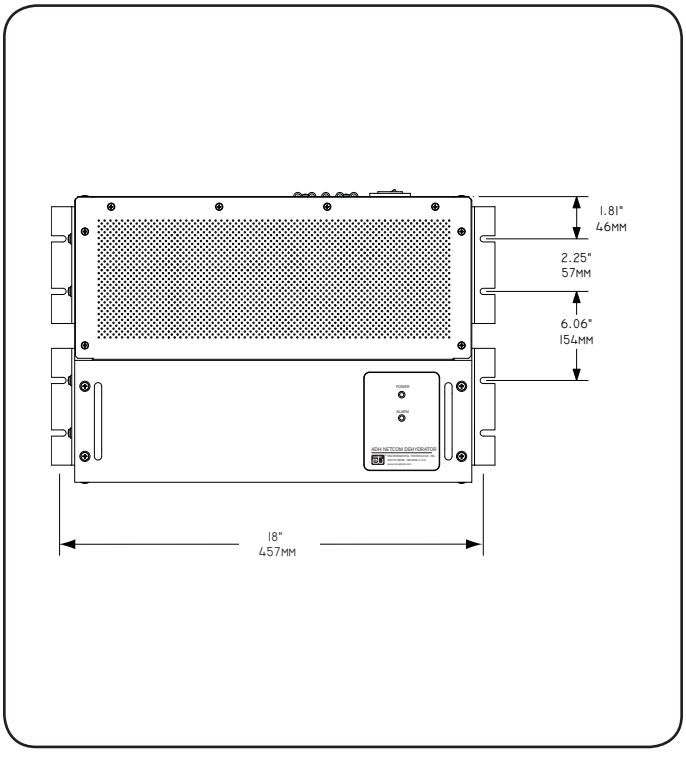

Figure 14: Wall mounting point dimensions.

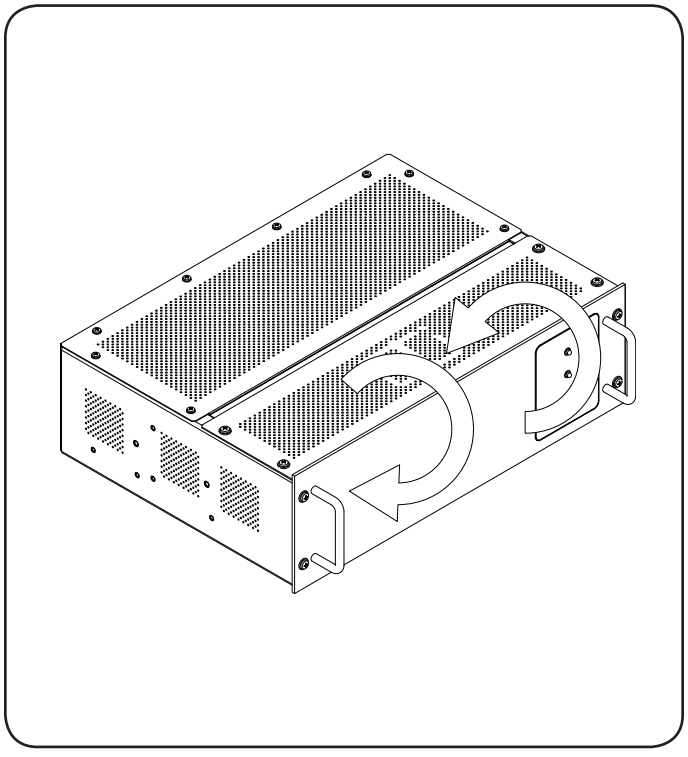

Figure 15: Simple wall mount conversion.

Wall Mounting

Wall mounting an ADH NETCOM requires an area of approximately 17˝ high by 19˝ wide and will project almost 6˝ from the wall. Plan your installation so that the ADH NETCOM will not interfere with normal traffic patterns at your site. Ensure the wall mounted unit has sufficient clearance above the connection panel to facilitate access to the power, communications and pneumatic interfaces.

To wall mount an ADH NETCOM automatic dehydrator all four mounting brackets are used. The mounting brackets will accommodate fasteners up to 1/4˝ (6mm) in diameter. The choice of anchors and companion hardware should be approprate for the mounting surface. At least four anchors (minimum one per mounting bracket) should be used and each should be capable of supporting at least 16 pounds (7.3 kg). If more than four anchors are used it is recommended that the combined load capacity be at least 64 pounds (29 kg).

To configure the dehydrator for wall mount installation remove the front panel and the portion of the vented cover with the ETI logo. Reinstall the front panel so that it will be in the new front position once the dehydrator is oriented for wall mounting. Reinstall the small vented panel so that it will be in the new bottom position.

Principal Considerations

The ADH NETCOM works best supplying dry air in a flowing system, where the dehydrator completely replaces the air on a regular, albeit leisurely, basis. Consequently, the equipment being supplied dry air should be **slightly leaky**. For a waveguide, this is best accomplished by slightly opening a purge valve at the window end of the system. Likewise, air dielectric coaxial cable should be equipped with a valve at the far end which can be set to allow a small leak. Many systems will have sufficient normal leakage that such actions may be unnecessary. For optimal performance and life expectancy of the dehydrator a duty cycle between 1% and 20% is recommended.

The ADH NETCOM has check valves in the air path and a pressure relief valve. A tightly sealed system may experience a pressure increase with a rise in ambient temperature. The ADH NETCOM will relieve such buildup should it reach 8 psig (552mbar) but it is advised the ADH NETCOM not be used as the only means of overpressure protection in any but the smallest of systems.

Communication Connections

The ADH NETCOM includes communication ports for RS-422/485 (one female and one male), an RS-232, Ethernet and alarm relays. The serial ports use standard DB-9 connectors. Do not use null-modem cables. Pin outs for the RS-422/485 are shown in Figure 18. The Ethernet port uses a standard RJ-45 connector and can use CAT-5 or CAT-5E UTP cable. The alarm relays use a female DB-15 using the pin outs shown in Figure 19.

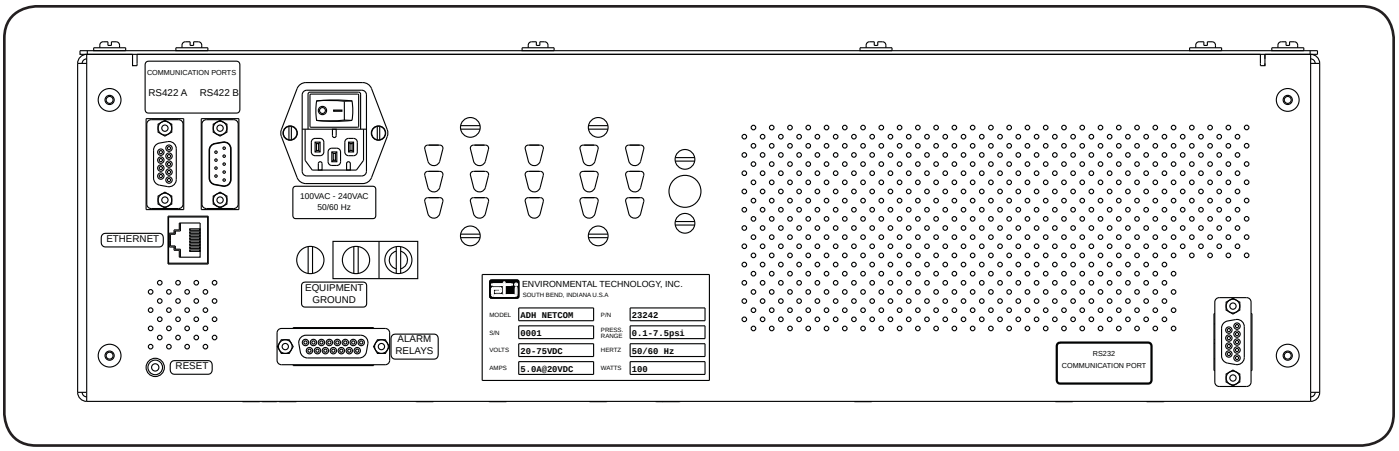

Figure 16: ADH NETCOM AC connections.

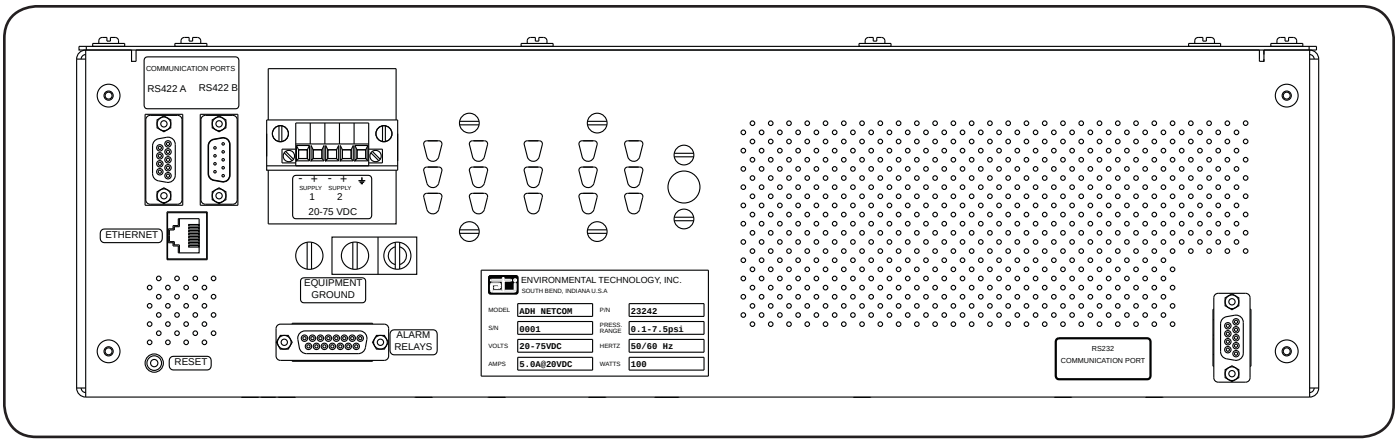

Figure 17: ADH NETCOM DC connections.

Pin	Description	Comments
1	Shield Ground	
2	Receive Ready	Tied to +5 volts via a 4.7K resistor internally
3	Receive +	Note: Also typically referred to as “R+” or “RB”
4	Transmit +	Note: Also typically referred to as “T+” or “TB”
5	Signal Ground	
6	Transmit -	Note: Also typically referred to as “T-” or “TA”
7	Request to Send	Pin 7 (RTS) is tied internally to pin 8 (CTS)
8	Clear to Send	Pin 8 (CTS) is tied internally to pin 7 (RTS)
9	Receive -	Note: Also typically referred to as “R-” or “RA”

Figure 18: RS-422/485 connector pin assignments.

Pin	Description
1	Relay 1 Closed on alarm
2	Relay 1 Opened on alarm
3	Relay 2 Closed on alarm
4	Relay 2 Common
5	Relay 2 Open on alarm
6	Not used
7	Not used
8	Not used
9	Relay 1 Common
10	Relay 3 Common
11	Relay 3 Open on alarm
12	Relay 3 Closed on alarm
13	Not used
14	Not used
15	Not used

Figure 19: Alarm relay connector pin assignments. Alarm relays are energized when the dehydrator is powered on.

Pneumatic Connections

The ADH NETCOM comes supplied with a 1/4″ brass barbed fitting and a 3/8″ brass barbed fitting for connecting the feed hose to the 1/8″ NPT female air discharge port. Alternatively other customer supplied fittings may be used to connect to the 1/8″ NPT female air discharge port. For longer feed lines larger diameter feed hose should be used to minimize compressor cycling during significant volume changes such as initial pressurization.

Power Connections

For the DC version of the ADH NETCOM the system can be connected to two independent supplies providing ±20-75 VDC each. Attach to Supply 1 (required) and Supply 2 (optional) as shown on the panel. Attach ground to either the ground lug and/or the ground terminal on the terminal block.

Note: The DC version of the ADH NETCOM does not have a power switch. When power is applied the system will start.

The AC version of the ADH NETCOM uses a standard NEMA 5-15P to IEC 320-C13 power cord (included, ETI PN 17618). Place the power switch in the off position before connecting the power cord.

Configuring

Web Interface

The ADH NETCOM automatic dehydrator may be configured and monitored via its simple web interface. Initial set up is typically done with a stand-alone PC or laptop configured for use in the 192.168.52.0 network. A typical IP address for the configuring host would be 192.168.52.1 with a subnet mask of 255.255.255.0.

The initial IP address of the ADH NETCOM dehydrator is 192.168.52.9 with a subnet of 255.255.255.0. Open a web browser and connect to this IP address.

Click on the configuration page link. From here you can configure the operational pressure limits, pressure alarms, SNMP parameters and the IP configuration.

To configure the serial ports on the back of the unit click on the communications configuration page link. There are three ports labeled “RS422A”, RS422B” and “RS232” on the back of the dehydrator and each can be configured. See Appendix C for more information regarding the use of the Scientific-Atlanta protocol.

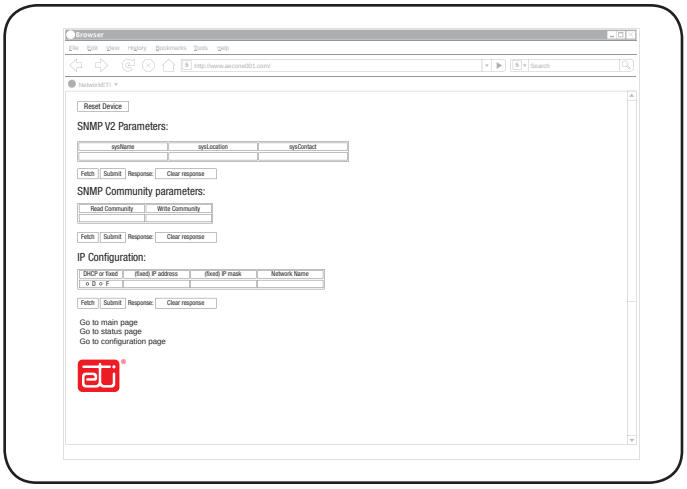

Figure 20: Dehydrator parameter configuration page.

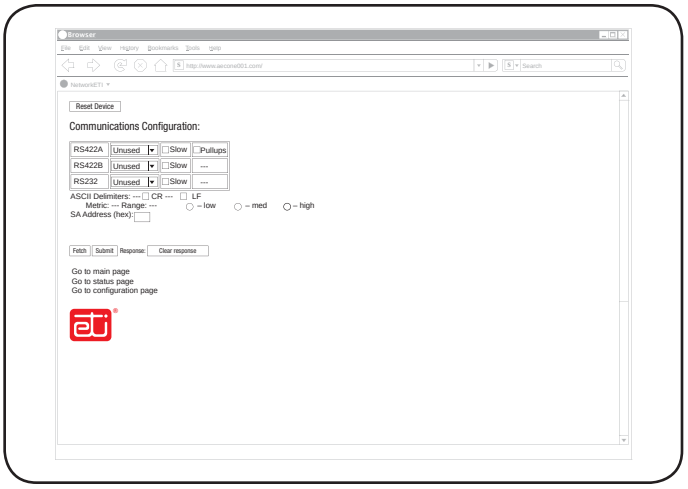

Figure 21: Serial communication port configuration page.

Operating Instructions

Normal Operation

During normal operation the ADH NETCOM begins functioning automatically once power is applied. No operator intervention is required after initial installation and configuration.

Indicators

The ADH NETCOM has two LED indicators. The Power indicator operates when there is power applied to the dehydrator. The Alarm indicator operates as a summary alarm when there is an alarm or warning condition present.

Status Information

To obtain status information for an ADH NETCOM automatic dehydrator use either the simple web interface or query the dehydrator via SNMP. Optionally the dehydrator may be queried using the S-A protocol via one of the serial ports on the back of the units. See Appendix C for more information on the use of S-A protocol.

Placing a dehydrator in standby

The ADH NETCOM can be switched between online and standby mode either through the web interface, by issuing an SNMP command or by issuing a standby command using the SA Protocol. The dehydrator can only be placed into standby at the front panel if the optional front panel display has been installed.

Troubleshooting

Alarms

01 Low Pressure Alarm: user defined see above, level must be maintained for at least 30 seconds before alarm condition.

02 High Pressure Alarm: user defined see above, level must be maintained for at least 30 seconds before alarm condition.

03 Leaky System: High Duty Cycle

04 High Temperature: Ambient over 150°F

05 Low Temperature: Ambient under 32°F

06 Not used.

07 Absorption Unit 1 Heating Failure

08 Absorption Unit 1 Overheating or fail to cool

09 Absorption Unit 2 Heating Failure

10 Absorption Unit 2 Overheating or fail to cool

11 Excessive Run Time: Very Leaky. System fails to come up to pressure. Shutdown.

12 Dew Point Alarm: Indicates that both absorption canisters have failed to regenerate. This alarm is usually accompanied by one or more other alarms. In this alarm condition there is a possibility that the dehydrator will not supply dry air.

13 Not Implemented.

14 No communications (Master/Slave only). This alarm indicates that a dehydrator configured as a Master has lost communications with the slave. Only the Master will announce this alarm.

15 Absorption Unit 1 thermistor bad

16 Absorption Unit 2 thermistor bad

17 Ambient temperature sensor bad.

18 Over Pressure Alarm: 9.0 psig (620.5mbar) for at least 30 seconds

The Summary Alarm is announced for any of the following alarms:

- High Pressure
- Absorption Unit Heating Failure
- Absorption Unit Overheating or fail to cool
- Excessive Leakage
- Dew Point
- Low Pressure

Troubleshooting Steps

Nothing works

Verify the unit has power.

For unit with AC power check the on-off switch located at the back of the dehydrator.

Check the power cable for proper installation.

Ensure power is available at the outlet and circuit breaker.

Move the unit to the bench and remove the top cover.

Apply power.

Verify green LED indicator on power supply/converter(s).

Verify wiring and connections from AC power entry or DC power supply.

Verify 24VDC between “+24HC” and “GND” probe points next to J4 terminal block on the main control circuit board.

If no power after verifying wiring and connections to the power supply/converter(s) then replace the power supply/converter(s).

Alarm 01 – Low Pressure Alarm

Disconnect feed tube from air outlet. Pump should operate continuously, otherwise:

If no pump operation

Check front power LED; if not on go to Nothing works section.

Remove top front cover.

Check pump electrical connections. Check for 22-30 VDC at pump connections.

If power to pump, pump has failed. Replace the pump.

If no power to pump, main control circuit board has failed. Replace the control circuit board.

If pump operation

Plug air outlet.

If dehydrator reaches correct operating pressure, check communication equipment pressurization system for leaks, dehydrator is operating correctly.

If dehydrator fails to reach correct operating pressure:

Check pressure at output port. If pressure is low:

Listen for internal air leaks/ repair as found.

Check internal air path for leaks or blockage such as kinked or damaged hose.

Check air flow through pump inlet filter. No airflow with pump running, replace pump.

Check for 22-30 VDC power to solenoid two or three connector. If neither has power/ replace control circuit board.

If pressure is high:

Check for kinked or plugged line to pressure sensor. Repair if found.

Replace control circuit board.

Alarm 02 – High Pressure Alarm

Disconnect feed tube from air outlet, allow pressure to reduce.

Reconnect feed tube.

Proper pressure attained

Pressurization system too tightly sealed. Install external relief valve with relief pressure between high target pressure and high pressure alarm level or increase high pressure alarm level if pressure will not damage system.

System returns immediately to overpressure condition.

Replace control circuit board.

Alarm 03 – Leaky System Alarm

Disconnect feed tube from air outlet and plug.

Allow unit to run for an hour or so and check duty cycle.

Low duty cycle.

Check communication equipment pressurization system for excessive leakage.

High duty cycle (above 50%).

Check for stuck relief valve.

Check air path inside unit for leaks.

Check solenoids 2 and 3 for leaks to vent.

Alarm 04 - High Temperature Alarm

Check for inadequate ventilation around unit.

Check equipment room temperature above 100°F.

Remove front cover and check temperature near center of main circuit board.

If over 120°F address equipment room temperature and/or ventilation around the dehydrator.

If below 120°F replace main control circuit board.

Alarm 05 – Low Temperature Alarm

Check equipment room temperature above 40°F

Equipment room temperature above 40°F

Replace main control circuit board.

Alarms 07, 09 – Absorption unit won't heat

Move unit to bench and remove top cover.

Do not apply power.

Verify integrity of absorption unit leads to connectors.

Disconnect four pin connector. Measure resistance between two red wires (heater). Should measure between 9Ω and 11Ω.

If not, replace drying canister

Measure resistance between two black wires. Should measure between 0.54 MΩ and 0.60 MΩ at 20°C.

If not, replace drying canister

If above resistance measurements are satisfactory, then replace main circuit board.

Alarms 08, 10 – Absorption unit won't cool

Move unit to bench and remove top cover. With no power to unit, immediately check for excessive heat near drying canister by placing hand near drying canister.

Warm or hot to touch.

Replace control circuit board.

Unit feels cool.

Disconnect pin place connector. Measure resistance between two black wires. Should measure between 0.54 and 0.60 MΩ at 20°C.

If not, replace absorption unit.

Alarm 11 – Excessive Run Time

See leaky system alarm.

Alarm 12 – Dew Point Alarm

Check for other alarm conditions; this alarm will usually occur in conjunction with other errors. Indicates that either the drying canisters or the dew point sensor need replacement. Drying Canister errors are generally present with this error.

Alarm 14 – No Communications (Master units only)

Verify proper address and speed are properly configured.

Verify integrity of communications cable.

Verify slave dehydrator functions properly.

Replace control circuit board.

Maintenance and Repair

Preventive Maintenance

The ADH NETCOM requires no preventive maintenance. All components in the ADH NETCOM are designed to have a minimum operational life of 15 years at duty cycles of up to 20%. Higher duty cycles may reduce component life.

Corrective Maintenance

Verifying the performance of the ADH NETCOM requires special equipment, fixtures and expertise. Please consult with Customer Service at Environmental Technology before attempting to service or repair an ADH NETCOM dehydrator.

Safety note: Servicing should be left to qualified personnel. ADH NETCOM dehydrators contain lethal voltages. Assume that all circuits are live. The unit may produce as much as 24 psig (1655 mbar) under worse case failure. Vent the system to atmosphere before servicing pneumatic components.

All fittings and hardware are standard American dimensions (inches). Use a solution of mild liquid dish detergent and water to locate air leaks. By convention Drying Canister 1 is the left hand drying canister when viewed from the front of the unit.

Warning: Do not apply power to the unit unless all internal connections have been made. Failure to do this may result in component destruction.

It is best to return the entire unit to Environmental Technology for evaluation and repair, but we realize that is not always possible. If you can determine the problem and its resolution, replacement modules and assemblies can be obtained from Environmental Technology.

Returns and Replacement Part Purchases

Before returning an ADH NETCOM to Environmental Technology obtain a return authorization number from our Customer Service Department between 8:00 AM and 5:00 PM eastern time at 574-233-1202 or 800-234-4239. Use the original container and pack materials when packing the ADH NETCOM for shipment if possible. Replacement shipping materials are available from Environmental Technology. It is important to ensure that the **return authorization number** is clearly marked on the outside of the shipping container so that it may be correctly processed upon receipt at Environmental Technology.

For more information about replacement parts and for replacement part data sheets and manual please go to http://www.networketi.com/.

Appendix A – ADH NETCOM NEMA Configuration

Purpose

The ADH NETCOM NEMA provides the same functionality as a standard ADH NETCOM in an environmentally sheltered NEMA 4X enclosure. It is ideal for use with mobile satellite antenna installation and for outdoor mounting of an air dehydrator for pressurization systems localized to the satellite antenna pedestal. This outdoor configuration is also ideal for use in pressurization systems in remote locations such as along rail lines, pipe lines and at power distribution substations. While the NEMA enclosure keeps out moisture, the temperature control system allows operation to -40°F (-40°C).

Description

The ADH NETCOM NEMA consists of the same modular components as an ADH NETCOM mounted inside a NEMA 4X enclosure with a dedicated temperature and humidity control system allowing outdoor operation. To save energy small heaters are mounted on key temperature sensitive components. This allows for key components such as the compressor to continue to run normally below 40°F while excess heat from the component heater is captured in the enclosure to heat other less temperature sensitive components. To prevent moisture from collecting inside the enclosure, pressurized discharge air from the dehydrator is evacuated from the enclosure through a discharge port and diffuser at the bottom of the unit.

The ADH NETCOM NEMA is available for input voltages of either ±20 – 75 VDC or 100 – 240 VAC. Each voltage range is auto-sensing and requires no special configuration.

The ADH NETCOM NEMA includes the same communication features as standard ADH NETCOM dehydrators.

Installation

The following are suggested steps for installing the ADH NETCOM NEMA:

1. A suitable mounting area, 24” W x 26” L x 10” D (610 mm W x 660 mm L x 250 mm D), must be selected to mount the unit in a vertical manner. A wall such as reinforced concrete or steel plating should be used to support a static load of approximately four times the weight of the unit, or 100 pounds (45 kg). Use four appropriate 5/16” mounting hardware to fasten the unit to the support wall. Proper bolt size and depth is important for stable mounting.
2. The NEMA 4X enclosure shall be installed in an orientation with hinges to the left, hinges to the top, or the enclosure oriented feet down.
3. The ADH NETCOM NEMA is permanently connected equipment and does not have an internal disconnect device. A readily accessible disconnect device, and short circuit and current protection shall be provided and are not supplied by Environmental Technology.

4. A 7/8˝ hole is provided at the bottom of the enclosure for a conduit connection for the electrical wiring.
5. Connect wires and terminal blocks; refering to the labels on the enclosure and the internal interconnect diagrams for further information.
6. Connect the input voltage wires to the input power terminal block. Refer to the label on the enclosure and the internal interconnect diagrams for further information.
7. Connect supply tubing to the 1/8" NPT female connection at bottom of NEMA enclosure.

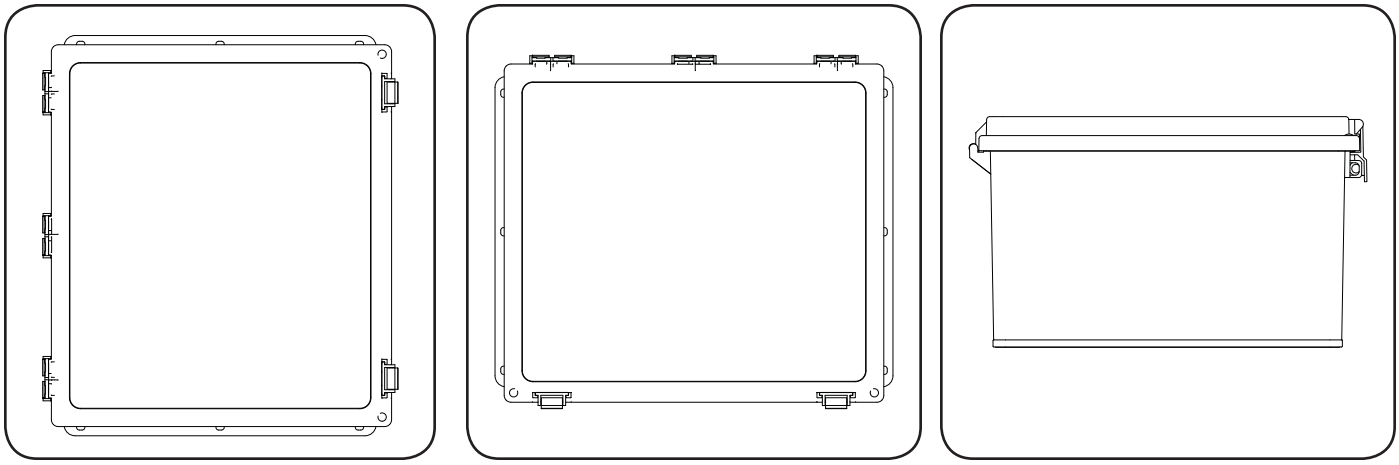

Figure 22: NEMA enclosure mounting orientations. Hinge left, hinge top and enclosure flat.

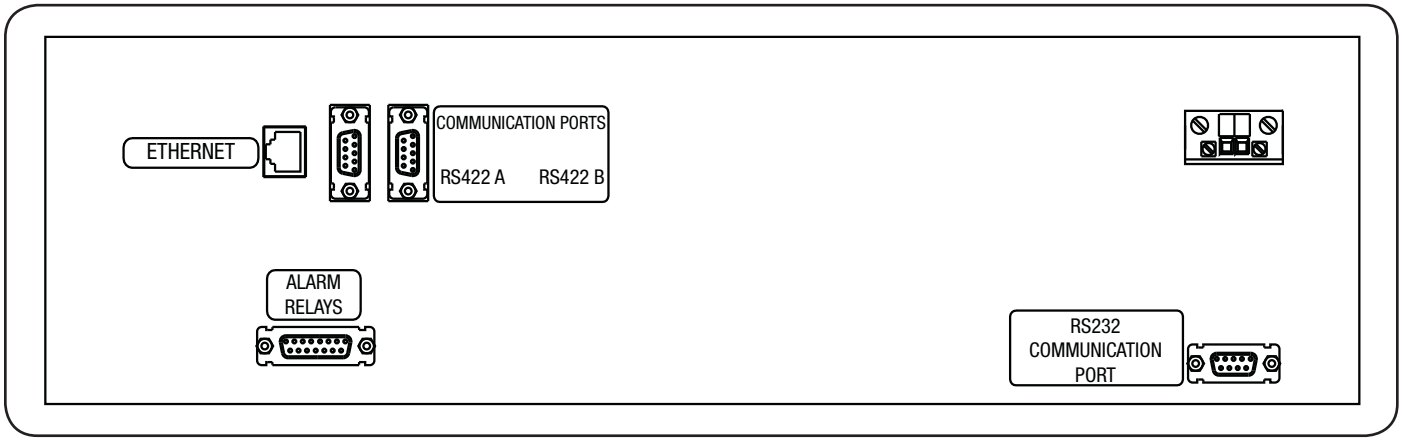

Figure 23: ADH NETCOM NEMA unit dataports.

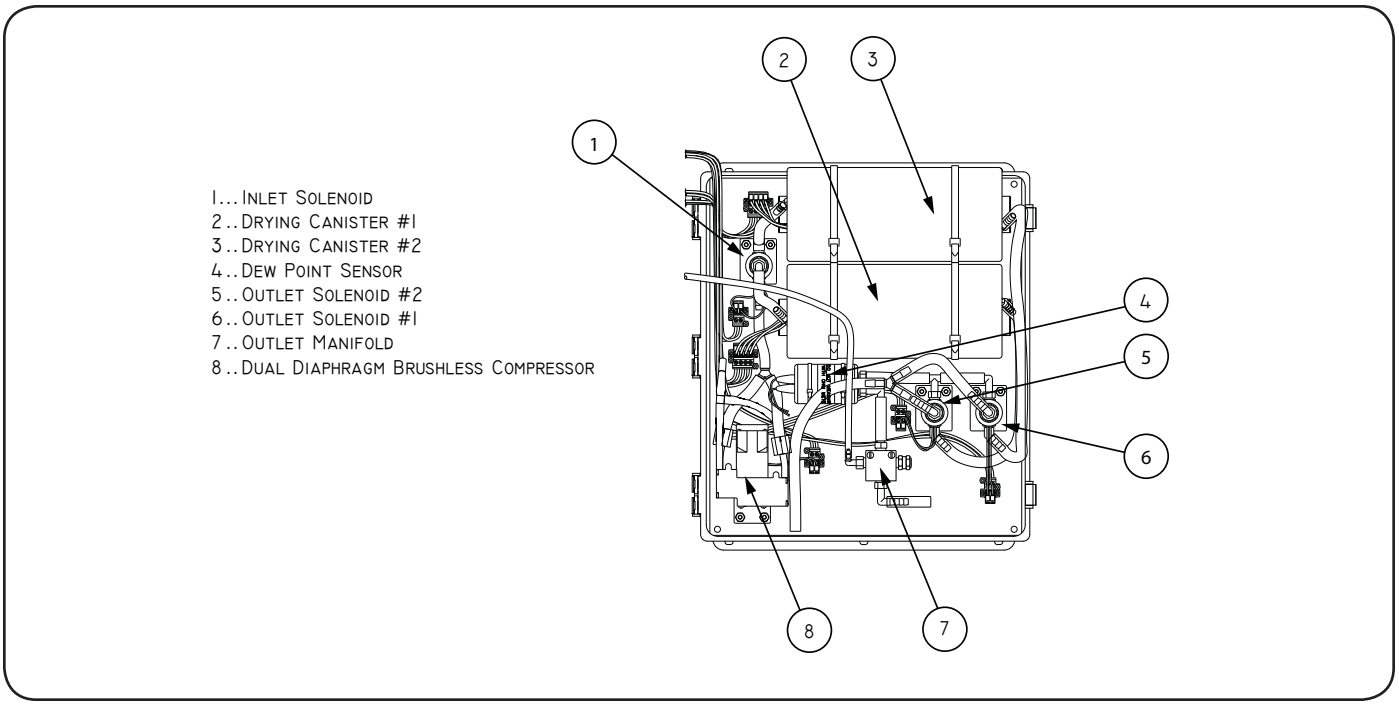

Figure 24: ADH NETCOM NEMA Unit Components.

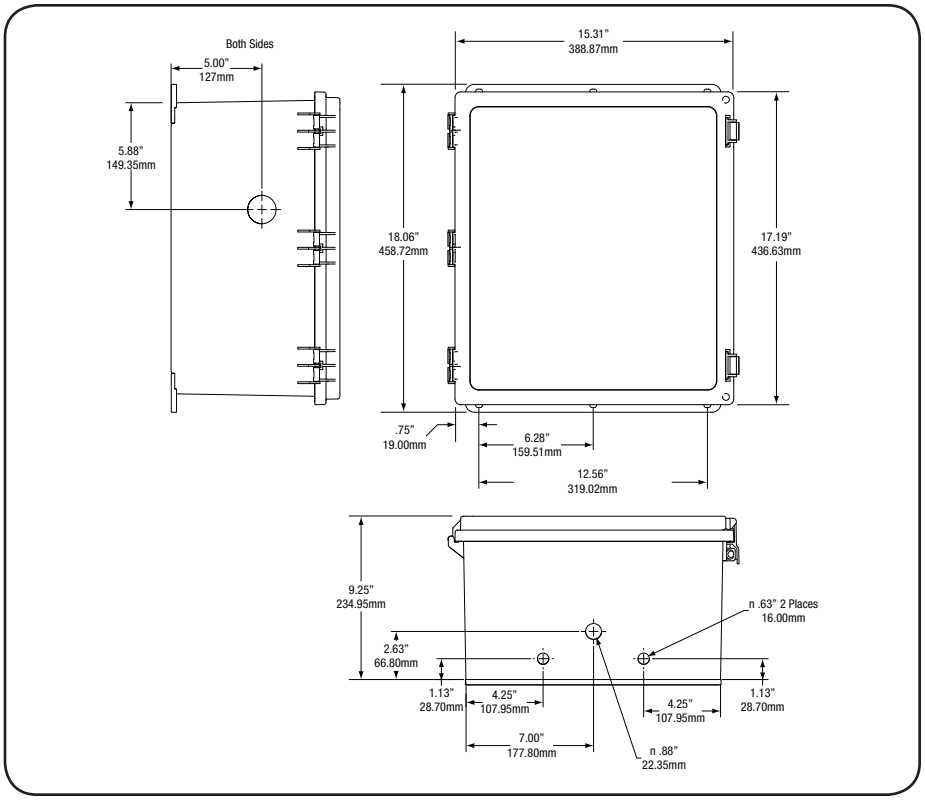

Figure 25: ADH NETCOM NEMA dimensions.

Appendix B Communication Protocols

Overview

On an Ethernet network the ADH NETCOM automatic dehydrator primarily uses the UDP network protocol for communication between an ADH NETCOM automatic dehydrator and one or more other ADH NETCOM automatic dehydrator. UDP is also the protocol that will be used to communicate between an ADH NETCOM automatic dehydrator and an ASM-1 smart manifold. M&C systems may also use UDP along with, or instead of, SNMP.

The ADH NETCOM has three configurable serial communication ports: an RS-422/485 male port, an RS-422/485 female port and an RS-232 female port. Each port communicates at 9600 baud by default but may be configured as a “slow” port and communicate at 1200 baud. Only the RS-422/485 female port can be configured to use pull-ups or not; the RS-422/485 male port always has pull-ups.

Devices intending to communicate with an ADH NETCOM using one of its three serial ports must be configured to use a matching baud rate as the port to which it is connected. Additionally the connecting device needs to be configured for seven data bits, one stop bit and even parity.

Serial Communications

The ADH NETCOM automatic dehydrator provides serial communications for directly connecting one dehydrator to another or for compatibility with legacy M&C systems. There are four configurable modes of operation: standard mode, terminal mode, master mode and unused. Standard mode complies with the Scientific-Atlanta (S–A) protocol. In terminal mode the unit responds in straight ASCII. Terminal mode should be used when the unit is accessed by a dumb terminal. Master mode allows a port to be used to set an ADH NETCOM as the controlling dehydrator for a standard mode dehydrator. The standard mode dehydrator, or slave, may be another ADH NETCOM, an ADH-2A COM or an ADH-3COM. If a port isn’t going to be used it may be configured as unused.

Standard Mode Command Format

A valid command in the standard mode must consist of the following: The first character is STX (2 Hex) and is followed by the remote address. Next, the command you wish to execute and the associated data bytes are transmitted. ETX (3 Hex), and the checksum are then sent to conclude the transmission.

Standard Mode Response to a Command

The response format of the unit is identical to the command format except for the first character. If the command was understood, an ACK (06 Hex) will replace the STX character. If the command was not understood or cannot be acted upon, the

response will begin with an NAK (15 Hex) and the data bytes will not be returned; only the NAK, address, command, ETX, and the checksum will be sent.

Checksum Calculation

The checksum is a bitwise exclusive-or of all the characters in the stream. This includes the STX and the ETX characters.

Terminal Mode Command Format

When the unit is placed in terminal mode the only valid command is the carriage return (0D Hex). This requests the unit for the status.

Terminal Mode Response Format

Terminal Mode is straight ASCII. The end of line delimiters may be configured as a carriage return (CR), a line feed (LF) or as both.

User Datagram Protocol

The ADH NETCOM automatic dehydrator uses the User Datagram Protocol (UDP) network protocol for communicating with one ADH NETCOM automatic dehydrator and any of the following:

- Another ADH NETCOM automatic dehydrator
- An ASM–1 smart manifold
- Third party software such as M&C systems

The ADH NETCOM automatic dehydrator will normally use port 52091 for UDP messages. The main exception is that when operating as a master dehydrator in master/slave configuration the master will send messages out using UDP port 52092 as the source port and 52091 as the destination port. Another exception is that when resolving dehydrator names to an IP address the ADH NETCOM will use NetBIOS Name Service (NBNS) on UDP port 52090.

Message Format

S-A Protocol

An S-A protocol query to an ADH NETCOM will consist of the following:

- STX: 02 hex
- S-A Address: configurable to a hex value from 30 to 6f
- Command Character: See list of commands
- Message Data: Zero or more data bytes

- ETX: 03 hex
- Checksum: Exclusive-or of all the other bytes in the message including the control bytes.

The response to a message is in the same form as above, except that the STX is replace with either an ACK (06 hex) if the message is accepted or a NAK (15 hex) if the message is rejected. The address and command characters of the response must always match the address and command characters of the command. The sender of the command does not have a relevant S-A address.

UDP Protocol

- An outgoing UDP protocol query consists of the following:
- C: binary 43; C stands for command
- Index: a one byte field used to match a query to a response
- Command Character: See list of commands

The response to a message is in the same form as above, except that the first character is replace with a return code. The return code will be one of the following:

Y: Command accepted and acted upon if relevant

N: Command rejected

?: Command not valid

Commands

Command characters are passed either as a quoted character (using single quotes) or as that characters hex value. For example, If I want to know the model of automatic dehydrator I am talking to I would use either '0' or 30 hex as the command character.

Command Group I

These commands were documented with the ADH–2A COM and ADH–3COM automatic dehydrators.

'0' – 30 hex – Returns a 6-character ID string. This string is always "NETCOM" for ADH NETCOM automatic dehydrators. An ADH–3COM may return ADH331 indicating that the ADH–3COM is using firmware version 3.1.

'1' – 31 hex – Returns a status string.

Note: In the communications setup screen, the user can choose between English and metric, and also choose one of three pressure ranges. The ONLY use of those settings is in the form of the return for the '1' command.

'7' – 37 hex – Go into standby. For master/slave configurations this command will put the master/slave set into standby.

'8' – 38 hex – Go online. For master/slave configurations this command will put the master/slave set online. Which automatic dehydrator will actually be placed online will still be controlled by the master.

Command Group II

These commands were not documented with the DH–2A COM and ADH–3COM automatic dehydrators but were used in the master/slave interface.

'2' – 32 hex – Returns a special character call qstat1. See the notes below.

'5' – 35 hex – The same as '2', but sets the communications error flag in the slave.

'J' – 4a hex – Puts the slave into remote mode.

'[' – 5b hex – Sets a flag to turn on the slave compressor if in remote mode.

']' – 5d hex – Sets a flag to turn off the slave compressor if in remote mode.

Notes on this group:

The command '2' returns what we call qstat1: it is a single character encoding important elements of the dehydrator's status.

The low bit (bit 0, binary 1) is set if the unit is "reluctant" : this means that it is capable of pressurizing, but would have to use a canister which is or may be wet to do so. We avoid giving control to the slave when it is reluctant, if it is possible to do so.

The second bit (bit 1, binary 2) is set if the unit is currently pressurizing - ie, the pump is running and aimed at the antenna (although there may be a brief lag of up to 100 msec).

The reason for the '5' command is that it is possible that communications from the master to the slave may be intact but that the return path from the slave to the master could be broken. In that case, the master will not know what the slave's status is, and will continually broadcast commands to determine it. The slave receives all these commands normally. Without the '5' command, the slave would not declare a communications error, and would stay in standby forever.

The rest of the byte is a state index, multiplied by 4. The state index is:

0: On line

1: Standby

2: Leaky (Stopped pumping because of a declared leak)

3: Remote (Compressor on or off according to commands from master)

4: Alternating (Not used, included for legacy compatibility.)

5: Joint (The master's state when slave is in remote control.)

Group III: Commands new to the ADH NETCOM

'9' – 39 hex – The NETCOM returns a character 'N'. This is mainly to allow the NETCOM to determine whether a slave is a NETCOM or a legacy dehydrator.

'E' – 45 hex – Returns current status, in English units.

'M' – 4d hex – Returns current status, in metric units: see next section

Note: this is a fixed-length string, giving the most important information

about the status of the NETCOM.

'L' – 4c hex – Alarms, form 1. This is a fixed-length string, with the Nth character being a '+' if alarm N is set, or a '-' if it is not. The length is 20 characters.

'R' – 52 hex – Alarms, form 2. This is a variable-length string, with two characters for each alarm which is present, giving the number of the alarm (the first character is '0' if the alarm number is less than 10).

'T' – 54 hex – Compressor run time. Return is a variable-length string: a number with one decimal place (the decimal point is included in the string: as "12.3"). This represents approximate accumulated compressor time, in hours.

'C' – 43 hex – Configuration information. The result is a fixed-length string of the form "Xaaabbbcccddd". This gives the current pressure limits. If the first letter is E or e, the limits are given in hundredths of a PSI. If the first letter is M or m, the limits are given in mbar. A lower case letter means that it is configured as a small system. The aaa is the lower pressure alarm, the bbb is the lower limit, the ccc is the upper limit, and the ddd is the high pressure alarm limit.

'I – 49 hex – ID information. The response is a variable-length string with two sub-strings, separated by a semicolon. The first substring is the name of the firmware in the NETCOM. The second is the serial number of the unit.

'Q' – 51 hex – Enhanced quick status (similar to the '2' command). The return is a four-character string. The first character is the same as is returned by the '2' command. The next three characters are the pressure in hundredths of a PSI (there is no metric equivalent for this command).

Meaning of the string for the E and M commands:

Chars 0,1,2: the current pressure, in hundreds of a PSI or in mbars

Chars 3,4,5,6: current temperature, in degrees F or C. Character 3 is + or -

Chars 7,8,9: duty cycle, in percent.

Char 10: descriptor for “superstate”: only important for a master

S: Unit is a slave

M: Unit is a master, and system is on line

N: Unit is a master, and whole system is in standby

D: Unit is a director, and system is on line

E: Unit is a director, and whole system is off line

Char 11: descriptor for major state:

N: On line

S: Standby

L: A leaky system; not attempting to pump

R: Remote mode: pumps as directed by master

A: Alternating: not used (legacy state)

J: Joint: the master side of the remote mode: controls the slave

Char 12: state of the environment (temperature)

N: normal

C: cold

H: hot

Char 13: condition of canister 1:

O: Okay; normal, dry

F: Full; wet

U: Unknown; used for a while after unit is powered up

D: Dead; failed to regenerate and will not be used if avoidable.

Char 14: usage of canister 1:

I: idle (not being used)

U: in use (for pressurization)

R: being regenerated

Char 15: condition of canister 2: as in char 13

Char 16: usage of canister 2: as in char 14

Char 17: 'A' if there is an alarm condition, '-' if not.

THE X COMMAND:

The X command is used to "forward" a command through the master ADH NETCOM automatic dehydrator to a slave unit when the are connected via a serial connection. The X command will not function for master and slave sets connected via Ethernet where the master and slave can each be directly communicated with.

There are two forms of the X command:

Form One – One data byte, the command to forward. The address is understood to mean the slave.

Form Two – Two data bytes: the first is an address, the second the command to forward. The address byte must be either '1', meaning forward to the slave, or '0', meaning the recipient should do it himself.

If the command is to be forwarded and the unit is not a master, the X command will be rejected. The X command will be accepted if it is possible to forward it to a slave, even if we know that the slave will reject it. This is to allow the possibility that in the future the slave will have features that the master does not have.

There are certain commands that are never forwarded. At the moment this includes the '7' and '8' commands, the 'J' and '[' and ']' commands (all of which can cause an actual effect on the slave), as well as the X command itself.

The response to the X command is as follows:

First data byte: repeat of the address character ('0' or '1')

Second data byte: repeat of the command being forwarded

Third data byte: status of the command

After this comes any returned data.

The status bytes are:

Y: Slave returned an ACK

N: Command returned a NAK

T: Command timed out: no return within 1/2 second

B: System too busy to send command.

Example S-A Communication Session

Suppose we wish to communicate with a ADH–3COM that has no address jumpers set, making the user selected address 0. Then we add 30 hex to this number (remember, 30 hex gets added to every address). This makes for a final address of 30 hex for this ADH–3COM. Now, suppose we wish to retrieve the units status. The command line we use is 31. The following is the string of bytes that must be sent:

02, 30, 31, 03, 00

The bytes, in order, are STX, ADDRESS, COMMAND, ETX, CHECKSUM.

A typical response may be:

06, 30, 31, 45, 30, 31, 33, 2b, 30, 36, 30, 55, 52, 30, 31, 30, 30, 31, 35, 2d, 2d, 2d, 2d, 2d, 2d, 2b, 2d, 2d, 2d, 2d, 2d, 2d, 2d, 57, 20, 03, 30

This Message decodes as follows:

06, 30, 31 = STX, ADDRESS, COMMAND

45, 30, 31, 33 = E013 = English, 0.13 psig. The decimal point is assumed and its location is determined by pressure and display options.

2b, 30, 36, 30 = +060 = +60°F

55, 52 = UR = Absorption unit #1 in use, absorption unit #2 regenerating.

30, 31, 35 = 015 = 0.015 cfm flow rate

2d, 2d, 2d, 2d, 2d, 2b, 2d, 2d, 2d, 2d, 2d, 2d, 2d, 57, 20 = –+–W = Indicates that Warning 6 (low line voltage) has been issued and no alarms are present.

03, 30 = ETX, CHECKSUM

Note: The 13 data fields following the flow rate field correspond to the alarms and warnings shown on page 24.

Appendix C Master Configuration Appendix

Purpose

An ADH NETCOM automatic dehydrator may be configured as a master dehydrator to control another ADH NETCOM, an ADH–3COM or an ADH–2A COM automatic air dehydrator. The connected master/slave dehydrator pair can the be connected to the same pressurization system in order to provide redundancy and increase the system reliability.

Description

The two air dehydrators in the master/slave configuration communicate with each other over an Ethernet network or directly connected via the serial RS-232 or RS-422/485 ports. If paired with an ADH–2A COM or ADH–3COM, the ADH NETCOM must connect via an RS-422/485 connection. The interface cable wiring connection is shown in Figure 26. The master and slave units must have the same baud rate set for serial RS-232 and RS-422/485 connections. It is recommended to use 9600 baud in the master/slave configuration.

Under normal conditions, the master and slave unit will alternate control of air dehydration in the waveguide system, each being on line for 50 hours. When one unit is in control, the other will be in a standby mode.

There are three conditions that will cause an ADH NETCOM to relinquish control to the connected dehydrator. The three conditions are:

1. Unit unable to perform air dehydration
2. Unit unable to attain desired pressure
3. Master/slave communication failure

Condition 1 would occur if both absorption units in the air dehydrator fail or an absorption unit has failed and the other needs to be regenerated. Once a unit has relinquished control for this condition, it will not get it back unless the condition goes away.

Condition 2 would exist if a unit runs for one hour without attaining the desired pressure. The unit declares itself leaky. This is a permanent condition, unless the other unit also declares itself leaky. In this situation the master and the slave will attempt to pressurize the system together by running together. If the two units together are not able to attain pressurization in four hours, they are both declared leaky and pressurization halts.

Condition 3 would occur if either the master or the slave does not receive a message within 15 minutes of the last one. If this occurs the master declares a communication failure (Alarm 14); the slave will not indicate an alarm. After the two dehydrators have determined that a communications failure has occured each will operate independantly. The units should not be allowed to continue to operate in this condition for an extended period of time as behavior would be difficult to predict.

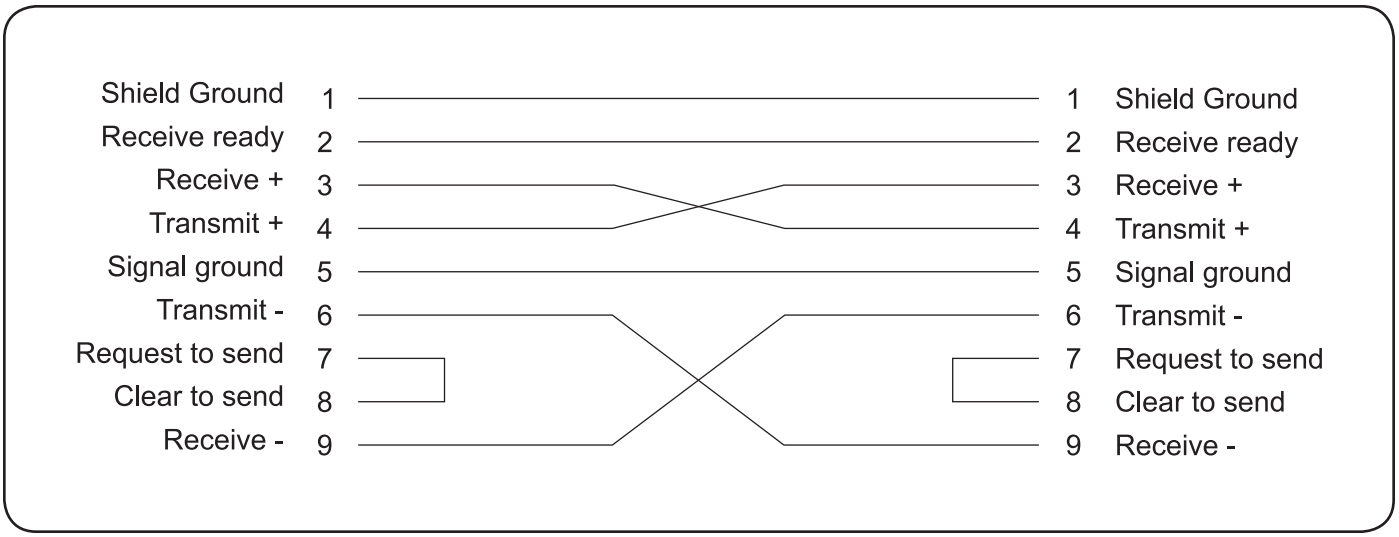

Figure 26: Cable wiring diagram for directly connecting units via RS-422/485 port interfaces.

ORDERING INFORMATION

Order Number	Description
23437	ADH NETCOM Automatic Air Dehydrator, AC
23242	ADH NETCOM Automatic Air Dehydrator, DC
23483	ADH NETCOM Automatic Air Dehydrator, AC, NEMA
23589	ADH NETCOM Automatic Air Dehydrator, DC, NEMA

LIMITED WARRANTY

ETI's two year limited warranty covering defects in workmanship and materials applies. Contact Customer Service for complete warranty information.

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