ARID TECHNOLOGIES INC.

PERMEATOR AT-150 Operating and Installation Manual
California Air Resources Board (CARB) CP-201 Configuration
Certified Under Executive Orders VR-201-Z and VR-202-Z

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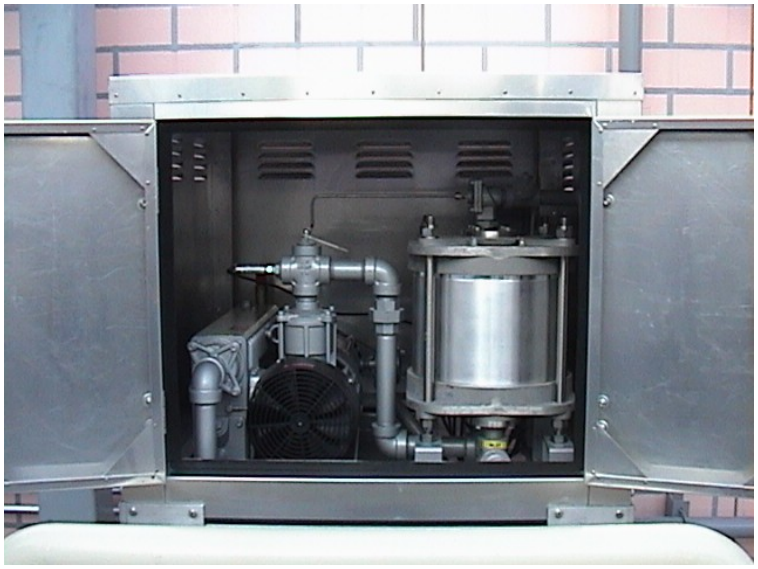

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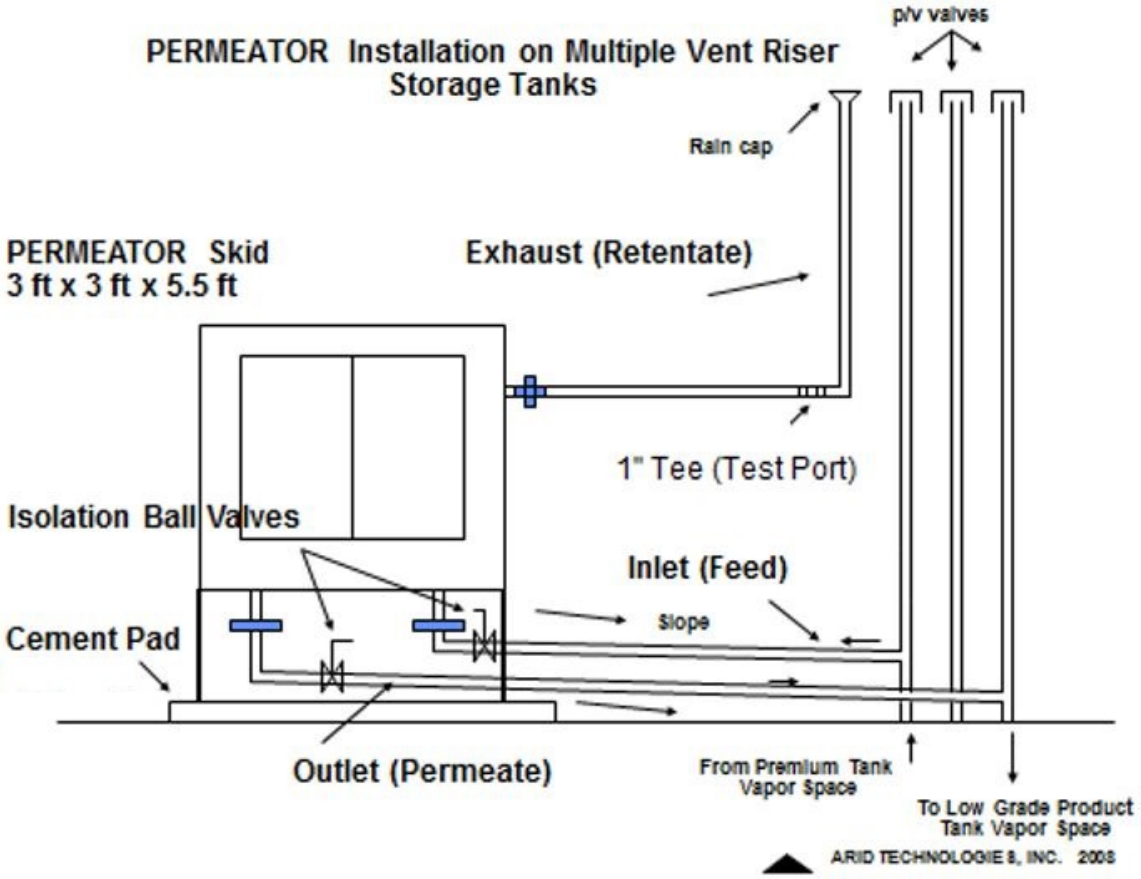
Introduction

The PERMEATOR System is a membrane based vapor recovery system which is installed on manifold storage tank vent lines to reduce on-going evaporative losses from refueling and transfer operations, as well as atmospheric pressure variations (Please refer to Figure 1). PERMEATOR simply separates hydrocarbon vapors from air; exhausts the cleaned air to atmosphere and returns the enriched hydrocarbon vapors to the storage tank headspace. This simple process virtually eliminates evaporative losses and the subsequent harmful emissions of ozone precursors to the environment. By using the rich vapors to "blanket" the storage tank liquid, the fundamental mechanism of evaporation loss is defeated.

PERMEATOR is designed with extremely high quality, robust components to provide consistent, efficient operation over many years. The membrane technology used has a proven performance record in numerous tank farms and refineries. The standard warranty on PERMEATOR is 36 months, covering parts.



In California, the PERMEATOR AT-150 is certified for installation on the Assist Phase (Stage) II Enhanced Vapor Recovery (EVR) System, Executive Order VR-202 series. In addition to reducing evaporative losses in the interval between tanker deliveries, the PERMEATOR also reduces losses during Phase (Stage) I cargo tank deliveries and losses caused by atmospheric pressure variations. Thus, emissions are reduced and gasoline is saved.

System Components

The primary components included with purchase of PERMEATOR systems are as follows:

AT-150 Control Panel – The function of the control panel is to monitor storage tank pressure continuously and to actuate PERMEATOR in response to increased pressures. Also, the control panel houses a programmable logic controller (plc) which displays measured tank pressure (inches H2O, gauge), an hour meter (to log cumulative run time of the unit), a main power switch, a manual/automatic operation switch and indicator lights to provide on-going diagnostics of system operation (Please refer to Figure 2). The indicator lights are used to show control voltage, vacuum pump oil level fault, and vacuum pump ON, respectively from left to right. The switch, E has three settings; manual operation, off and automatic operation, left, center, and right, respectively.

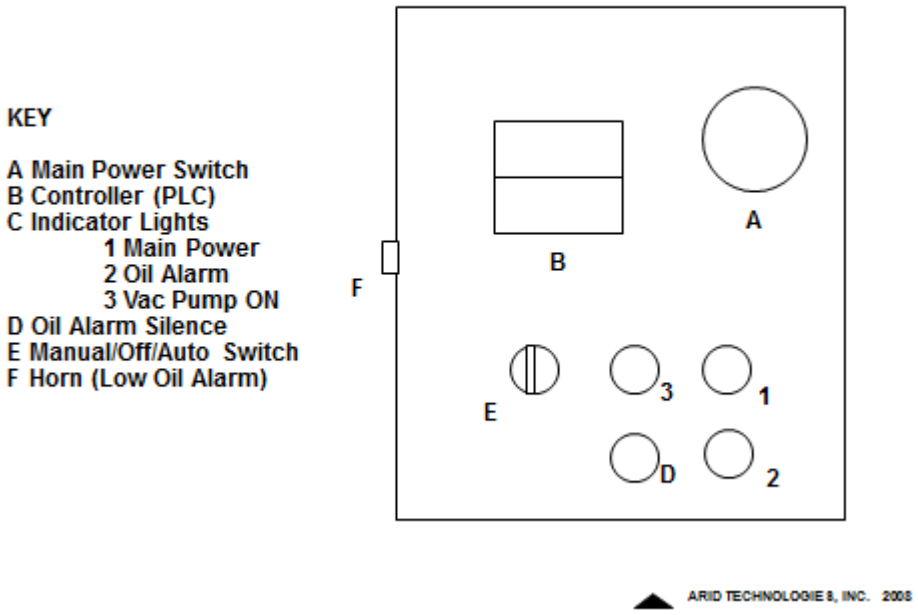
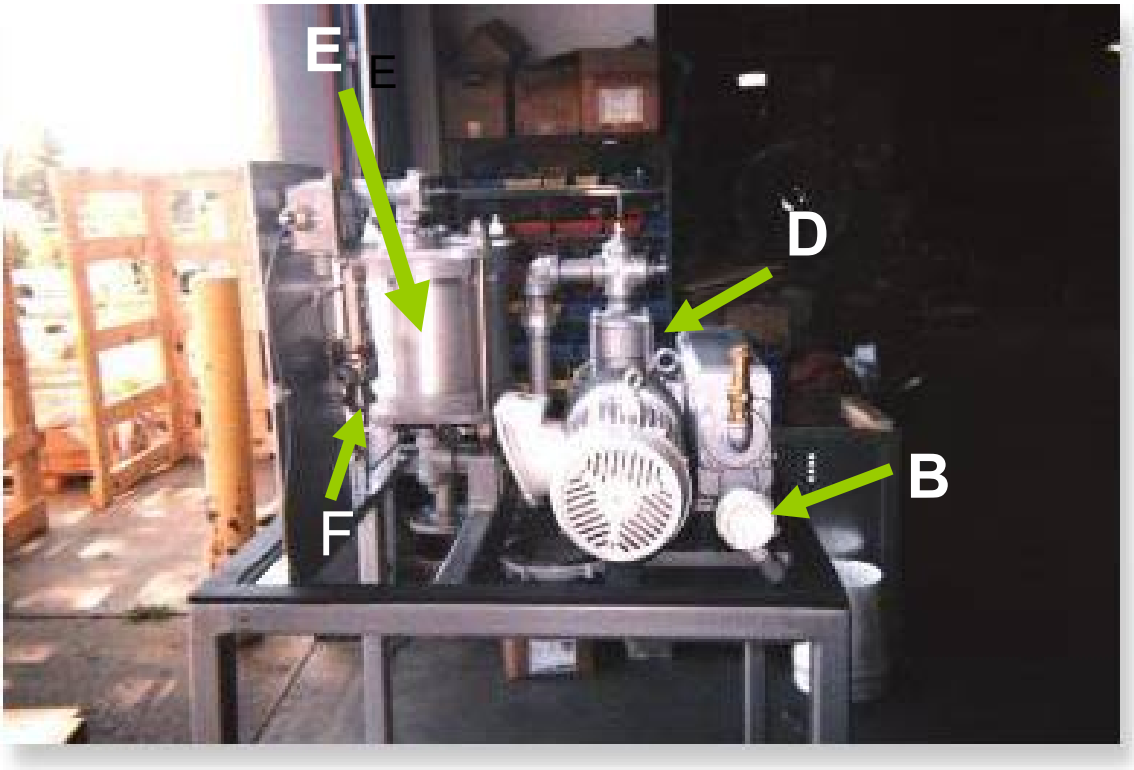


Figure 2

Optional features of the AT-150 Control panel include data logging, modem access and downloading capability to local or remotely located computers.

Membrane module houses the selectively permeable membranes used to separate hydrocarbon vapors from air. The module is a cylindrical structure containing baffle plates to ensure good contact between hydrocarbon vapors and the membrane material. The membrane is shown as “E” in Figure 3.



PERMEATOR, internal view
Figure 3

The vacuum pump, D removes hydrocarbons which have passed through or permeated the membrane to ensure a constant driving force for continuous separation. Our vacuum pump uses a rotary vane design which incorporates a shock-resistant design, integral flame arrestors on inlet and discharge and anti-static materials to prevent static discharge. The pump is housed in the main cabinet as seen above.

The pressure sensor/transmitter, F is used to continuously monitor the combined ullage pressure in the gasoline storage tanks. The pressure information is sent to the plc located in the control panel. Based on pressure actuation set-points, the vacuum pump is started and stopped.

> **Note**: This pressure sensor is different from the pressure sensor installed as part of an In-Station Diagnostic (ISD) system so there can be slight variations in readings when comparing the two sensors depending on Permeator On/Off condition and other dynamics (temperature, atmospheric pressure, etc.).

The oil level sensor, B, is used to continuously monitor oil level in the vacuum pump. If the oil level falls below a minimum threshold value, a light is illuminated on the panel to indicate a fault, the horn sounds and the power to the vacuum pump motor is interrupted

until the oil level is brought back up. The oil level horn alarm is silenced by pushing the alarm silence button on the front of the control panel.

The main cabinet houses all components except the electrical control panel, which is mounted in a zone free area. The main cabinet can be mounted at grade, or above or below ground. The electrical components in the main cabinet are rated for operation in hazardous locations Class I, Groups C & D (UL, TUV, PTB and BASEEFA approvals). The main cabinet dimensions are Width: 3 ft., Depth: 3 ft., Height: 5 ft and the weight is approximately 750 pounds, uncrated.

Other items required for operation of PERMEATOR include the following:

Pressure vacuum vent valves (P/V valves) which are installed on the manifold storage tank vent lines. These valves are designed to prevent high vacuum or high pressure conditions in the storage tanks and to increase the recovery efficiency of Phase (Stage) I cargo tank delivery operations. Typical pressure settings in USA are +3 inches water column (407" water equals 1 atmosphere) pressure threshold and -8 inches water column vacuum threshold. Only P/V valves certified on CARB Phase (Stage) I EVR Executive Orders are permitted for installations in California. Exhibit 2 of the VR-202 series Executive Order (starting with Revision Y) shows typical installation options for P/V valve installation.

Mounting stand required to place PERMEATOR at grade. A suitable concrete support pad is poured and cured and the stand is secured to this pad with bolts. This stand is included with PERMEATOR and does not have to be supplied by the installation contractor.

For incorporation of PERMEATOR into an integrated vehicle vapor recovery and storage tank pressure management system, additional items are required for the "front-end" vapor recovery system. These components, typically referred to as "hanging hardware", such as nozzles, vacuum pumps, hoses, and breakaways are provided by existing Phase (Stage) II vapor recovery system suppliers listed on the VR-202 series Executive Order (any Revision level).

PERMEATOR System Operation (Please reference Figure 4)

1. Air and hydrocarbon vapors fill the space left in a storage tank when liquid gasoline is transferred to an automobile.

2. The pressure in the storage tank headspace increases as liquid gasoline in the storage tank evaporates to increase the hydrocarbon concentration in the headspace. A pressure switch connected to the ullage actuates the PERMEATOR system.

3. The air/hydrocarbon mixture expelled from the storage tank vent line is directed to a membrane module where a vacuum pump creates a differential pressure that causes the hydrocarbon molecules to preferentially permeate, or pass through, the membrane.

4. The hydrocarbon-rich permeate stream is returned to the storage tank while the air-rich non-permeate stream is vented to the atmosphere. (Note: The purity of the exiting air stream that has been depleted of hydrocarbons is determined by feed flow rate, membrane area and the pressure ratio between the feed and permeate streams.)

5. As tank pressure decreases to a pre-set level, the pressure switch automatically deactivates the *PERMEATOR* system.

6. The above sequence is repeated when the storage tank pressure exceeds a pre-set maximum level.

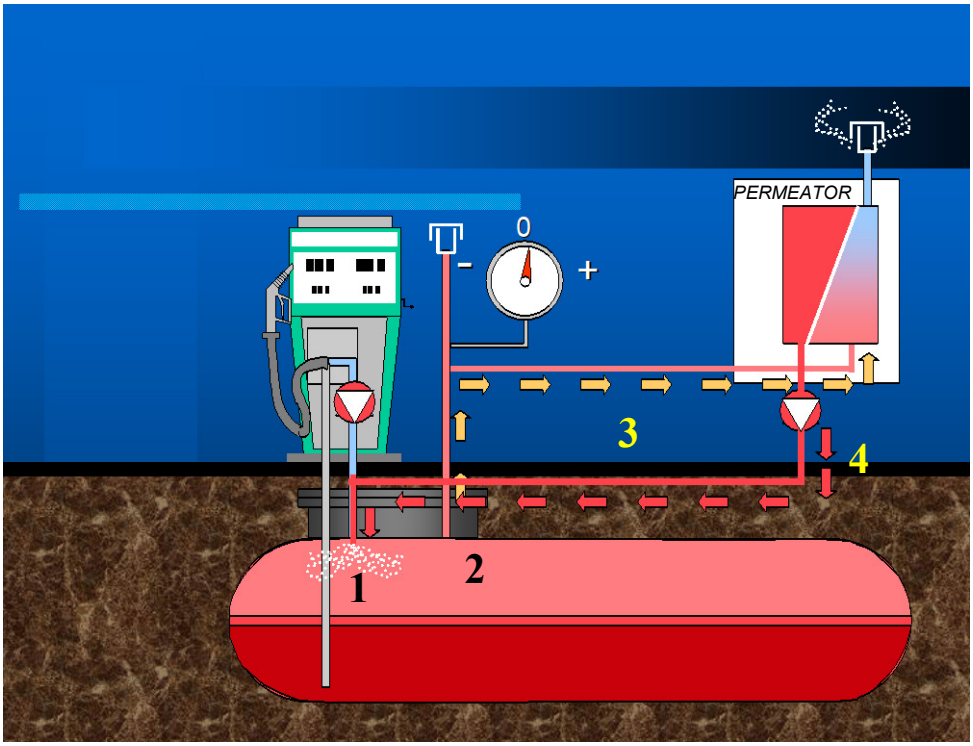


Figure 4

System Applications

The PERMEATOR AT-150 is designed to accommodate a wide range of refueling station throughputs. Individual fueling points are not a factor in sizing PERMEATOR. Exhibit 2 of the VR-202 series Executive Order (starting with Revision Y) outlines installation parameters that must be followed for correct implementation of the PERMEATOR AT-150 at California GDF installations.

A standard purchased AT-150 unit includes the following hardware:

Main cabinet housing membrane module, vacuum pump, pressure sensor/transmitter, oil level sensor, vacuum sensor/transmitter and interconnection piping. The flanged connections provided are DN50, or 2" on each of the three connection points for Feed, Exhaust and Return lines.

Electrical control cabinet including plc, cumulative run time meter, manual/auto/off switch, indicator lights, and main power switch

Optional equipment:

Upgrade kit for data logging of critical parameters such as tank pressure and run time readings and to allow electrical control panel to communicate with computers.

Component Selection and Location

AT-150 Control Panel operates and monitors the PERMEATOR system operation. Any anomalies of system operation will cause indicator lights to signal refueling station operating personnel that something is wrong. The panel is factory wired and assembled. Field wiring tasks include connecting 3 phase power from the site (L1, L2, L3 and Ground) and sensor input wires from the pressure and vacuum sensors/transmitters and the oil level sensor. The electrical panel is designed for use in a ZONE FREE area, mounted indoors. The electrical panel is typically mounted within the station kiosk adjacent to existing electrical panels and switching gear.

The panel should be mounted so that the panel meter is vertical (please refer to Figure 2). Prior to connecting site power to the unit, sensor input wires should be connected in accordance with detailed instructions provided within the electrical panel (Please reference the "Quick Start Guide" found in the Appendix). Also, once these connections are made, a current loop test must be carried out and correctly verified before attaching main power supply leads and switching main power switch on.

Mounting of PERMEATOR is quickly and easily accomplished at or slightly above grade. First, a suitable concrete support pad is poured and cured. This pad should be level, because the oil level sensor will not function properly if the pad is not flat and level. In California, if the PERMEATOR is replacing an existing Franklin Fueling Systems (Healy) vertical or horizontal Clean Air Separator (CAS), that concrete mounting pad is suitable for installation of the PERMEATOR provided that installation distances called out in Exhibit 2 are met. If the existing CAS mounting pad is not in a location that permits usage and a new pad needs to be poured, the specifications in

drawing number 9900-9945 in the Healy CAS portion of the CARB-Approved Installation, Operation and Maintenance (IOM) Manual is suitable for construction details to produce a new concrete pad suitable for installation of the PERMEATOR. Next, the PERMEATOR mounting stand is attached to the concrete pad with appropriate sized bolts and the use of a small hoist. Once secured in place, the aluminum lid is removed and the piping and electrical conduits and connections can be made. Since the main cabinet is rated for service in Class I, Division 1, Group C & D hazardous environments, this allows for the unit to be located in relatively close proximity to the manifold vent lines to avoid long piping runs. After all piping and wiring connections are completed, then the PERMEATOR aluminum lid can be attached and fastened in place. The doors are equipped with a lock and key. Site personnel should be aware of the storage spot for the key.

Typically, a protective barrier (bollards) or fence is constructed to keep PERMEATOR out of view and to discourage vandalism. (In Luxembourg and Shikoku, Japan the units are mounted right on the island, adjacent to the dispensers). Contractors should check with local Fire and Safety authorities prior to installation to ensure that the location chosen meets all applicable Fire Marshal codes and regulations.

Piping Layout and Installation

ARID's PERMEATOR system requires three piping connections; one for feed flow from the combined storage tank vapor spaces to the membrane module, a second connection for returning rich vapors from the permeate side of the membrane to the vapor space of one of the low grade tanks, and a third connection for venting air discharged from the retentate side of the membrane to atmosphere. The PERMEATOR can be connected to existing piping configurations in various ways.

Installation is easily accomplished in accordance with Figure 5. Other variations are possible and are outlined in Exhibit 2 of the VR-202 series of Executive Order (starting with Revision Y). Field experience shows that elevating the PERMEATOR approximately 3 feet above grade provides adequate slope in the interconnection piping to avoid liquid accumulation in either the feed or permeate lines. The pipe sizes used should be the same size as existing vent piping – typically 2" nominal ID minimum for US installations. All three piping ports on PERMEATOR are equipped with flanges to ease field connections.

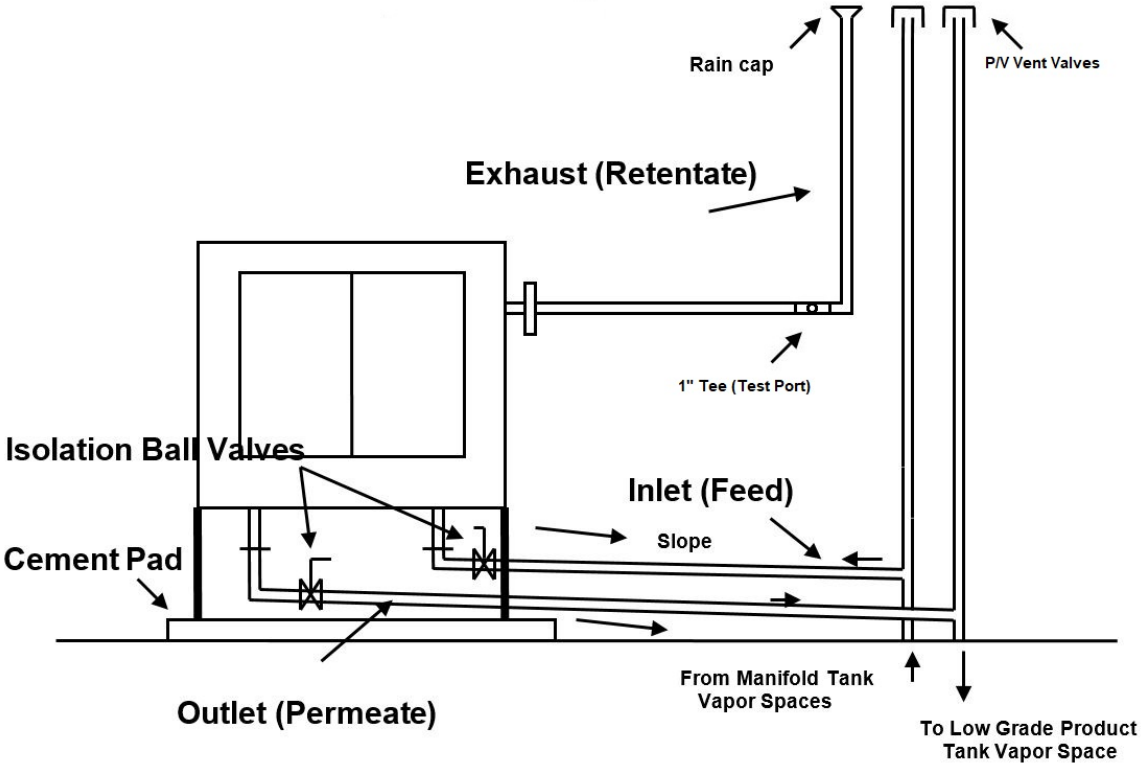


Figure 5

Figure 5 shows a schematic of a typical installation. In Figure 5, the PERMEATOR system is located on a stand slightly above grade and installed at a site having storage tanks which have individual vent lines running into UST tanks that are manifold across the top of the tanks. This integration allows PERMEATOR Feed and Return piping to be connected to separate above ground lines, with no excavation required at the site.

The piping diameter and wall thickness for all three connections; Feed, Permeate return and Retentate exhaust should be at least the same specification of the existing vent piping employed above grade at the site (corrosion resistant steel). The piping contractor should ensure that pipe threads are clean cut and coated with UL listed pipe joint sealing compound and tightened to the appropriate torque to eliminate chance of leakage. The typical piping diameter for these lines is 2 inch. The PERMEATOR unit is factory supplied with DN50 (2 inch) flanges for connection to the three conduits. All piping should be sloped back towards the tank at a minimum of 1/8 inch per foot of pipe run. After the piping is installed, the system should undergo the CARB leak decay test, TP-201.3 to ensure that there are no leaks in the UST system.

Installation of the AT-150 Control Panel

PERMEATOR comes complete with a separate electrical control panel. This panel must be located in a zone free area and includes an hour meter to register cumulative running time of the unit and a pressure indicator/controller. The panel also contains a main power On/Off switch, and a power supply for the pressure, vacuum and oil level sensors. Also, a galvanic isolation barrier is used to ensure that no ignition sources can be passed from the control panel to the main PERMEATOR skid, located in the hazardous area. The vacuum pump is equipped with a 2.0 HP motor that operates on 208V/3-phase/60 Hz power. The steady-state load is estimated as follows for this motor:

Watts = (1.73) x V x I x PF, where 1.73 = square root of 3, V = volts, I = amps, and PF = power factor.

Assuming power of 1.5 KW, PF = 0.8, I = 5.2 amps.
Operating expenses are calculated as follows:

1.5 kW x 7.2 hours/day (@30% duty cycle) = 10.8 kWh/day
10.8 kWh/day x $0.10/kwh = $1.08/day @ 30% duty cycle
$1.08/day x 30 days/mo. = $32.40/month

The system requires a 20 Amp service rating on the circuit breaker and connecting wiring used at the site. Motor wiring is typically 12 or 14 gauge, depending on run length, local codes and electrician recommendation. The 24 v dc signal cables should be 18 gauge, depending on run length, local codes and electrician recommendations.

The detailed installation manual found in the electrical control box provides a wiring diagram and instructions for qualified electricians to connect the power supply to the electrical panel. The manual also provides further instructions for completing the control loop and power output wiring from the panel to the junction box housed within the PERMEATOR cabinet.

The panel should be located in a Zone Free, non-hazardous area located indoors. This area should also be easily accessible to technicians and site operating personnel. The panel is pre-wired at the factory and field tasks include only the connection of 3-phase power from the site and sensor and control inputs from components housed within the Main cabinet and previously connected to the junction box located within the Main cabinet.

Installation of Communications for AT-150 Control Panel to the Veeder-Root In-Station Diagnostic (ISD) System

Integration of the ARID PERMEATOR Control panel to the Veeder-Root TLS/ISD panel requires linking two connections: one for any alarm and the other connection for On/Off actuation of the PERMEATOR. The On/Off actuation is linked to a normally open (N/O) contact on the motor starter; when the starter coil is pulled in, the contact becomes closed and the change of state is registered by the Veeder-Root TLS/ISD panel. It may be necessary for the Certified Permeator Technician (CPT) to consult with a certified Veeder-Root technician to ensure proper communication between the PERMEATOR and the ISD system.

Commissioning and Start-up of PERMEATOR on site

Start-up testing for a GDF that has the Permeator AT-150 installed on it must be tested in accordance with the test procedures outlined in the CARB Executive Order VR-202 series (starting with Revision Y). These tests are listed below:

TP-201.3 (Leak Decay)
Exhibit 8 (Items to Consider when Conducting TP-201.3)
TP-201.4 (Dynamic Back Pressure – if applicable) **See Note Below**
Exhibit 5 (V/L of Model 900 Nozzle)
Exhibit 9 (Veeder-Root ISD Operability Test)
Exhibit 11 (Liquid Condensate Trap Compliance – if applicable)
Exhibit 14 (Dispenser Integrity)
Exhibit 15 (Permeator Compliance)

Note: TP-201.4, Dynamic Back Pressure (July 3, 2002), is primarily conducted at new GDF installations prior to backfill. If required by the District, it shall be conducted in accordance with the conditions listed in item 1 of the Vapor Recovery Piping Configurations Section of Exhibit 2. Districts have the authority to require conducting of Exhibit 5, Vapor to Liquid Volume Ratio, in lieu of TP-201.4, provided that at least two gallons of product are introduced into the system through each dispenser riser prior to conducting the test.

Liquid Leak Integrity Testing

EPA approved and third-party tested liquid leak technologies should be applied to new and existing sites before the PERMEATOR system is started up and commissioned. The application of such protocols will ensure that the liquid piping and tankage is leak free. The choice of a test protocol lies with the local installation contractor.

Pressure Control Set Points

In automatic control mode, the vacuum pump is actuated when the upper control limit (P hi) of 0.30 ± 0.06" W.C. is reached by the measured variable – the underground storage tank pressure. On the plc (B, Figure 2), the Motor status box on the lower right side will indicate ON. At the same time, the minimum run timer will ensure operation for at least the factory pre-set minimum run time. If the tank pressure is reduced to the Lower Control Limit (P lo) of 0.20 ± 0.06" W.C. before the minimum run time period has elapsed, the vacuum pump will continue to operate. At any time after this 40-minute interval, when the storage tank pressure reaches the low pressure set point, the vacuum pump will shut off.

Note: If the tank pressure drops below zero (negative pressure) at any point during the 40-minute run interval (as measured by the PERMEATOR pressure sensor), the PERMEATOR will shut off to limit electricity usage and unnecessary run time for the system.

Configuration of the Set-points is done at the Factory. The CPT should verify at Control Panel installation and power up that the P hi and P lo set points are properly configured.

The vacuum pump will remain off until the underground storage tank pressure again increases to the P hi, and the above cycle repeats. The tightness of the station is continuously monitored by both the Veeder-Root ISD System installed at the GDF and ARID's own pressure sensor/transmitter. If pressure vs. time plots exceeding the P hi set point are consistently observed, the PERMEATOR unit is not operating properly. Also, if the pressure plots do not show rapid pressure reduction once the unit is actuated at the P hi threshold, the vapor feed path may be restricted.

Vacuum Pump Motor Rotation

Having made the appropriate tests and connections, it is very important to test the direction of the rotation of the vacuum pump. This is done by quickly switching the unit on and off (E, Figure 2) and observing the rotation of the vacuum pump motor. If the motor is spinning in the direction indicated by the arrow on the housing of the vacuum pump --clockwise, everything is fine. If the direction is opposite the arrow, it must be changed immediately to avoid damaging the vacuum pump. The direction is changed by switching two of the leads within the L1, L2, L3 power strip in the electrical control cabinet or switching two wires within the electrical junction box mounted to the motor housing in the main cabinet. A quick means of determining proper rotation is to place a piece of paper in close proximity to the vacuum pump cooling fan cage. If the paper is sucked into the fan cage, the motor rotation is correct.

PERMEATOR System Details

Piping

Piping should incorporate minimum of 2" diameter corrosion resistant steel for all vapor carrying conduits. For installations at grade or slightly above ground level, please ensure that PERMEATOR connections are made in accordance with manifold or non-manifold storage tanks. Please note that a CPT should be present during installation to ensure proper practices are being carried out (Key factors are feed and return tanks properly identified, manifold vents, isolation ball valves, and pressure vacuum valve installation). Before operating the system in unattended mode and initiating start-up of the unit, a CPT should ensure that the PERMEATOR connections are properly made for Feed, Return and Exhaust lines and that the unit and piping are adequately mounted and secured in place. The isolation ball valves must be opened to allow feed flow to the unit and permeate return flow from the unit and vapor carrying piping should meet minimum slope requirements. The station vent piping should be leak tight and use at least one p/v valve listed as CARB approved for Feed connection(s) and Return connection.

TP 201.2 back pressure and TP 201.3 pressure decay test results should conform to acceptable standards published by CARB.

Vehicle Vapor Recovery System – Phase (Stage) II System

For AT-150 installations, the front-end vapor recovery hanging hardware is supplied and tested by others. Only Phase (Stage) II hanging hardware listed for use on the Assist Phase II EVR Executive Order VR-202 Series is permitted in California.

Electrical Control Panel

The electrical control panel should be checked for proper wiring, accessibility and indoor location. Explosion proof conduit, junction boxes and seals should be used within the classified area.

System should be cycled between P hi and P lo to ensure proper operation. Run time meter should be referenced with detailed pressure vs. time data to verify proper system response.

Instructions to Site Operating Personnel

Station employees should receive instructions on checking panel plc, run time meter and indicator lights. They should be able to interpret the diagnostics and reference a Frequently Asked Question sheet which explains the impact of the system diagnostics. If the unit is stopped and cannot be restarted by following prescribed instructions, the station personnel should be instructed to call ARID or a local representative for technical support. The station personnel should also know how to use the main power interrupt feature on the electrical control panel as well. Station management should also be instructed to relay proper filling and balancing procedures to tanker truck drivers. By following proper procedures, the pressure integrity of the station vapor connections will be maintained. The closed system will allow PERMEATOR to be properly actuated and provide both economic and environmental benefits to the end-user. A copy of this manual should be kept on file at the station site.

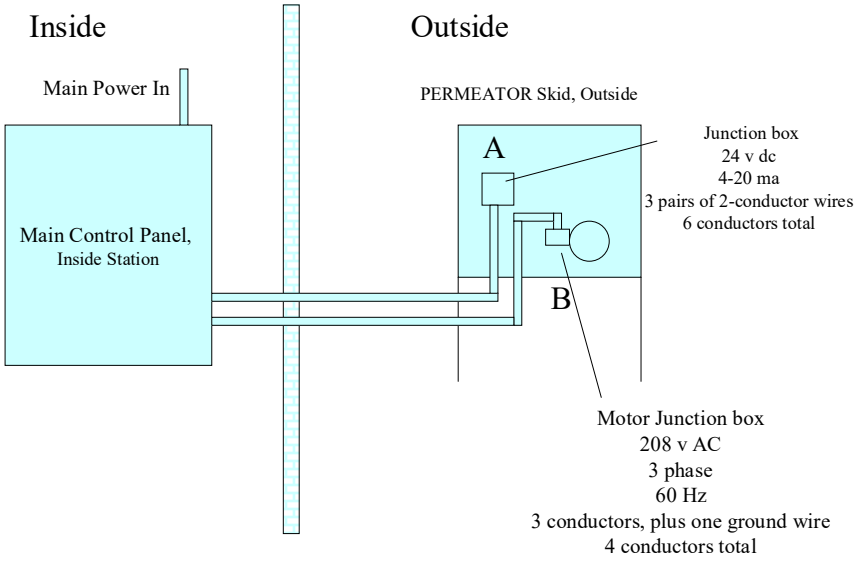
Inspection Checklist

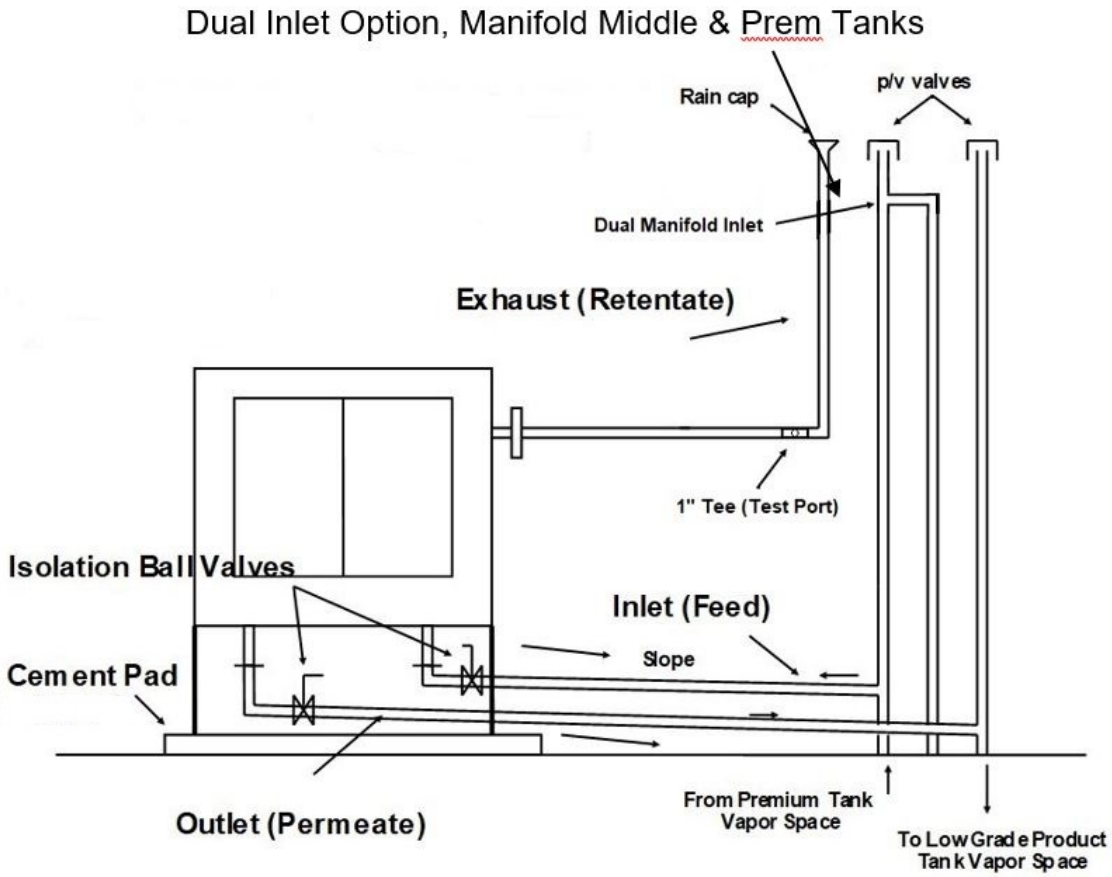
- Δ Open PERMEATOR unit cabinet (A key is needed to first unlock the cabinet).
- Δ Visually look for any accumulated oil in the oil spill pan.
- Δ Physically inspect fittings to ensure that they are more than hand-tight.
- Δ Sniff for presence of hydrocarbon vapors from the piping to ensure leak tightness.
- Δ Listen and feel for any noises or vibrations that may indicate vacuum pump motor bearings may be worn.
- Δ Close cabinet and lock the doors.
- Δ Visually inspect p/v valve(s) and the raincap on the PERMEATOR clean air exhaust. Ensure no obstructions. Look or smell for presence of vapors exiting the p/v valve or clean air exhaust of the PERMEATOR.
- Δ Locate the electrical control panel installed inside the station (Typically located near the electrical submersible turbine pump controls located in the back room of the station).
- Δ Ensure that the green “Power ON” light is illuminated.
- Δ Note the cumulative run time of the PERMEATOR unit. This time is expressed in hours, and is located in the lower right hand corner of the illuminated display screen.
- Δ Compare the present run time with the run-time recorded on a previous visit.
- Δ Note the current tank pressure as indicated on the plc display screen.
- Δ Compare the current pressure to the P hi setting on the plc display screen. If the current pressure is greater than the P hi setting, ensure that PERMEATOR is “ON”.
- Δ PERMEATOR “ON” is indicated by the light green vacuum pump “ON” light illuminating.
- Δ If equipped with a laptop and ARID’s proprietary software, insert the RS232 Serial connection plug (exiting the control panel) into the appropriate port on the back of your computer.
- Δ Contact the data logger within the control panel, and download operating parameters.
- Δ Plot the operating parameters and visually check on run time frequency, oil level status, vacuum pump pressure, storage tank pressure variations and max/min storage tank pressures.

Appendix

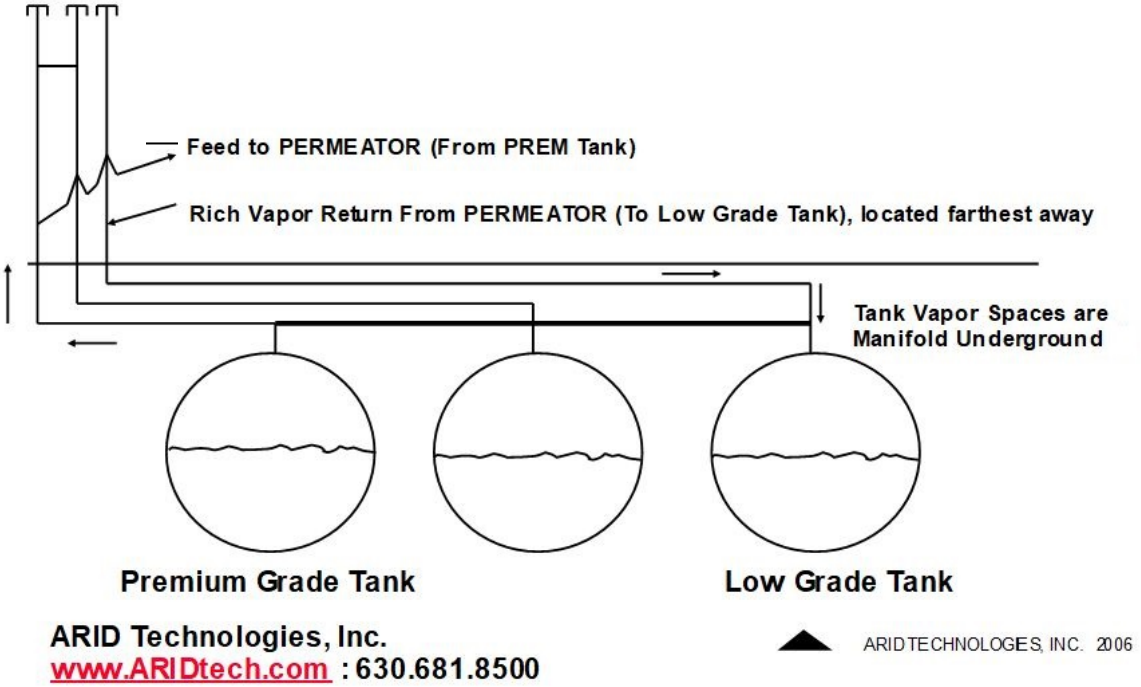
Quick Start Guide

Overall Installation Schematic





Overall Tank Detail



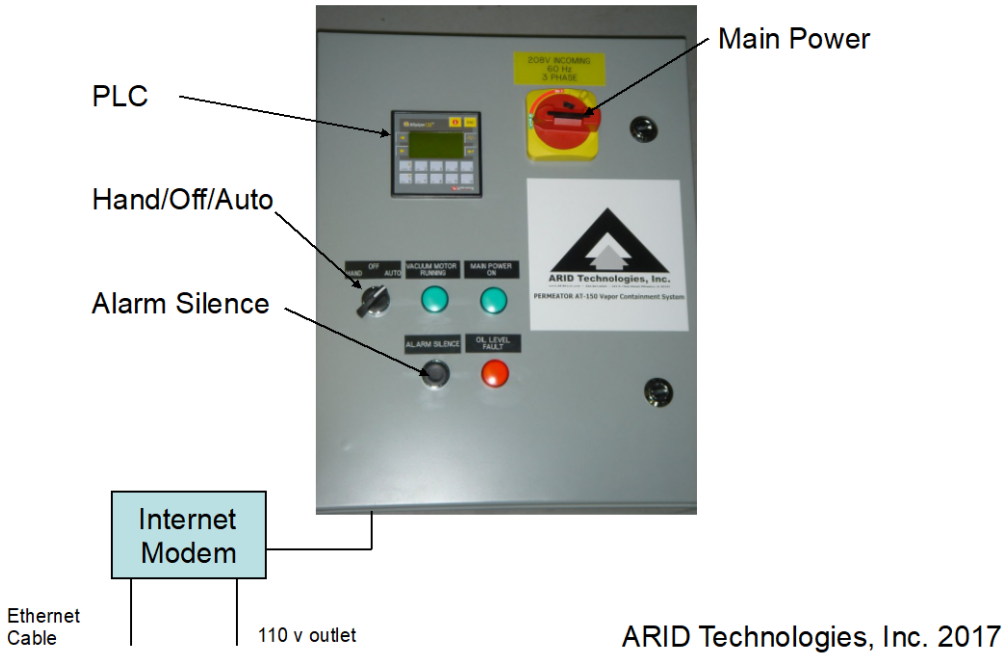
PERMEATOR Installation

- Mounting of PERMEATOR with four (4) lugs into cement slab
- PERMEATOR must be perfectly level (Oil level limit switch)
- ¾ inch conduit for power wires (208 v, 3 phase, 60 Hz)
- 1 inch conduit for communication wires (24 v dc)
- P/V valves are 2 or 3 inch NPT threads – vent pipes should be threaded accordingly.
- After all piping and electrical conduit connections are made, a pressure decay test must be conducted before start-up and commissioning of PERMEATOR. Pressure decay test uses nitrogen gas and starting pressure of 2 inches H2O, gauge. (Reference CARB procedure TP-201.3)
- If data logging option is chosen, internet jack is located in close proximity to control panel

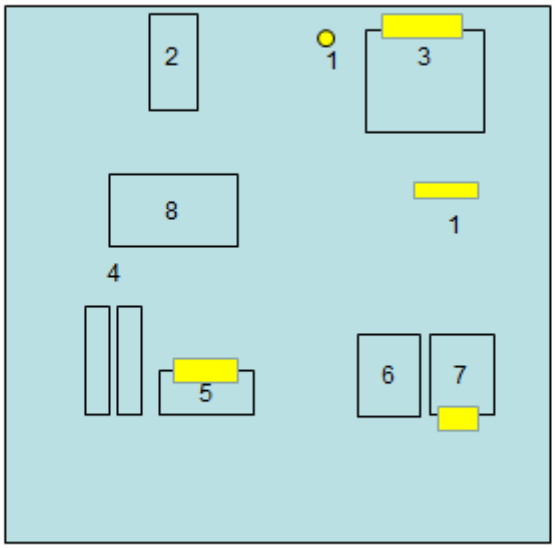
Electrical Details

ELECTRICAL DETAILS: PERMEATOR AT-150

Control Panel Mounted Inside Station



Control Panel: Main Component Outline



1 Ground Lug
2 24 v dc Power Supply
3 Main Power Switch with fuses
4 Galvanic Isolation Barriers
5 Terminal Strip
6 Motor Overload Breaker
7 Motor Starter
8 Data Logger

Field Wire Connections

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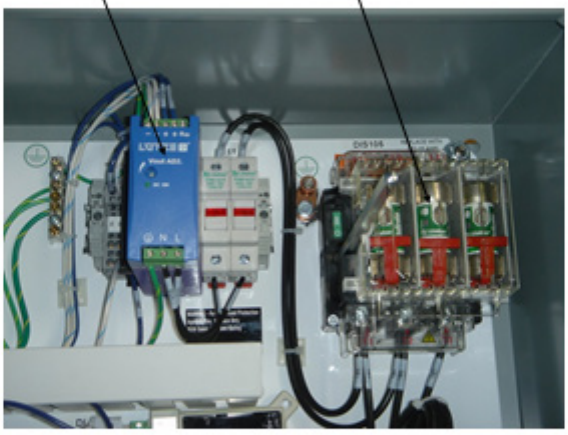
Power Supply (2) and Incoming Power Fuses (3)



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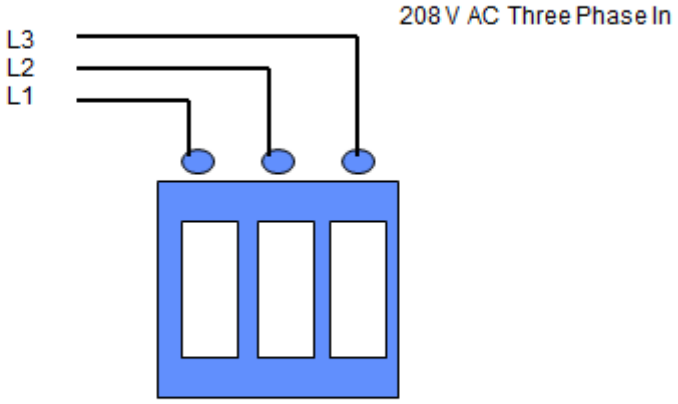
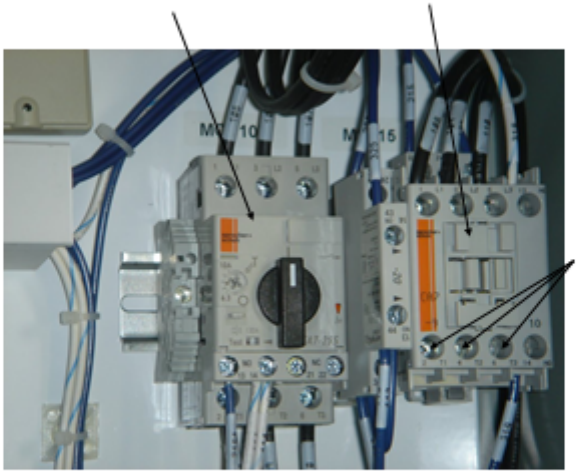
Close-up of 3, Main Power Switch

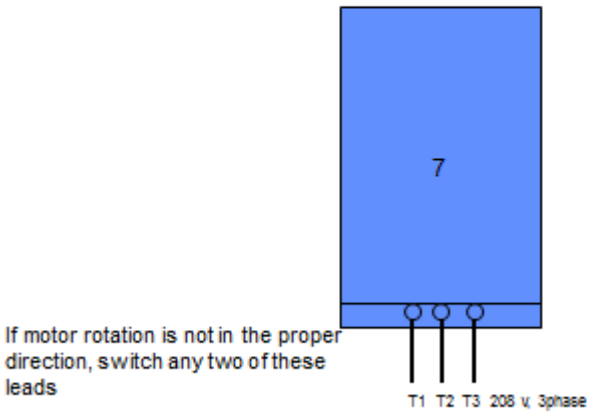


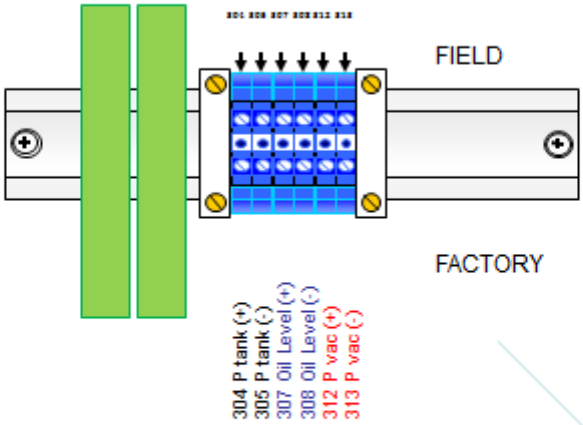
Motor Overload Breaker (6) and Motor Starter (7)



Overload Breaker: Normal position is 12 o'clock
Tripped position is 9 o'clock, re-set by setting back to 12 o'clock

Close-up of 7, Motor Starter



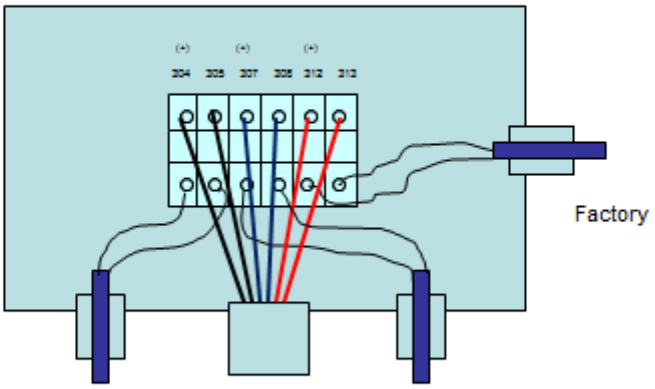


Close-up View of 5, Terminal Strip Within Control Panel (Control Signals)

PERMEATOR Skid, Outside

ARID TECHNOLOGIES, INC. 2006

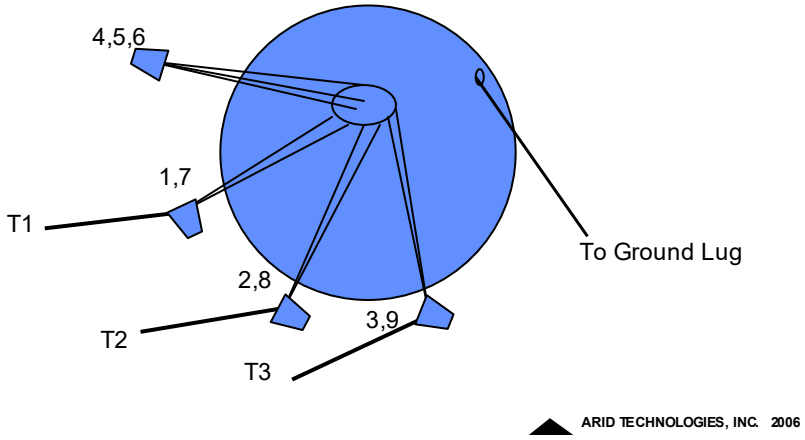
Close-up of 9, Outside J-box & Terminal Strip



ARID Technologies, Inc. 2006

Close-up of 8, Motor J box

NEMA; Dual Voltage: Wye Connection- 9 Leads



Troubleshooting

Low Oil Level Alarm:

NOTE: ARID uses a specially formulated oil (Part Number AT-11) which has certain properties specifically engineered for the PERMEATOR AT-150. The use of other oils is not authorized.

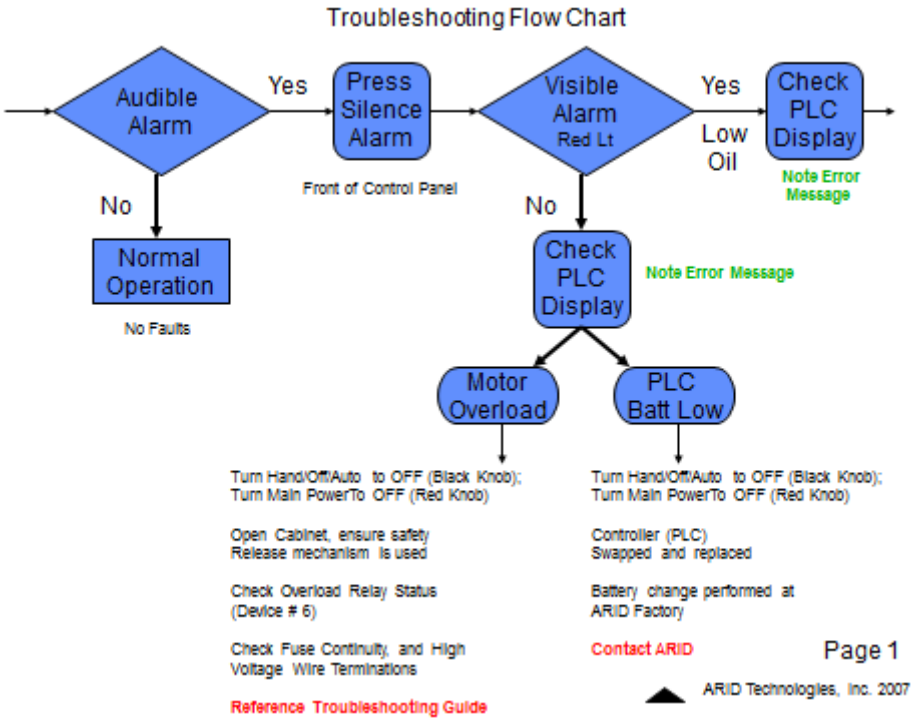
1. Ensure that oil is added until a small amount of oil just begins to overflow from the port 5B located on the exhaust box. Please reference the attached drawing of the vacuum pump exhaust box. Add oil from port 5, located on the top of the vacuum pump exhaust box.

2. If alarm persists after oil is added, change the setting of the MIN/MAX limit switch located within the Oil Level Sensor (This switch is found by unscrewing the white cap on the oil level sensor). After changing the setting, did the oil level alarm light go off? If yes, use the new setting. If no, oil level sensor or field wiring is faulty.

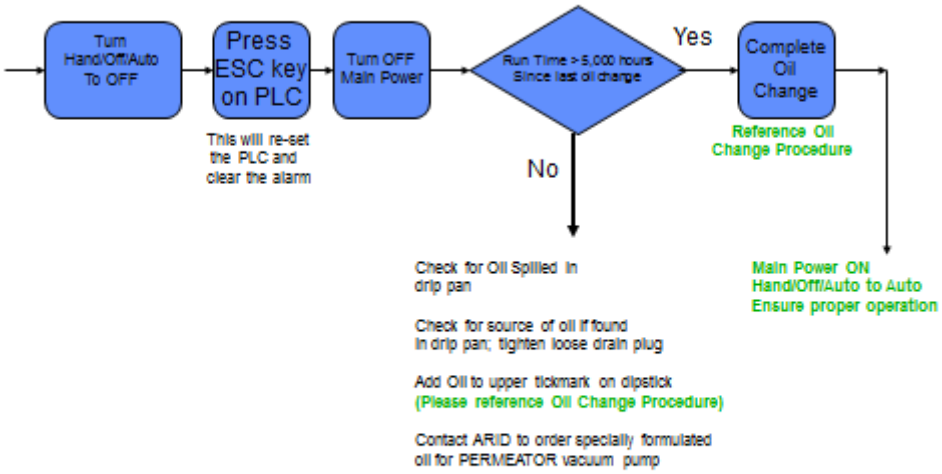
3. To ensure that P tank and Oil Level sensor wires are not interchanged, please verify that oil level sensor wires (2 lead wires) are connected to the proper terminals. Please reference the attached diagram as well as the detailed schematic of the main control panel wiring. Please be sure to observe proper polarity by connecting (+) to (+) and (-) to (-).

4. To ensure that the signal is carried properly by the wires from the sensor located outside to the main control panel mounted inside the station, please carry-out an electrical continuity check. If continuity is established, the integrity of the signal cable is verified. If electrical continuity is not established, then the cable which connects the PERMEATOR to the main control panel should be replaced or repaired.

5. If oil is added to suitable level, and if MIN/MAX switch does not change state of oil level alarm, and if P tank and Oil Level sensor wires are not interchanged, and if electrical continuity is established for the signal cable, and if oil alarm persists, then the oil level sensor must be replaced. Contact ARID or a CPT.



Troubleshooting Flow Chart



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