HY-PRO
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Hy-Pro Vac-U-Dry Owner's Manual

Part No. V15D46D3MV24A-ARTU

S/N: **20170011**

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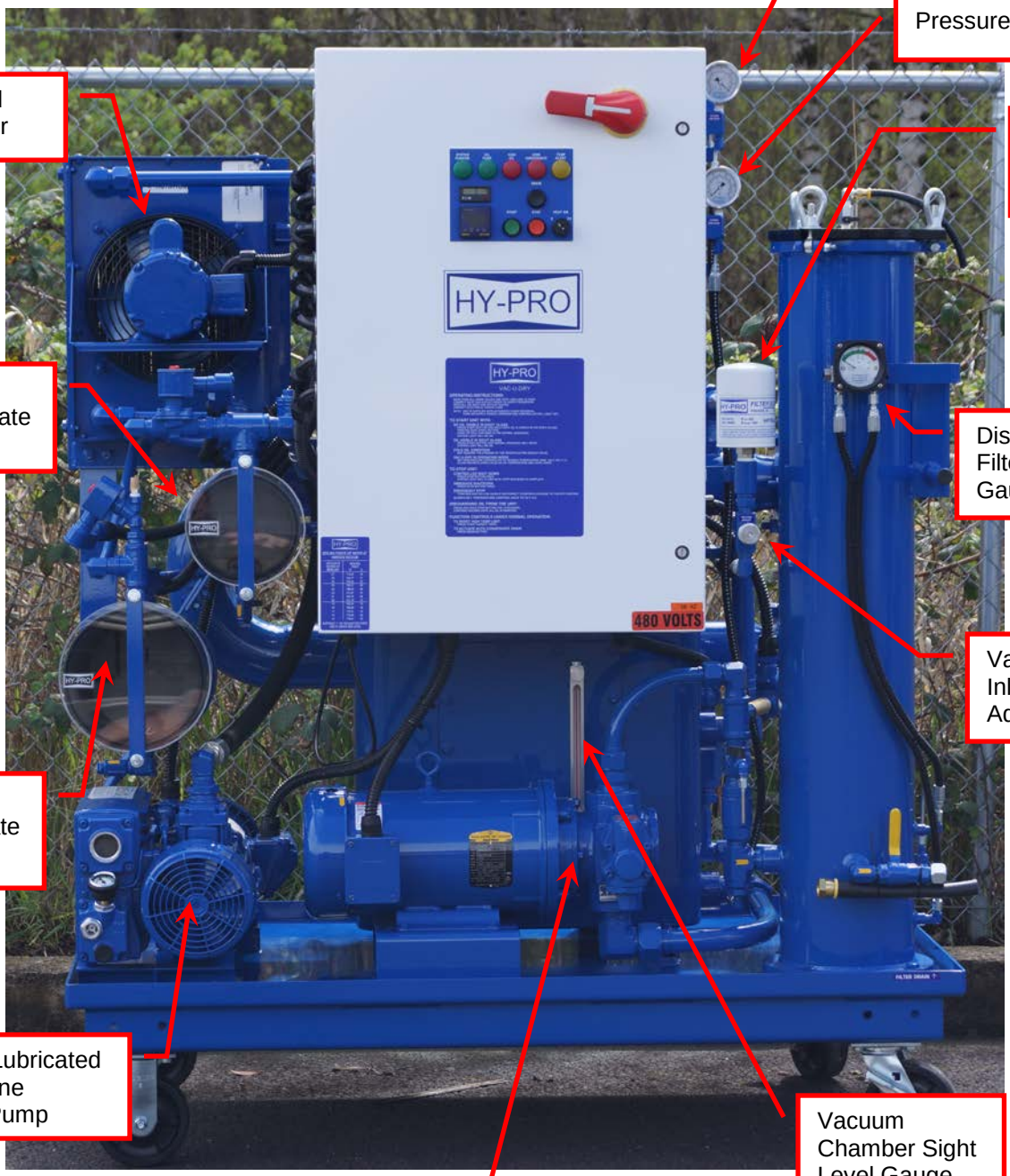

Vacuum Gauge

Pressure Gauge

Air Cooled Condenser

Vacuum Inlet Air Filter

Upper Condensate Tank

Discharge Filter DP Gauge

Vacuum Air Inlet Valve Adjustable

Lower Condensate Tank

Dry Seal Lubricated Rotary Vane Vacuum Pump

Vacuum Chamber Sight Level Gauge

Fixed Displacement Gear Pump

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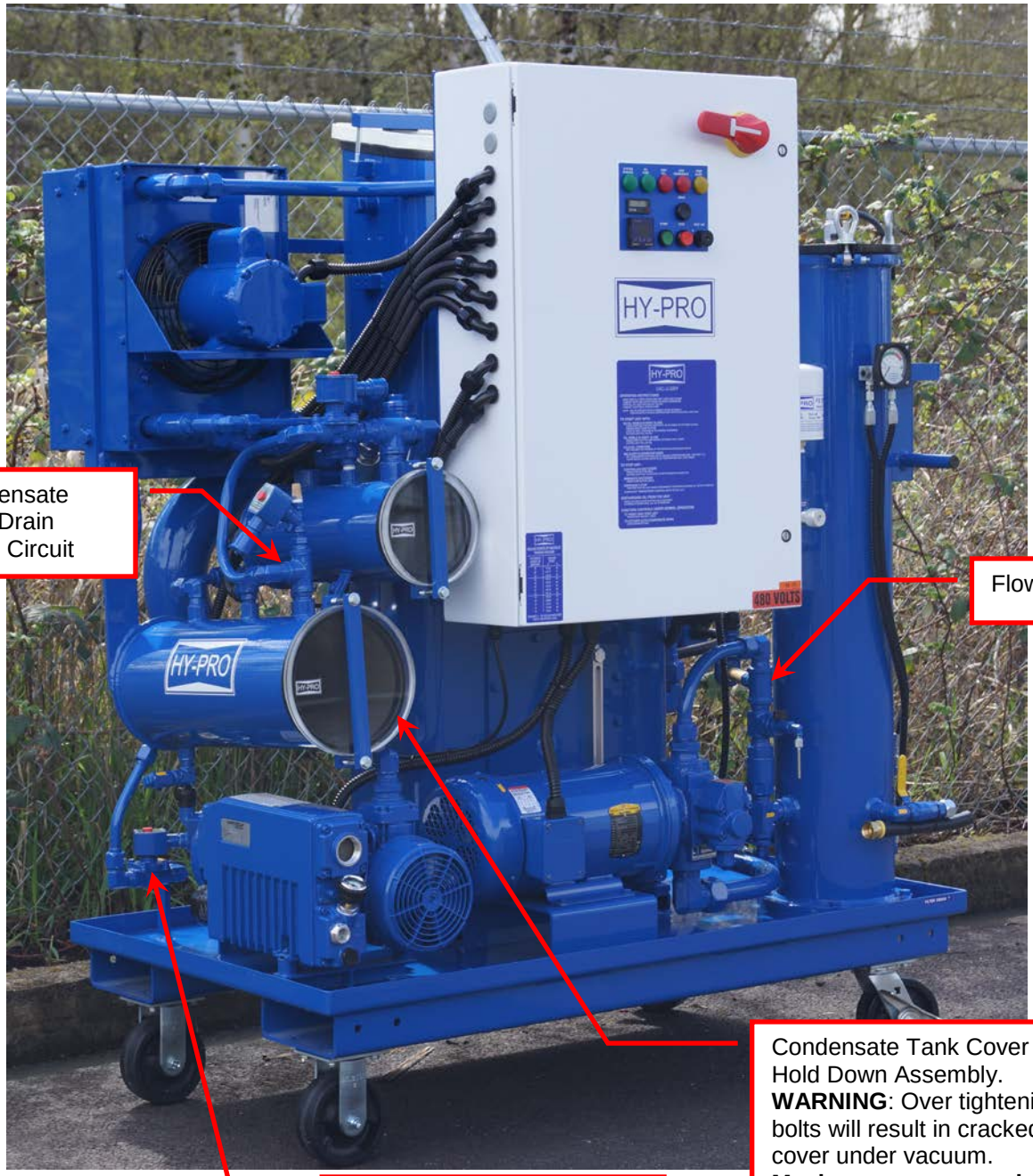

Condensate Auto-Drain Valve Circuit

Flow Switch

Condensate Tank Cover Hold Down Assembly. **WARNING**: Over tightening bolts will result in cracked cover under vacuum. **Maximum recommended torque 2 foot pounds.**

Condensate Auto-Drain Line

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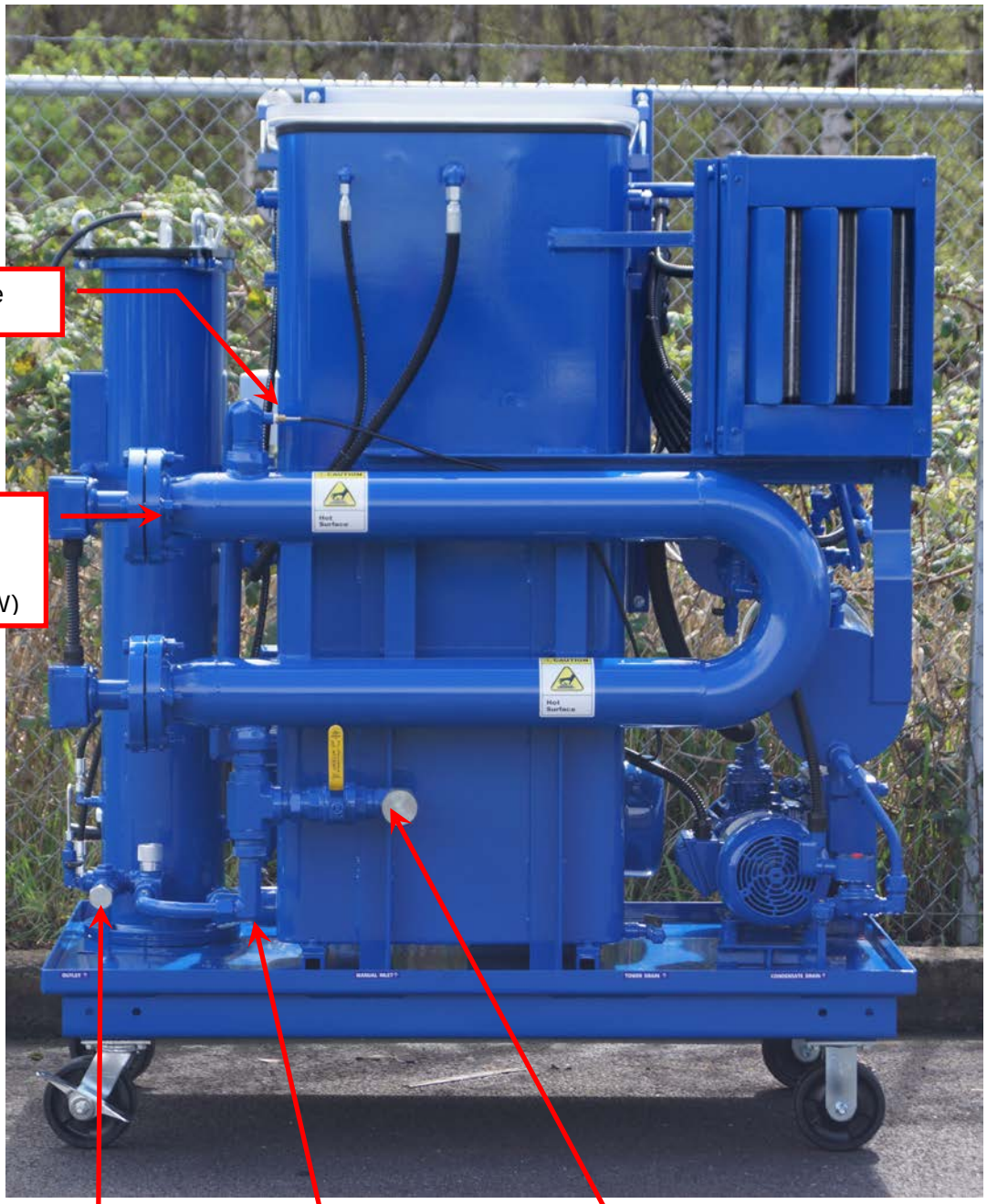

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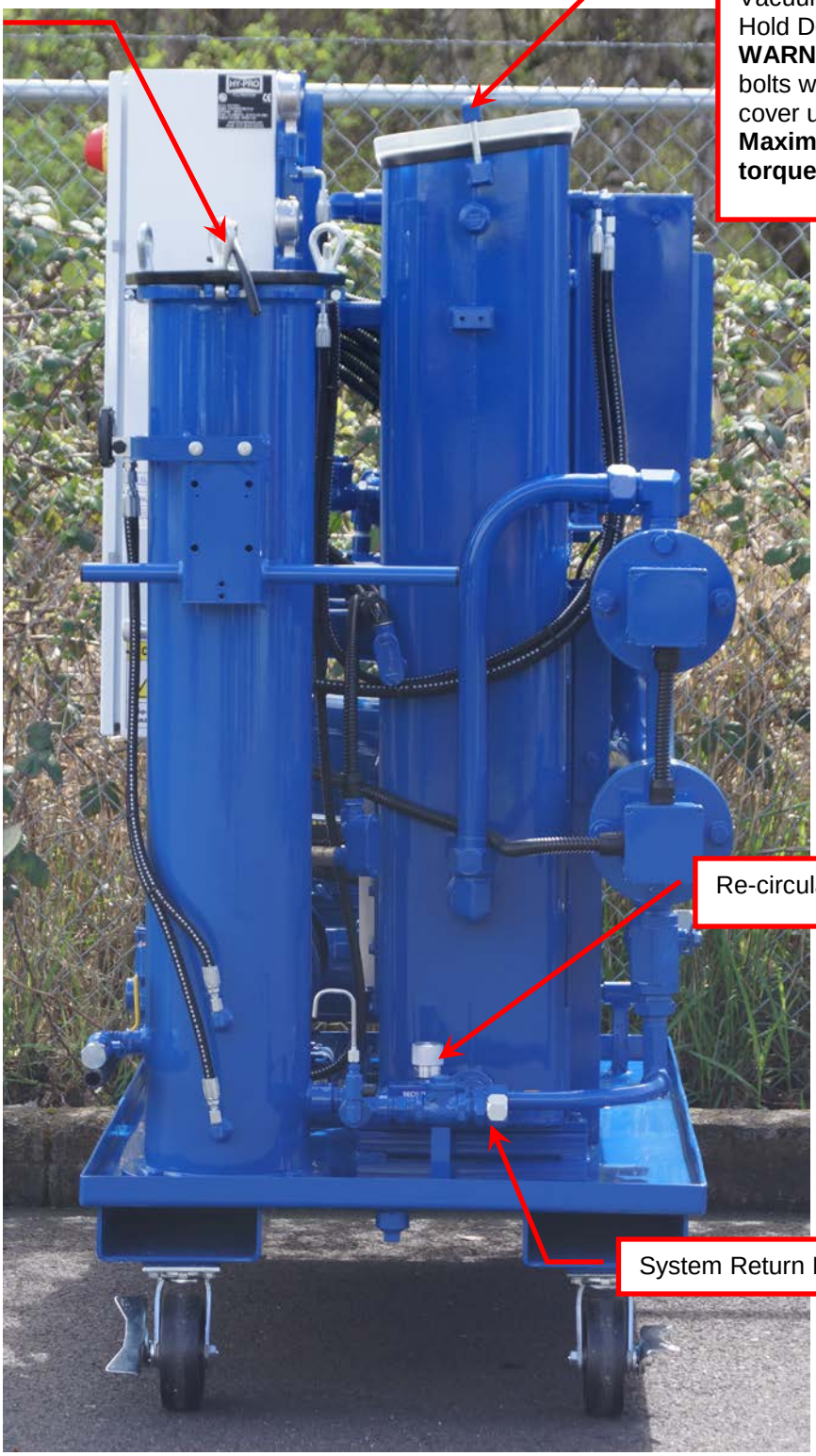
Particulate Filter Bleed Valve

Vacuum Chamber Cover Hold Down Assembly. **WARNING**: Over tightening bolts will result in cracked cover under vacuum. **Maximum recommended torque 2 foot pounds.**



Re-circulation line control valve

System Return Line

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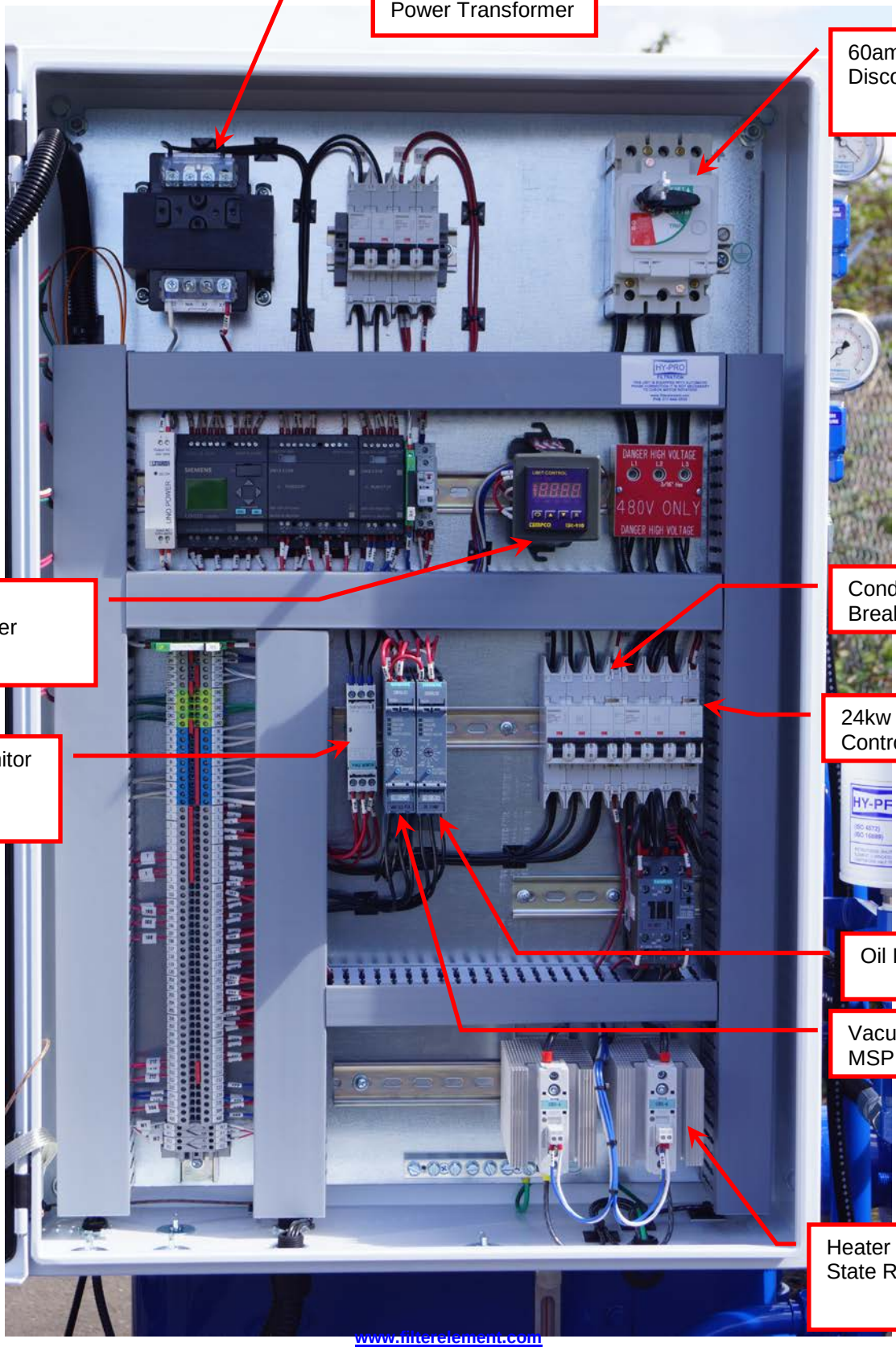

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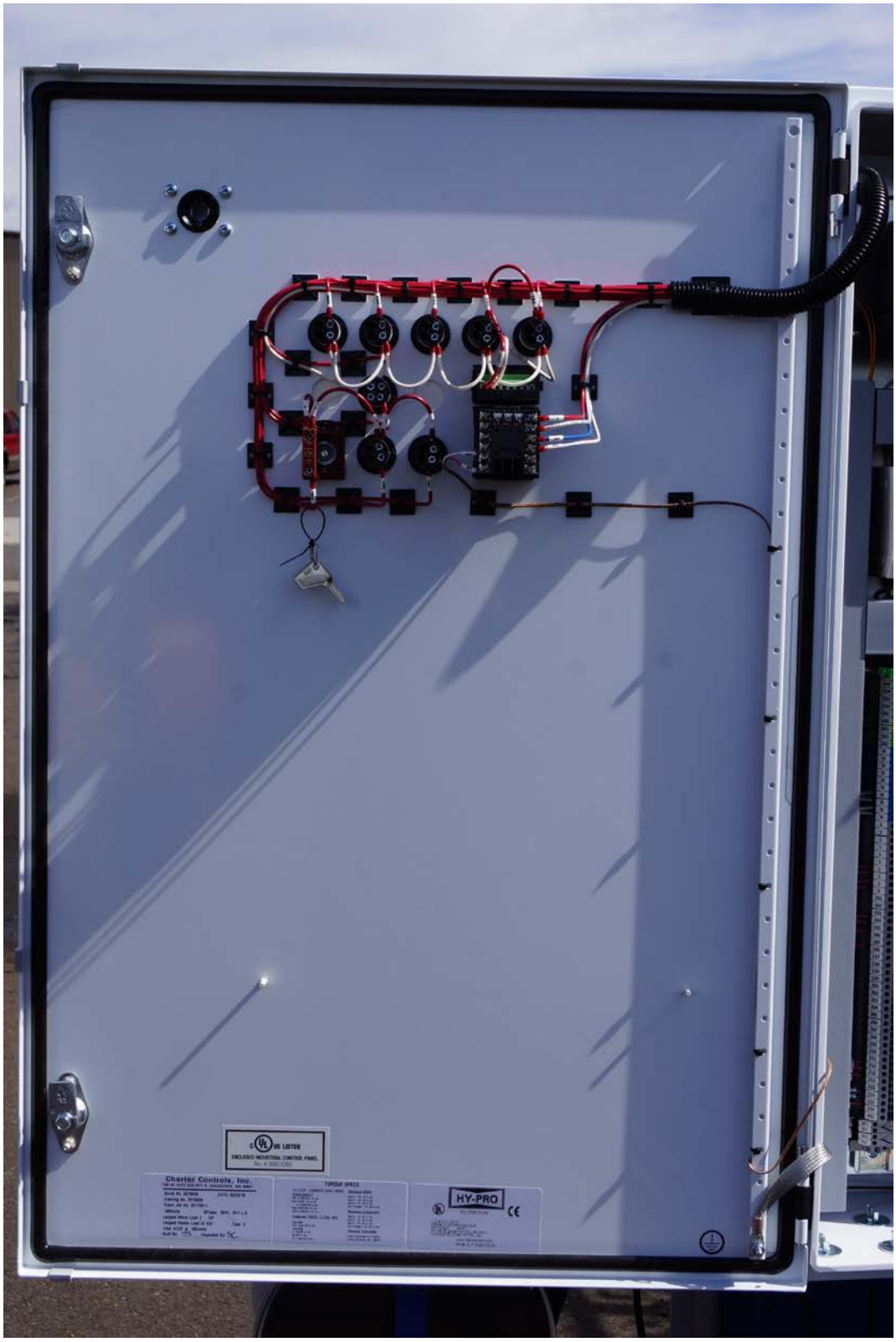

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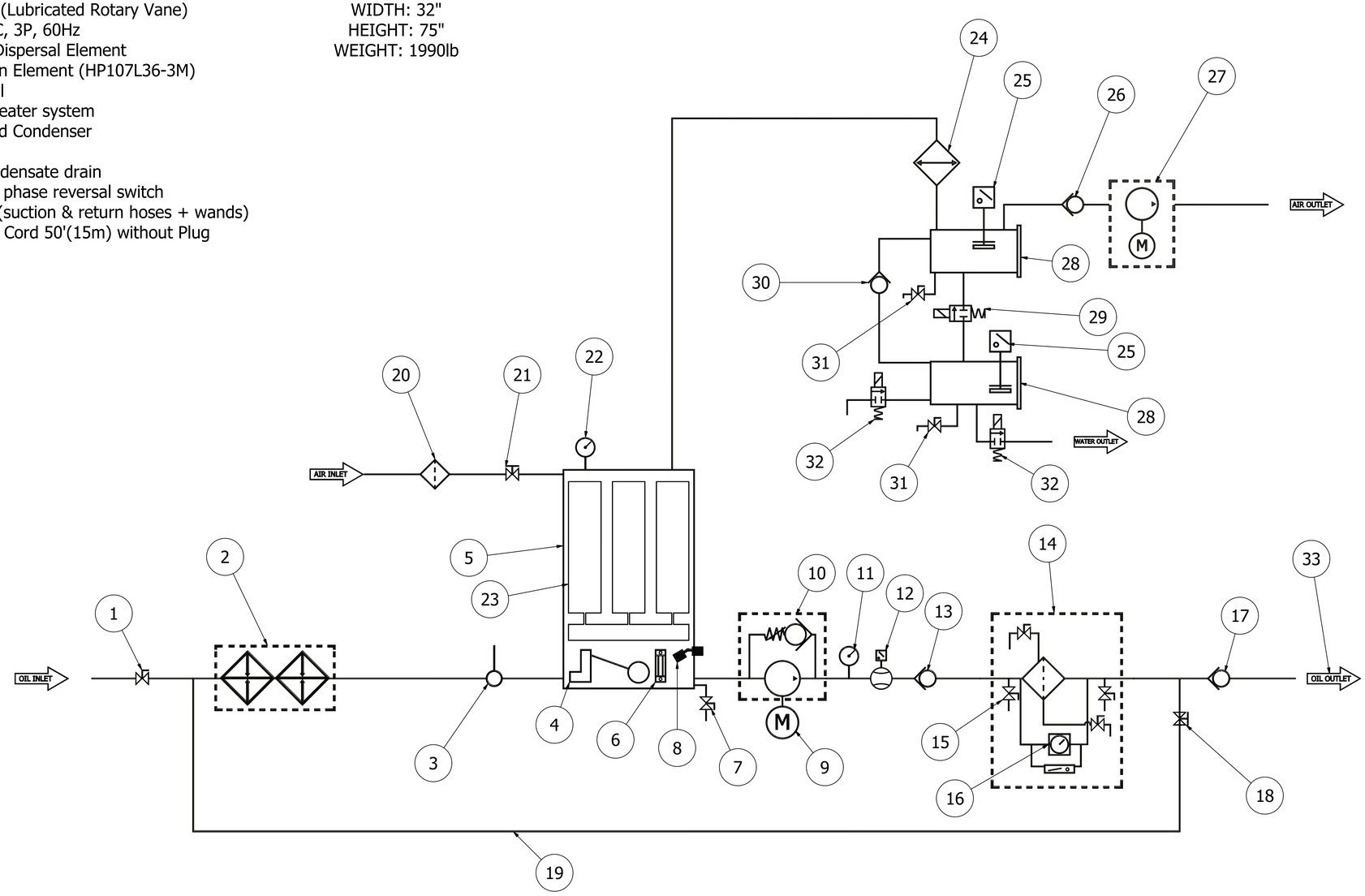
PARTS LIST	
ITEM	DESCRIPTION
1	OIL INLET, MANUAL VALVE, 1-1/2" MALE JIC
2	24kW HEATER ASSEMBLY
3	THERMOCOUPLE
4	FLOAT BALL VALVE
5	VACUUM TOWER HOUSING
6	SIGHT GLASS
7	VACUUM TOWER DRAIN VALVE
8	HIGH OIL SWITCH
9	460 VAC, 3P, 60Hz MOTOR
10	OIL DISCHARGE PUMP
11	SYSTEM PRESSURE GAUGE
12	LOW FLOW SWITCH
13	FILTER HOUSING CHECK VALVE
14	FILTER HOUSING
15	SAMPLE PORT
16	DIFFERENTIAL PRESSURE GAUGE
17	SYSTEM CHECK VALVE
18	RECIRCULATION VALVE
19	RECIRCULATION LINE
20	AIR INLET BREATHER
21	VACUUM ADJUST NEEDLE VALVE
22	VACUUM GAUGE
23	DISPERSAL ELEMENT - 3 ELEMENT
24	AIR COOLED CONDENSER
25	CONDENSATE DRAINR SWITCH
26	VACUUM PUMP CHECK VALVE
27	DRY SEAL (Lubricated Rotary Vane) VACUUM PUMP
28	CONDENSATE SUMP
29	CONDENSATE SUMP N.O. SOLENOID VALVE
30	SWING CHECK VALVE
31	CONDENSATE SUMP MANUAL BALL VALVE
32	CONDENSATE SUMP N.C. SOLENOID VALVE
33	MAIN OIL OUTLET 1" JIC

V - VAC-U-DRY
15 - 15 GPM
D - Dry Seal (Lubricated Rotary Vane)
46 - 460 VAC, 3P, 60Hz
D - Pleated Dispersal Element
3M - 3 Micron Element (HP107L36-3M)
V - Viton seal
24 - 24kW Heater system
A - Air Cooled Condenser

A - Auto Condensate drain
R - Electrical phase reversal switch
T - Hose kit (suction & return hoses + wands)
U - Electrical Cord 50'(15m) without Plug

SPECS:
LENGTH: 56"
WIDTH: 32"
HEIGHT: 75"
WEIGHT: 1990lb



SYSTEM VERIFICATION SIGNATURE:

DATE: _____

UNIT VOLTAGE: 460VAC, 3P, 60Hz

ESTIMATED FULL LOAD AMP's: 40 FLA

FLUID VOLUME: _____

FLUID TYPE (IF RENTAL, LIST ANTICIPATED FLUIDS): _____

HY-PRO FILTRATION
6810 LAYTON ROAD
ANDERSON, IN 46011
TEL: 317.849.3535 FAX: 317.849.9201
www.filterelement.com

DRAWN	JAE	2/18/2015
CHECKED	JAE	2/18/2015
APPROVED	JAE	2/18/2015

ALL DIMENSIONS IN INCHES (METRIC IN BRACKETS)

TOLERANCES UNLESS OTHERWISE STATED (IN)
±.005" ON THREE PLACE DECIMAL
±.010" ON TWO PLACE DECIMAL
±.020" ON ONE PLACE DECIMAL
< ±1°
◎ .005" TIR
⊥ .005" TIR

SALES ORDER NO: 20170011

CLIENT: RELIABILITY EQUIPMENT

TITLE: 20170011 V15D PNID

QUICK SPECS:
FLOW RATE: 15 GPM
VOLTAGE: 460VAC, 3P, 60 Hz
FILTRATION: HP107L36-3M
NEMA RATING: NEMA 4

SIZE D | MODEL NO V15D46D3MV24A-ARTU | REV

SCALE 1:1 | DWG NO: W15-15 | SHEET 1 OF 1

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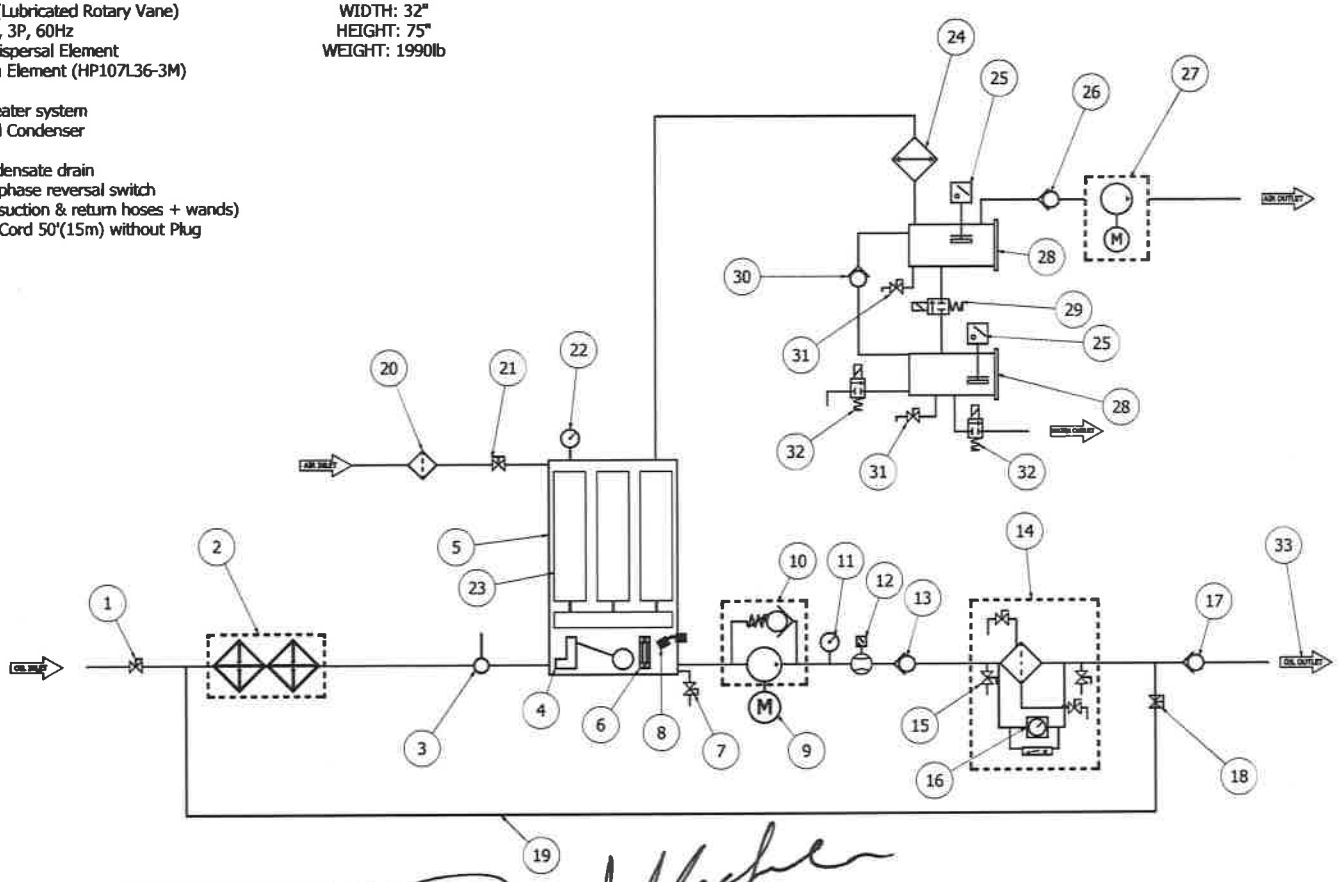

SYSTEM VERIFICATION SIGNATURE: Paul Schlaefer

DATE:

UNIT VOLTAGE: 460VAC, 3P, 60Hz

ESTIMATED FULL LOAD AMPs: 40 FLA

FLUID VOLUME:

FLUID TYPE (IF RENTAL, LIST ANTICIPATED FLUIDS):

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SIZE D | MODEL NO: V15D46D3MV24A-ARTU | REV

SCALE 1:1 | DWG NO: W15-15 | SHEET 1 OF 1

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Vac-U-Dry Operator's Manual
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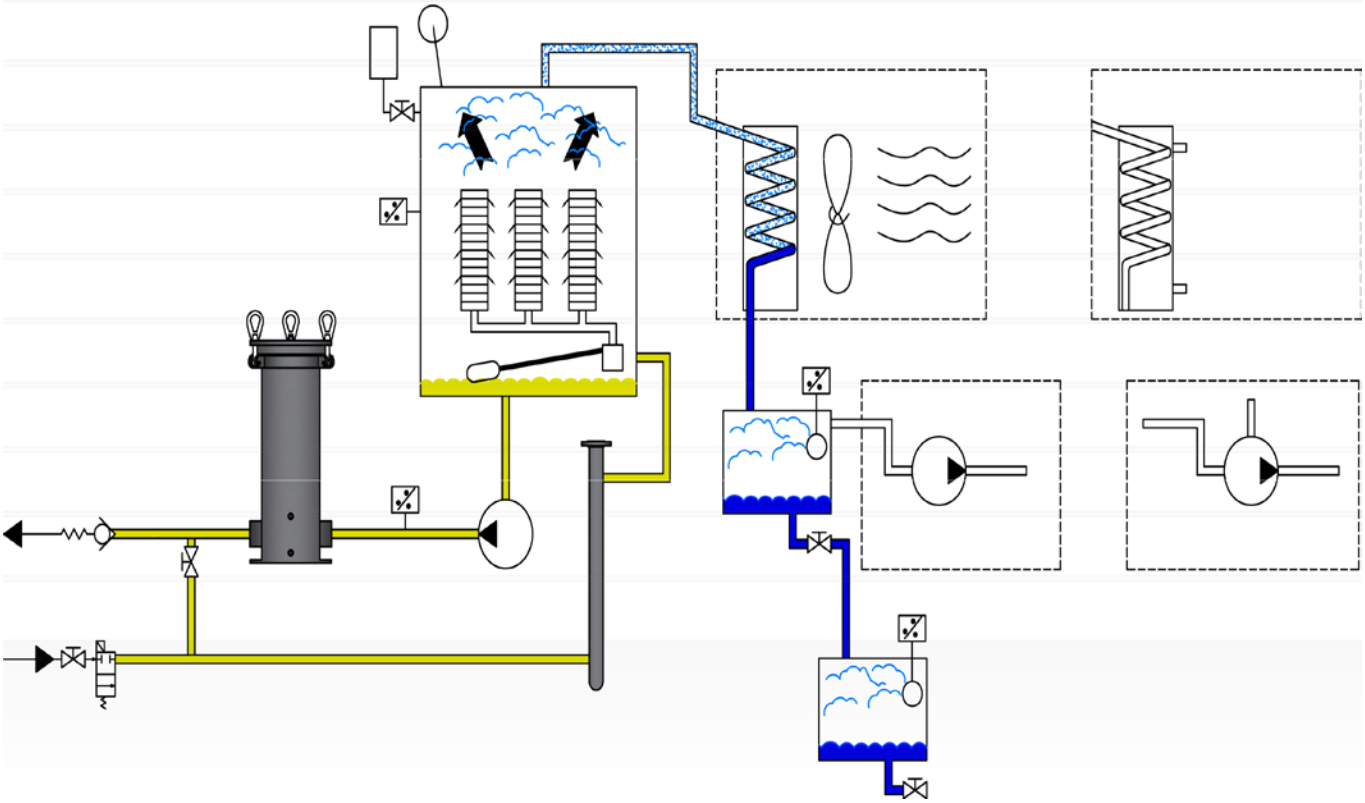
8.0 Frequently Asked Questions

1.0 General Information

1.1 Introductory Information

The Hy-Pro oil purification system is designed to remove water (free/dissolved), solid particulate and dissolved gasses from petroleum and synthetic fluids. The water removal principle used is simple, reliable and will dependably remove water well below the oil saturation point, even when tightly bound in emulsion.

Figure 1 below shows schematically the Hy-Pro Dehydrator operation. A vacuum pump creates a vacuum that draws fluid into the unit through an inline heater and the fluid is heated up to 150℉ (66℃). It then flows through dispersal element s, which are located inside the vacuum tower. Oil flows out of these element towers and is exposed to the vacuum, normally 25 “/hg (635 mm/HG). The boiling point of water is below the fluid temperature at this vacuum. The water is boiled off and the fluid is dehydrated. An outlet pump removes the oil from the bottom of the vacuum chamber and pumps it through a particulate filter and back into the reservoir. The water vapor is run through a condenser and then into the condensate tanks.



The mechanical components of the system are uncomplicated and require little or no routine maintenance, making the dehydrator very reliable. All components can be field repaired or replaced without special tools.

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1.2 Fluid Compatibility

The process fluid must be compatible with Viton™ seal material. Viton™ is compatible for service with most petroleum-based oils. Hy-Pro units may be ordered with EPR seals to provide compatibility with other fluids. **Contact Hy-Pro for special applications and pricing.**

NOTE: THE HY-PRO UNIT SHOULD NEVER BE USED TO REMOVE VOLITILES SUCH AS; DIESEL FUEL, GASOLINE, OTHER PRODUCTS EXPLOSIVE IN NATURE, TOXIC OR WITH LOW FLASH POINTS. FOR CLARIFICATION, CONSULT YOUR FACTORY REPRESENTATIVE FOR DETAILED INFORMATION.

2.1 Installation and Startup Procedures

2.2 Unpacking

The Hy-Pro dehydrator is shipped in a heavy-duty wooden container for maximum protection during shipment. Unscrew and remove the wooden shell first, then remove the hold-down straps at the base of the unit. Lift the unit off the wooden skid with a forklift. Do not discard the wooden crate until the dehydrator has been set up and tested, as the crate will make returning the unit much easier should servicing be necessary. Caution should be exercised while initially moving the dehydrator, as this unit has been tested with a petroleum-based fluid. Though the unit was drained prior to shipment, trace amounts of fluid can be present in the connecting lines and in the sump area of the vacuum tower. It is suggested that the unit be manually pumped for a short while to remove any of the remaining fluid.

Note: The operational manuals are shipped with the unit and are located below the base

After the unit has been removed from its shipping crate it should be checked thoroughly for any damage that may have occurred during shipment. *All damage attributed to the handling and shipping of the unit must be recorded and brought to the attention of the shipper immediately. This unit is insured for shipping related damage.*

This unit has been thoroughly tested for a minimum of 8 hours (run time). Fluid used to test the unit is matched as closely as possible to that listed on the application sheet completed by the customer and supplied with the order. The unit has been thoroughly inspected for defects prior to shipment. However, all connections should be checked prior to operating this unit. Vibration and/or rough handling during shipment could adversely affect component alignment and/or connection tightness.

2.3 Mechanical Installation

With the dehydrator in place, connect the inlet and outlet hoses from the reservoir to the dehydrator. See **3.1 Initial Set-up** Step 2 in the manual for correct sizing and distance from the reservoir. The inlet port has been sized to provide enough flow to operate the unit in the automatic mode using oil with a maximum viscosity of 1500 SSU (323 cSt). A hose diameter equal to inlet/outlet port size is required to provide adequate oil supply to this unit. *Use of a smaller diameter line will restrict the flow, and will adversely affect the automatic operation of the unit.*

The inlet and outlet connections have been sized for maximum hose lengths of 20 feet. Use of longer hose lengths is possible under some conditions, but must be approved by the factory prior to installation. Use of a “quick disconnect” on the inlet line is not recommended, it can restrict flow to the unit in specific applications.

Note: It is important to verify that the hose being used for the inlet connection is vacuum-rated (100R4 rated) and that the hoses for both inlet and outlet are compatible with the fluid being used.

Oil is drawn into the unit by vacuum created by the dehydrator and is capable of pulling in oil with up to 8-ft. (2.4 m) of negative head. *For applications that exceed this please consult the factory as the Vac-U-Dry is capable of much higher negative head distances.*

When placing the dehydrator unit below the reservoir by more than 4-ft. (1.2m), a solenoid operated inlet shut off valve (Option Code ICV) is required. If not installed, the unit can overflow with oil when shut off.

2.4 Electrical Installation

2.3.1 Electrical Power Supply Connection
Attach a properly sized power cord to the unit. Use caution in considering placement, size and protection of power cord for safety.

Note: The Hy-Pro dehydrator is not supplied from the factory with a power cord, as there are many different codes and preferences in different areas of the world. Size the cord for the load stated in the specification sheet found as part of the manual. The power leads should be connected to the labeled terminal points located in the electrical control panel.

Note: It is important that the unit be grounded properly before operation.

2.4 Vacuum Pump Pre-Start
A lubricated vane dry seal vacuum pump has been selected for this vacuum dehydrator (sample p/n V**D**). The vacuum pump uses oil to lubricate the pump during operation. This oil is supplied from a reservoir located above the vacuum pump. The oil reservoir must be maintained at full capacity (approximately ¾ full on sight glass) or as near as possible for the vacuum pump to operate at optimum efficiency and avoid damage.

Prior to starting the unit it is important to inspect the vacuum pump for proper oil level, ¾ to full of sight glass. The recommended lubricant for this vacuum pump is AT0-2000. Change oil every 1000 hrs of service & exhaust filter # ATCF-1091 when needed.

3.0 Operating Instructions

3.1 Initial Set-up Instructions (Completed before startup)

1. Make sure all drain valves and vent lines are closed.

2. Connect inlet and outlet hoses to supply oil reservoir.

IMPORTANT: Line size should be >1" for 5 & 10 GPM (19 & 37 LPM) units for inlet and 1" (25.4mm) for outlet, with a maximum of 20' (6096mm) length.

For 15 & 25 GPM (56 & 94 LPM) units the line sizes should be 1" & 1.5" (25.4mm & 38.1mm) diameter, with a maximum of 20' (6096mm) length.

3. Open all inlet and outlet valves on the dehydrator and the oil supply reservoir.

4. Connect power supply cord to power source. The temperature reading in the heater controller will illuminate and have two readings (set point and actual), and five seconds may pass while automatic phase correction occurs before operation can begin. (*Caution: Power disconnect for the supply power should be located within a line of sight to the power supply source).*

5. Close all drain and check valves on the dehydrator (*Drain valves and connections are located at the bottom of the outlet filter; condensate tank and separate oil sample port valve are on top of the outlet oil filter).*

6. Your dehydrator is now ready to operate.

3.2 Vac-U-Dry Smart Relay Operating Instructions

To Start Unit With:

1. **No oil is visible in vacuum chamber sight glass**
   If no oil is visible in the sight-glass it is necessary to run the vacuum pump with the oil inlet control valve open until oil is visible. To do this, press and hold the START button until oil is visible in the sight-glass. After releasing the START button, the unit will continue with the normal startup sequence.

2. **Oil visible in the vacuum chamber sight glass**
   If oil is already visible in the sight-glass, press the START button once. The normal startup sequence will begin.

3. **Cold oil condition**
   Starting the Vac-U-Dry in a cold oil condition may require the opening of the re-circulating needle valve to achieve and maintain proper liquid levels or connecting to the auxiliary inlet / heater drain connection to avoid restriction through the ICV solenoid valve that can be encountered with high viscosity oils that are also cold.

4. **Vac-U-Dry in operating mode**
   Set temperature controller to desired temperature (max. 160℉ / 71℃). Close re-circulating valve as oil temperature and level rises.

During Operation:

Observe the vertical liquid level gauge located just below the air breather near the bottom of the vacuum chamber. Visually check the oil level while operating, it should normally run at about the half way mark in the gauge. *(If the oil level is low this could mean the inlet oil line is too small or the dispersal elements located in the vacuum chamber are becoming dirty,*

see troubleshooting guide). Note: When first starting the unit with cold oil it is common to see a "low level" in this sight glass. After the temperature has risen the oil level normally will rise to the half way mark.

NOTE: Upon initial startup the air bleed valve on the filter element housing will need to be opened after approximately an hour. Prepare to close it quickly before oil is released. This procedure only needs to be repeated when the filter element is changed.

To Stop unit:

1. **Controlled shut down**
   The Hy-Pro dehydrator should always be cooled down before shutting down. Pressing the STOP button once will initiate the automatic controlled shutdown sequence.

2. **Immediate shut down**
   The Un-controlled immediate stop option is not recommended under normal operating conditions.
   If circumstances require an immediate stop, the Un-controlled immediate stop sequence is as follows:

   1. Press STOP button 2 times.
   2. Everything turns off.

3. **Emergency stop**
   Push the emergency stop button

IMPORTANT: When stopping the unit, always set temperature control back to 32℉ / 0℃ before shutting down, or after an immediate or emergency stop.

Discharging oil from the unit

At times it may be necessary to operate the oil pump manually. After a normal shutdown sequence the procedure is as follows: (this is a manual operation, not automatic)

1. Press the STOP button for at least 10 seconds and hold it.
2. The oil pump will stay on as long as the button is held.
3. Release the STOP button when the vacuum tower is empty.

Function controls under normal operation

1. **To reset high temp limit**
   Press start button twice rapidly. See details about this in section 4.1.

2. **To actuate auto condensate drain**
   Systems with optional automatic condensate drains will drain the accumulated condensate automatically during normal operation of the dehydrator. It is possible on dehydrators with this feature to manually initiate the automatic drain sequence. The procedure is as follows, depending on the setup of your unit:

   1. During normal operation, press the Drain button.
   2. The automatic drain sequence will commence.

   OR

   1. During normal operation, press START 4 times quickly.
   2. The automatic drain sequence will commence.

Note: If the manual initiation of the automatic drain sequence is used during a controlled shut down sequence, the shut down sequence is aborted and the dehydrator will return to normal operation. Pressing STOP once more at this time will re-initiate the shutdown sequence.

4.1 Smart Relay Operation Details

4.2 Function Details

Set Temperature

Set desired operating temperature. Press the up or down arrow until the desired temperature set point is displayed on the temperature controller.

Note: The temperature controller has been programmed to prevent the heater setting to be raised manually above 180℉ (82℃). If this is not the case, do not exceed 180℉ (82℃) and contact the factory for instructions.

High Limit

The Hy-Pro dehydrator is equipped with an FM approved high temperature limit controller (high-limit). The high-limit is factory set at 180℉ / 82℃.
IMPORTANT: ATTEMPTING TO CHANGE THIS SETTING CAN RESULT IN EQUIPMENT DAMAGE OR FAILURE; DO NOT ATTEMPT TO CHANGE THIS SETTING.
If the high-limit set point is exceeded the following will occur:

1. The high-limit will disengage power from the heat control relays.
2. The yellow TEMPERATURE ALERT light will come on.
3. The dehydrator will continue to operate without heat.

It is possible that the rise in temperature that precipitated the high temperature condition was temporary and that the temperature has recovered or is recovering. After the temperature has dropped well below the high-limit setpoint, it is possible to reset the high-limit and allow the heaters to power up again.

The procedure is as follows:

1. Press START twice quickly (dehydrator will start if it's off at this time).
2. The high-limit will reengage power to the heat control relays.

Note: If the high-limit temperature controller setpoint is exceeded again, it may be necessary to correct a malfunction. Contact your Hy-Pro representative for service advice.

High Oil

The Hy-Pro dehydrator is equipped with a HIGH OIL warning light. If the oil level in the vacuum tower rises too high the following will occur:

1. HIGH OIL light comes on.
2. Heat is turned off.
3. Inlet Control Valve (ICV) is turned off.
4. If oil level drops, return to normal operation (skip steps 5, 6 & 7).
5. If oil level remains too high wait 30 seconds.
6. Immediate shutdown commences.

7. HIGH OIL light remains on.

Note: This might be a good time to manually run the oil pump as described in 3.2 in this manual. If this condition occurs again, contact your Hy-Pro representative for service advice.

High Condensate
The dehydrator is equipped with a HIGH CONDENSATE sensor. The HIGH CONDENSATE sensor being tripped could occur if the automatic condensate drain is malfunctioning or obstructed, if this is the case, consult the troubleshooting table or contact your Hy-Pro representative for service advice. If for any reason the condensate level rises too high the following will occur:

1. Immediate shutdown commences.
2. HIGH CONDENSATE light remains on.

Automatic Phase Correction
The dehydrator is equipped with an Automatic Phase Correction circuit that will operate the motors correctly regardless of the phase orientation of the main power connections brought to the control panel. There is no indication of the phase correction feature functioning other than all the motors turning in the correct direction. After power is supplied to the unit, it may take 5 seconds for the automatic phase correction to finish working before the unit can begin operating.

Normal Automatic Sequences
The following operations happen automatically at startup or shutdown and are provided for reference in diagnosing problems.

Normal Automatic Startup (after START button is pressed):

1. Green SYSTEM RUNNING light illuminates.
2. Vacuum Pump activates.
3. A wait of 30 seconds occurs to build vacuum.
4. Inlet Control Valve (ICV) opens to allow oil to enter the system.
5. 30 second pause to allow oil to begin filling vacuum tower.
6. Green OIL PUMP light illuminates.
7. Oil pump activates.

Normal Automatic Shutdown (after STOP button is pressed):

1. SYSTEM RUNNING light begins blinking.
2. Heating elements turn off to allow system to cool.
3. Approximately 10 minutes elapses while temperature drops.
4. Temperature drops to 135℉ / 57℃.
5. ICV is shut off.
6. Vacuum pump is shut off.
7. Oil pump runs until flow switch is activated.
8. Oil pump is shut off.
9. Green SYSTEM RUNNING light is shut off.

4.2 Optional Features

A = Auto-Condensate Water Drain (Supplied as a standard unless unselected)
This feature is necessary for continuous unattended operation where the VUD can discharge removed water captured as condensate without stopping the machine to break vacuum and discharge the water. During normal operation both upper and lower condensate tanks are under vacuum and the water will collects in the lower tank. Water in the lower tank will rise until it actuates the limit switch. The lower tank (full of water) is isolated from the upper tank and system vacuum by energizing a series of solenoid valves that allows the lower tank to drain to atmosphere. The sequence is controlled by a timer and once complete the solenoid valves revert back to the normal position and the lower tank collects the water.

D = Dirty Filter
Systems with dirty filter differential pressure gauge or pop-up indicator may have a dirty filter indicating light on the control panel. When the sensor determines the filter needs to be replaced, the HIGH OIL/DIRTY FILTER lamp will illuminate.

E = Vacuum Pump Carbon Exhaust Filter
For applications where foul smells are emitted from the vacuum pump exhaust the carbon exhaust filter can effectively help improve exhaust air quality. This option is not used to remove volatiles with 100% efficiency.

F = Vacuum Chamber Foaming Sensor
Some fluids can have a tendency to foam in the vacuum chamber especially in the presence of high concentrations of water. The foam sensor option features an emitter and receiver where a light beam is emitted across the top of the vacuum chamber through glass plugs. If the beam is broken by foam a normally closed solenoid valve will be pulsed allowing air into the vacuum chamber which will drop the vacuum level temporarily and knock the foam down. If the foam knock down valve is opening there will be rapid clicking noises coming from the top of the vacuum chamber. This indicates that there is a foaming condition that might require an adjustment to temperature or vacuum settings.

J = Individual Heater Selector Switch (Keyed)
For units with multiple heating elements (example: 48Kw = 4 x 12Kw heaters) a keyed switch can be used to control how many heaters are allowed to energize. For larger units this is useful where the available power supply might not have sufficient AMPS to run the unit at full heating capacity. On dehydrators equipped with a selectable power setting for the heaters, a keyed selector switch is provided. The label on the switch varies and should be self-explanatory. The lower KW number represents low power and the higher KW denotes high power setting. Some units will have LO and HI instead of a KW value listed. Other Vac-U-Dry units have up to four power selector options, including 16KW, 24KW, 32KW, and OFF. To adjust the power to the heaters, turn the selector switch to select the desired KW value, or to the “off” position for none at all. By removing the key at any time the operator can effectively “lock” the unit’s power at that setting. The KW value cannot be changed again until the key is re-inserted.

K = Sight Flow Indicator (Wheel Type)
Installed on the discharge line the sight flow indicator provides a visual indication that there is some amount of flow leaving the VUD machine but does not provide a flow rate as a flow meter

would. An experienced operator can make assumption on relative flow rate based on how rapidly the wheel is turning.

M = Flow Meter
Installed on the discharge line the flow meter visual indication of flow rate of oil leaving the VUD This is useful when using the re-circulation line to achieve target operating temperature in the VUD, processing high viscosity fluids or operating a VUD with variable frequency drive controls.

R = Automatic Phase Detection & Reversal (Supplied standard unless deselected)
For 3 phase power machines the phases are automatically detected and if need to be reversed for proper operation the phases are automatically reversed in the control panel. This avoids the need for electrician to detect phases and check rotation then change the wiring if it is not correct. This is very useful for VUD that will be moved to various systems.

V = ICV (inlet control valve) Normally Closed Solenoid Valve
The ICV valve is installed on the primary inlet suction line and is normally closed when the VUD is off. This prevents the VUD from being flooded by a reservoir that places a net positive suction head on the VUD inlet / suction line. A net positive suction head can be created by elevated reservoir location or oil level.

W = Water in Oil Percent Saturation Sensor and Display
The sensor detects the relative humidity of water in the oil and reports that level the relative humidity of the oil also know as percent saturation. If there is free or emulsified water in the oil that means that the saturation point of water in the oil has been exceeded and 100% will be displayed. Once all free and emulsified water has been removed and the dissolved water is being removed the display will start to display values that are less than 100%. This is useful when conditioning multiple reservoirs and determining when the oil has been removed to the desired level.

Y = Variable Frequency Motor Drive for Discharge Pump Speed Control (VFD)
If the VFD option is selected the motor speed for the oil discharge pump is varied based on the oil level in the vacuum chamber instead of the standard design that features a float valve that meters flow into the vacuum chamber and a fixed displacement gear pump driven by a motor at a fixed rpm rate. The VFD option is useful for VUD that will be used to condition many different fluids including some high viscosity fluids such as gear lube up to ISOVG1000. The VFD option makes start-up easier and prevents unit trip that could occur when processing high viscosity cold oils.

Dual Vacuum Pumps
Units with water sealed and standard air sealed vacuum pump types will have a key switch to select one or the other vacuum pump.

If the “water seal” vacuum pump has been selected, you must be sure that fresh water is hooked to the inlet of the water filter. This water supply should maintain 40 psi at the filter inlet. Insure once this pump is started that water is being exhausted from the drain line. There is a compound gauge located on the water inlet of the vacuum pump. When the pump is in operation, this gauge should read “0”. If this gauge is reading either a vacuum or pressure it can be adjusted by turning the inlet water gate valve one way or the other until “0” on the gauge has been obtained, at this point the pump is in its optimum setting.

The water filter on the inlet line is equipped with a visual “pop up” indicator to show when the element needs replacing. Please don’t overlook this point of service, as this water is in the vacuum pump and condenser.

Note: The key cannot be removed from the switch when in the water sealed vacuum pump position.

4.3 Button Function Guide

Button Function Guide

For Smart Relay VUD

Button and manipulation	**Operation**
START, once	If oil is visible in sight-glass, startup sequence begins
START, hold	If oil is not visible in sight-glass, vacuum pump runs until startup sequence begins
STOP, once	Normal automatic shutdown sequence begins
STOP, twice	Immediate stop sequence begins
STOP, press and hold (at least 10sec)	Operates the oil pump manually, pump runs until STOP is released
START, twice quickly	Reset high-limit to reengage power after high-temperature fault
START, four times quickly or DRAIN, once	If Automatic Condensate Drain is equipped, will manually drain condensate

5.1 Safety Instructions

The Hy-Pro dehydrator unit has been examined for safety. The hazards have been identified and adequate protection provided when these instructions are followed.

5.2 Precautions – Oil contaminated with hazardous materials

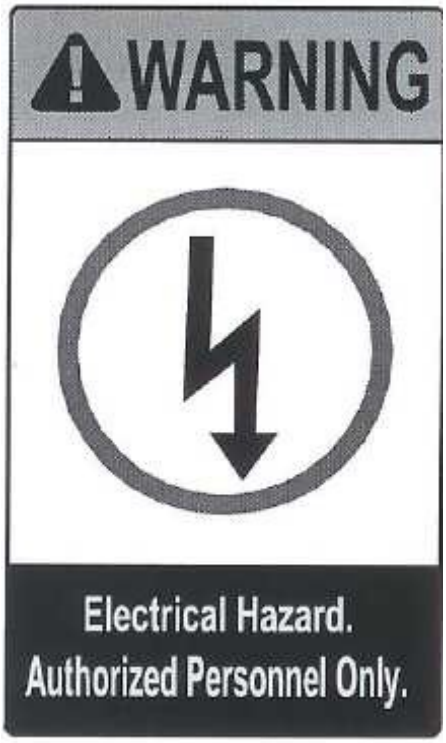
The Hy-Pro dehydrator *should not be used on liquids with a flash point below 200°F (93℃).* If there is any possibility that the oil being purified is contaminated with a solvent or materials which could be considered hazardous, either with toxicant or flammable explosives, the purifier should not be used unless precautions are taken to vent the vapors in a safe manner according to local, state and federal codes and the flash point of the liquid is above 200℉ (93℃). *Of course, normal safety practices and common sense should be used at all times when operating this unit.* This caution is necessary to prevent the possibility of fire, explosion, or toxic injury to persons and property.

NOTE: THE HY-PRO UNIT SHOULD NEVER BE USED TO REMOVE VOLITILES SUCH AS; DIESEL FUEL, GASOLINE, OTHER PRODUCTS EXPLOSIVE IN NATURE, TOXIC OR WITH LOW FLASH POINTS. FOR CLARIFICATION, CONSULT YOUR FACTORY REPRESENTATIVE FOR DETAILED INFORMATION.

5.2 Safety Labels

Danger
High Voltage
Turn Power Off
Before Servicing

The Hy-Pro dehydrator has been manufactured to use 460V~60Hz input electrical power. Supply power to the dehydrator should be disconnected before the electrical panel door is opened.



Warning
Electrical Hazard
Authorized Personnel Only

If the power supply needs disconnected, *ONLY* authorized and trained personnel should open the electrical cabinet to attempt services.

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CAUTION
Hot Surface
Do Not Touch

The normal operating temperature for the heater is 150℉ (66℃) and the housing can be this hot. While not normally hot enough to burn, it is uncomfortable and should be avoided.

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6.0 Trouble Shooting

PROBLEM	CAUSE	SOLUTION
Unit fails to start when start button is pushed.	Improper or no external power connection, low voltage, low amp service or power supply cord sizing	Check input power. Does it match machine specifications? Is the power cord sized correctly? Make changes as required.
	Circuit breaker or fuse tripped on main power disconnect or drive motor contactors	Reset circuit breakers or replace fuses. If circuit breaker/fuse trips again, check motor for failure. Check supply power line voltage for match to units design voltage.
	Control voltage power failure	• Check circuit breaker/fuse on control voltage transformer. Reset or replace (fuse) if necessary. • If primary circuit breaker/fuse trips again, transformer has probably failed. Test continuity. • If secondary breaker/fuses trips again, problem is most likely low voltage in the control circuit. Check components and control power circuit for problems.

PROBLEM	CAUSE	SOLUTION
Unit fails to run on automatic	Inlet valve partially or fully closed	Position inlet valve to full open. Valve should be “full port” type valve to reduce restrictions and should be sized as large as inlet hose.
	Inlet hose improperly sized or use of “quick disconnect.” Non-vacuum service hose or collapsed hose. Hose too long. Reservoir valve closed.	See specification sheet and change hose if necessary. Replace “quick disconnect” with oversized unit (1.5 x inlet hose diameter). Open Reservoir valve.
	Cold or high viscosity oil	Push and hold start button to operate machine manually, until vacuum gauge reads 25in/HG (635mm/hg), unit should now run on automatic. If not, check specifications for maximum oil viscosity (1500 SSU at 150℉, 323 cSt at 66℃)
	Coalescing dispersal elements	• Use flashlight to look inside

	are plugged from dirty oil	vacuum chamber through Plexiglas lid. While pushing the start button, look for oil passing through dispersal elements and cascading down sides. If no oil is seen running down elements and into the bottom of the chamber, then replace elements (D Model Code) by removing Plexiglas lid and removing hold down bolts for each element. • If elements are plugged, this indicates very contaminated fluid (they should last about 4320 hours). Replace "coalescing" (Model Code D) dispersal elements with "packed metal" (Model Code P) elements available from the factory.
	Low vacuum level, should be greater than 22 in/HG (558 mm HG) @ Sea Level.	• Check vacuum pump for proper operation and maintenance. • Check for leaks by shutting off oil inlet valve, close air bleed valve to vacuum chamber. Run unit manually until vacuum reaches 25"/HG, stop unit. If vacuum pressure decreases within 30 seconds, then a leak is present. The most likely causes are the Plexiglas lid seal, inlet hose or leaking fittings on the inlet hose. • If vacuum holds with leak test but will not reach 25"/HG (635mm/hg) then either a problem exists with the vacuum relief or the vacuum pump is worn. Adjust or replace parts as required.
	Inlet hose obstructed or pinched	Straighten or replace hose.
	Restriction in outlet hose	Repair or replace so that there are no restrictions. Check

		rating on outlet hose, it must be compatible with fluid being used.
	Unit is removing high levels of water, reducing the vacuum level in the chamber.	Allow the machine to continue running. As the high water level is reduced, the unit will return to the normal operating vacuum level. Do no screw in the air intake valve.

PROBLEM	CAUSE	SOLUTION
High oil level light	Outlet hose improperly sized	See Specification Sheet for proper size. Replace if necessary.
	Improper unit installation, negative head too high for unit	Check specification sheet. Maximum negative head is 8 ft. (2438mm). Increase inlet hose diameter and shorten hose length to reduce line pressure loss. Preheat oil to reduce viscosity.
	Inlet Control Valve solenoid stuck open, internal float valve broken or sticking.	Verify that solenoid is moving freely and that float valve is moving freely and not broken.
	Unit has set for a long period of time, creating oil buildup, especially if manual inlet valve is left open.	• Press start to run oil out of motor (see 3.2), if condition persists, consult the factory. • If inlet control valve is non-existent or stuck open, install, repair, or replace. • Verify that reservoir is not above recommended height.
	Float control valve stuck or has a damaged seal or float.	Repair or replace, consult factory if condition persists.

PROBLEM	CAUSE	SOLUTION
Oil in Condensate tank (Foaming)	Foaming oil in vacuum tower	Some oils will foam under specific operating conditions. If foam is visible in the vacuum tower, lower vacuum level with air bleed valve until foam disappears. This should occur at about 23 in/HG (584mm/hg).
	Oil is being overheated	Decrease the heat of the oil entering the system.

PROBLEM	CAUSE	SOLUTION
High level condensate light	Condensate tank full, automatic condensate drain malfunctioning	Stop unit, open manual drain valve at bottom of tank until drained, close valve and restart unit, if problem persists, consult factory for advice.
	Float switch faulty	Check for stuck or broken switch. Remove condensate tank cover to repair or replace.

PROBLEM	CAUSE	SOLUTION
Oil not achieving temperature set for operation	Improper heater size	Heater capacity too low for fluid volume. Consult factory (heating capacity can be increased.)
	Oil cooler on system reservoir is set lower than operating temperature of unit	• If possible, raise the temperature of the reservoir • Add additional heating capacity to the unit to provide single pass heating • Adjust "Variable Flow three-way valve" on unit to divert partial flow back to inlet of the unit to increase oil contact with heater.
	Heater failure	Check continuity on each leg of heater element(s). Consult factory to replace if necessary.
	Thermocouple failure (temperature will not reach set point and will vary by more than 4℉)	Replace with identical type. The controller and thermocouples may cause malfunction of the heating circuit. See spare parts list in this manual for correct part number and description. If problem persists, consult factory for advice.
	Temperature controller program has been changed or has failed	• Check program by referring to setup sheet in this manual. • Replace controller. (Normal failure mode is no display in LED window during operation). Consult factory for replacement controller.
	Heater circuit breaker/fuse is tripped	Reset circuit breaker or replace fuses, check continuity

		of heater(s) for short. If no short is found, check circuit breaker or fuses for defects or weakness.
	Temperature rose above high temperature setpoint	Reset high temperature setpoint, press start button twice (see 4.1).
	Temperature never set	Set desired temperature with “up” arrow on controller.

PROBLEM	CAUSE	SOLUTION
Vacuum level varies without manual adjustment, or runs high	Barometric pressure change from weather system	Adjusting the air bleed inlet valve will compensate for changes in Barometric pressure.
	Sudden introduction of water into oil during normal operation	Vacuum will “seek” its own level when operating with high water content. As water is removed from the oil the vacuum will automatically increase as oil becomes drier.
	Vacuum gauge malfunction or broken	Vacuum gauges are sensitive to vibration and shock. They should be replaced or tested annually to prevent false readings.
	Vacuum leak in system	• Check for leaks by shutting off oil inlet valve and air bleed inlet valve. Operate unit manually, when vacuum reaches 25”/HG shut off unit. If vacuum holds for less than 30 sec, a leak is present. • If leak is present, check the Plexiglas lid seal, inlet hose and fittings.
	Filter element on air inlet clogged or seated improperly	Replace or adjust filter element
	If high vacuum persists	Air inlet filter element is clogged, or inlet valve is malfunctioning.
	Operation at high altitudes above sea level	Consult the factory to determine a better vacuum setting for the unit.

PROBLEM	CAUSE	SOLUTION
Vacuum pump oil (DS Model Code) running hot	Improper or bad oil, incorrect amount.	• Check oil. Using improper oil can damage the vacuum pump prematurely. • Fill with correct amount of oil (do not fill above top of bowel stem) ¾ of sight glass to full. • Change oil every 350-450 hours, use ATO-2000-01

PROBLEM	CAUSE	SOLUTION
Reduced air flow out of air cooled condenser	Dust and debris in coils	Clean with high pressure air.
	Fan motor inoperative	• Check power lead from electrical panel. • Check motor for failure. • Check 115V power transformer for failure.
	Improper motor maintenance on cooled condenser	If failure is noticed, consult factory for replacement.

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7.0 Maintenance

7.1 Maintenance Schedule – *Maximum suggested service intervals*

ITEM	AS REQUIRED	1500 HOURS
Change vacuum chamber dispersal element ("D" Model Code Only)	Yes (change if low flow condition persists or changing oil family)	Yes
Change outlet oil filter element	Yes (change on DP gauge indication or when changing oil type)	-
Change vacuum chamber air bleed breather element	Yes	No (3000 hours)
Change vacuum pump outlet " spin-on" filter element	Yes	No (2160 hours)
Change vacuum pump oil	Yes	Yes

7.2 Vacuum Chamber Dispersal Element: (D Option)

The dispersal element function is to maximize the surface area of the oil exposed to the vacuum by creating droplets as the oil passes through the element. The elements are rated at 10-micron nominal and are not intended to act as a method of "pre-filtering" the oil as it enters the vacuum chamber. However, by design, the dispersal elements can be adversely affected by heavily contaminated fluid entering the vacuum chamber; or they can be plugged over a period of time even under fairly clean oil applications. If the oil level in the sight glass is continually high, it is likely that the dispersal elements need changing. Under normal conditions the frequency of element change can be at 1200 hour intervals (with continuous operation applications) or longer depending on fluid cleanliness. **When closing the vacuum chamber do not tighten the lid hold down bolts more than 2 foot pounds. Over tightening will result in cracked cover under vacuum.**

WARNING: The HPDEL22 option is incompatible with fluids containing phosphate-esters (fyrquel) and if the working fluid contains phosphate-esters the HPWEL22 elements must be used.

The dispersal element (HPDEL22) is ideal for fluid viscosities up to 500 SUS (100 cSt). If the viscosity exceeds 500 SUS (100 cSt) the vacuum chamber element should be changed to the packed element (HPPEL22).

Due to the design of the element, it is suggested that the elements be replaced at least every 4320 hours to prevent media breakdown from heat, water and pressure, even when a decrease in performance is not noted.

7.2.1 Vacuum Chamber Dispersal Element: (Option P)

The “P” or packed element is used when heavily contaminated oil or very high viscosity oil is used in the dehydrator. By design the “packed” elements are not affected by these types of conditions and do not require replacing on a regular basis, as do the “D” option dispersal elements because they can be cleaned. The packed element (HPPEL22) is ideal for fluid viscosities greater than 500 SUS (100 cSt) up to 5000 SUS (1098 cSt).

Note: The Model Code “P” packed elements are not as efficient in the dehydration process and may extend water removal time in some cases where very low water levels are present. **When closing the vacuum chamber do not tighten the lid hold down bolts more than 2 foot pounds. Over tightening will result in cracked cover under vacuum.**

7.2.2 Vacuum Chamber Dispersal Element: (Option W)

The “W” or pleated stainless element is used when low viscosity photphate ester or mid range high viscosity oil (ISO VG 150 cSt ~ 220 cSt) is used in the dehydrator. By design the “pleated stainless” elements are not affected by these types of conditions and do not require replacing on a regular basis, as do the “D” option dispersal elements because they can be cleaned. The HPWEL22) is ideal for fluid viscosities greater than 500 SUS (100 cSt) up to 1600 SUS (320 cSt). If the viscosity exceeds 750 SUS (150 cSt) the vacuum chamber element should be changed to the pleated stainless (HPWEL22) or packed element (HPPEL22).

7.3 Outlet Oil Filter Element:

The outlet oil filter is equipped with a differential pressure indicator to alert the user when the element is ready to be changed. This indicator is set approximately 2 PSI (103mm/hg) lower than the bypass valve in the filter assembly to allow the user to shut the unit down prior to the filter entering a “bypass” state. If the element is not changed at indication the unit will continue to operate but the filter will be in “bypass”. Element change frequency can and will vary with every application and cannot be predicated effectively. However, the filter has been oversized by approximately 6 times rated flow to maximize the life of the element under normal operating conditions.
It is suggested that the element be changed every 2500 hours even if no indication is shown during that time.

7.4 Vacuum Chamber Air Bleed Breather Element:

Metered outside air is used to control the vacuum pressure inside the vacuum chamber. This air is cleaned using a filter/breather to remove particulate from the air as it enters the vacuum chamber. The element can be plugged within a very short period of time if large amounts of air-borne contamination are present. Under normal operating conditions and continuous operation, the air breather element will last approximately 3-5 months.
It is suggested that the breather be changed at least every 2160 hours.

7.4.1 Vacuum Chamber Air Bleed Desiccant Breather (Hy-Dry)

The Hy-Dry Desiccant Air Breather may be used at the vacuum chamber air bleed inlet. This feature prevents moist air from entering the vacuum chamber from the ambient air outside the

dehydrator. This element is normally blue in color and will change to pink or white to indicate need of replacement. For more information refer to the Hy-Pro breather literature sheet in the component literature section of this manual. The installation of a desiccant breather is very useful in transformer oil applications where reducing contaminant levels to below 30 PPM is desired (transformer or insulating oil applications).

7.5 Vacuum Pump Outlet Exhaust Filter:
The vacuum pump uses an oil separator / exhaust air filter with green to red condition gauge element to filter the exhaust air leaving the pump. The element is located in the vacuum pump. To service this element remove the bolts on the pump end cap. The element is unscrewed from the post in the center of the filter. Discard and replace with a new element. Use the green to red indicator to determine when the filter element needs replaced, or replace on the suggested interval of 2160 hours.

7.6 Vacuum Pump Oil Spin-On Filter:
The vacuum pump oil filter is positioned at the bottom rear of the pump housing. Suggested replacement interval: 2160 hours. It is recommended to change the oil every 1000 hours of operation (part number ATO2000) and the spin-on filter (see spare parts list).

7.7 Vacuum Pump Carbon Exhaust Filter: (Option E)
The vacuum pump oil filter is positioned at the bottom rear of the pump housing. Suggested replacement interval: 350 to 450 hours.

7.8 Condensate Tank Cleaning:
The condensate tanks should be cleaned every 350-450 hours of operation. To clean the tanks, remove the Plexiglas lid and wash the tank. When replacing the Plexiglas cover, be sure to note which side of the cover has a Hy-Pro symbol, as that side should be facing out. This is absolutely necessary because the inside of the Plexiglas lid has been chemically treated to prevent any reaction with the condensate.

7.9 Vacuum Pump Oil Level Sight Glass:
The oil level sight glass on the vacuum pump can become dirty with time. To insure that the gauge is accurately displaying the oil level in the vacuum pump it is suggested that the sight gauge be removed and cleaned every 1000 hours.

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8.1 Frequently Asked Questions

1. **Q:** How do I know when to change the air inlet filter element?
   A: If the vacuum pressure is too high, this could mean that the air inlet filter element is clogged and needs replaced. Otherwise, this filter element should be changed at every 450 hours.

2. **Q:** How do I know when to change the oil outlet filter element?
   A: The dirty filter element indicator should signal when the outlet oil element needs to be changed, otherwise, replace it every 450 hours.

3. **Q:** How do I know when to change the dispersal elements?
   A: If the low oil indicator repeatedly displays a low oil level when the oil is not in cold condition, then it is highly possible that the dispersal elements are clogged and need replaced. Also, if changing oils that the Vac-U-Dry will be handling, it is suggested that the dispersal elements be changed.
   If the dispersal elements are Model Code P, then they do not need to be replaced and can be cleaned and placed back in the unit.

4. **Q:** Why doesn't the unit's vacuum pull in oil fast enough?
   A: The inlet line from the reservoir is most likely greater in length or smaller in diameter than recommended. The recommended maximum length is 20'. Check the manual for inlet line sizes (**3.1** Number 2). Other possibilities may be that the oil is not within the workable viscosity range, that the negative head is over the recommended 8 ft (2.4m), the dispersal elements are clogged (see Question 2), or that a quick disconnect is decreasing the flow of the inlet line.

5. **Q:** How much power is this unit going to use?
   A: Look in the manual or on the inside of the door of the Smart Relay Panel on the front of the unit for the voltage and amp usage. Overall usage could depend on the heater selection, if your unit is equipped with heater selection.

6. **Q:** How often will I have to perform maintenance on this unit?
   A: Scheduled maintenance and inspection should be at every 500~1000 hours of operating time.

7. **Q:** Does the vacuum pump oil need to be changed, if so, when?
   A: The vacuum pump oil should be checked weekly and kept near full, and should be changed every 1000 hours, or upon oil discoloration.

8. **Q:** Why do I have 500 PPM of water in the fluid running through the unit but don't see any water in the condensing tower?
   A: Less than 500 PPM of water is very difficult to see because air has a natural amount of water absorption ability (humidity), and thus it is still being removed but may not be visible to the operator.

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9. **Q:** How full should I keep the vacuum pump oil?
   A: The vacuum pump oil should be at least to the ¾ level in the sight glass, though it is highly recommended that the sight glass be kept nearly full for optimum efficiency and longevity of the pump. The sight glass can become discolored and improperly marked, which will indicate an incorrect oil level. To insure that the vacuum pump oil level remains accurate, a cleaning of the sight glass is recommended during the regular 1000 hour service interval.

10. **Q:** Can the Smart Relay Panel be damaged by a power surge or a malfunction in the breaker?
    A: No, the Smart Relay Panel is protected by fuses, and cannot be damaged by a power surge or a malfunctioning breaker, though should these conditions occur, blown fuses will need to be replaced.

11. **Q:** I have switched to packed dispersal elements (Model Code P), why are they still becoming plugged?
    A: Packed Tower elements can plug eventually when exposed to large or heavy particulate debris which collects on the inside of the perforated tube. The elements can be removed from the tower, turned upside-down and pressure washed inside and out to clear particulate build-up.

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Warranty

Hy-Pro Filtration supplied equipment is warranted to be free from defective materials and workmanship for a period of one year from the date of shipment when used within the normal working parameters for which the equipment was designed. Hy-Pro Filtration assumes no responsibility for unauthorized installation of any added components, removal or repair of originally installed components or alterations or rewiring of originally supplied equipment. Any such changes without written instructions or prior approval from Hy-Pro Filtration will void all warranties. If any Hy-Pro Filtration supplied equipment does not perform as warranted, it will be repaired or replaced on a no-charge basis by Hy-Pro Filtration with the Purchaser initially bearing the cost of shipping to a Hy-Pro Filtration manufacturing facility.

This warranty does not apply to parts, which through normal use require replacement during the warranty period. Hy-Pro Filtration liability under this warranty shall be limited to repair or replacement. In no event however will Hy-Pro Filtration be liable for any labor or consequential damages. This warranty shall not apply to any assembly or component part of the equipment which has been furnished by Purchaser

Except for the express warranty set forth above, Hy-Pro Filtration hereby disclaims all warranties, express or implied, to Purchaser, including but not limited to, warranty of fitness for a particular purpose and warranty of merchantability. Hy-Pro Filtration shall not be liable for any incidental or consequential damages which might arise out of the use of this property.

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Material Return & Warranty Authorization Policy

Any material returned to the factory for warranty credit or replacement must be accompanied by a completed RGA (Return Goods Authorization) form. To complete the form you must contact the factory for a RGA number, which will be used to track the material sent to the factory.

All shipments must be sent to the factory freight prepaid, unless otherwise approved, to the appropriate address (confirm return location with customer service):

Hy-Pro Filtration
6810 Layton Road
Anderson, IN 46011

Hy-Pro Filtration West
1704 64th Ave Suite B
Vancouver, WA 98661

In the case of multiple item returns, all must be tagged with possible causes of failure. Please mark the outside of the shipping carton with the RGA number.

Return Disposition: Stock Items

1. Any items returned must be in unused condition unless otherwise authorized.
2. If items are returned for customer order error a restocking charge will be applied.
3. If items are returned for a Hy-Pro error a full credit will be issued.
4. Credit will not be issued on items which are no longer in specification with current design or were manufactured more than 12 months prior to the return date. Hy-Pro will determine if the items are suitable for return.

Return Disposition: Manufactured Items

1. Upon request a warranty claim form will be sent to the customer.
2. If the returned item has been determined to have a manufacturing defect and not suitable for repair a replacement part will be supplied at no cost to the customer.
3. If the returned item has been determined to have a manufacturing defect and is suitable for repair the item will be repaired or replaced at the discretion of the factory at no cost to the customer.
4. If the item has been determined not to have a manufacturing defect and is suitable for repair the customer will be sent a disposition report approval request to replace, repair, or return the part at the customer's expense.
5. If the item has been determined not to have a manufacturing defect and is not suitable for repair the customer will be sent a disposition report and asked for approval to replace or return the part at the customer's expense.

Note: All correspondence must reference the RGA# to ensure proper tracking return or claim.

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RGA # _____

This form must accompany any items being returned to Hy-Pro Filtration.

Customer Contact: _____ Position: _____

Company Name: _____

Customer Address: _____

_____

_____

Machine Part No.: _____ Serial No.: _____

Part No Returned (Description): _____

Part No Returned (Description): _____

Describe Machine Application (Use) and cause of failure:_____

_____

_____

_____

For Hy-Pro Internal Use Only

Hy-Pro Contact: _____ Customer Contact: _____

Date Form Completed: _____ Date Item Received: _____

Received By: _____ Warranty Approved: _____ Yes _____No

Warranty Approved By: _____ Date of Approval: _____

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HY-PRO FILTRATION

VUD TEST REPORT

MODEL #	**V15D46D3MV24A-ARTU**
CUSTOMER	**RELIABILITY EUQIPMENT**
JOB #	**20170011**
DATE	**3/20/2015**

OIL PUMP & MOTOR DATA.

MOTOR CAT. #	**CEM3614T**				
MOTOR S/N #	**F1501210684**				
RPM	**1175**	FRAME	**184TC**	VOLTAGE	**460**
HZ.	**60**	AMPS	**3.5**		
OIL PUMP P/N#	**GMC1 1/2 GF3-B**				
OIL PUMP S/N #	**1572551**				

VACUUM PUMP & MOTOR DATA.

MODEL #	**00158ES3E56C-S**				
MOTOR S/N #	**TE01C0X0X0000300646**				
RPM	**1750**	FRAME	**56HC**	VOLTAGE	**460**
HZ.	**60**	AMPS	**2.23**		
VACUUM PUMP P/N	**L-25**				
VACUUM PUMP S/N	**N140813803**				

CONDENSOR MOTOR DATA

MOTOR CAT#	**34K73W312**				
MOTOR S/N	**W1409184802**				
RPM	**1700**	FRAME	**48**	VOLTAGE	**115**
Hz	**60**	AMPS	**1.2**		

TEST PARAMETERS

TEST VOLTAGE	**483**		
TEST HERTZ	**60**		
TEST OIL	**TURBINE 46**		
STARTING TEMP.	**60**		
TEST TEMP.	**150**		
WATER CONTENT	**NA**		
WATER REMOVAL	**NA**		
FINAL COUNT	**NA**		
REMOVAL TIME	**NA**		
VACUUM SETTING	**25**		
RATED FLA.	**38**		
TESTED AMPS	**32.58**		
VAC.PUMP FLA	**2.2**		
OIL PUMP FLA	**2.91**		
HEATER 1 FLA.	**15.07**	**14.28**	**14.78**
HEATER 2 FLA	**15.07**	**14.28**	**14.78**
HEATER 3 FLA	**NA**		
HEATER 4 FLA	**NA**		
HEATER FLA TOTAL	**30.14**		
RELIEF SETTING	**80 PSI**		
OUTLET FLOW RATE	**16 GPM**		
OVERTEMP SET	**180 DEG**		
RUNNING PSI	**10 PSI**		

OPTIONS CHECK

AUTO DRAIN	**X**	DISCHARGE AMT.	**4 GAL.**
DISCHARGE TIME	**1:40**	SET TIME	**2:10**
FOAM SENSORS	**NA**		
SIGHT OIL LEVEL	**0.75**		
PHASE REVERSAL CHECK	**X**		
HEATER CONTROLLER LOCKED	**X**		
DP INDICATOR LIGHT	**NA**		
25" VACUUM HOLD / 3 MIN.	**X**		
RELAY PROGRAM BACKED UP / CHIP IN JOB FOLDER			**X**
PANEL JOB #	**2015059**		
TESTED BY:	**JD**		
TEST DATE	**3/20/2015**		

COMMENTS:	TRANSFORMER 1.61 AMPS

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Machine Specifications

V15D46D3MV24A-ARTU
20170011

INSTALLATION REQUIREMENTS	*DESCRIPTION*
INPUT VOLTAGE	460 VAC
DESIGNED FLA (full load AMPS)	38 Rated (32.58 tested @ 24 Kw)
INLET CONNECTION SIZE	1 1/2” MJIC
OUTLET CONNECTION SIZE	1” MJIC
WATER INLET CONNECTION SIZE	N/A
HEATER SIZE	24 KW (2 x 12 KW)
MECHANICAL OPERATING SPECIFICATIONS	*DESCRIPTION*
FLOW RATE	15 GPM
DESIGN DISCHARGE PRESSURE	10 PSI
MAXIMUM DISCHARGE PRESSURE	85 PSI
MAXIMUM VACUUM SETTING	25 IN Hg
MINIMUM VACUUM SETTING	21 IN Hg
OPTIMUM / NORMAL VACUUM SETTING	24.5 IN Hg
NORMAL HEATER SET POINT SETTING	150 F
NOISE LEVEL AT STD OPERATING CONDITIONS	N/A
MAXIMUM OIL VISCOSITY	500 SUS use HPDEL22. (For Higher Viscosity use HPPEL22 metallic packed style dispersal elements)
SEAL MATERIAL	Viton mechanical, Viton lid seals

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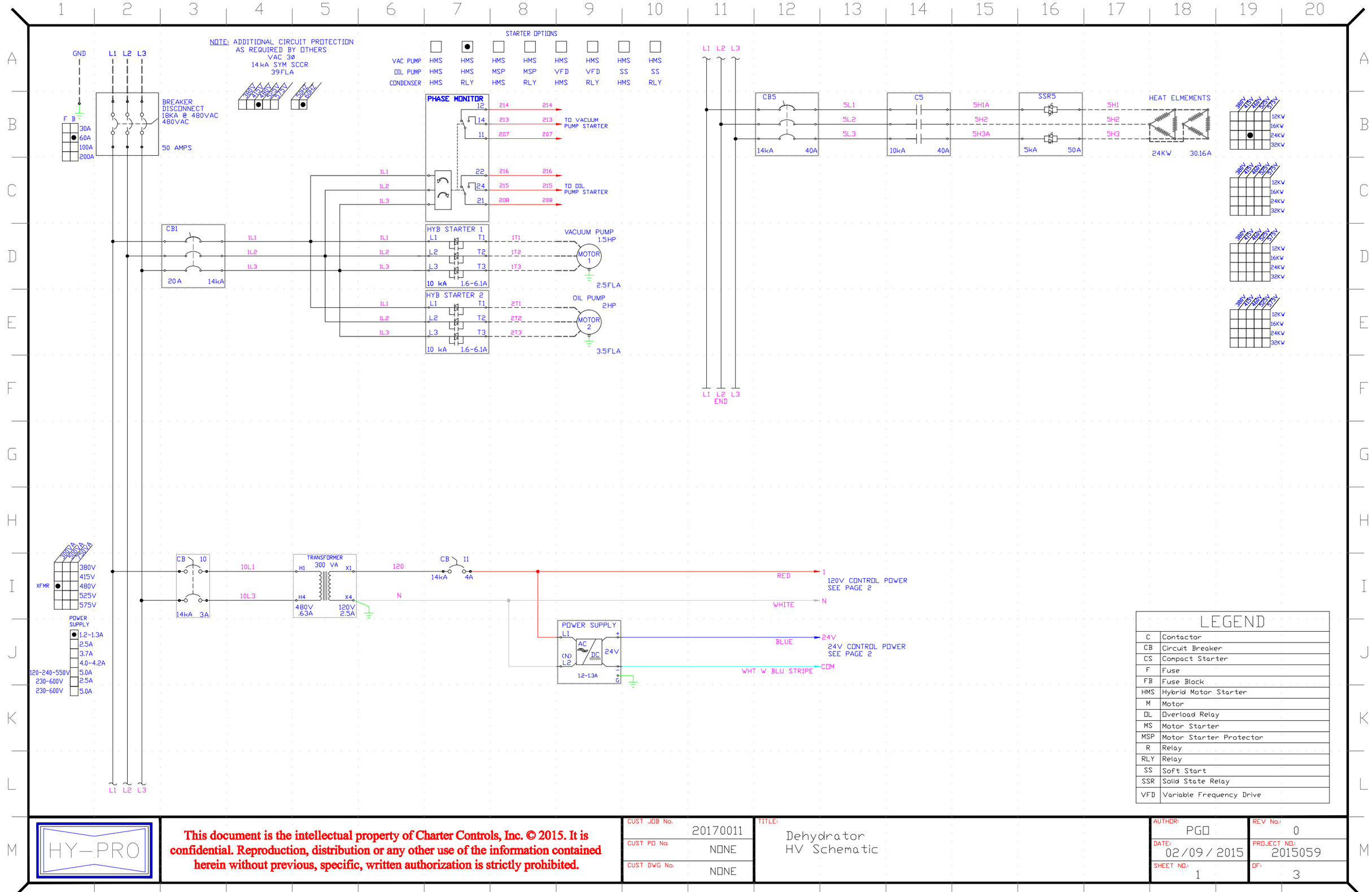
Recommended Spares List

V15D46D3MV24A-ARTU
20170011

PART NUMBER x (Qty)	*DESCRIPTION*
LIDCT8 x (1 ea)	Condensate Tank Lid
HPDEL-22 x (1 set)	Vacuum Chamber Dispersal Elements
HP107L36-xM x (1 ea)	Particulate Filter Element
V6EPB-B-S-6-0 x (1 ea.)	Flow Switch
SKVC3 x (1 set)	Chamber lid seals for condensate tanks and vacuum chamber
TTW00223 x (1 ea)	Thermal Couple
8210G22/120 x (1 ea)	Inlet Control Solenoid
LIDVC3 LID x (1 ea)	Vacuum Chamber Lid
LIDCT6 x (1 ea)	Condensate Tank Lid
VPOILx (1 qt.)	Vacuum Pump Oil

www.filterelement.com
6810 Layton Road. Anderson, IN 46011. USA. ph 317.849.3535 . fx 317.849.9201



LEGEND

C	Contactor
CB	Circuit Breaker
CS	Compact Starter
F	Fuse
FB	Fuse Block
HMS	Hybrid Motor Starter
M	Motor
OL	Overload Relay
MS	Motor Starter
MSP	Motor Starter Protector
R	Relay
RLY	Relay
SS	Soft Start
SSR	Solid State Relay
VFD	Variable Frequency Drive

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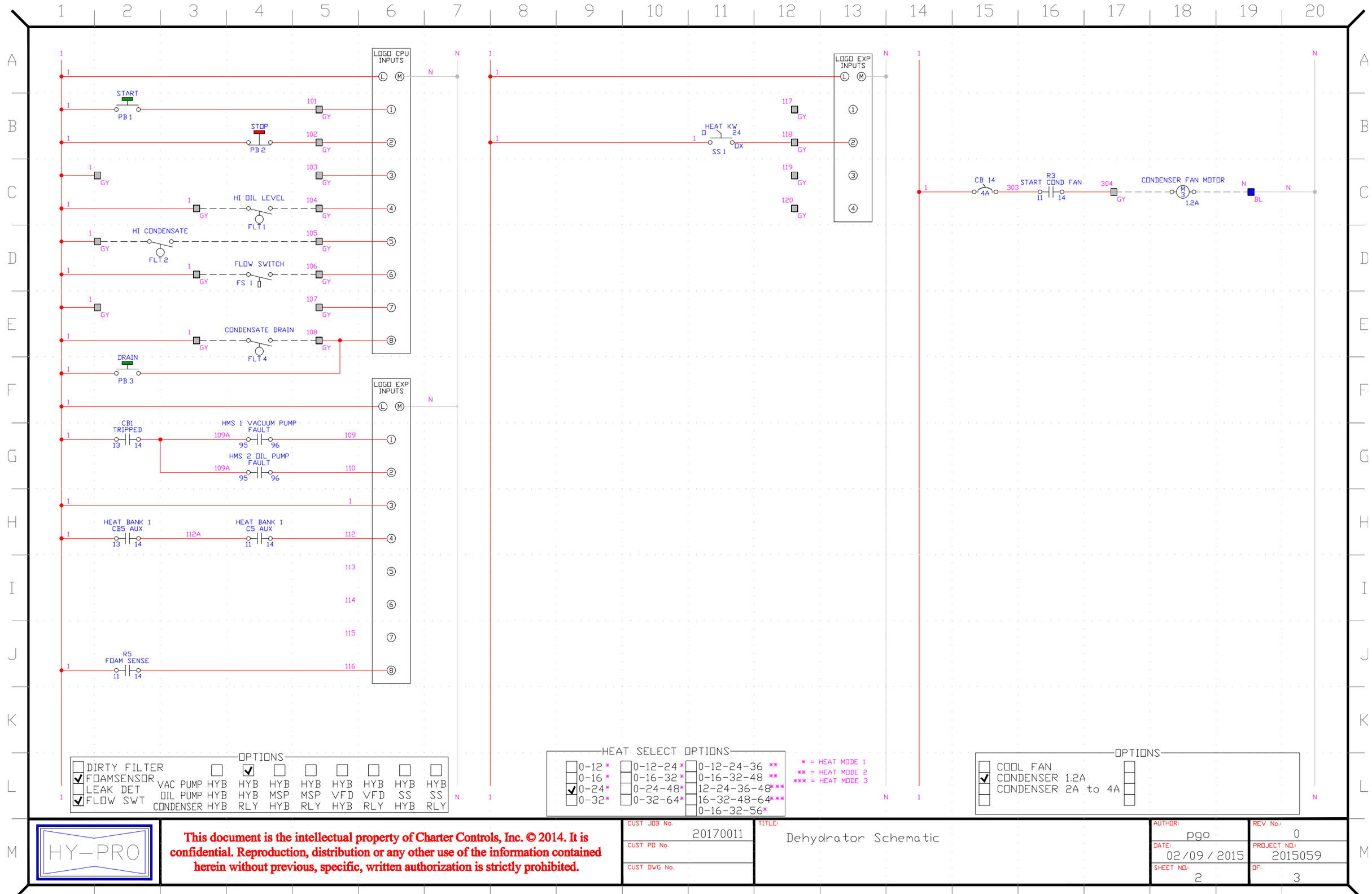
CUST JOB No.	20170011
CUST PO No.	NONE
CUST DWG No.	NONE
TITLE:	Dehydrator HV Schematic
AUTHOR:	PGO
DATE:	02/09/2015
SHEET NO.:	1
REV No.:	0
PROJECT NO.:	2015059
OF:	3



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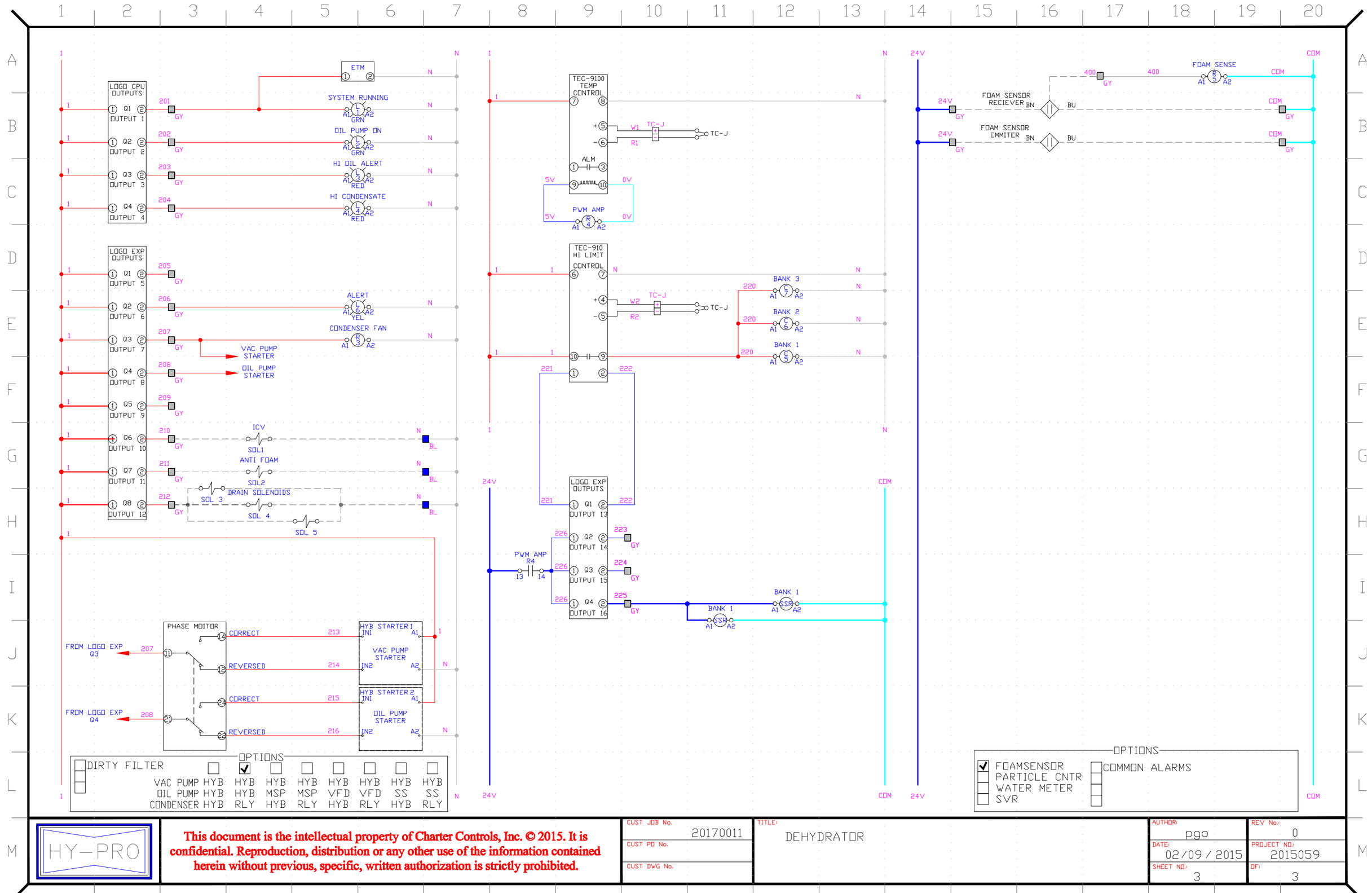
CUST JOB No.	20170011
CUST PO No.	
CUST DWG No.	
TITLE:	Dehydrator Schematic
AUTHOR:	pgo
DATE:	02/09/2015
SHEET NO.:	2
REV No.:	0
PROJECT NO.:	2015059
OF:	3



CUST JOB No.	20170011
CUST PO No.	
CUST DWG No.	
TITLE:	DEHYDRATOR
AUTHOR:	pgo
DATE:	02/09/2015
SHEET NO.:	3
REV No.:	0
PROJECT NO.:	2015059
OF:	3