



AV30 PRE-INSTALLATION REQUIREMENTS

AV30 Pre-Installation Requirements

Version: 3.0



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INTRODUCTION

Congratulations on your TruSteel equipment purchase! We here at TruSteel are sure you're going to be impressed at how efficient the AutoVap recovers your solvent and how EASY the system is to use.

But, before your AutoVap30 can be installed and run at maximum efficiency, we have to be sure that your facility is properly set up with all the equipment TruSteel provides you with.

By following the requirements throughout this checklist, you can be sure you will have a quick, easy install and your AutoVap system will run great for years to come. Setting the stage properly the first time will save you valuable time and money in the future.

Please take the time to carefully review this manual and refer to it throughout your AutoVap pre-Installation process.

It is suggested, but not required, to place all ancillary equipment (water heater, chiller, vacuum pump, PLC) outside of your C1D2 solvent recovery lab.

AUTOVAP30 IMAGES

The AV30 is the most efficient solvent recovery system when comparing throughput to footprint.

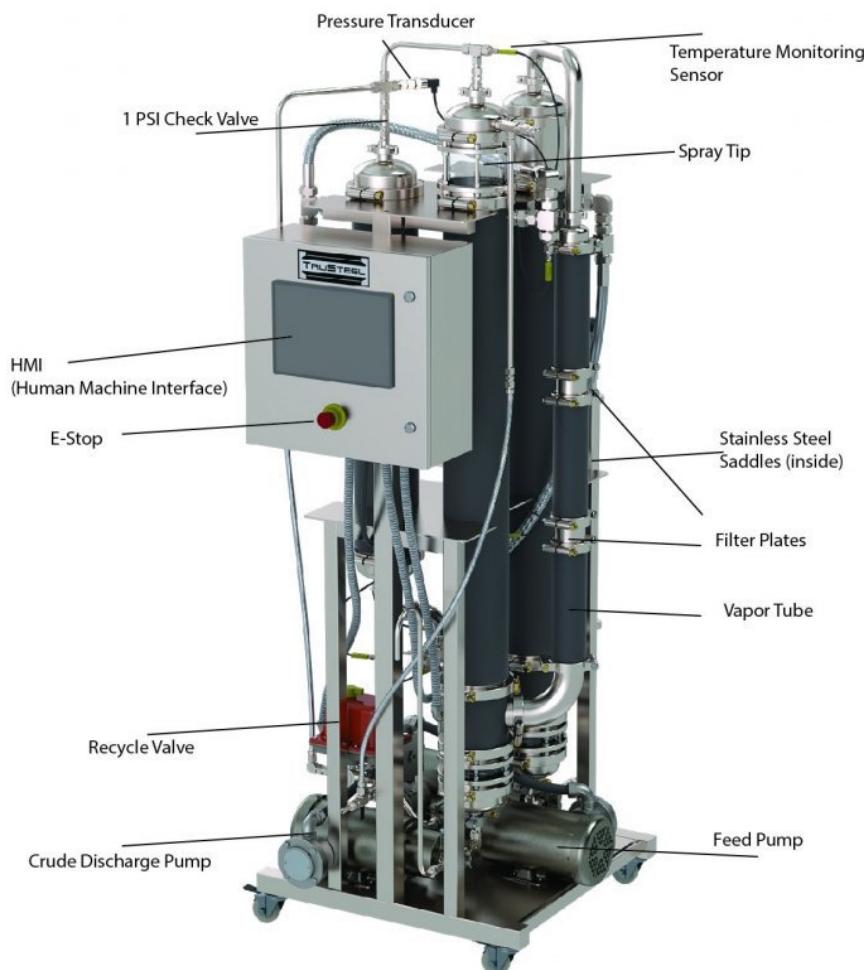
With built in fail safes, alarms, data logging, and remote access, the AV30 stands alone as the leader in the industry.

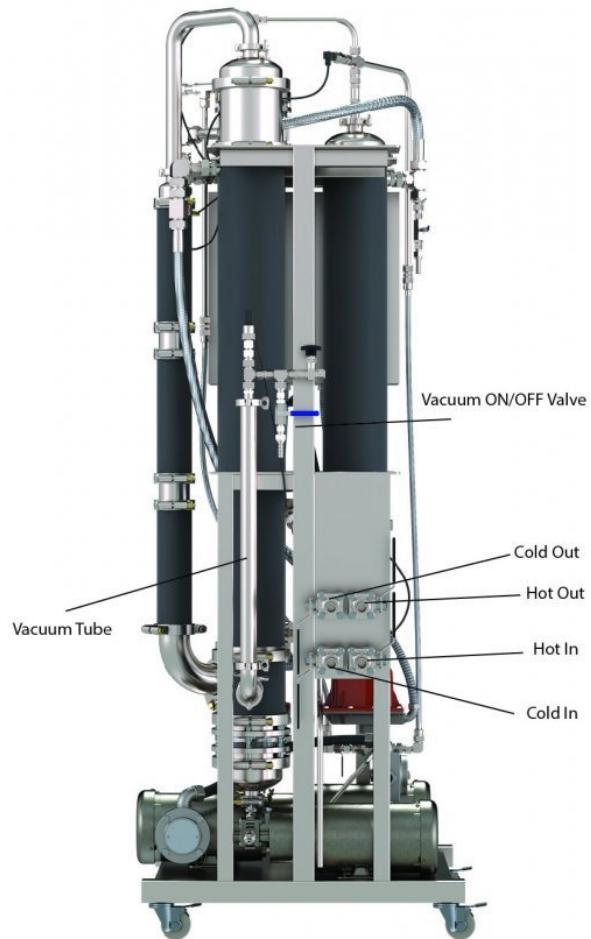
How the AutoVap30 Works

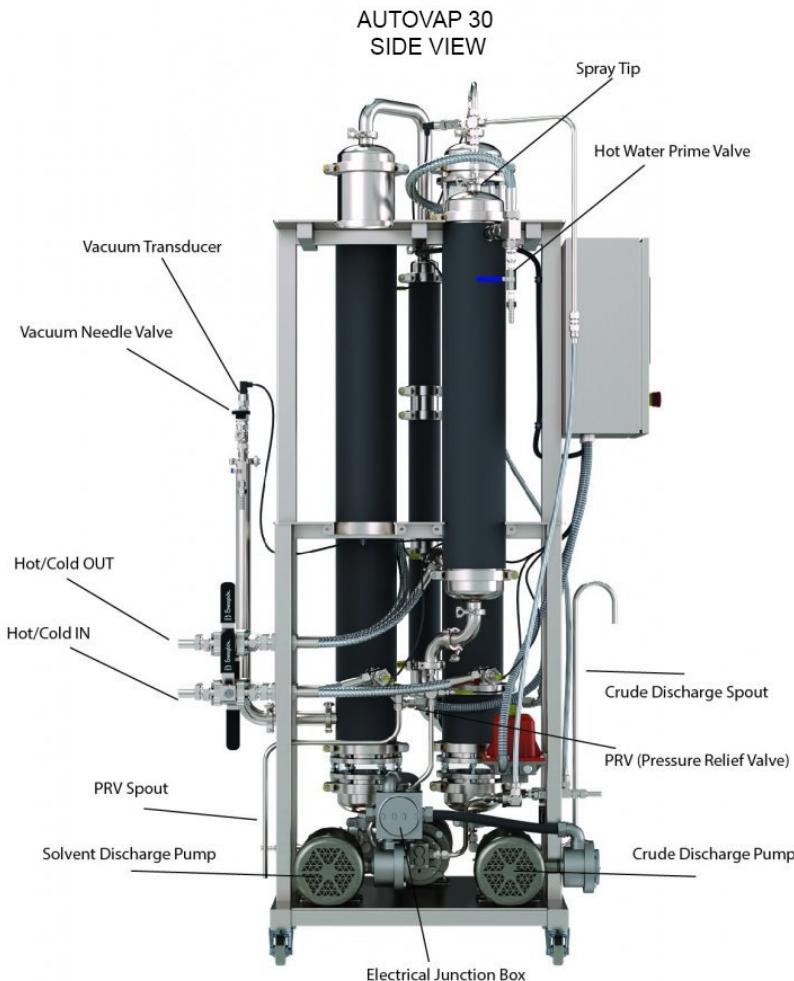
The AutoVap30 works by pumping your tincture up through a preheater before being atomized through a sprayer. The material than falls through a heated, jacketed exchanger where the solvent evaporates, and is "pulled" by vacuum into the condenser exchanger which is cooled from a chiller.

The "crude" material is automatically discharge through a pump and the solvent is re-condensed and automatically discharge through the solvent discharge pump.

The AutoVap30 has a easy to use cleaning cycle to ensure the longevity of your AutoVap30 system.

**AUTOVAP 30
FRONT VIEW**

**AUTOVAP 30
BACK VIEW**



STAGE1: RECEIVE EQUIPMENT

CHECKLISTS

Use the following checklists to keep track of your projects progress. Please print each of the following checklists for your records.



EQUIPMENT MANIFEST

Use this checklist as a manifest to ensure all equipment is delivered and on site.

Chiller

Your chiller will most likely be shipping directly from the manufacturer via LTL freight. TruSteel will provide tracking when available. Please check the delivered chiller for damage before receiving.

Chiller Model #:	
Chiller Serial #:	

- Chiller Arrived With No Damage
- Expansion Tank
- Remote Control

Water Heater

The heater unit will be delivered directly from the manufacturer. Please be aware that the heater will take at least 2 weeks to be manufactured. Tracking will be provided when available.

Heater Model #:	
Heater Serial #:	

- Electric Water Heater Arrived

Manifold Package

The manifold package will be shipped directly from TruSteel. It will include: VFD [Variable Frequency Drives], Taco Recirculating Water Pump, Chiller Bypass Manifold, Water Heater Manifold.

Note: If we determined are using your own chiller, or heater, we may not need to send this package.

- Heater Manifold Pieces: Pressure Release/Gauge Section (Medium), Fill Port/Filter Screen Section (Big)
- Expansion Tank (Blue Tank)



- Taco Pump (Green Recirculating Pump) and Flange Set
- Chiller Bypass Manifold
- Taco Pump Ball Valve (Small)
- (4) Hose Barbs
- (4) Sharkbite Valves

Inline Pump Model #:	
Inline Pump Serial #:	

Vacuum Pump

Vacuum Pump Model #:	
Vacuum Pump Serial #:	

- Vacuum Pump Received

AutoVap30 and Control Panel (2 Separate Crates)

Control Panel Model #:	
Control Panel Serial #:	

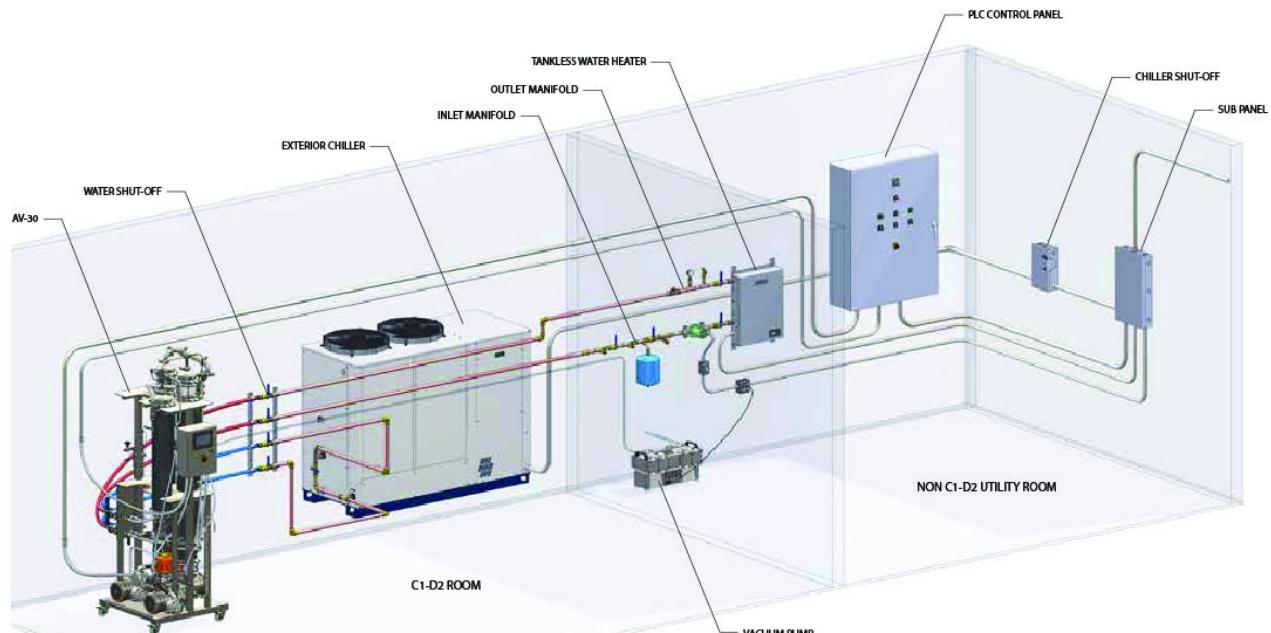
- AutoVap30 & Control Panel Received

STAGE 2: PLACE EQUIPMENT

Important things to consider when placing your equipment:

- 1) The chiller exhausts a large amount of hot air. We highly suggest placing the chiller outside of your facility, either on a concrete slab or on the roof. If this is not possible, please confirm with the chiller manufacturer if your facility has adequate air flow and space for the chiller to run inside. Placing an HVAC exhaust system on the chiller is also an option for indoor use.
- 2) The water heater is a crucial part of your AV30 system. It is important to get maximum efficiency out of your water heater. The flow rate of the water heater will be a determining factor of the efficiency of the heat as the AV30 recovers solvent. To ensure maximum flow rate, the water heater should be placed as close to the AV30 as possible and the plumbing should have a few 90 degree turns as possible. The plumbing run should have as little vertical differential as well.
- 3) The recirculating water pump, which is part of the water heater manifold, is what essentially powers on the water heater each day. It is advised to have your electrician connect this pump to a wall switch that is easily accessible by your operators.
- 4) The vacuum pump, similar to the recirculating pump, should be placed on its own wall switch for convenience. Note: place on a separate wall switch from the recirculating pump.

FACILITY LAYOUT



[CLICK HERE FOR PDF VERSION](#)



This layout diagram is only a suggestion to how a facility could lay out. The customer is responsible for consulting with their local fire marshal in order to ensure code compliance. TruSteel is not responsible for setting up the customer facility in order to comply with any local codes.

The AutoVap30 is C1D2 compliant. The ancillary, however, is not and should be placed outside of the solvent recovery room.

The chiller unit should be placed in a well ventilated area, preferably outside of the facility in the open air (on a concrete slab or on the roof).

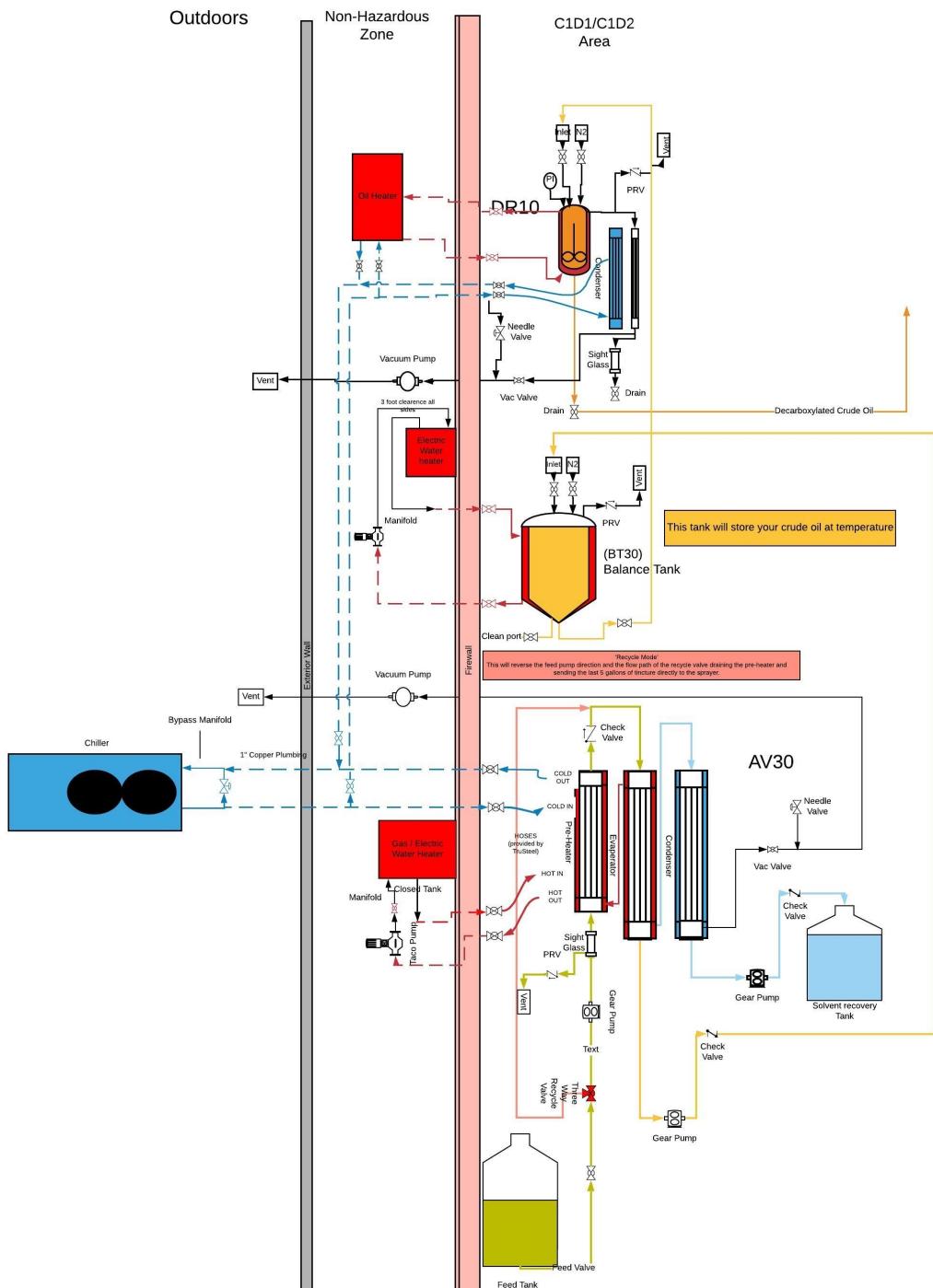
The chiller should be within 50 feet of the AutoVap30 unit in order to be most efficient.

The water heater should be placed outside of the C1D2 room. The electric water heater does not require ventilation, while the gas heater will require proper ventilation. The water heater, ideally, should be within 30 feet of the AutoVap30 for full efficiency.

The vacuum pump, AutoVap30 PLC, and heater manifold inline pump should all be outside of the C1D2 solvent recovery room.

AV30 FLOW DIAGRAM

[Click here for PDF Version of AV30 Flow Diagram](#)



Notes:						Project Title: AV30/BT30/DR10 Installation PNID
		TruSteel 416 Crown Point Circle Grass Valley, CA 95945 Phone: (530) 802-0420	Rev: 1.0 Mudflow: 1.0 Inception: 1/17/2010	By: DK		
						Drawings: HEATING & COOLING & PROCESS PIPEING DIAGRAM BASIC
						Scale: Job # Drawing # NA AV30/BT30/DR10

STAGE 3: INSTALL ANCILLARY

This section provides important information for each piece of equipment that needs to be installed. Most equipment will have manuals with them when they arrive, but we have also provided links to the manuals and, in some cases, some extra installation materials.

WATER HEATER INSTALLATION



[Picture Caption: Hubbell HX Electric Water Heater (left), Hubbell NX Gas Water Heater (right)]

ELECTRIC WATER HEATER: Model HX

Tankless Electric Water Heater

Available in 33-36 KW Three Phase Voltages

The Hubbell model HX Tankless electric water heater is a highly reliable and easily maintained heater designed for operation in a commercial or industrial application. The Hubbell HX Tankless heater is compact, extremely efficient, takes up minimal space and reduces operating costs.

Electric Water Heater Technical Documents

- [Model HX / TX Brochure PDF](#)
- [Model HX / TX Written Spec PDF](#)
- [Model HX / TX O&M Manual PDF](#)

GAS WATER HEATER: Model NX300

Tankless Electric Water Heater

Available in 33-36 KW Three Phase Voltages

The Hubbell model HX Tankless electric water heater is a highly reliable and easily maintained heater designed for operation in a commercial or industrial application. The Hubbell HX Tankless heater is compact, extremely efficient, takes up minimal space and reduces operating costs.

Important Note!! Gas Heater will require an external flow switch AND an strap-on aquastat. Your plumber can provide these or you can purchase them below.



Where to Purchase:

- 1) [Flow Switch](#)
- 2) [High or Low Limit & Circulator Strap-On Aquastat](#)

Gas Water Heater Technical Documents

- [Hubbell Model NX Brochure PDF](#)
- [Hubbell NX O&M PDF](#)
- [Hubbell NX300 Submittal Sheet PDF](#)
- [Model NX300 Spec PDF](#)

Water Heater Requirements

See Water Heater Requirements (Section AV30 REQUIREMENTS CHECKLIST)

Link To Helpful Video

Important Information

1. For C1D2 compliance, the water heater should be placed OUTSIDE of the room that the AutoVap will be running in. The heater is NOT C1D2. Place the heater on the outside of the wall from the AutoVap with the manifold attached, and then plumb your copper (NO FLUX), or PEX, through the wall, into the room.

Important Note: The closer your heater, and the more direct the plumbing run is, the more efficient your heater will work with the AutoVap. The flow rate of your closed loop to the AutoVap is VERY important. A short, straight path will ensure a higher flow rate.

2. The heater manifold, provided by TruSteel, will be installed directly into the water heater. To Install Manifold:

- a. Remove plastic pex fitting inside of the Sharkbite fitting on the water heater inlet and outlet.
- b. Insert straight copper end into Sharkbite fitting.
- c. Make sure manifold is securely mounted with unistrut

3. The copper (NO FLUX) will be run to the shark bite side of the ball valves provided. The ball valves are mounted on a unistrut.

4. The TACO inline water pump will be used to recirculate the water in the system. This will essentially power up the heater since it needs flow to run.

We suggest putting the Taco pump on wall switch, rather than a plug outlet, for convenience. This will essentially be your on/off switch for your heater since the flow powers up the heater.

Be sure the Taco pump is facing the correct direction (the control panel should be facing



out from the wall) and the flow arrow should be going toward the water heater.

Commodities Needed By Customer

Needed to prime the system and for maintenance

1. You will need a sump pump (minimum 25 ft. head pressure) to prime the system.
[Click Here to Purchase a Sump Pump \(or see example\)- Amazon.com](#)

2. Short piece of garden hose, with hose fittings to connect sump pump to manifold intake.
[Click Here to Purchase \(or see example\) - Amazon.com](#)

3. Distilled Water (about 20 gallons): You'll need around 50-60 gallons total, including the chiller requirements.

4. ~35 gallon reservoir

[Click Here to Purchase a Reservoir \(or see example\)-Amazon.com](#)

Contact Hubbell Heaters

Call: (800) 647-3165

Or: (203) 378-2659

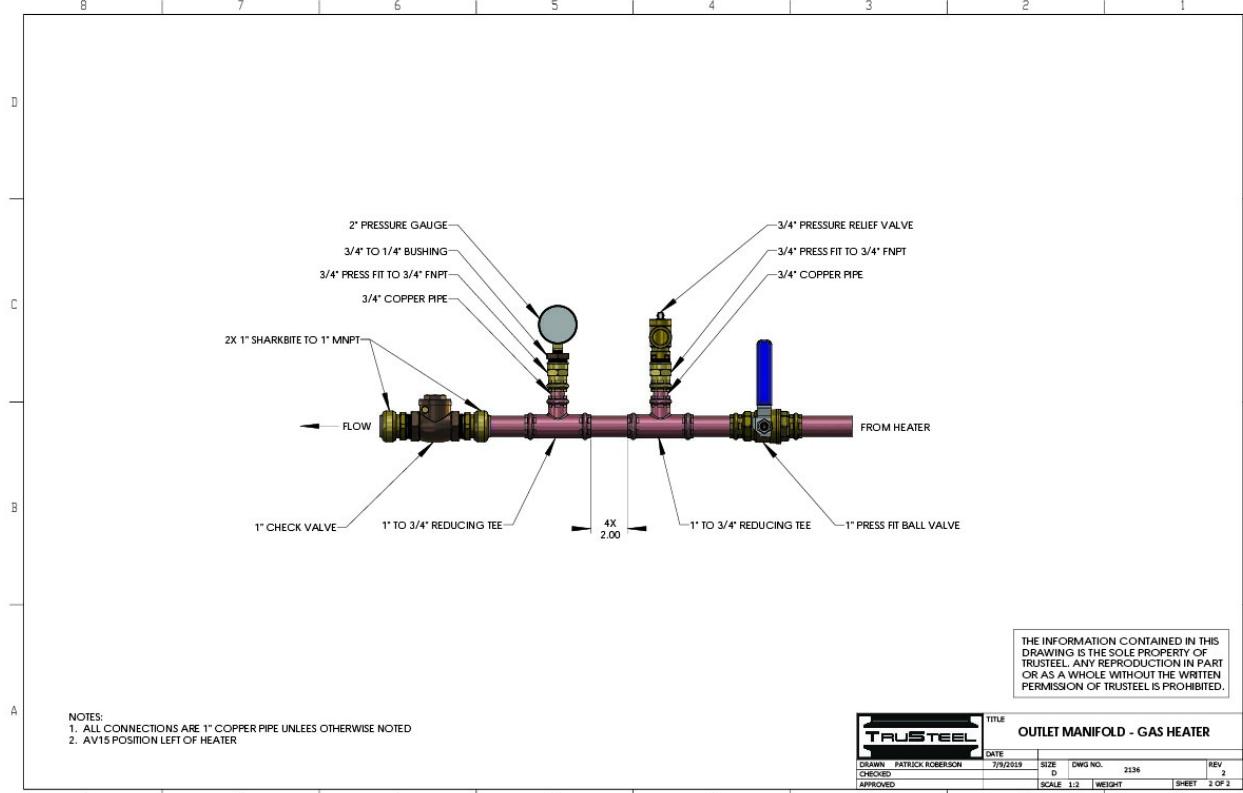
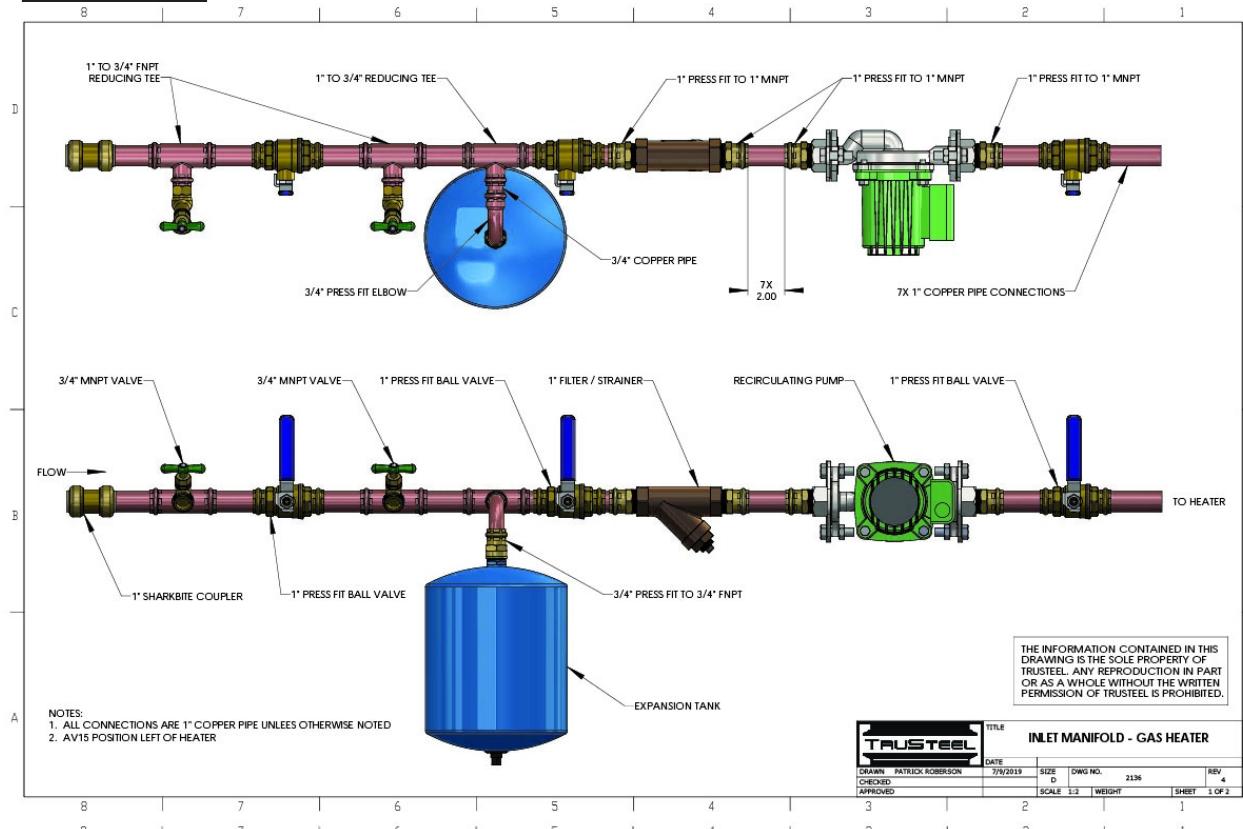
WATER HEATER MANIFOLD

The TACO Inline Recirculating Pump is part of the heater manifold that is supplied by TruSteel.

It is highly suggested to connect the power of the pump to a wall switch. Place the wall switch in a convenient location for your facility operators. This pump essentially powers on the water heater by supplying flow.

RECIRCULATING PUMP			
MODEL	ELECTRICAL	HORSEPOWER	UNIT DIMENSIONS
VR3452-HY1-FC1A00	115V 1Ø 2.5A	1/100 to 1/4	See Submittal Data Information

[CLICK HERE FOR PDF VERSION](#)



CHILLER INSTALLATION



MODEL TaeEvoTECH

Air Cooled Chillers

The TAEevo range of air-cooled chillers are a packaged unit designed for industrial applications. They are supplied with hermetic scroll or reciprocating compressors and an innovative finned pack evaporation inside the storage tank.

Technical Documents

Note: The installation instructions should be in the upper cabinet of the unit.

- [Installation Instructions \(PDF\) \[2 MB\]](#)
- [Alarm Resets and Other Important Info \(PDF\) \[5 MB\]](#)

SEE CHILLER REQUIREMENTS

Important Information

1. The chiller should be placed OUTSIDE of the facility, either on a roof, or a concrete slab. If placed inside, proper HVAC ventilation is required. The chiller CANNOT operate in a closed space; the unit dissipates a lot of heat. Please contact MTA (Manufacturer) if you have any doubt of chiller placement.
2. The bypass manifold, provided by TruSteel, should be properly installed by a plumber. Use plumbers dope AND plumbers tape.
3. The copper plumbing(Crimped or Push Connect – NO FLUX) will be run to the shark bite side of the ball valves provided. The ball valves are mounted on a unistrut.
4. The chiller requires a **propylene glycol/water mixture**. Please refer to the Installation Instructions to verify how much propylene glycol your unit will require. (Ratio is climate dependant) [Link to Purchase](#)
5. Please note that the chiller IS NOT powered by the AutoVap30 Control Panel. The chiller is not controlled by the AutoVap30. The AutoVap30 only monitors, not

controls, the temperatures supplied by the chiller. If the chiller is not supplying enough cool fluid, the AutoVap30 sensors will alarm you.

6. Don't forget to wire up your remote control for the chiller. The remote will make it very convenient to put the chiller into STANDBY mode when not in use.

Helpful Information

[Link To Purchase Propylene Glycol](#)

Contact MTA for Installation Inquiries

West Coast Customer Service
Joel Gordon (206) 851-8456
jgordon@mta-usa.com

East Coast Customer Service
Jim Kirchoff (248) 880-4025
jkirchoff@mta-usa.com

VACUUM PUMP INSTALLATION



Model Welch 2052

Welch 2052 2.3 cfm Full Chemical-Resistant 4-Head Diaphragm Pump

The original Welch 2052 is a full chemical-resistant (not like its cheaper version), 4-head, oil-free dry diaphragm vacuum pump with all-PTFE contact surfaces and deep vacuum capability. Oil-Free, portable, full chemical-resistant, means less maintenance and no more frequent and costly oil

change, or cross contamination.

MODEL	ELECTRICAL REQUIREMENTS	PUMPING RATE	UNIT DIMENSIONS	WEIGHT
WELCH 2052	110V 60Hz single phase 0.53 HP, 390 watts	2.3 cfm	9 x 15 x 7 inches	40.3 Lb

Vacuum pump is connected to AutoVap with a braided silicone hose (provided by TruSteel). The customer may choose to run a discharge line from the vacuum pump in the event that solvent gets "pulled" through the vacuum.

TruSteel suggests putting the vacuum pump on a wall switch to make easy on/off for facility operators.

Technical Document

- [Welch 2052 Operation Manual](#)

SEE VACUUM PUMP REQUIREMENTS

STAGE 4: CONTROL PANEL WIRING

Technical Documents

- [Technical Wiring Diagram](#)

Helpful Links & Important Information

[Purchase Link For K-Type Wire](#)

Your electrician should provide you with all the wiring and conduit.

Contact Aqua Sierra for Support, Call: 530.823.3241

SEE CONTROL PANEL REQUIREMENTS CHECKLIST

Link To Help Video

AutoVap30 System Startup

**WARNING! DO NOT TURN ANY POWER ON BEFORE CHECKING
VOLTAGE AND MEASURING TERMINAL RESISTANCE**

Tools Needed

- Volt/Ohm multimeter
- Small terminal block screwdriver
- Standard flat head screwdriver
- $\frac{1}{2}$ " wrench
- $\frac{5}{8}$ " wrench and/or $\frac{5}{8}$ " ratchet and socket
- $\frac{7}{8}$ " wrench
- 13/16" wrench
- Wire strippers
- Crescent wrench

Check for loose connections

Start by checking the wire connections made inside the Operator Panel(HMI) and in the PLC cabinet.

Pull softly but firmly on each of the wires for the 24v inputs and for VFD motor leads.

Reconnect any loose wires.

Measure terminal resistance of the 3 motors (inside the PLC cabinet)

Using a multimeter, measure the resistance(ohms) of the terminals to make sure that the motors are landed correctly in the junction box.



If all three resistance readings for each pump are relatively close then the motor wiring in the junction box is most likely correct.

Test each pump individually and as follows:

Using your multimeter put one test lead on U and the other on V. Note the resistance. Then leave the lead on U and put the other lead on W. Note the resistance. Lastly, leave the lead on W and put the other lead on V. Note the resistance. Do this for all 3 pumps. (See resistance ranges below for reference)

****If one of the three readings has a difference of more than 0.5 ohms. Check motor wiring at junction box.**

Resistance Ranges:

Residue Pump

U1A-V1A = 8-10 ohms

V1A-W1A = 8-10 ohms

W1A-U1A = 8-10 ohms

Ethanol Pump

U2B-V2B = 8-10 ohms

V2B-W2B = 8-10 ohms

W2B-U2B = 8-10 ohms

Feed Pump

U3C-V3C = 8-10 ohms

V3C-W3C = 8-10 ohms

W3C-U3C = 8-10 ohms

Checking Voltage in PLC Cabinet

*****WARNING! DO NOT POWER ON THE MAIN BREAKER UNTIL YOU VERIFY THE CORRECT VOLTAGE (208-240V)**

Measure (A phase-B phase) leg-to-leg by testing the two wires landed in the top side of Main Breaker(CB1) with your multimeter. Make sure you have 208-230v. If you don't have the proper voltage, first make sure the breaker or disconnect for PLC is powered "ON". **If you still don't have the correct voltage(208-230V) STOP and get an electrician for assistance. DO NOT CONTINUE UNTIL YOU RESOLVE THE ISSUE AS YOU COULD POSSIBLY DAMAGE THE PLC.**

After confirming the correct voltage, check that **all** Circuit Breakers in the PLC are set to "OFF" or Green(safe).

Make sure all circuit breakers are set to "OFF/GREEN". Once **all** circuit breakers are off, turn on Main Breaker(CB1).

Test the 120V wiring in the PLC cabinet with your multimeter by touching one lead to the Neutral and the other lead to the top side of Circuit Breaker # 5 (CB5). It is located in the top left side of the PLC cabinet.

If 120v is present you may turn on all circuit breakers and can now power on the HMI. If 120V is not present, STOP and call Aqua Sierra.

Powering on the Human Machine Interface (HMI)

Make sure the jumper wire in the PLC is removed. It's landed in terminals +24Q and +24R.

For the HMI to power up, terminals +24O and -24V must be landed in both the HMI and PLC panels.

Pull out the 2 the E-Stops to start the AutoVap. One is on the PLC cabinet and one is on the HMI.

If HMI powers up but does not display any data this means that PLC is not communicating with the HMI. Check the ethernet cable connections and re-crimp each end if necessary.

Contact Aqua Sierra

For questions/concerns/troubleshooting the PLC or HMI, please call Aqua Sierra (located in Pacific Standard Time)

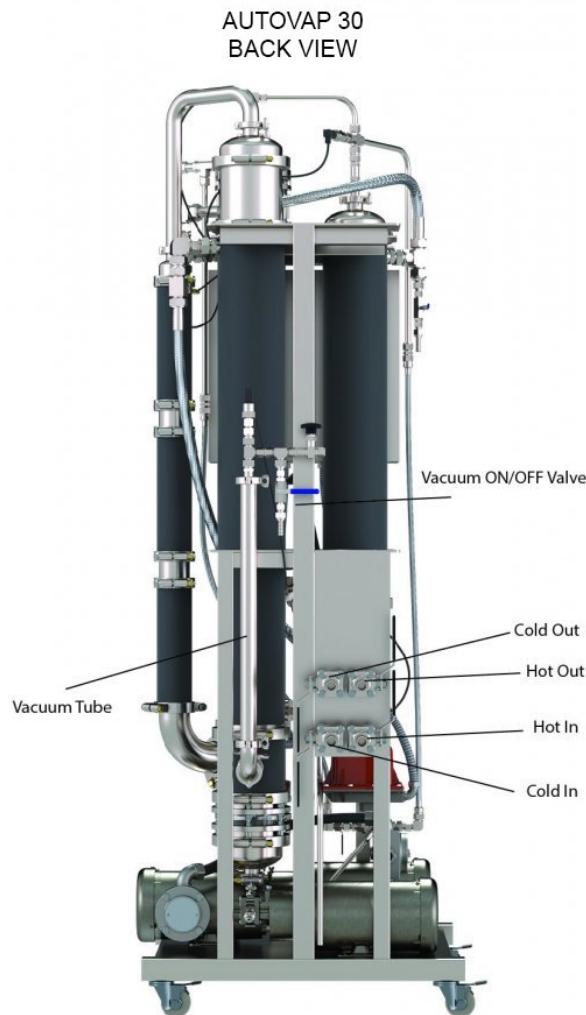
Call: 530.823.3241

STAGE 5: ASSEMBLE AV30

[Link to Video Online](#)

STAGE 6: PRIME WATER HEATER & CHILLER

Before proceeding to fill the water heater and chiller, you must have the **RED** and **BLUE** hoses connected to the AV30.



In the image of the AV30, locate the Cold Out and Cold In. These will be the **BLUE** hose connections to/from the chiller.

Cold In: From the chiller
Cold Out: Back to the chiller

In the image of the AV30, locate the Hot Out and Hot In. These will be the **RED** hose connections to/from the water heater.

Hot In: From the water heater
Hot Out: Back to the water heater



CHILLER FILLING & STARTUP

Proceed with this step ONLY after the AV30 is fully assembled and the chiller plumbing circuit is complete, including the blue hoses connected from the AV30 to the ball valves on the wall.

System requirements

Use this chart to determine your recommended propylene:water ratio. If you have any doubts, please call MTA-USA.

The total volume of your water/glycol mixture is around 80 gallons total.

Propylene Glycol Relative to Freeze Point

Propylene Glycol Solution (%)	0%	10%	20%	30%	40%	50%	60%
Temperature (F)° Freezing Point	32°	26°	18°	7°	(-8)°	(-29)°	(-55)°

Fill the Chiller

1. Premix your desired ratio of propylene glycol and water in a clean, 30 gal. reservoir.
2. Make sure all valves throughout the chilling lines are open before filling
3. Power on the sump pump and fill through the top of the expansion tank on the backside of the chiller unit.
4. Keep topping off the expansion tank, and allow it to drain down three quarters of the tank before refilling. DO NOT allow the tank to drain completely and allow air into the system.
5. Once the system has roughly 50 gallons, press the "SNOWFLAKE" button on the digital control panel on the front of the unit.
6. The water will begin to cycle and push air back to the expansion tank
7. During this process the system will turn on and off numerous times(20-30) as it pushes the air out of the lines.
8. You should receive an AEFL alarm during this process. This is normal during initial startup.
9. You will need to reset this alarm and restart the unit by pressing the "menu" and "set" buttons
10. To reset from AEFL, press the "menu" button until ALRN(Alarm) is displayed, then press "set" 1 time
11. Now you should see "RST"(reset) above ALRN. Press set again to reset the alarm and



the unit should begin to cycle again.

12. Repeat Steps 11-14 until all the air out of the system. You will know when the compressor turns on. Now the system is Primed and ready to go.

Troubleshooting

If you do not see ALRN after pressing "menu" toggle between "set" and "menu" until ALRN appears on the screen.

Alarm Reset Procedure

It is necessary to understand that any alarm is a condition which is protecting the chiller from serious damage. Repeatedly resetting the alarm without correcting the problem can lead to serious, if not catastrophic, damage which will void the warranty of the chiller.

If you are not sure, contact MTA at service@mta-usa.com or 716-693-8651.

Use this manual: [Alarm Resets and Other Important Info \(PDF\) \[5 MB\]](#)

Alarms display and reset

To open the functions menu, proceed as follows:

- Open the functions menu by pressing the MENU button
 - With the up or down buttons, select the alarm function.
 - Press SET
 - If no alarms are present, pressing the SET button is not enabled.
 - The lower display shows the label with the alarm code; the upper display, if the alarm is resettable, shows the label **rSt**, or **NO** if the alarm condition is still present.
-
- Pressing SET with **rSt** present, will reset the alarm. Continue this through all alarms until it is clear and the chiller is ready to start.
 - If you want to scroll through all alarms present, use up or down buttons

Alarm codes

CODE	DESCRIPTION	Cause	Reset	Alarm trip
"AP" Alarms	Probe Fault	Bad probe broken lead	Auto	Instantaneously
AEFL	Evaporator Water level alarm	Low water level	Auto/ Manual	Delayed
ALc1	Phase Monitor alarm	Wrong or missing phase	Auto/ Manual	Instantaneously
b (n) HP	Compressor (circuit number) High pressure	Fan? Condenser Blocked	Manual	Instantaneously

b (n) LP	Compressor (circuit number)	Low temperature, loss of refrigerant	Auto/ Manual	Delayed
b (n) AC	Compressor (circuit number)	Low temperature, freeze alarm	Auto/ Manual	Delayed
b1tF	Fan thermal alarm	Low Flow Fan jammed (ice)	Manual	Instantaneously
C(n) tr	Compressor (circuit number)	Running at high temperatures	Manual	Instantaneously
AEht	Evaporator inlet high temperature	High water temperature	Manual	Instantaneously

b1AC Set Point

After the unit is primed, you need to lower the freeze point of the reservoir.

****Note: Contact MTA** to determine the PG ratio before adjusting the freeze alarm (b1AC) from set point of 40F.

This will be based on the climate extremes for your chiller's location. For standard ambient temperature above (32F) set the (b1AC) to 25F

To Lower freeze point follow the instructions below.

TURN UNIT TO STNBY TO ACCESS

Verify that the glycol percentage in the circulated coolant is adequate to protect the coolant from freezing at the target outlet temperature. You must use Glycol and NOT water. Also consider the minimum ambient air temperature if the chiller is to be installed outdoors. Adjust the glycol percentage for the lowest of these temperatures with at a 10F safety factor below the freeze alarm set point. For example, to operate at 25F coolant outlet temperature (indoors) set the freeze alarm set point at 15F and adjust the glycol percentage to a minimum of 30% (by volume) to provide freeze protection to 5F.

1. Change the freeze alarm set point as follows:
2. Enter the programming mode of the controller by holding the "set" & "down arrow" buttons down simultaneously until the "Pr1" prompt (amber) appears with the "PASS" entry above it (red).
3. Press the "set" button once and the upper display (red) will show a flashing "0". Use the "up arrow" to change the flashing "0" to the user password value ("23"). If the password is correct, the upper display (red) will show "ALL".
4. At the "ALL" prompt press the "down arrow" once to display the "AL" menu. Then press "set" once to display the AL26 parameter (amber). This is the freeze alarm set point. The factory value is 39°F (5°C) and will be displayed above the parameter label in red.
5. Press the "set" button once and the upper display (red) will start flashing. Use the "down arrow" to adjust the parameter to the appropriate value commensurate with the glycol protection temperature.
6. Press the "set" button once more to store the new value.



7. Press the “set” & “up arrow” buttons simultaneously to exit programming mode and return to the main display.

Monitor chiller operation for several cycles to be check for alarms.

ALc1 ALARM ON START-UP

If you experience an ALc1 when you first power the unit, check the Carlo Gavazzi Phase rotation indicator, there Should be 2 lights illuminated.

GREEN indicates power available

Yellow indicates Phase is correct

Before starting this type of chiller, ensure all personnel involved have read chapter 2 safety.

If the phase monitor trips ALc1, check the correct phase sequence on the LINE IN to the disconnect. Change only the incoming power.

The ALc1 alarm may be generated tripping of the protection UP LINE from the chiller. (check the main fuses)

[Contact MTA](#)

Chiller Customer Service (MTA-USA)

(West Coast USA)

Joel Gordon

p. (206) 851-8456

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(East Coast USA)

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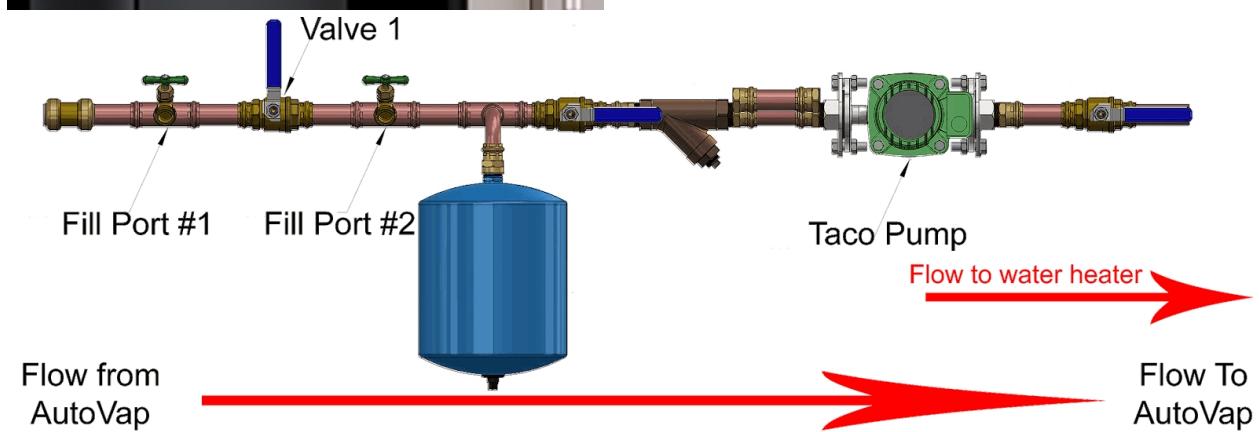
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FILL & START WATER HEATING SYSTEM

How to fill/refill the heating system for the AutoVap30

It is very important to remove all the air in the heating system before operating the heater. Failure to do so may damage the internal heating elements, cause inefficient evaporation as well as having improper flow through the heating system. Below are steps to ensure you properly fill the heating system:



Prepare Equipment

******WARNING: Never try to fill the heating system if the water is hot or if the heater is on**

1. Make sure the heater is powered OFF and has completely cooled down.
2. Get a large barrel/bucket and place it near the heating system. Also get another small container used to help bleed air/water from the system.
3. Fill the large barrel with 10-12 gallons of distilled water.
4. Get a 1/2 hp sump pump, attach a garden hose to it and place it in the barrel

Prepare To Fill PreHeater (Use Port #1)

Prepare To Fill PreHeater (Use Port #1)

1. Find the heater manifold and look for the 2 fill ports.(hose bibs)
2. Connect the hose to Fill Port #1 (on the left)



3. Close the ball valve (Valve 1) directly in between the 2 fill ports.

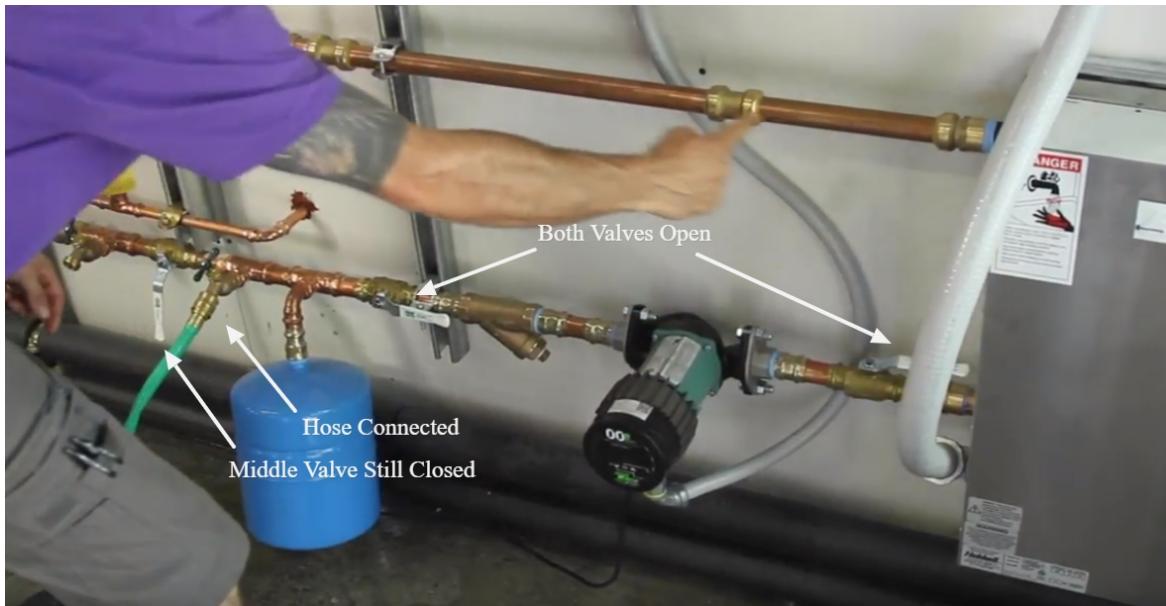
4. Have someone go over to the AutoVap30 with the other container to bleed air out of the system using the Air/water bleed valve.
5. Find the preheater on the left side of the AV30. Look for the blue ball valve toward the top.
6. Place the collection container under the ball valve and open it
7. Have the person at the heater manifold power on the sump pump and then open the hose bib on the left side.



8. This fills the preheater with water pushing air out along the way. Once all the air is pushed out let water come out for a few seconds. ****Note: Make sure to keep the barrel full of enough water at all times as to not push air back into the system.
9. The person at the AutoVap will be releasing air and then catching the excess water that comes out of the preheater. Once you start to see a steady flow of water coming out of the preheater, close the ball valve and the person at the heater manifold can close the hose bib fill port and unplug the sump pump.
10. Now most of the air should be bled out of the left side of the heater manifold. Now it's time to bleed the air out of the right side of the manifold.

Prepare To Fill Evaporator (Use Port #2)

1. Take the garden hose and attach it to the hose bib on the right side (Fill Port #2) of the heater manifold ball valve.
2. Plug in the sump pump
3. Open the hose bib on the right to fill the other side of the heater manifold.



4. Again, have the person next to the AutoVap open the blue ball valve on the preheater. ****Note: some water will come out right away so wait a few seconds and then air will be pushed out.
5. Once again, bleed all the air out of the system and once you have a steady flow of water coming out, close the blue ball valve.

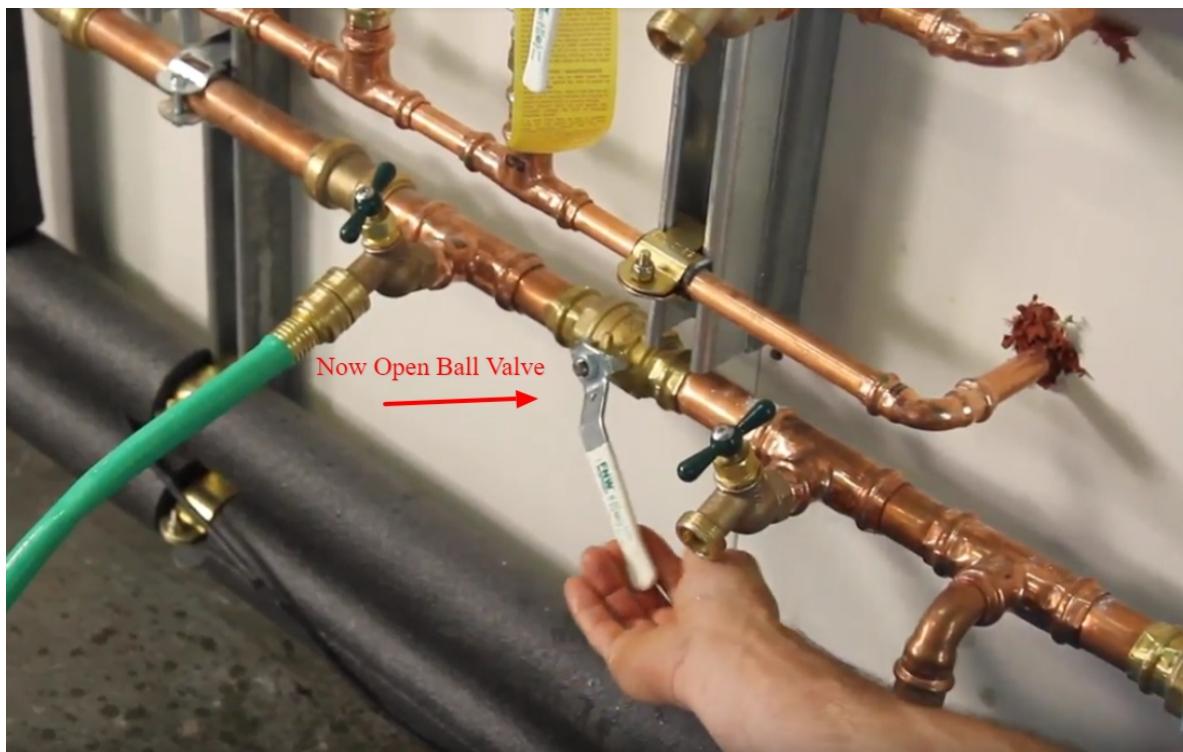


6. Now, the person back at the heater manifold will open FILL PORT #1 and collect the water into the same barrel/bucket used to fill the system. This creates a loop through the entire heating system, forcing water in one side of the system and out the other end.
7. Let this circulate for 2-3 minutes ensuring all the air is purged out. ****Note: If your recirculating TACO pump is operational, turn it on for a minute or so and this will

help purge the air out faster.

Note: For a Gas Water heater you will want to run water through the loop until the pressure gauge reads 15psi, not necessary for the electric gas heater.

8. Now close both FILL PORTS #1 and #2
9. Now open the ball valve that is between the 2 hose bibs to complete the flow of water through the system.



Allow Pressure To Rise In System

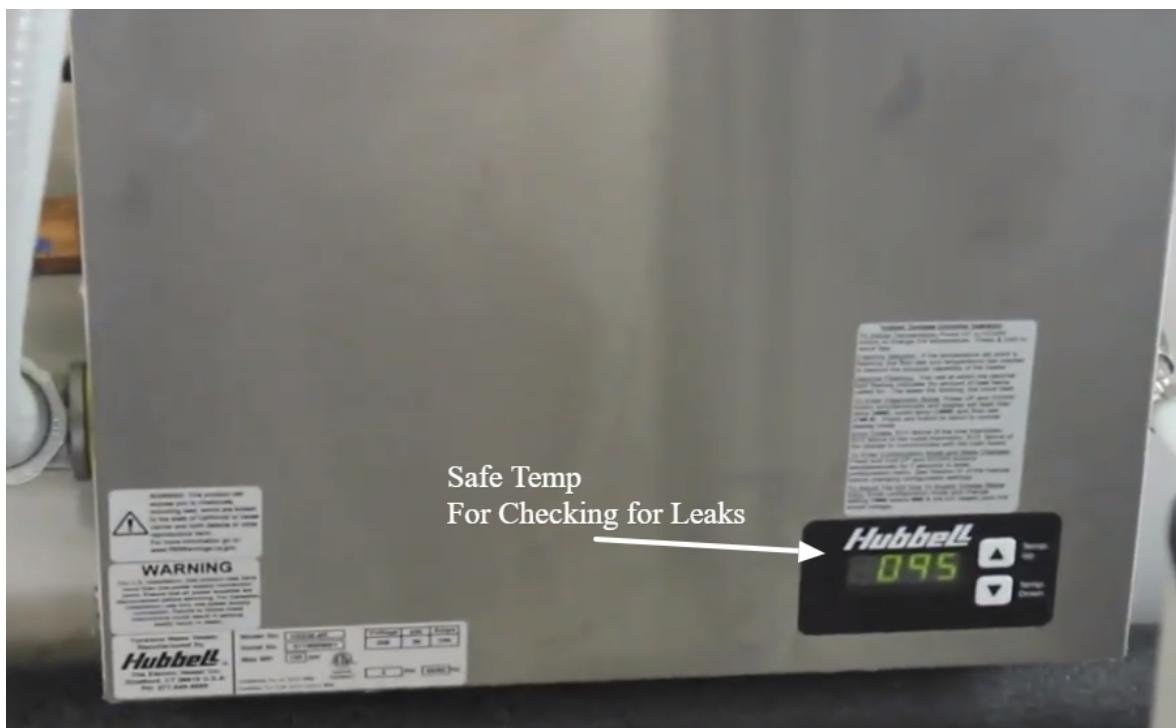
1. Look at the pressure gauge on the heater manifold and start to close the hose bib on the left.
2. Once the pressure reaches above 15-20 PSI, make sure both hose bibs fill ports are closed. The system is now filled/primed.
3. Turn off the sump pump.

Power On Heater and Recirculating Pump and check system for leaks

1. If you haven't already, power on the circulating TACO pump.
2. Turn on the heater disconnect and check the flow rate of the heater.
3. (Hubbell Electric heater only) For 1-2 seconds, simultaneously press the up and down arrow on the heater display.



4. This will display 4 different set points. Look for the flow rate set point.
5. The flow rate should be between 10-15 gallons per minute.
6. Set the heater temperature to a safe temperature (around 95F) while we check for leaks.



7. Check all your plumbing and the AutoVap system for leaks. Check the red hose ports on the AutoVap and anywhere the hot water flows.



If you do not have any leaks, you can proceed to the next step.

8. Now set heater temperature according to the solvent being used to extract. (i.e Ethanol=180-194F.)

Adjust Pressure On System (To compensate for heat expansion)

1. Once the heater is up to operating temperature you need to adjust the pressure in the heating system by removing some water. THIS IS VERY DANGEROUS, the water coming out will be EXTREMELY HOT
2. Get a bucket to capture water from the temperature/pressure valve or let the water drain out if plumbed properly.
3. Lift up on the Temperature/pressure valve on the heater manifold and set accordingly:
Electric heater set pressure between 15-20.
Gas heater set the pressure to 45-55 PSI.
4. The heating system is now filled, primed and ready to operate.

Contact Hubbell Support

For questions/concerns/troubleshooting regarding your water heater, please contact Hubbell.

Keep in mind that they are located in Eastern Standard Time

Call: (800) 647-3165

Or: (203) 378-2659

info@hubbellheaters.com

STAGE 7: VACUUM TEST AV30

This step will ensure the AV30 system does not have any leaks and can hold vacuum. To complete this step, you must have

- The HMI on a displaying the vacuum level (it should be at atmospheric pressure to start)
- The vacuum pump connected to the AV30 with the braided silicone hose.
- Power supplied to the vacuum pump.

Steps to complete:

- 1) Ensure all valves on the AV30 system are closed.
- 2) Turn on the vacuum pump
- 3) Open the vacuum ON/OFF ball valve. Ensure the vacuum needle valve (black knob) is completely closed tight.
- 4) Continue to pull vacuum down to around 2 psia.



5) When the vacuum reaches 2 psia, close the vacuum ON/OFF ball valve.

6) Monitor the vacuum level on the HMI.

If the vacuum level drops quickly, then you have a leak somewhere in the system. Most likely at one of the points where the assembly parts were installed in STAGE 5:
ASSEMBLE AV30

If the vacuum level drops very slowly (.1 psia every 5-10 seconds) this is acceptable.

STAGE 8: CLEAN SOLVENT RUN (VIDEO CALL WITH TRUSTEEL)

At this point in the installation, the AV30 is ready to have clean solvent run through the system. TruSteel prefers to have this step completed over a video call.

To be prepared for this stage you should:

- Have an electrician with you, or someone capable of swapping wires on the PLC. We may have to change the phasing on the pump motors and the recycle valve
- Familiarize yourself with certain parts of the AV30

Recycle Valve

Feed Valve

Pre-Heater Sightglass

Feed Pump

Residue Pump

Solvent Pump

On PLC (Hand Mode, Auto Mode)

- Have tools ready to swap wires in the PLC (Small terminal block screwdriver)
- Have at least 15 gallons of clean solvent ready to feed into the AV30
- Have collection vessels ready to capture residue and solvent
- Have your water heater and chiller powered up and verified that they are properly functioning (providing hot and cold to the AV30)
On the HMI, go to the TEMPERATURE page. The readouts should be hot for the evaporation side and cold for the condenser.

Completing this stage will ensure that:

- 1) The PLC and HMI are properly communicating.
- 2) All 3 pumps are spinning in the correct direction.
- 3) The recycle valve is properly functioning.



- 4) All sensors (thermocouples and pressure transducers) are properly functioning.

At this point you are ready for a TruSteel technician to visit your facility to finalize the AV30, train your operators, and perform an IQ/OQ (installation and operational qualification)

STAGE 9: TRUSTEEL TRAINING & IQ/OQ

TruSteel will come to your facility to complete the AV30 installation, perform an IQ/OQ, and train your operators on how to use the AV30 for maximum performance.

In order to prepare for this training, please ensure that you will have at least 60 gallons of tincture to run through the AV30. It is advised to have tincture that will be the same, or similar, to the tincture that will be normally process so that proper parameters can be set according to your material.

You should also have at least 5 gallons of distilled water and 5-10 gallons of clean solvent available to run a cleaning cycle.

TruSteel Project Management will coordinate with you the date of the on-site training and IQ/OQ.

Note that we require all stages throughout this installation manual to be complete before arriving to your facility. We also require at least a 2 week advance to arrange travel.

APPENDIX

REQUIRED COMMODITIES

The following is a list of commodities NOT supplied by TruSteel.

Please note that you should buy all this equipment NEW. Unsanitary equipment can damage the AutoVap system.

Required Commodities

A sump pump (minimum 25 ft head pressure) with a short piece of hose (with hose fittings) and 25+ gallon reservoir/tote...used to fill the water heater line.

[Link to Purchase Sump Pump \(Amazon\)](#)

[Link to Purchase Sump Pump \(Home Depot\)](#)

[Link to Purchase Hose \(Amazon\)](#)

[Link to Purchase Reservoir](#)

An air compressor dedicated to use with the AutoVap (used for discharge).

[Link to Purchase Air Compressor \(Home Depot\)](#)

At least 100 gallons of DISTILLED WATER, NOT tap water, on site.



Purchase this locally from the store or from a water distributor.

- At least 20 gallons of PROPYLENE GLYCOL. (To fill the Chiller)

[Link to Purchase Dowfrost Propylene Glycol \(96%\) - 5 Gallons](#)

- At least 20 gallons of clean solvent. (To run the cleaning cycle on the AutoVap)
This should be the same solvent you are using in your extraction.

- For Gas Heater ONLY - Flow Switch and Aquastat

Where to Purchase:

1) [Flow Switch](#)

2) [High or Low Limit & Circulator Strap-On Aquastat](#)

AV30 REQUIREMENT CHECKLIST

For your review below are the pre-installation requirements for the AV30. It is important to us that we can install your equipment in a timely fashion and to do so, the installation location needs to be ready. All the items on this list are required to be completed BEFORE the arrival of TRUSTEEL installation technicians.

Chiller Installation Requirements

- The chiller has power and is wired correctly. (Note: you can turn the power on and see STANDBY displayed)
- The chiller has sufficient airflow as per the manufacturer's suggestion.
- The remote control is wired up and mounted in a convenient location.
- The expansion tank is properly installed.
- The bypass manifold is installed on the chiller.
- The plumbing for the chiller is complete to the ball valves/hose barbs, which are on a unistrut on the wall behind where the AV30 will be.
- Blue hoses are connected from Ball Valve/Hose Barb to AV30 [Cold In/Cold Out]
- Chiller is filled with glycol/water mixture and operating

Water Heater Requirements

- There is power to the water heater.
- The water heater manifold, provided by TruSteel, is connected to the heater and mounted



securely on the wall.

- The manifold is oriented in the correct position (ports are facing out/Taco Pump control screen is facing out)
- The Taco pump arrow is pumping toward the water heater.
- The Taco pump is powered by a wall switch
- The garden hose coupling is installed
- The plumbing run is no more than 30 feet with fewer than 4 total 90° turns.
- The plumbing line is run all the way to the ball valves behind where the AutoVap30 will be.
(Note: Run your lines as straight as possible with as few 90s to maximize the flow)
- Red hoses are connected from Ball Valve/Hose Barb to AV30 [Hot In/Hot Out]
- Water heater is primed and holding pressure (20-40 psi)

For Gas Heater, Add the following Requirements

- Proper supply of gas to water heater
- Flow Meter Switch is installed
- Aquastat is properly installed on water line
- Altitude was taken into account when calibrating (over 2000 ft. needs calibration)

Vacuum Pump Installation Requirements

- There is a 110V outlet, or switch, located where the Welch 2052 Vacuum Pump will be.
- The vacuum pump hosing is able to go through your wall from the AutoVap to the Vacuum Pump

Control Panel (PLC) Installation Requirements

- The Control Panel (PLC) is mounted and wired in, outside of the solvent recovery room.
- The 2 Control Panel conduits are run from the PLC to the AutoVap30. 1 conduit to power the pump motors, the other to run the low voltage wires to the HMI.
- The wires are properly marked on both ends.
- The wires are properly landed to the HMI according to the Control Panel wiring diagram.
- Voltage is checked in the PLC (see section: Checking Voltage in PLC Cabinet)
- Measure terminal resistance is complete
- HMI powers on a shows AutoVap screen



Required Commodities (not supplied by TruSteel)

- Sump Pump: A clean/new sump pump (1/2 hp or greater) with a short piece of hose (with hose fittings)...used to fill the water heater line.
- ~35 gallon CLEAN reservoir
- (2) ~15-20 foot hoses with standard hose fittings on both ends
- Distilled Water: At least 50 Gallons of DISTILLED WATER, NOT TAP WATER, on-site.
- Propylene Glycol: See Chiller Manual to determine how many gallons you require. Minimum 20 gallons.
- Clean Solvent: At least 20 gallons of clean solvent. (To run cleaning cycle)
- Tincture: At least 60 gallons of tincture. (To run for training and performance testing)

Required personnel on-site during installation

- An electrician available on the day of the video call. (wires on the PLC may need to be changed)



CONTACTS

Company/Equipment	Contact Info
TruSteel - AutoVap30	Project Management (Pete & Kris) Kris: 530.777.2042 kris@trustel.com Pete: 530.777.2039 pete@trustel.com Monday - Friday, 8:30am - 5pm PST
MTA-USA - Chiller	West Coast Customer Service Joel Gordon (206) 851-8456 jgordon@mta-usa.com Monday - Friday, 8am - 5pm PST East Coast Customer Service Jim Kirchoff (248) 880-4025 jkirchoff@mta-usa.com Monday - Friday, 8am - 5pm EST
Hubbell Heaters - Water Heater	Tech Support (203) 378-2659 Doug: ext. 103 tech@hubbellheaters.com Monday - Friday, 8am - 5pm EST
Aqua Sierra - AV30 Control Panel/HMI	Call: 530.823.3241 service@aquasierra.com Monday - Friday, 7am - 5pm PST