TAW p3 - Eaton Start Guide

1) Plumb unit per local codes, make note that PVC may not be accepted in your area. It is the installers responsibility to insure local codes are followed. TAW P3 come with a 1, 1.25,1.5 ,2 & 3" female NPT thread suction and discharge header connection,s refer to the submittal and order for the size on your P3

2) Suggested threaded connection procedure is 3 wraps of silver infused Teflon tape followed by pipe dope followed by another 3 layers of tape to insure good leakless fit to inlet & outlet. Tighten fitting hand tight then tighten 1-2 turns with pipe wrench, let set for 30 seconds and tighten again 1/4 turn.

3) Wiring the P3. A red label will be above the left wire gland nut to tell proper voltage and amperage. Refer to order for 1 or 3 phase hookup. 1 phas hookup will have the L3 terminal plugged. DO NOT attempt to wire a single phase unit to three phase power by removing this plug. Damage will result and void warranty.

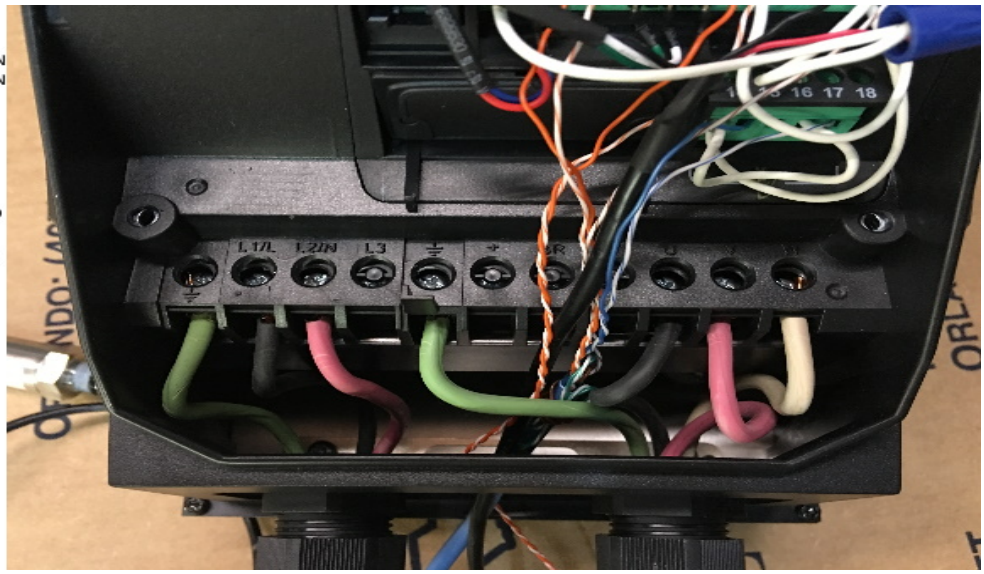
IMPORTANT NOTES:

1) REFER TO LOCAL CODES FOR WIRE TYPE.

2)WIRE SIZE NEEDS TO BE FOR NUMBER OF VFDS. REFER TO DRIVE MAX INPUT CURRENT X NUMBER OF DRIVES.

3) CIRCUIT PROTECTION IS EXTERNAL AND BY OTHERS.
BREAKERS SHOULD BE SIZED FOR 1.5 X VFD TOTAL INCOMING AMPS. REFER TO NEC STANDARD LOOK UP TABLES.

POWER CONNECTIONS
T1 - PWR GND
T2 - L1/ L PWR CONNECTION
T3 - L2/N PWR CONNECTION
T4 - L3 (3 PHASE ONLY)
T5 - MTR GND
T6-8 - NO CONNECTION
T9 - U MTR CONNECTION
T10-V MTR CONNECTION
T11-W MTR CONNECTION
(NOTE T10 & T11 MAY NEED TO BE REVERSED FOR CORRECT PUMP ROTATION. PLS MAKE NOTE OF WIRE COLORS PRIOR TO DISSASSEMBLY)



TAW P3 /Eaton VFD Quick Start Guide

4) Once the unit is wired, you are ready to power up the unit. BEFORE doing so, double check all connections for tightness & measure voltage. Make certain all covers are attached to prevent arch flash injuries. (Good practice with any electrical device).
Power up the skid without turning on the main non fused disconnect switch.
Pay particular attention to the voltage rating marked on the side of the VFDs. Please insure the incoming voltage matches the VFD rating or damage may result. This damage will not be warranteed so please double check BEFORE applying power.

5) After step 6 has been performed, apply power to the skid by turning on the main power disconnect and then turn on **one** of the VFDs power. After 5 seconds a display will flash. It should display setpoint pressure and actual pressure , alternating every 2 seconds. Turning up the set point pressure knob the display will show the setpoint only. 2 seconds after the knob is not adjusted the display will return to alternating between actual pressure and the setpoint pressure you just set. If this is proper, turn on the second VFD by flipping on its power disconnect, a smiliar display will occur. Set both pressures to the same desired pressure. (Displayed in PSI)
See picture below for clarification.

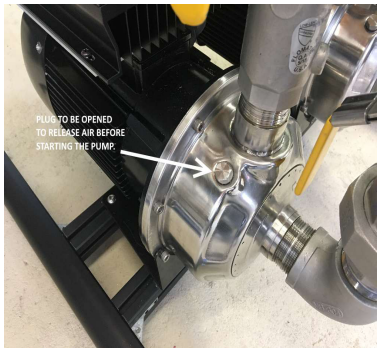
EATON BRAND VFDS

OK BUTTON IS NAVIGATE

INVERTEK BRAND VFDS (BOTH BRANDS ARE IDENTICAL) IN FORM, FIT AND FUNCTION.)

6) With the VFD cover on and secured (maintaining their IP66 , waterproof rating) slowly apply water to the skid. Check for leaks. If leaks are present, turn off power and the water and repair them. Then continue.
Turn on all pumps inlet and outlet ball valves.
Before running the pumps you must **FIRST** bleed the system of air.
You can do this by loosening the air purge plug on the pump(s).
Depending if the pump is a "end euction" or a "vertical multistage", this plug will be either at the 11-O'clock position on an End Suction pump OR at the top of the discharge side of the pump on a vertical multisage pump.
Loosen the plug enough to release the air, keep purging the air until no bubbles are present. This may need to be done several times and after you run the pump for a few seconds. Water **will leak out** so have a way to mop up the water in advance.
See pictures below for clarification.

Typical
end suction
air purge plug.
loosen it enough
to remove air.
Does NOT need to be totally
removed.



7) Once the air has been purged and the plugs are hand tightened, you can start the pumps. Do this one at a time. Turn on one pump by flipping the start switch from "OFF" to "FWD" and allow it to run for 30 seconds. If the pump does not generate pressure either there is still air in the pump, the ball valves are closed or the supply water is not present. The Drive will shut down on **"WATER PROBLEM".** Purge the air again as done in the previous step and reset the error by pushing the "OK" button on the keypad. This will restart the pump again. This may need to be done several times until all the air is out of the system.
Once the system comes up to pressure you can tighten the air purge plug 1/4 turn past hand tight. DO NOT over tighten.
Repeat this step with all drives one at a time until all pumps generate pressure.

8) Adjusting the drive is simple. There are three important adjustments you may need. P1-15 through P1-17. The others are preset and should not need adjusting but decribed here for clarifaction purposes.

Minimum Pressure turn on. P1-15

This is the absolute minimum pressure that you want the system to maintain.
TAW recommends keeping this setting 5-10 **PSI a**bove the suction pressure, This setting insures the pump turns on when the rate of pressure fall is so low that the unit will not turn on. It is intended to prevent the pressure from dropping below the suction, especially when feeding from a tank.
This is what we call our "Electronic Bladder tank algorithm".

To set this, push the "OK" OR "NAVIGATE" button for 3 or more seconds, the display will show the last parameter accessed.
Push the up or down arrow key until you reach parameter "01-15".
The display will read "**Minimum Pressure**", push the OK button again .
Push the up or down arrow key repeatedly until you reach the desired minimum turn on pressure.
Holding in the arrow button will make the increment move rapidly, pushing it repeatedly will make it increment/decrement 1 PSI per button push.
Push the OK button again to save the setting.
The display will default back to monitoring after 15 seconds or holding the "OK" button for 3 or more seconds.

Default is 30 PSI but it can be set to whatever PSI you desire. The factory may leave this higher depending on suction pressure available. You may want to set this about 5 PSI above typical suction pressure observed on the suction gauge when the pumps are off.

Turn on sensitivity: P1-16

TAW pump skids not only monitor pressure but rate of pressure to determine if demand is required.
This in addition to our exclusive predictive PID allows our skids to respond to demand changes must faster than any competitor.
It is also the reason we do not need a bladder tank although you can use one if desired.

To set this, push the "OK" button for 3 or more seconds, the display will show the last parameter accessed.
Push the up or down arrow key until you reach parameter "01-16". The display will read "Turn on sensitivity 1= HI".
Higher sensitivities make the pump turn on with lower demands (down to .2GPM) Too high will make it false on when an actual demand is not present. Too low will not make the pump come on when there is a demand, forcing it to come on at minimum pressure set in P1-15. If the pump waits to come on until it gets to the minimum pressure WITH true demand, adjust the sensitivity higher (lower numbers). The pump should never reach the minimum pressure set in P1-15 when there is true demand.
Push the OK button again and push the up down arrow key repeatedly until you reach the desired sensitivity.
Testing this will require a demand by turning on a fixture / etc..
Holding in the arrow button will make the increment move rapidly, pushing it repeatedly will make it increment/decrement 1 PSI per button push.
Push the OK button again to save the setting.
The display will default back to monitoring after 15 seconds or holding the "OK" button for 3 or more seconds.
Default is 3 this may not need adjusting but if the pump cycles make the the pump less sensitive (higher numbers).

Turn off sensitivity: P1-17

Higher sensitivity makes the pump turn off at higher flows.
To set this, push the "OK" button for 3 or more seconds, the display will show the last parameter accessed. push the up or down arrow key until you reach parameter "01-17". The display will read "Turn off sensitivity 1= HI".
This will require a demand to test by turning off all fixtures (no demand).
Holding in the arrow button will make the increment move rapidly, pushing it repeatedly will make it increment/decrement 1 PSI per button push.
Push the OK button again to save the setting.
The display will default back to monitoring after 15 seconds or holding the "OK" button for 3 or more seconds.

If the pump is not turning off with no demand (evident by pumps getting warm), you will need to set the sensitivity higher.
Too high a setting will make the pump cycle off and back on when no demand is present.

Proper setting is acheived when the pump turns off with no demand, although there may still be a slight flow. A common mistake is to make this too sensitive allowing the pump to turn off when there is a slight flow. You can determine this by allowing the pump to run for 5 minutes, feel the pump, if it is NOT warm, there is actual flow caused by a leak somewhere in the system. As long as the pump is not getting warm, keep the sensitivitiy low (higher numbers) which keeps the pump running. Pressure should hold when the pumps turn off, if it does not, there is a leak somewhere in the system. It is normal under a leak condition that the pump stay running. This is fine as long as the pump does not get warm.

Default is 15 -17 this may be ajusted in the field.
If the system has a continuous flow, the pump will never shut off, this is fine as long as the pumps are not heating up.

After 24 hours of continuous run the pumps will bumplessly alternate, keeping equal wear on the pumps.

DISABLE FLOW TEST CURRENT: P-18

If the motor current exceeds this value the pump will not test for flow. This is a fine tune to prevent the pump from testing for flow when we know there is flow based on a certain current level. We typically set this for about 60% of the FLA but you can see where this current should be in the field by looking at the amps on the bottom of the screen. KW, AMPS, HZ and other monitor functions can be scrolled on the bottom of the screen by momentarily pushing the "OK" or "Navigate" button.

WARNING: TURNING P-18 TOO LOW will not allow the pump to test for flow and could damage the pump. Check to make certain the pump is not heating up. The pump should turn off when no flow occurs. This setting will over ride that if set too low.

The setting is default to 60% FLA. Observe the motor current displayed on the OLED display when no flow is occuring and pump is running. The current should be below this setting.You can set this to whatever works the best in your application by pushing the OK or Navigate button for 3 or more seconds then push the up or down arrow key until you reach Parameter 1-18.
The display will read "MIN NO FLOW AMPS".

PRESSURE TRANSDUCER SETTING: P1-19

Set at the factory for the transducer pressure either 1 for 100 PSI or 0 for 200 PSI. This should never need to be changed unless you replace the transducer with a different PSI input. Factory set based on the transducer the system shipped with. Default is Zero. 0 = 200 PSI transducer.

MAXIMUM PRESSURE SETTING: P1-20

Set at the factory for 40% of transducer PSI (80 PSI for a 200 PSI transducer). This setting can be used to increase or decrease the maximum pressure output. Be careful when setting this as most fixtures are rated for 80 PSI max. Try not to exceed that at any fixture to prolong its lifespan.
DO NOT EXCEED 150 PSI or damage may result.

CAVITATION DISABLE SETTING: P1-21

Set at the factory for 0 **enables the cavitation circuit. When enable the unit will shut down on "WATER PROBLEM" if the pump can not keep up.**
A pipe break can also create this condition.

Troubleshooting.

There are several key settings that could cause the pump to not operate as desired.

It is important to understand how our system operates to efficiently troubleshoot a problem.
TAW uses rate of change in addition to PSI deviation and motor current to operate the pump. Rate of change is an important improvement over most competitors pump skids.

Our Minimum Pressure (P1-15) is also known as our electronic bladder tank setting. This pressure is the absolute minimum pressure you want the system to stay off above. It is only used to bring the pumps on when a very slow rate of pressure drop reaches this pressure. Typically set for 5 above suction. If there are no leaks in the system, this setting will never be reached IF the on sensitivity is set properly.

This brings us to On sensitivity (P1-16). This is the rate of pressure drop required for the pumps to turn on. Lower numbers are more sensitive.
Typically set at 3 the unit will come on when a real demand is sensed based on rate of pressure drop. If the unit does not come on when a real demand requires it, you can drop this IF there is no air in the line. Make certain to bleed the lines starting at the furthest fixture and run the water until NO air comes out of every fixture. After the pumps run and turn off the pressure should hold. If it does not, you have a leak somewhere, typically a toilet valve(s) . RO systems will make the pumps run, this is fine as long as there is sufficient flow through the pump to prevent it from heating up.

Turn off sensitivity (P1-17) sets the rate of pressure drop during low demands. Typically set to 15 - 17.
You will notice the pump will slow down at different rates and at different levels. This is our advanced no flow algorithm that will determine a real demand and it will not be falsed by different suction or head pressures as our competitors are. P1-17 is set properly when the system turns off when NO flow occurs. Turning the run/stop switch to off while running is another easy way to determine if there is real demand. If the pressure maintains in the off but the pump does not turn off within 20 seconds, you can adjust this sensitivity to lower numbers but be certain there is no demand before doing this because if there is real demand the pump will continuously cycle. This will not hurt the pump but the system steady state pressure will suffer.

P1-18 will disable the testing of no flow all together based on motor current. The theory here is if the pump is running at 60% or higher FLA, the pump is actually pushing water so there is no need to test for no flow. This setting can be raised or lowered if you notice a pressure dip during tests for low flow. Too low a setting will not allow the pump to test during no flow conditions and could cause pump overheating.

The biggest culprit in any pump system is AIR. Make certain the pumps have NO air in them. Also make certain the entire system has NO air trapped in it.