TOWLE WHITNEY
Booster Pump Systems

Emerson Troubleshooting

Loss of incoming water supply:

- Systems are programmed to stop when suction pressure drops. To restart pump, press the RED/RESET button. If this does not work, turn off the system using appropriate circuit breaker [in case of 115V, unplug the system], wait until the VF Drive display goes blank. Turn the system ON by plugging into outlet or turning on circuit breaker for. May need to press GREEN button.
- You may need to "burp" air from system if there is a complete loss of water and air is introduced in to the system. Do this by running water and opening/closing discharge ball valve. This may need to be repeated multiple times.

Loss of power supply:

- If system does not turn on automatically, turn off the system power using appropriate circuit breaker [in case of 115V, unplug the system], and wait until the display goes blank. Turn the system ON by plugging into outlet or turning on circuit breaker. May need to press GREEN button.

Short cycling:

Issue:

- Pump turns ON / OFF every few minutes / seconds

Solution:

- **Check pressure in expansion tank, following instructions on page 5.**
- Check for leaks (faucet, toilet fill valve, etc).
- As mentioned in the assembly section, it is essential to install a ball valve on the suction [City/ Well side] and discharge [Building side] of the pump.
- Close the ball valve on the discharge side of the pump and check to see if the pump turns OFF. If it does, there may be a leak in the water line, a faucet, a toilet, hose bib, etc.
- If the pump continues to run after the discharge shut off valve is closed, the water may be leaking back through the check valve [if installed on suction side of pump.]

Leaking toilet flapper

To test this:

1. Let pump run and increase pressure.
2. Close discharge ball valve when pressure reaches its highest point.
3. Close the suction ball valve.
4. Turn off circuit breaker OR unplug 115V. Wait for screen to go blank.
5. Open suction ball valve. Watch pressure gauge closely.
   If pressure starts to drop, then check valve is fouled and the water is leaking back through it.
6. Check valve debris must be flushed out by running a lot of water through system or removed and cleaned.

Fouled Check Valve

Clean Check Valve

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Pump continually runs:

Issue:

- Pump operates constantly without any demand for water

Solution:

- If a bypass is installed, ensure the bypass valve is **CLOSED!**
- When all fixtures are closed and no water is being drawn, air may get trapped within the lines causing the pump to not reach the pressure set point and hence cause it to operate continuously. You may need to "burp" air from the pump impellers and water lines. Do this by first opening multiple fixtures. With the pump running, Close the discharge ball valve, let the pressure build then open it quickly. This will force the air the air from the pump and water lines. This may need to be repeated **multiple times**.

- Maneuver to the pressure monitor menu on your Emerson drive. Press **M** button until you have **01** flashing on left side of screen. Press up arrow until you get to **62** flashing on the left. You should now see what the transducer is reading for pressure by looking at the number on the right. If this is significantly different that what your pressure gauge is reading, the transducer may be clogged or defective. The transducer is located below the expansion tank / pressure gauge. *** A difference of +/- 5 psi is expected. ****

- To check the transducer for debris, first turn the system power off and drain the water from the booster pump [the transducer is exposed directly to the water supply]. Remove your transducer [this can be done with an adjustable wrench as the transducer is only threaded in]. Inspect the back orifice for debris / mineral build up. If the orifice is clogged, try cleaning it with a toothpick, bobby pin, or vinegar. After cleaning, plug the transducer back in (make sure to plug the wire back in too) and test the system. If **62** still significantly differs from the pressure gauge reading, it most likely needs to be replaced. Please give us a call to order a replacement

Clogged orifice

Noise:

Pump Issue:

- There is a squeaking noise at the end of a pump duty cycle.

Solution:

- Lubricate the shaft through the gap between the pump casing and the motor.
- Often when the system shuts down the drive will command a "zero-speed" to the motor for a period of time before it goes to sleep. That whine you hear is the noise a motor makes when a drive commands zero speed in a running condition. VFD/pump packages exhibit this behavior to some extent – it's not indicative of a problem.

Clean orifice

VFD Issue:

- There is a noise coming from the Emerson VFD.

Solution:

- The VFD has a built in fan which is used to cool down the internals. The fan is programmed to turn on & off when it reaches certain temperatures, the pump does not necessarily need to be running.

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Double check the parameters are set properly. We are only concerned with the ones in RED

NOTE: No changes should be made to drive parameter settings without contacting the factory.

If changes are made to Parameter 05, this will erase the pump program in the VF drive causing the pump to stop operating.

Parameter #	Short Description	Program Value	Units
01	Minimum set speed	0.00	Hz
02	Maximum set speed	60.00	Hz
03	Acceleration rate	0.50	s/100 Hz
04	Deceleration rate	0.50	s/100 Hz
05	Drive Configuration **(critical do NOT change)**	PAD	
06	Motor rated current **Pump Specific**		Amps
07	Motor rated full load rpm	0	RPM
08	Motor rated voltage **Pump Specific**	230 or 480	Volts
09	Motor power factor	0.85	
10	Security status	L3	
11	Start/Stop logic select	0	
12	Brake controller enable	Dis	
15	Jog reference	1.5	Hz
16	Transducer feedback range	4-.20	
17	Allow negative references	OFF	
18	Preset speed 1	0.00	Hz
19	Preset speed 2	0.00	Hz
20	Preset speed 3	0.00	Hz
21	Preset speed 4	0.00	Hz
22	Load display units	Ld	
23	Speed display units	Fr	
24	Transducer scaling (1.00=100psi, 2.00=200psi)	1.000	
25	User security code	0	
27	Power-up keypad reference	0	
28	Parameter cloning	no	
29	Load defaults	no	
30	Ramp mode select	1	
31	Stopping mode select	1	
32	Dynamic V to F select	ON	
33	Catch a spinning motor select	0	
34	Terminal B7 mode select	dig	
35	Digital output control (Terminal B3)	n=0	
36	Analog output control (Terminal B1)	Fr	
37	Maximum switching frequency	18	Hz
38	Auto tune	0	

39	Motor rated frequency	60.0	Hz
40	Number of motor poles	2P	
41	Voltage mode select	Fd	
42	Low frequency voltage boost	0.3	%
43	Serial comms baud rate	19.2	
44	Serial comms address	1	
45	Software version	1.08	
55	Last trip		
56	Trip 1		
57	Trip 2		
58	Trip 3		
59	PLC ladder program enable	0	
60	PLC ladder program status	3	
61	Pressure SET POINT **System Specific**		%
62	Transducer reading (PSI Feedback)		%
63	Threshold—Lowest Hz Pump will run	50.00	%
64	Threshold detector 1 level	10.00	%
65	PID Proportional gain	2.500	
66	PID Integral gain	2.200	
67	Variable selector 2 control	0.25	
68	Brake release threshold (Low Suction Pressure) **Pump Specific** Normal	80.00 1.00	%
69	Analog input 1 scaling	1.00	
70	Analog input 2 scaling	1.00	
71	Parameter 61 setup	7.31	menu.param
72	Parameter 62 setup	14.21	menu.param
73	parameter 63 setup	12.24	menu.param
74	Parameter 64 setup	12.04	menu.param
75	Parameter 65 setup	14.10	menu.param
76	Parameter 66 setup	14.11	menu.param
77	Parameter 67 setup	12.35	menu.param
78	Parameter 68 setup	12.42	menu.param
79	Parameter 69 setup	7.08	menu.param
80	Parameter 70 setup	1.00	menu.param
81	Frequency reference selected	60.00	Hz
82	Pre-ramp reference	0.00	Hz

Emerson Troubleshooting

To change tank set pressure:

[Please read all instructions before beginning]

- Turn off the power to the TW booster pump system.
- Open a faucet/fixture to drain out all the pressure in the system.
- Check the pressure gauge to make sure the pressure is back to zero [or incoming supply pressure].
- Change pressure in pneumatic tank:
    a. If you are increasing system pressure, add air to tank so that tank

Remove cap to access valve and add or remove air in the pneumatic expansion tank.

Tank pressure MUST be 10

Figure: 01