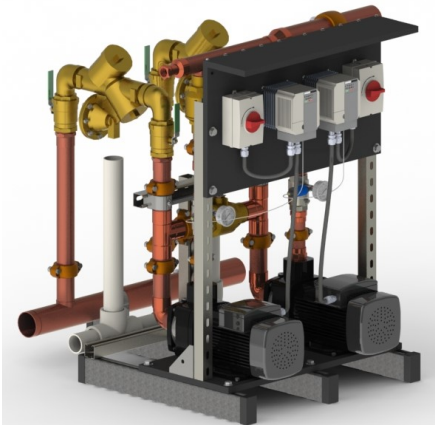


Instruction & Operations Manual

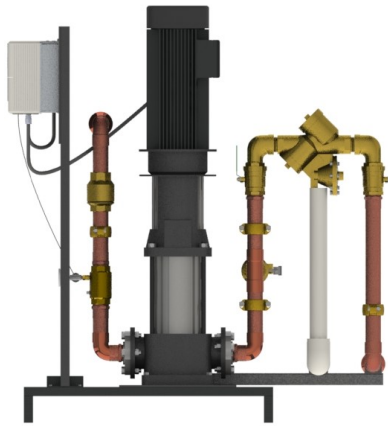
Updated 12/1/21



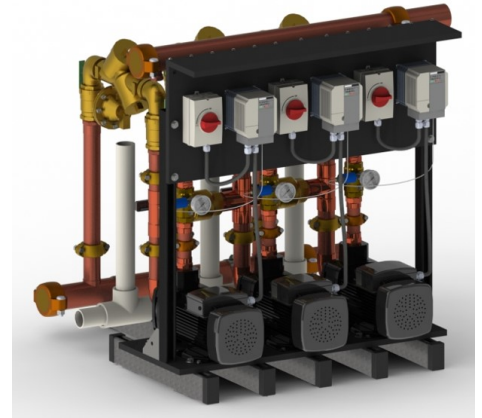
TOWLE WHITNEY
Booster Pump Systems



Duplex

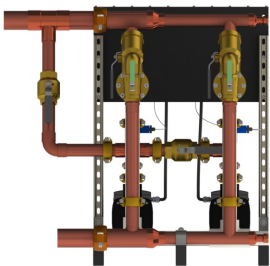


Vertical pumps



Triplex

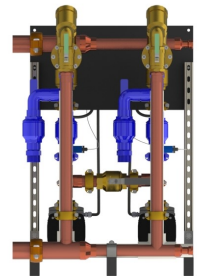
Includes OPTIONAL optional equipments



Bypass



Flood Control



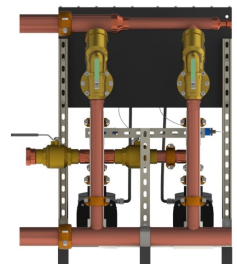
Test TEE



CU DWV



Strainer



Low Pressure Port

Table of Contents

- 1) Safety, Operation, and Maintenance
- 2) General Installation Instructions
- 3) Optional equipment
- 4) Manifold Installation
- 5) Expansion Tank Installation
- 6) System Flush
- 7) System start up
- 8) Start-up continued/ VFD (variable frequency drive)
- 9) RP (backflow prevention) Testing
- 10) Optional equipment: Strainer
- 11) Optional equipment: Pump 188-Bypass
- 12) Optional equipment: Low Pressure Port
- 13) Optional equipment: Copper DWV
- 14) Optional equipment: Flood Control
- 15) Optional equipment: Water Company meter test tee & shut-off
- 16) Pump maintenance
- 17) Troubleshooting
- 18) Check-list

1. Safety, Operation & Maintenance

VF Drives have been programmed at Towle Whitney.
Do not change any parameters without contacting Towle Whitney.

The pressure setpoint on each pump of the system can be changed by calling or emailing Towle Whitney.

Operation

Once plumbed and wired, a Towle Whitney Booster Pump System is designed to operate automatically:

- The pumps turn ON when there is a demand for water and system pressure drops
- The pumps go to standby “Sleep mode active” when the water demand is satisfied
- The drives are programmed to alternate the pumps every 24 hours of run time [adjustable]

The pumps will Lead & Lag

As the water demand exceeds the GPM capacity of Lead Pump, the system pressure will start dropping, causing the Lag Pump to start operating and both pumps will maintain the pressure setpoint.

Maintenance

- By virtue of self lubricated bearings, the pump system does not require any preventive maintenance.
- The VF drive being an electronic device, MUST be protected from the elements. Recommended maintenance: CLEAN VENTS to insure proper ventilation for cooling fans.

Any questions please call 800-807-9827
8a.m.- 4p.m. EST



CAUTION!

Issues such as water softeners, filters, low producing wells, and galvanized pipes can affect the performance of the system.

WARNING!

Plumbing code requirements for a closed system: The check valves and backflow preventers installed on the Booster Pump System create a closed system which may result in thermal expansion issues. Please provide thermal expansion provisions and ensure proper testing & tamper-proofing of the building’s T&P valves.



WARNING!

This Booster Pump System must ALWAYS be protected from the elements. [unless specified otherwise].

**PRE-WIRED
&
TESTED**

Your Booster Pump System is prewired and water tested at the factory for satisfactory operation and may contain some water and pipe dope.

2. General Installation Instructions

All local building, electrical and plumbing codes must be followed.

Towle Whitney Variable Speed Booster Pump Systems are built for ease of installation and quick hassle free start-up.



Step 1

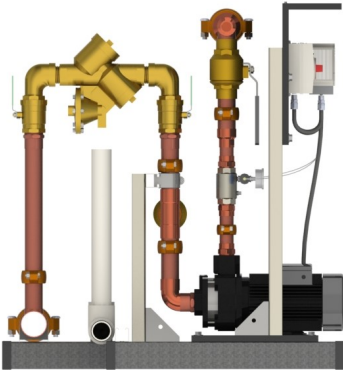
Electrical

Make appropriate electrical connections.

Amperage requirements shall be taken from the Variable Frequency Drive NAMEPLATE ONLY.

Each pump will always have a 3-phase motor.

Each Disconnect Box must be installed on independent circuit.



Step 2

Make appropriate plumbing connections.

(Optional):

Follow Section 4 Instructions to change Discharge Manifold Orientation.

Ensure all plumbing connections and grooved connections are tight.



Step 3

Follow instructions on Section 5 for expansion tank installation.

Step 4

Follow instructions on Section 6 to flush piping.

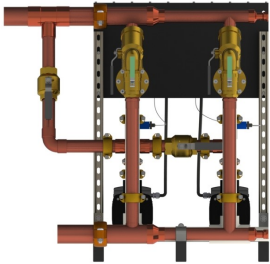
Step 4

If required, affix frame to floor.

3. Optional equipment

The GEN-5 Platform supports numerous optional equipments.

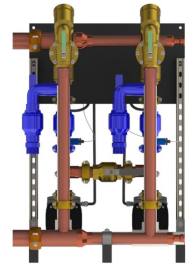
OPTIONAL EQUIPMENT is reviewed at end of the IOM.



Bypass



Flood Control



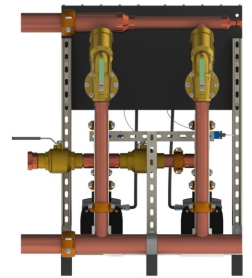
Test TEE



CU DWV



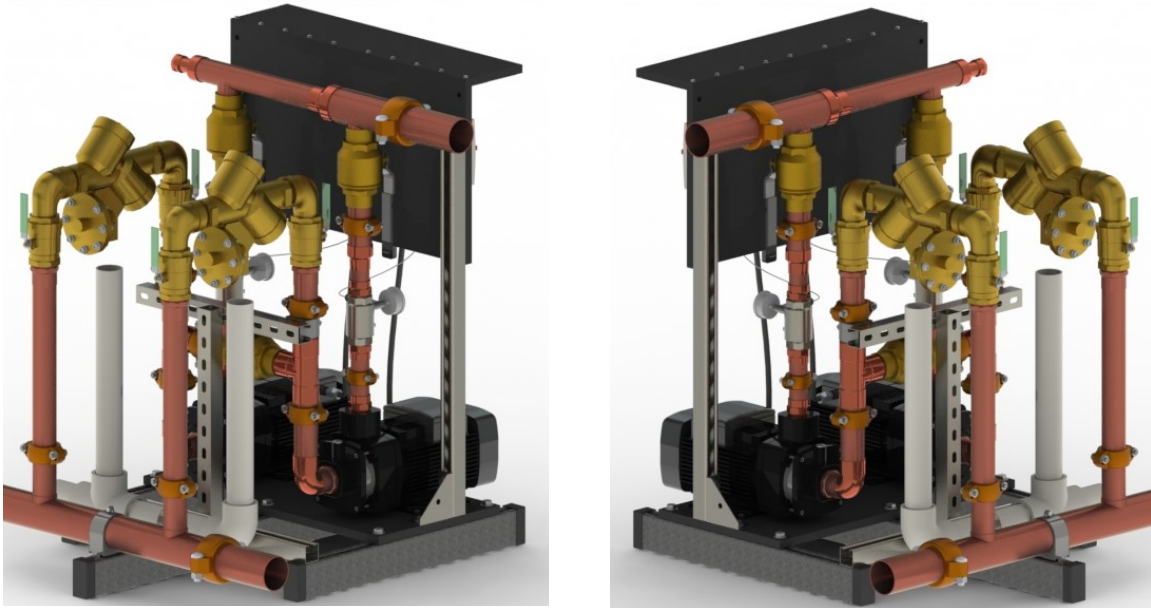
Strainer



Low Pressure Port

4. Manifold Orientation

**Manifold access can easily be switched
IN THE FIELD from RIGHT to LEFT**



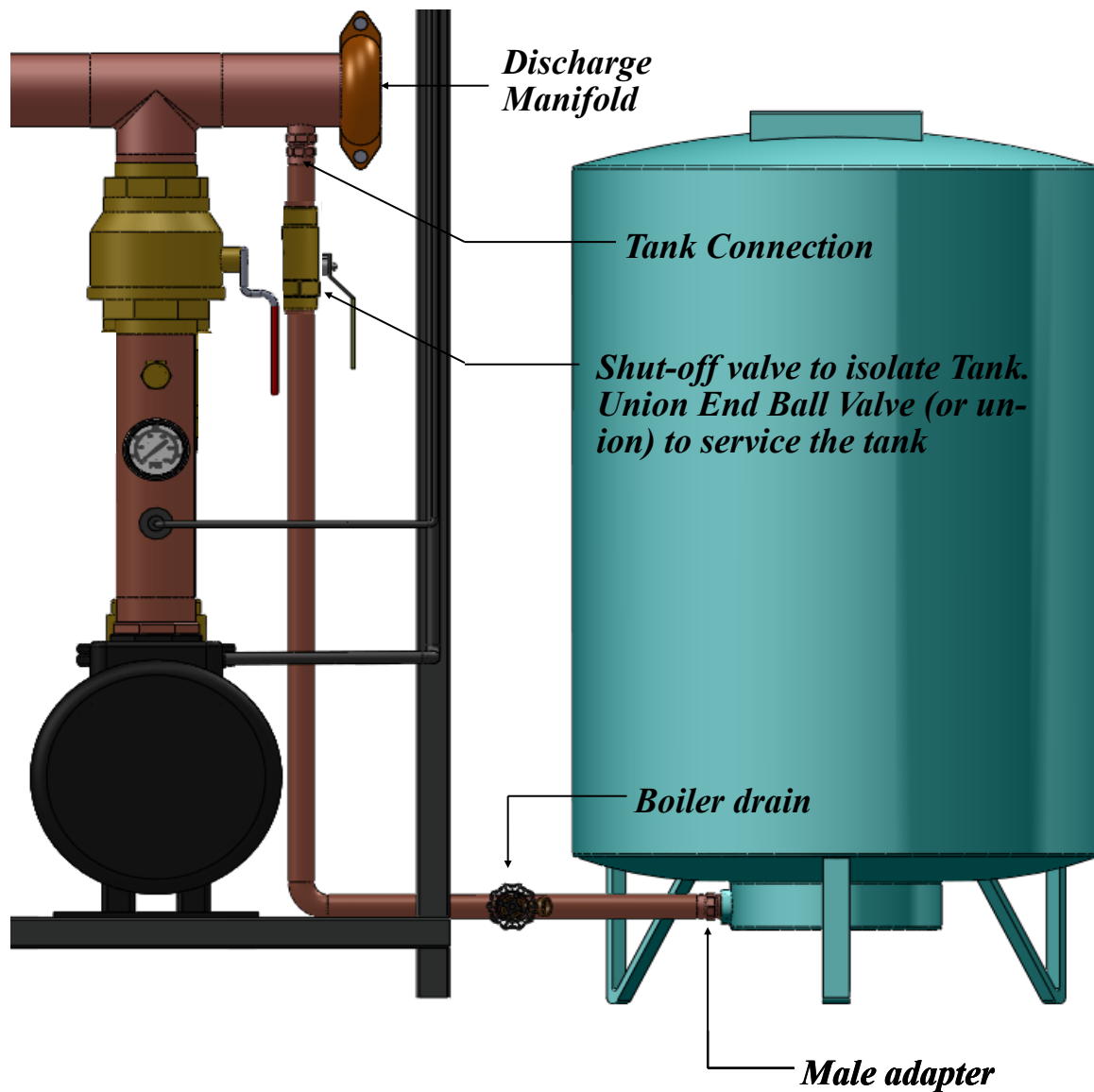
Suction Manifold is dual ended.

The DWV drain and discharge side can be switched using grooved couplings and clamps:

1. Loosen / remove clamps and grooved couplings.
2. Remove manifold and re-align.
3. Attach grooved couplings / DWV clamp.

5. Expansion Tank Installation

- Check pressure in tank before installing.
- Pressure must be 10 psi below Booster System Set Pressure.
- Pipe the tank to the discharge manifold using shut-off valve and boiler drain.

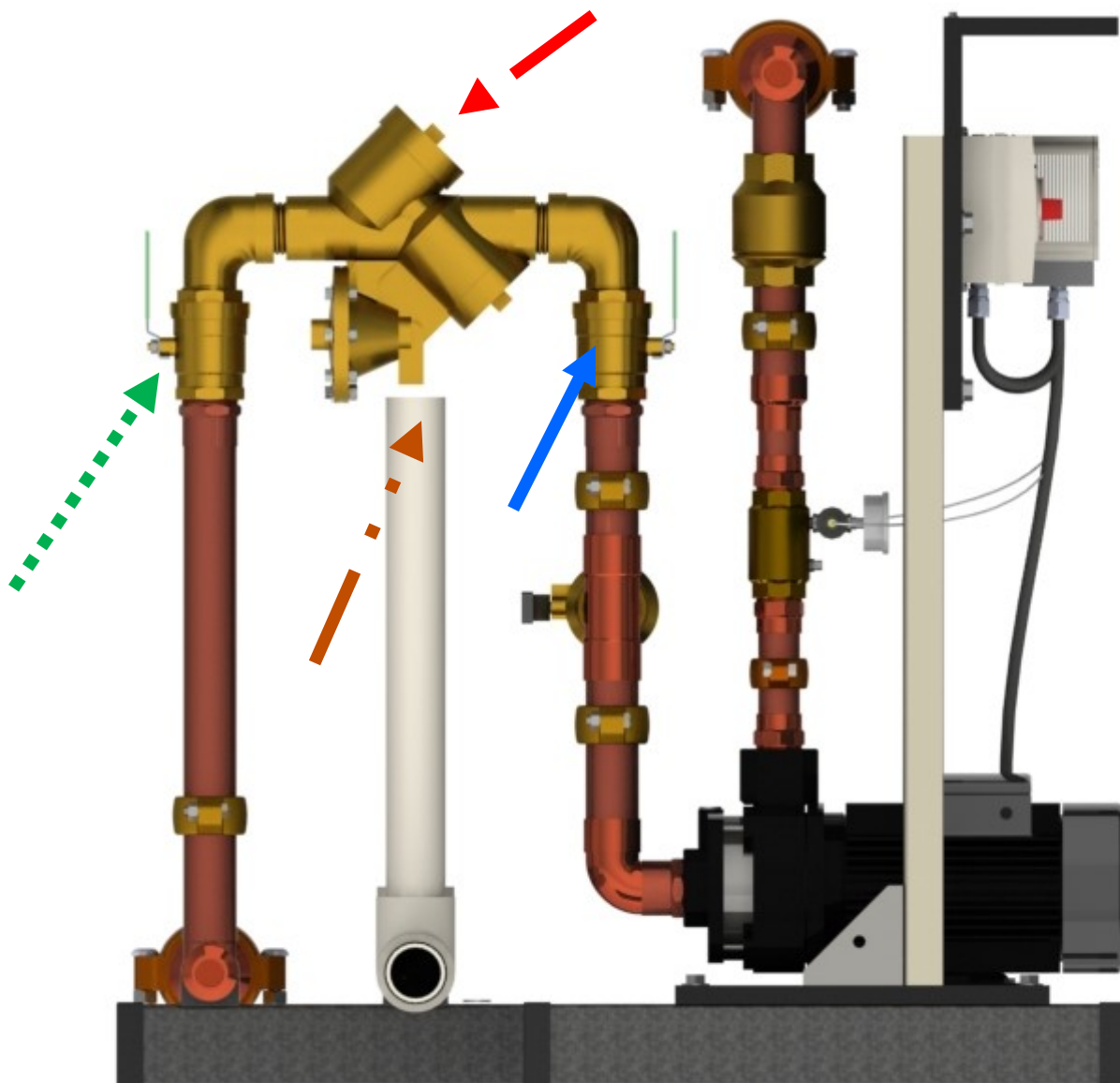
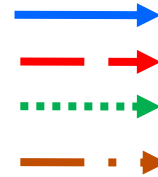


6. Flush system

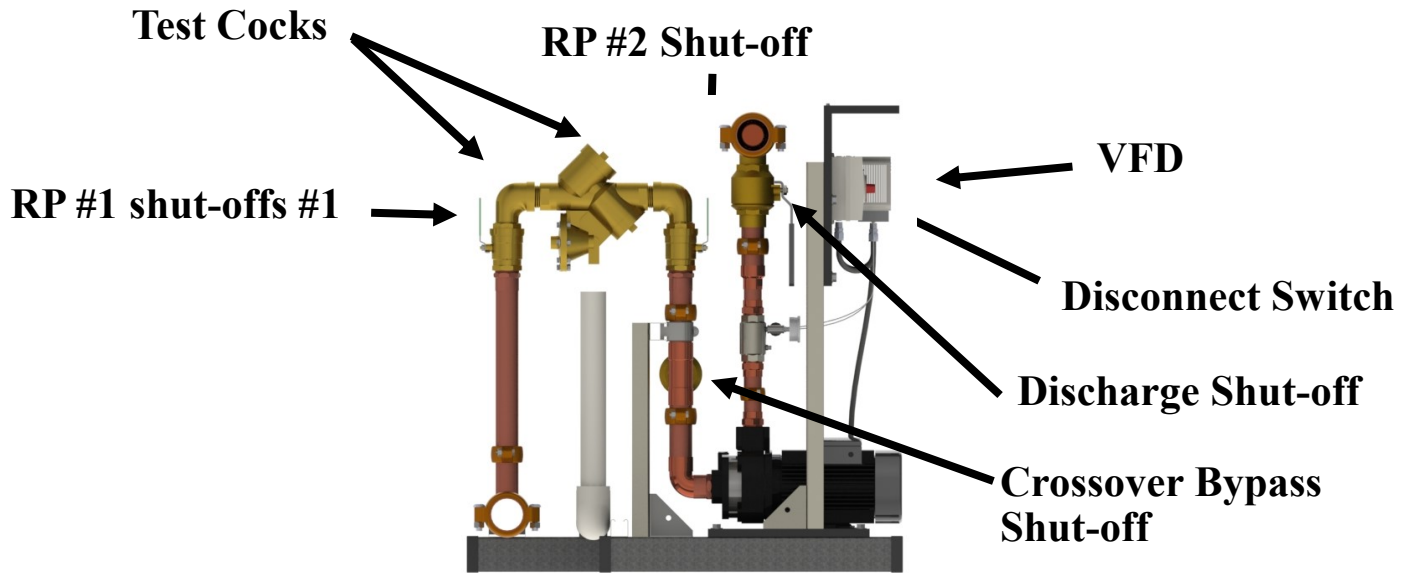
Piping tends to accumulate debris in the bottom. When the flow increases, the debris is stirred up and travels downstream; into the RP's and pumps.

The simplest method to flush incoming piping:

- 1) Close the RP's downstream (#2) shut-off valve
- 2) Remove the RP's first check & spring, tighten cover
- 3) Slowly open the RP's #1 shut-off valve
- 4) Water will discharge relief valve into DWV system



7. System START UP



Verify disconnect switches are OFF, and circuit breakers closed.

- A) FLUSH LINES IN ACCORDANCE WITH SECTION 6.
- B) Close ALL shut-off valves & BOTH RP #1 shut-off valves
- C) Exception: Leave the crossover bypass shut-off valve OPEN.
- D) Ensure ALL RP test cocks are shut.
- E) Pick one side to open. Slowly OPEN in order:
 - 1) Slowly open RP #1 Shut-off valve a crack.
 - 2) When water stop flowing, open/close test cocks to bleed air.
 - 3) Open RP #2 Shut-off valve a crack. When water stop flowing,
- F) Open all valves 100% EXCEPT THE DISCHARGE SHUT-OFF VALVES.
- G) Crack fixtures open on top floors to bleed air.
- H) Crack open the Discharge Shut-off valves to SLOWLY fill building.
- I) Turn on pumps:
 - 1) Open circuit breaker to first pump.
 - 2) Turn ON disconnect switch
 - 3) Press VFD's AUTO button
- J) Close fixtures on top floors after air is exhausted.
- K) Pump should ramp up, enter "BOOST" mode, then stop and read "SLEEP".
- L) Press VFD's OFF button
- M) Repeat (E-J) on second (third) pump
- N) After 2nd pump enters SLEEP mode, turn first pump ON.

Both pumps should now be on.

- The 2nd pump is now the lead pump (for 24 hours of run time), and the AUTO button should have a small solid/ blinking green light.
- The 1st pump is now the standby pump, and the AUTO button's green light should be blinking.

The 2nd pump will remain the lead pump for 24 hours of run time, OR if the 2nd pump is turned OFF, the 1st pump will automatically become the lead pump.

8. System Start-up (continued)

The Programming and Keypad are the same for both the standard NEMA1 & NEMA4X Yaskawa VFD's.

NOTE: The VF Drive is factory preset. DO NOT change the settings in the VF Drive.

Make the necessary power connections based on the type of power (220V / 480V).

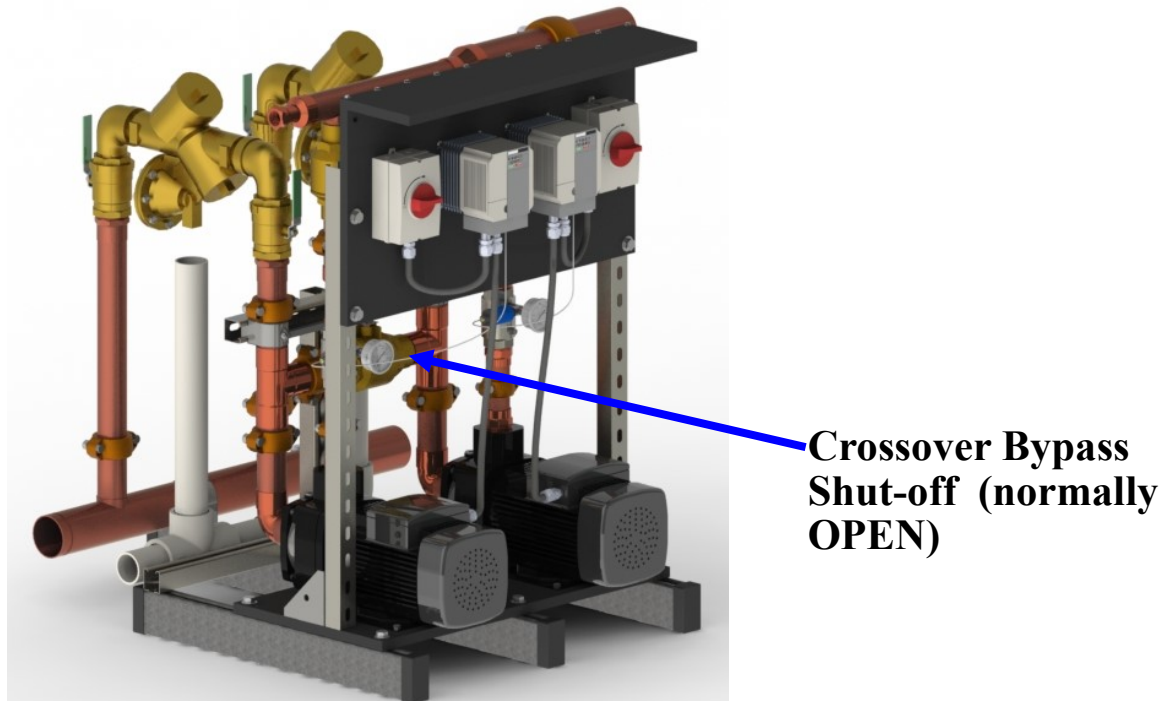
System Start-up:

- Turn on circuit breaker for 220V OR 480V pump system.
- Turn the disconnect switch to the ON position.
- Once power is provided, pump will start automatically.
 1. If Pump System does not turn on automatically, open a faucet or fixture and press the AUTO button. Pump will start up because there is demand for water.
- Close faucet. Pump will automatically stop and enter “sleep” when there is no water demand.
- You are ready to enjoy great water pressure.



***** CONTACT TOWLE WHITNEY PRIOR TO MAKING ANY PARAMETER ADJUSTMENTS *****

9. RP testing / Maintenance

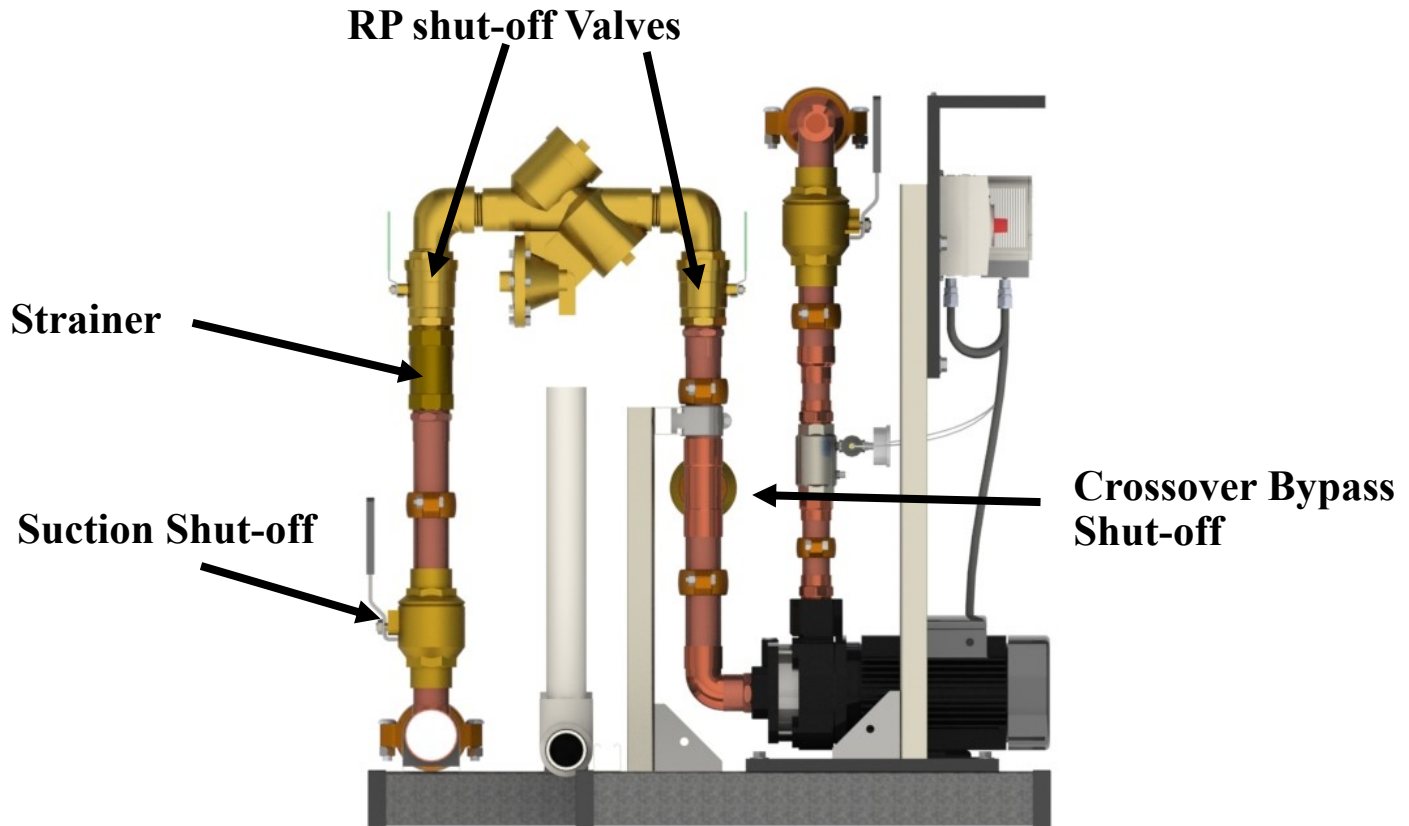


The benefits of testing two parallel RP's:

- Building's water supply DOES NOT NEED TO BE SHUT DOWN.
- Occupants do NOT need to be notified.
- Pumps do NOT need to be turned off.
- Either pump can run while testing.

- A) Pick one RP to test.
- B) Ensure CROSSOVER BYPASS SHUT-OFF valve is OPEN.
- C) Follow local protocol for testing RP.
- D) Repeat on other side.

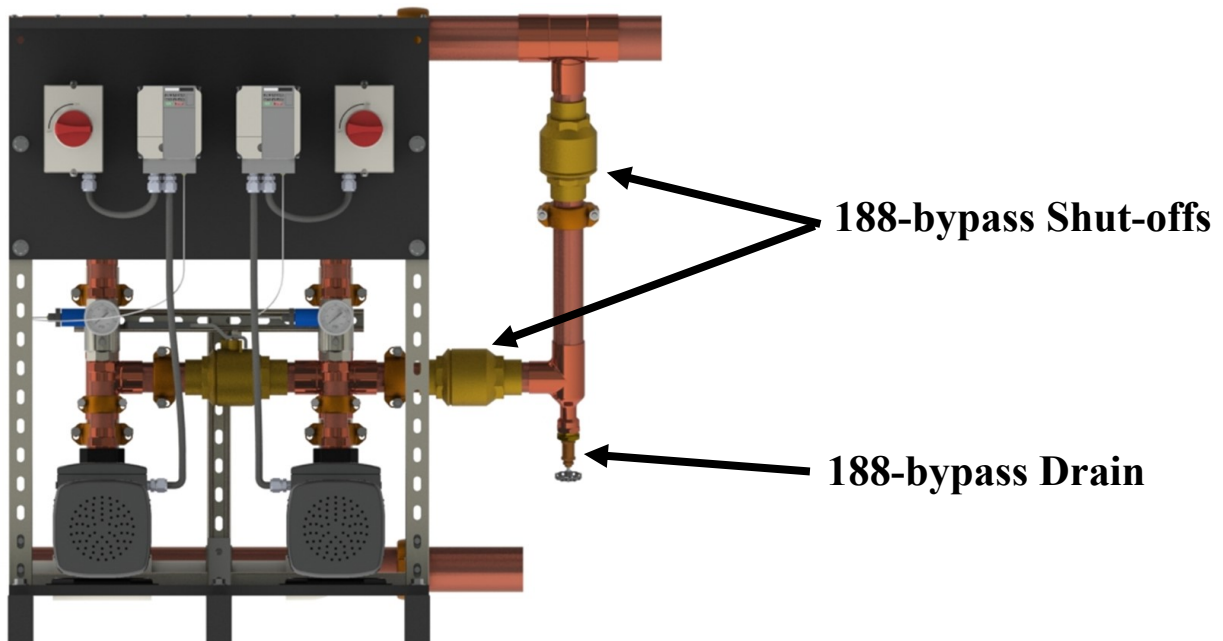
10. Strainer (optional equipment)



Strainers are an **OPTIONAL EQUIPMENT** that **MUST** be cleaned on a regular basis to ensure **PROPER OPERATION OF THE PUMPS**. This is easiest done when RP's are tested.

- A) Pick **ONE** Strainer to **CLEAN**. The other strainer/RP will be left alone.
- B) Close both RP shut-off valves on first side.
- C) Close Suction Shut-off valve.
- D) **SLOWLY** remove strainer cover to let off pressure. Then **remove and clean basket**. (a small residual amount of water will drain from cover).
- E) Replace basket and tighten cap.
- F) Crack open Suction Shut-off valve.
- G) Crack open #1 RP shut-off, then #2 RP shut-off. Then open fully.
- H) Repeat on 2nd (3rd) strainer.

11. Pump 188-Bypass (optional equipment)



Pump Bypass is used when PUMPS ARE NOT OPERATING.

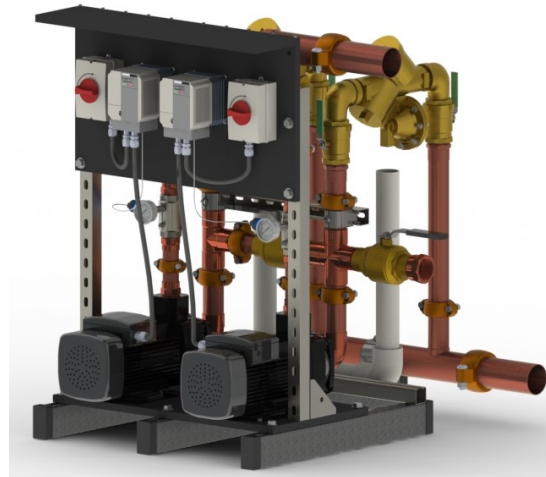
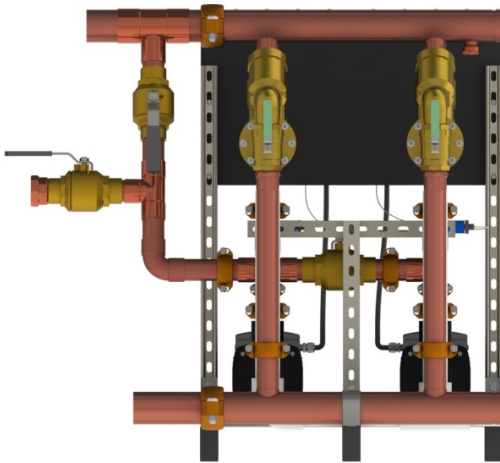
To ensure the long-term sanitary condition of the bypass, in accordance with ASHRAE 188 guidelines:

- the bypass's shut-off ball valves should be **NORMALLY CLOSED**.
- The drain valve may be left open

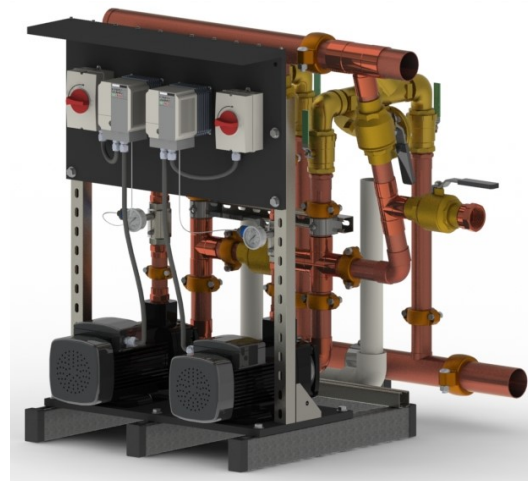
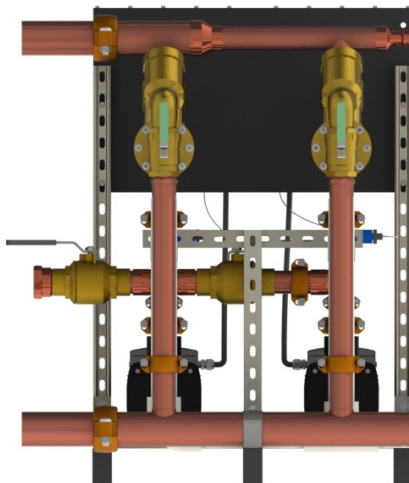
12. Low Pressure Port (optional equipment)

- A LPP (low pressure port) is located between the backflow preventers and the pumps. The LPP is used to supply low pressure water, typically for an irrigation system or to supply the first floor or two of a multi-floor building.
- The location of the LPP is dependent on whether or not a bypass is specified.
- The LPP includes a 2" shut-off ball valve.
- Unlike the 188-bypass, the LPP creates constant flow through the bypass, which eliminates a second isolating valve and drain is not needed.

LPP with bypass



LPP with-OUT bypass



800-807-9827

21 Londonderry Turnpike, Hooksett, NH 03106

towle-whitney.com

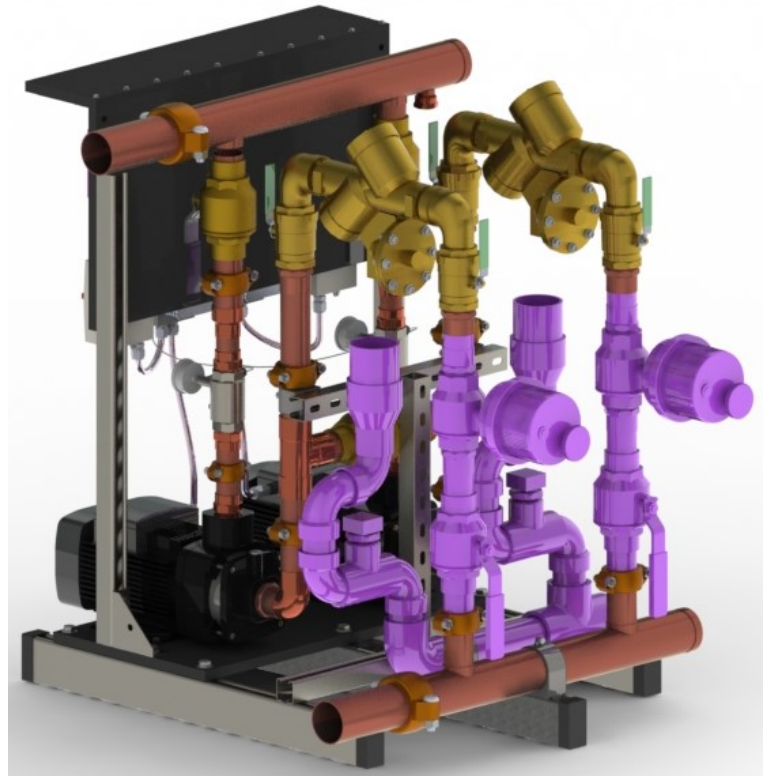
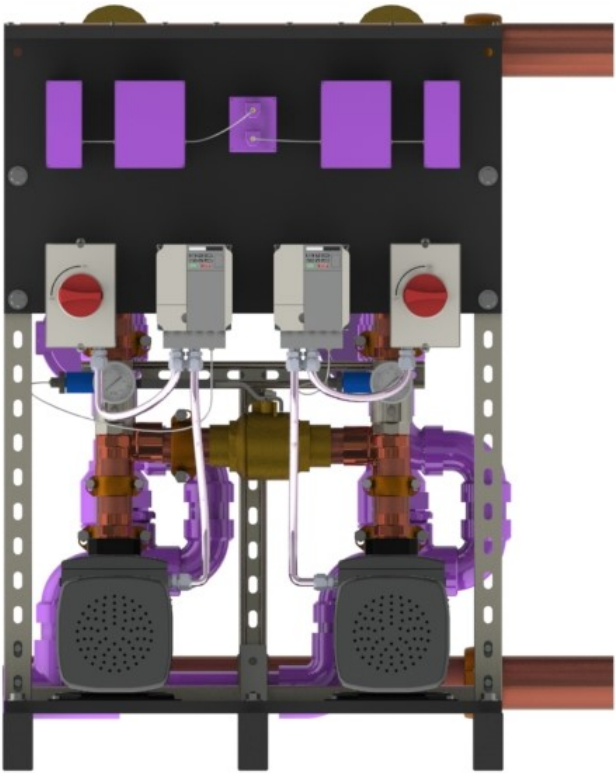
info@towle-whitney.com

13. Copper DWV (optional equipment)



Certain codes require the use of copper DWV.

14. Flood Control (optional equipment)



Flood Control (purple) is necessary in certain applications.

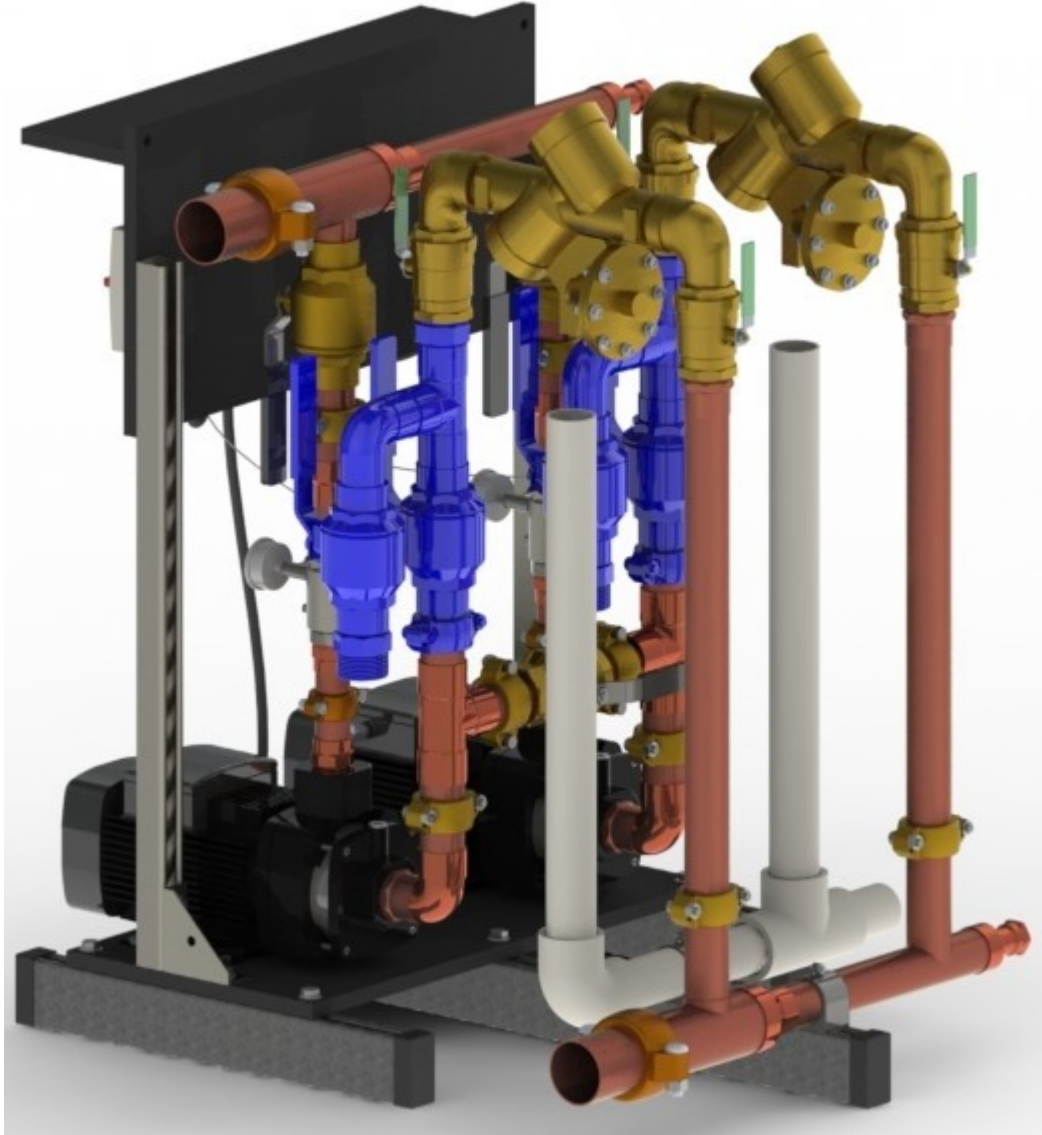
If the RP has a catastrophic failure, the RP can dump 125+gpm, which can overwhelm most floor drains.

Each RP is equipped with an independent Watts SentryPlus Alert flood control systems.

The flood control will only shut-down the affected RP, which allows the water to travel into the building through the unaffected RP(s).

For more detailed Installation, Operation, and Maintenance, please consult the Watts SentryPlus Alert IOM.

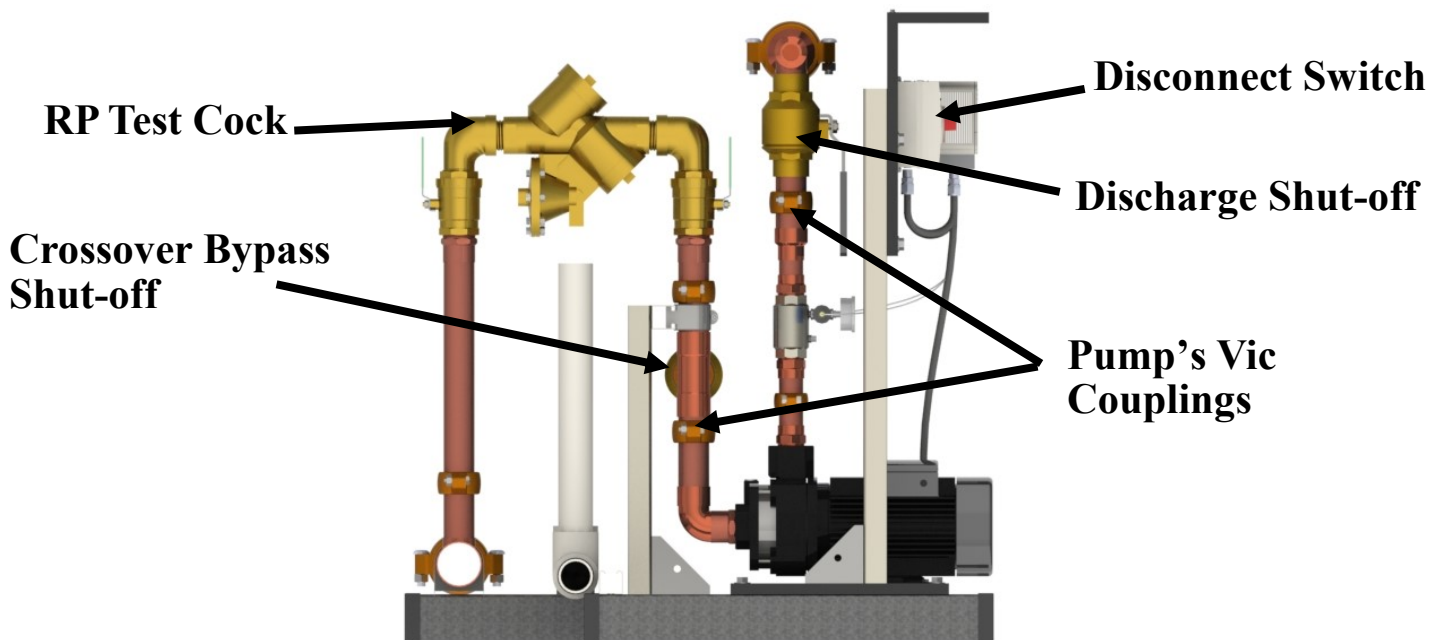
15. Water Meter test TEE (optional)



Certain codes (NYC) require the installation of a test tee and shut-off valve **AFTER** each RP.

Perform meter test in accordance with local guidelines.

16. Pump Maintenance



For any pump maintenance work, verify pump's disconnect switch is OFF, and breaker closed. Tag-out as required by local codes.

- A) To ISOLATE pump, **CLOSE and TAG-OUT** shut-off valves around pump to be repaired, including
 - 1) RP shut-off valves
 - 2) Crossover Bypass Shut-off
 - 3) Discharge Shut-off.
- B) Disconnect pump and remove using pump's Victaulic couplings.
- C) Refer to specific pump manufacturers IOM

17. Troubleshooting

Short Cycling

Issue

Pump turns ON / OFF every few minutes / seconds.

Solution

- Check for leaks in the line going from the pump to the building.
- Turn OFF the shut off 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.
- The pump continues to run after the shut off valve is OFF, ensure that water is not leaking back through the check valve on the suction side of the pump by turning OFF the shut off valve.
- The pump is governed by the controller which receives a pressure drop signal from the transducer. If there is a drop in pressure the pump will turn ON to increase the pressure up to the set point.

Constant Operation

Issue

Pump operates constantly without any demand for water

Solution

- Air may be present in the line going from the pump to the building. Open faucets to purge air. 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 setpoint and cause it to operate continuously.

Shaft Noise

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.

Issue

Power Outage

- Once the power is restored, the pump will resume normal operation.

Solution

- If Pump System does not turn on.
 - Turn Pump System OFF using appropriate circuit breakers.
 - Wait 5 minutes for the VF Drive capacitors to discharge.
 - Turn system ON and push the AUTO button on each drive.

Issue

Interruption of incoming water supply

- The VF Drive will trip and shut Pump System down to prevent the pumps from running dry.

Solution

- Once the water supply is restored.
 - Turn off the Pump System using appropriate circuit breakers.
 - Wait for 5 mins for the VF Drive capacitors to discharge.
 - Turn system ON and push the **AUTO** button on each drive.

18. Towle Whitney LLC GEN5 PLATFORM Start-Up Sheet

Project:

Signature:

Date:

Name:

This check-off sheet is intended to be an overview, and may NOT cover all local building, electrical, and plumbing codes which must be followed while installing and operating a booster pump system.

This check-off list covers a standard GEN5 PLATFORM.

Refer to OPTIONAL EQUIPMENT pages for non-standard installations.

Booster system MUST be protected from the elements and any adverse environmental conditions.



1: Ensure all electrical connections are per local code. Verify voltage and phase. *Note: All pumps are three phase. Amperage requirements shall be taken from the VFD nameplate.*

- Each Disconnect Box must be installed on an independent circuit.
- For alternate wiring, please contact Towle Whitney.

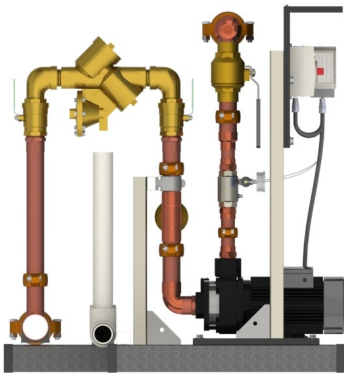
2: Ensure all plumbing connections are per local code, and tight. (including all RP test cocks (#1 thru #4.)

3: RP second check valve covers were loosened and drained prior to shipment. Ensure cover is tight.

4: Ensure pneumatic expansion tank is installed on the discharge manifold of the system using the port provided. Tank's air pressure must be:

- Set with no water pressure against it
- Shall be 10psi LESS than system discharge pressure.

5: Follow direction in Section 7 to start-up system.



Enjoy great pressure and energy savings!