

# QT FLOW CENTER

## INSTALLATION INSTRUCTIONS

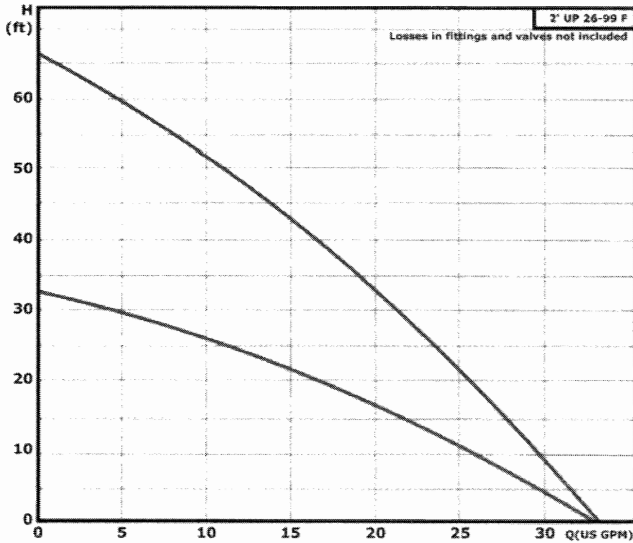


Fig. 1. 26-99 Pump Center Flow Chart

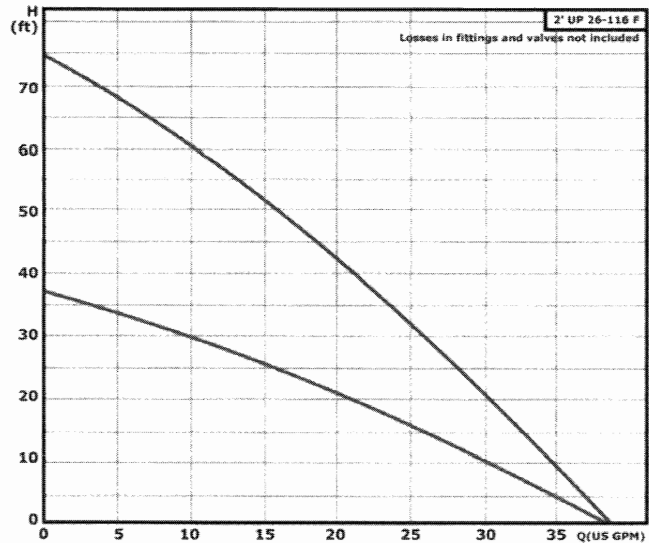


Fig. 2. 26-116 Pump Center Flow Chart

**NOTE :** Read the entire instruction manual before starting the installation.

### WARRANTY

The Flow Center is warranted for two years from date of sale. Alleged defective product must be returned to B&D Mfg., Inc. 901 9<sup>th</sup> Street, Scranton, Iowa 51462, for inspection via prepaid freight. Defective parts will be repaired or replaced at the manufacturer's discretion. No allowance for labor or property damage is implied. Warranty of performance is limited to the table provided with the unit and only when being used in a closed-loop, heat pump system. No warranty of performance is provided when pump(s) are provided by others.

### INTRODUCTION

These instructions cover the installation of the QT Flow Center Part No. 1-230QFC and 2-230QFC. The QT Flow Center is a prepackaged pumping station to be used with closed-loop, ground source heat pumps. The package contains a water vessel, an air-eliminating dip tube, a pump protecting check valve, pump(s), and ball valves that allow the pump(s) to be removed for service without loss of fluid to the system.

### SAFETY CONSIDERATIONS

Installing and servicing of air conditioning and heating equipment can be hazardous due to system pressures and electrical components. Only trained, qualified personnel should install, start-up, and service this equipment.

Untrained personnel can perform basic maintenance functions such as cleaning coils or cleaning and replacing filters. All other operations should be performed by trained service personnel.

When working on the equipment, observe precautions in the literature, tags, stickers, and labels attached to the equipment and to any other safety precautions that apply.

Follow all safety codes. Wear safety glasses and work gloves.

## INSTALLATION

Before installing the QT Flow Center, check the flow charts and loop table against your system flow and pressure drop characteristics to be sure you have selected the correct flow center for your system. A one-pump QT Flow Center can accommodate flow for 3½-ton units and smaller. (See Fig. 1) A two-pump QT Flow Center can accommodate flow for 3½-ton through 6-ton units. (See Fig. 2) To ensure adequate flow, the selection must be made based on your specific system design.

The Flow Center must be located between the heat pump and the ground source system heat exchanger. Location should be selected on the basis of ease of installation and future service. The Flow Center can be floor-mounted and/or if necessary, wall hung as field conditions require. The Flow Center is used for filling, flushing, air elimination, adding anti-freeze, and operating the system. The Flow Center should never be pressurized.

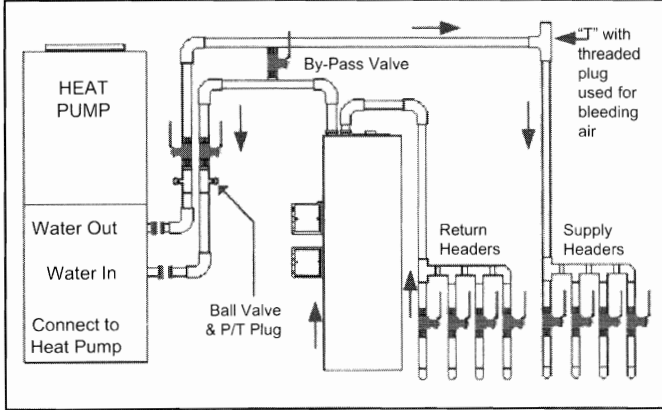


Fig. 3. Piping Schematic For Maximum Flexibility (Required With Internal Headers).

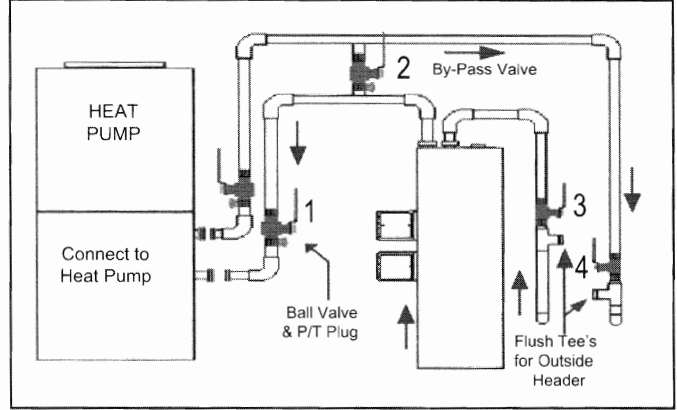


Fig. 4. Simplified Schematic (May Be Used With External Headers).

The recommended piping schematic is usable with all types of closed-loop, ground source heat pump systems, vertical bore holes, horizontal loops, slinky, outside headers, or inside headers. This recommended method allows for isolating the heat pump or the loop field for separate flushing and purging. Additionally, the flow through the loops can be reversed, which may be required when using external headers.

**NOTE:** The QT Flow Centers are designed to work with only one heat pump per loop field. More than one QT Flow Center on a common loop field will not work properly. Call B&D MFG, INC for information on equipment designed for multiple heat pumps.

Fig. 3 illustrates a simplified piping schematic that can be utilized when an internal header is used and separate purging of the heat pump and the ground loop is not required.

A tee with a threaded plug is located between the heat pump and the ground loop. This plug is used to bleed most of the air that was in the heat pump from the system, thus avoiding the need to pump it through the loops. Loops should not contain any dirt or debris prior to connecting to the Flow Center.

Fig. 4 shows typical piping for a system with outside headers.

Piping would be the same for all systems except for the number of pipes coming into the mechanical area. Install ball valves and P/T plugs where indicated. Ball valves should be the same size as the header. The Flow Center should be fastened to the wall with the bracket provided and all piping should be adequately supported. All piping should be sized for your particular system and adapted to the Flow Center at the inlet and outlet connections.

---

### PROCEDURE 1—FILL AND FLUSH A NEW SYSTEM

---

On systems where the ground loop has been filled and flushed by the well-driller, skip to Procedure 3.

Ensure that all piping is installed according to one of the piping schematics.

**NOTE :** Incorrect piping may not eliminate the air pockets.

1. Open the top of the canister and fill with clean water.

2. Open the ball valves on both sides of the pumps.
3. Remove the screw on the end of the Grundfos Pump motor and rotate the motor shaft with a small screwdriver. This vents air out of the pumping chamber and lubricates the motor bearings. When water appears at the screw opening, replace the screw.
4. Close all loop header valves except one pair (See Fig. 3).

NOTE : Before proceeding, be sure there is sufficient water available to fill the system without stopping the pumps or allowing the canister to run out of water.

5. Start the pumps and add water through the open top of the canister until a full stream of water is coming back to the canister, or use flow meter tool for ease of seeing the water flow in a full stream back into the canister.

---

CAUTION : To prevent damage to the pumps, only add potable water to the Flow Center.

---

6. When the first loop is full, close the loop valves and open the next pair of valves to fill/flush the second loop. Follow the same procedure to fill/flush all loops.
7. When the last loop is full and flushed, open all loop valves to the Flow Center. Water will now circulate through the entire ground source system and the Flow Center.

---

#### PROCEDURE 2—FLUSH AN EARTH LOOP WITH A BURIED MANIFOLD (OPTIONAL)

---

1. Refer to Fig. 4, close valves 3 and 4.
2. Follow sheet sent with flush cart (How to Flush a Earth Loop with a Buried Manifold).

#### SYSTEM READY

The complete system is now operational and ready for testing. Use the flow meter tool, Part No. 1-WFT17, which slips over the inlet pipe inside the Flow Center. Read the actual flow rate being pumped through the Flow Center. By closing all the loop valves but one pair, an actual flow rate can be read on the meter for each ground loop. This will assure that all loops are flowing without any air blockage. Remove the flow meter, but let the pumps run while other tasks are being completed on the job. The Flow Center will continue to eliminate any small air bubbles that remain in the system.

---

#### PROCEDURE 3—ADD ANTIFREEZE

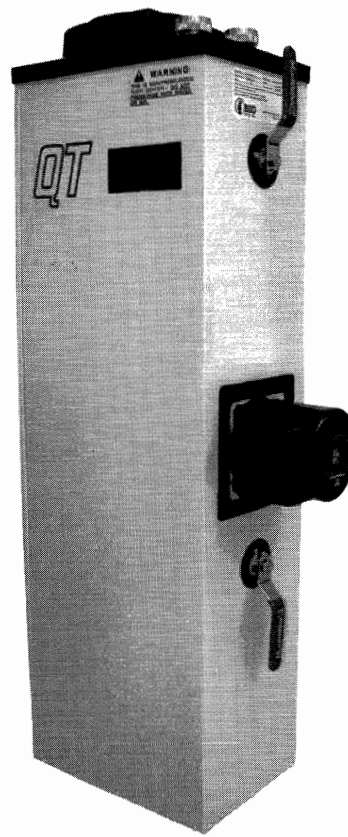
---

Anti-freeze may be added at any time.

1. Calculate the correct amount of antifreeze for the system and dilute if necessary for good circulation.
2. Attach flow meter tool, place flow meter return tube into separate bucket. Activate pumps. Use the pump's valve to gradually interchange fluids. At the same time, start adding the antifreeze through the top of the canister.
3. When the correct amount of anti-freeze is added, shut pump off. Place flow meter tool return tube back into the canister and reactivate the pumps, continually running them to circulate and mix the antifreeze. Continue adding all of the antifreeze into the pumping chamber.
4. Top off the pumping chamber with water or anti-freeze and close the canister top, hand tight only. DO NOT over-tighten top as it will be difficult to remove for future service and causes damage to the Flow Center. A coating of petroleum jelly on the threads will help in removing the top for the next inspection.



MODEL 2-230 QFC  
Weight: 55 lb.



MODEL 1-230QFC  
Weight: 40 lb.

Electrical: 1/60/230V

Insulation: Foam Cabinet

Approx. Volume of Fluid: 4.5 gal.

H=35" L=15"

LETTER AFTER MODEL NUMBER FOR PUMP NEEDED: G=2699 M=26-116

---

#### PROCEDURE 4—START-UP

---

1. By using the flow meter tool, monitor the gallons per minute (gpm) being pumped through the entire system. If the flow is not correct, double check that the proper Flow Center has been selected for the application. If the pumping curves from Fig. 1 and 2, confirm that the Flow Center is correct, then there is air in the system preventing full flow throughout the Flow Center and you must purge the system again. Any remaining air will normally be eliminated over a 24-hour period.
2. Air elimination on inside headers is simply done by re-purging each loop through the Flow Center and adding water as needed. On outside headers, it is best to let the Flow Center run. Open valve No. 2 to bypass the heat pump. This will provide additional pressure on the ground loop and help remove air. Air will continue to be eliminated through the Flow Center until all air has been eliminated.

NOTE: If the water level inside the canister changes after the pumps are turned off air is present in the system. Continue to purge the system until all air is removed.

---

**CAUTION** : For proper operation, water must be added as air is eliminated. The amount of water will be in proportion to the amount of air eliminated.

---

3. After all air has been eliminated and full flow established, close valve No. 2 to place the system back into full operation.