

MULTIZONE FLOW CENTER

INSTALLATION INSTRUCTIONS

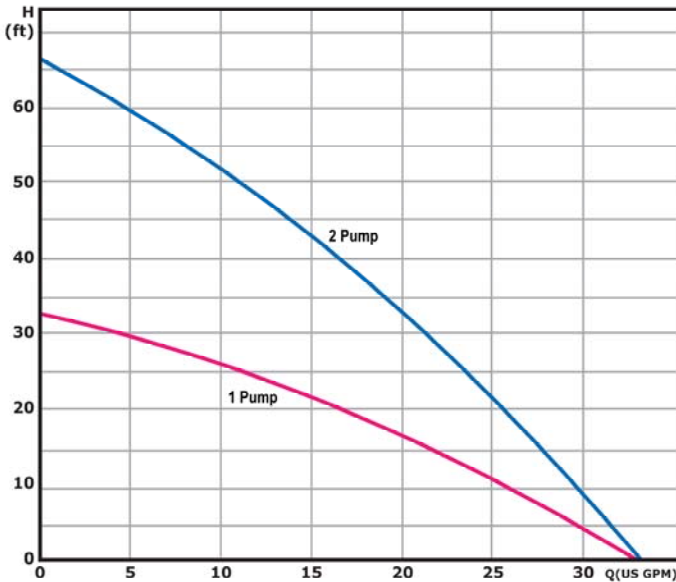


Fig. 1. Low Head Pump Center Flow Chart

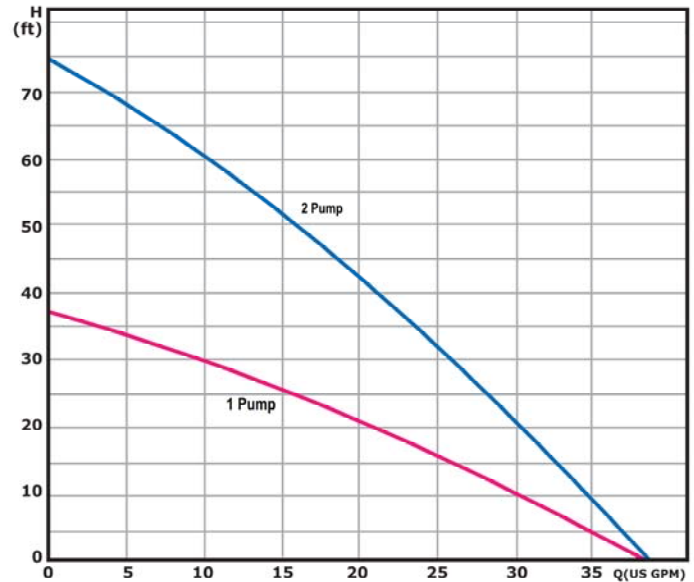


Fig. 2. High Head Pump Center Flow Chart

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

WARRANTY

This flow center is warranted for two years from date of sale. Alleged defective product must be returned to B&D Mfg., Inc., 901 9th 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 Multizone Flow Center Part No. CFCB-XXXX-XX and CFCC-XXX-XX. The Multizone 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

ELECTRICAL INFORMATION

See the Manufacture tag for the for electrical information to make sure you are supplying the correct voltage. Improper voltage may cause damage to the flow center pumps and void the warranty. Refer to the Geothermal Heat Pump manual on the proper location to wiring the pump(s).

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

The Multizone is designed to work with up to four heat pumps or four heat pump circuits. Each pumping circuit shall be checked with the performance curves (See Fig. 1, 2 & 3). To ensure adequate flow, the selection must be 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 is used for filling, flushing, air elimination, adding anti-freeze and operating the system. This flow center should never be pressurized.

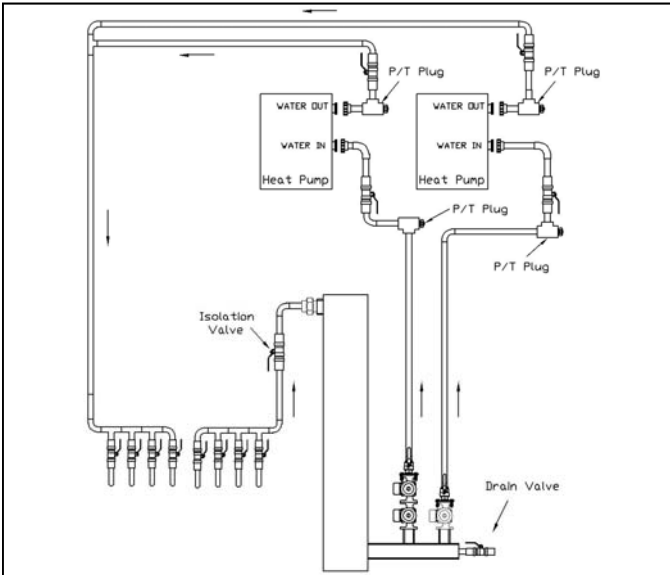


Fig. 4. Recommended Schematic (For Use With Internal Headers)

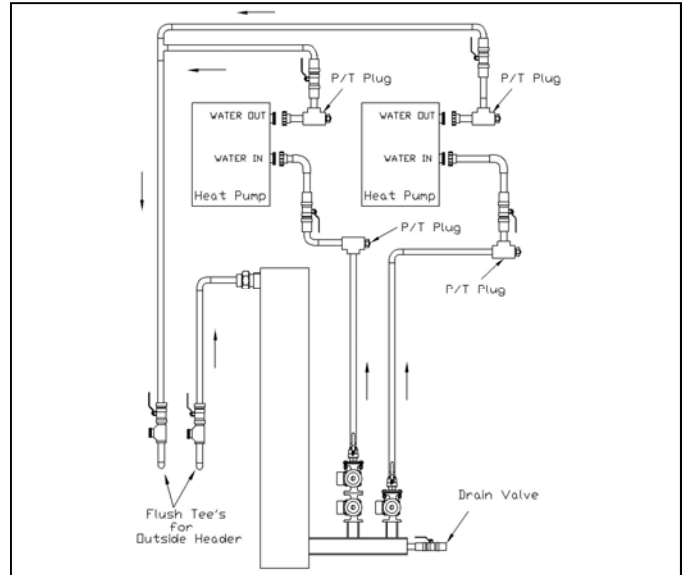


Fig. 5. Recommended Schematic (For Use with Underground Headers; Flush Cart Required)

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 Multizone Flow Centers are designed to work with one common loop field. More than one flow center on a common loop field will not work properly.

Fig. 4 Illustrates a recommended 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.

NOTE: Loops should not contain any dirt or debris prior to connecting to the flow center.

Fig. 5 Illustrates a recommended piping schematic for a system with underground headers.

Provide ball valves and P/T ports where indicated. Ball valves shall be the same as pipe size or greater. The flow center should be fastened to the wall with the bracket provided and all piping should be adequately supported. All piping shall be properly sized for the flow rate (GPM) required by the system. Reduce pipe size only at flow center and heat pump as necessary to make connections.

PROCEDURE 1—FILL AND FLUSH A NEW SYSTEM

NOTE: Incorrect piping may not eliminate the air pockets.

1. It is recommended that the loop field is filled, flushed and purged with a flush cart.

NOTE: Properly isolate the flow center with a valve before and after the canister prior to flushing and purging the loop field.

2. Open valves on flush tee's before operating pumps on the flow center.
3. Open the top of the canister and fill with potable water.
4. Open the ball valves on both sides of the pumps on each circuit.
5. 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.

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.

6. Start the pumps and add water through the open top of the canister until a full stream of water is returning back to the canister, or use a flow meter tool to determine the flow rate back into the canister.

CAUTION: To prevent damage to the pumps, only add clean potable water to the flow center.

PROCEDURE 2—ADD ANTI-FREEZE

Anti-freeze may be added at any time. *(Flush cart is recommended.)*

1. Calculate the correct amount of anti-freeze for the system and dilute if necessary for good circulation.
2. Attach flow meter tool to the return tube on the flow center and place the discharge of the flow meter tool into separate container. Operate the flow center while using the isolation valve above the pump to control the amount of water discharged into the container. At this point, you can begin adding the anti-freeze through the top of the flow center. This will allow you to estimate how much anti-freeze is being added to the system.
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 anti-freeze.
4. Finish filling flow center to the bottom of the elbow on the loop side with water and/or anti-freeze and close the canister cap hand tight only. DO NOT over tighten cap as it will be difficult to remove for future service and cause damage to the flow center. A coating of petroleum jelly on the threads will help in removing the cap for the next inspection. Use a flow center wrench (Part 1-FCW) when removing lid to prevent damage.

PROCEDURE 3—START-UP

1. By using the flow meter tool, monitor the flow (GPM) being pumped through the entire system. If the flow is not correct, check that the proper flow center has been selected for the application using curves from Fig. 1 and 2. If the pump curve indicates the proper flow center was installed and the GPM is less than the system requires, an obstruction in the system is restricting flow.

NOTE: Remaining air will normally be eliminated over a 24-hour period.

2. On outside headers, it is best to let the flow center run. Open valve (if equipped) to bypass the heat pump. This will provide additional pipe velocity on the ground loop and help remove air. During normal operation air will continue to be eliminated through the flow center.

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.



LETTER AFTER MODEL NUMBER FOR PUMP NEEDED: **G**=2699-3 Speed(230V) **M**=26-116 **B**=NRF36

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.

SYSTEM READY

The complete system is now operational and ready for testing. Use the flow meter tool (Part 1-WFT40) 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 indicate that all loops are flowing properly. If any loop shows a significant reduction of flow an obstruction may be present in the loop. Remove flow meter from the flow center canister and allow the pumps to run continuously for 24 hours. The flow center will continue to eliminate any small air bubbles that remain in the system.

WARRANTING

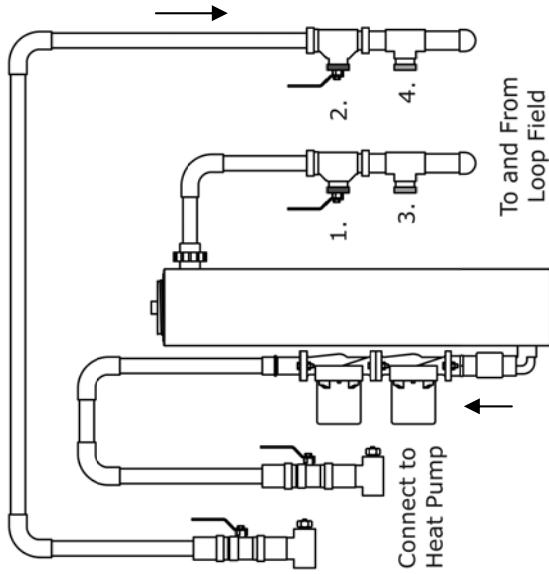
DO NOT USE A

FLUSHO-CARTON

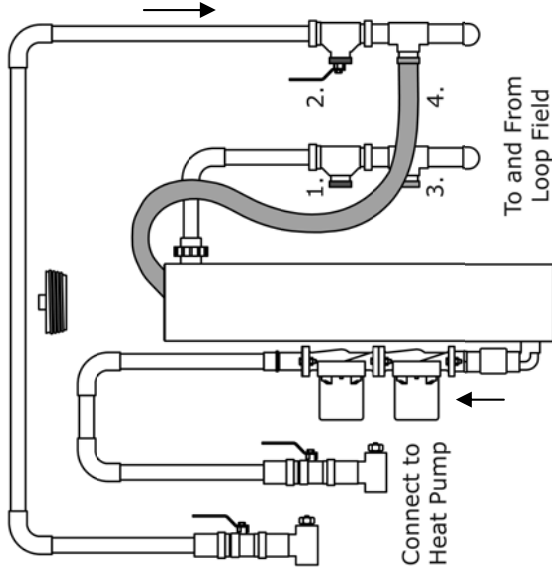
**GT,[®] QT,[®] EA,[®] XT
OR QT-EA**

How to Flush an Earth Loop with a Buried Manifold

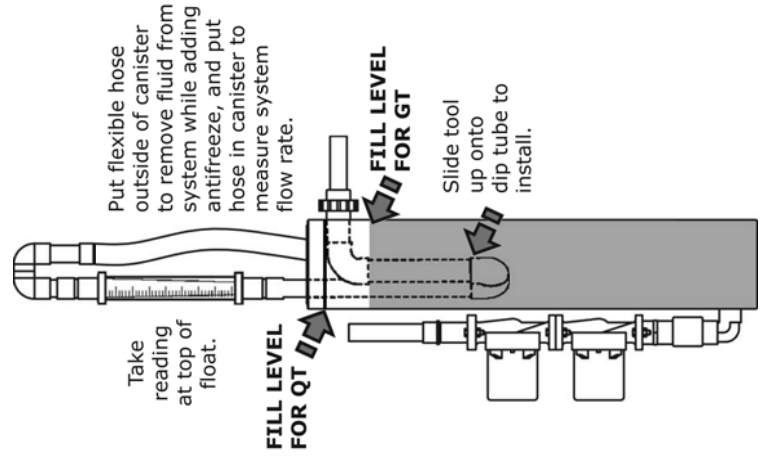
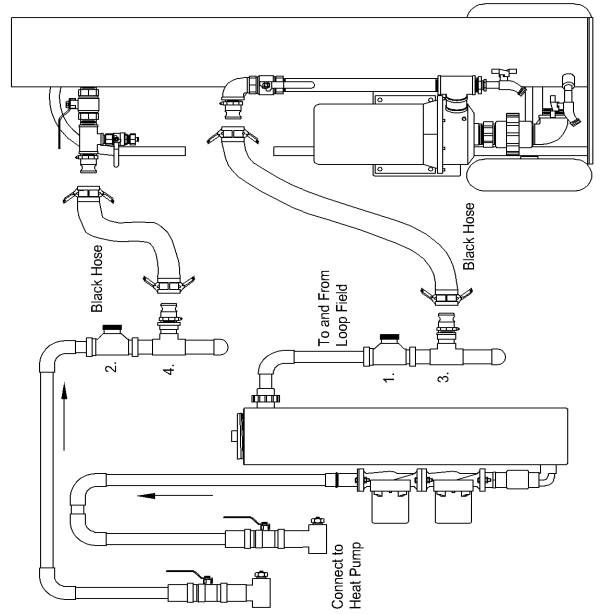
1. Close valves (1.) and (2.), located on lines to and from the loop field.
2. Remove screw caps from tees (3.) and (4.), then connect flush cart hoses to 1" MNT.
3. Flush and purge loop field thoroughly with flush cart.



- the GT®/QT® flow center pump(s).
7. Close valve (2.) and disconnect hose from tee (4.); screw cap back on.
 8. Open valve (1.) and (2.); start system.



4. Disconnect hoses from tees (3.) and (4.) Put cap back on tee (3.).
5. Connect 1" clear hose with swivel connector to tee (4.), put hose into top of flow center.
6. Open valve (2.) and turn on flow center; flush inside piping and heat pump with



9. Any small amounts of air remaining in the system will become trapped and isolated in the GT®/QT® flow center.
10. Check the flow with a flow meter tool. Fill flow center to bottom of dip tube elbow on a GT® flow center or to the top of the elbow on a QT® flow center.