

## Water Source Heat Pumps – Field Installed Loop Pump Module



Single pump module



Dual pump module

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### Receiving & Safety

#### Inspection

Upon delivery, inspect shipment for visible damage and document on the shipping papers.

Remove the module from the carton and inspect for damage. If the module shows signs of transit damage, file a claim with carrier promptly.

#### Safety

Prior to installing or servicing this loop pump module, please carefully read all instructions in this manual. Ensure that all installations are in complete accordance with applicable state and local codes. Owner should retain this manual after installation is complete.

#### **WARNING**

The installer must determine and follow all applicable codes and regulations. This equipment presents hazards of electricity, and sharp edges. Failure to read and follow these instructions can result in property damage, severe personal injury or death. This equipment must be installed by experienced, trained personnel only.

#### **CAUTION**

To prevent electrical shock, disconnect electric power to system at main fuse or circuit breaker box until installation is complete.



# Introduction

## Loop Circulating Pump Modules



Single pump module

Dual pump module

### Features

- Fully insulated cabinet eliminates condensation
- No assembly required
- All pump modules are leak tested
- Full flow 1-1/8" brass valves
- Standard 1" NPT connections
- Compatible with all industry components
- Functions smoothly and quietly
- Easy access to valves and circulators for ease of service
- 14-3/4" × 13-1/4" × 7" unit size makes for a compact unit
- Five year parts & labor warranty

### Loop Pump Modules Specifications:

#### Single Pump Geothermal Loop Modules

Module Dimensions:..... 14 3/4" × 13 1/4" × 7 1/8"

**All Circulators** ..... 1 Phase 60 Hz

**Cast Iron 230 VAC**

Load:..... Low 0.6A /Med 0.8A /High 1.2A

**Bronze 230 VAC**

Load:..... Low 0.6A /Med 0.8A /High 1.2A

#### Approved Liquid Solutions:

Methanol, Exoendosol, Propylene Glycol

#### Additional Information:

Minimum Valve Bore:..... 1-1/8"

External Piping Connections..... 1" NPT

Maximum Operating Pressure: .....150 PSI

Minimum Operating Temperature: .....0°F

Maximum Operating Temperature:.....225°F

Weight: .....34 lbs.

## Dual Pump Geothermal Loop Modules

Module Dimensions:..... 14 3/4" × 13 1/4" × 7 1/8"

**All Circulators** ..... 1 Phase 60 Hz

**Cast Iron 230 VAC** .....(2 pumps)

Load:..... Low 1.2A /Med 1.6A / High 2.4A

**Bronze 230 VAC** .....(2 pumps)

Load:..... Low 1.2A /Med 1.6A /High 2.4A

#### Approved Liquid Solutions:

Methanol, Exoendosol, Propylene Glycol

#### Additional Information:

Minimum Valve Bore:.....1-1/8"

External Piping Connections..... 1" NPT

Maximum Operating Pressure: ..... 150 PSI

Minimum Operating Temperature: ..... 0°F

Maximum Operating Temperature:..... 225°F

Weight: ..... 44 lbs.

### \*Loop Pump Module(s) Hose Kit Parts List

- 12 feet of 1" ID Reinforced Flexible Hose (1)
- Tapped Brass Heat Pump Adaptors (2)
- Brass Module Adaptors (2)
- Stainless Steel Hose Clamps (4)
- Pressure-Temperature Plugs – Permit pressure drop and temperature measurements (2)



*\* Hose kit not included with Loop Pump Module*

### Application

The circulator pumps in a geothermal loop circulate the liquid through a geothermal heat pump and the earth loop. This results in the transfer of heat.

The loop pump modules are designed to satisfy the fluid circulation requirements for most residential and light commercial closed-loop geothermal heating and cooling systems.

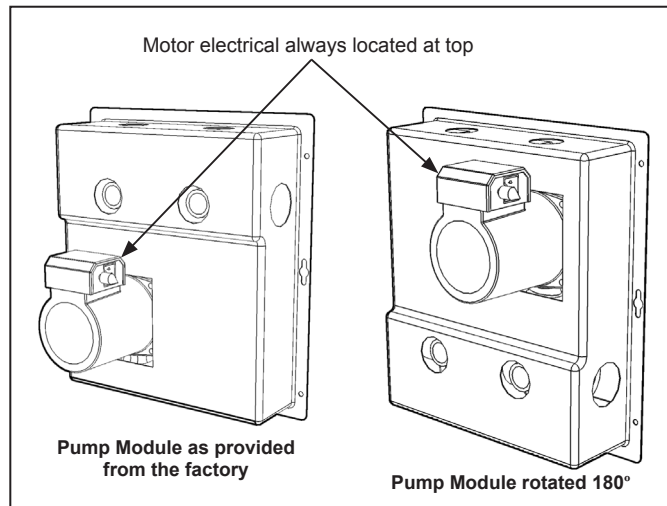
Consult your Daikin Sales Representative to determine which Loop Pump Module is required for a particular installation.



## Mounting The Module

Using the mounting holes provided, mount the module to a vertical surface as close to the heat pump as possible. The module can be mounted with the flow paths either vertical or horizontal.

**Figure 1: Pump Module Mounting Options**



## Piping The Module

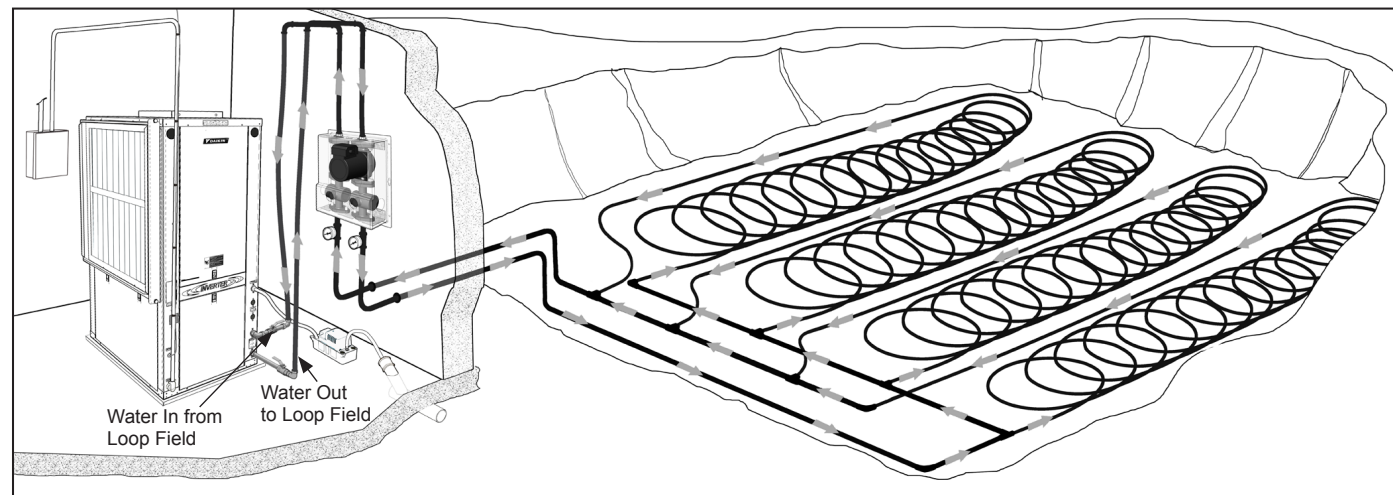
**Note:** 1. The following instructions illustrate the pump module mounted in the 180 degree rotated position.  
2. Always pipe the module so that the circulator(s) is (are) located between the module valves and the heat pump, never on the earth loop side of the valves. Flushing the earth loop through the circulator(s) could introduce unwanted debris into the pump.

Piping connections from the module to the heat pump are best made with a hose kit. Be sure to insulate the flexible hose where water condensation could be a problem.

Standard 1" NPT external water connections are provided to make connections with the earth loop piping. Follow the recommendations of the earth loop pipe manufacturer or IGSPHA (International Ground Source Heat Pump Association) when making these transition connections. Again, insulate the earth loop pipe indoors where water condensation could be a problem.

See Figure 2.

**Figure 2: Typical Ground Loop (Reverse Return) Application**



## Wiring The Module

Single pump or dual pump modules are available with 230VAC single phase circulator pump(s). Always check the circulator nameplate to confirm the correct voltage. Never make an assumption. Wire the module according to the instructions in [IM 1186](#). Follow all applicable electrical codes. Generally, the module should operate whenever the heat pump compressor operates.

## Flushing And Filling The System

### Step 1

Use water and a high-volume, high head circulator pump to flush all air and debris and fill earth loop system. Do not introduce antifreeze into the system until both the ground loop and the unit have been purged of air.

Refer to recommendations provided by IGSPHA when choosing a pump for the flushing process<sup>1</sup>. The pump must be capable of providing a water flow velocity of at least two feet per second.

It is recommended that pump suction should be from the bottom of a large volume container. Use a suction line strainer to prevent debris discharged into the container from being recycled to the system.

<sup>1</sup> [http://www.igshpa.okstate.edu/pdf\\_files/publications/IGSPHA2011StandardsSec.pdf](http://www.igshpa.okstate.edu/pdf_files/publications/IGSPHA2011StandardsSec.pdf)



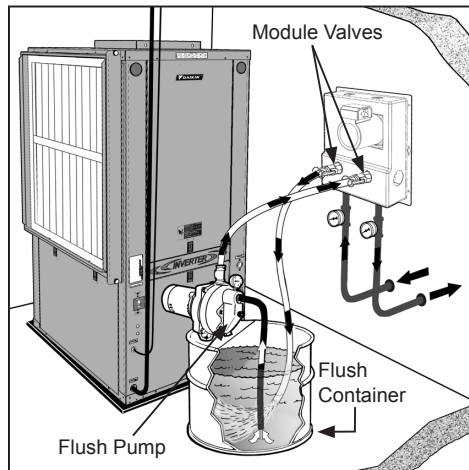
# Installation

## Step 2

Pump water into the system by connecting the pump discharge hose to one (not both) of the 1" NPT water connections located on the front of the module.

Connect a return hose to the opposite side of the the module to discharge debris, air and water as the loop is flushed. Check for air leaving the system by placing the return hose below the container water level (Figure 3).

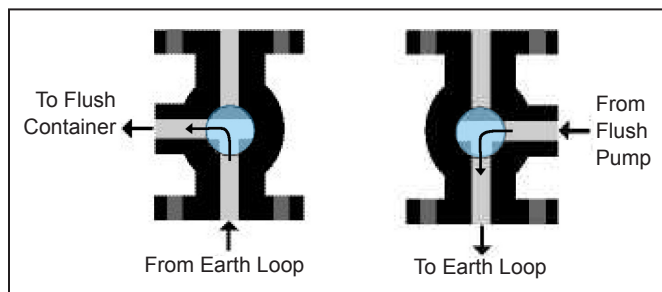
**Figure 3: Flushing The Loop**



## Step 3

Rotate the module valves as shown below:

**Figure 4: Rotate Valves as Shown**



## Step 4

Start the pump. Add anti-freeze and water to the container as needed so that no air enters the system (at first only air will come out of return hose, then air mixed with water, and finally nothing but water). If flushing pump assembly is equipped with valves to reverse flow direction through earth loop during flushing, do so occasionally to help remove trapped air. When air bubbles cease in the return hose container, the earth loop has been completely flushed.

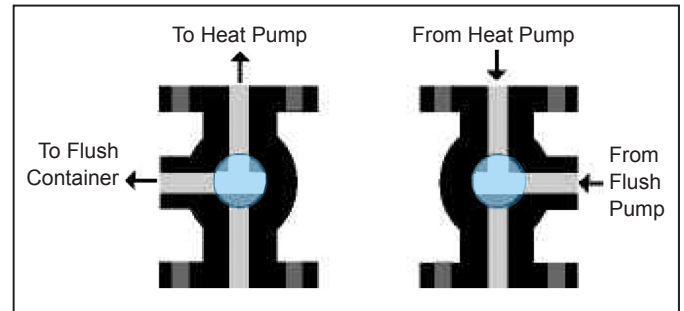
### **WARNING**

Do NOT use calcium as anti-freeze. This causes corrosion and voids pump warranty if used. Follow recommendations of IG-SPHA for the appropriate type and amount of anti-freeze.

## Step 5

Flush the heat pump. To do so, simply rotate valves as shown below while pump is running. Flush the heat pump using the same procedure as used to flush the earth loop.

**Figure 5: Step 5 Valves Positions**

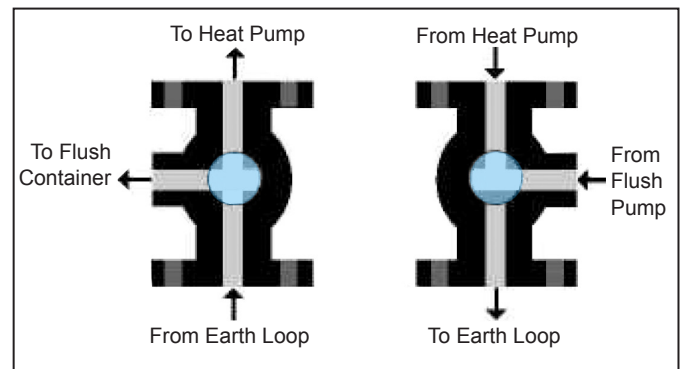


## Pressurizing The System

### Step 6

After flushing and filling the system, rotate the module valve discharging into the flush container as shown below, right.

**Figure 6: Step 6 Valves Positions**

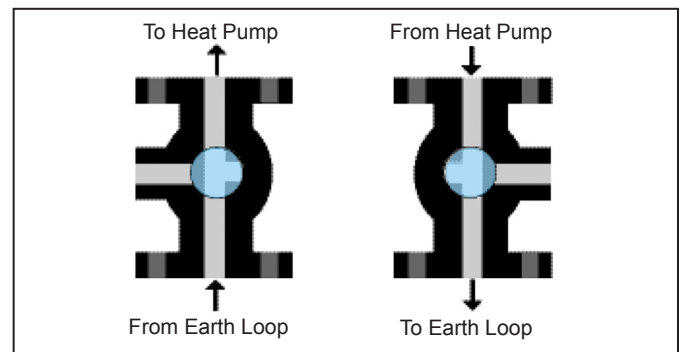


System pressure should increase rapidly as the flush pump works to force more water into the system. Flow into the container should cease.

Additional purging is necessary if the water level in the container falls.

This is evidence of air in the system that is being compressed. If purging has been successful, rotate the other module valve as illustrated in Figure 7.

**Figure 7:**





## Step 7

Turn off the flush pump. System should maintain pressure. Release excess pressure by rotating either module valve to allow a small amount of water to pass through and out of the system and into the container. Some initial loss of pressure can be expected and is due to the expansion of the earth loop pipe under pressure. This pressure will stabilize if the system has no leaks.

**Note:** System operating pressures are 10 to 40 PSI.

Protect circulators by maintaining positive pressure at all times.

## Step 8

If your module has a cabinet, put the module cover back in place.

## Step 9

Flushing, filling and pressurizing should be complete.

Now, start the loop pump module circulators.

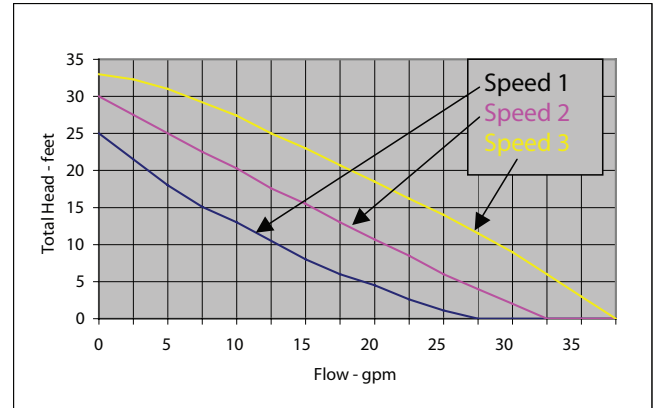
## Step 10

If for some reason the circulators are not operating, power off and diagnose the problem.

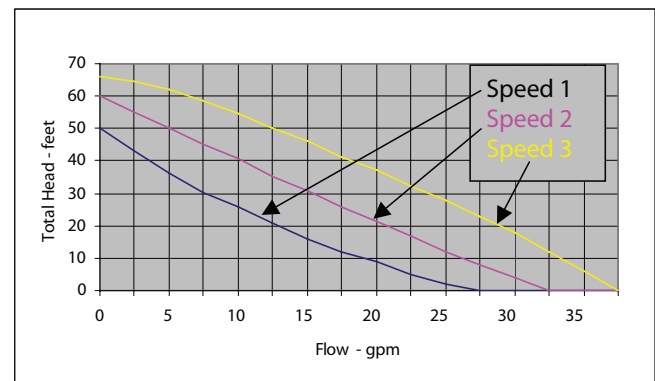
## Step 11

Using a single water pressure gauge, measure the pressure drop at the pressure/temperature plugs across the heat pump heat exchanger. Compare this measurement with the flow versus pressure drop data shown in Figure 3 on page 4 of IM 1160, to determine the actual flow rate. If the flow rate is low, recheck the selection of the loop pump module model for sufficient capacity. If the module selection is correct, there is likely trapped air or a restriction in the flow circuit.

**Figure 8: Single pump performance curve**



**Figure 9: Dual pump performance curve**



## Maintenance

Loop pump modules do not require routine maintenance.



### ***Daikin Training and Development***

Now that you have made an investment in modern, efficient Daikin equipment, its care should be a high priority. For training information on all Daikin HVAC products, please visit us at [www.DaikinAP.com](http://www.DaikinAP.com) and click on training, or call 540-248-9646 and ask for the Training Department.

### ***Warranty***

All Daikin equipment is sold pursuant to its standard terms and conditions of sale, including Limited Product Warranty. Consult your local Daikin Representative for warranty details. Refer to Form 933-430285Y. To find your local Daikin Representative, go to [www.DaikinAP.com](http://www.DaikinAP.com).

### ***Aftermarket Services***

To find your local parts office, visit [www.DaikinAP.com](http://www.DaikinAP.com) or call 800-37PARTS (800-377-2787). To find your local service office, visit [www.DaikinAP.com](http://www.DaikinAP.com) or call 800-432-1342.

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