

# Grundfos MixiMizer™

## Installation & Operating Instructions

Pumps Incorporating the  
(MR) Mixing Reset Control



**1.** Shipment  
Inspection  
Page 3

**2.** General  
Page 3

**3.** Operational  
Limits  
Page 4

**4.** Pump  
Installation  
Page 6

**5.** Installation  
Requirements  
Page 7

**6.** Mounting  
Control System  
Page 7

**7.** Rough-in  
Wiring  
Page 10

**8.** Settings  
Page 13

**9.** Error Messages  
& Control Response  
Page 18

**10.** Quick  
Reference  
Page 19



## CONGRATULATIONS!

You are now the fortunate owner of a **MixiMizer™ PUMP**. It has been carefully inspected and tested before shipment. It should give you long, efficient, trouble-free service. For maximum performance and reliability, please follow the simple instructions in this manual.

Since mixing by a variable speed injection pump is a relatively new concept, there are a few simple piping details that should be considered.

Variable speed injection systems require complete isolation between the boiler loop and system loop. For example, when the injection pump is turned off, there must be no heat transfer from the boiler loop to the system loop. In order to avoid this unwanted heat transfer, standard primary-secondary piping techniques are used.

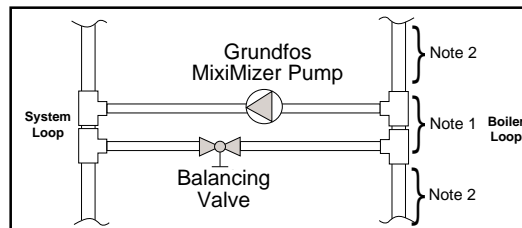
This piping arrangement requires that the injection piping be at least one pipe diameter smaller than the piping of the boiler and system loops.

### Note 1:

There must be a **maximum** of 4 pipe diameters between the tees in the boiler and system loops in order to prevent ghosts flow when the variable speed injection pump is off and either the boiler pump or system pump is on.

### Note 2:

There must be **at least** 6 pipe diameters of straight pipe on either side of the tees in order to prevent momentum of water in the boiler and system loops from pushing flow through the injection loop.



**Figure A - Injection loop without thermal trap.**

When installing and using this electrical equipment, basic safety precautions should always be followed, including the following:

The installer must ensure that this control and its wiring are isolated and/or shielded from strong sources of electromagnetic noise. Conversely, this Class B digital apparatus complies with Part 15 of the FCC Rules and meets all requirements of the Canadian Interference-Causing Equipment Regulations. However, if this control does cause harmful interference to radio or television reception, which can be determined by turning the control off and on, the user is encouraged to try to correct the interference by reorienting or relocating the receiving antenna, relocating the receiver with respect to this control, and/or connecting the control to a different circuit from that to which the receiver is connected.

**CAUTION:** The non-metallic enclosure does not provide grounding between conduit connections. Use grounding type bushings and jumper wires.

**CAUTION:** Improper installation and operation of this control could result in damage to the equipment and possibly even personal injury. It is your responsibility to ensure that this control is safely installed according to all applicable codes and standards. This electronic control is not intended for use as a primary limit control. Other controls that are intended and certified as safety limits must be placed into the control circuit.

#### **WARNING!**



All field wiring to be low voltage. Power for control is provided through the power cord supplying power to the pump. Use copper conductors only. Disconnect all power sources prior to servicing.

**Risk of electric shock.** This pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding type receptacle.

# 1. Shipment Inspection

Check the contents of this package. Care should be taken to ensure the pump is NOT dropped or mis-handled; dropping will damage the pump.

Grundfos MixiMizer Injection Pump Package Includes:

- One Grundfos UP15-42 MixiMizer pump with integral control or one Grundfos UP43-64 MixiMizer pump with integral control.
- Two Water Temperature Sensors 071 – Pre-wired into control unit with 6' of wire.
- One 6' line cord with 115 V plug, pre-wired into control unit.
- One Outdoor Air Temperature Sensor 070
- Two flange gaskets
- Installation and Operating Instructions.
- Two cable ties.

# 2. General

- All minimum and maximum settings are operating, not safety limits. Necessary auxiliary equipment and safety devices must be added.
- The boiler return minimum temperature is fixed at 135°F. This function can be disabled by DIP switch.
- The system supply maximum temperature is fixed at 140°F. This function can be disabled by DIP switch.
- External "Call For Heat"/Demand Input: The unit can accept external "Call For Heat" input signal. This must be a powered signal (20 to 30 V AC .1 VA). This function can be enabled by DIP switch.
- Warm Weather Shut Down (WWSD): When the outdoor air temperature is warmer than 70°F (with  $\pm 1^\circ\text{F}$  hysteresis), the unit shuts down until the temperature drops below 70°F.
- Heating curve parallel shift: The heating curve is shifted up 5°F parallel to the existing curve. This function can be enabled by the dip switch.

- Pump Exercising: After every three days of no operation, the control will exercise the pump for 10 seconds. The % of Pump Performance LED will be on during exercising.
- Post Purge: A 20 second post purge is available once the heat demand is removed or control enters WWSD. The purging holds the last speed used.
- As variable speed output modulates, the control flashes the % of Pump Performance LED on for ¼ second and off for ¼ to 2 1/2 seconds.
- A 2 second delay from demand to actually starting the pump is used to prevent issues with a noisy demand relay signal.

### 3. Operational Limits

#### **Outdoor Sensor 070**

Approvals: CSA, UL  
 Operating range: -60 to 140°F (-50 to 60°C)  
 Sensor: NTC thermistor, 10 kW  
 @ 77°F (25°C ± 0.2°C), B=3892  
 Enclosure: White U.V. resistant PVC

#### **Universal Sensor 071**

Approvals: CSA, UL  
 Operating range: -60 to 255°F (-50 to 125°C)  
 Sensor: NTC thermistor, 10 kW  
 @ 77°F (25°C ± 0.2°C), B=3892  
 Wire: 6' 20 AWG XPE Wire

Grundfos MixiMizer pumps with "FC" designation are designed to pump liquids compatible with their cast iron pump housing construction. They are recommended for use in closed hydronic systems. Grundfos MixiMizer pumps with "BUC" and "BF" designations are designed to pump liquids compatible with their bronze pump housing construction and can be used in both open and closed systems. Grundfos MixiMizer pumps are for Indoor Use Only. Grundfos MixiMizer Pumps are intended for use with water, or a 50/50 mixture by weight of propylene glycol.

**UP15-42FC/MR 115V 60 Hz MixiMizer Pump**  
**UP15-42BUC5/MR 115V 60 Hz MixiMizer Pump**  
**UP15-42BUC7/MR 115V 60 Hz MixiMizer Pump**

Maximum fluid temperature: 200°F (95°C)

Maximum ambient:

- 115°F (46°C) with control module vertical (Fig. 4a).
- 115°F (46°C) with control module under pump and horizontal (Fig. 4B).
- 105°F (40°C) with control module on top of pump and horizontal (Fig 4B).

Maximum Working Pressure: 145 PSI

Minimum Inlet Pressure: 5 PSI

**UP43-64FC/MR 115V 60 Hz MixiMizer Pump**  
**UP43-64BFC/MR 115V 60 Hz MixiMizer Pump**

Maximum fluid temperature: 195°F (90°C)

Maximum ambient:

- 105°F (40°C) with control module vertical (Fig. 4A).
- 105°F (40°C) with control module under pump and horizontal (Fig. 4B).
- 92°F (33°C) with control module on top of pump and horizontal (Fig. 4B).

Maximum Working Pressure: 145 PSI

Maximum Inlet Pressure: 5 PSI

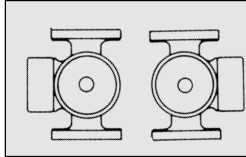
Design Injection Flow Rate (GPM)	Nominal Injection Pipe Diameter	MixiMizer Pump Model
0-5	1/2"	UP15-42BUC5/MR* UP15-42FC/MR*
0-8	3/4"	UP15-42BUC5/MR UP15-42FC/MR UP15-42BUC7/MR*
0-16	1"	UP15-42BUC7/MR UP43-64FC/MR*
0-32	1 1/4", 1 1/2" or 2"	UP43-64BFC/MR UP43-64FC/MR
*Can produce flow velocity greater than 8 ft/sec in this size.		

## 4. Pump Installation

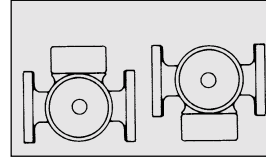
Remove the control from the pump and install pump in injection loop

Position of terminal box:

Preferred installation of the pump will have the terminal box located to one side of the pump or the other, with the conduit entry down.



**Figure 4A** - Preferred Terminal Box Orientation



**Figure 4B** - Optional Terminal Box Orientation (see **Operational Limits**)

If the terminal box position needs to be changed, it is best to do so before installation. However, if the pump is already installed, ensure that the electrical supply is turned off and close the isolation valves before removing the Allen screws.

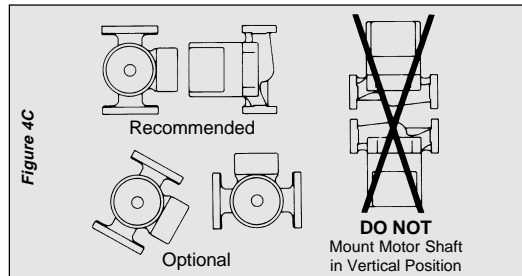
To Change terminal box position:

- Remove the four (4) Allen screws (4 or 5mm wrench) while supporting the stator (motor).
- Carefully separate the stator from the pump chamber and rotate it to the correct terminal box orientation.
- Replace the Allen screws and tighten diagonally and evenly (7 ft. -lb. torque).
- Check that the motor shaft turns freely. Remove the large screw in the middle of the nameplate, insert a small flat blade screwdriver into the end of the shaft, and turn gently.
- If the shaft does not turn easily, repeat the disassembly/reassembly process.

### **Pump Mounting: For Indoor Use Only**

Arrows on the side or bottom of the pump chamber indicate direction of flow through the pump. Grundfos Miximizer pumps can be installed in both vertical and horizontal lines. Flow direction should be from the boiler/supply loop into the system loop.

The pump must be installed with the motor shaft positioned horizontally. Under no circumstances should the pump be installed with the shaft vertical or where the shaft falls below the horizontal plane (Fig.4C).



## 5. Installation Requirements

- Thoroughly clean and flush the system prior to pump installation
- Ensure that water does not enter the terminal box during the installation process.
- **DO NOT START THE PUMP UNTIL THE SYSTEM HAS BEEN FILLED AND CHECKED FOR LEAKS.**
- Do not use the pump to vent the system.
- Never operate the pump dry. The bearings require water lubrication and will be damaged otherwise.
- Fill system with water. This will result in immediate lubrication of the bearings.
- Operate the pump for 5 minutes, when control installation is complete, to purge remaining air from the bearing chamber. This is especially important when installing the pump during the off-

## 6. Mounting Control System

Provisions for a 115 V grounded outlet within 6 feet of the pump mounting location, should be made.

**All electrical work should be performed by a qualified electrician in accordance with the latest**



edition of the National Electrical Code, local codes and regulations.

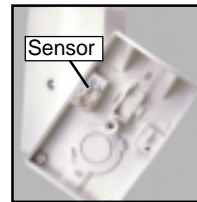
Install a 2" x 4" duplex electrical box to house low voltage wiring for connection to the control.

#### Outdoor Air Temperature Sensor 070

The Outdoor Air Temperature Sensor 070 includes a 10 kW thermistor which provides an accurate measurement of the outdoor temperature. The 070 sensor is protected by a white U.V. resistant PVC plastic enclosure (Fig. 6A & 6B).



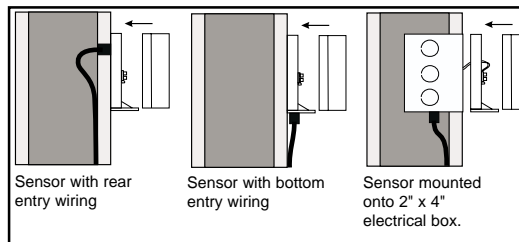
**Figure 6A** - Closed  
Outdoor Air Temperature  
Sensor 070



**Figure 6B** - Open  
Outdoor Air Temperature  
Sensor 070

**Note:** The outdoor air temperature sensor 070 (thermistor) is built into the PVC plastic enclosure.

- Remove the screw and pull the front cover off the sensor enclosure.
- The 070 can either be mounted directly onto a wall or a 2" x 4" electrical box. When the 070 is wall mounted, the wiring should enter through the back or bottom of the enclosure. Do not mount the 070 with the conduit knockout facing upwards as rain could enter the enclosure and damage the sensor (Fig. 6C).



**Figure 6C** - Mounting the Sensor

- In order to prevent heat transmitted through the wall from affecting the sensor reading, it may be necessary to install an insulating barrier behind the enclosure.
- The 070 should be mounted on a wall which best represents the heat load on the building (a northern wall for most buildings or a southern facing wall for buildings with large south facing glass areas). The 070 should not be exposed to heat sources such as ventilation or window openings.
- The 070 should be installed at an elevation above the ground that will prevent accidental damage or tampering.

#### **Water Temperature Sensor 071**

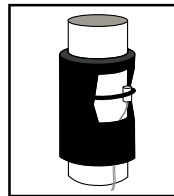
The Water Temperature 071 Sensor has a zinc sleeve for fast response and a wide operating range (Fig 6D).



*Figure 6D - 071 Sensor*

**Note:** The 071 sensor is designed to mount on a pipe or in a temperature immersion well.

- The 071 sensor can be strapped directly to the pipe using the cable tie provided. Insulation should be placed around the sensor to reduce the effect of air currents on the sensor measurement (Fig. 6E).



*Figure 6E - 071 Mounted Sensor*

- The 071 sensor should be placed downstream of a pump or after an elbow or similar fitting. This is especially important if large diameter pipes are used as the thermal stratification within the pipe can result in erroneous sensor readings. Proper

sensor location requires that the fluid is thoroughly mixed within the pipe before it reaches the sensor.

- Locate the labels attached to each sensor. One sensor will be identified as the return sensor and one will be identified as the supply sensor. (Fig 6F & 6G) Mount the return sensor to the return piping of the boiler loop. Mount the supply sensor to supply piping of the system loop.



Figure 6F - Return Sensor Label



Figure 6G - Supply Sensor Label

## 7. Rough-In Wiring

All low voltage wiring terminates in the wiring chamber on the control. The wiring is roughed-in to the electrical box prior to installation of the control. All field installed wiring should meet or exceed requirements for class 2 wiring per article 725 of the National Electrical Code rated at 30VAC/250VA. Ensure that enough wiring is in the electrical box to reach the control.

**CAUTION:** Power must not be applied to any of the wires during the rough-in wiring stage.

- Run wiring from the outdoor Air Temperature sensor 070 mounting location to the electrical box for the control wiring. Do not run the wires parallel to telephone or power cables. If the sensor wires are located in an area with strong sources of electromagnetic interference (EMI) shielded cable or twisted pair should be used. If using shielded cable, the shield wire should be connected to the

Com (–) terminal on the control and not to earth ground.

- Run wires from the 24-30 V (ac) power source or heat demand to the electrical box for the wiring. Use a clean power source to ensure proper operation.

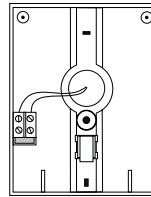
#### **Wiring and Testing the Outdoor Air Temperature Sensor 070**

**CAUTION:** No wires should be connected to the control during testing.

**CAUTION:** Do not apply voltage to the 070 at any time as damage to the 070 may result.

A good quality test meter capable of measuring up to 5,000 kW (1kW = 1000 W) is required to measure the sensor resistance. In addition to this, the actual temperature must be measured with either a good quality digital thermometer, or if a thermometer is not available, a second 070 sensor can be placed alongside the one to be tested and the readings compared.

Connect the wire to the two terminals provided in the PVC enclosure (Fig. 7A).



**Figure 7A** - Sensor Wire Connection

First measure the temperature using the thermometer and then measure the resistance of the 070 sensor at the control. The wires from the 070 sensor must not be connected to the control while the test is performed. Using the **Resistance/Temperature Chart** (page 12), estimate the temperature measured by the 070 sensor. The 070 sensor and thermometer readings should be close. If the test meter reads a very high resistance, there may be a broken wire, a poor wiring connection or a defective sensor. If the resistance is very low, the

wiring may be shorted, there may be moisture in the 070 or the 070 may be defective. To test for a defective 070 sensor, measure the resistance directly at the 070 sensor location.

Replace the front cover of the 070 sensor enclosure.

**Temperature/Resistance Chart**

Temperature Resistance			Temperature Resistance		
°F	°C	Ω	°F	°C	Ω
-50	-46	490,813	90	32	46,218
-45	-43	405,710	95	35	7,334
-40	-40	336,606	100	38	5,828
-35	-37	280,279	105	41	5,210
-30	-34	234,196	110	43	4,665
-25	-32	196,358	115	46	4,184
-20	-29	165,180	120	49	3,760
-15	-26	139,402	125	52	3,383
-10	-23	118,018	130	54	3,050
-5	-21	100,221	135	57	2,754
0	-18	85,362	140	60	2,490
5	-15	72,918	145	63	2,255
10	-12	62,465	150	66	2,045
15	-9	53,658	155	68	1,857
20	-7	46,218	160	71	1,689
25	-4	39,913	165	74	1,538
30	-1	34,558	170	77	1,403
35	2	29,996	175	79	1,281
40	4	26,099	180	82	1,172
45	7	22,763	185	85	1,073
50	10	19,900	190	88	983
55	13	17,436	195	91	903
60	16	15,311	200	93	829
65	18	13,474	205	96	763
70	21	11,883	210	99	703
75	24	10,501	215	102	648
80	27	9,299	220	104	598
85	29	8,250	225	107	553

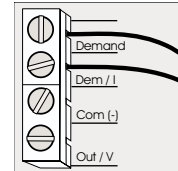
**Test the Power Supply or Heat Demand.**

Make sure exposed wires and bare terminals are not in contact with other wires or grounded surfaces. Turn on the power or provide a heat demand and measure the voltage across the leads. The voltmeter should read between plus and minus 4 volts of the supplied voltage.

### Electrical Connections To The Control

**CAUTION:** The installer should confirm that no voltage is present at any of the wires.

Pull wires through the wiring cover and install the wiring cover over the wiring chamber.



**Figure 7B - Electrical (demand) connections to the control**

24 V (ac) Power or Heat

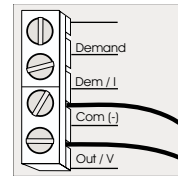
Demand Connections:

Connect the 24 V (ac) power supply or heat demand to terminals “Demand” and “DEM/I” (Fig. 7B).

Outdoor Air Temperature Sensor 070 Connections:

**CAUTION:** Do not apply power to these terminals at any time as this will damage the control.

Connect the two wires from the Outdoor Air Temperature Sensor 070 directly to the “Com (-)” and “Out/V” terminals (Fig. 7C).



**Figure 7C - Electrical (Com/Out) connections to the control**

Note: Demand and outdoor temperature sensor wires must be run through and secured by the strain relief on the terminal board.

## 8. Settings

Setting Dip Switches



**Figure 8A - Dip Switches**

### Dip switch settings

SWITCH	POSITION		
	ON	OFF	DEFAULT
A	Permanent Demand	External Demand	ON position Permanent Demand
B	Max system supply set at 140°F	Max system supply feature is off	ON position supply set at 140°F
C	Boiler return minimum set at 135°F	Boiler return minimum feature is off	ON position minimum set at 135°F
D	Heating curve No shift	Heating Curve 5°F Parallel shift	On position No shift

### Heating Curve Dial

Before adjusting the dial settings, read through the sequence of operation to ensure that you understand how the control operates.

During outdoor reset operation, the Heating Curve setting determines the number of degrees the supply water temperature is raised for each one degree drop in outdoor temperature. The Heating Curve dial position can be calculated from the following formula.



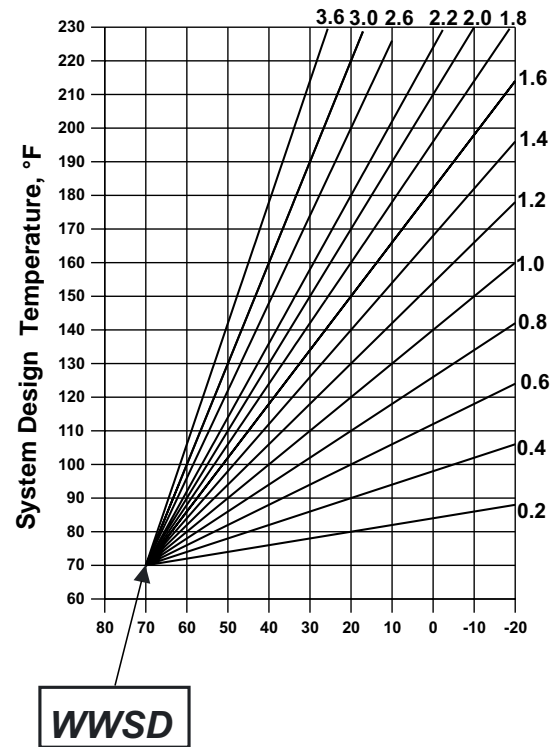
**Figure 8B -**  
Heating Curve Dial

$$\text{Heating Curve} = \frac{\text{Design supply temperature} - \text{occupied temperature}}{\text{Occupied temperature} - \text{design outdoor temperature}}$$

**Example:** A system is designed to supply 120°F (49°C) water when the outdoor temperature is 10°F (-12°C). The Occupied temperature is 70°F (21°C).

$$\begin{aligned} \text{Heating Curve} &= \frac{120 - 70^\circ\text{F} \ (49 - 21^\circ\text{C})}{70 - 10^\circ\text{F} \ (21 - (-12^\circ\text{C}))} = \\ &= \frac{50^\circ\text{F} \ (28^\circ\text{C})}{60^\circ\text{F} \ (33^\circ\text{C})} = 0.8 \end{aligned}$$

# Heating Curve





Heating Curve Table (Warm Weather Shut Down = 70°F)

**System Design Temperature, °F**

	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230
Outdoor Design Temperature, °F	60	1.0	2.0	3.0												
	50	0.5	1.0	1.5	2.0	2.5	3.0	3.5								
	40	0.3	0.7	1.0	1.3	1.7	2.0	2.3	2.7	3.0	3.3	3.7				
	30	0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5	2.8	3.0	3.3	3.5	
	20	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
	10	0.2	0.3	0.5	0.7	0.8	1.0	1.2	1.3	1.5	1.7	1.8	2.0	2.2	2.3	2.5
	0	0.1	0.3	0.4	0.6	0.7	0.9	1.0	1.1	1.3	1.4	1.6	1.7	1.9	2.0	2.1
	-10	0.1	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.1	1.3	1.4	1.5	1.6	1.8	1.9
	-20	0.1	0.2	0.3	0.4	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.6	1.7

If the design supply water temperature is unknown, the Heating Curve dial can be set to a trial value using the typical design supply temperatures given below.

Typical design supply temperatures:

- Hydronic radiant floors: 100 to 130°F  
(38 to 54°C)
- Baseboard convectors: 160 to 190°F  
(71 to 88°C)
- Fan coils: 180 to 210°F  
(82 to 99°C)

Factory default setting is 1.0.

Install control onto the pump. Insert the 115 V plug on the line cord from the pump into a properly grounded 115 V outlet. This will apply power to the pump/control.

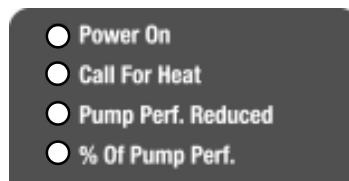
#### **Performance Indicator LEDs (Fig. 8c)**

**Power ON** (green) indicates power is applied.

**Call For Heat** (Green) indicates demand is applied from permanent or external source.

**Pump Perf. Reduced** (Yellow) Indicates the pump speed is limited due to protection limits.

**% of pump performance** (Yellow) indicates the speed of the pump by flashing at different rates.



*Figure 8C - Performance indicator LEDs*

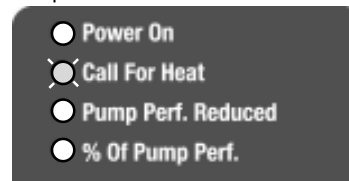
#### **Before You Leave**

- Place this brochure, and all other brochures relating to the installation, in a conspicuous location near the control for future reference.
- It is important to explain the operation of this control within the system to the end user and to anyone else who may be operating the system.

## 9. Error Messages and Control Response

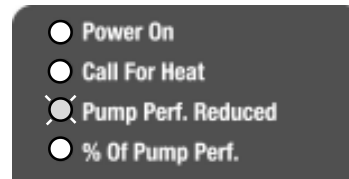
Whenever a fault is detected in any of the sensors, the control LEDs will flash in a specific way, to indicate the location of the problem, and the control will assume a specific operating condition.

- Call For Heat LED is flashing (Fig 9A):
  - Then the outdoor sensor is short or open circuit
  - And the control assumes an outdoor temperature of 30°F



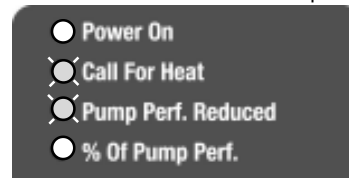
*Figure 9A - Control Lights (Call For heat)*

- Pump Performance Reduced LED is flashing (Fig. 9B):
  - Then the system supply sensor is short or open circuit
  - And the control runs pump at 10% and does boiler protection if enabled.



*Figure 9B - Control Lights  
(Pump Performance Reduced)*

- Call For Heat and Pump Performance Reduced LEDs are flashing (Fig. 9C):
  - Then the boiler return sensor is short or open circuit
  - And the control disables boiler protection.



*Figure 9C - Control Lights (PPR & CFH)*

## 10. Quick Reference

### Dip Switch Settings

SWITCH	POSITION		
	ON	OFF	DEFAULT
A	Permanent Demand	External Demand	ON position Permanent Demand
B	Max system supply set at 140°F	Max system supply feature is off	ON position Permanent Demand 140°F
C	Boiler return minimum set at 135°F	Boiler return minimum feature is off	ON position Permanent Demand 135°F
D	Heating curve No shift	Heating Curve 5°F Parallel shift	On position No shift

### Temperature Sensors Circuit Ratings

#### Outdoor Temperature Sensor Circuit Rating

Terminals: Out/V & Com (-)  
 5V DC  $\pm$  5% Max  
 0.166 mA DC  $\pm$  5% Max

#### Supply Temperature Sensor Circuit Rating

Terminals: Sup & Com  
 5V DC  $\pm$  5% Max  
 2.3 mA DC  $\pm$  5% Max

#### Return Temperature Sensor Circuit Rating

Terminals: Ret & Com  
 5V DC  $\pm$  5% Max  
 2.3 mA DC  $\pm$  5% Max

#### Demand Input Circuit Rating

Terminals: Dem & Dem/I  
 20-30 VAC  
 0.1 VA Max



### **WARNING!**

All field wiring to be low voltage. Power for control is provided through the power cord supplying power to the pump.  
 Use copper conductors only.  
 Disconnect all power sources prior to servicing.

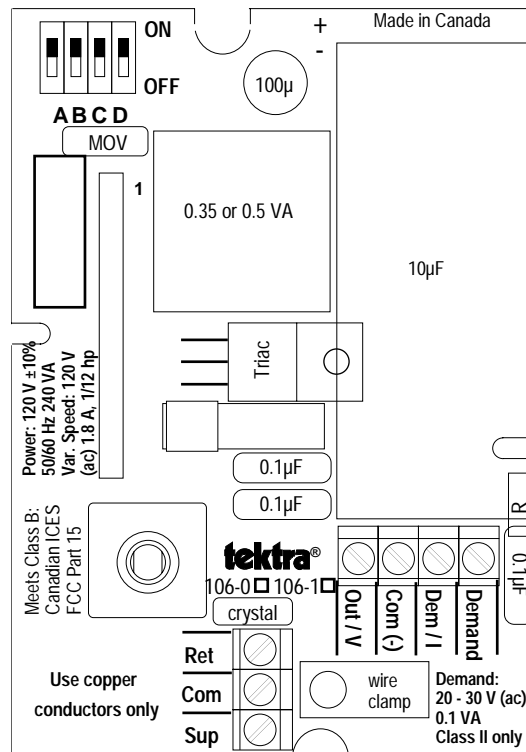


Figure 10A - Control Layout

# Limited Warranty

Products manufactured by GRUNDFOS PUMPS CORPORATION (GRUNDFOS) are warranted to the original user only to be free of defects in material and workmanship for a period of 18 months from date of installation, but not more than 24 months from date of manufacture. GRUNDFOS' liability under this warranty shall be limited to repairing or replacing at GRUNDFOS' option, without charge, F.O.B. GRUNDFOS' factory or authorized service station, any product of GRUNDFOS manufacture. GRUNDFOS will not be liable for any costs of removal, installation, transportation, or any other charges which may arise in connection with a warranty claim. Products which are sold but not manufactured by GRUNDFOS are subject to the warranty provided by the manufacturer of said products and not by GRUNDFOS' warranty. GRUNDFOS will not be liable for damage or wear to products caused by abnormal operating conditions, accident, abuse, misuse, unauthorized alteration or repair, or if the product was not installed in accordance with GRUNDFOS' printed installation and operation instructions.

To obtain service under this warranty, the defective product must be returned to the distributor or dealer of GRUNDFOS products from which it was purchased together with proof of purchase and installation date, failure date, and supporting installation data. Unless otherwise provided, the distributor or dealer will contact the GRUNDFOS factory or authorized service station for instructions. Any defective product to be returned to the factory or service station must be sent freight prepaid; documentation supporting the warranty claim and/or a Return Authorization must be included if so instructed.

GRUNDFOS WILL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSSES, OR EXPENSES ARISING FROM INSTALLATION, USE, OR ANY OTHER CAUSES. THERE ARE NO EXPRESS OR IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH EXTEND BEYOND THOSE WARRANTIES DESCRIBED OR REFERRED TO ABOVE.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages and some jurisdictions do not allow limitations on how long implied warranties may last. Therefore, the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from jurisdiction to jurisdiction.



Grundfos Pumps Corporation • 17100 W. 118th Terrace • Olathe, KS 66061

Phone: 913.227.3400 • Fax: 913.227.3500



Canada: Oakville, Ontario • Mexico: Apodaca, N.L.

Visit our website at [www.us.grundfos.com](http://www.us.grundfos.com)

L-UP-TL-031	8/01
PRINTED IN USA	