

# Zone Pump Controller

## Installation & Operation Manual



Models

**FMZ-20/ 30/ 40/ 60**



Keep this manual near this Zone Pump Controller for future reference whenever maintenance or service is required.

 **WARNING**

All installations should be done only by a qualified expert and in accordance with the appropriate Navien manual. Installing an electric appliance with improper methods or materials may result in serious injury or death due to fire.

**ELECTRICAL SHOCK HAZARD.** Disconnect power before installing or servicing. This can cause severe personal injury, death, or substantial property damage if ignored.

All wiring must be installed in accordance with local regulations of the installation site.

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# 1. Safety Information

The following safety symbols are used in this manual. Read and follow all safety instructions in this manual precisely to avoid unsafe operating conditions, fire, explosion, property damage, personal injury, or death. Keep this manual for future reference.

## DANGER

Indicates an imminently hazardous situation which, if not avoided, could result in severe injury or death.

## WARNING

Indicates a potentially hazardous situation which, if not avoided, may result in injury or death.

## CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in property damage.

### When Installing this Product:

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for the application.
3. Installers must be trained, experienced, and licensed service technicians.
4. Follow local codes for installation and application.

After installation is complete, check the product's operation by following the instructions provided in this manual.

### Note

All wiring must be installed in accordance with local regulations of the installation site.

## WARNING

All installations should be done only by a qualified expert and in accordance with the appropriate Navien manual. Installing an electric appliance with improper methods or materials may result in serious injury or death due to fire.

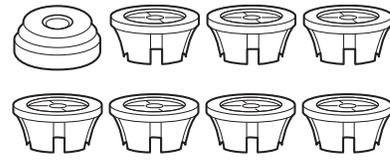
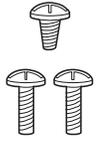
**ELECTRICAL SHOCK HAZARD.** Disconnect power before installing or servicing. Can cause severe personal injury, death, or substantial property damage if ignored.

Careful attention must be paid to keeping the polarity of the wiring consistent between the Navien zone pump controller and the boiler aquastat. Failure to do so could result in a secondary source of power activating the boiler under certain circumstances which could result in serious injury or death. Always disconnect power to both the Navien zone pump controller and the boiler when installing or servicing this product.

## 2. About the Zone Pump Controller

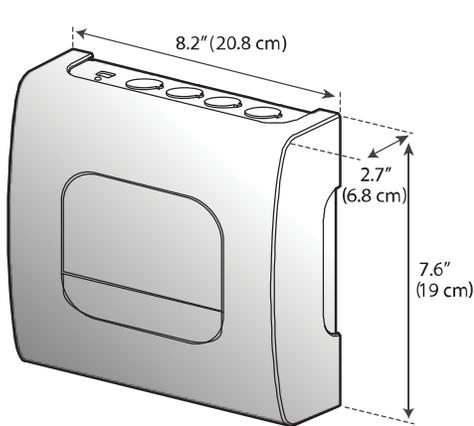
### 2.1 Items Included

When you open the box, you will find the following items with the Zone Pump Controller. Check the box for the following items before installing the controller.

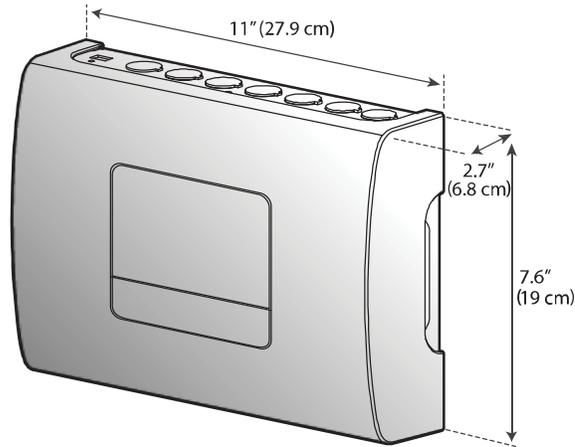
				
<b>Navien Zone Pump Controller</b>	<b>Installation &amp; Operation Manual</b>	<b>Indoor Sensor</b>	<b>Cable Grommet (Numbers may vary by models) &amp; 1 x Rubber Grommet (for Ready-Link connector)</b>	<b>Screws (1x Indoor Sensor Screw, 2x Case Fixing Screws)</b>

### 2.2 Dimensions and Specifications

Refer to the following diagrams for product dimensions.



Models FMZ-20/ 30



Models FMZ-40/ 60

### Electrical Specifications

Models	Number of Zones	Combined Load	Pump Load	Pump Relay	Operating Voltage and Frequency	Thermostat Input
FMZ-20	2	10A	1/3 hp MAX /pump	Resistance load: 16A/240VAC, 20A/120VAC  Motor load: 1/2hp (120VAC)	Rated voltage/frequency: 120V, 60 Hz,  Voltage/frequency range: -15% to +15% of rated voltage/frequency	Single Pole Single Throw (SPST), No power supplied to thermostat, DC 12V feedback signal only
FMZ-30	3	10A				
FMZ-40	4	20A				
FMZ-60	6	20A				

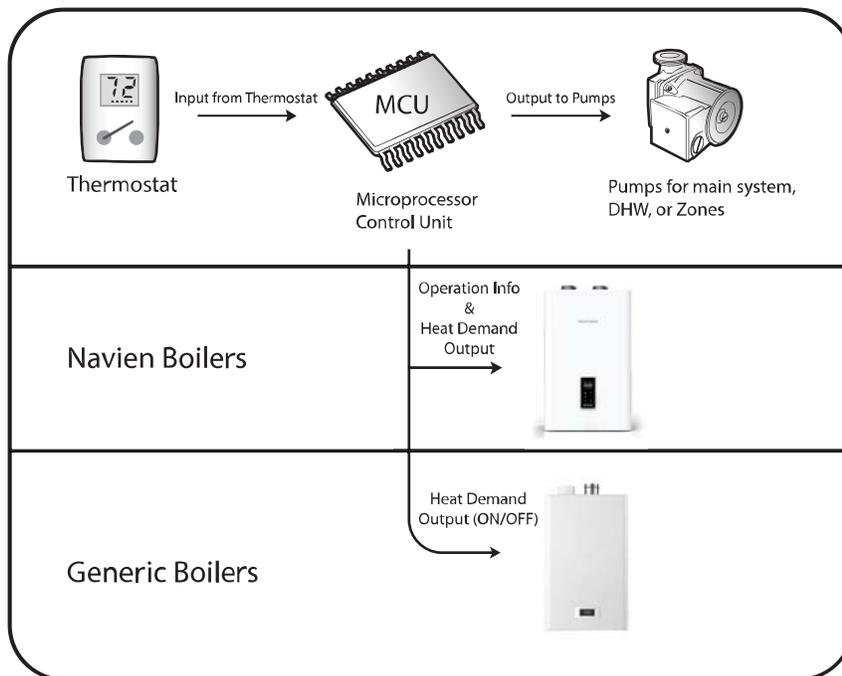
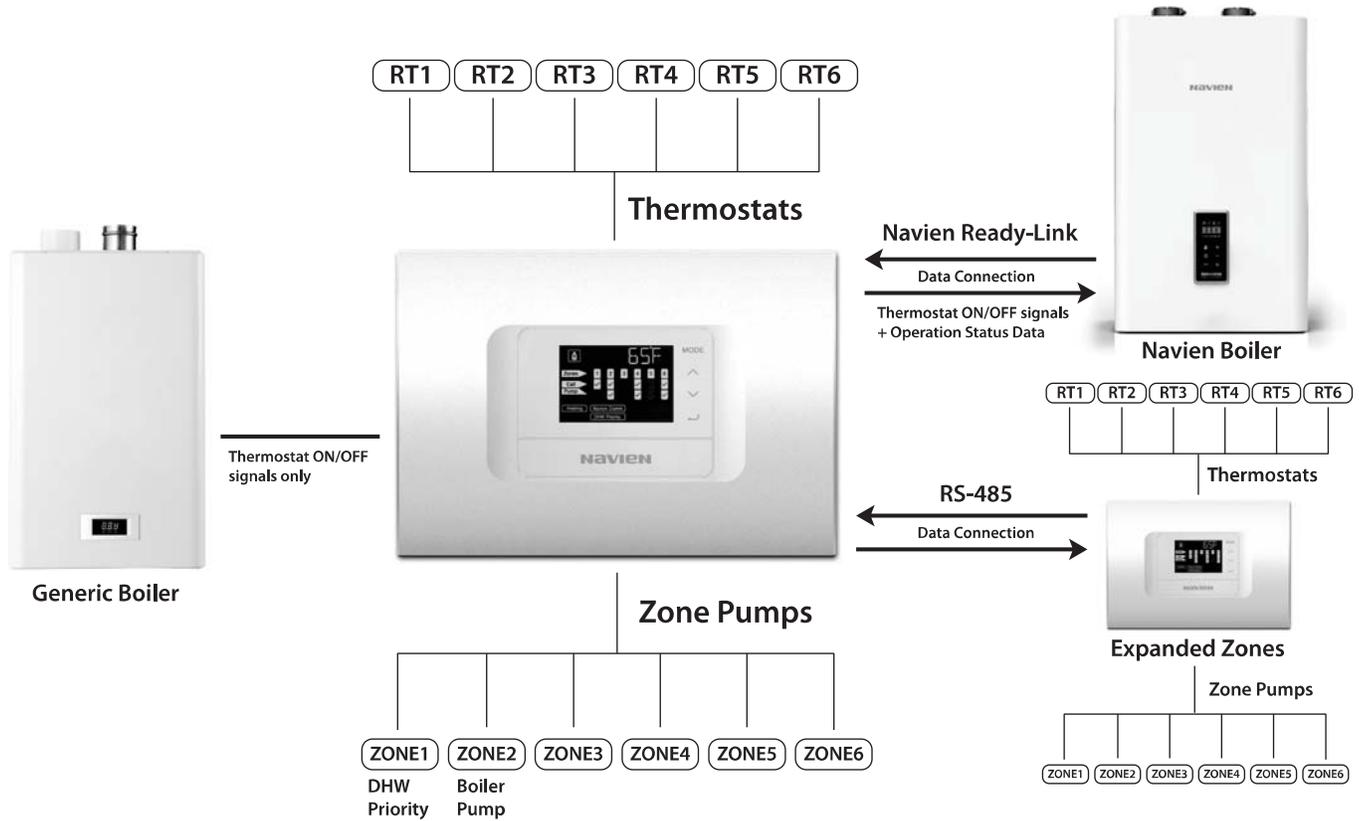
## General Specifications

The following table lists the specifications for the controller.

List	Description
Model name	FMZ-20, FMZ-30, FMZ-40, FMZ-60
Control	Microprocessor control (not a safety control)
Ambient temperature	32–122°F (0–50°C), indoor use only
Storage temperature	14–140°F (-10–60°C)
Pollution degree	Degree 2
Installation category	Category II
Heat source control	With Navien boilers: RS-485 communication (UTP 24 AWG field-supplied wiring required) With generic boilers (Non-Navien brand): on/off contacts only, no power supply provided
Zone expansion	Connection: RS-485 communication Maximum number of controllers: 4 Maximum number of zones: 24
Indoor sensor (optional)	NTC Thermistor, 122°F (50°C, 3.485KΩ), B = 3,457K ± 1 %

## 2.3 Basic Operation Principles

The following diagrams show the basic operation of the zone pump controller.



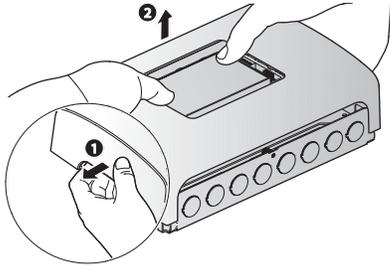
# 3. Installing the Device

## 3.1 Mounting the Device

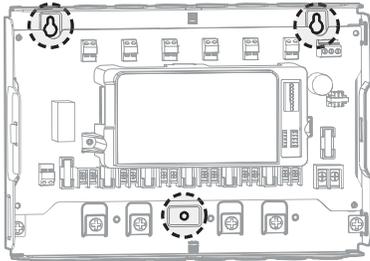
This section describes how to mount the zone pump controller. The zone pump controller is designed to be mounted on the wall.

To mount pump controller:

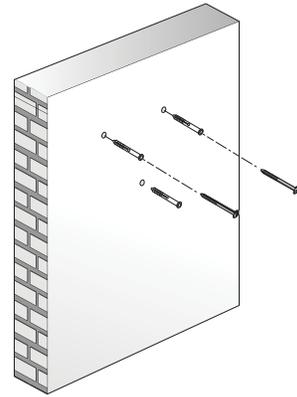
1. Remove the front cover by (1) pulling both sides of the cover outwards using your fingers, and then (2) lifting the cover upwards while pushing against the display with your thumbs.



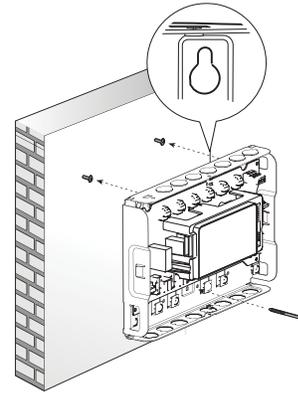
2. Place the zone pump controller on the wall and mark the drilling positions through the mounting holes.



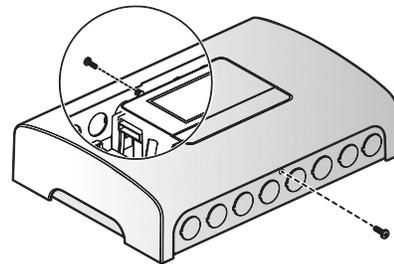
3. Drill the holes into the wall and insert three wall anchors into the holes.
4. Insert the two upper screws into the wall anchors, but do not fully tighten the screws yet.



5. Hang the zone pump controller on the two screws installed in Step 4, tighten the screws and secure the zone pump controller in place by installing the third, lower screw.



6. Follow the steps in "Wiring the Device" to connect the zone pump controller to a heating system.
7. After completing the wiring connections, replace the front cover and tighten the two case fixing screws.



### Note

The drawings are based on the FMZ-60 model. Actual design may differ depending on the model.

## 3.2 Wiring the Device

This section describes the electrical installation of the zone pump controller.

### CAUTION

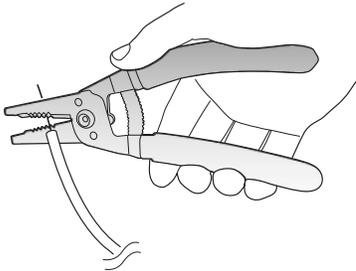
Do not remove the front cover unless the power to the zone pump controller is turned off or disconnected. Failure to do so may result in electric shock.

### 3.2.1 Preparing Cables for Installation

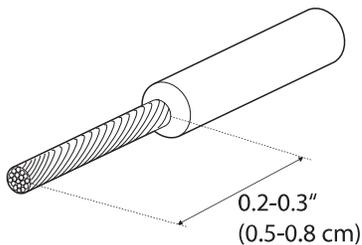
Follow the instructions below to install the thermostat cables, pump cables, and power cables:

#### Thermostat/signal cables and generic boiler T/T cables

1. From the end of the thermostat signal cables, remove the plastic insulation (0.2–0.3 in/ 0.5–0.8cm) using a cable stripper.

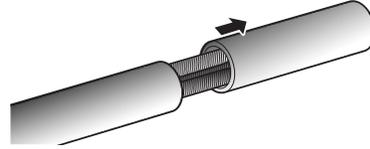


2. Twist the exposed wires neatly.

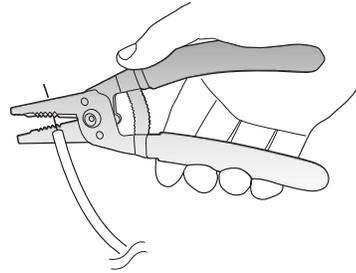


#### Pump cables and power cables

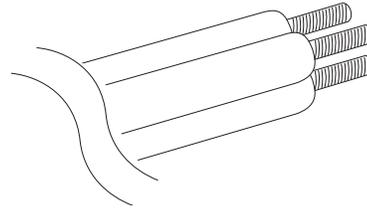
1. Remove the outer sheath of the pump cables or power cables.



2. From the end of the inner cables, remove the plastic insulation (0.2–0.3 in/ 0.5–0.8 cm) using a cable stripper.



3. Twist the exposed wires neatly.



### CAUTION

#### **Grounding Requirements for Pump Cables and Power Cables**

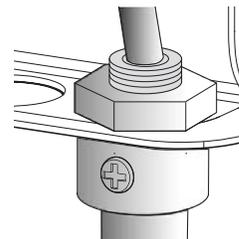
Proper grounding is required for safe use of the device. Improper grounding or no grounding connection may result in electric shock.

Refer to [3.2.2 Grounding for Pump Cables and Power Cables on page 9](#) and properly ground the cables.

#### **Note**

Navien recommends the use of clamp nuts to secure the cables in place. Clamp nuts are NOT supplied with the product.

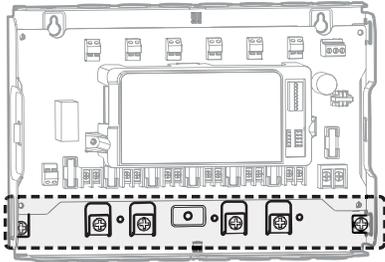
Use wires thicker than 14 AWG (0.06 in. diameter).



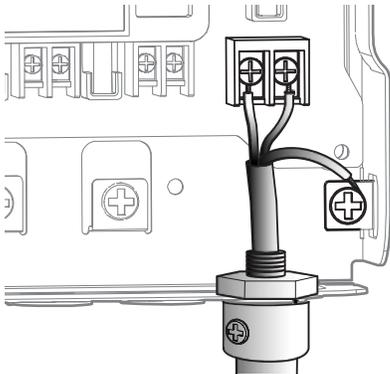
### 3.2.2 Grounding for Pump Cables and Power Cables

When installing the pump cables and power cables to the zone pump controller, refer to the following information to connect the ground cable to one of the ground terminals for safe use.

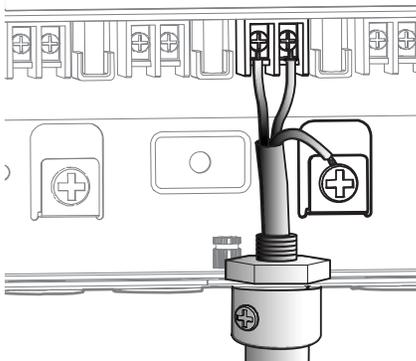
#### Location of the ground terminals.



#### Examples of ground cable installation



<Power ground cable>



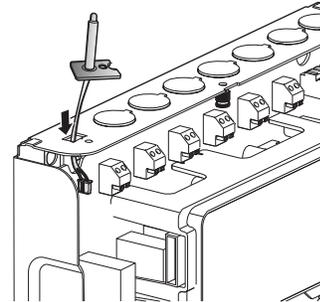
<Pump ground cable>

### 3.2.3 Connecting the Indoor Sensor

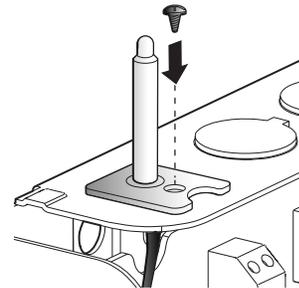
An indoor sensor is supplied with the Navien zone pump controller. The indoor sensor measures the ambient temperature where the zone pump controller is installed.

To connect the indoor sensor:

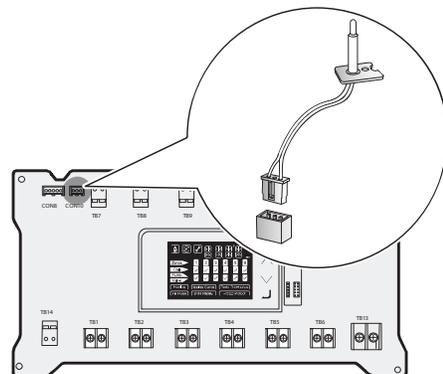
1. Insert the indoor sensor through the hole as indicated in the picture.



2. Secure the indoor sensor by tightening the screw on the top-left side of the zone pump controller.



3. Connect the sensor's 3-pin connector into the connector socket (CON10) on the main PCB.

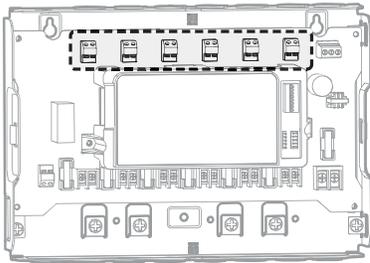


### 3.2.4 Connecting the Zone Thermostat Cables

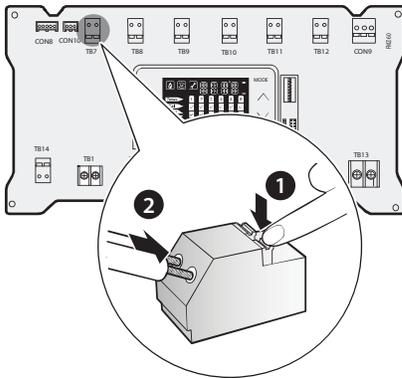
The zone pump controller receives inputs from room thermostats (zone thermostats) to control the pumps in the heating system's zones. FMZ-30 models have three contacts for zone thermostats. FMZ-60 models have six contacts.

To connect the room thermostats:

1. Locate the thermostat cable terminals at the top of the main PCB, and then follow the steps in [3.2.1 Preparing Cables for Installation on page 8](#).



2. Hold down the button at the back of the cable connector, insert the exposed part of the cable into the contacts, and then release the button.

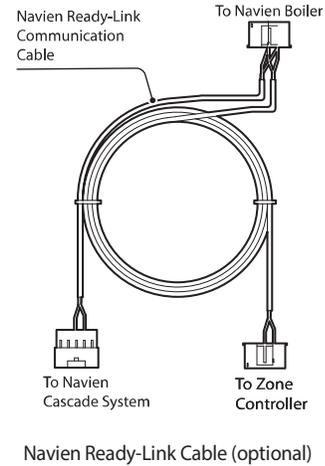


#### Note

Refer to the instruction manual that is supplied with the boiler for the connection on the boiler side.

### 3.2.5 Connecting a Navien Branded Boiler

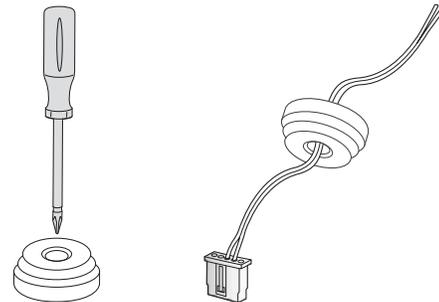
If you are connecting the device to Navien boilers, use a Ready-Link connection. A Ready-Link connection allows for data exchange between the device and Navien branded boilers.



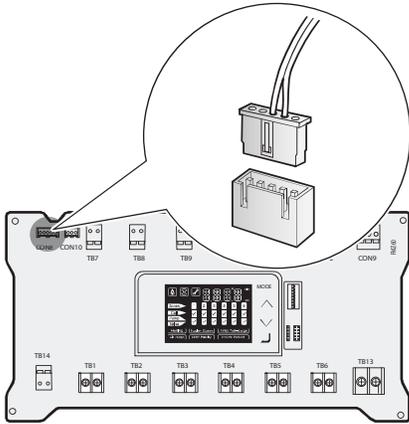
A Ready-Link cable is not supplied with the device and is sold separately. Contact your local Navien supplier to purchase a Ready-Link cable.

#### Note

- Before connecting the cable connector to the socket, place the end of the cable connector through the rubber grommet that is supplied with the zone pump controller.
- The hole in the middle of the rubber grommet is covered with a thin layer of rubber. Make an appropriately-sized hole in the middle of the rubber grommet with a screw driver before using it.



Connect the proper end of the Ready-Link cable to the CON8 connection on the zone pump controller.



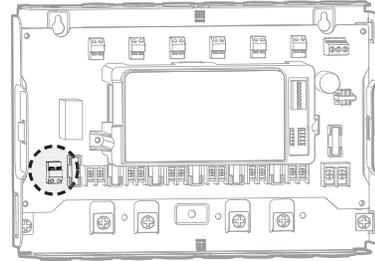
**Note**

Refer to the instruction manual that is supplied with the boiler for the proper connection of the Ready-Link cable to the boiler.

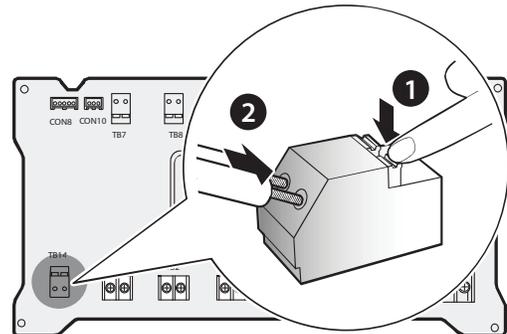
### 3.2.6 Connecting a Generic Boiler

To connect a generic boiler to the zone pump controller:

1. Locate the boiler T/T contact at the bottom-left of the main PCB, and then follow the steps in [3.2.1 Preparing Cables for Installation on page 8](#).



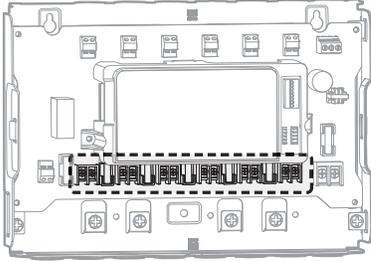
2. Insert the cable through the hole in the casing directly below the contacts.
3. Hold down the button at the back of the cable connector, insert the exposed part of the cable into the contacts, and then release the button.



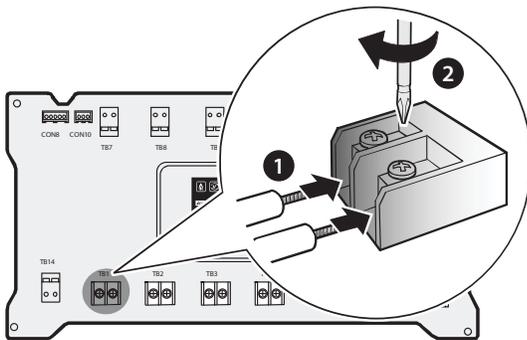
### 3.2.7 Connecting Zone Pumps

To connect the zone pumps to the zone pump controller:

1. Locate the boiler zone pump contacts at the bottom of the main PCB, and then follow the steps in [3.2.1 Preparing Cables for Installation on page 8](#).



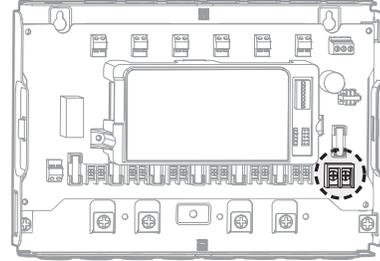
2. Insert the cable through the hole in the casing directly below the contacts.
3. Insert the exposed cable into the contacts, and then use a screw driver to tighten the terminal screws.



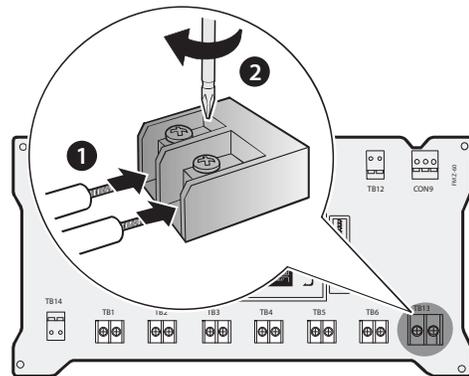
### 3.2.8 Connecting Power Cables

To connect the power cables to the device:

1. Locate the power cable terminal located at the bottom-right side of the main PCB, and then follow the steps in [3.2.1 Preparing Cables for Installation on page 8](#).



2. Insert the cable through the hole in the casing directly below the contacts.
3. Insert the exposed cable into the contacts, and then use a screw driver to tighten the terminal screws.



#### CAUTION

##### Grounding Requirements for Pump Cables

Proper grounding is required for safe use of the device. Improper grounding or no grounding connection may result in electric shock.

Refer to [3.2.2 Grounding for Pump Cables and Power Cables on page 9](#) and properly ground the cables.

#### CAUTION

##### Grounding Requirements for Power Cables

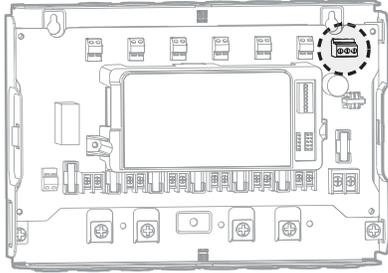
Proper grounding is required for safe use of the device. Improper grounding or no grounding connection may result in electric shock.

Refer to [3.2.2 Grounding for Pump Cables and Power Cables on page 9](#) and properly ground the cables.

### 3.2.9 Connecting Communication Cables for an Expanded Zone Pump Controller System

To connect the RS-485 communication cables between two zone pump controllers and establish an expanded zone controller system:

1. Locate the RS-485 communication terminal located at the top-right side of the main PCB, and then follow the steps in [3.2.1 Preparing Cables for Installation on page 8](#).

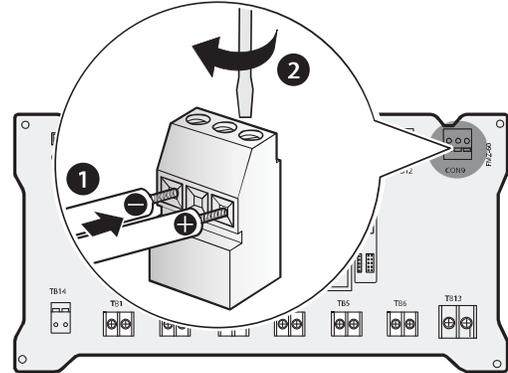


2. Insert the RS-485 communications cable through the hole in the casing directly above the contacts.

#### Note

RS-485 communication cable (UTP 24 AWG) must be field supplied.

3. Insert the exposed part of the RS-485 communication cable wires into the provided contacts. Ensure proper polarity when connecting the wires to the terminal (refer to the illustration). Then, use a flat-headed screwdriver to tighten the terminal screws.



4. Repeat steps 1–3 on the other zone pump controller.

#### Note

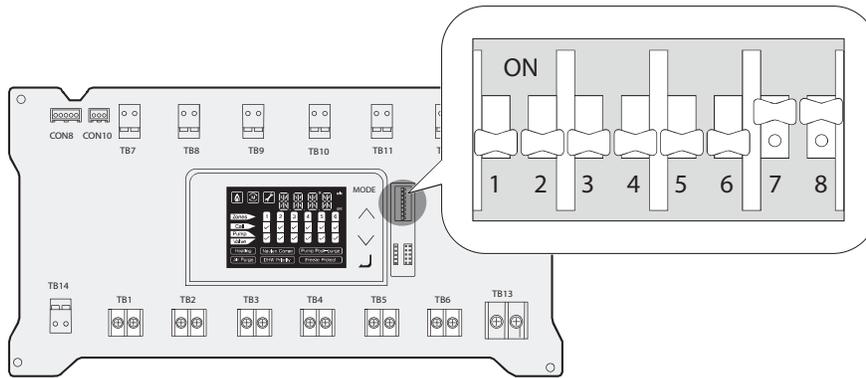
- Verify the proper polarity of wires before connecting them to the terminal.
- The maximum number of controllers in an expanded zone is four, and the maximum number of zones is 24 (FMZ-60 x 4EA). Refer to [6. Communication Detailson page 34](#) for detailed information.

### 3.3 DIP Switch Settings

#### CAUTION

Do not remove the front cover unless the power to the zone pump controller is turned off or disconnected. Failure to do so may result in electric shock.

The zone pump controller has a set of DIP switches on the circuit board. DIP switches are used to control boiler functions. Set the DIP switches appropriately for the desired installation setup.



Switch	Function	Setting	
1	DHW Priority	Used	1-ON
		Unused	1-OFF
2	Boiler Pump	Used	2-ON
		Unused	2-OFF
3	Indoor Sensor Temperature Unit	°C (Celsius)	3-ON
		°F (Fahrenheit)	3-OFF
4	Expansion Control	Used	4-ON
		Unused	4-OFF
5 & 6	Expansion	Master	5-OFF, 6-OFF
		Slave 1	5-ON, 6-OFF
		Slave 2	5-OFF, 6-ON
		Slave 3	5-ON, 6-ON
7 & 8	Model	FMZ-20 (Zone 2)	7-OFF, 8-OFF
		FMZ-30 (Zone 3)	7-ON, 8-OFF
		FMZ-40 (Zone 4)	7-OFF, 8-ON
		FMZ-60 (Zone 6)	7-ON, 8-ON

#### Note

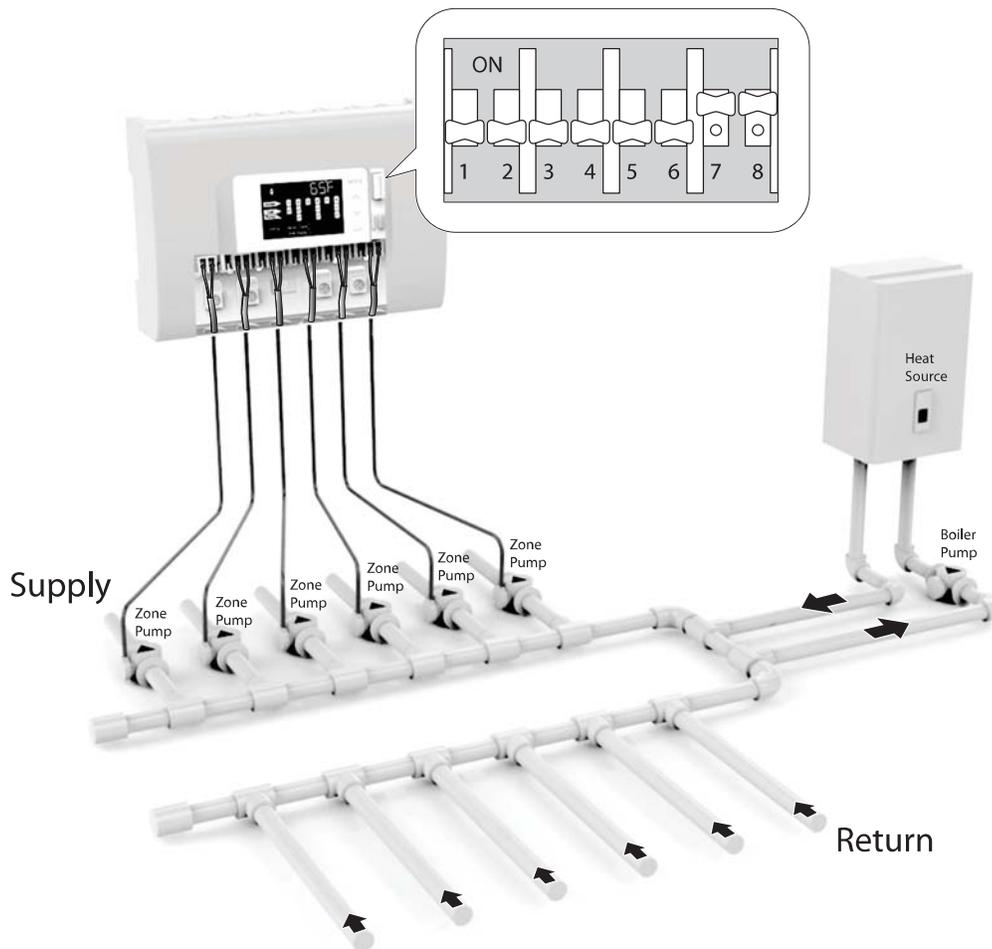
- When the power is turned on, it takes a few seconds for the controller to scan the settings. You cannot change any of settings during the system scan.
- Turn off the power to the device before making changes to the DIP switch settings. Turn the power on when you have finished.
- DIP switch #7 and #8 (model designation) are factory set. Do not change these settings.

### 3.4 Installation Examples

Refer to the following examples to correctly install the zone pump controller system. These examples are provided to suggest basic guidelines when you install the zone pump controller. The actual installation may vary depending on the circumstances, local building codes, or state regulations.

#### 3.4.1 Basic Mode

All zones are used for zone pumps.\*



\*This installation example is based on an FMZ-60 zone pump controller. Other models may have a different number of connection terminals.

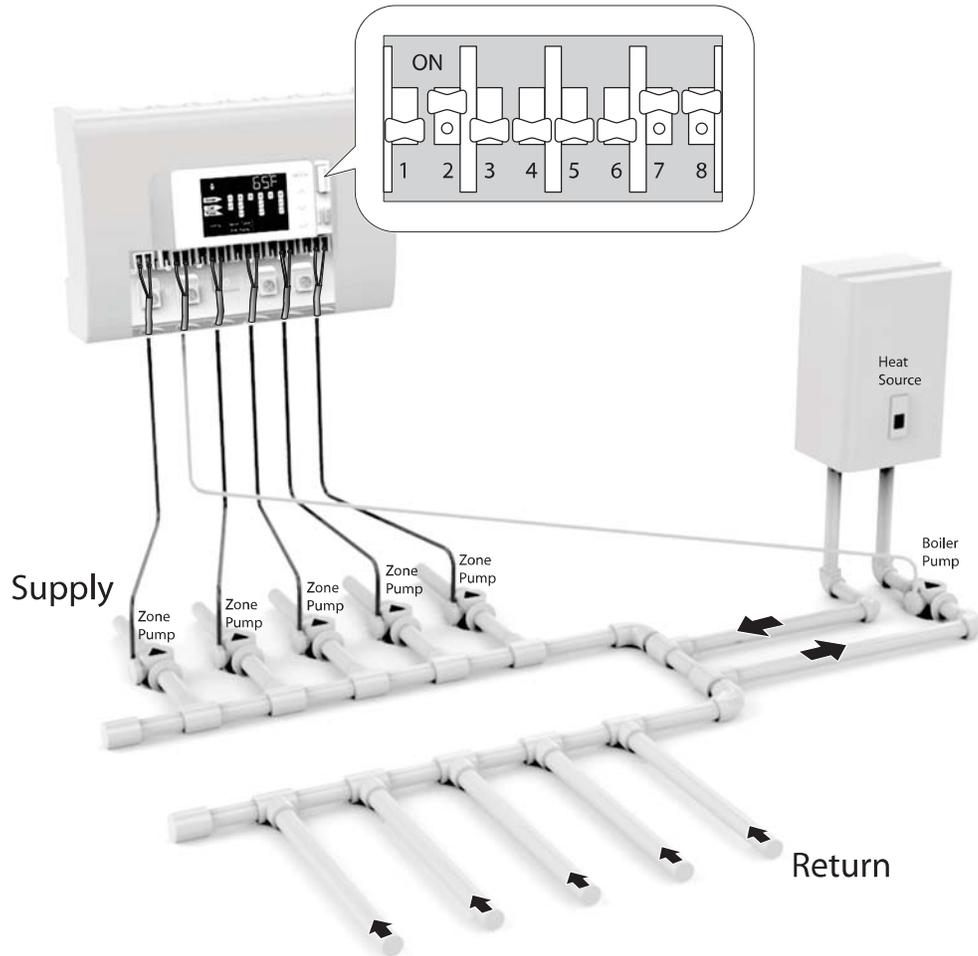
Figure 1-1. Basic Operating Mode

**Note**

System application diagrams and drawings are intended for reference only.

### 3.4.2 Boiler Pump Configuration

Zone 2 is used for the boiler pump and the rest of the zones are for zone pumps.\*



\*This installation example is based on an FMZ-60 zone pump controller.  
Other models may have a different number of connection terminals.

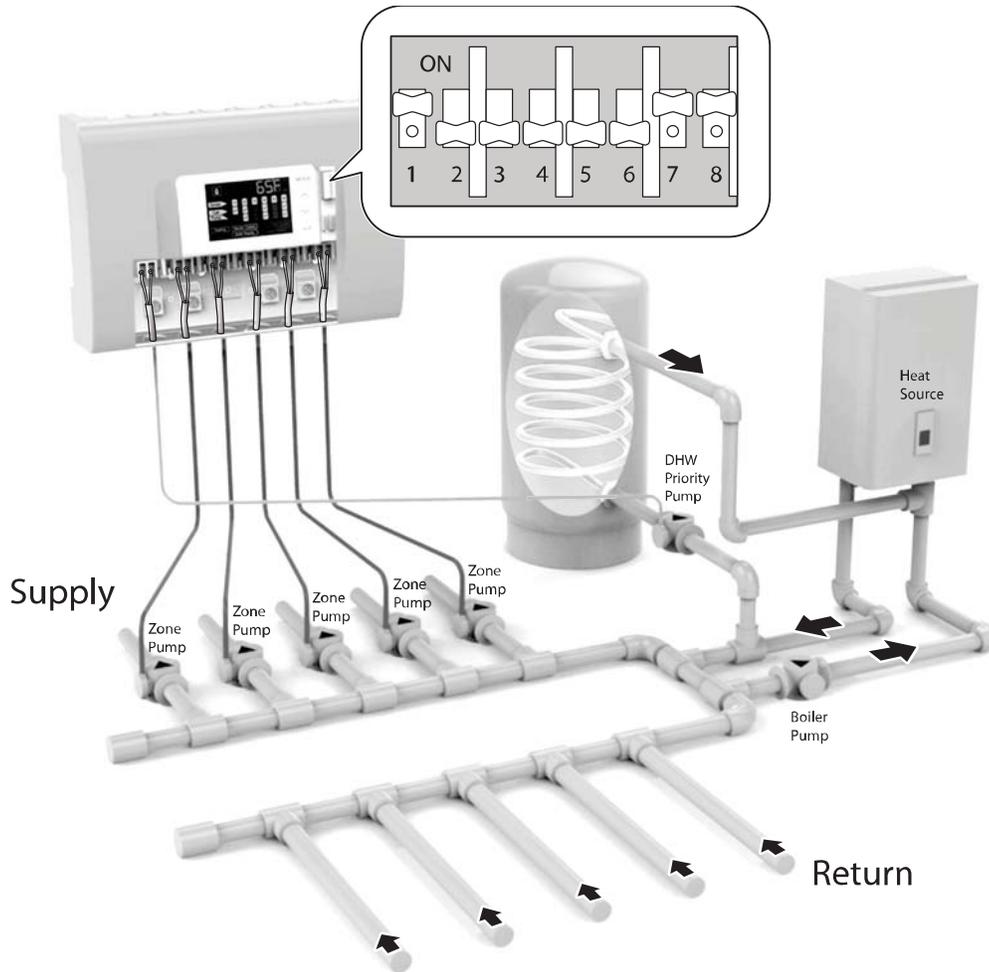
Figure 1-2. Boiler pump configuration

#### Note

System application diagrams and drawings are intended for reference only.

### 3.4.3 DHW Priority Configuration

Zone 1 is used for the DHW priority pump and the rest of the zones are for zone pumps.\*



\*This installation example is based on an FMZ-60 zone pump controller. Other models may have a different number of connection terminals.

Figure 1-3. DHW priority configuration

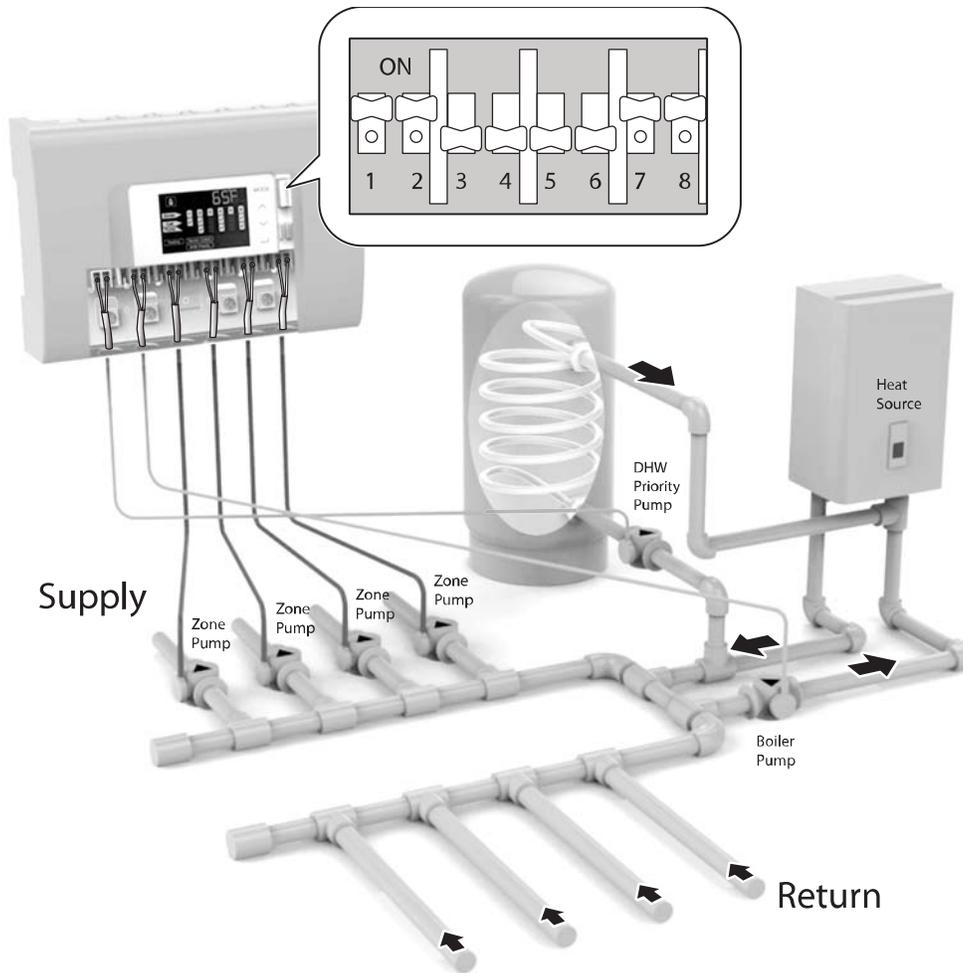
**Note**

System application diagrams and drawings are intended for reference only.

### 3.4.4 DHW Pump and Boiler Pump Priority Configuration

#### DHW Pump Only Configuration During DHW Priority Operation

During DHW priority operation, only the DHW pump operates. To operate DHW priority operation in the plumbing system shown in the figure below, set Installer menu item #G to OFF. When Zone 1 controls the DHW priority pump and Zone 2 controls the boiler pump, all other zones control the zone pumps.\*



\*This installation example is based on an FMZ-60 zone pump controller. Other models may have a different number of connection terminals.

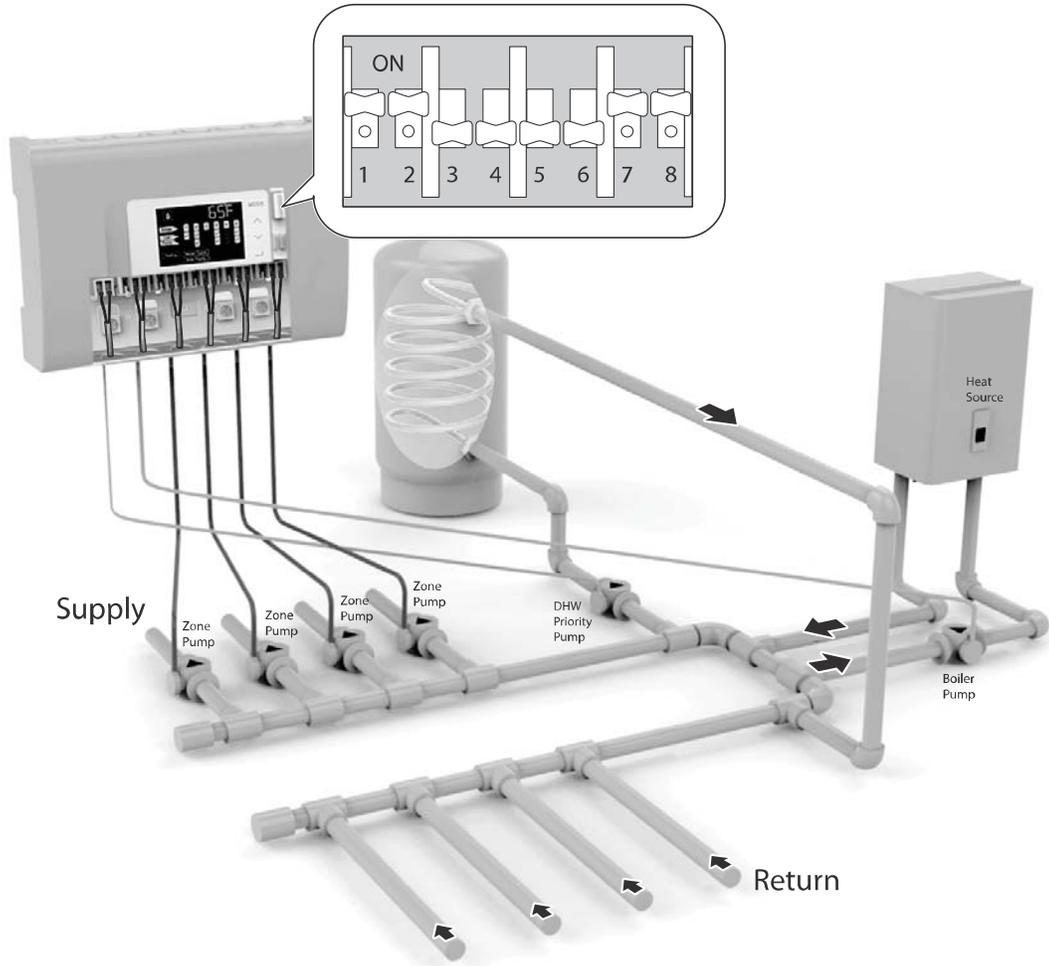
Figure 1-4. DHW priority operation, DHW pump operates only

#### Note

System application diagrams and drawings are intended for reference only.

### Simultaneous DHW and Boiler Pumps During DHW Priority Operation

During DHW priority operation, the DHW and boiler pumps operate simultaneously. To operate DHW Priority Operation in the plumbing system shown in the figure below, set Installer menu item #G to ON (see section [4.5 Installer Menu on page 27](#)). When Zone 1 controls the DHW priority pump and Zone 2 controls the boiler pump, all other zones control the zone pumps.\*



\*This installation example is based on an FMZ-60 zone pump controller.  
Other models may have a different number of connection terminals.

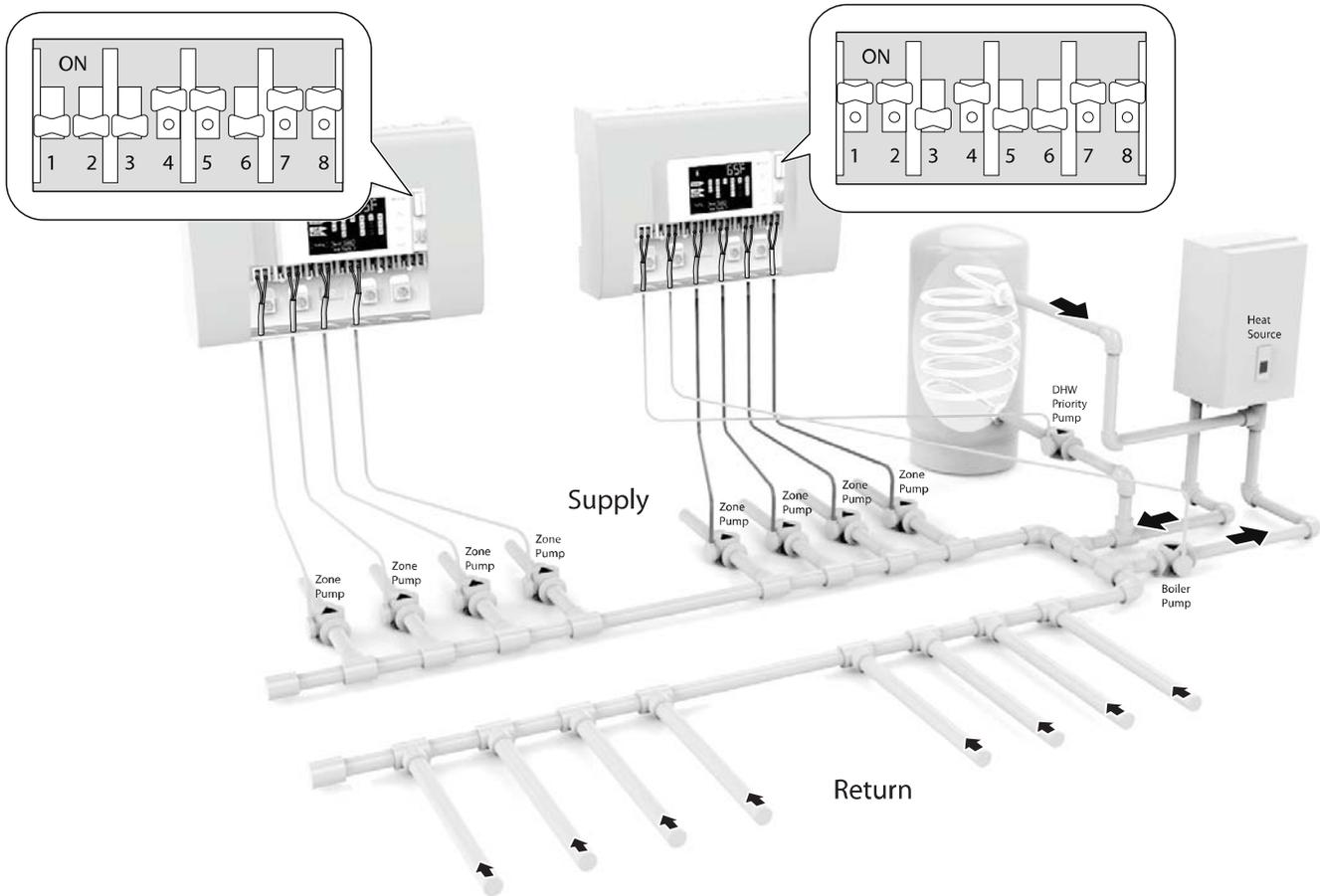
Figure 1-5. DHW priority operation, DHW pump and boiler pump running simultaneously

#### Note

System application diagrams and drawings are intended for reference only.

### 3.4.5 Expanded Zone Pump Configuration

If you cannot control all the zones with one zone pump controller, you can expand the zone pump controller system by adding more zone pump controllers and connecting them via RS-485 communication.\*



\*This installation example is based on an expanded zone control system with two FMZ-60 zone pump controllers. Other models may have a different number of connection terminals.

Figure 1-6. Using the expanded zones

#### Note

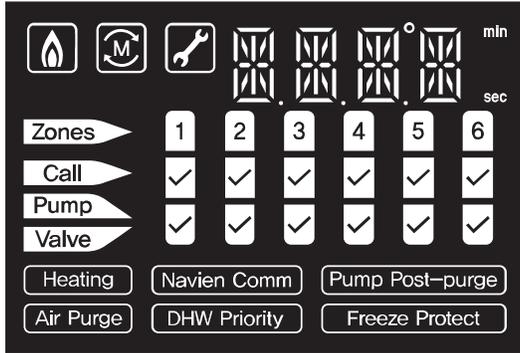
System application diagrams and drawings are intended for reference only.

# 4. Operating the Device

## 4.1 Displays and Buttons

### LED Display

The LED display provides important information about the zone pump controller. You must understand the LED display to use the zone pump controller properly. Refer to the following table for detailed information.



### Basic Information Icons

Icon	Description
	Indicates flame detection.
	Indicates master controller is set.
	Indicates an error.
	Display segments.

### Operating Status Icons

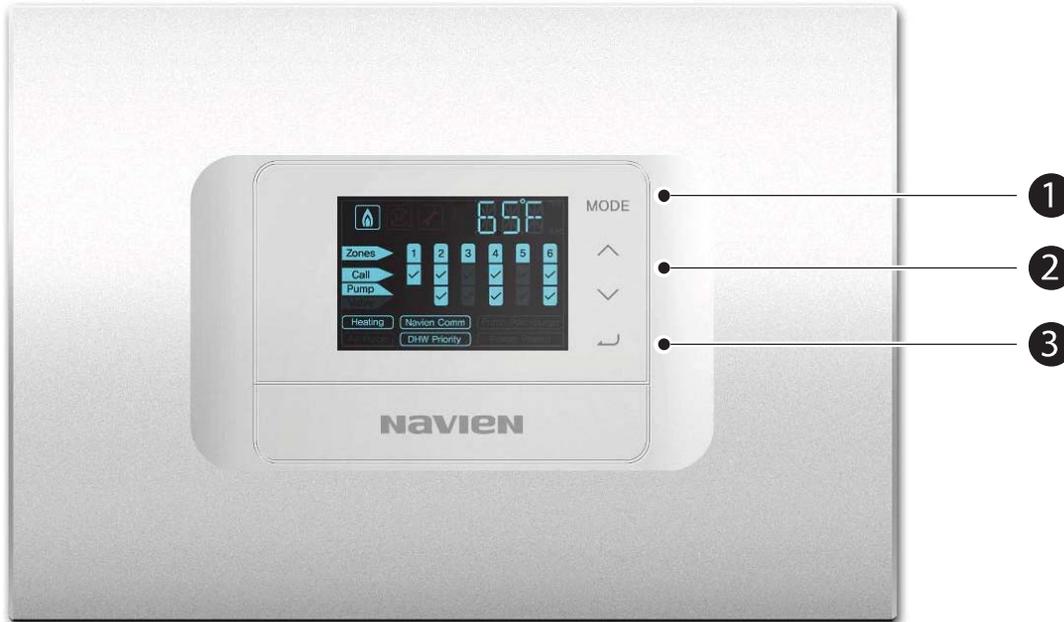
Icon	Description	Icon	Description
	Indicates zones.		Indicates the current status of zone, thermostat, pump, and valve.
	Indicates heat demand.		
	Indicates pump operation.		
	Indicates valve operation.		

### Heat Demand and Function Icons

Icon	Description	Icon	Description
	Indicates heat demand.		Indicates air purge operation.
	Indicates communication connection. (for NHB, NCB series)		Indicates DHW priority operation.
	Indicates pump post-purge operation.		Indicates freeze protection operation.

## Buttons

Use the buttons on the zone pump controller to monitor the current status and set the values required for the zone pump controller's operation. Refer to the following table for detailed information.



Number	Image	Description
1		Changes the menu mode. (User, Installer, Manual, Auto)
2		Increases or decreases the value, or turns a function ON or OFF.
3		Selects the specific value.

## 4.2 Basic Display Menu

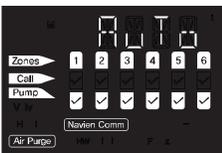
Basic display menu is the default screen that is displayed when the zone pump controller is turned on. From the basic display menu you can enter different menus and change the settings suitable for the system’s environment. The basic display may look different depending on the boiler and settings you use. The following examples are provided to show you how to interpret basic display information.

Basic display when a Navien NHB or NCB series boiler is in use with the indoor sensor (without T.T contact)	
	<p><b>System status</b></p> <ul style="list-style-type: none"> <li>• Segment: Current ambient indoor temperature (range: -4–122°F / -20–50°C).</li> <li>• Call: No thermostat input is detected.</li> <li>• Pump: No pump operation.</li> <li>• Navien Comm: Communication link is established.</li> </ul>
Basic display when a generic boiler is in use (with T.T contact) and the DHW priority setting is “ON”	
	<p><b>System status</b></p> <ul style="list-style-type: none"> <li>• Segment: DHW priority operation setting time.</li> <li>• Zones: The number of zones set by DIP switches.</li> <li>• Call: Thermostat 1 is on.</li> <li>• Pump: Pump is on.</li> <li>• DHW Priority: DHW priority operation is in use.</li> </ul>
Basic display when a generic boiler is in use (with T.T contact) and the DHW priority setting is “OFF”	
	<p><b>System status</b></p> <ul style="list-style-type: none"> <li>• Segment: Priority setting is not set. “No. PRIORITY” text keeps moving to the left across the display.</li> <li>• Zones: The number of zones set by DIP switches.</li> <li>• Call: No thermostat input is detected.</li> <li>• Pump: No pump operation.</li> </ul>

### 4.3 Main Menu

You can enter the main menu to change operating time, temperatures, and other values to configure the zone pump controller. The main menu consists of four different modes: User menu, Installer menu, Manual menu, and Automatic menu.

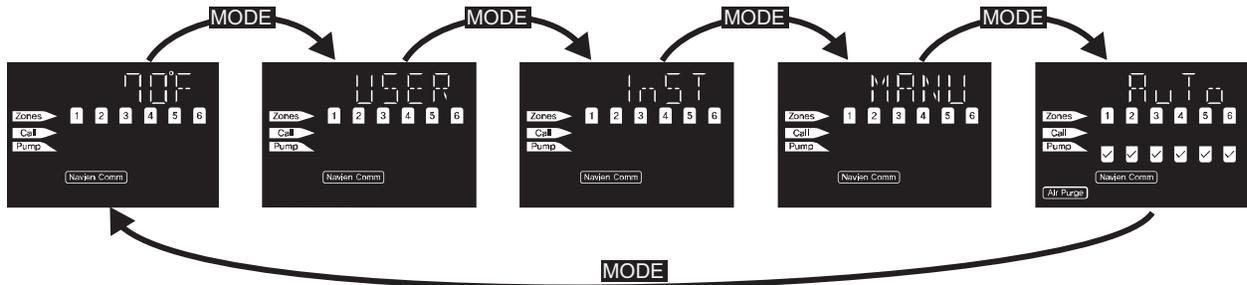
From the basic display mode, press the Mode button (**MODE**) to enter the main menu standby modes:

Status	Thermostat Input	Pump Operation
 <p>User mode standby</p>	<p>“Call” is displayed when there is a thermostat input.</p>	<p>“Pump” is displayed and the pump operates when there is a thermostat input.</p>
 <p>Installer mode standby</p>		
 <p>Manual mode standby</p>	<p>Not displayed</p>	<p>Before entering the advanced mode, “Pump” is displayed. After entering the advanced mode, “Pump” will be displayed depending on the pump’s operational status.</p>
 <p>Automatic mode standby</p>		<p>“Pump” is displayed and the pump operates when there is a thermostat input.</p>

## Entering the advanced menu modes

Follow the instructions below to access the advanced menu modes:

1. Press the Mode button (**MODE**) from the basic display to enter the main menu standby mode. "USER" is displayed. The User mode is the first of the four main menu modes. You can press the Mode button (**MODE**) again to move to the next mode.



2. From the current main menu standby mode (USER, InST, MANU, or AuTo), press the enter button () to enter the advanced mode. You can change setting values such as heating time, temperature, and other specific values from the advanced mode.
3. When you have finished making changes, press the Mode button (**MODE**) to return to the main menu from the advanced menu mode.

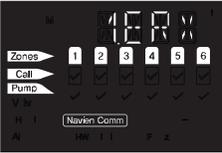
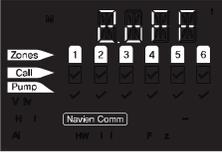
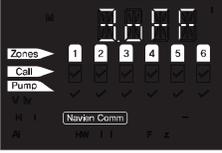
### Note

- If no button is pressed in 20 seconds in the User and Inst menu, the screen automatically returns to the basic display mode.
- If there is no pump operation in the Manual and Auto mode for 20 seconds, the display returns to the basic display mode.

## 4.4 User Menu

The current operating status and error conditions are displayed in the User menu. Press the enter button (  ) to enter the advanced user menu from the user menu standby mode for access to additional settings.

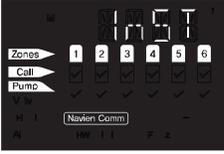
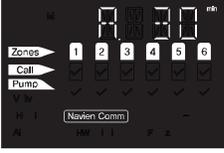
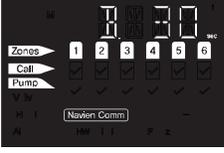
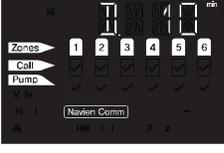
In the advanced user menu, press the enter button (  ) to move to the next sub menu. To return to the main menu from the advanced menu, press the Mode button ( **MODE** ). The installation menu standby mode is displayed.

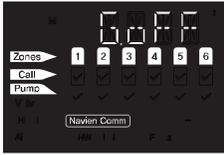
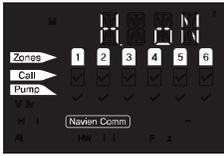
Display	Description
	User menu standby mode.
	1. Current error code "1.ERX": No error. "1.E--": Error code -- has occurred. (01–12)
	2. Boiler pump availability "2.oFF": Boiler pump is not used. "2.oN": Boiler pump is in use.
	3. Expansion availability "3.oFF": Expansion not used. "3.oN": Expansion in use.
	4. Expansion mode Master/Slave status "4.EPX": Expansion mode is not used. "4.MST": Master "4.SL1": Slave 1 "4.SL2": Slave 2 "4.SL3": Slave 3
	5. Expansion mode communication status (when in use) "5.MON": Master communication normal "5.MOF": Master communication not normal "5.S10": Slave 1 communication normal "5.S1F": Slave 1 communication not normal "5.S20": Slave 2 communication normal "5.S2F": Slave 2 communication not normal "5.S30": Slave 3 communication normal "5.S3F": Slave 3 communication not normal
	6. Model name "6.F20": FMZ-20 "6.F30": FMZ-30 "6.F40": FMZ-40 "6.F60": FMZ-60

## 4.5 Installer Menu

In the Installer menu, you can change the time and temperature settings for the heating system. Press the enter button (  ) to enter the advanced Installer menu from the Installer menu standby mode.

In the advanced Installer menu, press the up/down buttons (  ) to change the setting values, and the enter button (  ) to move to the next sub menu. To return to the main menu from the advanced menu, press the Mode button ( **MODE** ). The Manual menu standby mode is displayed.

Display (Default)	Description
	Installer menu standby mode.
	A. DHW priority time setting Setting range: 10–240min Default: 30 min
	B. Post-purge time setting Setting Range: 30–240sec Default: 30 sec
	C. Freeze protection temperature setting Setting Range: 35–50°F (3–10°C), in 1°F (1°C) increments. Default: 42°F (6°C)
	D. Freeze protection operating time setting Setting Range: 1–10 min, in 1 minute increments. Default: 10 min
	E. Freeze protection combustion downtime setting Setting Range: 1–4 hours, in 1 hour increments. Default: 4 hours
	F. Air purge time setting Setting Range: 1–24 hours, in 1 hour increments. Default: 12 hours

Display (Default)	Description
	<p>G. Boiler pump ON/OFF settings for DHW priority</p> <p>"G.oFF": Boiler pump is turned OFF in DHW priority pump operation.</p> <p>"G.oN": Boiler pump is turned ON in DHW priority pump operation.</p> <p>Default: OFF</p>
	<p>H. DHW priority pump ON/OFF settings for heating system operation.</p> <p>"H.oFF": DHW priority pump is turned OFF when thermostat 1 is ON while the heating system is operating.</p> <p>"H.oN": DHW priority pump is turned ON when thermostat 1 is ON while the heating system is operating.</p> <p>Default: ON</p>

## 4.6 Manual Menu

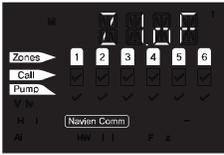
In the Manual menu, you can manually turn on or off each pump connected to the zone.

Press the enter button (  ) to enter the advanced Manual menu from the Manual menu standby mode. Once you enter the advanced Manual mode, all the connected pumps are automatically turned off for manual control.

In the advanced Manual menu, press the up/down buttons (  ) to turn on or off the pump, and the enter button (  ) to move to the next zone. To return to the main menu from the advanced menu, press the Mode button ( **MODE** ). The Automatic menu standby mode is displayed.

### Note

- The screen returns to the basic display mode when there is no pump operation for 20 seconds.
- After manual operation, the pumps continue to operate for the time set in the air purge time setting in the Installer menu item #F before ending the operation. Then, the screen automatically returns to the basic display mode.

Display	Description
	<p>Manual menu standby mode.</p>
	<p>Turn zone pumps on or off manually.</p> <p>"Z1.oF": Zone 1 pump OFF, "Z1.oN": Zone 1 pump ON</p> <p>"Z2.oF": Zone 2 pump OFF, "Z2.oN": Zone 2 pump ON</p> <p>"Z3.oF": Zone 3 pump OFF, "Z3.oN": Zone 3 pump ON</p> <p>"Z4.oF": Zone 4 pump OFF, "Z4.oN": Zone 4 pump ON</p> <p>"Z5.oF": Zone 5 pump OFF, "Z5.oN": Zone 5 pump ON</p> <p>"Z6.oF": Zone 6 pump OFF, "Z6.oN": Zone 6 pump ON</p>

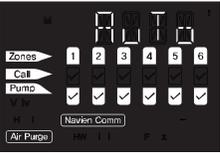
## 4.7 Automatic Air Purge Menu

In the Automatic Air Purge menu, you can allow the zone pump controller to automatically perform air purge at the initial start up, on all connected zone pumps. When the auto purge function is set to “ON”, the controller operates the pump for the air purge duration time set with the Installer menu item #F and the screen returns to the basic display mode.

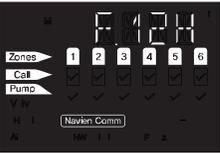
Press the enter button (  ) to enter the Automatic purge setting menu from the Automatic purge menu standby mode. In the Automatic Purge setup menu, press the up/down buttons (   ) to turn the function on or off.

### Note

- The screen returns to the basic display mode when there is no pump operation for 20 seconds.
- Pressing the Mode button ( **MODE** ) during an automatic purge forces the purge operation to stop and the screen returns to the basic display.

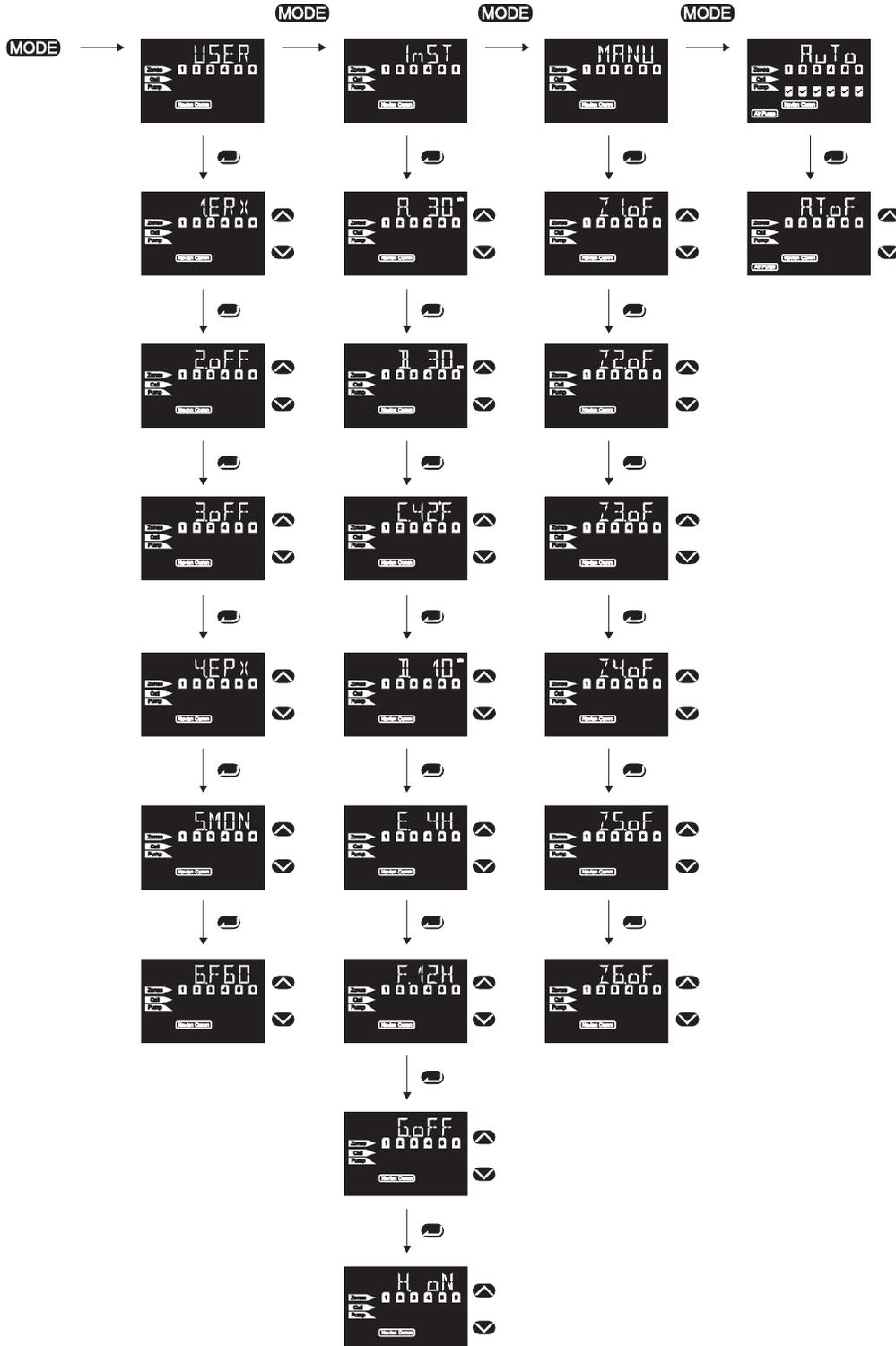
Display	Description
	Automatic menu standby mode.
	A. Turn the automatic purge function on or off. “A.T.oF”: Turn automatic air purge off. “A.T.oN”: Turn automatic air purge on.

- The Installer menu item #F sets the automatic purge time duration.

Display	Description
	F. Air purge time setting Setting Range: 1–24 hours, in 1 hour increments. Default: 12 hours

## 4.8 Menu Map

The menu map illustrates the main menu more easily. The Navien zone pump controller has four main menus. In the advanced modes of these menus, you can change the controller settings to customize the system operation. Refer to the following illustration for details.

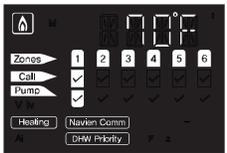


# 5. Using the Functions

## 5.1 DHW Priority Mode

The DHW priority mode allows the domestic hot water supply to take priority over the heating system operation.

When the DIP SW #1 is set to ON (DHW priority ON) and the thermostat 1 is ON, the zone pump controller operates the DHW priority pump for the duration set with the Installer menu item #A (DHW priority time).

Display	Description
	The DHW priority function is in use.

While operating in DHW priority mode, the zone controller operates the DHW priority pump regardless of the heat demand from any other zone thermostats. Then, when the DHW priority time ends, the priority pump operation stops, and a zone pump begins to operate according to its thermostat input for the duration of the DHW priority time.

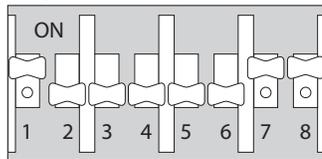
If the heating system's thermostat is ON when the DHW priority time ends and the heating system's priority time starts, the heating zone pump runs for the set priority time duration.

If thermostat 1 (AQUASTAT) is ON when the DHW priority time ends and the heating system's priority time starts, the DHW priority pump will turn ON or OFF based on the Installer menu #H setting (DHW priority pump). The pump can be set to ON or OFF according to the installation's plumbing design.

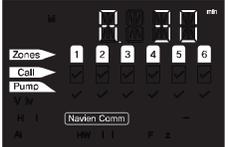
If DHW priority thermostat 1 (AQUASTAT) is OFF, the heating system pump runs regardless of the priority time and is controlled by the zone thermostat.

**Note**

- Dip switch #1 setting for the DHW priority mode



- The Installer menu item #A sets the DHW priority time duration.

Display	Description
	A. DHW priority time setting Setting range: 10–240 min Default: 30 min

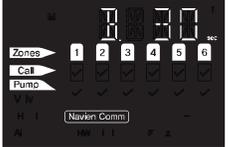
## 5.2 Post-Purge Operation

When the heat demand for all thermostats is met, the boiler stops combustion, and the zone pump controller performs the pump post-purge operation for the time duration set with the Installer menu item #B.

Display	Description
	Zone pump post-purge is in operation.

**Note**

The installer menu item #B sets the post-purge duration.

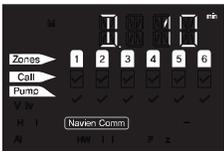
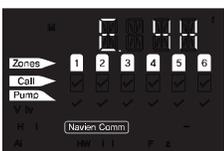
Display	Description
	B. Post-purge time setting Setting Range: 30–240sec Default: 30 sec

## 5.3 Freeze Protection

Freeze protection is used to prevent water freezing inside the heating system and causing damage.

Freeze protection may be configured with the Installer menu items #C, #D, and #E.

Freeze protection options in the Installer menu

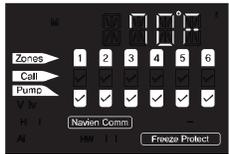
Display	Description
	<p>C. Freeze protection temperature setting            Setting Range: 35–50°F (3–10°C), in 1°F (1°C) increments.            Default: 42°F (6°C)</p>
	<p>D. Freeze protection duration setting            Setting Range: 1–10 min, in 1 minute increments.            Default: 10 min</p>
	<p>E. Freeze protection combustion downtime setting            Setting Range: 1–4 hours, in 1 hour increments.            Default: 4 hours</p>

### Freeze protection using the indoor sensor (no data communication between the boiler and zone pump controller)

- The indoor sensor detects the ambient temperature. If the temperature decreases to the freeze protection temperature set with the Installer menu #C, the zone pump controller starts all the pumps to circulate the water and prevent it freezing.
- If the indoor sensor detects a temperature below the freeze protection temperature for 10 seconds, the zone pump controller starts the pumps for the freeze protection. It uses the operation time set with the Installer menu #D and stops for 1 minute, and then continues to perform the cycle.
- After pump operations, if the temperature continues to decrease and the sensor detects a temperature below the freeze protection temperature set with the Installer menu #C (-6°F/-3°C) for 10 seconds, the controller sends a signal to the boiler thermostat and turns on the burner.
- The burner runs for 1 minute, and then turns off for the freeze protection combustion downtime set with the Installer menu #E.
- The freeze protection combustion is disabled immediately when the temperature increases 1 degree higher than the freeze protection temperature.
- If there is heat demand requested from a thermostat, the freeze protection combustion setting is disabled immediately and the freeze protection combustion downtime is reset.

**When data communication is established between the zone pump controller and Navien boilers**

- Freeze protection settings in the Installer menu will be bypassed, and the boiler's freeze protection setting will be used.
- If a DHW priority pump is configured in the system, the freeze protection signal from the boiler will not operate the DHW priority pump (because this may cause the temperature to drop in the DHW storage tank).
- When the controller is used with Navien boilers, the indoor sensor is used to display the current indoor temperature only.

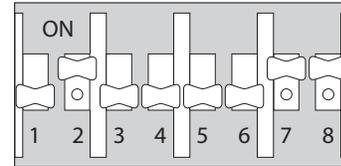
Display	Description
	Freeze protection is in operation.

**CAUTION**

- Freeze protection requires either the indoor sensor or data communication between the controller and the boiler – **otherwise freeze protection is NOT available.**
- Freeze damage is not covered by the warranty.

**5.4 Boiler Pump Control**

Set DIP switch #2 to ON to operate the zone pump 2 as the boiler pump.



When DIP switch #1 (DHW priority) is OFF, and DIP switch #2 (boiler pump) is ON, zone pump #2 operates as a boiler pump. This will occur whenever there is a call for heat in the system, regardless of the signals from its own thermostat (thermostat 2).

When DIP switch #1 and DIP switch #2 are both ON (DHW priority ON/boiler pump ON), the boiler pump (zone pump #2) operates with the DHW priority pump in DHW priority mode. While the DHW priority thermostat (thermostat 1) is off, Zone pump #2 continues to operate as a boiler pump whenever there is a call for heat in the system.

When DIP switch #1 and DIP switch #2 are both ON (DHW priority ON/boiler pump ON), the boiler pump (zone pump #2) operation can be controlled by Installer menu item #G.

- Installer menu item #G set to OFF: Boiler pump is turned OFF in DHW priority pump operation.
- Installer menu item #G set to ON: Boiler pump is turned ON in DHW priority pump operation.

In both cases, when the zone pump is operating the boiler pump is turned ON and runs at the same time.

**5.5 Pump Exercise Operation**

The pumps used in the system may seize and fail if they are not used for a prolonged period. Periodic use prevents the pumps from seizing. The Pump Exercise function is designed to prevent premature pump failure by operating the pumps periodically.

The zone pump controller finds any zone pumps that have not been used in the last 24 hours and runs them for 30 seconds.

## 6. Communication Details

Navien zone pump controllers support RS-485 data communication. The communication function can expand the zones by connecting zone pump controllers together. You can also connect Navien boilers to the controller to establish a data communication link to transmit and receive operational data from all connected boilers.

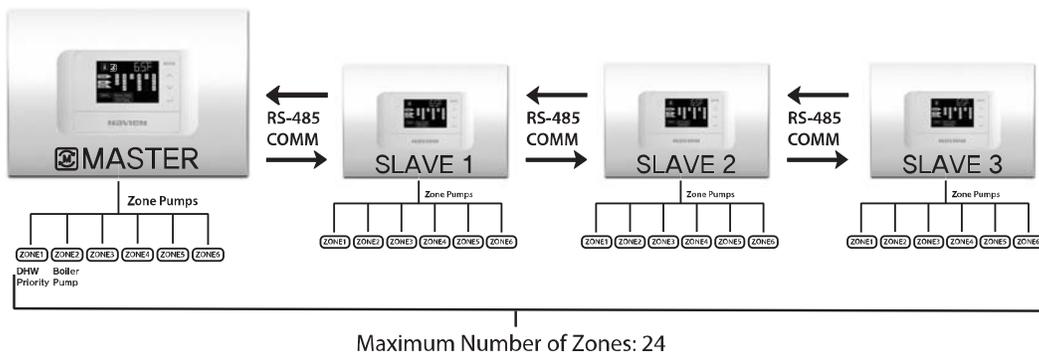
### Note

RS-485 communication cables must be field supplied.

### Zone Expansion

Zones can be expanded by connecting up to four zone pump controllers. Additional zone pump controllers can be added through RS-485 data connections (UTP 24 AWG, field-supplied). The maximum number of expanded zones is 24 (with FMZ-60).

While an expanded zone is used, all the zones, DHW priority pumps and boiler pumps will operate in the same way as they would with a single controller.



### Note

- When expanded zones are in use, the DHW priority pump and the boiler pump can be configured at the master zone pump controller only.
- The maximum number of controllers in an expanded zone is four. The maximum number of zones is 24 (FMZ-60 x 4EA).
- If communication between controllers is lost for 60 seconds, all communication data will be deleted (error codes will not be displayed).

### Communication with Navien Boilers

When Navien boilers are used with the zone pump controller, an RS-485 data communication link is established through the Ready-link connection. This allows the controller and the boiler to share operational information and to control the zones more efficiently by minimizing unnecessary pump operation. The communication link also provides an optimal control environment for freeze protection.



## 7. Error Codes

During pump operation, the zone pump controller monitors feedback signals from the relays and then displays an error code if there is an abnormal condition.

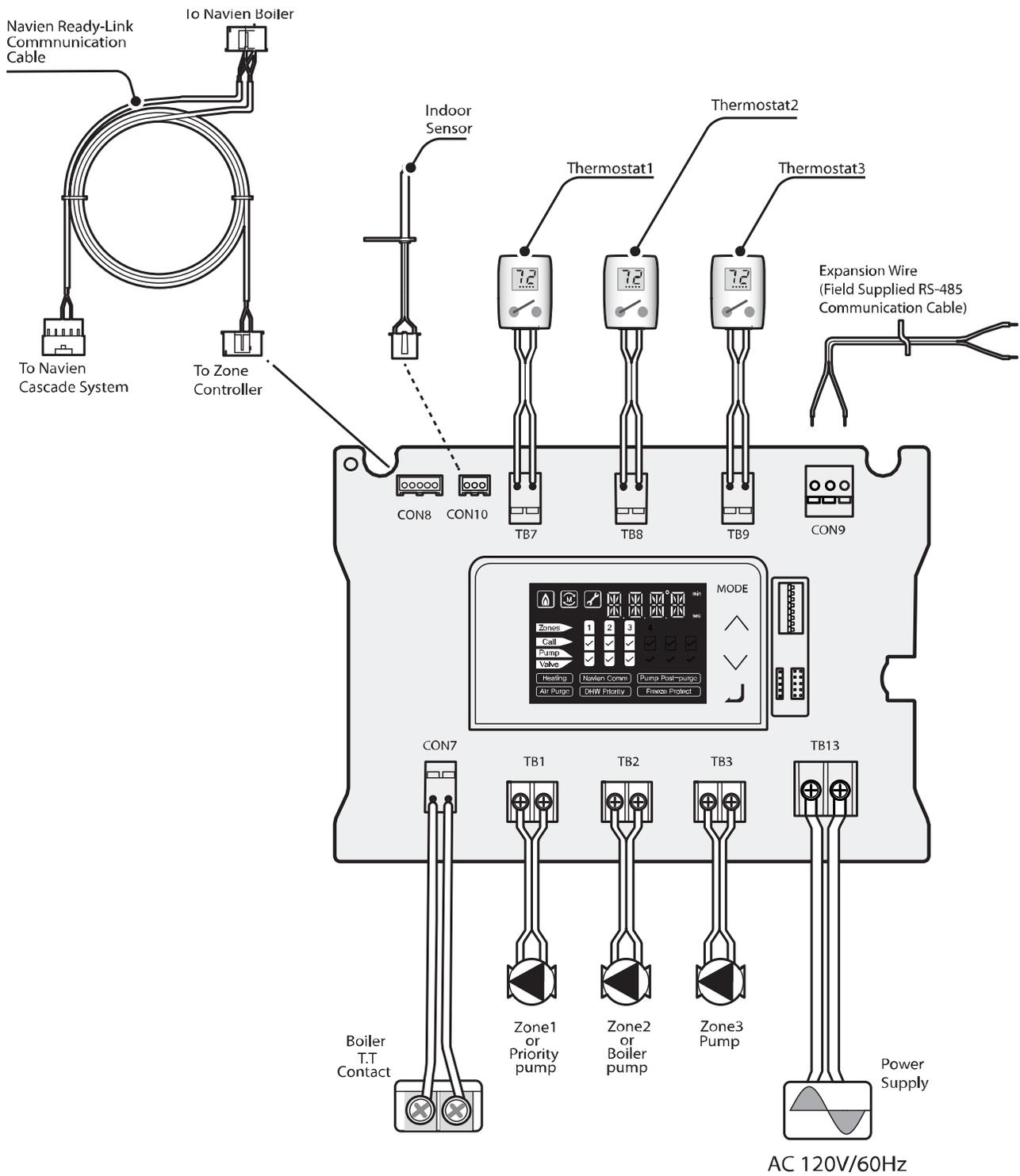
If a thermostat requests an increase in heat during a fault and if the boiler is operational, the controller will send the request to the boiler and starts the pump. If a pump stop command is received from the boiler during a fault condition, the controller will not start the pump.

Display	Description
	<p>1. Error Code 01</p> <ul style="list-style-type: none"> <li>• Error/maintenance icon turns on.</li> <li>• For a pump error, the corresponding pump icon does not turn on, and the Error/maintenance icon flashes.</li> </ul>

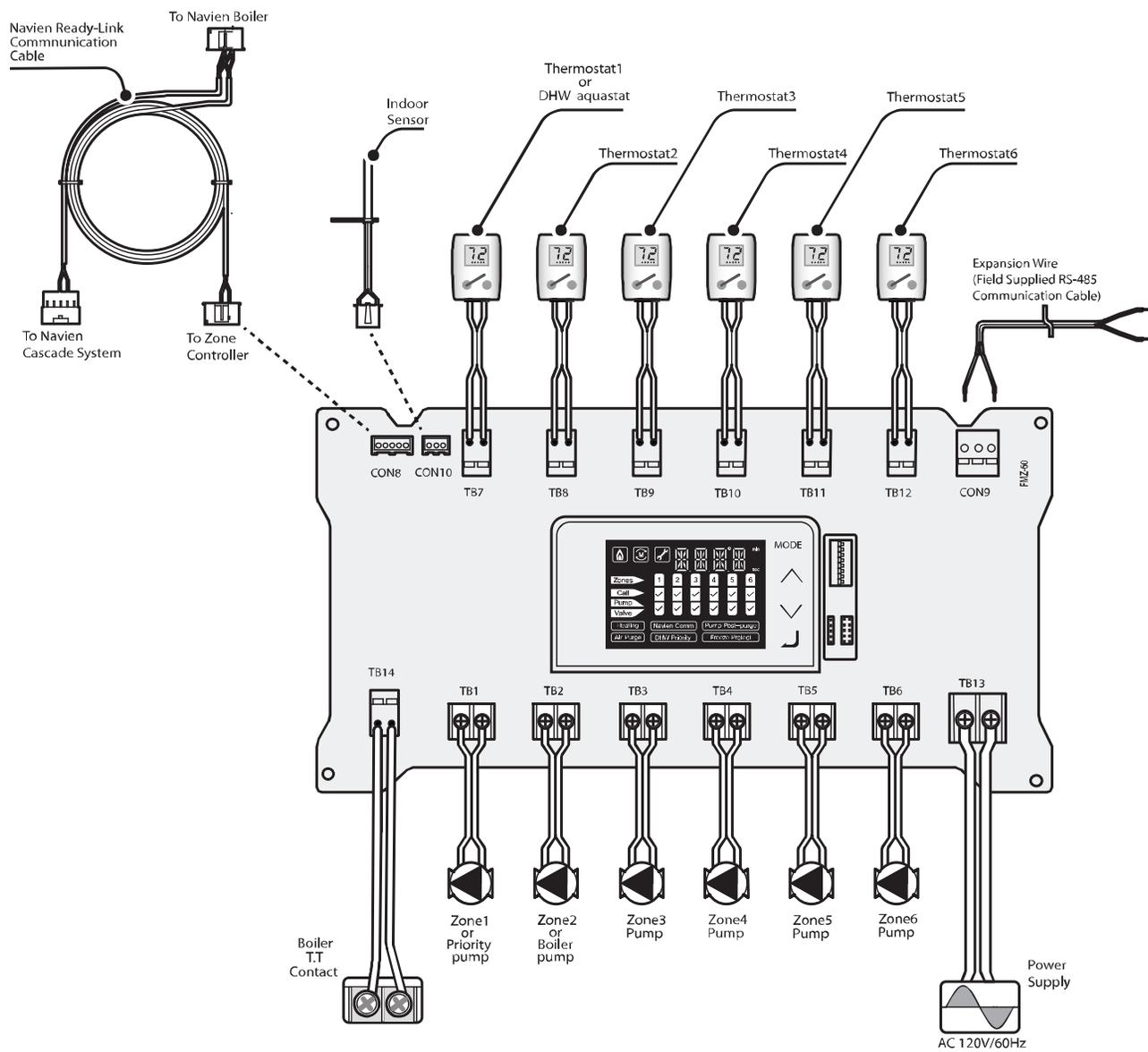
### Error Code

Error Code	Description
01	MCU transmits an (ON) signal for pump #1, no input at relay 1.
02	MCU transmits an (ON) signal for pump #2, no input at relay 2.
03	MCU transmits an (ON) signal for pump #3, no input at relay 3.
04	MCU transmits an (ON) signal for pump #4, no input at relay 4.
05	MCU transmits an (ON) signal for pump #5, no input at relay 5.
06	MCU transmits an (ON) signal for pump #6, no input at relay 6.
07	MCU transmits an (OFF) signal for pump #1, input received at relay 1.
08	MCU transmits an (OFF) signal for pump #2, input received at relay 2.
09	MCU transmits an (OFF) signal for pump #3, input received at relay 3.
10	MCU transmits an (OFF) signal for pump #4, input received at relay 4.
11	MCU transmits an (OFF) signal for pump #5, input received at relay 5.
12	MCU transmits an (OFF) signal for pump #6, input received at relay 6.

# 8. Wiring Diagrams



\* MODEL : FMZ-30



\* MODEL : FMZ-60

# LIMITED WARRANTY NAVIEN AMERICA, INC.

## Warranty Period

Navien products come with a limited warranty covering parts. The following warranty periods begin to run from the date of original installation. The date of original installation must be provided to Navien, and upon request, proof of the original installation date must also be provided to Navien. When the product is installed in a new construction, the commencement date shall be dated upon which the end-user takes title to the property.

## APPLICABLE WARRANTY PERIOD

Period of Coverage	
All other parts and components	3 years

## Warranty Claim Procedures

To obtain warranty repair service, the end user or homeowner must contact the original installer of your Navien product. If the original installer cannot be identified, the end user or home owner may contact Navien's Technical Administration Department at (800) 519-8794. Proof of purchase is required to obtain warranty service.

## Warranty Service

At its option, Navien will replace the defective component (part), in accordance with the terms of this Limited Warranty, if it fails in normal use and service during the applicable warranty period identified above. The replacement component must be Navien original factory component. Navien, at its sole discretion, may replace the product with a new or refurbished product of comparable quality and design. The replacement component or product will be warranted only for the unexpired portion of the original component's applicable warranty period. Payment for labor in completing the warranty service is subject to Navien's prior written approval and shall be subject to Navien's schedule of approved labor allowances.

## Warranty Exclusions

Navien's Limited Warranty shall be void in the event of an occurrence of any of the following:

- Improper installation, failure to install in strict compliance with the Installation & Operation Manual procedures, installed by an unlicensed installer, and installation in violation of applicable rules, laws or building codes.
- Product purchased through the internet, other e-commerce channels, or any installer that obtained the product from a supplier or distributor not authorized by Navien.
- Failure to perform regular maintenance, misuse, operation at settings other than those recommended or specified, noncompliance with instructions or guidelines set forth in the User's Information Manual.

- Modification or alteration of the product in any manner, including but not limited to, removal of any component or part, addition of any non-approved components, relocating or moving the product from its original installation site, or any accidental or intentional damage to the Product.
- Installer's failure to fully comply with the warranty service and return policy procedures previously provided to installer and as is available on Navien's website. Such policies include but are not limited to the installer's failure to first contact Navien Technical Support while in front of the product for purposes of trouble shooting the identified problem or issue.
- Any damage, malfunction or failure caused by abuse, negligence, alteration, accident, fire, flood, freezing, wind, lightning and other acts of God.
- Operating, using or storing the zone pump controller in a corrosive or contaminated atmosphere or environment.
- Installation at any location outside the United States and Canada.

Other Terms: This Limited Warranty is subject further to the terms and conditions set forth herein and as may be further specified in the terms and conditions page located on Navien's website at [www.navienamerica.com](http://www.navienamerica.com). WITH THE EXCEPTION OF THIS LIMITED WARRANTY, NAVIEN DISCLAIMS ANY OBLIGATION OR LIABILITY WITH RESPECT TO THE PRODUCTS OR THEIR SALE AND USE, AND NAVIEN NEITHER ASSUMES NOR AUTHORIZES THE ASSUMPTION OF, ANY OBLIGATION OR LIABILITY IN CONNECTION WITH THE PRODUCTS. THIS DISCLAIMER INCLUDES ANY OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY RESPECTING THE PRODUCTS OR ANY PARTS OR COMPONENTS THEREOF, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Navien's total liability for any claim arising hereunder shall not exceed the purchase price which you paid for the product. NAVIEN SHALL NOT IN ANY EVENT BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL OR LIQUIDATED DAMAGES OR PENALTIES, INCLUDING CLAIMS FOR LOST REVENUE, PROFITS OR BUSINESS OPPORTUNITIES, EVEN IF NAVIEN HAD OR SHOULD HAVE HAD ANY KNOWLEDGE, ACTUAL OR CONSTRUCTIVE, OF THE POSSIBILITY OF SUCH DAMAGES.

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**navien** Zone Pump Controller

# Installation & Operation Manual

## Getting Service

If your zone pump controller requires service, you have several options for getting service:

- Contact Technical Support at 1-800-519-8794 or on the website: [www.navienamerica.com](http://www.navienamerica.com). For warranty service, always contact Technical Support first.
- Contact the technician or professional who installed your zone pump controller.
- Contact a licensed professional for the affected system (for example, a plumber or electrician).

When you contact Technical Support, please have the following information at hand:

- Model number
- Serial number
- Date purchased
- Installation location and type
- Error code, if any appears on the LED display.

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**navien**

**Navien America, Inc.**

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