Installation, Operation, and Maintenance Manual

IntelliStation® | 2

Domestic Hot Water Regulation

A Smart and Connected Digital Water Mixing Solution

works with nexa

IntelliStation 2

IntelliStation 2S

POWERS™

A WATTS Brand

Contents

⚠ WARNING

Read this Manual BEFORE using this equipment.
Failure to read and follow all safety and use information can result in death, serious personal injury, property damage, or damage to the equipment. Visit PowersControls.com with any questions.

Keep this Manual for future reference.
DO NOT DISCARD.

Safety

Attention Owners and Users

Thank you for purchasing the **Powers IntelliStation® 2**. This equipment will provide safe and productive operation as long as it is installed, set up, used, and serviced in accordance with the instructions in this Manual and is properly maintained. Owners and users of this equipment have the responsibility to make certain that this equipment is used properly and safely. To avoid the possibility of death, serious personal injury, property damage, or damage to the equipment, owners should not permit anyone to touch this equipment unless they are over 18 years of age, are adequately trained and supervised, and have read and understood this Manual. Owners should ensure that no unauthorized personnel come in contact with this equipment.

READ THIS MANUAL carefully, learn how to install, set up, use, service, and maintain this equipment correctly, and strictly follow all safety information and instructions contained in this Manual and on the equipment, as well as any requirements of local, state, and federal law. Failure to do so could result in death, serious personal injury, property damage, or damage to the equipment. This Manual should be considered a permanent part of the IntelliStation 2 equipment and be kept available for easy reference by any user.

If this equipment, or any of its parts, becomes damaged or needs repair, stop using the equipment and contact an experienced service individual immediately. If the product labels or this Manual are misplaced, damaged, or illegible, or if you require additional copies, visit PowersControls.com.

Remember that this Manual and the product labels do not replace the need to be alert, to properly train and supervise users, and to use common sense when using this equipment.

If you are ever uncertain about a particular task or the proper method of operating this equipment, ask your supervisor, consult this Manual, visit PowersControls.com, or contact your local sales representative.

Product Identification

Record your product's identification and purchase. This record will help in the event you have questions or need any service.

Model:	**Date of purchase:** **Seller name/address:**

Reading and Understanding the Manual

⚠ WARNING

TO AVOID DEATH, SERIOUS PERSONAL INJURY, PROPERTY DAMAGE, OR DAMAGE TO THE EQUIPMENT:

- **Read the Manual and all product labels and follow all safety and other information.**
- **Learn how to properly and safely use the equipment BEFORE installing, setting up, using, or servicing.**
- **Keep the Manual available for easy access and future reference.**
- **Replace missing, damaged, or illegible Manual and product labels.**
- **Visit PowersControl.com for Replacement Manuals.**

Understanding Safety Information

This safety-alert symbol is shown alone or used with a signal word (DANGER, WARNING, or CAUTION), a pictorial and/or a safety message to identify hazards and alert you to the potential for death or serious personal injury.

⚠ DANGER Identifies hazards which, if not avoided, will result in death or serious injury.

⚠ WARNING Identifies hazards which, if not avoided, could result in death or serious injury.

⚠ CAUTION Identifies hazards which, if not avoided, could result in minor or moderate injury.

NOTICE Identifies practices, actions, or failure to act which could result in property damage or damage to the equipment.

This pictorial alerts you to the need to read the manual.

This pictorial alerts you to scalding, burn, and hot water hazards.

This pictorial alerts you to burn and hot surfaces hazards.

This pictorial alerts you to electricity, electrocution, and shock hazards.

This pictorial alerts you to the need to perform appropriate Lock Out/Tag Out procedures.

Compliance

The following statements apply to the IntelliStation® 2 IS2075VL, IS2100VL, IS2150VL, and IS2200VL

- Installation of these valves MUST be performed by qualified technicians, including licensed electricians and plumbers, following all manufacturer's instructions, complying with all local, state, federal and other governmental requirements, and with all building and construction codes and standards.
- Use ONLY with a potable water distribution system free of debris, foreign materials, corrosive chemicals or substances, and other adverse conditions.
- Recommended for use as part of an ASSE compliant water distribution system, including mixing valves and/or temperature limiting devices at all point-of-use fixtures (such as faucets, sinks, tubs, showers).
- MUST be installed indoors in a dry enclosed area not susceptible to the weather elements such as rain, snow, ice, freezing temperature, direct sunlight, or excessive heat. Such weather elements may impact performance.
- Keep work area clean, well-lighted, free of clutter and distractions, and accessible only by authorized personnel and workers.
- Valves and touchscreen display must be located in accessible and well lighted area for use, servicing, repair or replacement by authorized personnel.
- The valve control module is electrically powered. ALWAYS take proper precautions to recognize, evaluate, and control electricity hazards during installation, programming, use, and service/maintenance.

A. Purpose of control: Operating Control,

B. Type 1 Action

C. Pollution Degree 2

D. Impulse Voltage: 2500

E. Installation Instructions including control mounting

FCC Caution for modifications:

Note: The Grantee is not responsible for any changes or modifications not expressly approved by the Grantee or the Party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

FCC Class A digital device statement:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

ICES RSS statement:

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:

(1) This device may not cause interference; and

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

« Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de license. L'exploitation est autorisée aux deux conditions suivantes:

(1) l'appareil ne doit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement. »

Specification

Call customer service if you need assistance with technical details.

ITEM	PARAMETER
Connection Type	Sweat/Press (Street)
Maximum Test Pressure	250 psi (1793 kPa)
Maximum Operating Pressure	200 psi (1034 kPa)
Maximum Operating Pressure Differential at Inlets	20% of Average Inlet Pressures with Maximum 20 psi (172 kPa)
Temperature Adjustment Range[1]	60°F – 180°F (16°C – 82°C)
Maximum Hot Water Supply Temperature	200°F (93°C)
Minimum Hot Water Supply Temperature[2]	2°F (1°C) above set point
Hot Water Inlet Temperature Range	120°F – 180°F (49°C – 82°C)
Cold Water Inlet Range	35°F – 80°F (2°C – 27°C)
Maximum Cold Water Supply Temperature[2]	2°F (1°C) below set point
Minimum Flow Demand	0 gpm (0.0 lpm)
Minimum Total Valve Flow Required[3]	3 gpm (11.36 lpm)
Outlet Temperature Accuracy per ASSE 1017	±2°F
Outlet temperature Accuracy at Recommended Minimum Flow Rates by Valve Size[2]	
IS2075VL @ 3 gpm	±2°F
IS2100VL @ 3 gpm	±2°F
IS2150VL @ 3 gpm	±2°F
IS2200VL @ 5 gpm	±2°F
Listing /Compliance	ASSE 1017, cUPC, NSF 61 & 372
Weight	
IS2075VL	19.0 lb (8.6 kg)
IS2100VL	19.1 lb (8.7 kg)
IS2150VL	24.06 lb (10.9 kg)
IS2200VL	34.19 lb (15.5 kg)
Ambient Temperature	32°F – 122°F (0°C – 50°C)
Ambient Humidity	0% – 90% RH noncondensing

[1] Set temperature low limit cannot be less than the cold water temperature. For best operation, hot water should be at least 2°F above desired set point.

[2] With equal pressure.

[3] Minimum flow (3 gpm) when IntelliStation 2 is installed at or near hot water source recirculating tempered water with a properly sized continuously operating recirculating pump.

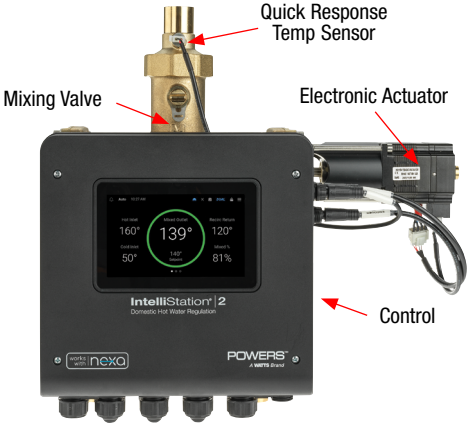
Control Electrical Specification

ITEM	PARAMETER
Input Power	120/240 V (ac) ±10%, 50/60 Hz, 17 W
Pump Relays (Motor Load)	120/240 V (ac), 10/8 FLA, 50/48 LRA
Alert Relay	120/240 V (ac), 5 A, 1/6 hp
Isolation Valve Relays	24 V (ac/dc), 5 A, Resistive
+5V Capacity	25 mA maximum, Resistive, Class 2
+20V Capacity	20 mA maximum, Resistive, Class 2
Actuator Load	13 W
Pump Proof Demand	24 V (ac) or Short
Operating Temperature	32°F – 122°F (0°C – 50°C)
Wi-Fi	802.11 b/g/n, 2.4 GHz
Listing/Compliance	FCC/ISED, UL 60730-1, UL 60730-2-9, IEC 60730, BACnet Testing Laboratories (BTL), CE

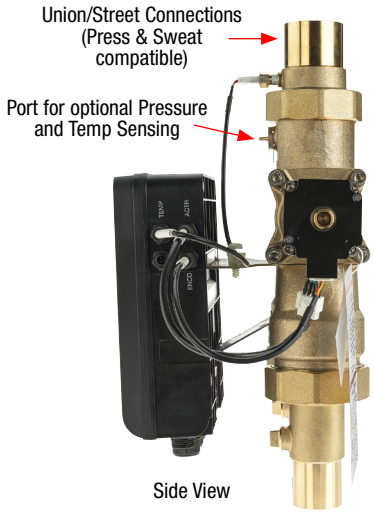
			Flow at Pressure (GPM)							
Inlet	Outlet	Valve Size	5	10	15	20	30	45	50	Cv
¾"	1"	¾"	34.1	54.8	65.5	76.4	92.3	114.3	125.3	17.3
1"	1¼"	1"	50.5	73.4	91.6	103.8	131.1	159.8	170.6	23.2
1½"	2"	1½"	77.8	112.2	135.7	156.0	200.6	245.0	251.4	35.5
2"	2½"	2"	100.4	149.4	184.0	216.2	256.5	317.0	332.3	47.3
			Pressure Drop (PSI) WITH CHECK							

			Flow at Pressure (GPM)							
Inlet	Outlet	Valve Size	5	10	15	20	30	45	50	Cv
¾"	1"	¾"	40.3	55.0	66.0	78.9	97.2	119.8	127.0	17.4
1"	1¼"	1"	57.2	76.8	102.5	114.5	140.8	171.3	180.9	24.3
1½"	2"	1½"	85.7	117.8	137.8	166.2	204.7	248.7	256.4	37.2
2"	2½"	2"	114.2	153.7	197.7	218.1	266.2	325.2	338.8	48.6
			Pressure Drop (PSI) WITHOUT CHECK							

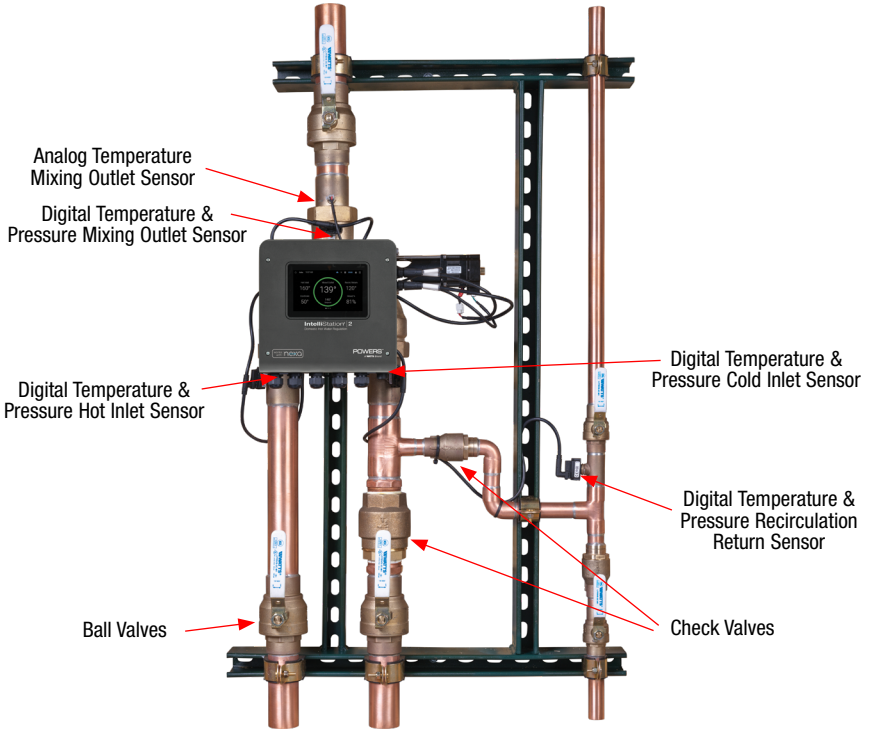
Diagrams



Front View



Side View



Installing IntelliStation 2

Installation of IntelliStation 2 is performed by the owner using qualified and licensed trades such as plumbers and electricians, following all local, state, federal and other governmental requirements, and all building and construction codes and standards. Step-by-step installation instructions depend upon the application and the configuration of the building's water distribution system. All installations require thorough flushing of all piping BEFORE installation, and testing for and elimination of all leaks before and after installation.

Both owner and user of IntelliStation 2 have the following responsibilities:

- Assign only qualified personnel with installation and adjustment tasks.
- Follow the manufacturer's instructions and comply with governmental requirements, building codes, and standards.
- Install the IntelliStation 2 as part of an ASSE-compliant water distribution system, including mixing valves and temperature-limiting devices at all point-of-use fixtures (faucets, sinks, tubs, showers) approved to ASSE 1016, 1069, 1070, and 1071.
- Select and install the product in an appropriate water distribution system.
- Establish equal inlet pressures through use of pressure reducing valves (PRV) or Automatic Compensating Valves (ACV). This is highly recommended.
- Ensure proper sizing of valve.
- Maintain water quality and condition. Max recommended water hardness is 10 grains (171 mg/L) for trouble-free operation of the valve.
- Decide on a safe and appropriate outlet water temperature for users and the facility.
- Use pressure differentials and flowrates (Design Flowrate), based on recommended flow velocities per system pipe size, for optimal control and valve longevity.

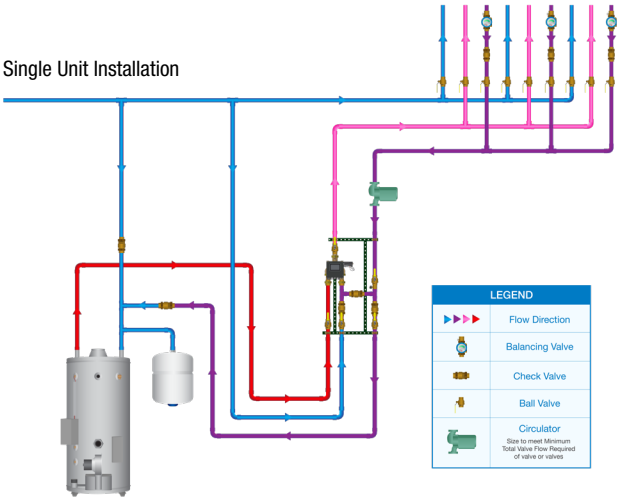
Mechanical

Use appropriate rack mounting methods with consideration to weight of the system. Ensure the rack is mounted so that features of the system can be accessed easily for normal operation and maintenance. Allow for a minimum 8" to 14" on either side of the valve to allow for service.

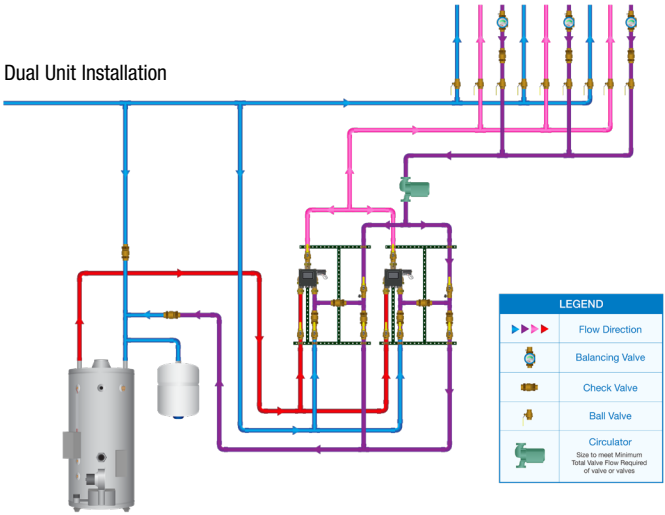
Plumbing

Below are examples of typical plumbing installations.

Single Unit Installation



Dual Unit Installation



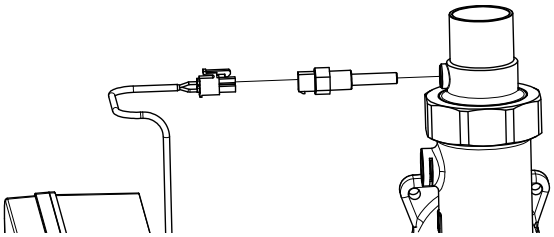
Connections

IntelliStation 2 can be installed with either of two different Union Connection fittings: Press-connect/Solder (standard) or NPT Threaded (separate purchase of the optional NPT kit required).

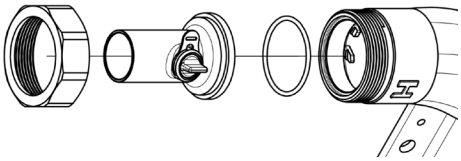
Press-connect/Solder

Best practice requires certain parts to be disassembled before soldering to avoid damaging O-rings and sensors.

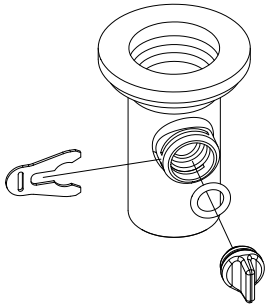
1. Remove the temperature sensor.
   a. Unplug the Quick Response Temp Sensor cable from the sensor by depressing the tab and pulling out the cable.
   b. Unscrew the sensor from the mixed outlet tailpiece.



2. Disconnect the union connections from the valve.



3. Carefully remove the sensor port retaining clips, plugs, and O-rings. (Be careful not to drop or lose the O-rings.)
   a. Use a flathead screwdriver, or similar tool, to engage the cutout on the retaining clip and pull out the clip.
   b. Pull the brass plug out of the sensor port.
   c. Remove the O-ring from inside of the port.



4. Properly identify the two inlet fittings and the mixing outlet fitting. The the inlet fittings and the outlet fittings are not the same.
5. Solder all connections in the correct locations with sensor ports facing toward the front of the control for accessibility.
6. Reinstall all parts after the joints have cooled.
    a. Re-install sensor port plugs.
        i. Install O-ring on the brass plug.
        ii. Insert plug and O-ring in the port (recommended to lubricate all O-rings with silicon based lubricants).
        iii. Insert the plug clips into the port. (NOTE: Plug clips are directional and must be installed on the correct side of the port.)
    b. Connect all union connections and the O-rings.
    c. Install temp sensor.
        i. Ensure threads properly sealed.
        ii. Thread in the sensor.
        iii. Reconnect the cable.

NOTICE

Press-connect installation can be done without part removal.

NPT Threads

1. Remove all parts as described in the Press-connect/Solder section.
2. Properly identify the two inlet union fittings from the NPT connections kit and the mixing outlet union fitting. The inlets and outlet fittings are not the same.
3. Install the NPT union fittings from the kit in the correct locations, ensuring all ports are pointed in the same direction as the screen on the control.
4. Using the O-ring, plug, and clips as well as the temperature senor, reinstall the parts on the NPT fittings as described in the Press-connect/Solder section.

Electrical

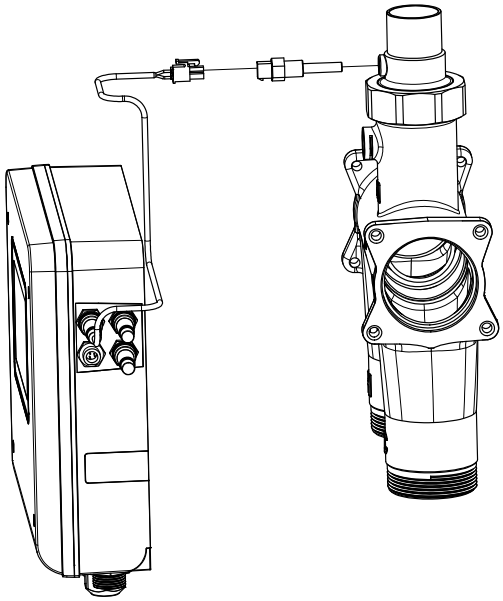
Cable connections are required from sensors and actuators to the control in order for the valve to function properly.

Factory Wired Connections

Cabling connects to the four ports on the side of the control: TEMP, ACTR, SENS, and ENCD.

Temperature Sensor (TEMP)

A quick response temperature sensor is included on the valve to measure and adjust the temperature at the mixed outlet position. The control includes a keyed 2 pin quick-connect port to connect the quick response temp cable labeled TEMP.

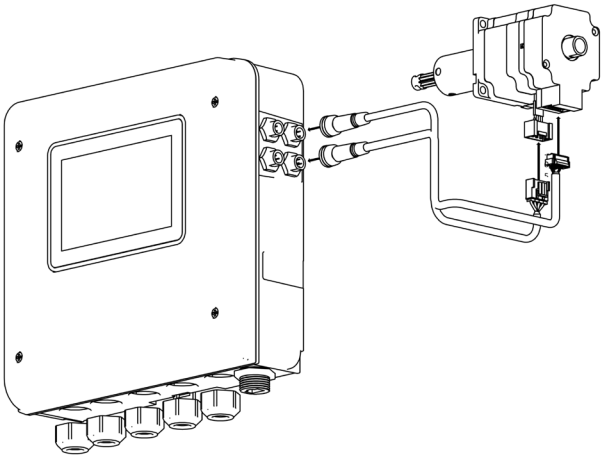


Mixing Valve Actuator Encoder (ENCD)

The mixing valve actuator includes an encoder for determining the position of the mixing valve. The control includes a keyed quick-connect 5 pin port for connecting the encoder cable labeled ENCD. (There is no low temperature actuator reset. A reset is not required for the actuator used with IntelliStation 2.)

Mixing Valve Actuator Power (ACTR)

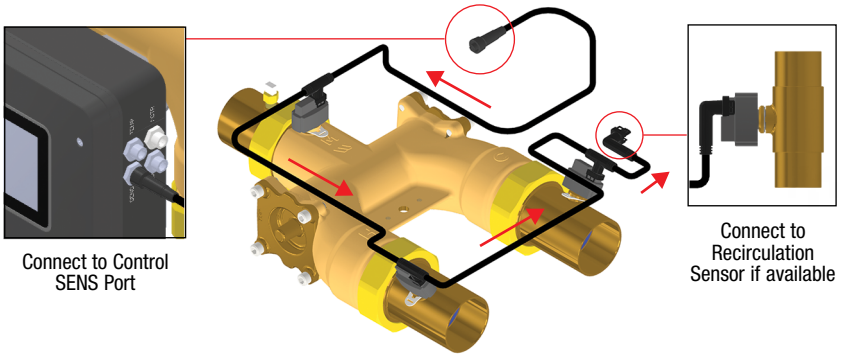
A stepper motor drive in the control is used for regulating the actuator. The control has a keyed quick-connect 4 pin port for connecting the actuator power cable labeled ACTR.



Digital Sensor Package (SENS)

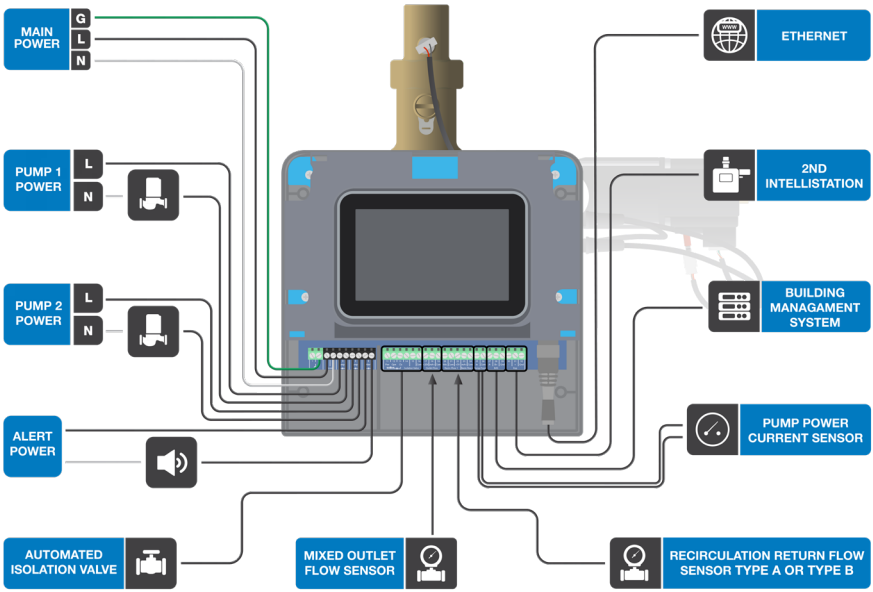
An optional digital sensor package includes either three or four sensors used to measure temperature and pressure at the mixed outlet, cold inlet, and hot inlet positions. The optional fourth position is for monitoring recirculation. The sensors must be installed in specific positions for proper measurement and control purposes. The control includes a keyed 3 pin quick-connect port for the sensor cable labeled SENS.

This illustration shows the specific position for each of the four sensors.



Field Wiring

Use the following illustration and instructions to connect each segment of the potable water system to IntelliStation 2. See the appendix for additional detailed examples of pump wiring.



Input Power (Terminals 1, 2, 3, 4)

1. Connect the 115 V (ac) line wire (L) to terminal 3.
2. Connect the neutral wire (N) to terminal 4.
3. Connect the ground wire (G) to either terminal 1 or 2.

Recirculation Pumps (Terminals 5, 6, 7, 8)

A recirculation pump requiring up to 115/230 V (ac) 10/8 FLA can be switched through terminals 5, 6, 7, 8. If a single power source is used for multiple pumps, ensure they are not tied together at any point between the pumps and the control. For simplicity in wiring and troubleshooting, a separate breaker for each pump is recommended.

For recirculation pump 1

1. Connect the power source (L) to terminal 5.
2. Connect a wire from terminal 6 to the pump L.
3. Connect a wire from the pump N back to the source neutral.

For recirculation pump 2

1. Connect the power source (L) to terminal 7.
2. Connect a wire from terminal 8 to the pump L.

Alert (Terminals 9, 10)

An alert device requiring up to 115/230 V (ac) can be switched through the alert terminals to provide notification of specific events.

1. Connect the L (line voltage) or R (low voltage) to terminal 9.
2. Connect the N (line voltage) or C (low voltage) back to the power source neutral.

Isolation Valve Actuator (Terminals 11 to 16)

An isolation actuator requiring up to 24 V (dc) can be connected to the control to provide functionality for dual valve sequencing. The control provides power for the actuator. A separate power source is not required.

For the actuator power, connect power to terminal 11.

For the actuator open, connect open to terminal 12.

For the actuator closed, connect closed to terminal 13.

For the actuator power open end switch, connect open end switch to terminal 14.

For the actuator power closed end switch, connect closed end switch to terminal 15.

For the actuator common end switch, connect common end switch to terminal 16.

Outlet Flow Sensor (Terminals 17, 18, 19)

An analog flow sensor can be connected to the control to provide flow monitoring of the mixed outlet. The control supports a Grundfos or Keyence brand flow sensor.

For a Grundfos model

1. Connect a wire from the sensor to terminal 17.
2. Connect a wire from the sensor to terminal 18.

For a Keyence model

1. Connect a wire from the sensor to terminal 18.
2. Connect a wire from the sensor to terminal 19.

Recirc Flow Sensor (Terminals 20, 21, 22)

An analog flow sensor can be connected to the control to provide flow monitoring of the recirculation return. The control supports a Grundfos or Keyence brand flow sensor. This connection is specific to the Grundfos model.

1. Connect a wire from the sensor to terminal 20.
2. Connect a wire from the sensor to terminal 21.
3. Connect a wire from the sensor to terminal 22.

Recirc Flow Sensor (Terminals 23, 24)

An analog flow sensor can be connected to the control to provide flow monitoring of the recirculation return. The control supports either a Grundfos or Keyence brand flow sensor. This connection is specific to the Keyence model.

1. Connect a wire from the sensor to terminal 20.
2. Connect a wire from the sensor to terminal 21.

Pump Proof (Terminals 25, 26)

The control requires a closed switch or short for proof of flow. Up to 24 V (ac) can be passed through the switch.

Connect the Pump Proof terminals 25 and 26 to the pump proof device.

Building Management System (Terminals 27, 28, 29)

A Building Management System (BMS) can be connected to the control for remote monitoring and adjustment capability.

1. Connect the A (-) terminal on the BMS network to terminal 27.
2. Connect the B (+) terminal on the BMS network to terminal 28.
3. Connect the ground (G) terminal on the BMS network to terminal 29.

Dual Valve Expansion (Terminals 30, 31, 32)

The control supports dual valve sequencing for backup operation. The connection is RS485 and is polarity sensitive.

1. Connect terminal 30 (-) to terminal 30 (-) on the 2nd control.
2. Connect terminal 31 (+) to terminal 31 (+) on the 2nd control.
3. Connect terminal 32 (Com) to terminal 32 (Com) on the 2nd control.

Ethernet

The control can connect to the internet through Ethernet.

Connect the Ethernet RJ-45 port on terminal 24 to the building Local Area Network (LAN) router or network switch using Category 5 cable.

Wi-Fi

The control can connect to the internet through Wi-Fi.

To allow for the option to connect to the internet through Wi-Fi, remove the jumper bar.

Power Loss and Startup

In the case of a power loss the control has a bank of capacitors with enough power to automatically close the hot water inlet so that mixed outlet water temperature does not rise to a dangerous level. During startup the control displays “Initializing IntelliStation” on the screen. This screen allows time for the capacitor bank to charge so the valve can be safely closed if power is lost.

The valve also makes some noise during startup as the valve calibrates itself by fully closing off the hot water side temporarily.

Monitoring IntelliStation 2

⚠ WARNING

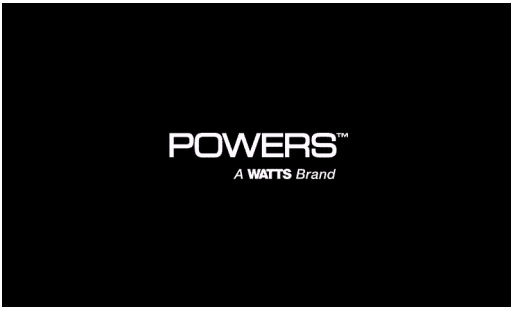
Always read the Manual and all product labels and follow all safety and other information. If you are ever uncertain about a particular task or the proper method of operating this equipment, ask your supervisor, consult this Manual, or Visit PowersControls.com.

The control touchscreen operates much like a smartphone. Dragging your finger left or right on the touchscreen navigates to the next or previous screen and tapping selects different menus or settings. On a menu, dragging your finger up or down navigates to all settings on the menu.

You can monitor seven standard screens and show the main sensor readings and current settings of the system. Screens may look different depending on the options installed on the system. Live readings are displayed on each screen.

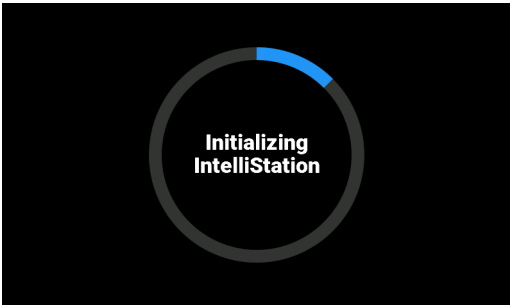
Screen 1 **Power On**

When first powered on, the Powers logo is displayed.



Screen 2 **Initializing**

Next Initializing IntelliStation is displayed. During initialization, the control is charging the capacitor bank used for failsafe operation. When the process is finished, the control performs normal operation.



Screen 3 **Temperatures**

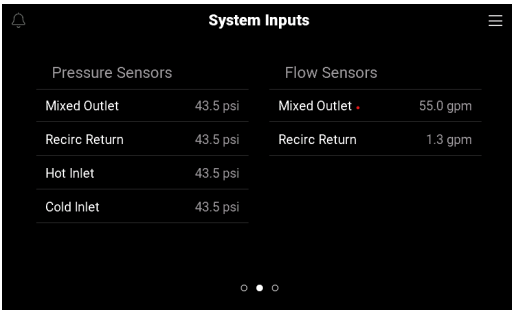
Hot, Cold, and Recirc Return temperatures (If option installed) and Mixing outlet setpoint and actual temperature.

Swipe your finger left or right to view the main screens.

Screen 4 **System Inputs**

Water pressures and flow rates (If option installed)

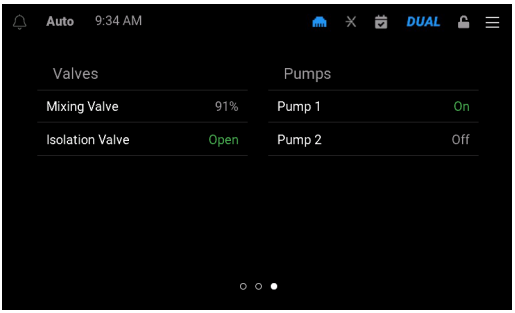
Swipe your finger left or right to view the main screens.



Screen 5 **System Outputs**

Isolation valve and pump status (if option installed)

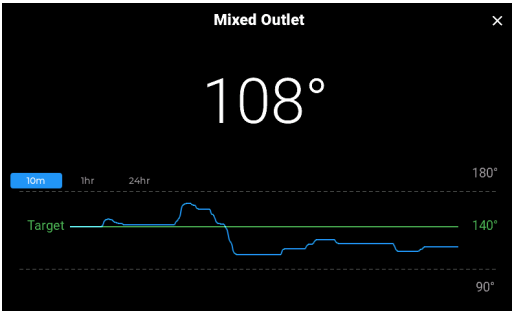
Swipe your finger left or right to view the main screens.



Screen 6 **Mixed Outlet History**

Mixed outlet temperature history up to 24 hours

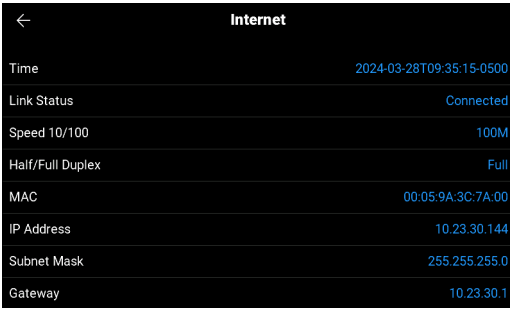
Tap the mixed outlet circle on screen 1 for a graphical view of temperature relative to target setpoint over a time period. Tap ✕ to exit.



Screen 7 **Internet Connection**

Internet connection settings and status

Tap . Swipe your finger up or down for more connection settings. Tap ← to return to the main screen.



Icons and Commands

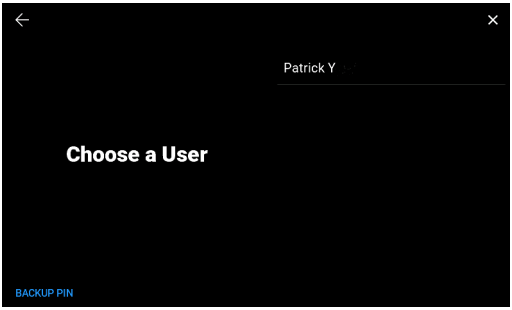
Tap an icon or command for information or to complete an action.

Item	Description
	Indicates messaging of an error or alert. Tap to see the last error message (Tap the X icon to exit the screen.)
AUTO	Indicates one of three operating modes Auto, the control is managing the mixing valve. Manual, the user has manual control of the mixing valve. Idle, the mixing valve is not being controlled.
9:46 PM	Show current time at location (Can also be displayed in 24-hour format.)
	Indicates internet connection type is Wi-Fi (Per configuration selected, either the Wi-Fi icon or the Ethernet icon is displayed in this location on the taskbar.)
	Indicates internet connection type is Ethernet (Per the configuration selected, either the Ethernet icon or the Wi-Fi icon is displayed in this location on the taskbar.)
	Indicates by color whether the system is connected to the Nexa platform Blue, connected Gray, not connected
	Indicates by color whether the system is running a programmed schedule Blue, a schedule is active Gray, no schedule is active

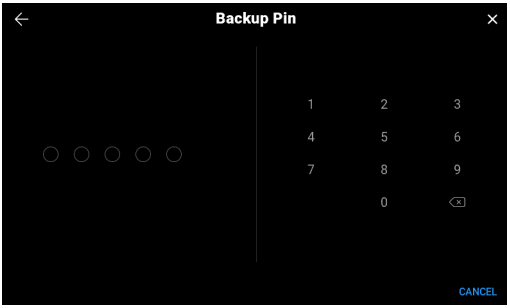
Item	Description
DUAL	Indicates by color whether valve sequencing is active or inactive Blue, ON Gray, OFF
	Indicates by color whether settings are locked or unlocked Gray, locked Blue, unlocked
	Provides access to main menu commands and submenu commands
	Closes a menu screen
	Returns to the previous screen
BACKUP PIN	Opens the Backup Pin screen for entering the security passcode (A custom passcode can be set through the Security menu.)
	Provides more information
	Enables or disables a function

Changing Settings

All settings menus are locked on the control and cannot be seen until you enter the correct user security pin number. Tap ☰, choose your user name and enter the passcode. To unlock the basic user menu, tap **BACKUP PIN** in the lower left.



Enter the user-level pin number (10170). This unlocks the menu screens allowing you to make various adjustments to settings and turn on or off various options. (A custom passcode can be set through the Security menu.)



Remote Monitoring IntelliStation 2 with Nexa

IntelliStation 2 can be monitored remotely when you connect the equipment to the cloud-based Nexa application. Nexa offers a centralized dashboard for viewing and controlling multiple mixing valves at one or more locations.

How Nexa Supports IntelliStation 2

With Nexa, you have a toolkit for taking an array of actions to create an efficient water mixing system. For instance, you can modify and observe the current or past temperature of the valve. You can alter valve configurations, tweak the setpoint for the outlet temperature of the mixing valve, and compare this setpoint temperature with the actual one. You can also review the events log, examine a graphical representation of valve performance history, and establish schedules for varying outlet temperatures throughout the day or week. Additionally, you can configure parameters to receive notifications.

Nexa Setup

An internet connection is required to register your IntelliStation 2 on the Nexa platform. Whether you connect to Nexa as a single event or through the setup wizard, you must follow the procedure outlined below. You need access to both the IntelliStation 2 control and a web browser on your computer or smartphone to complete this integration.

1. Launch a web browser and enter **app.nexaplatform.com**.
2. Create a user account with a valid email address and password.
3. After verification, log in to Nexa and set up your organization by entering property name and address.
4. Return to the IntelliStation 2 control to get a registration code.
   a. Tap ☰ (upper right) to start. Then tap **BACKUP PIN** (lower left) and enter 10170.
   b. Tap Settings > Internet > Nexa Register. Jot down the registration code that is displayed on the screen.
5. Return to the Nexa app and select IntelliStation 2 on the Register equipment page.
6. Enter the equipment name and the registration code to complete the setup.

You can add additional equipment as needed with the same process. After setup, you can continue to invite users and view your equipment on the platform or do so later.

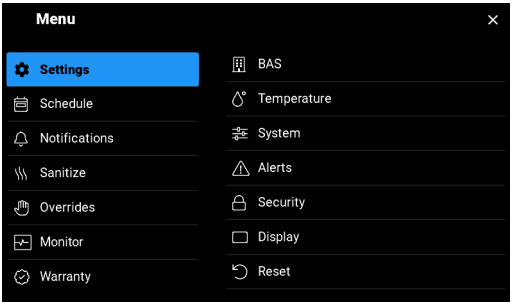
Menus and Programming

Settings Menu

When you select the Settings menu, the first seven submenus are displayed on the right of the screen.

Use your finger to drag the submenu list up to see the last four submenus. Use the same technique to view all commands on a submenu.

Some menus and submenus have commands that you can enable or disable by tapping  . This button slides left to disable and right to enable.



Setup Wizard

⚠ DANGER

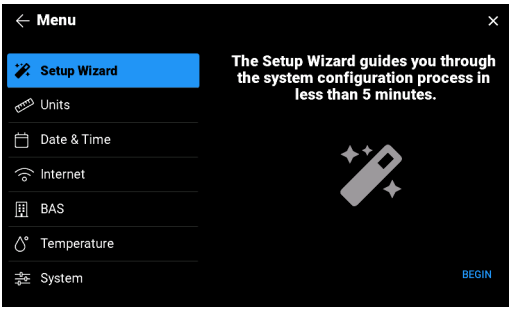
Hot water poses a danger of burning or scalding above 110 degrees Fahrenheit. Setting the mixing valve to temperatures over 110 Fahrenheit without the protection of additional point of use mixing valves could result in scalding at point of use fixtures such as faucets, sinks, tubs, showers, etc.

⚠ WARNING

The next steps involve selecting or adjusting the mixed outlet water temperature which is the hot water temperature in the water distribution system and delivered to point-of-use fixtures (faucets, sinks, tubs, showers, etc.). The owner or manager of the water distribution system is solely responsible for determining the safe and appropriate temperatures to protect people using, contacting or exposed to water or any parts of the water distribution system from scalding, burning, thermal shock or other hazards, and to control waterborne bacteria in the system. Only qualified and authorized personnel who fully understand each function's operation, output and risks, should use Programming Menu functions. Always read and follow the Installation, Operation, and Maintenance Manual.

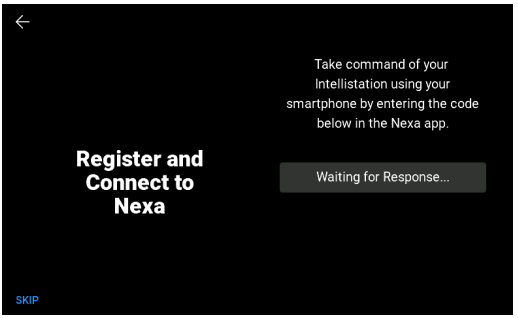
The setup wizard runs through a sequence of screens for completing the most basic setup of the device to reach an operational state. Application screens differ depending on whether you have already activated any optional devices.

Tap Begin in the lower right to launch the setup wizard.



Choose how the control is to be connected to the internet, by Ethernet or by Wi-Fi.

Register and connect to Nexa or skip to the next screen. (To register and connect to Nexa, see “Remote Monitoring IntelliStation 2 with Nexa.” Complete steps 1 to 6 then return to complete the setup wizard.)

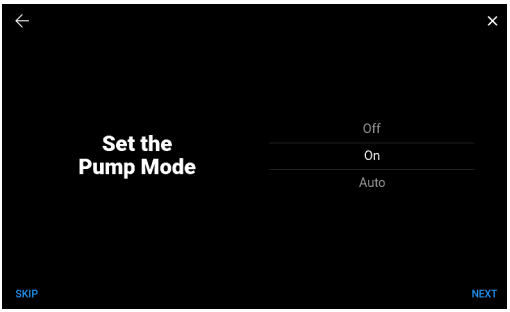


Set the mixed outlet setpoint, from 60°F to 180°F.

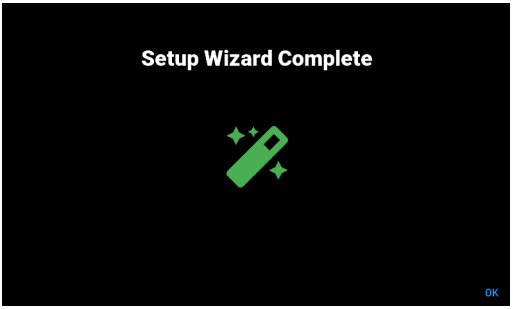
Set the recirculation return setpoint, from 60°F to 180°F. (Digital Sensor Package (SENS) must be installed and enabled for access to the Auto pump mode setting.)

Set the recirculation return differential, from 2°F to 50°F.

Set the pump mode to Off, On, or Auto. (Digital Sensor Package (SENS) must be installed and enabled for access to the Auto pump mode setting.)



Tap OK to close the setup wizard.



Units Menu

Setting	Range	Description
Temperature	°F or °C	Temperature in selected units
Pressure	psi or kPa	Pressure in selected units
Flow	L/min, gpm, m³/h	Flow in selected units
Energy	thm, GJ, MBtu, kWh	Energy in selected units

Date & Time Menu

Setting	Range	Description
24-hour Time	On or Off	All system times in a 24 hour format
Set Automatically	On or Off	System sets time automatically (requires internet connection)
Time Zone	All U.S. and Canadian time zones	Sets which time zone time to display
Date	All dates 2021 to 2030	Allows for today's date to be manually set (Only available when time is not set automatically)
Time	All times	Allows for current time to be manually set (Only available when time is not set automatically)
Daylight Saving	On or Off	System automatically adjusts time for daylight saving

Internet Menu

Setting	Range	Description
Connection Type	Off, Ethernet, Wi-Fi	Wi-Fi scans for networks and allow you to choose and enter password
Wi-Fi Network	Chosen Available Network Name	Selects network to use (Displayed when Wi-Fi is chosen for Connection Type)
Nexa Enable	Switch	When tapped, toggles to enable or disable connection to the Nexa platform
Nexa	Register	Initiates Watts Nexa Registration Process for Device (Requires internet connection to be turned on)
IP Configuration	DHCP, Static	DHCP allows for IP address to be assigned by server. Static allows for IP address to be manually assigned.
IP Address	Any IP Address	Manual selection of the devices IP address on your network (Requires Static IP Configuration)
Subnet Mask	Any Subnet Mask	Manual selection of the devices subnet mask on your network (Requires Static IP Configuration)
Router	Any IP Address	Manual selection of your network routers IP address (Requires Static IP Configuration)
DNS1	Auto (0.0.0.0) or any Valid IP Address	Automatically or manually selects a Domain Name System to be used
DNS2	Auto (0.0.0.0) or any Valid IP Address	Automatically or manually selects a Domain Name System to be used
i in a circle	Information icon	When tapped, shows current internet settings, status, and device MAC address

BAS Menu

Setting	Range	Description
BAS Type	Off, ModBus RTU, BACnet MS/TP, BACnet IP	Sets the BAS communication type to be used
Modbus Address	1 to 247	(Only available when ModBus RTU selected as BAS Type)
Modbus Baud Rate	9600, 19200, 38400, 57600, 76800, 115200	(Only available when ModBus RTU selected as BAS Type)
Modbus Parity	None, Odd, Even	(Only available when ModBus RTU selected as BAS Type)
BACnet Device ID	0 to 4194302	(Only available when BACnet MS/TP or BACnet IP selected as BAS Type)
BACnet Name	User Defined	(Only available when BACnet MS/TP selected as BAS Type)
BACnet MAC Address	0 to 127	(Only available when BACnet MS/TP selected as BAS Type)
BACnet Baud Rate	9600, 19200, 38400, 57600, 76800, 115200	(Only available when BACnet MS/TP selected as BAS Type)
BACnet Port	0 to 65535	(Only available when BACnet IP selected as BAS Type)
BBMD Foreign Device	On or Off	(Only available when BACnet IP selected as BAS Type)
BBMD IP Adress	Auto (0.0.0.0) or any IP Address	(Only available when BACnet IP selected as BAS Type and BBMD Foreign Device turned on)
BBMD IP Port	0 to 65535	(Only available when BACnet IP selected as BAS Type and BBMD Foreign Device turned on)
BBMD Time	30 to 65535	(Only available when BACnet IP selected as BAS Type and BBMD Foreign Device turned on)

Temperature Menu

⚠ DANGER

Hot water poses a danger of burning or scalding above 110 degrees Fahrenheit. Setting the mixing valve to temperatures over 110 Fahrenheit without the protection of additional point of use mixing valves could result in scalding at point of use fixtures such as faucets, sinks, tubs, showers, etc.

Setting	Range	Description
Mixed Outlet Setpoint	60°F to 180°F (15.5°C to 82.0°C)	Sets the temperture of water leaving the mixing valve. This setting must be higher than cold water temperature in order for the valve to achieve the desired temperature setpoint.
Mixed Outlet Setback Enable	On or Off	(Setting only available when a schedule has been set up)
Mixed Outlet Setback Diff	1°F to 70°F (0.5°C to 16.5°C)	(Only available when Mixed Outlet Setback Enable is on)
Remote Setpoint Max	60°F to 180°F (15.5°C to 82.0°C)	Used to set the maximum temperature that a remote user can set mixed temperature to (Available only when a BAS type has been selected in BAS Menu)
Recirc Return Enable	On or Off	Requires Digital Sensor Option
Recirc Return Setpoint	80°F to 180°F (26.5°C to 82.0°C)	The temperature that the control is trying to maintain the return (Only available when Recirc Return Enable is on)
Recirc Return Diff	2°F to 50°F (1.0°C to 27.5°C)	(Only available when Recirc Return Enable is on)

System Menu

Submenu	Setting	Range	Description
Digital Sensor Package	Enable	On or Off	Allows the readings of the sensors to be displayed in the system Inputs Screen if the digital temperature pressure sensor is installed
Mixed Outlet Flow Sensor	Enable	On or Off	Allows the readings of the Mixed outlet flow sensor to be displayed in the System Inputs Screen if the flow sensor option is installed
	Make	Grundfos, Keyence	Tells the control which brand/style of flow sensors are installed
	Model	FD-Q20C, FD-Q32C, FD-Q50C, FD-R80, FD-R125	Tells the control which model of Keyence flow sensors are installed (Only available when Make is set to Keyence)
Recirc Return Flow Sensor	Enable	On or Off	Allows the readings of the Return flow sensor to be displayed in the System Inputs Screen if the flow sensor option is installed
	Make	Grundfos, Keyence	Tells the control which brand/style of flow sensors are installed
	Model	FD-Q20C, FD-Q32C, FD-Q50C, FD-R80, FD-R125	Tells the control which model of Keyence flow sensors are installed (Only available when Make is set to Keyence)
Valve	Valve Size	¾", 1", 1½", 2"	Is qualified for valves in the specified range
	Valve Sequencing	Off, Leader, Follower	Tells the control if sequencing should be active and if so whether the valve should be the leader or not
	Valve Rotation Enable	On or Off	Allows control to rotate operation between the leader and follower valve
	Valve Rotation Time	12 to 180 hours	Sets length of time between rotation cycles (Only available when Valve Rotation Enabled)
Pumps	Pump1 Operation	Off, On, Auto	Off turns pump 1 off, On turns pump on and allows for pump rotation if enabled. Auto allows pump to be turned on and off by the control to achieve recirculation set temperature and allows for pump rotation if enabled.
	Pump 2 Operation	Off, On, Auto	Off turns pump 2 off, On turns pump on and allows for pump rotation if enabled. Auto allows pump to be turned on and off by the control to achieve recirculation set temperature and allows for pump rotation if enabled.
	Pump Rotation Enable	On or Off	Allows the control to rotate use of two pumps in a system. Pump 1 and Pump 2 must be set to On or Auto.
	Pump Rotation Time	12 to 180 hours	Sets length of time each pump runs before switching pumps (Only available when Pump Rotation Enabled)
	Pump Proof Enable	On or Off	Turns pump proof function on or off. Requires a pump proof device to be installed in order to work correctly. See “A Note on Pump Proofing.”
	Pump Proof Delay	10 to 180 seconds	Sets time delay for proof check (Only available when Pump Proof Enabled)
	Pump Head	0 to 500 psi	Sets the force of the pump head
	Pump Min On/ Off/Time	Never to 60 minutes	Sets how long the pumps run between rotations

A Note on Pump Rotation

For a pump rotation event to occur, both pumps must be set to Auto or to On, or to a combination of Auto and On. Regardless of the configuration the control monitors run time for each pumps and rotates from pump to pump based on the rotation time setting.

Installation of Digital Sensor Package (SENS) is required and must be enabled along with Pump Rotation through Settings > System > Pumps.

A Note on Pump Proofing

For dual recirculation pump operation, the control includes a flow proving feature to verify if a pump is working once turned on.

When pump operation is required, the control first attempts to turn on the lead pump. If a flow proof input is not detected within a certain period of time, the control turns off the lead pump and turns on the lag pump. The control then waits for a period of time for a flow proof.

A flow proof device can be a number of devices such as current sensing switch or pressure differential switch.

Alerts Menu

To enable an alert, open the user menu to Settings > Alerts and choose the specific one. Tap lower left to enable the function. Drag your finger up or down to desired setting then tap Save.

Setting	Range	Description
Mixed Outlet High Temp Diff Alert	On or Off, 0°F to 30°F (0.0°C to 16.5°C)	Sets how high the mix temperature can drift from setpoint before an alert is issued
Mixed Outlet Low Temp Diff Alert	On or Off, 0°F to 30°F (0.0°C to 16.5°C)	Sets how low the mix temperature can drift from setpoint before an alert is issued
Hot Inlet High Temp Alert	On or Off, 80°F to 180°F (26.5°C to 82.0°C)	Sets how high the hot inlet temperature can drift from setpoint before an alert is issued
Hot Inlet Low Temp Alert	On or Off, 80°F to 180°F (26.5°C to 82.0°C)	Sets how low the hot inlet temperature can drift from setpoint before an alert is issued
Hot Inlet High Pressure Alert	On or Off, 25 psi to 225 psi (175 kPa to 1575 kPa)	Sets how high the pressure for hot inlet can drift from setpoint before an alert is issued
Cold Inlet High Pressure Alert	On or Off, 25 psi to 225 psi (175 kPa to 1575 kPa)	Sets how high the pressure for cold inlet can drift from setpoint before an alert is issued
Inlet Pressure Diff Enable	On or Off	Enables or disables calculation of the pressure differential

Security Menu

Setting	Range	Description
User Management	Reserved	For future use
Lock Screen Timeout	Never to 60 minutes	Sets how long a user can stay idle before being logged off

Display Menu

Setting	Range	Description
Brightness	0% to 100%	Sets brightness of the screen
Clean Screen	10 second countdown	Allows for screen to be temporarily locked for cleaning

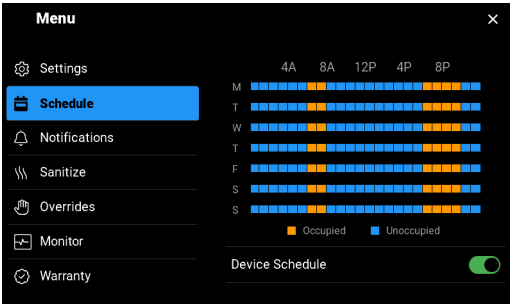
Reset

Allows reset all of the control settings to factory defaults. Factory defaults (such as valve size) are set when the control is paired with the valve. Adjustments can be made through the user settings menus; for example, in the event of a control replacement. For more information, see the “Changing Settings” section.

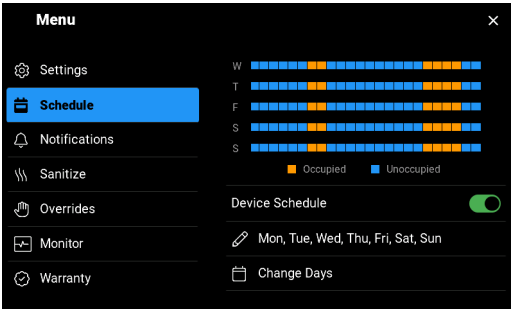
Schedule Menu

If the Mixed Outlet Setback Enable setting has been turned on through Settings > Temperature, the temperature setting of the valve can be scheduled to decrease by the Mixed Outlet Setback Diff setting in the same menu during scheduled unoccupied times.

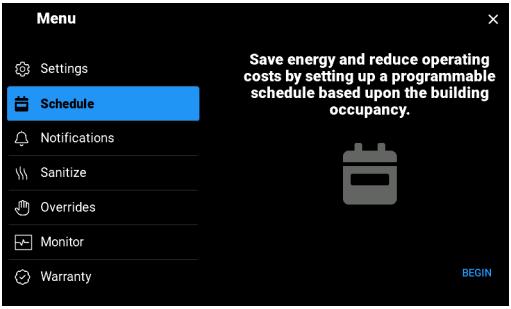
If a schedule has already been set up for the control, the 7-day weekly schedule is displayed onscreen with the currently programmed occupied and unoccupied times.



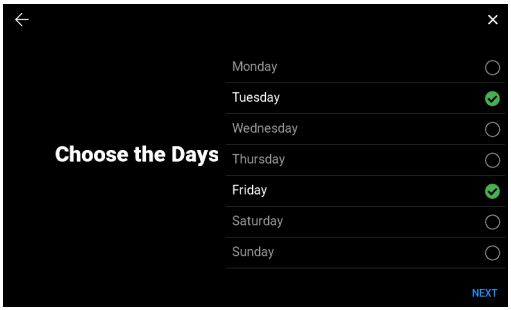
To edit an existing schedule scroll down to lower part of schedule screen as shown and tap on detail you want to change.



If a schedule has not been set for the control, the following screen is displayed. From here, you can begin to program a schedule.



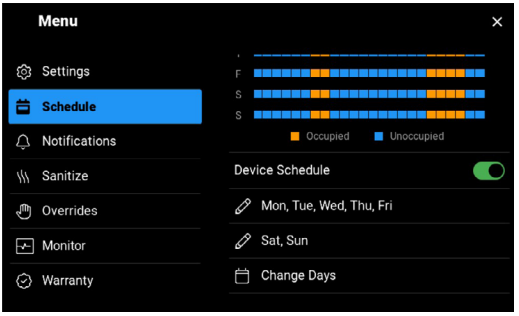
Select the first set of days to be assigned the same scheduled times.



Then, program the start and end of each occupied time frame of those days. Up to two occupied time frames can be programmed. But if only one or none is desired, you can skip programming and advance to the next screen.

Repeat the process for the remaining days until **all days of the week** have been programmed.

To edit the schedule, scroll to the Device Schedule section. Tap the Pencil icon to edit the occupied and unoccupied times of weekdays. Tap the Calendar icon to change the set of days assigned the same scheduled times.

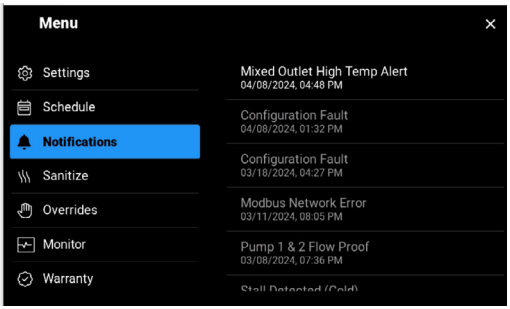


Notifications Menu

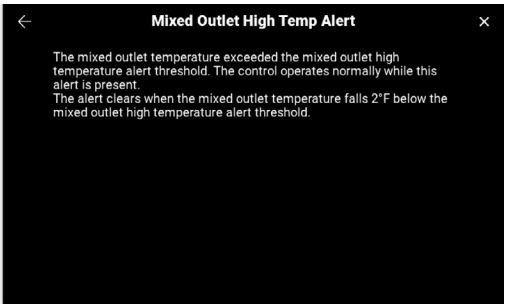
The control keeps track of the last 30 errors and alert notifications. (See Troubleshooting for explanations of each notification and correction actions.)

As soon as a setting is completely out of range, an alert or error is triggered and immediately displayed on the main screen.

Tap ☰ to access the Notifications screen and view the notification entry with date and time.



Tap the error or alert notification entry to read the complete message.



Sanitize Menu

⚠ WARNING

BEFORE starting the Sanitization function, make sure you are in full compliance with a safely and properly designed thermal sanitizing protocol, protecting end-users, facility employees or contractors, personnel performing the Sanitization, and bystanders from scalding, burning, thermal shock, or other hazards.

Time and temperatures should be chosen based on your company's Sanitation Protocol requirements, your plumbing systems characteristics, and sanitation validation data.

⚠ DANGER

The Sanitizing function produces high temperature at all point-of-use fixtures (faucets, sinks, tubs, showers, etc.) and extreme care must be taken to mitigate against the risk of personal injuries such as burning or scolding, or other property damage. The Sanitization function must only be used for the purposes of sanitizing the system, and never during normal operations or use.

Only qualified and authorized personnel who fully understand the Function's operation, output and risks, should use the Sanitization function, and only as part of and in compliance with, a Sanitization protocol safely and properly designed by the owner or manager of the water distribution system.

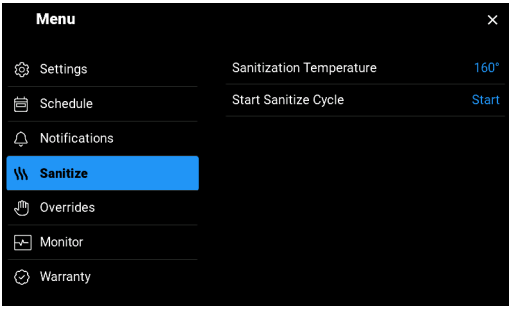
Time and temperatures should be chosen based on your company's Sanitation Protocol requirements, your plumbing systems characteristics, and sanitation validation data.

Ensure proper time is allotted for proper cooldown of water system after sanitization in order for temperatures to return to normal. Not giving enough time for this cooldown period can also result in scalding at point of use devices.

NOTICE

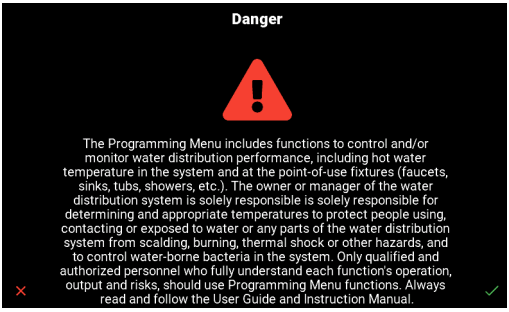
The owner or manager of the water distribution system has responsibility to protect end-users, facility employees or contractors, personnel performing the Sanitization, and bystanders from scalding, burning, thermal shock, or other hazards from possible exposure to water or any parts of the water distribution system during Sanitization and cool down period, until system water returns to a safe and proper outlet water temperature set point Always read and follow the Installation, Operation, and Maintenance Manual.

You can manually begin a high temperature sanitization cycle from the Sanitize menu. Specify the temperature and duration of the cycle then launch the sanitization process.

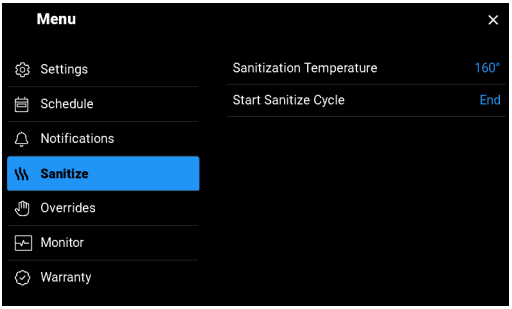


Set the duration of the cycle from 0 to 600 minutes. This time and temperature should be chosen based on your company's Sanitation Protocol requirements, your plumbing systems characteristics, and sanitation validation data.

After reading the warning, tap the red X to cancel (or go back to modify the setting) or the green check mark to confirm acceptance of responsibility.



If at any time during the cycle you wish to discontinue the sanitization process, you can select End from the Sanitize menu.

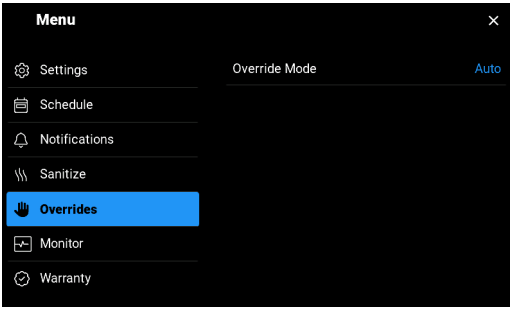


Or select STOP from the main monitoring screen on which the time remaining for the cycle is also displayed.

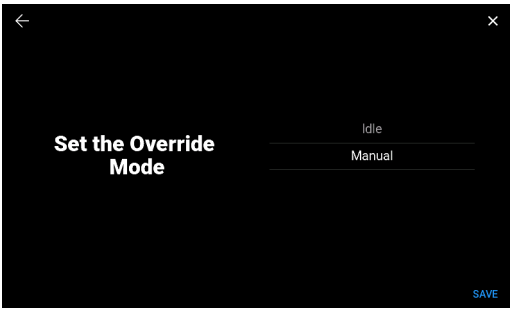
Setting	Range	Description
Sanitization Temperature	120°F to 180°F (49.0°C to 82.0°C)	Indicates the temperature to which the mixed water must be raised to sanitize the water system. **See warnings at beginning of the Sanitation section on high temperature and scalding risk.
Sanitize Cycle	Start (Select time 0 minutes to 600 minutes), End	Starts the sanitization process and selects how long the process is to run. Can also be used to end the process early.

Overrides Menu

Allows for manual control of the actuator and mixing valve position.



By changing the setting to manual, the status bar indicates manual mode and the main screen allows you to change the % Mixed of the valve. To return to automatic mode, change the setting back in the Overrides menu.



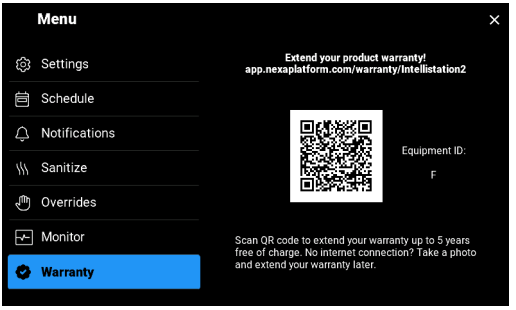
Setting	Range	Description
Override Mode	Auto, Idle, Manual	Auto allows the control to adjust programmed settings to maintain steady state. Manual allows custom control of the mixing valve from the temperature screen. Idle allows valve to idle.

Monitor Menu

Presents historical data on the system such as highest and lowest recorded readings, cycles, and runtimes based on the installed options. Tapping a blue reading allows you clear and restart. You can also restore all readings at once by tapping Reset at the bottom of the list.

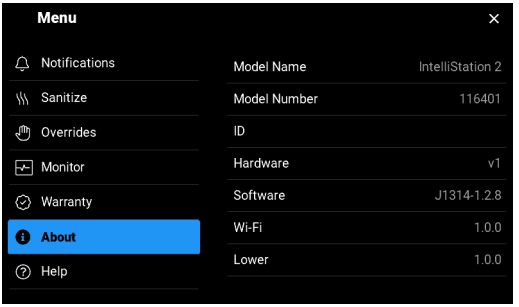
Warranty Menu

Displays information of the devices warranty.



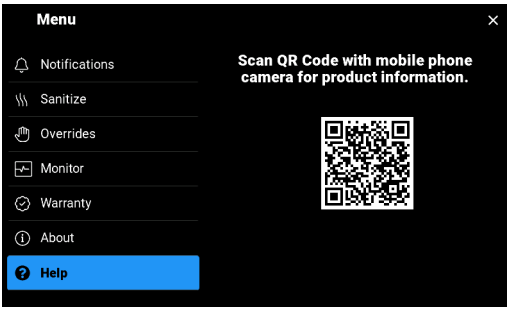
About Menu

Lists important details about the control. This information may be required when contacting Customer Support.



Help Menu

Scan the QR code to view or download product support documentation.



Troubleshooting

RECOMMENDED: Complete all wiring to ensure trouble-free operation. Should an error occur, follow these steps:

1. **Find** If a banner is on the screen, it is indicating a problem on the system.
2. **Identify** Tap ☰ (upper right) to enter the menus and press notifications. The latest error notification is displayed at the top of the list.
3. **Solve** The notification description provides the instructions on the corrective action required to clear the error.

Scheduled Testing, Inspection, and Maintenance

Testing/Inspection

⚠ WARNING

Periodic inspection and yearly maintenance by a licensed contractor is required. Corrosive water conditions and/or unauthorized adjustments or repair could render the valve ineffective for service intended.

Need for Periodic Inspection/Maintenance: This product must be tested periodically in compliance with local codes, but at least once per year or more as service conditions warrant. All products must be retested once maintenance has been performed. Regular checking and cleaning of the product's internal and external components helps assure maximum life and proper product function.

⚠ DANGER

BEFORE attempting to open Control Module, a certified and qualified electrician MUST fully de-energize and disconnect all electrical power from IntelliStation®.

Perform required LOCK OUT/TAG OUT procedures.

When done, reconnection and reenergizing of IntelliStation® MUST be performed by certified and qualified electrician.

Errors and Alerts

Errors and alerts are listed when an error is detected or an alert initiated. Each error description may include a possible solution. Each alert description reports the conditions under which the alert is cleared.

Control Memory Error

A memory error has been detected. The control operates the mixing valve actuator to close off the hot port of the mixing valve while this error is present. To correct, all settings have to be reviewed. You can also reload factory defaults and use the Setup Wizard to configure the control. If the memory error keeps recurring after a power outage, the control may need to be replaced. Contact Customer Support for further assistance.

Hardware Fault

An internal hardware fault has been detected. Power the control off and then back on. If the hardware fault reoccurs, the control may need to be replaced. Contact Customer Support for further assistance.

Firmware Fault

An internal firmware fault has been detected. Make sure the control is connected to the internet. The control attempts to perform a firmware over-the-air (OTA) update. Contact Customer Support for further assistance.

Configuration Fault

The valve size has not been configured. The control operates the mixing valve actuator to close off the hot port of the mixing valve while this error is present. To correct, change the Valve Size setting in the control user interface to that of the actual mixing valve size. When the fault is corrected, the error clears automatically.

Ethernet Disconnected Error

The ethernet is not connected to a network. Check the ethernet cable connection to the control and the router or switch. Check that the router or switch is powered on and operating correctly.

Wi-Fi Disconnected Error

The Wi-Fi network could not be found. Check that the Wi-Fi network name was entered correctly and that the router signal is medium to high strength. If necessary, reconfigure the Wi-Fi network.

Wi-Fi Invalid Password Error

The Wi-Fi password was not accepted. Check that the password was entered correctly. If necessary, reconfigure the Wi-Fi network.

DHCP Address Error

The router has not assigned the control an IP address. Check the configuration settings and ensure that the DHCP server is enabled and enough IP addresses are available. Contact an IT professional for further assistance.

Internet Unavailable Error

The control is unable to communicate to the Watts cloud through the internet. The error automatically clears when internet communications are established. You can also set the Connection Type to OFF to clear the error. To correct:

1. Check the Internet DNS 1 and DNS 2 settings
2. Check that the router firewall is not blocking or filtering MAC addresses
3. Check that the router firewall is not blocking outbound port 23

Nexa Error

The control is unable to connect to Nexa. Check that your router is not blocking outbound ports 443 or 8883. Contact an IT professional for further assistance.

Modbus Network Error

The control detected a problem with the Modbus communication. Check the Modbus wire polarity, the cable length, connection to the Modbus network, and connection of any terminating resistors.

BACnet MS/TP Network Error

The control detected a problem with the BACnet MS/TP communication. Check the BACnet wire polarity, the cable, length, connection to the BACnet network, and connection of any terminating resistors.

Expansion Valve Control Lost Error

The control lost communication to the expansion control unit. Dual valve sequencing is inoperable until this fault is corrected. To correct, check that the expansion is powered up. If the power is off, use an electrical multimeter to check the power line and neutral terminals for 115 V (ac). If the expansion power is on, then check the expansion communication wires +, -, and Gnd on both the control and the expansion to ensure the wire polarity is correct, the wire insulation is stripped, and the wire terminals are tight.

Mixed Outlet Sensor Open Error

An open circuit is detected on the mixed outlet temperature sensor input. The control operates the mixing valve actuator to close off the hot port of the mixing valve while this error is present. To correct, remove the wires from the mixed outlet sensor terminals, then use an electrical multimeter to measure the resistance. If the resistance is open circuit, check the wires for loose wiring connections. If the wires and connections are solid, then replace the sensor. Once the fault is corrected, the error clears automatically.

Mixed Outlet Sensor Short Error

A short circuit is detected on the mixed outlet temperature sensor input. The control operates the mixing valve actuator to close off the hot port of the mixing valve while this error is present. To correct, remove the wires from the mixed outlet sensor terminals, then use an electrical multimeter to measure the resistance. If the resistance is short circuit, check the wires for damage. If the wires and connections are solid, then replace the sensor. Once the fault is corrected, the error clears automatically.

Outlet Sensor Lost Error

The control lost communication to the digital mixed outlet sensor. The control operates normally while this error is present. To correct, check the wiring and connections. If the wiring and connections are solid, then the sensor may require replacement. Contact Customer Support for further assistance.

Outlet Temperature Error

The control detected an error with the temperature reading from the digital mixed outlet sensor. The control operates normally while this error is present. To correct, check the wiring and connections. If the wiring and connections are solid, then the sensor may require replacement. Contact Customer Support for further assistance.

Outlet Pressure Error

The control detected an error with the pressure reading from the digital mixed outlet sensor. The control operates normally while this error is present. To correct, check the wiring and connections. If the wiring and connections are solid, then the sensor may require replacement. Contact Customer Support for further assistance.

Hot Inlet Sensor Lost Error

The control lost communication to the digital hot inlet sensor. The control operates normally while this error is present. To correct, check the wiring and connections. If the wiring and connections are solid, then the sensor may require replacement. Contact Customer Support for further assistance.

Hot Inlet Temperature Error

The control detected an error with the pressure reading from the digital hot inlet sensor. The control operates normally while this error is present. To correct, check the wiring and connections. If the wiring and connections are solid, then the sensor may require replacement. Contact Customer Support for further assistance.

Hot Inlet Pressure Error

The control detected an error with the pressure reading from the digital hot inlet sensor. The control operates normally while this error is present. To correct, check the wiring and connections. If the wiring and connections are solid, then the sensor may require replacement. Contact Customer Support for further assistance.

Cold Inlet Sensor Lost Error

The control lost communication to the digital cold inlet sensor. The control operates normally while this error is present. To correct, check the wiring and connections. If the wiring and connections are solid, then the sensor may require replacement. Contact Customer Support for further assistance.

Cold Inlet Temperature Error

The control detected an error with the temperature reading from the digital cold inlet sensor. The control operates normally while this error is present. To correct, check the wiring and connections. If the wiring and connections are solid, then the sensor may require replacement. Contact Customer Support for further assistance.

Cold Inlet Pressure Error

The control detected an error with the pressure reading from the digital cold inlet sensor. The control operates normally while this error is present. To correct, check the wiring and connections. If the wiring and connections are solid, then the sensor may require replacement. Contact Customer Support for further assistance.

Recirc Return Sensor Lost Error

The control lost communication with the digital recirculation return sensor. The control operates normally while this error is present. However, if applicable, pump operation may be affected. To correct, check the wiring. If the wiring and connections are solid, then the sensor may require replacement. Contact Customer Support for further assistance.

Recirc Return Temperature Error

The control detected an error with the temperature reading from the digital recirculation return sensor. The control operates normally while this error is present. However, if applicable, pump operation may be affected. To correct, check the wiring. If the wiring and connections are solid, then the sensor may require replacement. Contact Customer Support for further assistance.

Recirc Return Pressure Error

The control detected an error with the pressure reading from the digital recirculation return sensor. The control operates normally while this error is present. However, if applicable, pump operation may be affected. To correct, check the wiring. If the wiring and connections are solid, then the sensor may require replacement. Contact Customer Support for further assistance.

Mixed Outlet Flow Error

The control is unable to read flow within the allowable range from the mixed outlet flow sensor. The control operates normally while this error is present. To correct, check the wiring between the sensor and the control. If the wiring and connections are solid, then the sensor may require replacement. Contact Customer Support for further assistance.

Recirc Return Flow Error

The control is unable to read flow within the allowable range from the recirculation return flow sensor. The control operates normally while this error is present. To correct, check the wiring between the sensor and the control. If the wiring and connections are solid, then the sensor may require replacement. Contact Customer Support for further assistance.

Pump 1 Flow Proof Error

The control did not detect a flow proof signal within the delay time after turning on recirculation pump 1. To correct, check the wiring between the flow proving device and the control. If the wiring and connections are solid, check the flow proving device and the pump. The flow proving device or pump may require replacement. Contact Customer Support for further assistance.

Pump 2 Flow Proof Error

The control did not detect a flow proof signal within the delay time after turning on recirculation pump 2. To correct, check the wiring between the flow proving device and the control. If the wiring and connections are solid, check the flow proving device and the pump. The flow proving device or the pump may require replacement. Contact Customer Support for further assistance.

Pump 1 & 2 Flow Proof Error

The control did not detect a flow proof signal within the delay time after turning on the recirculation pumps. To correct, check the wiring between the flow proving devices and the control. If the wiring and connections are solid, check the flow proving devices and the pumps. The flow proving device(s) or the pump(s) may require replacement. Contact Customer Support for further assistance.

Pump False Flow Error

The control detected a flow proof signal after the delay time expired once the recirculation pump turned off. To correct, check the wiring between the flow proving device and the control. If the wiring and connections are solid, check the flow proving device and the pump. The flow proving device or pump may require replacement. Contact Customer Support for further assistance.

Mixed Outlet High Temp Alert

The mixed outlet temperature exceeded the mixed outlet high temperature alert threshold. The control operates normally while this alert is present. The alert clears when the mixed outlet temperature falls 2°F below the mixed outlet high temperature alert threshold.

Mixed Outlet Low Temp Alert

The mixed outlet temperature fell below the mixed outlet low temperature alert threshold. The control operates normally while this alert is present. The alert clears when the mixed outlet temperature rises 2°F above the mixed outlet low temperature alert threshold.

Hot Inlet High Temp Alert

The hot inlet temperature exceeded the hot inlet high temperature alert threshold. The control operates normally while this alert is present. The alert clears when the hot inlet temperature falls 2°F below the hot inlet high temperature alert threshold.

Hot Inlet Low Temp Alert

The hot inlet temperature fell below the hot inlet low temperature alert threshold. The control operates normally while this alert is present. The alert clears when the hot inlet temperature rises 2°F above the hot inlet low temperature alert threshold.

Hot Inlet Low Pressure Alert

The hot inlet pressure is less than 10 psi. The control operates the mixing valve actuator to close off the hot port of the mixing valve while this alert is present. The alert clears when the hot inlet pressure increases above 11 psi.

Hot Inlet High Pressure Alert

The hot inlet pressure exceeded the hot inlet high pressure alert threshold. The control operates normally while this alert is present. The alert clears when the hot inlet pressure falls 1 psi below the hot inlet high pressure alert threshold.

Cold Inlet Low Pressure Alert

The cold inlet pressure is less than 10 psi. The control operates the mixing valve actuator to close off the hot port of the mixing valve while this alert is present. The alert clears when the cold inlet pressure increases above 11 psi.

Cold Inlet High Pressure Alert

The cold Inlet pressure exceeded the cold inlet high pressure alert threshold. The control operates normally while this alert is present. The alert clears when the cold inlet pressure falls 1 psi below the cold inlet high pressure alert threshold.

Inlet Pressure Differential Alert

The Inlet pressure differential between the hot and the cold exceeded the Inlet Pressure Differential setting. The alert clears when the Inlet pressure differential between the hot and the cold falls below the threshold.

Encoder Error

The control has detected an error with the stepper motor encoder. Valve position can no longer be accurately calculated. The valve continues to operate with limited functionality while this error is present. To correct, check the cabling between the encoder and the control. If the wiring and connections are solid, the encoder/stepper motor may require replacement. Contact Customer Support for further assistance.

Stall Detected (Cold) Error

The valve is attempting to close off the hot inlet port but the encoder is not detecting movement, indicating a stall condition. The control operates the mixing valve actuator to close off the hot port of the mixing valve while this error is present. The error clears when the stepper motor encoder detects movement.

Stall Detected (Hot) Error

The valve is attempting to close off the cold inlet port but the encoder is not detecting movement, indicating a stall condition. The control operates normally while this error is present. The error clears when the stepper motor encoder detects movement.

Isolation Valve End Switch Error

The end switch from the isolation valve motor failed to close within the allotted time after power was applied to the motor. The control disables operation and communicates to the expansion control for it to begin operation. To correct, check the wiring between the motor and the control. If the wiring and connections are solid, check for any obstruction within the valve. Also, check the isolation valve and isolation valve motor. The isolation valve or isolation valve motor may require replacement. Contact Customer Support for further assistance.

BAS and Modbus Integration

BAS Integration

IntelliStation 2 provides user-directed control and monitoring of water distribution systems. It is the user's responsibility to select and maintain water temperatures and pressures that are safe and appropriate for the water system users, guests and facility. The Sanitization mode is intended for use as part of a user-directed, controlled and supervised protocol that has been safely and properly designed. It is recommended to install IntelliStation 2 as part of a ASSE 1070 compliant water distribution system, including point-of-use mixing valves. Always read and follow Installation, Operation, and Maintenance Manual and all product warnings and labels, and comply with all governmental and safety requirements.

⚠ DANGER

BEFORE attempting to connect BAS, a certified and qualified electrician MUST fully de-energize and disconnect all electrical power from IntelliStation 2.

Perform required LOCKOUT/TAG OUT procedures.

BAS connection MUST be performed by certified and qualified electrician.

Modbus® Specification

Communication Protocol	Modbus over RS485
Physical Layer	RS485 Two-Wire plus Signal Ground
Baud Rate	2400, 9600, 19200, 38400, 57.6k, 115k)
	(default 19200 bps)
Recommended Cable	18 AWG Shielded Twisted-Pair (STP)
Transmission Mode	RTU
Maximum Cable Length	Without terminating resistors
	115,200 baud --> 177 m (580 ft)
	57,600 baud --> 353 m (1,158 ft)
	19,200 baud --> 1,000 m (3,280 ft)
	9,600 baud --> 1,000 m (3,280 ft)
	2,400 baud --> 1,000 m (3,280 ft)
	With 2 x 120 Ohm resistors
	115,200 baud --> 1,000 m (3,280 ft)
	57,600 baud --> 1,000 m (3,280 ft)
	19,200 baud --> 1,000 m (3,280 ft)
	9,600 baud --> 1,000 m (3,280 ft)
	2,400 baud --> 1,000 m (3,280 ft)
Start Bit	1 Bit
Data Length	8 Bits for RTU Mode
	7 Bits for ACSII Mode
Parity	None (2 Stop Bits)
	Even (1 Stop Bit)
	Odd (1 Stop Bit)
	(default Even)
Addressing	1 to 247 (default 1)

Modbus Registers

Read = R Read/Write = R/W

System Status Registers

Register	Parameter Name	Read/Write	Units	Type	Format	Range
0	Mixed Outlet Temperature	R	°F	Input	U16	-31 to 266
1	Recirc Return Temperature	R	°F	Input	U16	32 to 212
2	Hot Inlet Temperature	R	°F	Input	U16	32 to 212
3	Cold Inlet Temperature	R	°F	Input	U16	32 to 212
4	Mixed Outlet Pressure	R	PSI x 10	Input	U16	0 to 232 PSI
5	Recirc Return Pressure	R	PSI x 10	Input	U16	0 to 232 PSI
6	Hot Inlet Pressure	R	PSI x 10	Input	U16	0 to 232 PSI
7	Cold Inlet Pressure	R	PSI x 10	Input	U16	0 to 232 PSI
8	Mixed Outlet Flow	R	GPM	Input	U16	0 to 1000
9	Recirc Return Flow	R	GPM	Input	U16	0 to 1000
10	Remote Setpoint Max	R	°F	Input	U16	60 to 180
11	Valve Position	R	%	Input	U16	0 to 100
12	Energy Usage	R	Therms	Input	U16	0 to 65535
13	Pump 1 Status	R	N/A	Input	U16	0=Off, 1=On
14	Pump 2 Status	R	N/A	Input	U16	0=Off, 1=On
15	Isolation Valve Status	R	N/A	Input	U16	0=Closed, 1=Open
16	Error Code	R	Enum	Input	U16	See error code list

System Parameter Register

Register	Parameter Name	Read/Write	Units	Type	Format	Range
0	Mixed Outlet Setpoint	R/W	°F	Holding	U16	60 to Remote Setpoint Max

Product Information

Register	Parameter Name	Read/Write	Units	Type	Format	Range
1	Model	R	Num	Input	U16	Product model “116401”
2	Firmware Revision	R	Num	Input	U16	SV revision

BACnet Integration

IntelliStation 2 provides user-directed control and monitoring of water distribution systems. It is the user's responsibility to select and maintain water temperatures and pressures that are safe and appropriate for the water system users, guests and facility. The Sanitization mode is intended for use as part of a user-directed, controlled and supervised protocol that has been safely and properly designed. It is recommended to install IntelliStation 2 as part of a ASSE 1070 compliant water distribution system, including point-of-use mixing valves. Always read and follow Installation, Operation, and Maintenance Manual and all product warnings and labels, and comply with all governmental and safety requirements.

⚠ DANGER

BEFORE attempting to connect BAS, a certified and qualified electrician MUST fully de-energize and disconnect all electrical power from IntelliStation 2.

Perform required LOCKOUT/TAG OUT procedures.

BAS connection MUST be performed by certified and qualified electrician.

BACnet Protocol Implementation Statement (PICS)

Vendor Name: Powers Control Systems Ltd.

Vendor ID: 834

Product Name: IntelliSation 2

Product Model Number: 116401

Application Software Version: J1314, BACnet Protocol Revision: 16

Product Description: Electronic DHW Tempering Valve

The IntelliStation 2 is a mixing control designed to deliver tempered water to plumbing fixtures. The control uses Proportional Integral (PI) logic to accurately maintain a target temperature by mixing a high temperature water source with a low temperature water source. This control also offers advanced features including communication with a Building Automation System (BAS).

BACnet Standardized Device Profile (ANNEX L)
BACnet Application Specific Controller (B-ASC)

Supported BIBB (Annex K)	Name
DS-RP-B	Data Sharing-ReadProperty-B
DS-RPM-B	Data Sharing-ReadPropertyMultiple-B
DS-WP-B	Data Sharing-WriteProperty-B
DM-DDB-B	Device Management-Dynamic Device Binding-B
DM-DOB-B	Device Management-Dynamic Object Binding-B
DM-DCC-B	Device Management-Device Communication Control-B

Note: Device communication control password is "Powers1164".

Segmentation Capability	Supported
Able to transmit segmented messages	No
Able to receive segmented messages	No

Standard Object Types Supported	Creatable	Deletable
Analog Input	No	No
Analog Value	No	No
Binary Input	No	No

Data Link Layer	Supported
BACnet® IP (Annex J)	Yes
BACnet® MSTP	Yes

Device Address Binding	Supported
Static Device Address Binding	No

Network Security Options
Non-Secure Device

Character Set	Supported
ANSI X3.4	Yes

BACnet Objects

BACnet Analog Parameters

Analog Input Object = AI Analog Value Object = AV Read = R Read/Write = R/W

Analog Input Objects

ID	Data Type	Name	Description	Read/ Write	Units	Range / Value
0	AI	Mixed Outlet Temperature	Mixed Outlet Temperature	R	°F	-31 to 266
1	AI	Recirc Return Temperature	Recirculation Return Temperature	R	°F	32 to 212
2	AI	Hot Inlet Temperature	Hot Inlet Temperature	R	°F	32 to 212
3	AI	Cold Inlet Temperature	Cold Inlet Temperature	R	°F	32 to 212
4	AI	Mixed Outlet Pressure	Mixed Outlet Pressure	R	PSI	0 to 232
5	AI	Recirc Return Pressure	Recirculation Return Pressure	R	PSI	0 to 232
6	AI	Hot Inlet Pressure	Hot Inlet Pressure	R	PSI	0 to 232
7	AI	Cold Inlet Pressure	Cold Inlet Pressure	R	PSI	0 to 232
8	AI	Mixed Outlet Flow	Mixed Outlet Flow	R	GPM	0 to 1000
9	AI	Recirc Return Flow	Recirculation Return Flow	R	GPM	0 to 1000
10	AI	Remote Setpoint Max	Mixed Outlet Target	R	°F	60 to 180
11	AI	Valve Position	Valve Position	R	%	0 to 100
15	AI	Energy Usage	Totalized Energy	R	Therms	0 to 65535
16	AI	Error Code	Error or Alert Code	R	Enum	See error code list

Analog Value Objects

ID	Data Type	Name	Description	Read/ Write	Units	Range / Value
0	AV	Mixed Outlet Setpoint	Mixed Outlet Setpoint	R/W	°F	60 to Remote Setpoint Max

BACnet Binary Parameters

ID	Data Type	Name	Description	Read/ Write	Units	Range / Value
0	BI	Recirc Pump 1	Recirculation Pump 1 Status	R	N/A	0=Off, 1=On
1	BI	Recirc Pump 2	Recirculation Pump 2 Status	R	N/A	0=Off, 1=On
2	BI	Isolation Valve	Isolation Valve Status	R	N/A	0=Closed, 1=Open

BACnet Troubleshooting

If there is no or intermittent communication, check the following:

- Check the Ethernet cable. Cable length must not exceed 150 ft (45.7 m) for CAT-5E or 300 ft (91.4 m) for CAT-6.
- If the cable was manually made, check continuity across each of the wires.

Error/Alert Codes

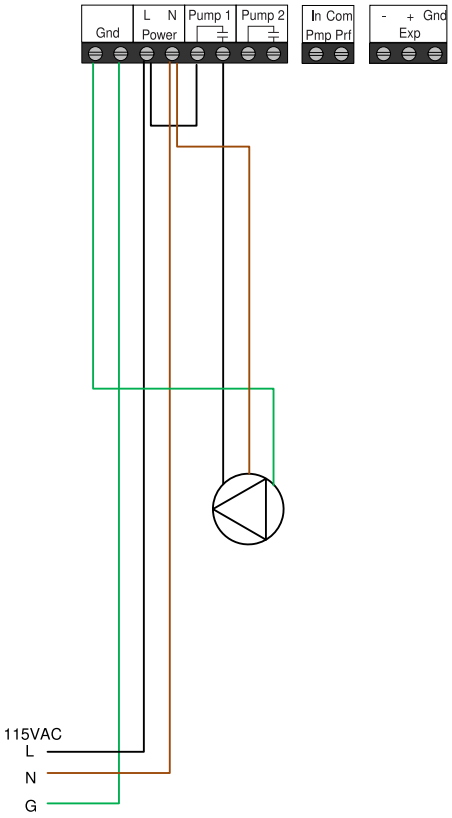
Code	Description
1	Control Memory Error
2	Hardware Fault
3	Firmware Fault
4	Configuration Fault
5	Mixed Outlet Sensor Short Error
6	Mixed Outlet Sensor Open Error
7	Outlet Sensor Lost Error
8	Outlet Temperature Error
9	Outlet Pressure Error
10	Hot Inlet Sensor Lost Error
11	Hot Inlet Temperature Error
12	Hot Inlet Pressure Error
13	Cold Inlet Sensor Lost Error
14	Cold Inlet Temperature Error
15	Cold Inlet Pressure Error
16	Recirc Return Sensor Lost Error
17	Recirc Return Temperature Error
18	Recirc Return Pressure Error
19	Mixed Outlet Flow Error
20	Recirc Return Flow Error
21	Expansion Valve Control Lost Error
22	Modbus Network Error
23	BACnet MS/TP Network Error

Continued

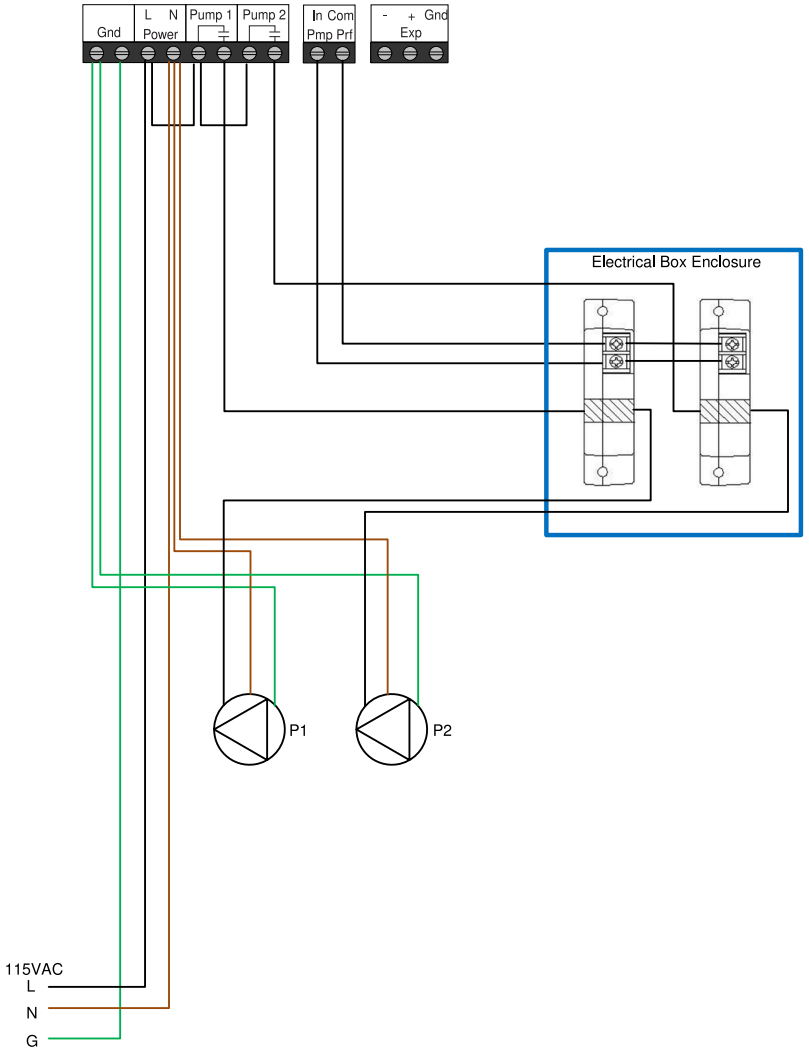
Code	Description
24	Ethernet Disconnected Error
25	Wi-Fi Disconnected Error
26	Wi-Fi Invalid Password Error
27	DHCP Address Error
28	Internet Unavailable Error
29	Nexa Error
30	Mixed Outlet High Temp Alert
31	Mixed Outlet Low Temp Alert
32	Hot Inlet High Temp Alert
33	Hot Inlet Low Temp Alert
34	Hot Inlet High Pressure Alert
35	Hot Inlet Low Pressure Alert
36	Cold Inlet High Pressure Alert
37	Cold Inlet Low Pressure Alert
38	Inlet Pressure Differential Alert
39	Encoder Error
40	Stall Detected (Hot) Error
41	Stall Detected (Cold) Error
42	Pump 1 Flow Proof Error
43	Pump 2 Flow Proof Error
44	Pump 1 & 2 Flow Proof Error
45	Pump False Flow Error
46	Isolation Valve End Switch Error

Appendix: Supplemental Wiring Diagrams

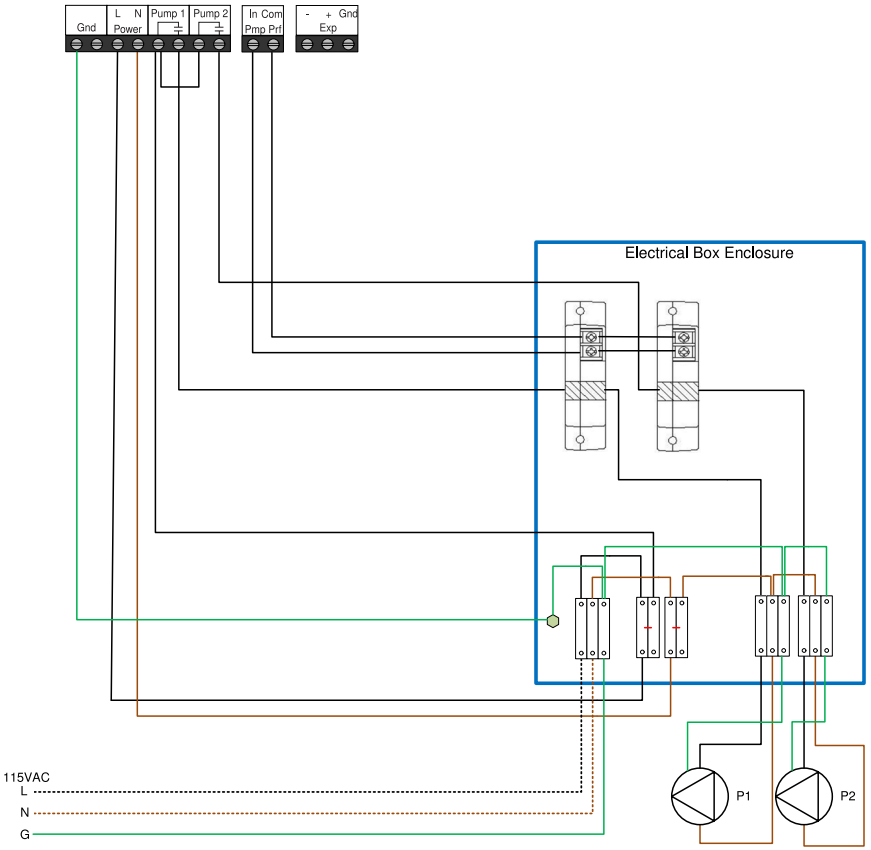
Single Valve, Single 115 Vac Recirculation Pump



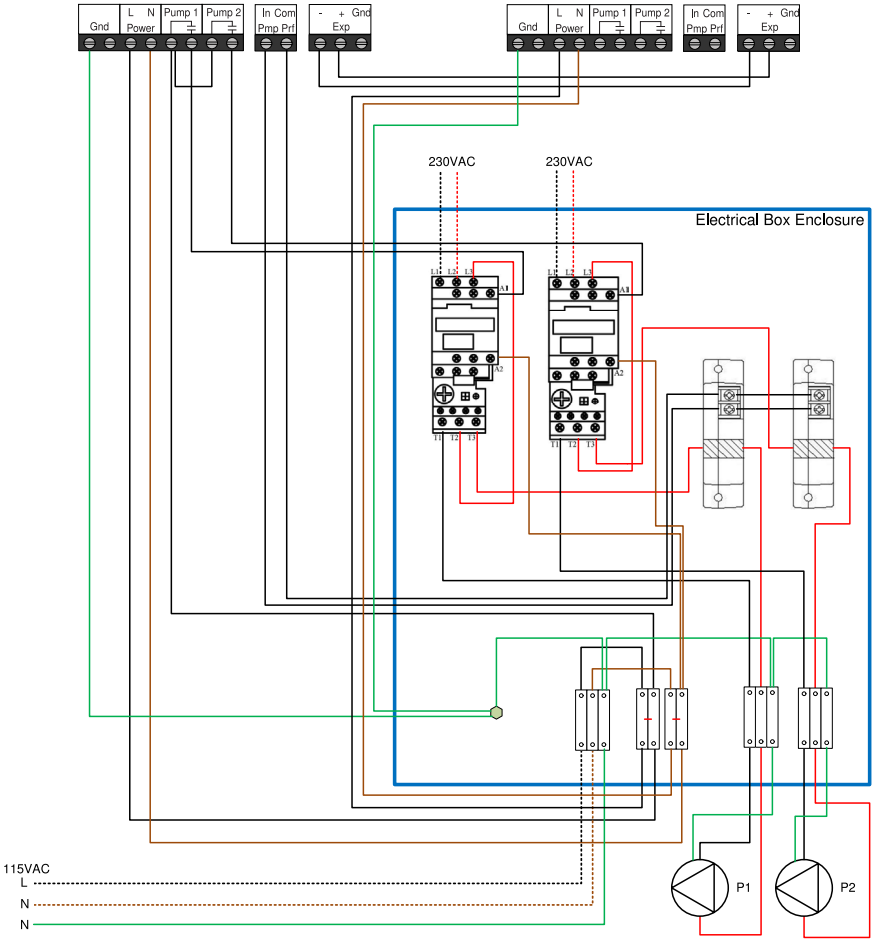
Single Valve, Dual 115 Vac Recirculation Pumps (direct)



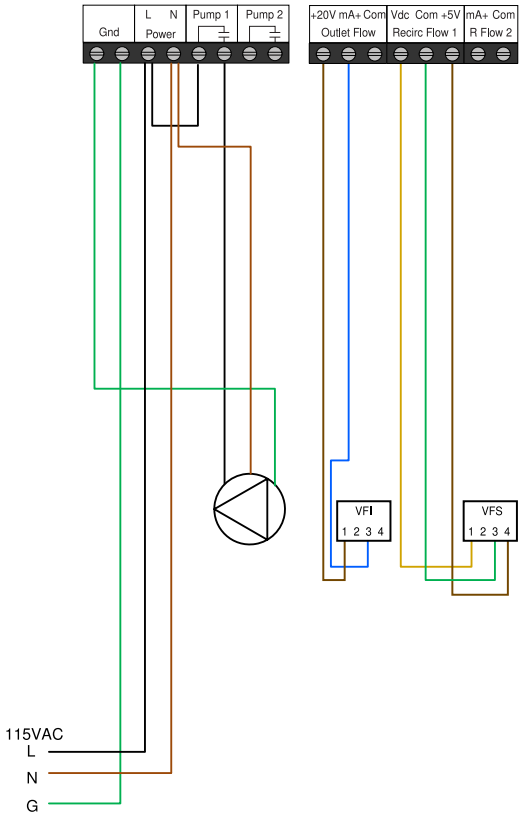
Single Valve, Dual 115 Vac Recirculation Pumps



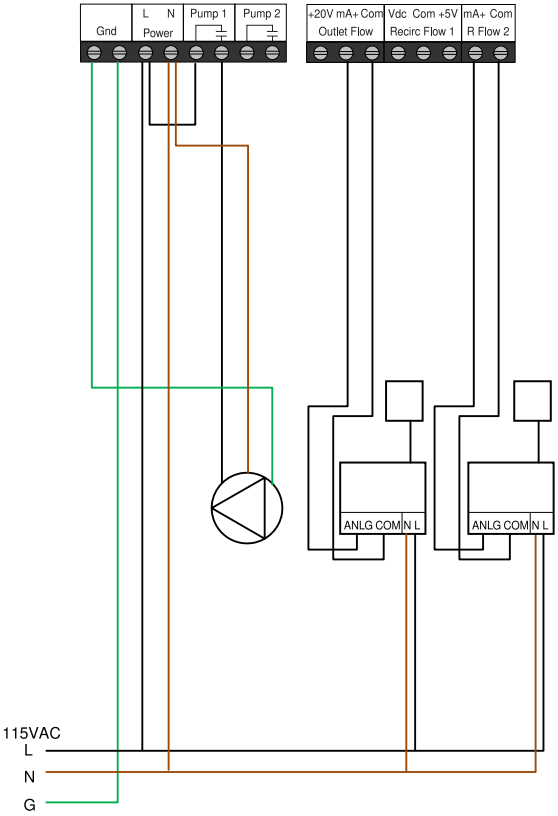
Dual Valve, Dual 230 Vac Recirculation Pumps



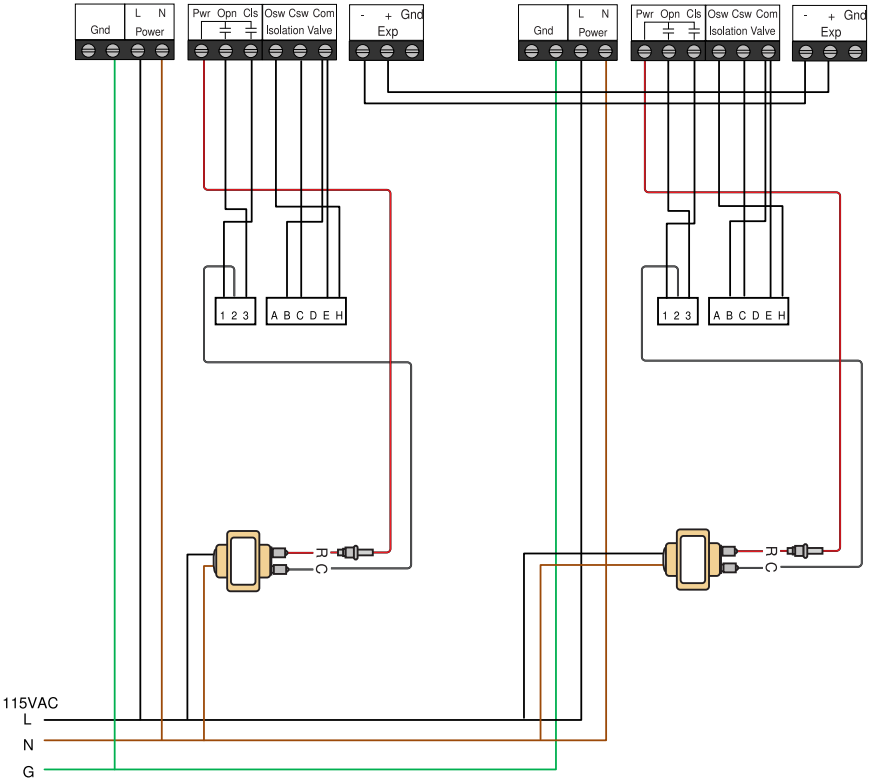
Single Valve, Single 115 Vac Recirculation Pump, Grundfos Flow Meters



Single Valve, Single 115 Vac Recirculation Pump, Keyence Flow Meters



Dual Valve, Isolation Valve



POWERS™

A **WATTS** *Brand*

COMPUTER SYSTEM, NETWORK AND DATA DISCLAIMER:

IntelliStation 2 receives stores and displays data concerning your water distribution system, performs functions based upon owner/user data input and selections, and can be remotely programmed and utilized with specified and compatible building automation systems.

AS SUCH, POWERS MAKES NO EXPRESS OF IMPLIED WARRANTY, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, REGARDING COMPATIBILITY WITH OTHER TECHNOLOGIES, HARDWARE, SOFTWARE, NETWORK OR SYSTEMS, THE ACCURACY OR COMPLETENESS OF ANY DATA, THE SECURITY OF ANY COMPUTER NETWORK OR SYSTEM, OR ANY RESULTS TO BE ACHIEVED FROM THE INTELLISTATION 2 OR ANY COMPUTER NETWORK OR SYSTEM. POWERS HAS NO RESPONSIBILITY OR LIABILITY ARISING FROM: THE UNAUTHORIZED USE OF THE INTELLISTATION 2; THE CONNECTION TO OR INTEGRATION WITH A USER'S OR ANY OTHER COMPUTER NETWORK OR SYSTEM; ANY HARDWARE OR SOFTWARE NOT SUPPLIED BY POWERS; ANY DATA THAT IS INCORRECT, CORRUPT OR CORRUPTED, LOST, STOLEN OR PIRATED; ANY FAILURE TO SECURE THE INTELLISTATION 2 OR THE USER'S OR ANY OTHER COMPUTER NETWORK OR SYSTEM; ANY "CRASHING" OR TEMPORARY/PERMANENT INOPERABILITY OF INTELLISTATION 2 OR ANY COMPUTER NETWORK OR SYSTEM; ANY UNAUTHORIZED USES, USERS, OR INTRUDERS OF THE INTELLISTATION 2 OR ANY COMPUTER NETWORK OR SYSTEM; ANY INTENTIONAL OR UNINTENTIONAL VIRUSES OR CORRUPTION OF ANY KIND OF THE INTELLISTATION 2 OR ANY COMPUTER NETWORK OR SYSTEM; OR ANY THIRD PARTY ACTION SUCH AS HACKING OR UNAUTHORIZED ACCESS OR USE OF THE INTELLISTATION 2 OR ANY COMPUTER NETWORK OR SYSTEM.

Limited Warranty

INTELLISTATION® 2 LIMITED WARRANTY

Watts Regulator Co. (the "Company") warrants the IntelliStation 2 (the "Product") to be free from defects in material and workmanship under normal usage for a period of eighteen (18) months from the date of original shipment (the "Warranty Period").

The Warranty Period may be extended up to a maximum period of five (5) years from the date of original shipment as follows:

1. If you register the Product at https://app.nexaplatform.com/warranty/IntelliStation2 or such other site as determined by the Company from time to time, the Warranty Period will be extended to a period of three (3) years from the date of original shipment.
2. If you connect the Product to the Watts Nexa™ platform, the Warranty Period will be extended to a period of five (5) years from the date of original shipment.

In the event of a covered defect within the Warranty Period, the Company will, at its option, replace or recondition the Product without charge.

THE WARRANTY SET FORTH HEREIN IS GIVEN EXPRESSLY AND IS THE ONLY WARRANTY GIVEN BY THE COMPANY WITH RESPECT TO THE PRODUCT. THE COMPANY MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED. THE COMPANY HEREBY SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

The remedy described in the first paragraph of this warranty shall constitute the sole and exclusive remedy for breach of warranty. This limited warranty does not cover (a) any product, components or parts not manufactured by the Company, (b) faulty or improper installation or unsuitable installation environment, (c) failure to follow instructions or warnings, (d) problems caused by unauthorized attachments, modification, repairs or parts, (e) negligence or vandalism, (f) problems due to foreign material, adverse or improper water conditions, chemicals, contamination, improper pH, water treatment activities or products, mineral deposits, or decomposition by galvanic action, (g) shipping defects or damage, (h) normal wear and tear, (i) any abuse, misuse, unintended use, failure to maintain or inspect, (j) any circumstances over which the Company has no control. This limited warranty shall be invalidated by any abuse, misuse, misapplication, improper installation or improper maintenance or alteration of the Product.

This limited warranty does not cover the connected functionality and features of the Product, which are governed by the provisions of the Watts Terms of Use available at: https://www.watts.com/terms-of-use (the "Terms of Use") that are applicable to "Connected Devices" as such term is defined in the Terms of Use.

IN NO EVENT SHALL THE COMPANY BE LIABLE TO BUYER OR THIRD PARTIES FOR ANY GENERAL, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES INCLUDING, BUT NOT LIMITED TO, PROPERTY DAMAGE, PERSONAL INJURIES, LOST PROFITS, LOSS OF SAVINGS OR REVENUE, LOSS OF THE USE OF THE PRODUCT OR ANY ASSOCIATED PRODUCTS, COST OF REPAIR, COST OF ANY SUBSTITUTE PRODUCTS OR SERVICES, DELAY DAMAGES, LABOR CHARGES, FINES/ PENALTIES, ECONOMIC OR NON-ECONOMIC LOSSES, ARISING DIRECTLY OR INDIRECTLY FROM THE SALE/PURCHASE, OWNERSHIP, INSTALLATION, OR USE OF THE PRODUCT, WHETHER BASED ON BREACH OF WARRANTY, BREACH OF CONTRACT, NEGLIGENCE, STRICT LIABILITY, OR ANY OTHER LEGAL THEORY. IN NO EVENT SHALL THE COMPANY'S LIABILITY EXCEED AN AMOUNT EQUAL TO THE SALES PRICE OF THE PRODUCT.

To obtain warranty service: Contact the Company at 800-669-5430 with description of the problem and proof of the date of original purchase. Cost of shipping and insuring returned Product must be paid by purchaser. The Company is not responsible for any loss of damage to the Product incurred during shipping.

POWERS™

A **WATTS** *Brand*

USA: Tel: ((888) 432-8932 • PowersControls.com
Canada: Tel: (888) 208-8927 • PowersControls.ca
Latin America: (52) 55-4122-0138 • PowersControls.com

IOM-P-IntelliStation2 2414 88006486