

# Installation and Operation Manual

## Element Q<sup>®</sup>

### This Manual Applies to models:

- Element Q 100
- Element Q 80
- Element Q 60

### This manual applies to serial numbers:

21LN0001 and above

### Patents Pending



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# Table of Contents

<b>1</b>	<b>SAFETY PRECAUTIONS .....</b>	<b>7</b>
1.1	Warnings & Cautions .....	7
1.2	Emergency Shutdown .....	8
1.3	Prolonged Shutdown .....	8
1.4	For Massachusetts Installations .....	9
<b>2</b>	<b>GENERAL INFORMATION .....</b>	<b>11</b>
2.1	Safety Considerations .....	11
2.2	Electrical Requirements .....	12
2.3	Handling and Locating the Element .....	12
2.4	Theory of Operation .....	12
<b>3</b>	<b>INSTALLATION .....</b>	<b>15</b>
3.1	Description .....	15
3.2	Receiving and Inspecting the Unit .....	17
3.3	Unpacking and Moving the Unit .....	17
3.3.1	Moving the Element .....	18
3.4	Site Selection and Preparation .....	20
3.4.1	Service Clearances .....	21
3.5	Electrical Service .....	22
<b>4</b>	<b>GENERAL PIPING GUIDELINES .....</b>	<b>23</b>
4.1	Inlet and Outlet Connections .....	23
4.2	Building Return Piping .....	24
4.3	Flow Requirements .....	24
<b>5</b>	<b>CONDENSATE DRAIN, TRAP &amp; DISPOSAL .....</b>	<b>25</b>
5.1	Connect Condensate Trap .....	25
5.2	Condensate Neutralization System (CNS) .....	26
5.2.1	CNS Installation Requirements .....	26
<b>6</b>	<b>GAS SUPPLY AND PIPING .....</b>	<b>27</b>
6.1	Inlet Pressure .....	27
6.2	Manifold Pressure .....	27
6.3	Gas Connection .....	27
<b>7</b>	<b>VENTING .....</b>	<b>28</b>
7.1	Maximum Vent Length (Equivalent Length) .....	30
7.2	Vertical or Horizontal Vent Termination .....	30

## Section 1: Safety Precautions

<b>7.3</b>	<b>Combining Category IV Vents .....</b>	<b>31</b>
7.3.1	Concentric Vent Connections to the Vent Pipe and Remote Air Inlet Duct .....	32
7.3.2	Concentric Vent Kit Assembly, Installation and Support.....	32
<b>7.4</b>	<b>Connecting to an Existing Vent System.....</b>	<b>33</b>

## SECTION II – ELEMENT STARTUP PROCEDURE..... 34

### 8 WATER HEATER AND AQUASOLVE STARTUP ..... 35

<b>8.1</b>	<b>Initial Startup Requirements .....</b>	<b>35</b>
<b>8.2</b>	<b>Required Tools and Instrumentation .....</b>	<b>35</b>
<b>8.3</b>	<b>Resources .....</b>	<b>36</b>
<b>8.4</b>	<b>On-Site Considerations .....</b>	<b>36</b>
<b>8.5</b>	<b>Pre-Startup Checklist .....</b>	<b>36</b>
8.5.1	Check Electrical Service .....	36
8.5.2	Confirm Water Tanks are Completely Filled .....	37
8.5.3	Check Tank Flanges and Plumbing Connections for Leaks .....	38
8.5.4	Check Condensate Trap.....	38
8.5.5	Confirm Gas Type .....	38
8.5.6	Confirm Supply Gas Pressure .....	38
<b>8.6</b>	<b>Startup Procedure .....</b>	<b>39</b>
8.6.1	Burner Combustion Adjustment – General.....	40
8.6.2	Optimizing Combustion.....	40
8.6.3	Check the Vent Pressure .....	41
8.6.4	Water Heater Interlocks.....	42
<b>8.7</b>	<b>AquaSolve Media Fill .....</b>	<b>44</b>

### 9 CONTROLS STARTUP..... 45

<b>9.1</b>	<b>Sign In .....</b>	<b>45</b>
<b>9.2</b>	<b>Download &amp; Install the Latest Firmware .....</b>	<b>45</b>
<b>9.3</b>	<b>Change Owner PIN on Unit .....</b>	<b>45</b>
<b>9.4</b>	<b>Communication Wiring .....</b>	<b>47</b>
<b>9.5</b>	<b>Initial BAS Connectivity .....</b>	<b>49</b>
<b>9.6</b>	<b>Initial Startup and the First User .....</b>	<b>50</b>
<b>9.7</b>	<b>Setting up the Organization Hierarchy.....</b>	<b>58</b>
<b>9.8</b>	<b>Managing Users .....</b>	<b>60</b>
9.8.1	Invite New Users .....	61
9.8.2	Reassigning Personas .....	63
9.8.3	Deactivating Users .....	63
<b>9.9</b>	<b>Ownership Transfer .....</b>	<b>63</b>
9.9.1	Organization Ownership Transfer .....	64
9.9.2	Troubleshooting Ownership Transfer .....	68

## SECTION III – SUB-SYSTEM DETAILS ..... 69

### 10 EDGE SC CONTROLLER OPERATION ..... 69

## Section 1: Safety Precautions

<b>10.1</b>	<b>Edge SC Controller Description.....</b>	<b>69</b>
<b>10.2</b>	<b>Welcome Screen and Navigation.....</b>	<b>69</b>
<b>10.3</b>	<b>Menu Structure .....</b>	<b>71</b>
10.3.1	Water Heater .....	73
10.3.2	Unit Anti-Scale .....	74
10.3.3	UV Cold Water and UV Recirculation.....	75
10.3.4	Mixing Valve .....	76
10.3.5	Filters: Cold Water and Recirculation .....	77
10.3.6	Booster Pump .....	78
10.3.7	Diverter Valve .....	79
10.3.8	Blowdown Valve .....	80
10.3.9	Sanitation Pump .....	81
10.3.10	Monitoring.....	85
10.3.11	Event History.....	86
10.3.12	Infection Control.....	87
10.3.13	Comments.....	87
<b>10.4</b>	<b>Settings .....</b>	<b>88</b>
10.4.1	User Accounts .....	88
10.4.2	Network Connections .....	89
10.4.3	Cloud Connectivity .....	90
10.4.4	Unit Details .....	90
10.4.5	Time .....	91
10.4.6	Units.....	91
10.4.7	Software Update.....	92
<b>10.5</b>	<b>BAS Modbus Points.....</b>	<b>92</b>
10.5.1	Communication Specification .....	93
10.5.2	Troubleshooting.....	93
10.5.3	Modbus Points List.....	93
<b>11</b>	<b>LYNC Q WATER HEATER OPERATION .....</b>	<b>96</b>
<b>11.1</b>	<b>Temperature and Pressure Relief Valve(s) .....</b>	<b>96</b>
<b>11.2</b>	<b>Electronic Low Water Cut-Off.....</b>	<b>96</b>
<b>11.3</b>	<b>Operating Temperature Control.....</b>	<b>97</b>
<b>11.4</b>	<b>High Water Temperature Limit.....</b>	<b>97</b>
<b>11.5</b>	<b>Electronic Operating System (EOS) .....</b>	<b>98</b>
11.5.1	Touch Screen User Interface.....	99
11.5.2	Status Field Display .....	99
11.5.3	Operational Sequence Field Display .....	99
11.5.4	View Menu (Home Screen - Default Display) .....	100
11.5.5	Control System Menus.....	101
11.5.6	Changing the Vent Material Type (ADVanced Level Access) .....	101
11.5.7	Changing the Operating Setpoint (USER Level Access).....	102
11.5.8	Setting the Real Time Clock (User & Installer Level Access) .....	102
11.5.9	Scheduled Setback (USER Level Access) .....	103
11.5.10	Using the Manual Override Menu (ADVanced Level Access) .....	104
11.5.11	Potentiometer (Operating Setpoint for Standalone Operation) .....	105
11.5.12	Using Tool Box Menu.....	105
11.5.13	Basic Operational Reference Information .....	106
11.5.14	Potentiometer (Adjusting the Setpoint) .....	107
<b>11.6</b>	<b>Sequence of Operation .....</b>	<b>107</b>



<b>12</b>	<b>DIGITEMP JR. MIXING VALVE .....</b>	<b>110</b>
<b>12.1</b>	<b>Description .....</b>	<b>110</b>
12.1.1	Repair.....	110
<b>12.2</b>	<b>Setup and Programming .....</b>	<b>111</b>
12.2.1	To Create a Passcode:.....	112
12.2.2	To Unlock the System: .....	113
12.2.3	System Setup Menu .....	113
12.2.4	Selecting and Setting the Outlet Water Temperature Setpoint: .....	114
<b>12.3</b>	<b>Time Function.....</b>	<b>115</b>
<b>13</b>	<b>AQUASOLVE ANTI-SCALE OPERATION AND MAINTENANCE.....</b>	<b>120</b>
<b>13.1</b>	<b>AquaSolve Anti-Scale Benefits.....</b>	<b>120</b>
<b>13.2</b>	<b>Specifications .....</b>	<b>120</b>
<b>13.3</b>	<b>Standards .....</b>	<b>120</b>
<b>13.4</b>	<b>Equipment Specifications.....</b>	<b>121</b>
<b>14</b>	<b>LYNC UV .....</b>	<b>124</b>
<b>15</b>	<b>FILTER MAINTENANCE.....</b>	<b>125</b>
<b>15.1</b>	<b>Cold Filter.....</b>	<b>125</b>
<b>15.2</b>	<b>Recirculation Filter.....</b>	<b>125</b>
<b>15.3</b>	<b>Cleaning .....</b>	<b>125</b>
<b>16</b>	<b>MAINTENANCE .....</b>	<b>126</b>
<b>16.1</b>	<b>Lync Q Water Heater Communications and Diagnostics.....</b>	<b>126</b>
16.1.1	Indicators .....	126
16.1.2	Alarm Messages – Diagnostic Codes (Flashes) .....	126
16.1.3	Fuse.....	127
16.1.4	Self-Check/Control Failure.....	128
16.1.5	System Safety Checks .....	128
16.1.6	Flame Current Measurements.....	128
16.1.7	Non-Volatile Lockout/Manual Reset.....	128
16.1.8	ID Card .....	128
16.1.9	Error Codes .....	128
16.1.10	Maintenance Schedule .....	129
<b>16.2</b>	<b>Cold and Recirc Sediment Filter Maintenance.....</b>	<b>130</b>
16.2.1	Changing Recirc Filter .....	130
16.2.2	Changing Cold Filter .....	131
<b>16.3</b>	<b>AquaSolve Maintenance .....</b>	<b>132</b>
16.3.1	Replacing the Media .....	133
<b>16.4</b>	<b>Lync UV Systems Maintenance.....</b>	<b>135</b>
<b>16.5</b>	<b>Component Maintenance and Troubleshooting.....</b>	<b>138</b>
16.5.1	Sanitation Pump .....	138
16.5.2	Booster Pump .....	139

Section 1: Safety Precautions

16.5.3	Blowdown Valve .....	141
16.5.4	Diverter Valve .....	142
<b>APPENDIX.....</b>		<b>144</b>
<b>APPENDIX A. STATUS, FAULT MESSAGES .....</b>		<b>144</b>
<b>APPENDIX B. DIAGRAMS.....</b>		<b>146</b>
<b>APPENDIX C. USER PERMISSIONS TABLE .....</b>		<b>155</b>
<b>APPENDIX D. CHANGE LOG.....</b>		<b>157</b>

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# 1 SAFETY PRECAUTIONS

## 1.1 Warnings & Cautions

Installers and operating personnel **MUST**, at all times, observe all safety regulations. The following warnings and cautions are general and must be given the same attention as specific precautions included in these instructions. In addition to all the requirements included in this AERCO Instruction Manual, the installation of units **MUST** conform with local building codes, or, in the absence of local codes, ANSI Z223.1 (National Fuel Gas Code Publication No. NFPA-54) for gas-fired heaters and ANSI/NFPA5B for LP gas-fired heaters. Where applicable, the equipment shall be installed in accordance with the current Installation Code for Gas Burning Appliances and Equipment, CSA B149.1, and applicable Provincial regulations for the class; which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.

### IMPORTANT!

This Manual is an integral part of the product and must be maintained in legible condition. It must be given to the user by the installer and kept in a safe place for future reference.

### IMPORTANT!

The water heater can only be used for applications where the chlorine concentrations **do not exceed 4 mg/L**, the EPA limit for chlorine concentrations in drinking water.

- **Do Not** use this heater for a pool heating application.

### WARNING!

- Do not use matches, candles, flames, or other sources of ignition to check for gas leaks.
- Fluids under pressure may cause injury to personnel or damage to equipment when released. Be sure to shut off all incoming and outgoing water shutoff valves and carefully decrease all trapped pressures to zero before performing maintenance.
- The unit's electrical service connection cover must be installed at all times, except during maintenance and servicing.
- A disconnect switch must be installed at the electrical service connection in accordance with local codes.

**CAUTION!**

Many soaps used for gas pipe leak testing are corrosive to metals. The piping must be rinsed thoroughly with clean water after leak checks have been completed.

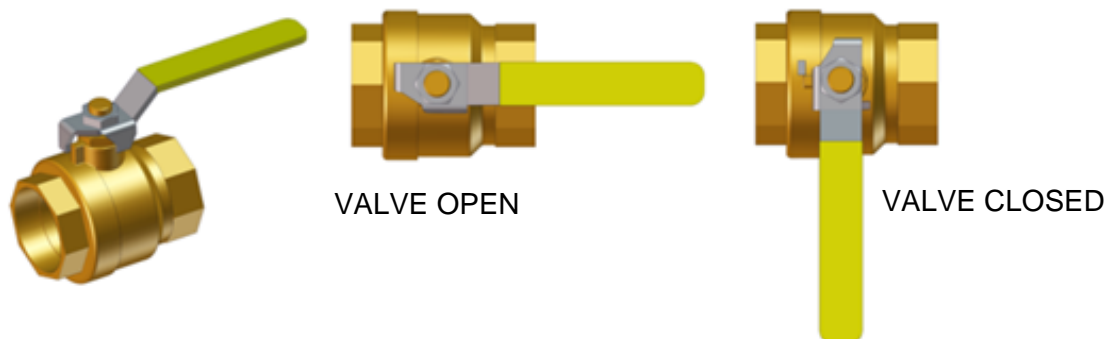
DO NOT use this heater if any part has been under water. Call a qualified service technician to inspect and replace any part that has been under water.

## 1.2 Emergency Shutdown

If overheating occurs or the gas supply fails to shut off, close the manual gas shutoff valve (Figure 1-1) located external to the unit.

**IMPORTANT!**

The Installer must identify and indicate the location of the emergency shutdown manual gas valve to operating personnel.



**Figure 1 - Manual Gas Shutoff Valve**

## 1.3 Prolonged Shutdown

After prolonged shutdown, it is recommended that the initial startup procedures in Chapter 4 and the safety device test procedures in Chapter 5 of this manual be performed to verify all system-operating parameters. If there is an emergency, turn off the electrical power supply to the unit and close the manual gas valve located upstream of the unit. The installer must identify the emergency shut-off device.

## 1.4 For Massachusetts Installations

Water heater Installations within the Commonwealth of Massachusetts must conform to the following requirements:

- Heater must be installed by a plumber or a gas fitter who is licensed within the Commonwealth of Massachusetts.
- Prior to unit operation, the complete gas train and all connections must be leak tested using a non-corrosive soap.
- The vent termination must be located a minimum of 4 feet (1.2m) above grade level. If side-wall venting is used, the installation must conform to the following requirements **extracted from 248 CMR 5.08 (2)**:

(a) For all side wall horizontally vented gas fueled equipment installed in every dwelling, building or structure used in whole or in part for residential purposes, including those owned or operated by the Commonwealth and where the side wall exhaust vent termination is less than seven (7) feet (2.1m) above finished grade in the area of the venting, including but not limited to decks and porches, the following requirements shall be satisfied:

1. INSTALLATION OF CARBON MONOXIDE DETECTORS. At the time of installation of the side wall horizontal vented gas fueled equipment, the installing plumber or gasfitter shall observe that a hard-wired carbon monoxide detector with an alarm and battery back-up is installed on the floor level where the gas equipment is to be installed. In addition, the installing plumber or gasfitter shall observe that a battery operated or hard-wired carbon monoxide detector with an alarm is installed on each additional level of the dwelling, building or structure served by the side wall horizontal vented gas fueled equipment. It shall be the responsibility of the property owner to secure the services of qualified licensed professionals for the installation of hard-wired carbon monoxide detectors.

a. In the event that the side wall horizontally vented gas fueled equipment is installed in a crawl space or an attic, the hard-wired carbon monoxide detector with alarm and battery back-up may be installed on the next adjacent floor level.

b. In the event that the requirements of this subdivision cannot be met at the time of completion of installation, the owner shall have a period of thirty (30) days to comply with the above requirements; provided, however, that during said thirty (30) day period, a battery-operated carbon monoxide detector with an alarm shall be installed.

2. APPROVED CARBON MONOXIDE DETECTORS. Each carbon monoxide detector as required in accordance with the above provisions shall comply with NFPA 720 and be ANSI/UL 2034 listed and IAS certified.

3. SIGNAGE. A metal or plastic identification plate shall be permanently mounted to the exterior of the building at a minimum height of eight (8) feet (2.4m) above grade directly in line with the exhaust vent terminal for the horizontally vented gas fueled heating appliance or equipment. The sign shall read, in print size no less than one-half (1/2) inch in size, "**GAS VENT DIRECTLY BELOW. KEEP CLEAR OF ALL OBSTRUCTIONS**".

4. INSPECTION. The state or local gas inspector of the side wall horizontally vented gas fueled equipment shall not approve the installation unless, upon inspection, the inspector observes carbon monoxide detectors and signage installed in accordance with the provisions of 248 CMR 5.08(2)(a)1 through 4.

(b) EXEMPTIONS: The following equipment is exempt from 248 CMR 5.08(2)(a)1 through 4:

1. The equipment listed in Chapter 10 entitled "Equipment Not Required To Be Vented" in the most current edition of NFPA 54 as adopted by the Board; and

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Section 1: Safety Precautions

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2. Product Approved side wall horizontally vented gas fueled equipment installed in a room or structure separate from the dwelling, building or structure used in whole or in part for residential purposes.

(c) MANUFACTURER REQUIREMENTS - GAS EQUIPMENT VENTING SYSTEM PROVIDED.

When the manufacturer of Product Approved side wall horizontally vented gas equipment provides a venting system design or venting system components with the equipment, the instructions provided by the manufacturer for installation of the equipment and the venting system shall include:

1. Detailed instructions for the installation of the venting system design or the venting system components; and
2. A complete parts list for the venting system design or venting system.

(d) MANUFACTURER REQUIREMENTS - GAS EQUIPMENT VENTING SYSTEM NOT PROVIDED. When the manufacturer of a Product Approved side wall horizontally vented gas fueled equipment does not provide the parts for venting the flue gases, but identifies "special venting systems", the following requirements shall be satisfied by the manufacturer:

1. The referenced "special venting system" instructions shall be included with the appliance or equipment installation instructions; and
2. The "special venting systems" shall be Product Approved by the Board, and the instructions for that system shall include a parts list and detailed installation instructions.

(e) A copy of all installation instructions for all Product Approved side wall horizontally vented gas fueled equipment, all venting instructions, all parts lists for venting instructions, and/or all venting design instructions shall remain with the appliance or equipment at the completion of the installation.

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**[End of Extracted Information From 248 CMR 5.08 (2)]**

## 2 GENERAL INFORMATION

### 2.1 Safety Considerations

Follow these **WARNINGS** and **CAUTIONS** at all times. Failure to follow these instructions can cause property damage, personal injury, exposure to hazardous materials or death.

- Initial startup of all Lync units must be performed by factory-trained personnel so as not to void the warranty.
- Installers and operating personnel must observe all applicable safety regulations.
- In addition to these requirements, installation must conform with local building codes as well as, where applicable, the current Installation Code for Gas Burning Appliances and Equipment, CSA B149.1, and applicable Provincial regulations. Authorities having jurisdiction should be consulted before installation.

#### CAUTION:

All initial installation procedures must be satisfied before attempting to start the unit.

#### WARNING:

**DO NOT** dry-fire the unit. Starting the unit without a full water level can seriously damage the unit, may result in personnel injury or property damage, and will void all warranties.

**DO NOT** store or use gasoline or other flammable vapors or liquids near this or any appliance.

**IF YOU SMELL GAS:** Do not try to light appliance. Do not touch any electric switch; do not use any phone in your building. Immediately call your gas supplier from a location away from your building and the smell of gas. Follow the gas supplier's instructions. If you cannot reach your gas supplier, call the fire department.

**IN AN EMERGENCY:** Shut the main gas supply valve to the appliance from a location safely away from the emergency.

## 2.2 Electrical Requirements

See appliance rating decal for electrical service requirements. The appliance must be electrically supplied and grounded in accordance with the requirements of the authority having jurisdiction or, in the absence of such requirements, with the latest edition of the National Electrical Code ANSI/NFPA No. 70. In Canada, the electrical service must conform to local electrical codes and/or CSA C22.1, Canadian Electrical Code, Part 1.

- All wiring between the unit and field installed devices must be made with type T copper wire.
- Line voltage wires must be enclosed in approved conduit or metal-clad cable.
- To avoid serious damage, DO NOT energize the unit until the appliance is full of water.

## 2.3 Handling and Locating the Element

### **WARNING:**

Use industry-standard safe rigging methods, such as spreader bars, when attempting to lift or move this product. Failure to follow industry standard safe rigging methods can result in property damage, serious injury or death.

The Element unit must be installed indoors so it is not exposed to freezing temperatures. The water heater may be installed directly on a combustible floor.

Install the unit on a level surface near a floor drain. Position the unit so if the tank or water connections should leak, water damage will not occur to the adjacent area or to lower floors of the building. The manufacturer's warranty does not cover water damage.

Protect all electrical components and connections from water (dripping, spraying, rain, etc.) during operation and service.

Position the unit where the vent and air intake piping, when installed, will remain within the maximum equivalent lengths allowed. See Section 7: Venting.

Allow for minimum service clearances as described in Figure 8 **Error! Reference source not found..**

## 2.4 Theory of Operation

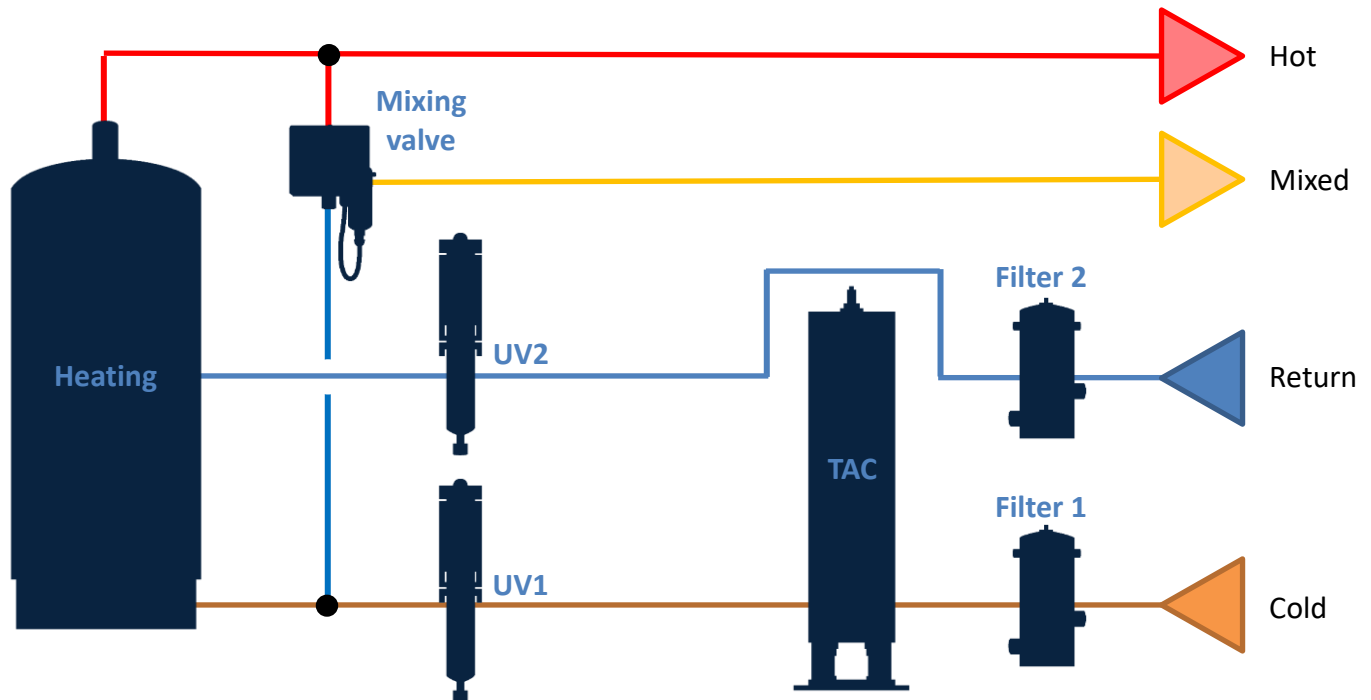
Element Q heats, treats, mixes, and reports on operation to the user. Following Figure 2 from the cold inlet, incoming potable water is filtered through Filter 1, a 5µm sediment filter. Next it passes through the AquaSolve Template Actuated Crystallization (TAC) anti-scale unit. Following that it passes through the cold water Lync UV system to inactivate pathogens. Not shown in the figure is the booster pump. The intent of the booster pump is not to compensate for lower incoming cold water pressure but rather to overcome any internal losses with the unit.

Following the booster pump and tee connection, cold water enters the Lync Q water heater. It exits from the top where there is another tee to supply the hot water to the building, and the DigiTemp Jr digital mixing valve that supplies mixed water for distribution to end user fittings and fixtures, e.g. showers and faucets.

On return, the recirculated water is passed through an additional 5µm sediment filter and an additional recirc water Lync UV system for ongoing pathogen prevention. The recirc water enters the Lync Q water heater at a mid-tank port.

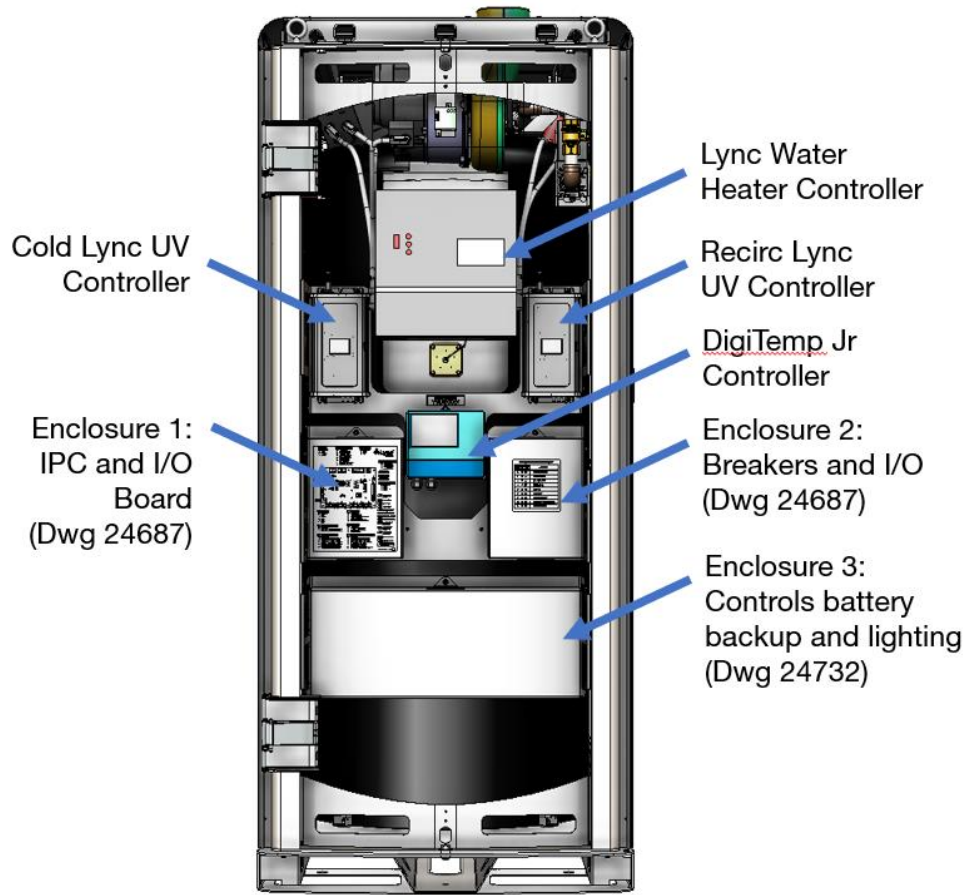
A recirculation sanitation pump and check valve are located between the water heater exit and entrance for tank volume sanitation cycles.





**Figure 2 - Element Summary Schematic**

You will notice when opening the front door of Element that the controllers for the various subsystems are all located in front. All wiring is connected to these front panels with external communication and power connections at the rear. Wiring schematics are located in the appendix.



**Figure 3** - Front of unit, door assembly removed

## 3 INSTALLATION

### 3.1 Description

The Element is the first all-in-one, fully engineered water wellness solution that provides safe, reliable domestic hot water through a complete, compact system designed and built by a single source, and operated by a supervisory controller. It integrates water heating, temperature control, and water treatment; mitigates risks of Legionella, waterborne pathogens and scalding; and aids in full building sanitation.

The Element features a unique, supervisory controller for the entire system for easy installation, operation, maintenance and sanitation. The compact footprint allows for multiple units to be installed in parallel and can all be accessed from a single unit or mobile device. The unit controller and mobile app locally and remotely control and report on the health of the system.

See Table 1 for the three (3) models available:

Element Q Models			
Maximum Flow	Q 100	Q 80	Q 60
<b>Cold Water Supply</b>			
Flow Rate GPM (LPM)	30 (113.6)	25 (94.6)	20 (75.5)
<b>Recirculation Loop</b>			
Flow Rate GPM (LPM)	30 (113.6)	14 (53.0)	14 (53.0)
<b>Performance</b>			
Input MBH (kW)	999 (293)	800 (234)	600 (176)
<b>Recovery GPH (Thermal Efficiency) *</b>			
70°F to 140°F	1635 (95%)	1317 (96%)	988 (96%)
40°F to 140°F	1157 (97%)	932 (97%)	699 (98%)

**Table 1 - Element Q Performance**

Input Requirements	
Natural gas pressure	>3.5in W.C. flowing (872 Pa), <14in W.C. static (3487 Pa). Convertible to use LP gas (propane)
Electrical service	120VAC, 30A
Exhaust venting	Use a Category IV PVC, CPVC or ETL, UL, ULC or CSA listed stainless steel or Centrotherm InnoFlue SW Polypropylene vent. Minimum vent length is 5 eq. feet. See installation manual for specifics.
Inlet Combustion Air Duct	Use PVC or galvanized pipe. 150 eq. ft. using 6in pipe. Longer lengths are ETL listed with larger diameters: see installation manual for specifics.
Internet connectivity	Wired via Ethernet RJ-45
Ambient temperature	0 - 130°F (-17.8 – 54.4 °C). Assumes continuous cold water supply flow.

**Table 2 - Element Input Requirements**

Cold Water Inlet Requirements	
Pressure	15 - 145psi (1000 kPa)
Temperature	Cold: 40 - 100°F (5 - 38 °C) Recirc: ≤ 180°F (≤ 82.2 °C)
pH	6.5 - 8.5
Hardness	Cold: ≤ 30 grains (≤ 513 ppm CaCO <sub>3</sub> ) Recirc: ≤ 7 grains (≤ 120 ppm CaCO <sub>3</sub> )
Free chlorine	≤ 1 ppm
Iron	≤ 0.3 ppm
Manganese	≤ 0.05 ppm
Phosphates	< 3.0 ppm
Silica	≤ 20 ppm
Oil and H <sub>2</sub> S	Must be removed
TDS	500 mg/L
Copper	< 1.3 ppm
Chloride	≤ 200 ppm
Sulfate	≤ 250 ppm

**Table 3 - Element Q Requirements**

The Element provides consolidated controls and a single source of service for ease of operation. Each Element unit is equipped with a hot water system, master mixing, UV disinfection, anti-scale and a filtration system.

## Section 3: Installation

Internal and external communications are covered by a separate *Element Communications Manual for System Integrators*. Refer to that for connections to building automation systems (BAS) or building management systems (BMS).

The Edge SC Controller contains a highly sensitive capacitive touchscreen. It continuously checks for user interaction at a high frequency. Boiler room environments are often harsh, electromagnetically noisy and dirty, and can experience wide temperature ranges, all of which can damage sensitive electronic components.

Lync has taken precautions to ensure proper operation of your unit. The Edge SC Controller is built with a high-quality glass screen for clarity and performance and has an optically bonded overlay covering the front of the enclosure to prevent dirt and liquids from affecting its operation.

Installation consists of the following tasks, in summary:

1. Unpack the Element unit from its shipping container (Section 3.3).
2. Position, secure, and level the unit at the site. Ensure the base is level (Section 3.4).
3. Verify condensate discharge piping is installed per local codes (Section 5)
4. Connect and install gas supply (Section 6) and venting (Section 7)
5. Connect the domestic hot water (DHW) supply piping and mixed (i.e. tempered) supply from the unit.
6. Connect DHW return and cold-water supply (CWS) piping.
7. Flow water through the unit to remove any entrapped air.
8. Connect external AC power to the rear of the Element enclosure.
9. Commission the water heater (Section 8).
10. Connect Element to the internet via network connection.
11. Set up the EdgeSC Controller (Section 9)
12. Configure Element per system and site needs.

### 3.2 Receiving and Inspecting the Unit

Inspect the unit completely upon receipt from the freight carrier before signing the bill of lading. Inspect the appliance and all accompanying parts for signs of impact or mishandling. Verify the total number of pieces shown on packing slips with those actually received. Contact the freight carrier immediately if any damage or shortage is detected.

Check the data decal on the appliance. Be sure the electrical, water and gas supply is adequate for the installation.

Carefully remove all side and top shipping supports and bracing. If possible, do not remove the wooden base/skid assembly until the product has been moved to its final location for installation and operation (see: 2.3 Handling and Locating the Element).

### 3.3 Unpacking and Moving the Unit

Each Element unit is shipped as a single crated unit. The packaged shipping weight is approximately 3,000 lbs (1,360 kg).

## Section 3: Installation

The unit must be moved with the proper equipment (forklift, pallet jack, etc.) to avoid possible injury to personnel or damage to the shipping container or unit. The shipping carton should be inspected for any damage incurred during transit prior to signing the bill of lading.

**NOTE:** Each unit has a Tip-N-Tell indicator on the outside of the shipping container, which indicates if the unit has been turned on its side during shipment. If the Tip-N-Tell indicator is tripped, do not sign for the shipment. Note the information on the carrier's paperwork and request a freight claim and inspection by a claims adjuster before proceeding. Notify delivering carrier immediately of any damage to the packaging. Lync is not responsible for lost or damaged freight

1. Unpack the Element from its shipping container taking care not to damage the unit when cutting away the packaging material.
2. Each unit includes an installation kit. Verify that each of the following has been received:

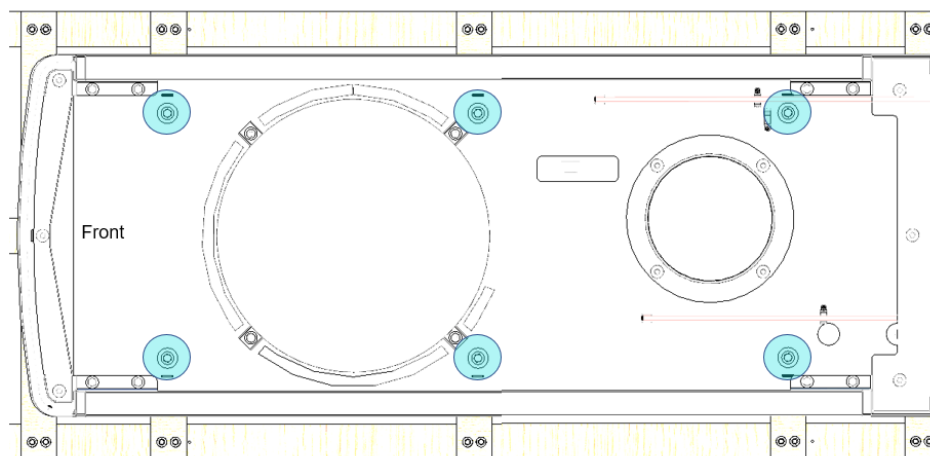
Item #	Qty	Part Number	Description
1	1	34120	Base Fascia Plate
2	1	96020	Exhaust Adapter
3	2	96018	Exhaust Vent
4	1	24757	Flexible Rubber Adapter
5	1	89025-2	Condensate Neutralizer
6	4	89061	Panel Plug 1-1/2" Id
7	6	89064	Snap-In Round Plug
8	1	89076	Media for Aquasolve

**Table 4 - Element Installation Kit BOM (part # 58204)**

3. If optional accessories were ordered, they may be packed within the unit's shipping container, factory installed on the unit, or packed and shipped in a separate container. Any standard or optional accessories shipped separately should be identified and stored in a safe place until ready for installation or use.

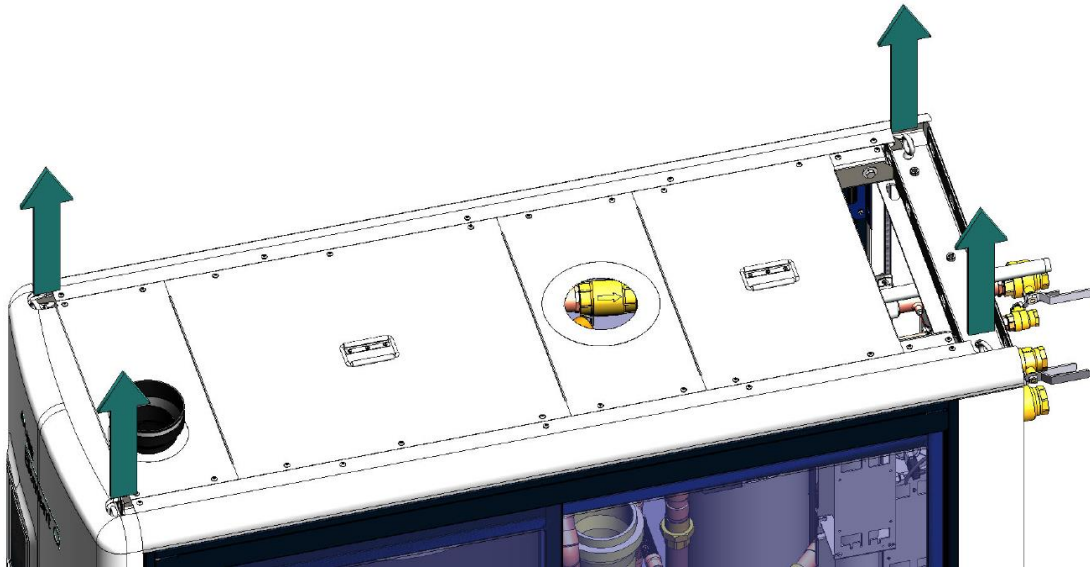
### 3.3.1 Moving the Element

Inspect the path and all thresholds that unit will move through to ensure appropriate clearance. It is recommended to use the installed pallet to move the Element to the installation site, if possible. The pallet is fastened to the unit with (6) hex-head lag bolts, as shown in Figure 4.



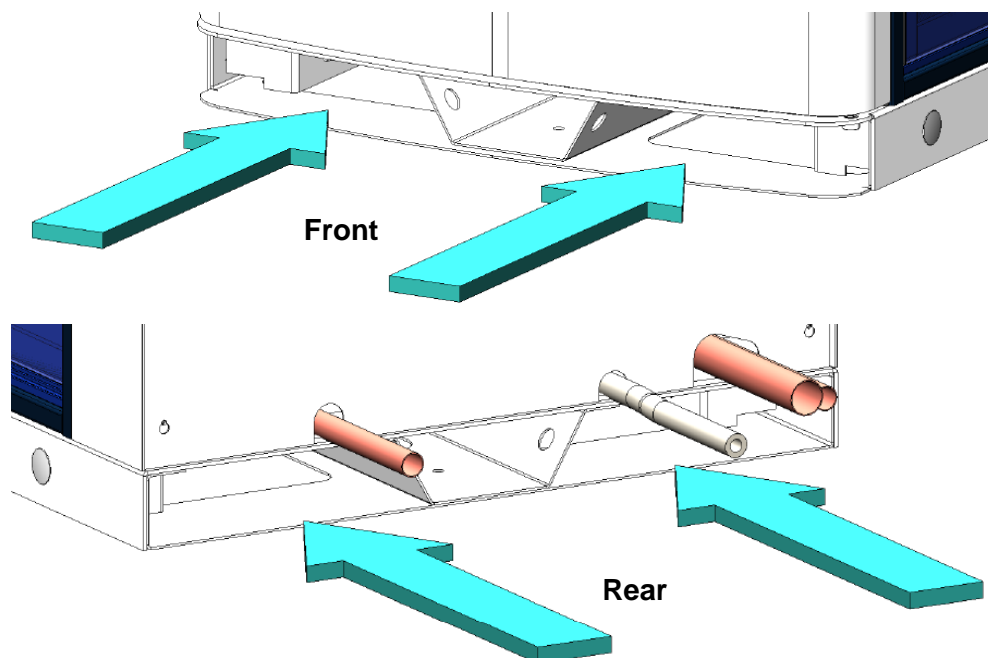
**Figure 4 – Locations of Lag Bolts to Remove Unit from Wood Pallet.**

**Moving the Unit with a Crane:** Remove the rear, top cover panel to expose the rear eyebolts. Open the front door to fasten the front rigging hooks. Spreader bars are recommended when lifting with a crane, to prevent damage to the unit.



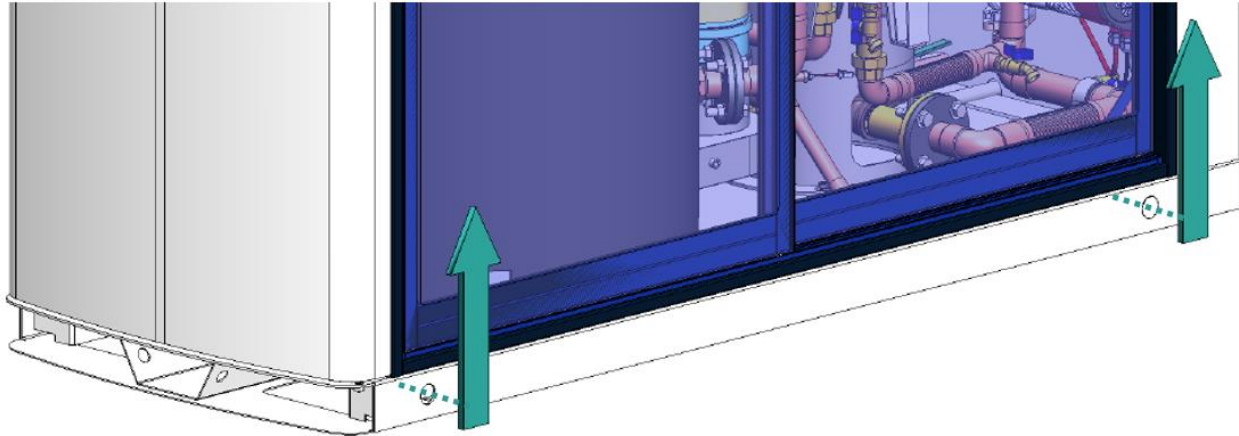
**Figure 5 – Lifting Points**

**Moving the Unit with Pallet Forks:** Ensure that the middle of Element is supported when using forks from the front, and that the middle of the water heater is supported when using forks from the rear. When complete, install the front fascia plate.



**Figure 6 – Pallet Fork Insertion Points**

**Moving the Unit with Crossbars:** Insert crossbars through the entire width of the unit. Hole diameter is 1.5in (3.8cm). The width of Element is 35.5in (90.2cm).



**Figure 7 – Crossbar Insertion Points**

### 3.4 Site Selection and Preparation

No concrete pad is required for installation of the Element. Ensure that the site selected includes the following:

- Access to AC Input Power: 120 VAC, Single-Phase, 60 Hz @ 30 Amps

#### **WARNING:**

Always follow local codes and regulations to reduce risk of electrical shock.

- Access to a natural gas line or LP gas (propane) line.
  - Natural gas units require a minimum flowing pressure of 3.5 inches of water column (0.87 kPa) with the unit operating at maximum BTU output. Maximum static pressure is 14.0 inches of water column (3.49 kPa).
  - LP gas units require minimum flowing pressure of 8.0 inches of water column (2.0 kPa) with the unit operating at maximum BTU output. Maximum static pressure is 13.0 inches of water column (3.24 kPa).
- A cold-water connection protected by a backflow prevention assembly per local codes.
- Access to the internet via RJ45 connection. Ensure any firewalls, IP filters, and MAC filters are appropriately configured.
- Floor drain, for condensate and water discharge. Maximum water discharge is from a fully open 1" CTS pipe at system return pressure. Discharge to floor drain shall pass through an air gap per local codes.

#### **WARNING:**

Condensate discharge from the Element can be corrosive and damage the drain, waste, vent (DWV) piping system. It is recommended to install a condensate neutralizer such as the Lync CN-2 between the Element condensate drain tube and discharge to drain.

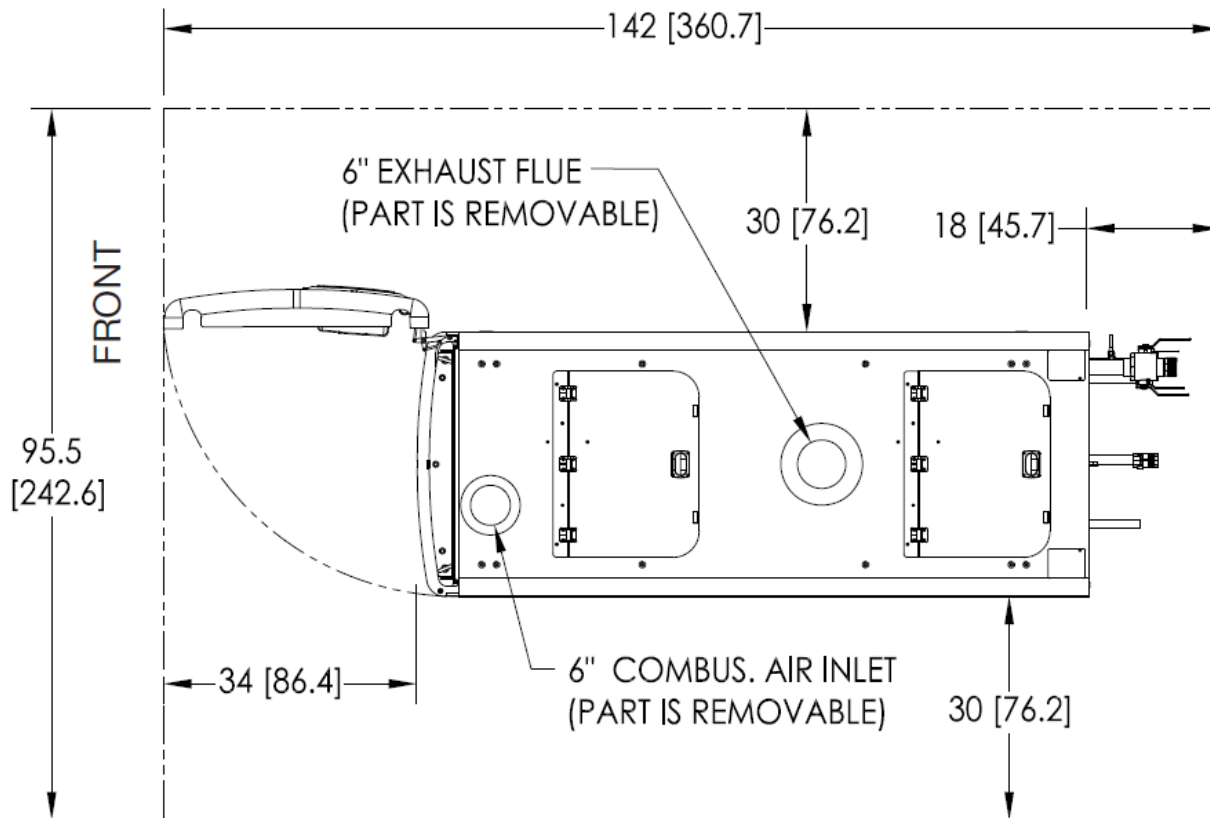
Risk of flooding if floor drain is not sized or located properly. Risk of excessive splashing from a drain grate can create a slip and fall hazard.



### 3.4.1 Service Clearances

All Element models are packaged in enclosures that have identical exterior dimensions. The unit must be installed with sufficient clearance for service access. The recommended clearance dimensions are listed below. However, if local building codes require additional clearances, these codes take precedence.

**Sides:** 30 in. (76 cm)    **Front:** 34 in. (86 cm)    **Rear:** 18 in. (45 cm)    **Top:** 18 in. (45 cm)

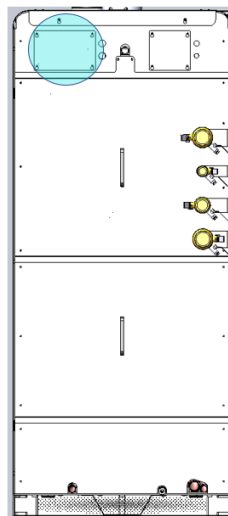


**Figure 8 – Plan View Service Clearances**

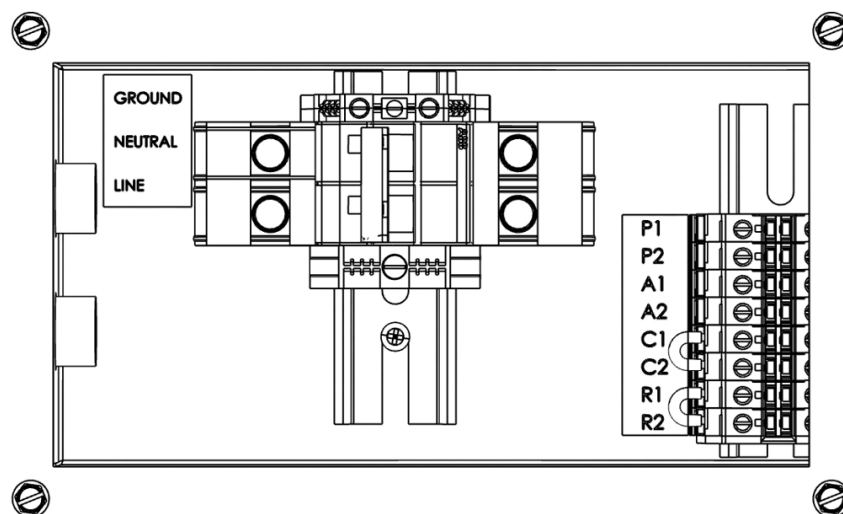
Additional clearance beyond the minimum required from combustible material should be considered to facilitate access for inspection and service of the burner, gas controls and plumbing connections. Also allow sufficient space for installing and servicing building water, gas, vent, combustion air, electrical, pump and other auxiliary/optional equipment and connections.

Additional clearance may be required to comply with local, state or national codes and regulations. It is the responsibility of the installer to comply with these requirements. Examples of codes or regulations that may apply are the National Electric Code, State/Regional/National drain water and flue emissions regulations, the National Fuel Gas Code, Building Construction and Safety Codes, the Americans with Disabilities Act (ADA) and, in states where a water heater above a certain input or storage capacity is considered a boiler, applicable boiler code requirements, boiler installation requirements in "Safety Code for Controls and Safety Devices for Automatically Fired Boilers" (CSD-1) and other regulatory requirements.

### 3.5 Electrical Service



**Figure 9 – Location of power and interlocks**



**Figure 10 – Power and interlocks**

The Element requires a 120VAC single phase electrical connection going into the rear power and interlock panel. The “neutral” connection from the building power supply should be connected to the upper 30A circuit breaker, and the “hot/line” connection should be connected to the lower 30A circuit breaker. Perform electrical connections according to all applicable electrical codes. Ensure a suitable “Earth” connection is securely installed to the designated green terminal block above/next to the 30A circuit breakers.

**NOTE:** The circuit breakers located on the back of Element are not substitutes for a building’s circuit overload protection! Ensure that properly rated conductors and matching circuit breakers are used to supply the Element’s power and interlock panel.

## 4 GENERAL PIPING GUIDELINES

### 4.1 Inlet and Outlet Connections

**WARNING:**

Hot outlet and cold-water piping materials connected to this product must be suitable for temperatures up to 212°F at normal operating water pressures.

1. Use only non-ferrous water piping and fittings. Do not use galvanized pipe or fittings. Use of ferrous or galvanized pipe or fittings can cause rust to form.
2. Install shut-off valves and unions on the inlet and outlet water piping before servicing. Use caution when threading pipe connections to prevent cross threading or over-tightening. Always use a back-up wrench on tank nipples when tightening unions, valves, etc.
3. Insulate hot water and return circulation lines. Insulate cold water supply lines if subject to freezing during shutdown periods.

**IMPORTANT!**

Do not use the plumbing connected to the Element as a ground for any purpose.

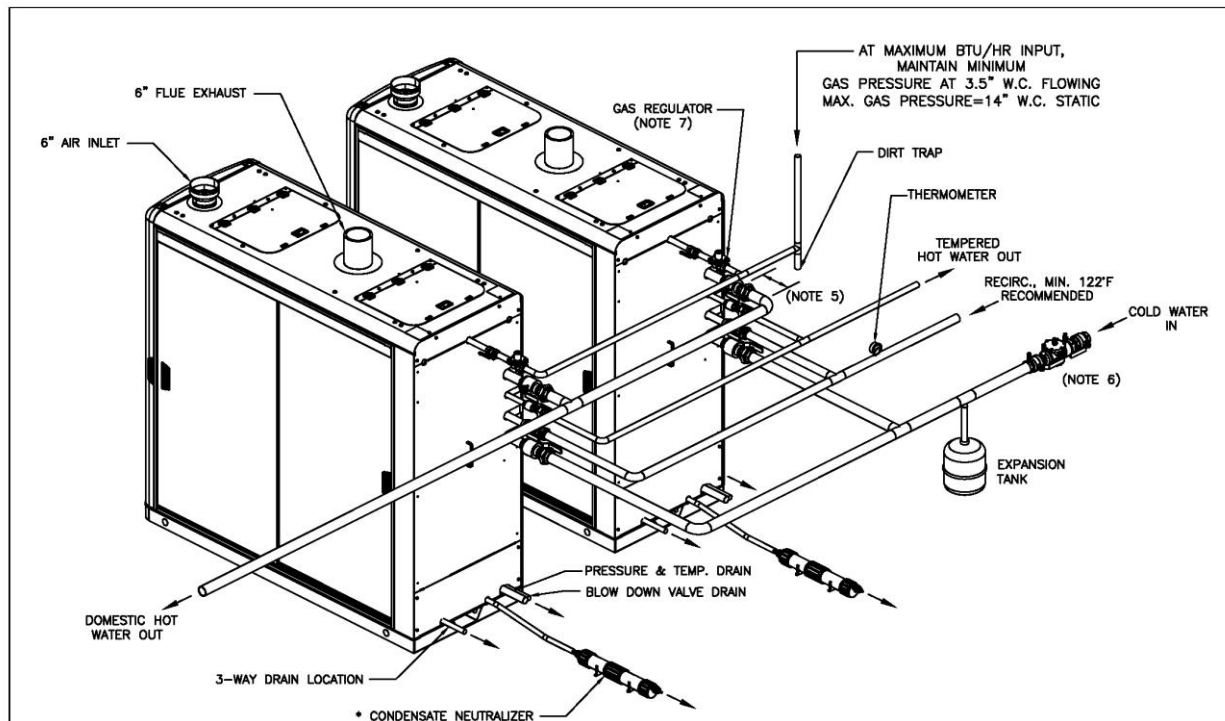
4. If not utilizing the return connection, contact your Lync rep.
5. Pipe the drain valve to a suitable open drain capable of receiving temperatures up to 212°F.
6. For maximum efficiency, cold water into the Element should not exceed 100°F. It is recommended that the building return or dishwasher recirculation piping be connected to the return water connection, not to the cold inlet water supply. The Element utilizes cold inlet water to extract heat energy and allow the use of PVC vent pipe. Higher cold inlet water temperatures will reduce heater efficiency and increase the vent temperature. If the vent temperature approaches the maximum allowed, a vent temperature limit switch will cycle the heater off to protect the PVC vent.

**WARNING:**

Risk of severe scalding is present if downstream valves and fittings are not set to reduce point-of-use water temperatures to meet local code requirements.

7. While dependent on incoming water conditions, it is recommended to place an initial 20µm sediment filter on both the cold and recirc inlets in order to minimize a buildup of large sediment in the filters.

## 4.2 Building Return Piping



**Figure 11 – Element Example Installation**

## 4.3 Flow Requirements

The pressure drop across Element from cold inlet to hot and mixed outlets is negligible due to the internal booster pump. Minimum flow capacity is a  $C_v$  of 5.8 during a building power outage.

## 5 CONDENSATE DRAIN, TRAP & DISPOSAL

The Element is designed to operate with normal cold inlet water temperatures of  $\geq 100^{\circ}\text{F}$  and to produce a significant amount of condensate. The condensate drain is under slightly positive flue pressure, so the provided  $\frac{3}{4}$ " PVC condensate trap must always be used. This trap is sized and designed to fill with the proper amount of condensate and create a liquid barrier to prevent flue gases escaping through the condensate drain into the installed space.

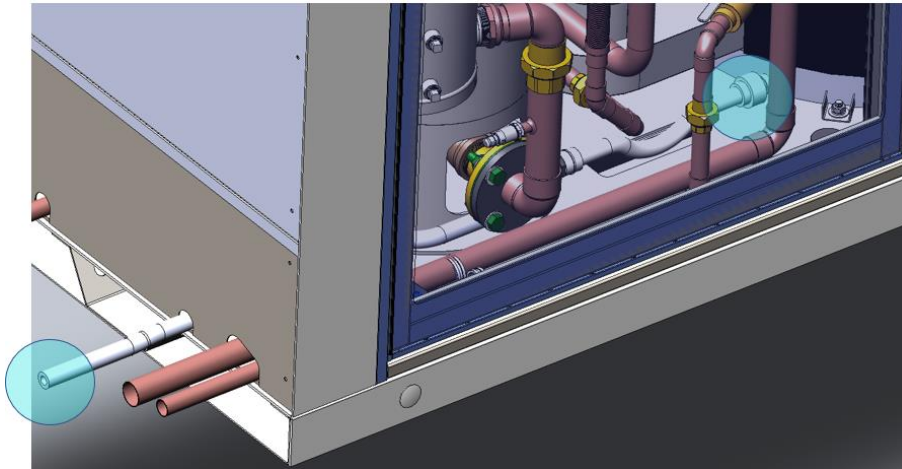


Figure 12 – Condensate Tube Location

### WARNING!

The condensate trap included with the unit must be installed and maintained as described in these instructions and must be included as part of the condensate piping system. This trap is required to keep potentially hazardous products of combustion from entering the space where the condensate piping terminates. Failure to properly install this trap can cause, personal injury, exposure to hazardous materials or death.

### 5.1 Connect Condensate Trap

Follow these instructions if condensate trap is not connected or is loose.

1. The condensate drain is located at the bottom-rear of the water heater, near the flue outlet. Connect the condensate trap assembly to the PVC fitting on the condensate drain pipe. Additional PVC fittings and pipe can be added to the condensate drain connection to relocate the condensate trap assembly as long as all added parts are at the same elevation. After attachment, the trap must be rotated so the offset in the pipe aims down toward the floor. Do not rotate the offset toward the ceiling. Do not use tools to tighten the PVC union. Hand-tighten the PVC union to seat the internal gasket.
2. Do not combine the Element condensate drain with condensate drains of other appliances into a single drain line. Route each drain line into a drain suitable for condensate and make certain the end of each line is not submerged or otherwise blocked.
3. All condensate plumbing must be protected from freezing. Do not locate the condensate piping such that an ice dam of frozen condensate can block condensate from leaving the outlet.
4. Connect the condensate drain line or the Condensate Neutralization System (CNS) to the barbed hose connection, sized for 1" heavy wall vinyl tubing rated for  $170^{\circ}\text{F}$  or higher, located at the end of the condensate trap. All piping from the trap to the drain or the CNS must remain below the highest point (top of the condensate outlet pipe) on the condensate trap.

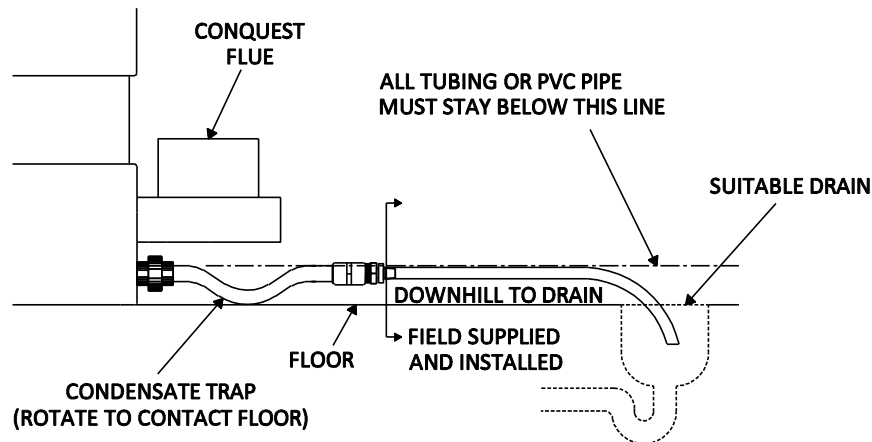


Figure 13 – Condensate Trap Without Condensate Neutralizer

## 5.2 Condensate Neutralization System (CNS)

The Element is shipped with an optional field-installed CNS.

Condensate is acidic (3 to 5 pH). In some locations, local codes require it to be neutralized prior to entering a suitable drainage system. If required, this acidity can be neutralized by routing it through a CNS. The Element includes a CNS sized for the specific system and shipped separately. For additional information on the CNS, contact your local Lync representative.

The CNS neutralizes condensate while it slowly flows through a container filled with renewable neutralizing media. The CNS reduces or avoids the need for separate chemical treatment or dilution using substantial quantities of tap water.

### 5.2.1 CNS Installation Requirements

1. Install CNS in a convenient place between the condensate outlet and a suitable drain.
2. CNS must be positioned so condensate flows downhill from the trap outlet to the inlet on one end of the CNS, and then downhill from the other end of the CNS to the drain. If downhill flow is not maintained trap will not operate properly and condensate may back up into water heater.
3. Install CNS where the threaded end cap can be removed to recharge the Neutralizer.
4. Follow instructions included with CNS to connect tubing. Use only materials included.
5. The CNS must be mounted horizontally and level.
6. Always keep the condensate trap flooded, except when the Element is turned off for maintenance or to recharge the condensate neutralizer with replacement media.

#### **WARNING!**

Keep the CNS closed at all times while the Element is operating. Failure to keep the CNS closed during operation can cause potentially hazardous combustion products to enter room and property damage, exposure to hazardous material, personal injury or death.

## 6 GAS SUPPLY AND PIPING

Verify the type of gas specified on rating plate is supplied to the unit. This unit is designed for operation up to 2000 feet altitude. Appliance Btu/h input derates 4% per 1000 feet elevation above sea level. Consult Factory for installations above 2000 feet elevation.

### 6.1 Inlet Pressure

Measure at the inlet pressure tap located at the main gas cock. The inlet pressure must remain within the minimum and maximum values while the unit is at rest and while the unit is operating at maximum firing rate.

Inlet Pressure	Nat. Gas	Propane
Maximum Static Pressure (in-H <sub>2</sub> O)	14.0	13.0
Minimum Flow Pressure (in-H <sub>2</sub> O)	3.5	8.0

### 6.2 Manifold Pressure

Measure at the pressure tap on the downstream side of the manual valve closest to the burner. The rated manifold pressure appears on the product data label near the front of the appliance.

### 6.3 Gas Connection

1. Safe operation of the unit requires adequate gas supply with the required static and dynamic (flow) pressures. Actual piping selection depends on many variables that must be carefully considered by the gas piping system designer.
2. Do not select gas pipe sizes based only on the supplied tables. These tables are for use by the gas piping system designer as a reference in checking pipe size selections.
3. Gas pipe size may be larger than heater connection.
4. Installation of a union is suggested for ease of service.
5. Install a manual main gas shutoff valve on the gas supply piping connected to the appliance to isolate the burner and gas train from the main supply gas in compliance with NFPA 54 National Fuel Gas Code and most local Codes.
6. The gas system installer must clearly identify the emergency shut-off device.
7. A sediment trap (drip leg) MUST be provided in the inlet of the gas connection to the unit.
8. The combination gas valve incorporates an internal vent limiter. Venting to outdoors is not allowed.



## 7 VENTING

All Element models use the positive pressure generated by the burner system blower to push combustion products out of the vent. Since the vent system is under positive pressure and must be capable of containing condensate, it must be constructed of schedule 40 solid PVC or CPVC pipe. Use of cellular core PVC (ASTM F891), cellular core CPVC, or Radel® (polyphenylsulfone) in nonmetallic venting systems is prohibited. Polypropylene or single or double wall stainless steel venting listed by ETL, UL, ULC or CSA for Category IV positive pressure gas appliance venting may be used instead of solid PVC or CPVC plastic pipe venting.

Follow the instructions below for installing solid PVC or CPVC pipe. For other listed vent materials, follow the vent manufacturer's instructions for installation, sealing, supporting and terminating their vent system. Covering non-metallic vent pipe and fittings with thermal insulation is prohibited.

The stainless-steel vent connection located near the front of the water heater is 6-5/8" O.D., to accept a 6 inch PVC or CPVC pipe coupling. A reducer coupling may also be used to accommodate smaller or larger vent pipe. (See Maximum Vent Length tables). Do not use a barometric damper with the Lync Water Heater positive pressure vent. The Lync Water Heater can be vented either vertically, through a ceiling or roof, or horizontally through a wall.

The Element includes Category IV positive pressure gas appliance venting and can be routed to the outdoors in any direction, from the flue outlet of the water heater, except down. The vent must be installed and supported at least every four feet to slope downward toward the water heater vent connection with at least ¼ inch drop per linear foot of horizontal vent run, to allow proper drainage of accumulated condensate. The venting system shall also have a means for collection and disposal of condensate. All penetrations through walls and roofs must be weather and gas tight, such that rain and products of combustion cannot pass from outdoors back indoors.

For common venting applications, please call your Lync representative for your specific installation.

### **Additional steps required when venting with solid PVC or CPVC pipe:**

1. Read and follow the information, instructions and warnings in "VENTING" section.
2. Do not insulate the plastic vent pipe.
3. Design the vent pipe route so that normal expansion and contraction due to changing temperatures does not bind or put stress on cemented pipe fittings.
4. A 6" pipe coupling must always be the first fitting attached to the vent connection when using a PVC or CPVC vent system. If a listed stainless steel or polypropylene Category IV vent system is used, the correct adapter for attaching and sealing to the Lync Water Heater 6-5/8" O.D. vent connection must be obtained from the manufacturer of the vent system.
5. For PVC or CPVC, dry-fit the 6" pipe coupling onto the vent connector. Then remove the coupling and apply a liberal coating of room temperature vulcanizing (RTV) adhesive to the outside of the vent connector and to the inside of the plastic pipe coupling. Before the RTV sets, slide the coupling over the vent connector while rotating approximately 1/8 of a turn. Inspect and apply additional RTV to the joints, if needed, to provide a tight seal.
6. Drill a pilot hole through the PVC or CPVC coupling flange and into the center of the stainless-steel vent connector flange in three equally spaced locations around the pipe. Drive stainless steel sheet metal screws through the pilot holes to attach and firmly hold the plastic coupling onto the vent connector flange.



## Section 7: Venting

7. Clean and deburr all solid PVC or CPVC pipe ends, then trial assemble the entire vent system vent before joining with cement. Mark the pipe and fittings to identify their locations, then disassemble. Reassemble the vent system using fresh PVC cement to connect PVC pipe and fresh CPVC cement to connect CPVC pipe. If both solid PVC and solid CPVC pipe are used in the same vent system, all joints between the two types of pipe must be made with fresh cement suitable for both materials. Follow the cement manufacturer's instructions for making sound air and water tight joints.
8. Vent support: For PVC or CPVC, the vent system must be supported at intervals no greater than four feet, to prevent sagging, distortion and stress on pipe fittings. Vertical pipe must also be supported to avoid stress on all cemented pipe fittings and to prevent putting excessive weight on the appliance vent connection. For listed stainless steel or polypropylene vent system, follow the vent system manufacturer's instructions.
9. Testing for leaks: Once the vent system is installed, check that all joints are air- and water-tight. After the vent is assembled, close the end of the vent with a taped plastic bag or other temporary seal. With the gas supply turned off, energize the Lync Water Heater combustion blower to apply air pressure to the vent system. Spray each joint and vent connection with commercially available leak detection liquid to confirm no air is escaping from any point. Repair any leaks and retest. After testing is complete, de-energize the combustion blower, wipe the leak detection liquid clean and REMOVE the temporary vent closure.
10. The vent pipe must be sealed at the point where it passes through a wall or roof, to prevent rain, insects or flue products from entering the living space or interior of the building.
11. Provide suitable termination to prevent wind, water, debris and animals from obstructing or entering the vent. The vent for this appliance must not terminate:
  - A. Over public walkways;
  - B. Near soffit vents or crawl space vents or other areas where condensate or vapor could create a nuisance or hazard or cause property damage; or
  - C. Where condensate vapor could cause damage or could be detrimental to the operation of regulators, relief valves, or other equipment.
12. Do not use a barometric damper with the venting system. The Element uses Category IV positive pressure vent systems and will not operate safely with a barometric damper.

**WARNING:**

Use only solid PVC or CPVC pipe or use Polypropylene or stainless-steel venting (single or double wall) listed by a nationally recognized testing laboratory for Category IV positive pressure gas appliance venting. Use of ABS, PVC or CPVC pipe with cell/foam type construction or use of venting materials other than specified in these instructions can result in failure of the venting system and/or exposure to carbon monoxide or other toxic fumes, which can result in property damage, personal injury or death.

DO NOT vent water heater into an existing or traditional gas vent or chimney. Do not combine vent with any other appliance. Do not use barometric damper in vent. Such venting could result in failure of the venting system and/or exposure to carbon monoxide which can result in property damage, personal injury or death.

## 7.1 Maximum Vent Length (Equivalent Length)

The maximum length of field supplied Category IV vent is shown in Table 5 below:

Duct Size	6" Duct	8" Duct
Max Equivalent Length Model Q 60 and Q 80	250 feet / 10	300 feet / 10
Max Equivalent Length Model Q 100	150 feet / 5	250 feet / 10

**Table 5 – Maximum Allowable Equivalent Vent Length / Max Number of Elbows**

Pipe fittings reduce the maximum allowable vent length. Use the vent manufacturer's equivalent length deduction for all elbows, terminations, etc. If the information is not readily available from the vent manufacturer, use the Vent Fitting Equivalent Length chart below to find the total equivalent length for all vent fittings in your combustion air system. Subtract this number of feet from the total equivalent length allowed in Maximum Category IV Vent Equivalent Length chart above. The sum of this calculation is the maximum length of straight vent allowed. If a longer length is required, repeat the calculation using a larger vent size. When using this chart, no additional deduction is required for the addition of the vent system terminal.

Vent Pipe Size	6 in		8 in
Vent Material	PP*	Other**	All
90° Elbow	22 feet	20 feet	10 feet
90° Long Radius Elbow	14 feet	12 feet	6 feet
45° Elbow	14 feet	12 feet	6 feet

**Note:** PP\* = polypropylene      Other \*\* = PVC, CPVC or Stainless Steel

**Table 6 – Vent Pipe Fitting Equivalent Length**

## 7.2 Vertical or Horizontal Vent Termination

1. The vent terminal must have a minimum clearance of 4' (1.22 m) horizontally from, and in no case be located above or below, unless a 4' (1.22 m) horizontal distance is maintained from electric meters, gas meters, regulators and relief equipment.
2. Vent cap must terminate at least 3' (0.91 m) above any forced air inlet within 10' (3.05 m).
3. The vent shall terminate at least 4' (1.22 m) below, 4' (1.22 m) horizontally from or 1' (0.3 m) above any door, window or building air inlet to the building.
4. The vent system shall terminate at least 1' (0.3 m) above grade and at least 1' (0.3m) above possible snow accumulation levels and shall terminate at least 7' (2.13 m) above grade when located adjacent to public walkways or gathering areas.
5. To avoid a blocked flue condition, keep the vent cap clear of snow, ice, leaves, debris, etc.
6. The vent must not exit over a public walkway, near soffit vents or crawl space vents or other areas where condensate or vapor could create a nuisance or hazard or cause property or could be detrimental to the operation of regulators, relief valves or other equipment.
7. A horizontal vent must extend one foot beyond the wall.

8. A horizontal vent terminal must not be installed closer than 3 feet (0.91m) from an inside corner of an L-shaped structure.
9. A vertical vent must exhaust outside building at least 3 feet (0.91m) above the exit and at least 2 feet (0.61 m) above high point of roof within a 10-foot (3.05 m) radius of termination.
10. A vertical termination less than 10 feet (0.91 m) from a parapet wall must be a minimum of 2 feet (0.61 m) higher than the parapet wall.

### 7.3 Combining Category IV Vents

To provide a single sidewall or roof penetration that is capable of providing both combustion air and flue exhaust termination, each Element must be installed using an IPEX System Concentric Vent Termination Kit. Both the IPEX System PVC and CPVC Flue Gas Venting Systems are third party tested and listed to the appropriate standard. They comply with the non-metallic vent listing requirements in CSA B149.1 Natural Gas and Propane Installation Code.

The following IPEX System Concentric Vent Termination Kits are available from Lync:

Part No.	Description
150862	KIT, VENT CONCENTRIC 4 PVC IPEX #397021 for PVC (4" x 36")
150863	KIT, VENT CONCENTRIC 4 CPVC IPEX #197021 for CPVC (4" x 36")

**Table 7 – IPEX System Concentric Vent Termination Kit**

Each IPEX System vent kit includes or specifies the required pipe, fittings, hardware, adhesives and Installation instructions. Follow the IPEX Installation instructions and use only the materials and adhesives it specifies. Additional copies of the Installation Guide for the IPEX System concentric vent kit and additional information is available from your local Lync representative.

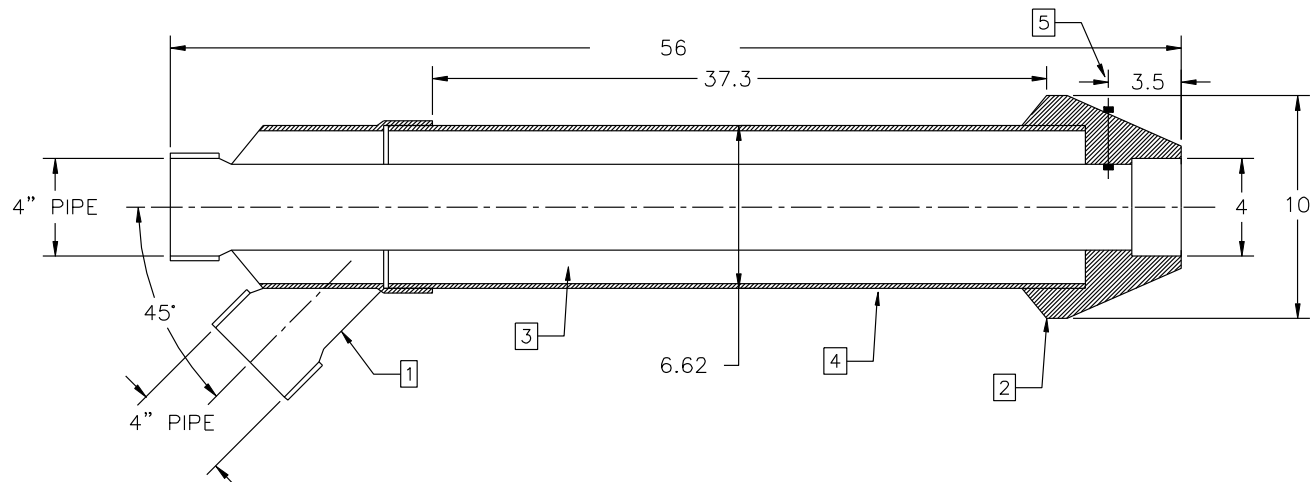
When using concentric vent termination kits, all combustion air duct, all exhaust vent pipe and the IPEX concentric vent kit material types must be the same. If the Element is installed with a PVC exhaust vent pipe, then the combustion air duct and the IPEX concentric vent kit must also be made of PVC. If the Element is installed with a CPVC exhaust vent pipe, then the combustion air duct and the IPEX concentric vent kit must also be made of CPVC.

#### **WARNING!**

Follow all installation instructions, termination requirements and spacing requirements provided with listed IPEX Concentric Vent Kit. Use only the pipe, fittings and cement included or specified in the IPEX installation instructions. Failure to follow the instructions or to use pipe, fittings or cement not included or specified in the instructions could result in an unreliable vent assembly and property damage, exposure to hazardous materials, personal injury or death.

ITEM NO.	DESCRIPTION
1	Wye-(Concentric)
2	Rain Cap
6	Exhaust Vent Pipe (Inner)
4	Fresh Air Intake Pipe (Outer)
5	Stainless Steel Screw & Nut

**Table 8 – IPEX System Concentric Vent Termination Kit**



**Figure 14 – Concentric Vent Dimensions**

### 7.3.1 Concentric Vent Connections to the Vent Pipe and Remote Air Inlet Duct

1. The Element can obtain combustion air and exhaust products of combustion through 4" exhaust IPEX System Concentric Vent Termination Kit. This option is not currently available for water heater models LC9Q and LC10Q.
2. Do not exceed the maximum allowed combustion air duct and vent pipe equivalent lengths provided in this manual. Remember to include the IPEX System Concentric Vent Termination Kit in the maximum equivalent calculation. When calculating the additional length added by the IPEX kit, use the diameter of the IPEX kit combustion air duct connection as the combustion air duct diameter.
3. Select a concentric vent kit from the list above that matches the material type of the water heater's flue gas pipe, as described above, and is the same size as the flue gas pipe. 6" venting can be used with a 4" IPEX concentric vent kit.
4. When using an IPEX System Concentric Vent Termination Kit connected to 6" PVC or CPVC vent and remote air duct, use locally available fittings of the same material as the Kit to reduce from 6" to 4", immediately before connecting to a 4" IPEX Concentric Vent termination Kit. The reduction from 6" to 4" does not change the maximum allowed equivalent vent length or the maximum number of elbows for 6" pipe.

### 7.3.2 Concentric Vent Kit Assembly, Installation and Support

5. Follow the concentric vent kit instructions to properly assemble the kit.
6. Follow the concentric vent kit instructions to locate and cut a hole in the roof or wall large enough to accommodate the largest dimension of the kit. The size of the hole can vary greatly, depending on the roof pitch.
7. For the IPEX System 636 Concentric Vent Kit, follow the procedures outlined in the System 636 Installation Guide:
  - a) Use solvent cement specified in installation guide to connect inner pipe to concentric Wye fitting, then connect outer pipe to concentric Wye fitting.
  - b) Slide the assembly through the roof or wall penetration. (Install flashing if needed).
  - c) Kits must be securely fastened to structure, to ensure proper dimensions are maintained.

- d) Use straps, clamps or equivalent that will not score or damage the pipe. Do not constrain or clamp the vent system anywhere between the Element and the vent termination point such that it is unable to expand or contract as it heats and cools during operation.
- e) The weight of the concentric kits must be supported by clamps/straps and not by the vent system it connects to.
- f) All penetrations must be sealed according to local building codes. Caulking for side wall terminations and flashing for roof penetrations are typical. Use only PVC/CPVC compatible sealing material, contact IPEX for a complete list
- g) Attach the rain cap to allow for removal and cleaning according to section titled *Mechanically Fastened Rain Cap*. The rain cap can also be permanently attached to the inner pipe with the solvent cement specified in the Installation Guide. Whether mechanically or permanently attached, the outer pipe is only a friction fit with the cap.
- h) Once rain cap is installed and the kit secured, connect kit to the venting system.
- i) For multiple horizontal installations, keep Concentric Vent Kit gaps close (up to 4" apart) or over 24" apart.
- j) When installing three or more horizontal vents, consult the IPEX 636 installation manual.
- k) Contact IPEX at [www.ipexinc.com](http://www.ipexinc.com), if additional System 636 Concentric Vent Termination Kit assembly or installation guidance is needed.

## 7.4 Connecting to an Existing Vent System

Do not connect the Element to an existing vent system until it has been confirmed that the existing vent system complies with all requirements for a new vent system. A venting system in full compliance with the instructions provided in this manual is required for safe and reliable operation of Elements. Do not connect the Element to a masonry chimney.

### **WARNING!**

Before operating a unit connected to an existing vent system, confirm the vent system complies with all guidance and requirements for a new vent system specified in this manual. Failure to confirm the existing vent system complies can result in unsafe operation and the potential for poisonous carbon monoxide to enter occupied areas and can cause property damage, personal injury, exposure to hazardous materials or death.

## Section II – Element Startup Procedure

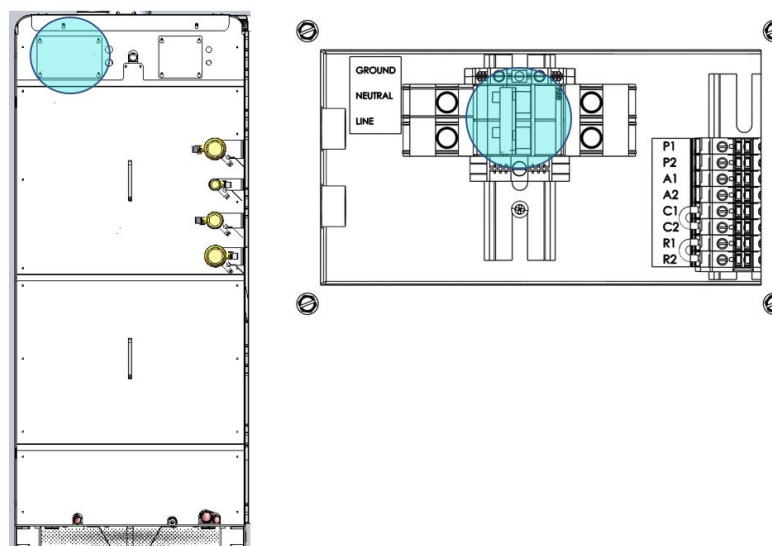
Startup of Element essentially consists of two parts: first the water heater (Section 8) and second the controls system (Section 9.)

In order to prevent potential damage if energizing the unit dry, breakers 3, 5, and 6 are set open (turned off) during shipment. The water heater does not have a separate breaker and is controlled by the main power breaker at the rear of the unit. Close (turn on) all breakers once unit is filled with water.

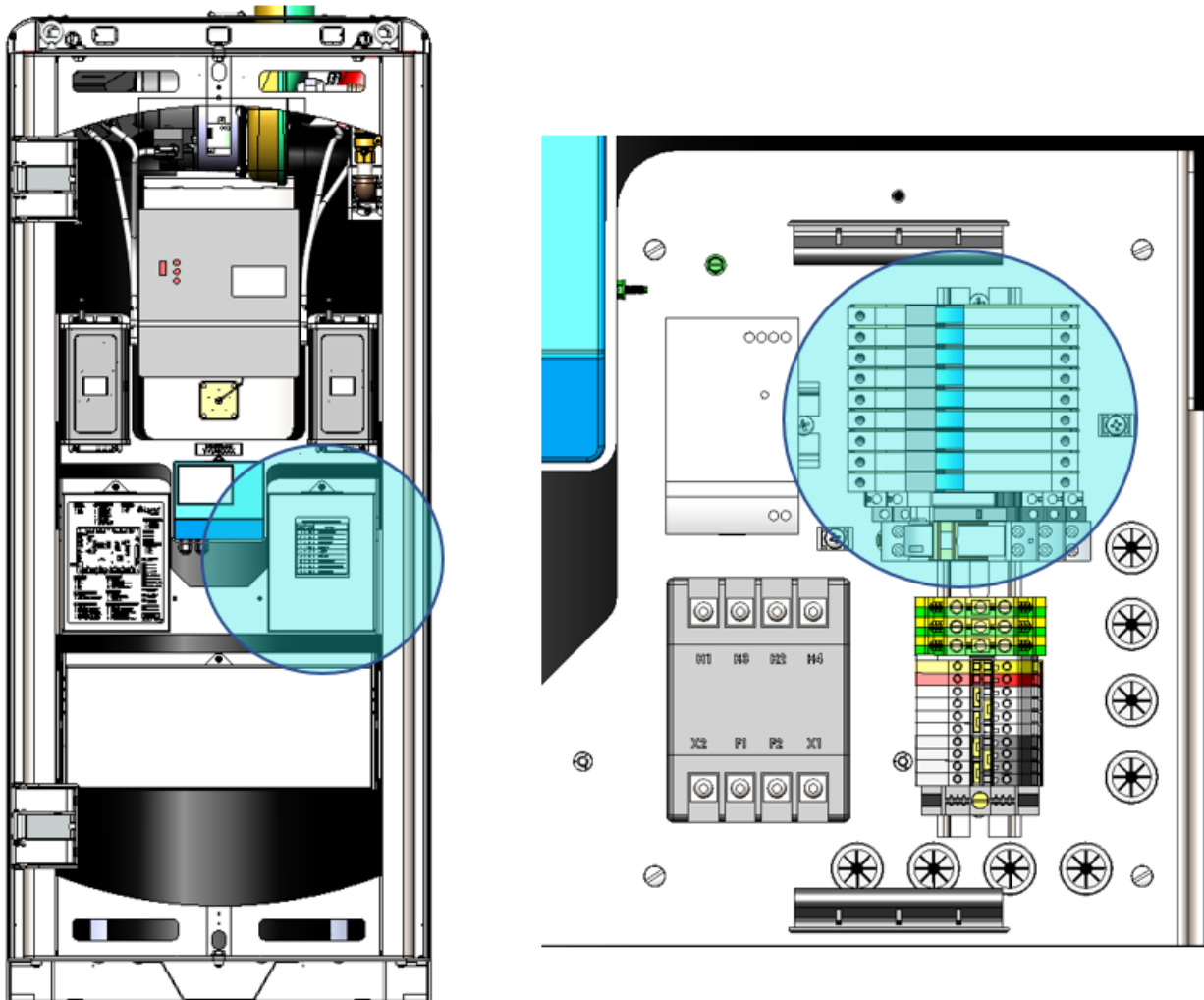
It is recommended to open (turn off) the same breakers when draining the unit in order to prevent accidental use in a dry state.

Breaker Position	Current Rating	Connection
1	0.5A	Blowdown Valve
2	5A	Cabinet Lights
3	5A	Booster Pump
4	0.5A	DigiTemp Jr
5	2A	Cold UV System
6	2A	Recirc UV System
7	6A	Sanitation Pump
8	2A	I/O Board and Touchscreen
9	1.5A	Diverter Valve

**Table 9 – Local Circuit Breaker Directory**



**Figure 15 – Location of primary breaker for Element**

**Figure 16** – Location of local circuit breakers

## 8 WATER HEATER AND AQUASOLVE STARTUP

### 8.1 Initial Startup Requirements

Installation must be complete before performing initial startup and placing the Element unit into service. Starting the Element without proper piping, combustion air, venting or electrical connections or control settings can be dangerous and may void the product warranty. Follow these instructions precisely to achieve proper operation and trouble-free service life.

#### **WARNING!**

Proper startup must be made by a qualified installer or service agency, who must read and follow the supplied instructions and unit markings. Failure to complete proper startup before use, tampering with controls or not following all instructions and markings may damage this equipment, void the warranty and may result in property damage, personal injury or death.

### 8.2 Required Tools and Instrumentation

- Stack Temperature Gauge
- Stack Draft Gauge
- Electronic Combustion Analyzer



## Section 8: Water Heater and AquaSolve Startup:

- Two U-tube Manometers or pressure gauges
- AC/DC Multi-meter (with 20,000 OHM/Volt rating)
- Amp Meter
- Normal Hand Tools

### 8.3 Resources

- Product Installation & Maintenance Manuals
- Start-up Report with instructions
- Local, State, & Federal Codes
- Website: <https://lyncbywatts.com/support>
- Technical Support: 1-800-433-5654

### 8.4 On-Site Considerations

- Electrical Supply in accordance with the Nameplate Rating
- Adequate uncontaminated indoor or outdoor combustion air
- Adequate Fuel Supply
- Adequate Water Supply
- Exhaust Vent that complies with the installation instructions
- Condensate drainage that complies with the installation instructions

### 8.5 Pre-Startup Checklist

**IMPORTANT:** Ensure unit is properly and completely installed before startup. Confirm adequate electrical service; check any external control wiring connections; ensure tank is filled with water; check all tank connections for leaks; ensure that condensate trap is properly installed and that the gas supply meets the product rating decal requirements.

If a unit is not installed properly, DO NOT attempt startup. Contact your installer immediately.

#### 8.5.1 Check Electrical Service

The standard electrical service required is a grounded 120-volt, single phase, 60 Hertz power supply. See rating decal at rear of unit for specific requirements.

Shut off electrical service to unit and turn power switch on water heater to **OFF**.

1. On the water heater, remove the panel screws to lower the hinged upper control enclosure panel.
  - a) Locate the document packet containing the control circuit fuse and fuse cap. A wiring diagram is also attached to the back of the front panel.
  - b) Remove fuse and cap from the packet and install them into fuse holder on front of panel.
  - c) Check back of the digital control display board on the hinged panel to see if a 2-wire, RS-485 communication cable is connected. These wires must be removed to isolate the water heater from the Building Automation System during startup. Remember to reconnect cable to digital display board after startup is complete.
  - d) Ensure that all components are intact and that no damage is visible.
  - e) Ensure all wiring connections within the control cabinet are tight. A loose connection could cause sporadic shutdowns and malfunctions.
  - f) Close the hinged upper control enclosure panel and secure the panel screws.



Section 8: Water Heater and AquaSolve Startup:

2. At the rear of the Element, remove the panel screws on the left service panel per Figure 17
  - a) Check if terminals **R1** and **R2** are jumped. If they are, nothing more needs to be done. If the terminals are not jumped but have wires connected to them, this indicates that a remote on/off relay is controlling the water heater from the Building Automation System. These wires must be removed and the terminals must be jumped prior to startup. Remember to remove jumper and reconnect wires after startup is complete.
  - b) Re-check all components and ensure all wire connections are tight.
  - c) Close the service panel cover and secure panel screws.

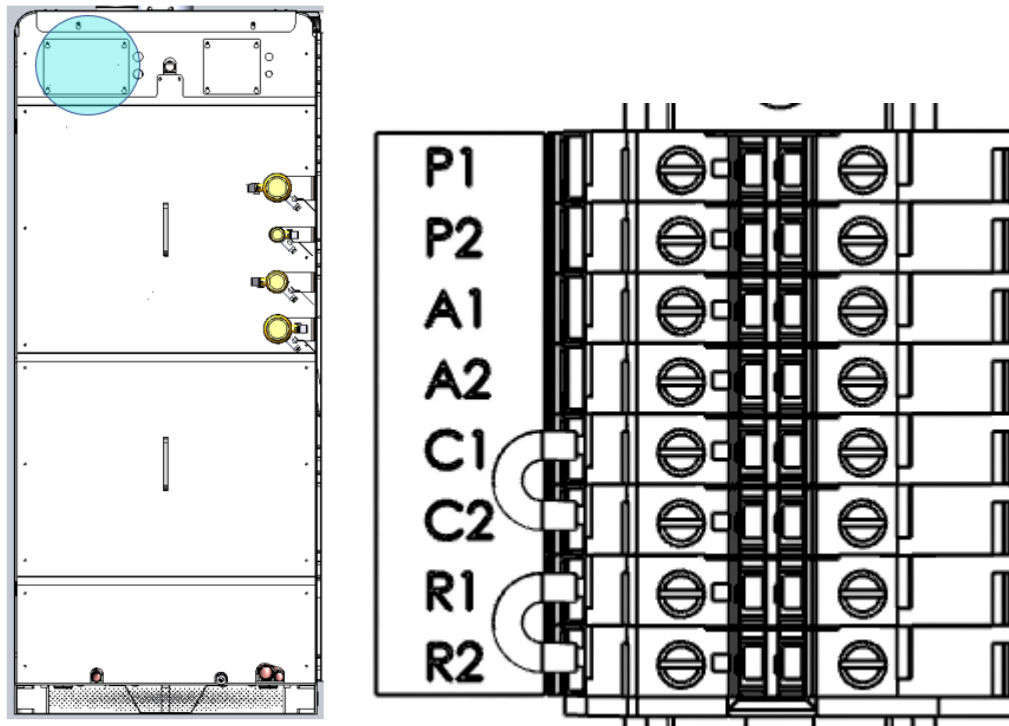


Figure 17 – Interlocks and Controls Terminal Block

### 8.5.2 Confirm Water Tanks are Completely Filled

#### **IMPORTANT:**

Using the T&P Relief valve alone to vent the tank will NOT allow the tank to completely fill!

1. Close the water heater drain valve.
2. Fully open shutoff valves on the cold-water inlet and hot water outlet piping to the unit.
3. Open the T&P valve to vent the tank. Close the valve when flow is observed.
4. Open a nearby hot water faucet(s) to allow trapped air to escape from the piping.
5. A steady flow observed from the hot water faucet(s) indicates the tank is full.
6. Close the hot water faucet(s).

#### 8.5.2.1 Element as a Booster Water Heater (Optional)

If configuring the Element as a booster water heater, the fill water supplied by the general purpose water heater should be a minimum of 140°F.

## Section 8: Water Heater and AquaSolve Startup:

Use of colder water may cause condensation and cause burner lockout. To remove condensation: after startup is complete and the water has reached proper temperature, turn the booster water heater OFF; remove the condensation drain plug and allow condensation to drain; replace drain plug and turn booster water heater back ON.

**8.5.3 Check Tank Flanges and Plumbing Connections for Leaks**

Be sure all connections into the tank are tight, as leaks at tank fittings may damage insulation.

**8.5.4 Check Condensate Trap**

A condensate trap assembly ships installed in the Element to prevent flue gasses from escaping and creating a hazardous condition in the installed space. The water heater condensate drain is located at the bottom rear of the water heater near the flue outlet.

Ensure the condensate trap assembly is connected securely to the PVC fitting on the condensate drain pipe. Rotate trap so it contacts the floor. Connect 1/2" ID clear vinyl tubing rated for  $\leq 170^{\circ}\text{F}$  or an optional Condensate Neutralization System to barbed hose connection at end of condensate trap.

**8.5.5 Confirm Gas Type**

The Element requires either **Natural gas** or **Propane**. Confirm the gas type supplied matches the rating label requirement on the front of the unit.

If available gas type is not correct the Element unit will require a conversion. Contact your Lync representative for instructions for converting to/from **Natural Gas** or **Propane**.

**8.5.6 Confirm Supply Gas Pressure****WARNING!**

If you smell gas do not try to light the unit. Do not touch any electrical switch or use a phone inside the building. Immediately call your gas supplier and follow their instructions.

For **Natural Gas**, the maximum inlet static gas pressure must not exceed **14.0** inches water column and must not drop below **3.5** inches water column during operation.

For **Propane Gas**, the maximum inlet static gas pressure must not exceed **13.0** inches water column and must not drop below **8.0** inches water column during operation.

Complete the following to check the supply gas pressure:

1. Shut off the main gas supply to the Element.
2. Ensure that manual gas valves at the burner and at the inlet of the gas train are closed.
3. Attach 1/8" NPT pilot shutoff test valve and tube to test port on the manual shutoff gas valve at the inlet of the gas train. Attach a second test valve and tube to the valve downstream of gas train at the burner. Close both test valves.
4. Attach U-tube manometers or gas pressure gauges to both pilot shutoff test valves.
5. Open the main gas supply to the water heaters and check for gas leaks on all joints upstream of the manual shutoff gas valve at the inlet of the gas train.
6. Open test valve at the inlet of the gas train and measure the supply gas pressure.

**IMPORTANT:**

If the supply gas pressure is outside of the allowable range, notify the building maintenance personnel or installer to reduce the gas pressure to the water heaters.

7. Open manual shutoff valve at inlet of gas train. Check the train for leaks using a soap solution. If any bubbles are detected close manual gas valve, tighten the leaking connection, then open the manual gas shutoff valve again and check for leaks.
8. Open the 1/8" pilot shut-off test valve connected to the manual shutoff gas valve downstream of the gas train closest to the burner. Note gas pressure measured by the monometer. Check gas pressure again after about 15 minutes. A gas pressure increase of 0.5" W.C. or more indicates one of the gas solenoid valves is leaking. Isolate and replace the leaking gas valve. After any leaking valve is replaced, the reassembled gas train must be leak tested again before start-up is attempted.

NOTE: Some flame controls read the flame signal in micro amps, some in volts DC.

## 8.6 Startup Procedure

1. Turn the water heater power switch to the OFF position.
2. Drill a small test hole in the flue vent approximately two feet from the vent connection and insert the combustion analyzer probe into the vent test hole.
3. Simulate a Safety Shutoff Ignition Fail Test of the EOS control system on each Element:
  - a) With the manual gas valve at the burner closed, turn on the electrical service to the water heater, then turn the Element power switch to the ON position.
  - b) The EOS Temperature control touch screen will energize. If the tank temperature is 5° or more below the factory setpoint of 120° the Call-For-Heat sequence will initiate.
  - c) With no gas pressure, the ignition control will attempt to ignite the burner three times before proceeding to a safety shutoff. Following the third failed attempt, the display screen immediately shows a **LOCKOUT** condition has occurred.
  - d) In a few seconds an **ERROR** code flashes in the Status field, and a **FLAME FAIL** alarm message is displayed followed by **"IGNITION TRIAL FAIL"** across the top of the screen.
  - e) **IMPORTANT:** Open one or more nearby hot water faucets before restarting the Element to allow heat to dissipate.
4. When the call for heat sequence begins, the burner blower is energized.
  - a) When the BLOWER operation is verified by the tachometer, the **Ignition Pre-Purge** sequence and **Hot Surface Igniter Heat up Period** begins. The **BLOWER** message is displayed during this pre-purge period.
  - b) Following a pre-purge and Hot Surface Igniter Heat Up countdown of about 36 seconds, a 4-second trial for Ignition period is initiated. During this sequence the screen displays **IGNITION** while the gas valves are being energized.
  - c) When ignition occurs, and flame is proven, the Status field shows the **BURNER** is firing and the flame **CURRENT** is displayed in micro amps for about 8 seconds.
  - d) As the burner fires, the modulating firing rate percentage displayed at the bottom of the screen will increase and then decrease as the Element reaches its setpoint temperature of 120 degrees. Disregard this display for inputs with On-Off burner control systems.
  - e) The **CONTROL TEMPERATURE** will continue to display throughout the burner run cycle and after shutdown until the Element returns to a satisfied and idle state.

### 8.6.1 Burner Combustion Adjustment – General

#### **WARNING!**

If carbon monoxide is in excess of 200 ppm at any point, do not operate unit. Contact your Lync representative for assistance. Carbon monoxide (CO<sub>2</sub>) is a colorless, odorless and poisonous gas that is extremely dangerous to humans and animals. CO<sub>2</sub> levels above 200 ppm can cause property damage, personal injury, exposure to hazardous materials or death.

1. With the burner firing, measure the flow gas pressure at the beginning of the gas train.
  - a) If the inlet flow gas pressure for Natural Gas is equal to or greater than 3.5 inches water column, or if the inlet flow gas pressure for Propane Gas is equal to or greater than 8.0 inches water column, continue startup.
  - b) If the inlet flow gas pressure drops below these levels a supply gas volume or piping problem may exist and must be corrected before startup can continue.
2. With the burner firing, monitor the combustion analyzer readings. The CO<sub>2</sub> level must be between 8.5 and 9.5% for Natural Gas and between 9.5 to 10.5% for Propane Gas.
  - a) If the CO<sub>2</sub> level is in this range, no adjustment is required or recommended.
  - b) If the CO<sub>2</sub> level is outside of these ranges, the combustion must be optimized.

### 8.6.2 Optimizing Combustion

Element uses a modulating burner control system with a larger gas regulator and separate safety solenoid gas valves. The CO<sub>2</sub> level on these models must be adjusted at both Low Fire and High Fire in the Manual Override menu, through the EOS Touch Screen Digital Control.

To access the Manual Override Menu:

1. Press and hold the **HOME** button for 3 seconds.
2. Press the **NEXT ITEM** or **ITEM BACK** buttons to navigate to the **TOOLBOX** menu.
3. Press the **ENTER** button to display the **ACCESS** screen.
4. Press the **UP** or **DOWN** arrow buttons to select the **ADVANCED** setting.
5. Exit the menu by pressing the **HOME** button.
6. Press the **NEXT ITEM** or **ITEM BACK** buttons to navigate to the **OVERIDE** menu.
7. Press the **Enter** button to display the **MANUAL OVERRIDE** screen. Press the **UP** or **DOWN** arrow buttons to select the **HAND** setting.
8. Press the **NEXT ITEM** or **ITEM BACK** buttons to navigate to the **HEATER MODULATION (HTR MOD)** menu. This setting will override the operating control.
9. Press the **UP** or **DOWN** arrow buttons to select firing rate. **NOTE:** If the **HTR MOD** program is activated while the burner is firing, the burner will shut down and recycle.
10. Press the **UP** or **DOWN** arrow buttons to adjust the firing rate from **OFF** to the minimum rate of 10% for **Low Fire**. Then adjust the **Gas Regulator** screw clockwise to increase gas flow and increase CO<sub>2</sub>, or counter-clockwise to decrease flow and decrease CO<sub>2</sub>.

## Section 8: Water Heater and AquaSolve Startup:

11. Once the desired **Low Fire** combustion levels are achieved, return to the touch screen and increase the **HTR MOD** firing rate to the maximum **High Fire** rate for the specific product.  
**NOTE:** The maximum factory-set **High Fire** firing rate may not be 100%.
12. With the burner firing rate now stabilized at High Fire, turn the Gas Valve Orifice Adjustment screw clockwise to decrease gas flow and decrease CO<sub>2</sub>, or counter-clockwise to increase gas flow and increase CO<sub>2</sub>. For models LC5Q to LC8Q, loosen the set screw on the side of the shutter valve body before attempting to adjust the shutter. Be sure to tighten the set screw on the valve body when adjustments are complete.
13. Once desired combustion is reached at **High Fire**, return to **Low Fire** to confirm settings.
14. When all combustion adjustments are complete, go back to the **MANUAL OVERRIDE** screen and return the function back to the "**AUTO**" setting.

**8.6.3 Check the Vent Pressure**

Once the combustion is properly adjusted, use the test hole in the flue vent to measure vent pressure. With the burner firing, confirm the vent pressure does not exceed 0.5" W.C. Pressure in excess of 0.5" W.C. indicates a vent sizing issue that must be addressed before operating the water heater.

**WARNING!**

When adjustments are complete return the MAN OVR function back to "AUTO" before operating unit to avoid risk of high water temperature that may result in property damage, scalding, other serious injury or death.

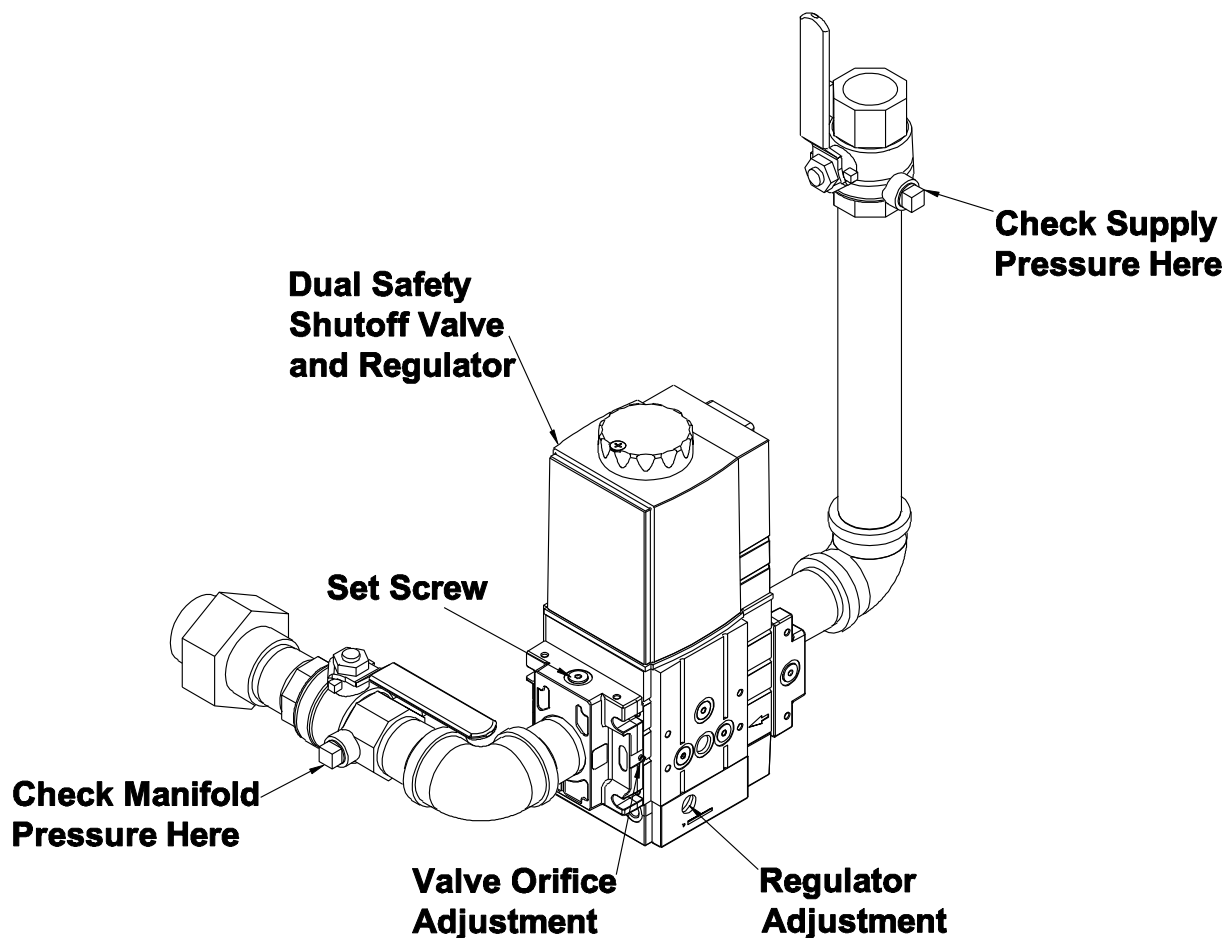


Figure 18 – Gas Train Illustration

NOTE: Optional components may not be shown.

#### 8.6.4 Water Heater Interlocks

As a safety measure for interfacing with an Energy Management System, the Lync Q Water Heater includes interlocks that connect to remote devices such as draft dampers, gas pressure gauges, and air proving switches. The labels at the rear of the unit match the terminal block on the water heater itself.

#### **WARNING!**

Turn off all electrical service to the Element when accessing the remote connections and close and fasten the control cabinet cover before restoring electrical service to them. The remote connection terminals are High Voltage or may become High Voltage. If the electrical service is not turned off and these terminals are touched, a dangerous shock could occur, causing personal injury or death.

Terminal Connections	Description
<b>P1 – P2</b>	Provides a 5 Amp contact closure to control remote equipment (e.g. mechanical room air louvers, draft inducer or power vent, etc.). Do not directly energize pumps or motors through these terminals. If operation or repositioning of the remote equipment is required for safe operation of Elements, the remote equipment must send a return proving signal to terminals C1-C2, via its proving switch, to confirming proper operation or repositioning to enable Element units to energize.
<b>A1 – A2</b>	Used to activate a remote alarm, signaling shutdown of combustion control. Provides a maximum 2 Amp relay contact closure when the control system terminates operation due to a tripped safety interlock (e.g, an air proving switch, high limit switch or flame sensor, etc.).
<b>C1 – C2</b>	Used for proving operation of remote device. Terminals are wired to a proving switch on a remote device such as a power venter, louvers or a combination of these in series. When all remote proving switches close, the circuit from C1 to C2 is completed and the Element's controls are enabled. Elements ship from the factory with an orange jumper between terminals C1 and C2 that must be removed when a proving switch is connected.
<b>R1 – R2</b>	Used to activate / de-activate the water heater from remote master control. When switching this low current circuit, a relay with gold plated contacts or the use of two relay contacts in parallel must be used. Terminals are wired to a relay in a remote Energy Management System. When the relay closes, the circuit from R1 to R2 is completed and the unit's controls are enabled. The Element ships from factory with a jumper between terminals. Remove orange jumper when connecting to a remote controller.

**Table 10 – Interlock Terminal Functions**

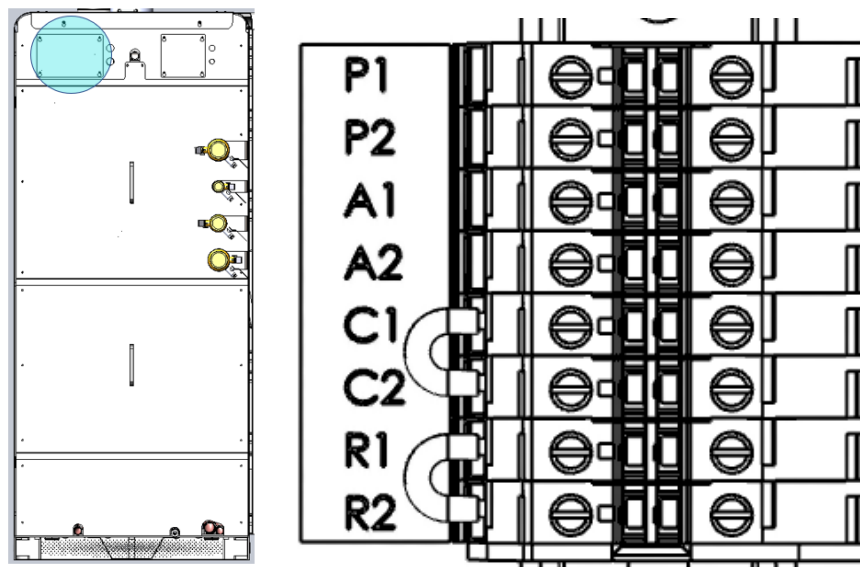


Figure 19 - Interlocks and Controls Terminal Block

## 8.7 AquaSolve Media Fill

In systems with new copper piping, such as new construction or recently repaired domestic hot water piping, copper and flux may temporarily increase the copper content of the supply water above the recommended operating limits for the AquaSolve scale prevention system. In these cases, it is highly recommended to withhold adding AquaSolve media into the system for the first 6 weeks of operation to allow the new copper piping to develop a natural protective oxide layer. After 6 weeks, add AquaSolve media following the procedure in section 16.3.1.



## 9 CONTROLS STARTUP

Before initiating controls startup, verify that:

1. The unit is installed in a location that meets minimum maintenance clearance requirements.
2. Water, gas, venting, combustion air, electric and drain discharge are connected.
3. The water heater has been successfully calibrated and commissioned.
4. AquaSolve TAC media, both UV bulbs and both filters are installed.
5. The unit is connected to the internet via RJ45 connection.

### 9.1 Sign In

Upon startup, the “Owner” user is created on the device as the default user. The Edge SC Controller can be accessed with the preassigned password: **2143**.

#### **WARNING**

Inform the customer to change this password as soon as possible per Section 9.3

### 9.2 Download & Install the Latest Firmware

Lync is committed to making the Edge SC Controller a reliable and easy to use front-end to your Water Heating Solutions. As part of that effort, Lync will be continuously monitoring the user’s experience and implementing improvements to the Controller firmware.

It is possible the Controller firmware on the unit may be out of date. **You must update the firmware to the latest version before using the Edge SC Controller for the first time.** This will eliminate potential problems and allow Lync Technical Support to better serve you if you need assistance.

The latest firmware can be found directly through the Controller by accessing **Settings → Unit Software → Install Update**. Follow the steps in Section 10.4.7.1.

Certified technicians can download the latest firmware from the Lync Learning Management System (LMS) website at <https://training.watts.com> , or by contacting your local Lync rep.

### 9.3 Change Owner PIN on Unit

Upon start up, it is highly recommended to change the PIN for the Owner role at this time. Click on the sequence as shown in the below figures.



Figure 20 – Go to the Settings Page and click on *Manage Users*

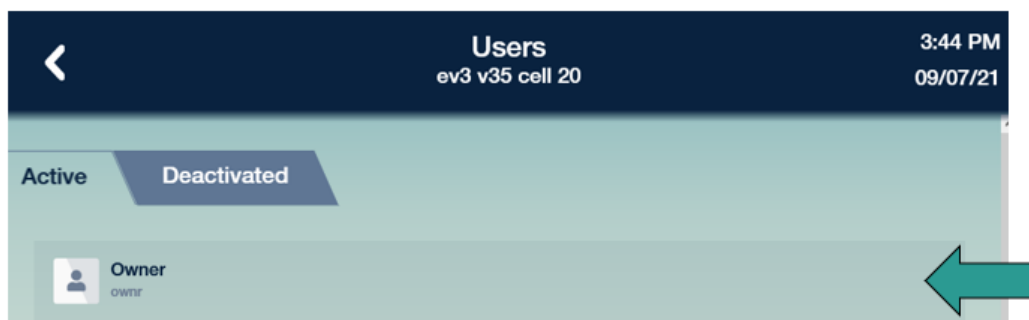


Figure 21 – Click on the Owner User Profile

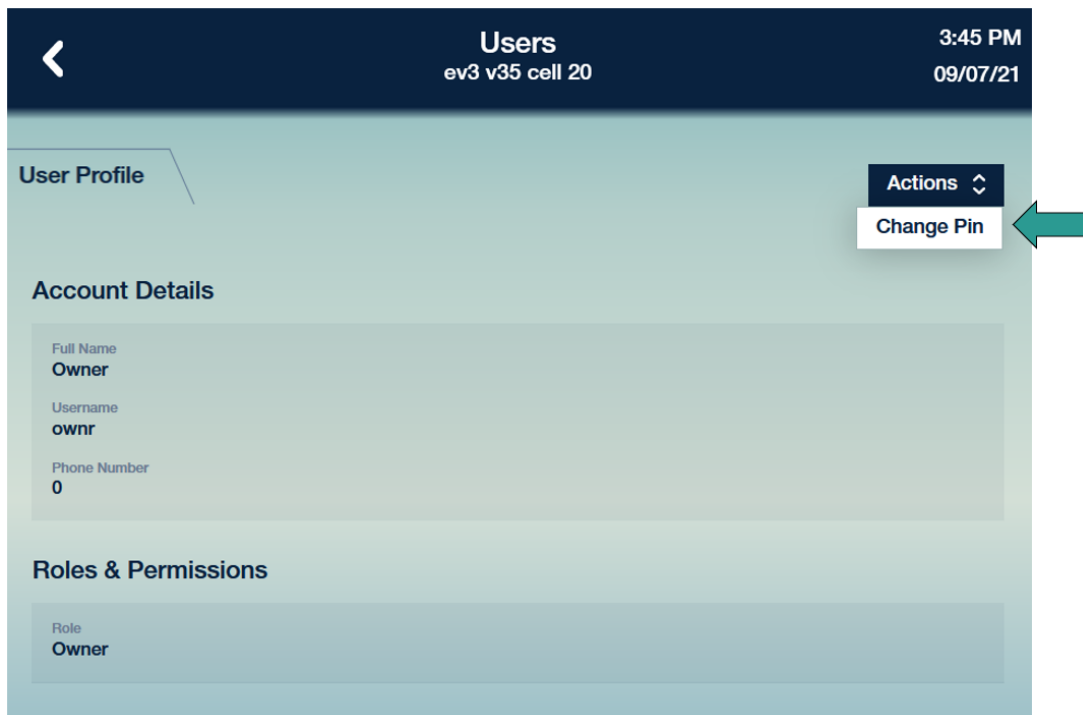


Figure 22 – Change PIN in owner profile

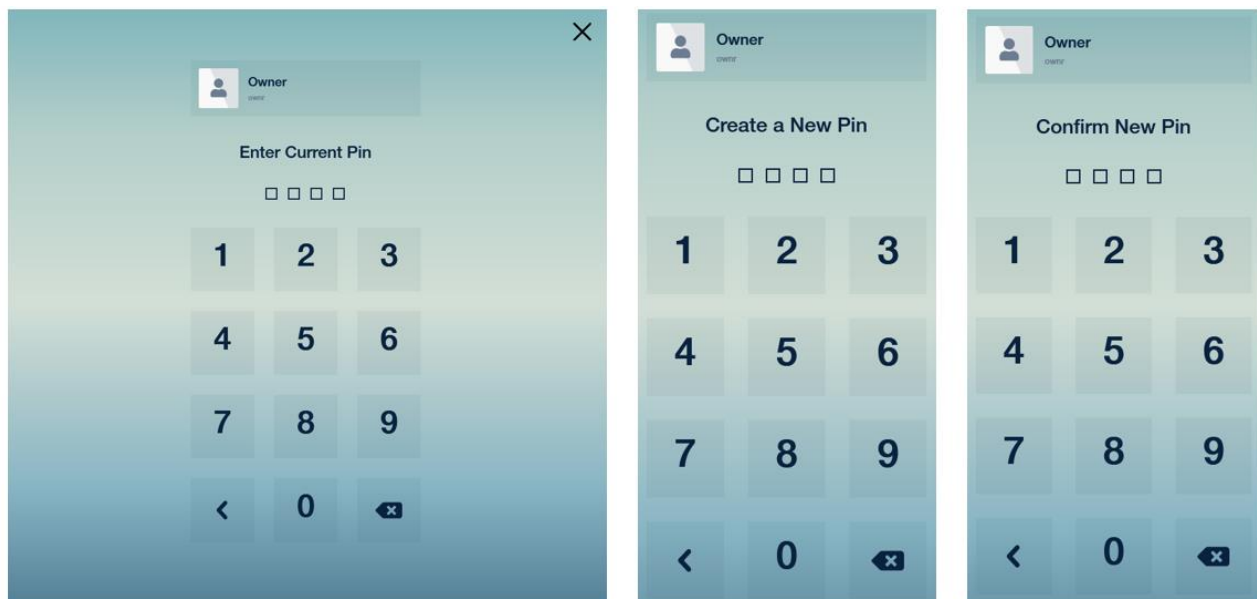


Figure 23 – Create new PIN

**CAUTION**

Keep your PIN information in a safe place. PIN recovery for an Owner requires assistance from Lync technical support and your Lync rep.

## 9.4 Communication Wiring

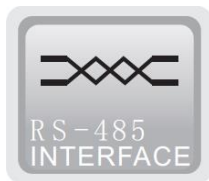
Before Element is connected to the network or the cloud or when communication is interrupted, Element can continue to operate as a standalone unit. Once connected, Element can

communicate via the onboard EdgeSC supervisory controller with a Building Automation System (BAS) or Building Management System (BMS) using either BACnet® or Modbus® protocols.

The EdgeSC is designed with integrated communication as one of its main features. In addition to the I/Os, it connects to a BMS and the cloud using two primary methods:



- **Ethernet:**
  1. BACnet IP
  2. Modbus TCP

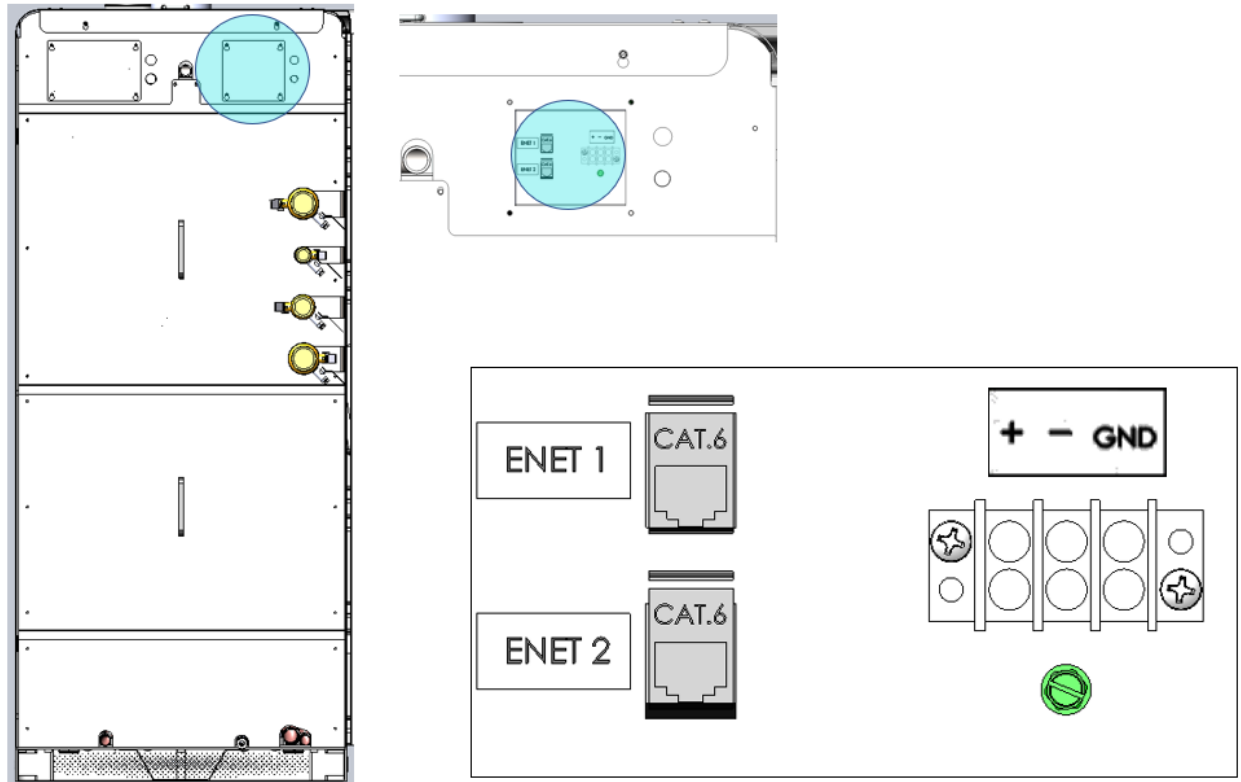


- **RS485:**
  1. BACnet MSTP
  2. Modbus RTU
  3. External devices

1. Open the rear, low-voltage electrical panel on the right side of Element per Figure 24.
2. Connect as required to the building's internet connection to the top RJ45 ports, ENET 1. The other RJ45 port, ENET 2, is used for BAS connections.
3. To the right of the ports is a 3-pole terminal block for an RS485 connection. Connect to the open pole on the left for BAS RS485 +, to the middle for BAS RS485 -, and to the right for BAS RS485 Ground.

## NOTE

The BAS chain may only have one shield connection in order to avoid a ground loop. If that is Element, connect at the green ground screw below the RS485 terminal block. Else connect it elsewhere among BAS units.



**Figure 24** – Location of network and BAS connections via ethernet or RS485 at the rear of the unit.

## 9.5 Initial BAS Connectivity

Ensuring a secure connection to the data within Element is critical to ensure appropriate service to the domestic hot water system. The EdgeSC has security options built into its firmware to support this.

Log in with a user that has a role of either:

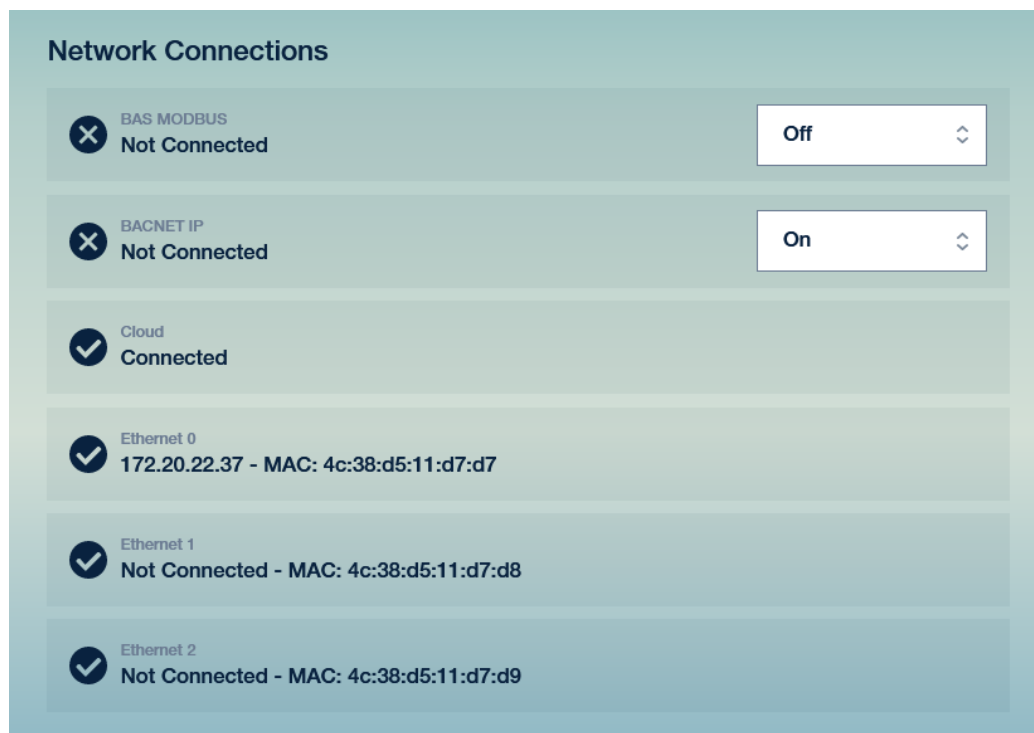
Owner
Chief Engineer
Facilities Manager
Infection Control
Technical Customer Support

1. Navigate to the System Settings screen.



**Figure 25**

2. Confirm that a network connection is established by scrolling to the network connections section and observing a checkmark and IP address for Ethernet.



**Figure 26 – Network Settings**

If an IP address is not present, check the rear of the unit in the low voltage section of the electrical compartment for a proper network connection to ENET 1 per Figure 24. Element receives an IP address via DHCP rather than a static IP.

MAC addresses are available if the building network requires MAC filtering.

3. Change the BAS MODBUS and/or BACNET IP dropdowns from Off to On.
4. Verify in the building automation software that Element is visible.

**NOTE:** All points are read-only. Any configuration of the unit may be performed using the myLync app or at the unit itself with sufficient permissions.

## 9.6 Initial Startup and the First User

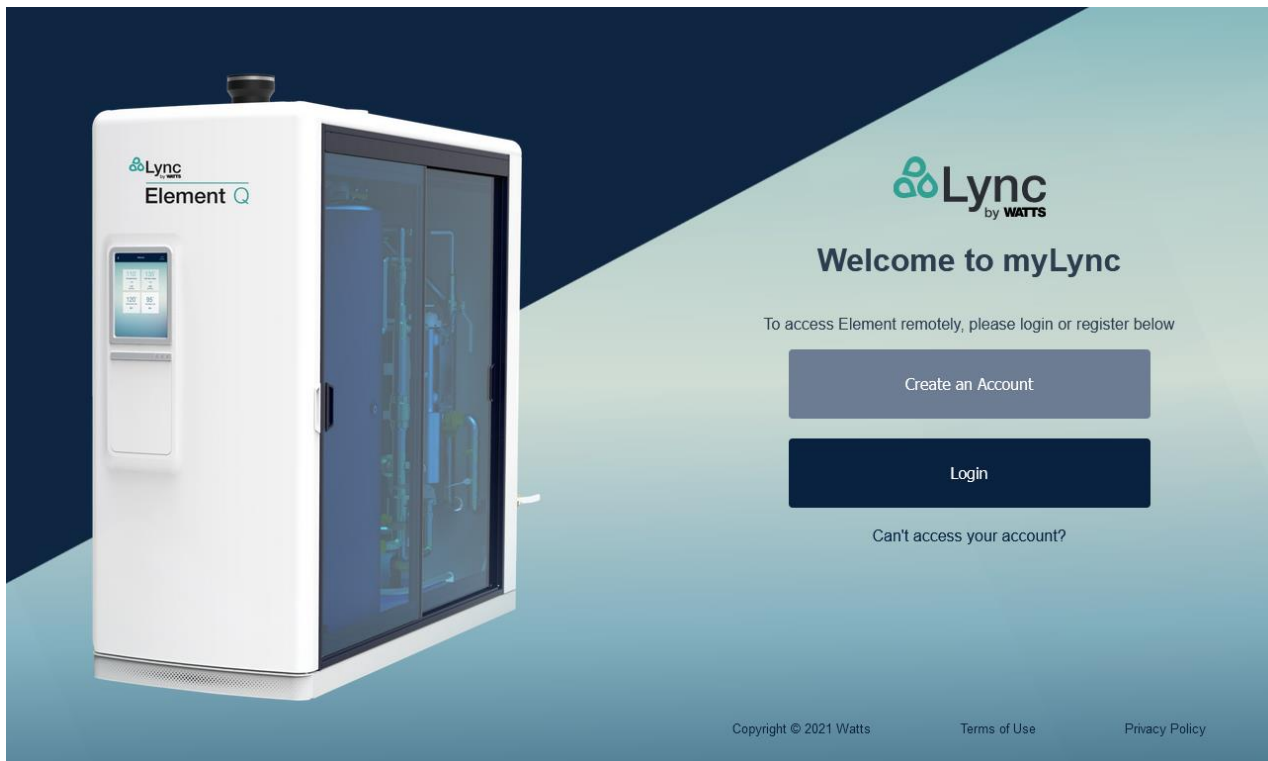
The myLync app available on iOS and Android provides remote monitoring of any Element associated with an organization to anyone who has the appropriate permission and credentials. Initial setup is performed by the Lync rep and installer and then the unit is transferred to the customer. Follow the flow chart in Figure 31 as well as the instructions below.

1. Install the Element and connect to a network with access to the internet. Turn the unit on.
2. The first user created is the “Owner”. Log in as the Owner with the code: **2143**. It is recommended that once the customer receives access to the unit that the user managing the Owner role changes this code immediately.
3. The Element can now be accessed locally. Cloud provisioning is recommended to gain full access to the benefits of Element. This is performed between the Lync rep and the installer.

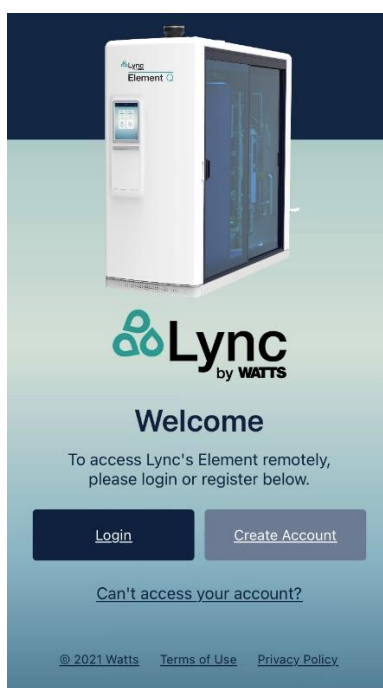
**NOTE:** If you choose not to connect to the cloud at this time, continue to Section 9.8

4. First-time myLync users must navigate to the web app at <http://www.mylyncbywatts.com>. Click on *Create an Account*. This can also be performed through the myLync mobile app, available on the Google Play® store or on the Apple® app store.

**NOTE:** This address is different from the main Lync product page.




**Figure 27** – myLync web app welcome page



**Figure 28** – myLync mobile app landing page

5. This new account is created through the Microsoft Azure® credentialing service. This login info is used throughout Azure so if the user has another account within Azure, they can log in using those credentials. For most first-time users, fill out the information shown in Figure 29.



Sign up with a new account

Email Address

Verification code

[Send verification code](#)

New Password

Confirm New Password

First Name

Last Name

Country/Region

Country/Region

Terms and Conditions

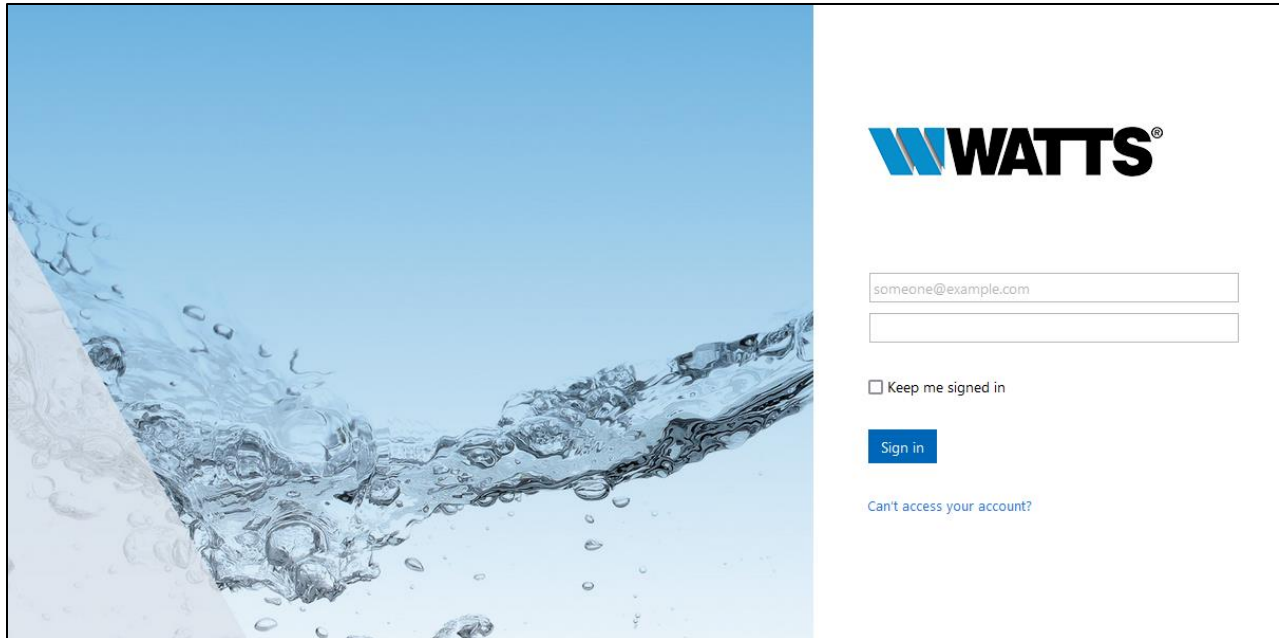
☐ [I agree to the Terms and Conditions](#)

[Create](#) [Cancel](#)

**Figure 29 - Create a new account with Watts**

6. The user can now log in. Navigate back to <http://mylyncbywatts.com> or to the mobile app home page and click on *Login*.





**Figure 30 – Login page**

7. The user is now able to create an organization and the associated hierarchy within their buildings. See Section 9.7 for more information.
8. If the initial user is the installer or the Lync rep, they are now a part of the organization. Follow Section 9.9 to perform an ownership transfer to the first customer user.

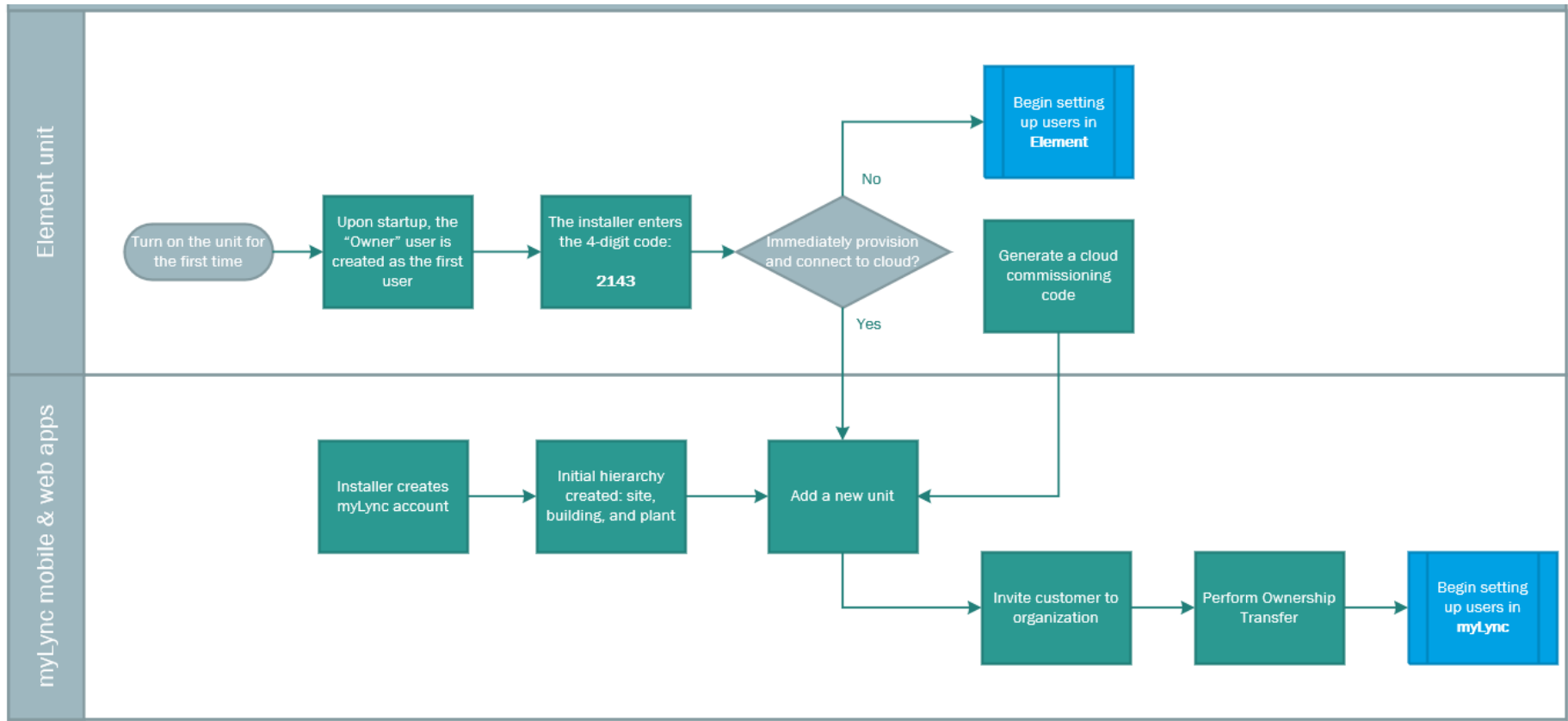
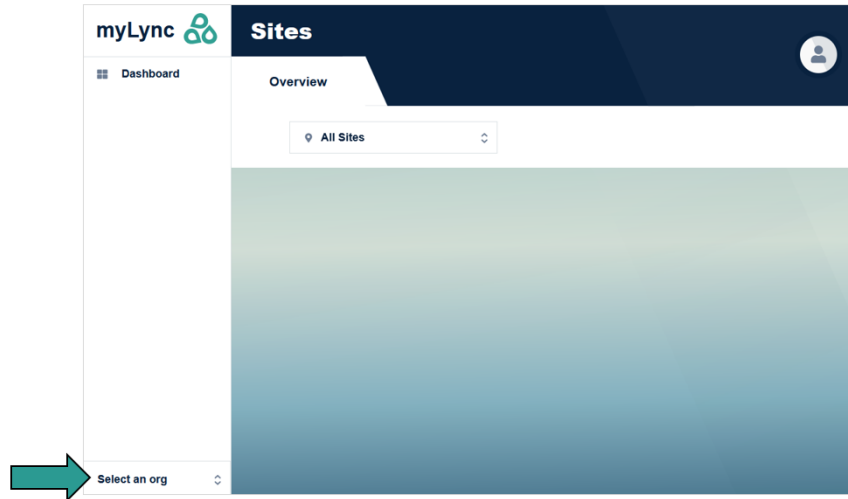
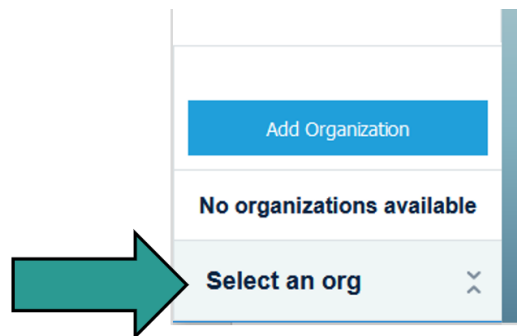


Figure 31



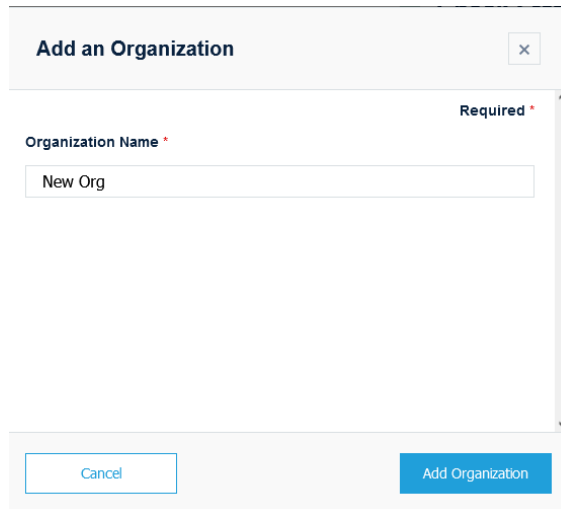
**Figure 32 – New User Dashboard on Web App**

1. Click on *Select an org*. No organizations are available, so click on *Add Organization*.



**Figure 33 – Add a new organization**

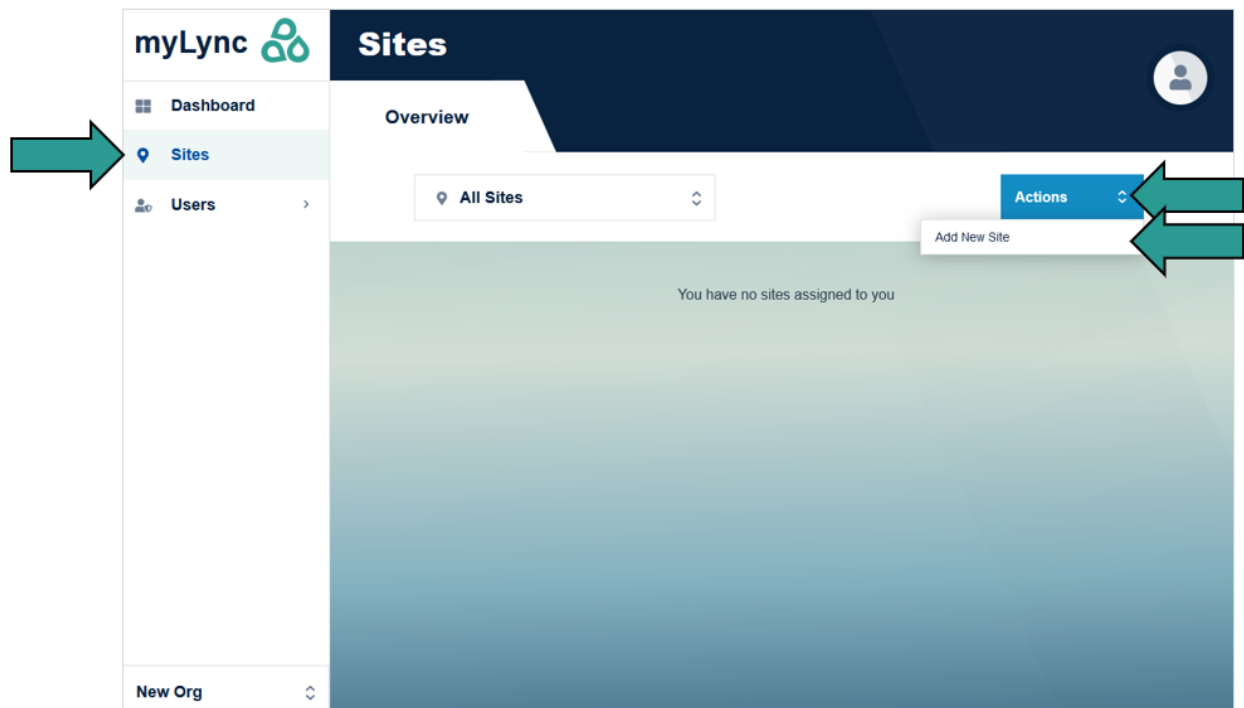
2. Enter your organization's name. This can be edited later.



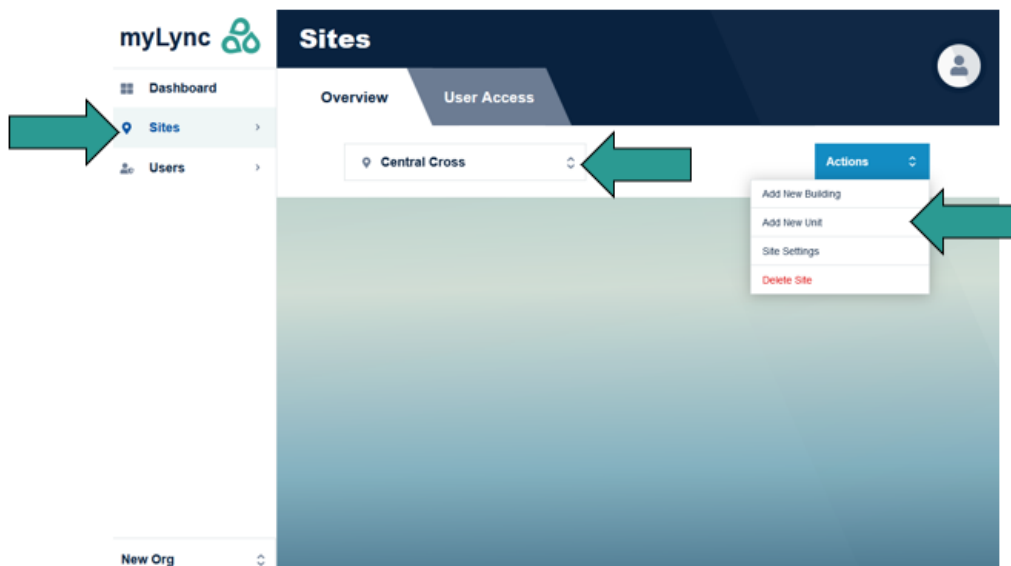
The dialog box titled "Add an Organization" has a close button (X) in the top right corner. It contains a "Required" label and a red asterisk next to the "Organization Name" label. Below this is a text input field containing the text "New Org". At the bottom of the dialog are two buttons: "Cancel" on the left and "Add Organization" on the right.

**Figure 34 – New organization entry**

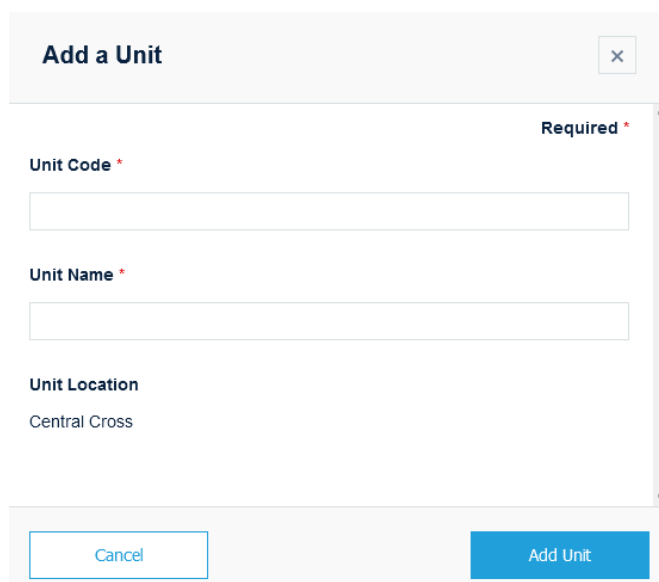
3. As the creator of the organization, you are the owner. Ownership can be transferred per 9.9.1 after another user is added to the organization.
4. Next, create a site within the organization. Follow the prompts and see Section 9.7 for more information.

**Figure 35 – Create a New Site**

5. Go to the site's page. In this example it is "Central Cross" as a part of the "New Org" organization. Click on *Actions* then *Add New Unit*.

**Figure 36 – Add a Unit Within the Site**

6. The pop-up window will ask for a Unit Code and a Unit Name.

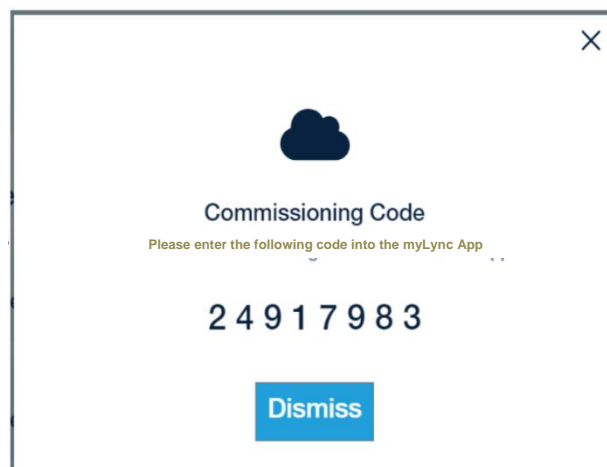
**Figure 37 – Add Unit Information**

7. Type in a *Unit Name* of your choosing. The *Unit Code* comes from the Element itself so it can be associated with the site and organization. On the unit, go to the settings page and click on the *Commission* button as shown in Figure 38.



**Figure 38 – Connecting a Unit to the Cloud**

8. This creates a unique, temporary cloud commissioning code. This code expires in 25 minutes once generated.



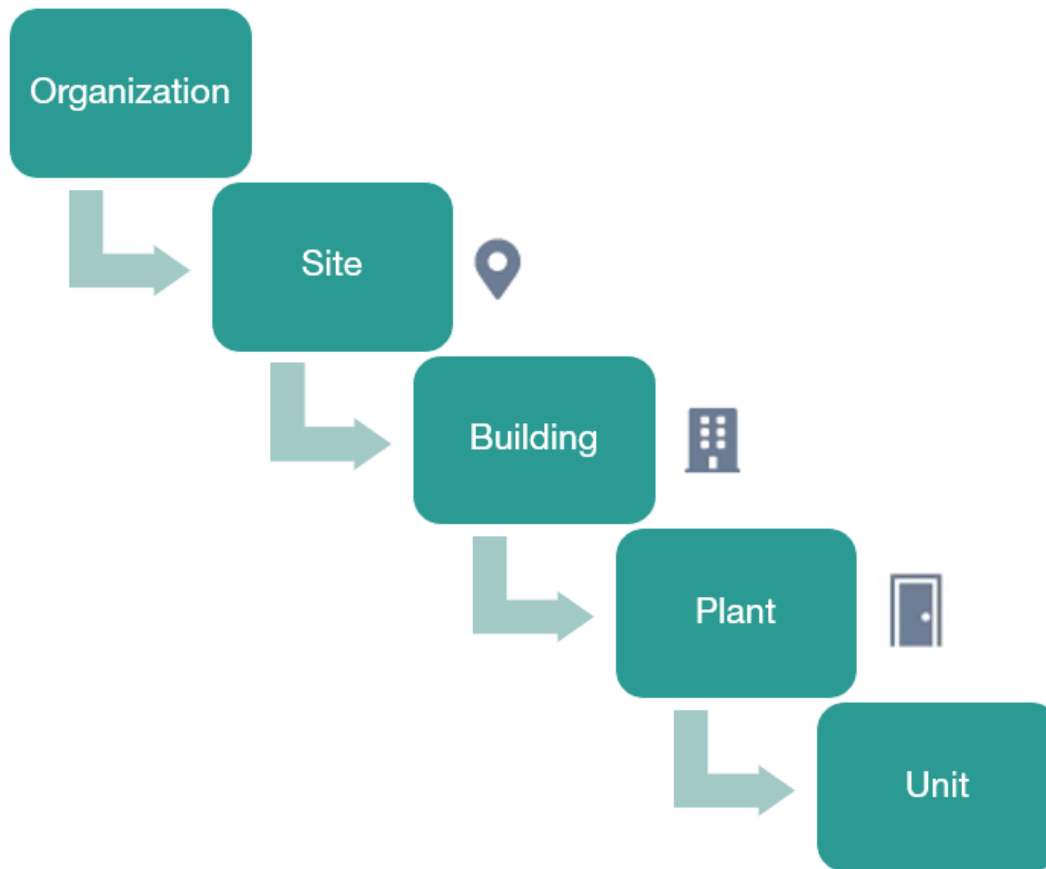
**Figure 39 – Sample Commissioning Code**

9. Enter this code into the app. If successful, a new unit will be a part of the site. If unsuccessful, *Error adding unit* will show.
  - a. Confirm the time between generating the code and adding the unit in the prompt.
  - b. Confirm whether the unit has access to the internet and any firewall or MAC filters are appropriately set within the network.
  - c. Also confirm the code itself.
10. Verify connectivity on the mobile app and web app.

## 9.7 Setting up the Organization Hierarchy

The Element is designed to be managed remotely and from a central location for multiple units.

Units are organized by Organization, Site, Building, Plant, and Unit. The hierarchy assists with organizing individual units, defining user permissions, organizing reports, and communication between staff members.



**Figure 40 – Hierarchy of locations**

Organization	The parent organization of the customer
Site	The campus or location where one or multiple Element units are installed. Top level user permissions would be assigned here.
Building	The name of the building. When a central water heating plant services multiple buildings, it is recommended to state the name of the building group.
Plant	The name of the single or group of Element units that serve a specific domestic hot water system. Recommended to either be the name of the mechanical room or the system the unit(s) serve.

**Table 11 – Hierarchy Definitions**

An organization can be created by any user within the myLync web or mobile apps. From there, users with appropriate permissions can define the structure of the hierarchy. Units can be associated directly with a site or building if desired, however it is recommended to establish the hierarchy down to a plant.

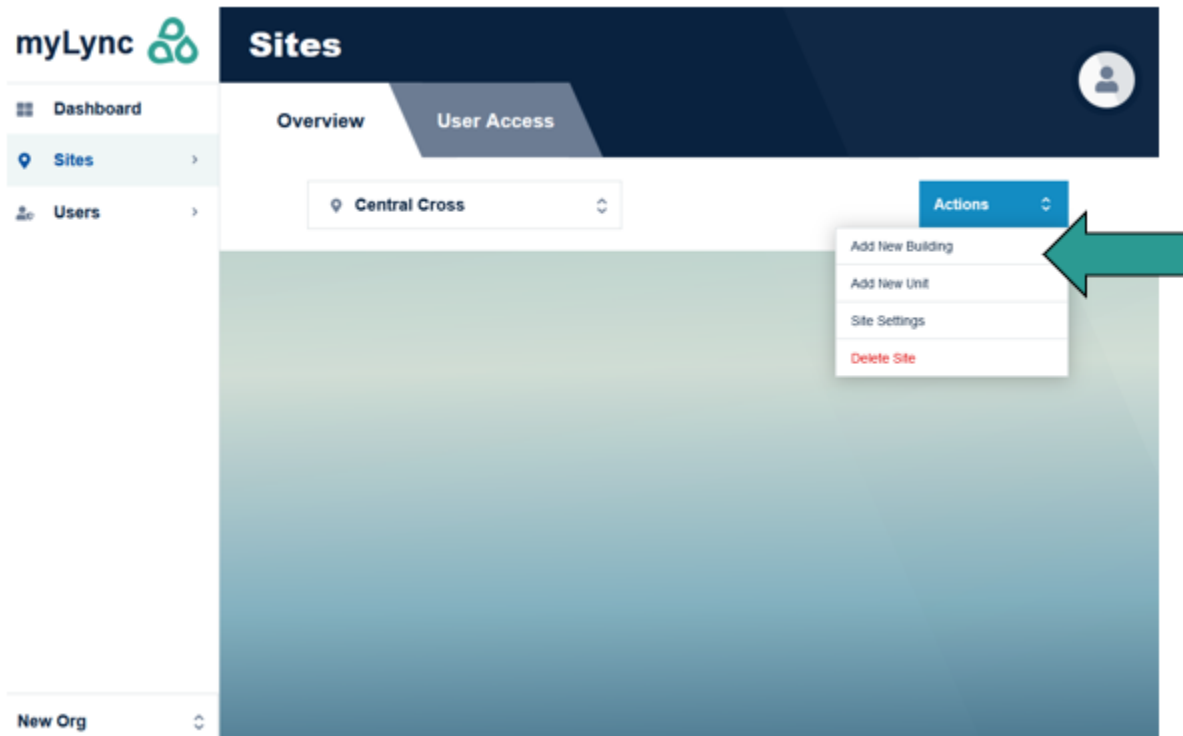
**NOTE:** Creating hierarchies can be performed only in my Lync, not locally at the unit.

Creating a new organization is shown in section 9.6 Figure 33.

Creating a new site is shown in section

Creating a new building is found when navigating to the site page, clicking on *Actions*, and clicking on *Add New Building*.

Creating a new plant is found when navigating to the building page, clicking on *Actions*, and clicking on *Add New Plant*.



Changing the name of the site, building, or plant is under *Actions* and then the location's *Settings*.

Deleting a location level will delete the structure beneath it.

**NOTE:** Organizations, sites, buildings and plants cannot be deleted if there are units associated in the hierarchy. Remove or transfer ownership of the units before deleting a part of the hierarchy structure.

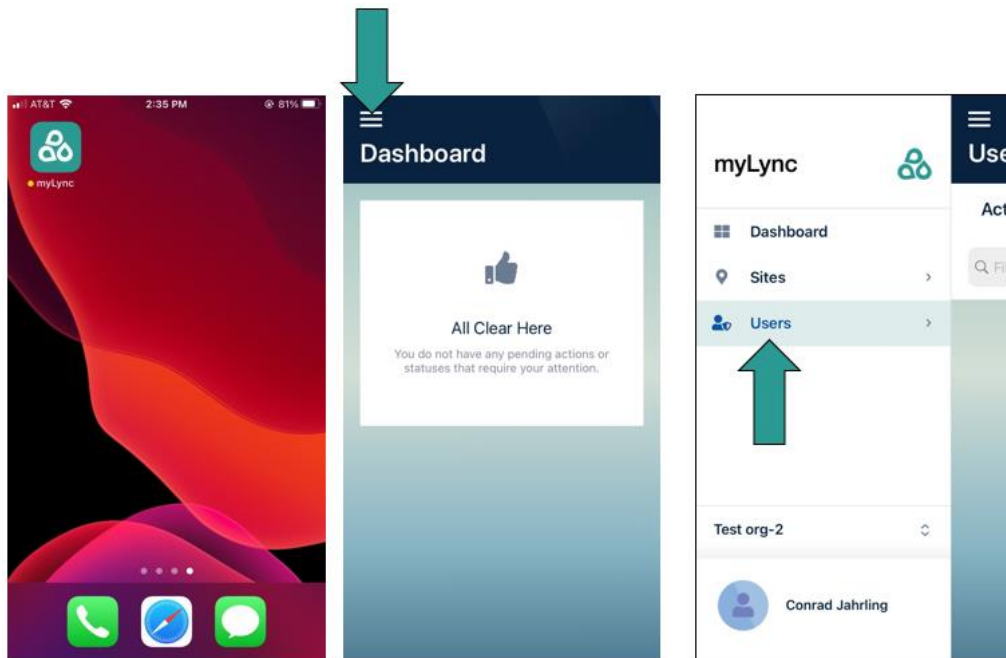
## 9.8 Managing Users

Element is designed to be used by multiple people with different responsibilities both inside and outside your company. There are numerous predefined personas for each of team members as given in Appendix C User Permissions Table. Verify that the access you are giving the individual via the selected persona matches your intent for permissions to the unit and organization.

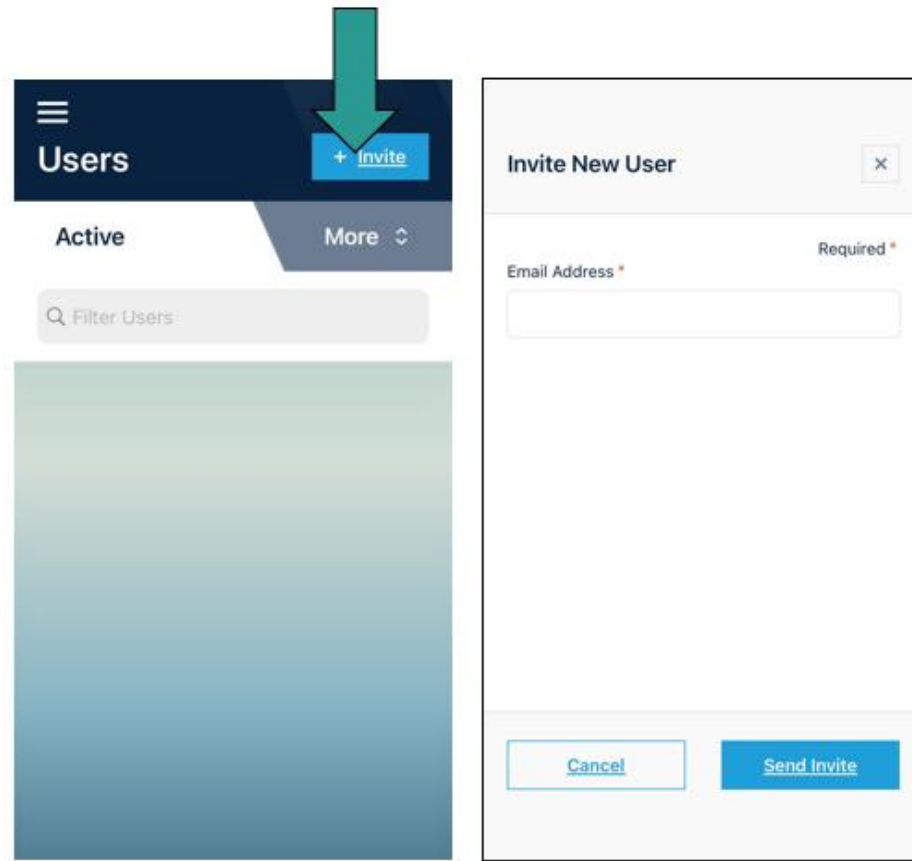
When assigning personas for cloud-connected units, a user's persona given at the site level will cascade to all other levels and units in the hierarchy below that. However, it will not cascade up. Nor will a user defined at the organization level cascade down. This is because individual units cannot be associated with organizations, only sites and lower. When defining permissions and personas, start at the site level and work down towards the plant level.



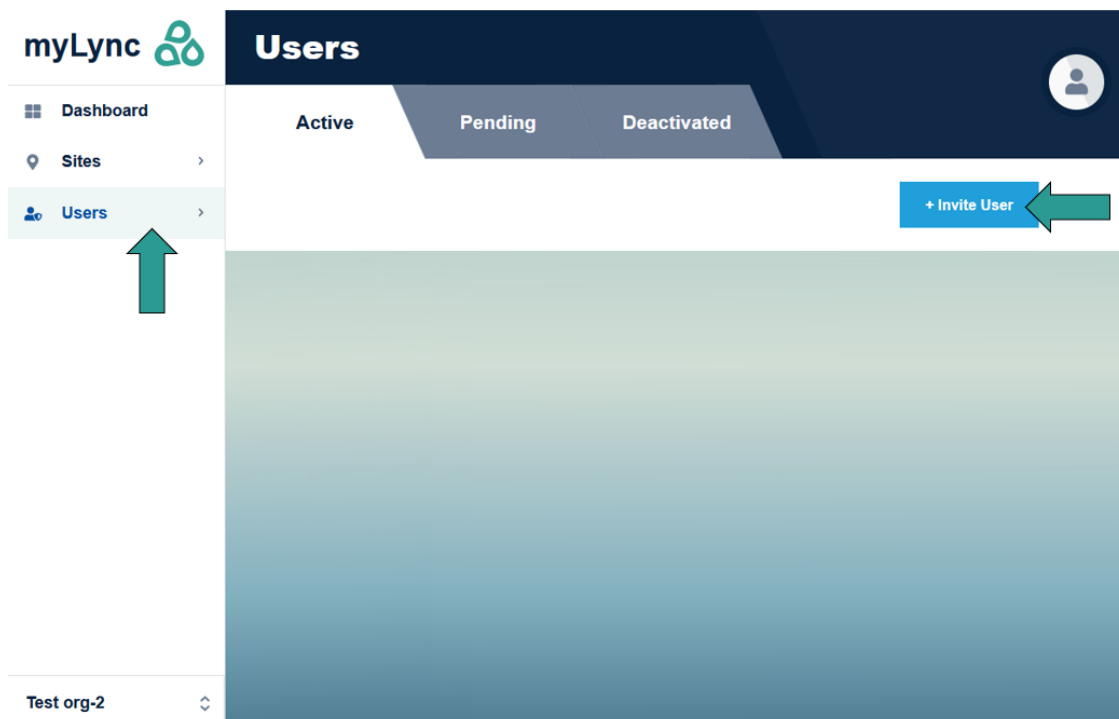
### 9.8.1 Invite New Users



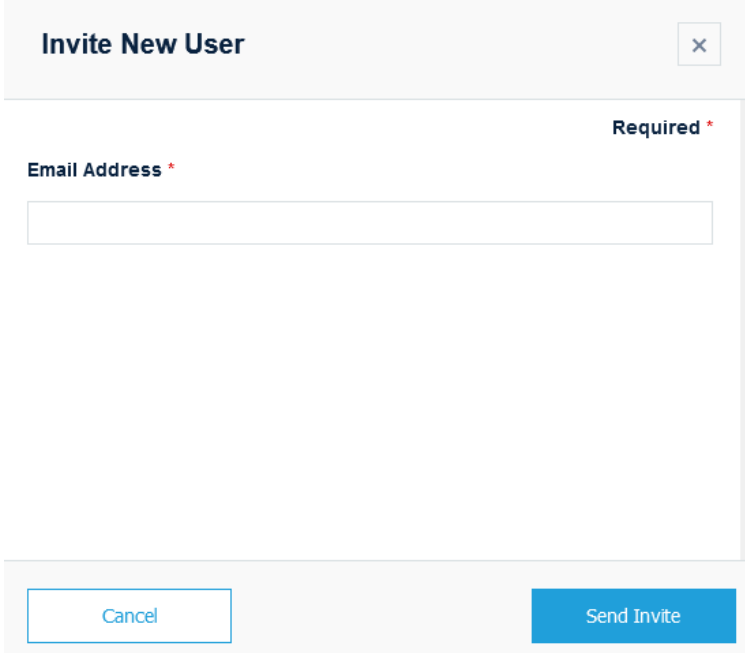
**Figure 41** – Go to the user page within the myLync app



**Figure 42** – Click on "+ Invite" to invite a new user to the organization



**Figure 43** – Go to the Users page and click on "+ Invite User"



**Figure 44 – Invite new users**

9. The user then will receive an email from [no-reply@watts.com](mailto:no-reply@watts.com) with the ability to create a new cloud account.

**NOTE:** It is recommended that users keep the same email address for multiple units, plants, buildings, sites, and organizations (especially important for individuals who manage multiple clients' equipment so all notifications can be compiled into the same app without re-logging in).

Clicking on the link in the email will direct the user to the web app landing page.

### 9.8.2 Reassigning Personas

If you have the appropriate permissions, you may change the persona of another user. For cloud-connected units, log in and navigate to the Users page.

You may not reassign yourself.

The owner persona may not be reassigned. Changing owners is performed by ownership transfer.

### 9.8.3 Deactivating Users

No users can be deleted. This is because their history of interaction with the unit remains intact even after they leave the organization.

The Owner persona cannot be deactivated.

The exception to deleting users is that the Owner persona is removed once an ownership transfer succeeds to an existing user. That user then cannot be deactivated.

## 9.9 Ownership Transfer

Once the unit has been setup by the installer or Lync rep, whom the Element recognizes as the initial user and owner, ownership is then transferred to the customer. The analogy for ownership

transfer is handing the keys to your car to someone else: you will no longer have access without their permission.

There are three methods of ownership transfer:

1. At the unit for a non-cloud-connected unit, the initial Owner can transfer ownership to another user. The Owner user role would then be deleted.
2. At the organization level for a cloud-connected unit, the organization Owner is the owner of all units within the organization. The transfer process begins in the mobile or web app.
3. At the unit for a non-cloud-connected unit, the initial Owner pin can simply be shared and then changed in the Settings page on the unit. An explanation is given in the *Lync Element Installation and Operation Manual (L-OMM-003)* in Section 9.

**NOTE:** There can only be one owner on any Element unit. Once the unit is connected to the cloud, **the local owner role will be removed and replaced** with the organization's owner. There can only be one owner of any Organization.

### 9.9.1 Organization Ownership Transfer

Cloud-connected units are associated with an organization. The organization owner role assumes the role of the owner for all Element units in the organization. Transfer of organization ownership is performed within either the mobile app or the web app.

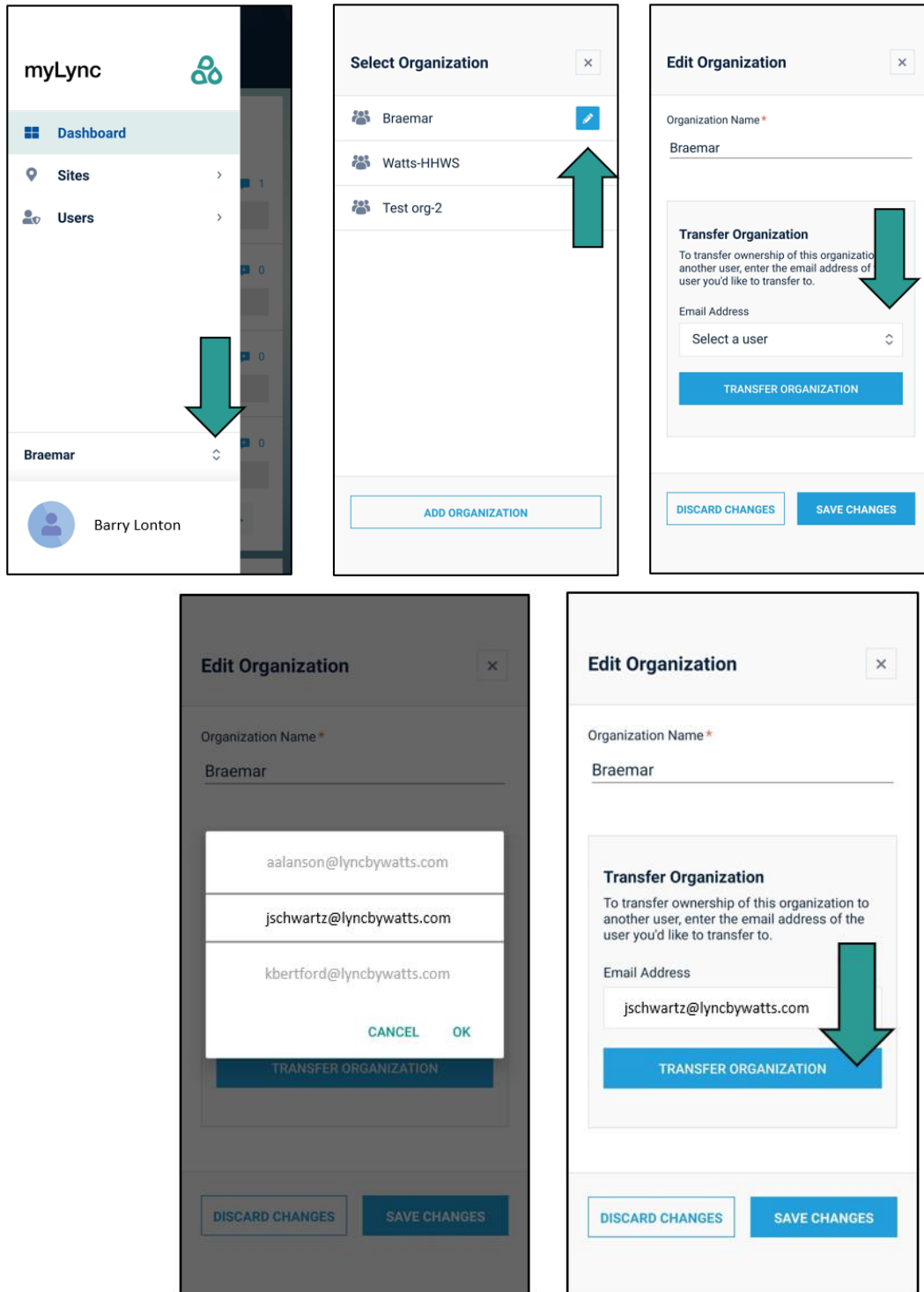
#### **WARNING**

Once an organization transfer is complete, the previous owner is no longer part of the organization and needs to be re-invited.

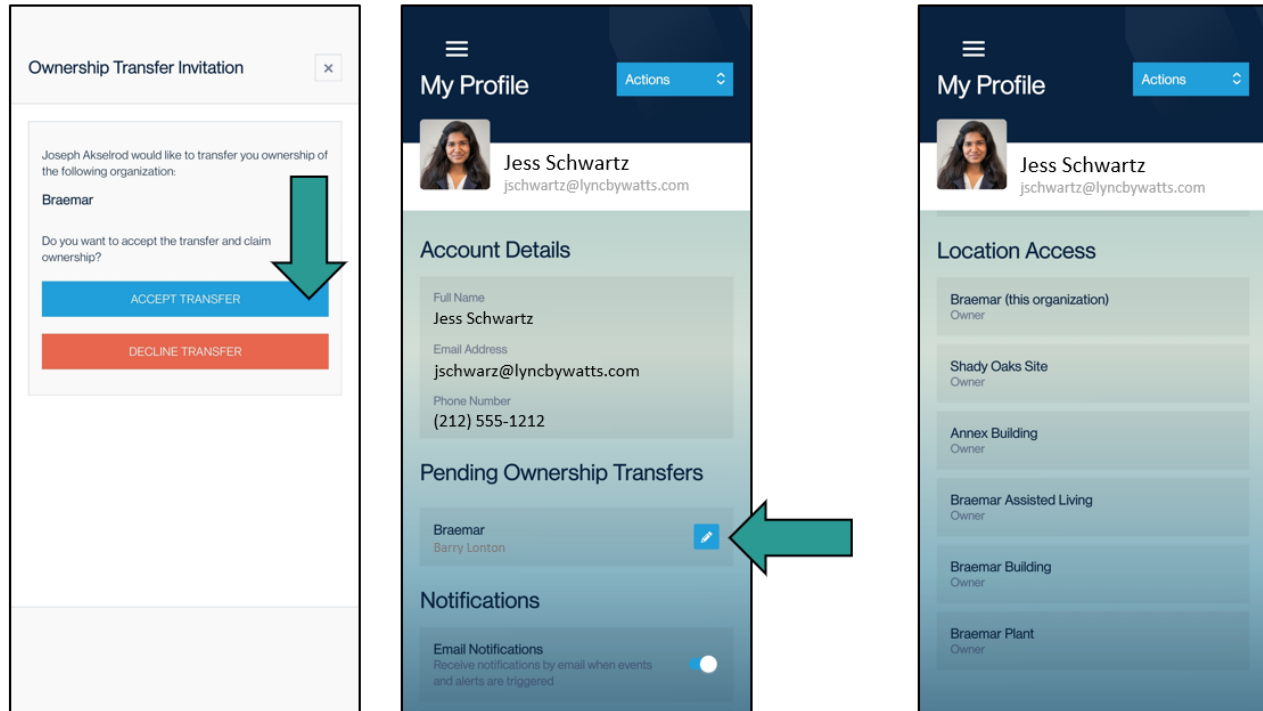
#### 9.9.1.1 Using the Mobile App

Ownership transfer is performed in the mobile app through editing the organization. When logged in as the owner role, select the organization menu, click on the blue icon to edit organization, and select a user to transfer organization.

**NOTE:** The user must already be a part of the organization.



**Figure 45** - Organization transfer from owner screen on mobile app



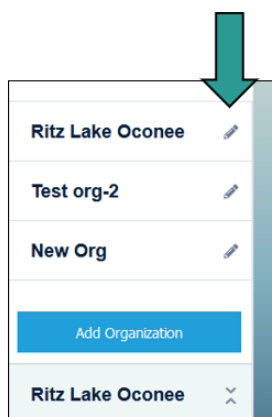
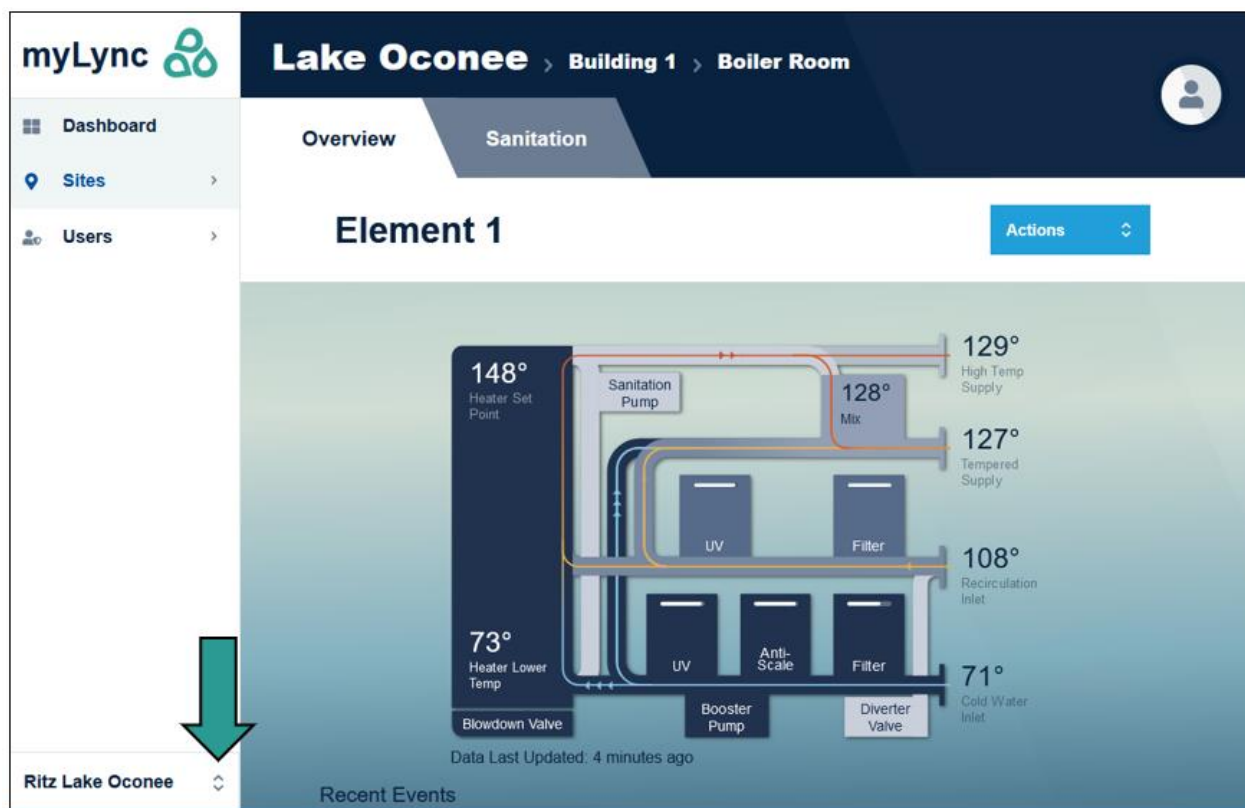
**Figure 46 - Organization transfer from receiving screen on mobile app**

When the receiving user logs into their mobile app again (close and reopen the app if necessary), they will see the Ownership Transfer Invitation. They may choose to accept it, decline it, or close the window. If the window is closed, the invitation can be accessed in their profile view.

Once accepted, it will show under Location Access in their profile view as being the owner, and the previous owner will no longer be a part of the organization.

#### 9.9.1.2 Using the Web App

Alternatively, organizational ownership transfer can occur in the web app. Navigate to <https://www.mylncbywatts.com> and log in as the owner. Click on the organization menu. Click on the pencil to edit. Select the user to transfer the organization. Click on Transfer Organization. The next time the selected user logs into the web app, a notification will show to either accept or decline the transfer, or to close the window to postpone decision.



×

Edit Organization

Required \*

Organization Name \*

Ritz Lake Oconee

Transfer Organization

To transfer ownership of this organization to another user, enter the user you'd like to transfer to

Select user

TRANSFER ORGANIZATION

Cannot delete organization. Organization either contains units or a sublocation that is unable to be deleted.

Discard Changes

Save Changes

Figure 47 - Organization transfer using web app

### 9.9.2 Troubleshooting Ownership Transfer

Cannot perform ownership transfer	<ul style="list-style-type: none"> <li>No other users besides the Owner within the organization. Invite and add a user.</li> <li>Target user rejected transfer. Communicate and try again.</li> <li>You do not see the transfer menu because you are not the Owner. Determine the unit's or organization's owner.</li> </ul>
Transfer request sent to wrong email	<ul style="list-style-type: none"> <li>Transfer requests can be cancelled</li> <li>Requests expire after 24 hours.</li> </ul>
Transfer request accepted by wrong person	<ul style="list-style-type: none"> <li>Verify user. Target user needs to be a part of the organization first in order to act on the request.</li> <li>Upon incorrect transfer, it needs to be transferred back.</li> </ul>
Owner is no longer with our company	<ul style="list-style-type: none"> <li>Contact your Lync rep for technical support</li> </ul>
Lost Owner Pin on the unit	<ul style="list-style-type: none"> <li>Perform a factory reset on the unit. Data will be lost on the unit.</li> <li>For cloud-connected units, data will still be available in myLync.</li> </ul>



## Section III – Sub-System Details

### 10 EDGE SC CONTROLLER OPERATION

The information in this Chapter provides a guide to the operation of the Element using the Edge SC Controller. Initial startup of this unit should only be performed by factory trained personnel. Operation prior to initial startup by factory trained personnel will void the equipment warranty. In addition, the following WARNINGS must be observed at all times.

#### **WARNING:**

Do not attempt to dry-fire the unit. Starting the unit without a full water level can seriously damage the unit, may result in injury to personnel or property and will void any warranty.

The unit must be serviced only by factory certified service technicians.

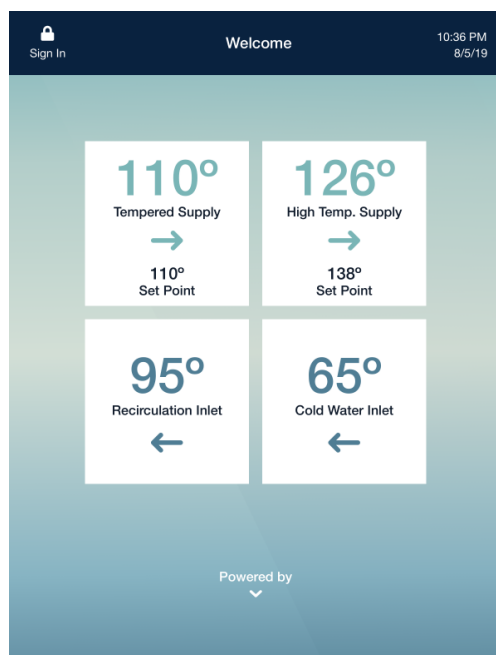
#### 10.1 Edge SC Controller Description

The Edge SC Controller contains all the controls, indicators and displays necessary to operate, adjust and troubleshoot the Element. The Edge SC Controller's capacitive touchscreen is a highly sensitive device that continuously checks for user interaction at a very high frequency.

Mechanical room environments are sometimes harsh, electromagnetically noisy and dirty, and can experience wide temperature ranges, and can be difficult for sensitive electronic components. Care should be taken to not damage the touchscreen or get any grease or pipe thread sealant on the touchscreen.

#### 10.2 Welcome Screen and Navigation

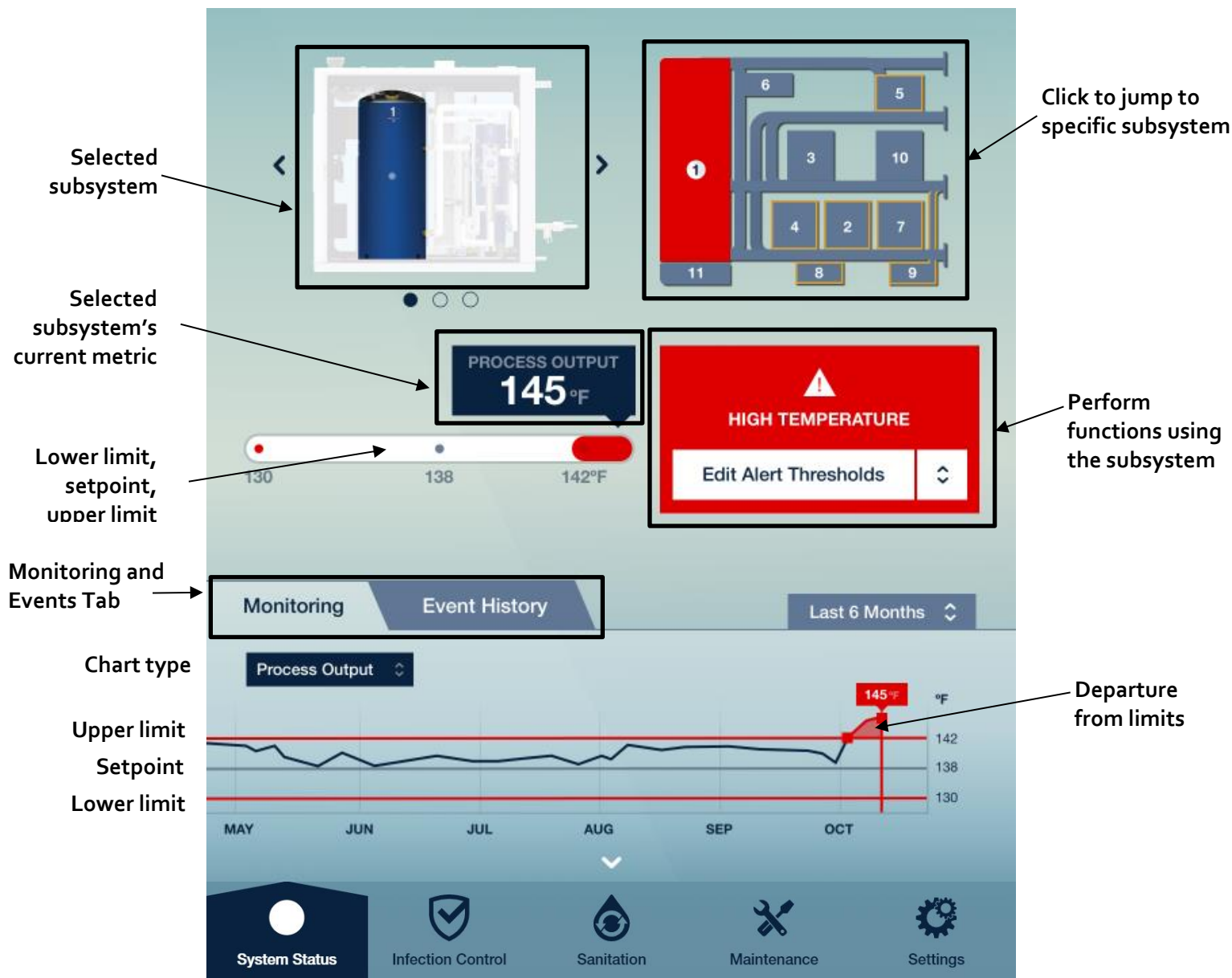
Upon powering up, the Welcome screen appears with a **Sign In** prompt. This initial display shows the **Tempered Supply**, **High Temp. Supply**, **Recirculation Inlet** and **Cold Water Inlet** temperature along with any applicable **Set Point** temperatures. Selecting any option will forward the user to the Main Menu with each component displayed as outlined below.



**Figure 48 – Welcome Screen**

The Edge Controller SC allows users to view each component of the Element along with the status, alerts, temperature (if applicable), monitoring and event history. The intuitive menu highlights the selected component and displays all connected parts. The user can toggle between the various components to view their status or check alerts.

Figure 9-2 below shows the Controller displaying a high temperature alert:



**Figure 49 – Menu Navigation Example**

## 10.3 Menu Structure

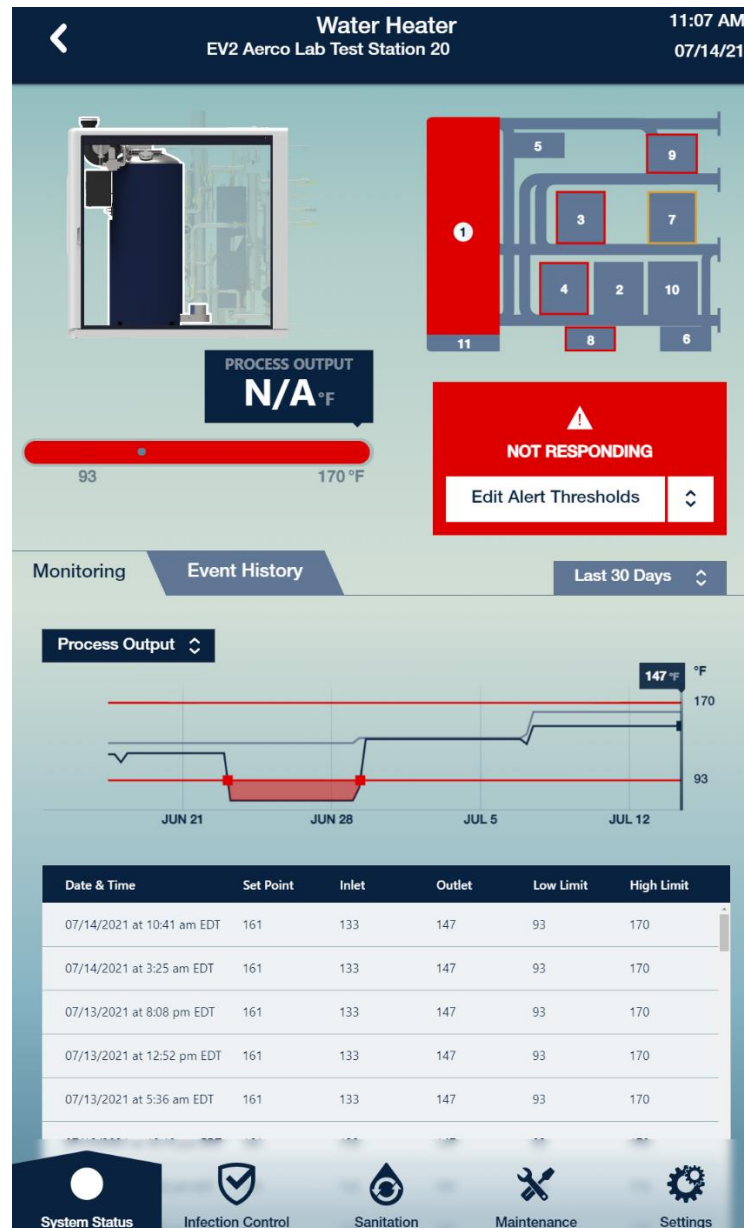
The **System Status** menu provides a dashboard of the Element and the status of each of the ten (10) subsystems within the Element:

- Water Heater
- Anti-Scale
- Mixing Valve
- Booster Pump
- Diverter Valve
- Blowdown Valve
- UV: Recirculation
- Filter: Recirculation
- UV: Cold Water
- Filter: Cold Water

Each selection provides a visual of each subsystem allowing the user to monitor outputs, review event history and edit alert thresholds or set points.



Figure 50 – System Status



**Figure 51 – Menu Structure**

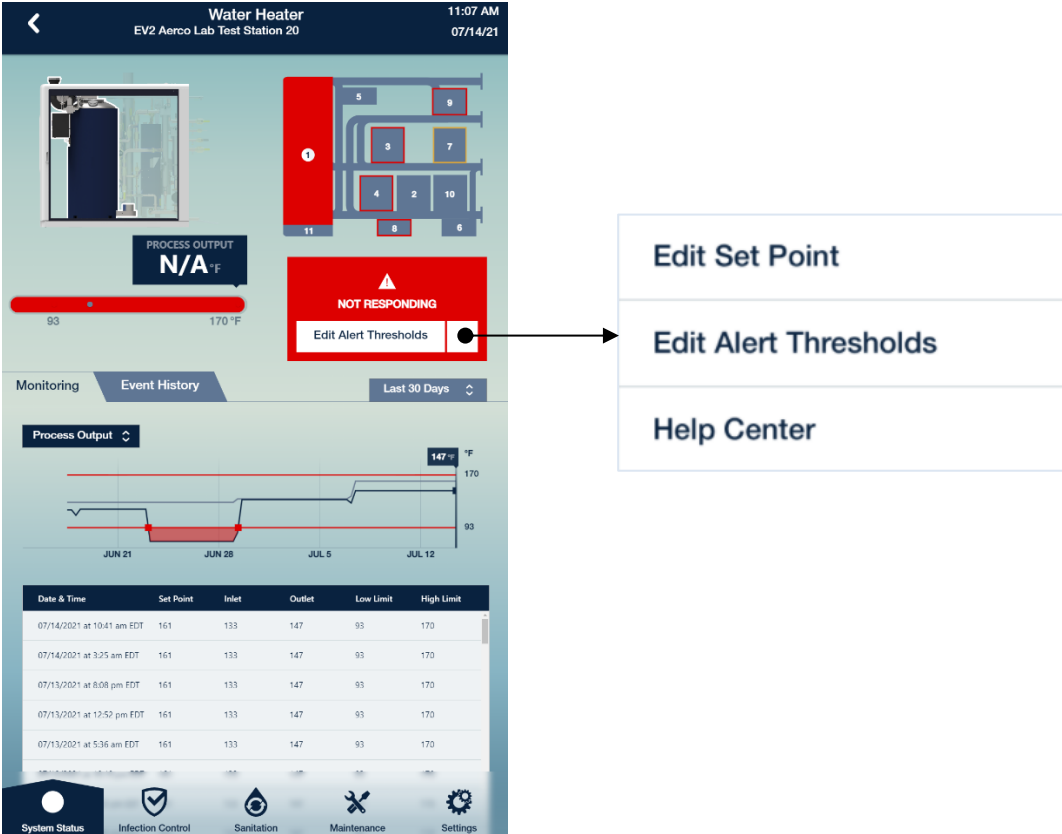
The five (5) menu shortcuts on the bottom provide specific visibility into the Element:

- System Status
- Infection Control
- Sanitation
- Maintenance Log
- Settings

The following sections show examples of the display along with corresponding submenus for each selection. Each component is highlighted when selected and displays any pending alerts or warnings. Additional information shows a monitoring chart along with an Event History option. The default history graph shows values for the previous 6 months.

### 10.3.1 Water Heater

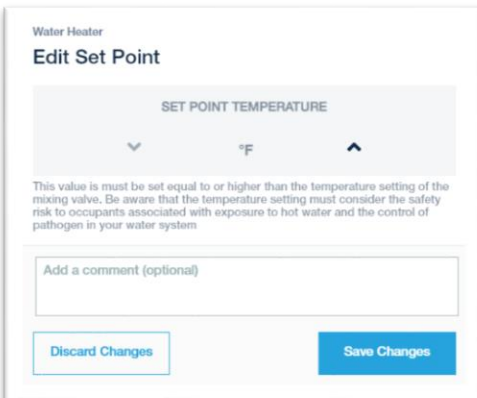
The **Water Heater** screen shows the component's current status. Options also include viewing the Process Output Temperature, editing the current Set Point and editing the alert thresholds.



The screenshot shows the 'Water Heater' screen for 'EV2 Aerco Lab Test Station 20'. It displays a 'PROCESS OUTPUT' of 'N/A' and a 'NOT RESPONDING' alert. A red button labeled 'Edit Alert Thresholds' is highlighted, with an arrow pointing to a menu that includes 'Edit Set Point', 'Edit Alert Thresholds', and 'Help Center'.

Date & Time	Set Point	Inlet	Outlet	Low Limit	High Limit
07/14/2021 at 10:41 am EDT	161	133	147	93	170
07/14/2021 at 3:25 am EDT	161	133	147	93	170
07/13/2021 at 8:08 pm EDT	161	133	147	93	170
07/13/2021 at 12:52 pm EDT	161	133	147	93	170
07/13/2021 at 5:36 am EDT	161	133	147	93	170

#### Edit Set Point:



**Water Heater**  
**Edit Set Point**

SET POINT TEMPERATURE

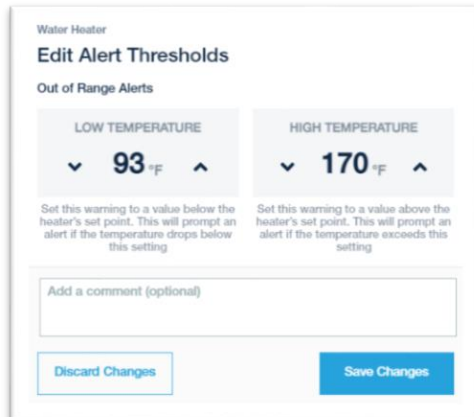
▼ °F ▲

This value must be set equal to or higher than the temperature setting of the mixing valve. Be aware that the temperature setting must consider the safety risk to occupants associated with exposure to hot water and the control of pathogen in your water system.

Add a comment (optional)

Discard Changes Save Changes

#### Edit Alert Thresholds:



**Water Heater**  
**Edit Alert Thresholds**

Out of Range Alerts

LOW TEMPERATURE  
▼ 93 °F ▲

Set this warning to a value below the heater's set point. This will prompt an alert if the temperature drops below this setting.

HIGH TEMPERATURE  
▼ 170 °F ▲

Set this warning to a value above the heater's set point. This will prompt an alert if the temperature exceeds this setting.

Add a comment (optional)

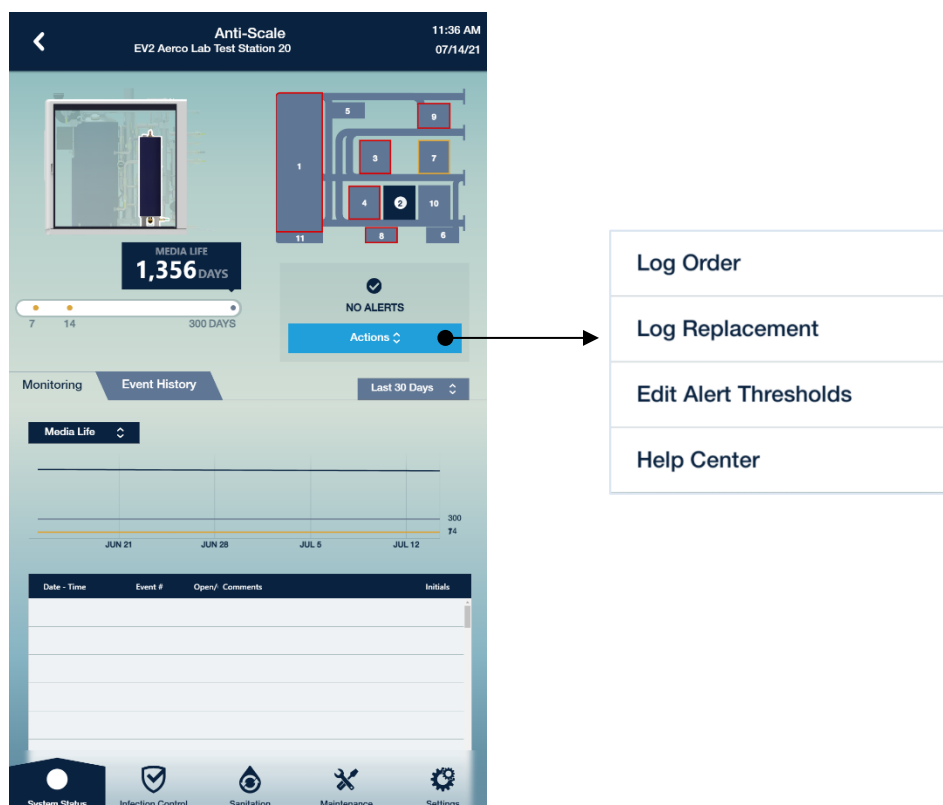
Discard Changes Save Changes

Figure 52 – Water Heater

### 10.3.2 Unit Anti-Scale

The Lync AquaSolve anti-scale subsystem prevents scaling of minerals such as calcium and magnesium salts within the DHW system and downstream fittings.

The **Anti Scale** screen shows the component's current status. Options include viewing the media life, logging an order or replacement, and editing alert thresholds.

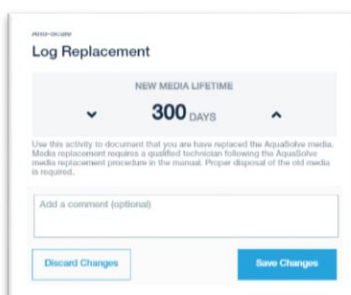


Log Order



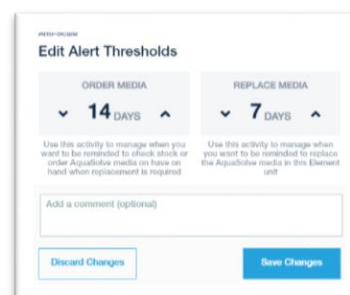
The 'Log Order' form includes a checkbox for 'I acknowledge that the media has been ordered or is available in inventory.' Below this is a text area for 'Add a comment (optional)'. At the bottom, there are 'Discard Changes' and 'Save Changes' buttons.

Log Replacement



The 'Log Replacement' form shows a 'NEW MEDIA LIFETIME' of 300 DAYS. It includes a text area for 'Add a comment (optional)'. At the bottom, there are 'Discard Changes' and 'Save Changes' buttons.

Alert Thresholds



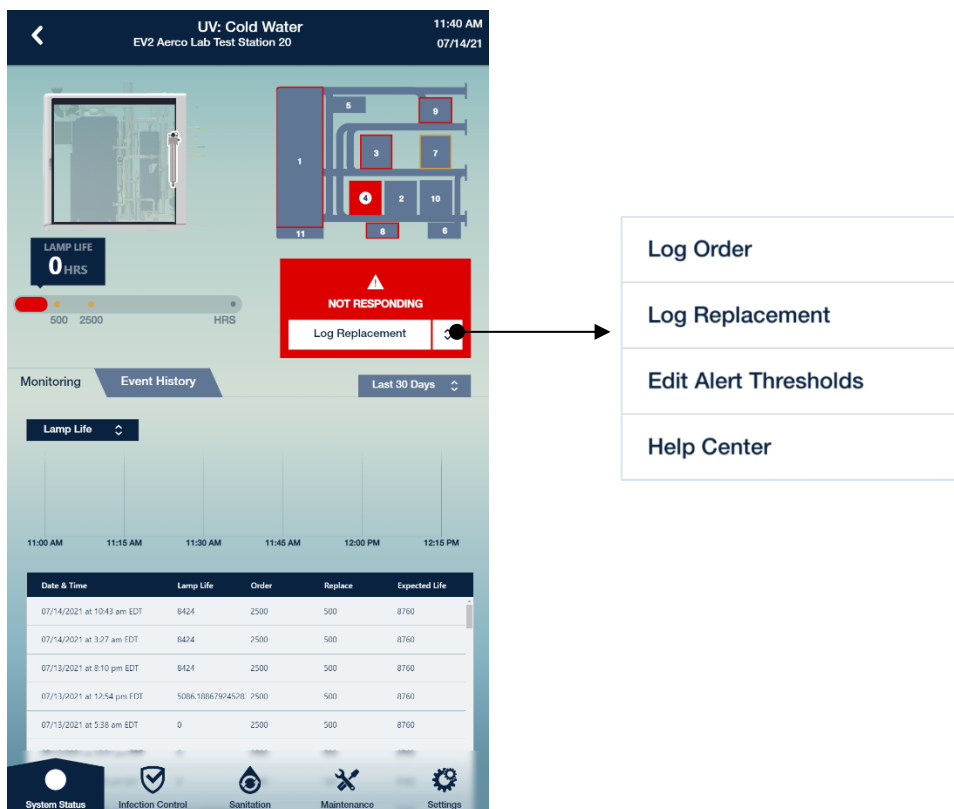
The 'Edit Alert Thresholds' form has two sections: 'ORDER MEDIA' with a value of 14 DAYS and 'REPLACE MEDIA' with a value of 7 DAYS. Both sections have up and down arrows for adjustment. Below these is a text area for 'Add a comment (optional)'. At the bottom, there are 'Discard Changes' and 'Save Changes' buttons.

Figure 53 – Anti-Scale

### 10.3.3 UV Cold Water and UV Recirculation

The ultraviolet (UV) subsystems disinfect water that passes through the Element, with one subsystem for the cold inlet for incoming water and a second subsystem for the recirc inlet for ongoing disinfection in the DHW loop.

The UV Cold Water and UV Recirculation screens show the component's current status. Options include viewing lamp life, logging an order or replacement and editing alert thresholds.



**UV: Cold Water**  
EV2 Aerco Lab Test Station 20  
11:40 AM  
07/14/21

LAMP LIFE  
0 HRS  
500 2500 HRS

**NOT RESPONDING**  
Log Replacement

Monitoring Event History Last 30 Days

Lamp Life

Date & Time	Lamp Life	Order	Replace	Expected Life
07/14/2021 at 10:43 am EDT	8424	2500	500	8760
07/14/2021 at 3:27 am EDT	8424	2500	500	8760
07/13/2021 at 8:10 pm EDT	8424	2500	500	8760
07/13/2021 at 12:54 pm EDT	5086,1086704576	2500	500	8760
07/13/2021 at 5:38 am EDT	0	2500	500	8760

System Status Infection Control Sanitation Maintenance Settings

Log Order  
Log Replacement  
Edit Alert Thresholds  
Help Center

#### Log Order

UV: Cold Water  
**Log Order**

☐ I acknowledge that the UV Lamp has been ordered or are available in inventory

Check the table below to determine the correct lamp and quartz sleeve to have on hand for servicing the UV system.

System	Lamp P/N	Quartz Sleeve P/N
WC025	7300863	7300868
WC050	7300865	7300870

Add a comment (optional)

Discard Changes Save Changes

#### Log Replacement

UV: Cold Water  
**Log Replacement**

☐ I acknowledge that the UV Lamp has been replaced

Check the table below to determine the correct lamp and quartz sleeve to have on hand for servicing the UV system.

System	Lamp P/N	Quartz Sleeve P/N
WC025	7300863	7300868
WC050	7300865	7300870

Add a comment (optional)

Discard Changes Save Changes

Figure 54 – UV Cold Water



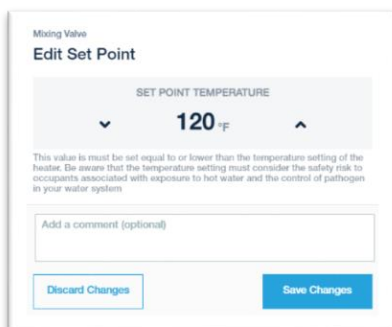
### 10.3.4 Mixing Valve

The mixing valve provides tempered water for distribution using the integral Lync DigiTemp Jr subsystem that complies with ASSE 1017.

The **Mixing Valve** screen shows the component's current status and tempered supply temperature. Options include editing the set point, editing alert thresholds, and updating the anti-scald protection.



#### Edit Set Point



Mixing Valve  
Edit Set Point

SET POINT TEMPERATURE

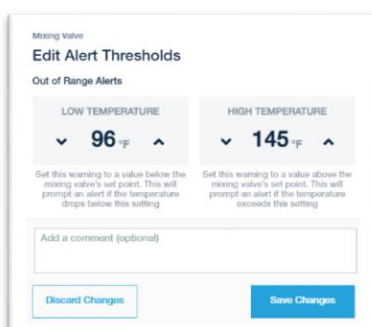
120°F

This value is must be set equal to or lower than the temperature setting of the heater. Be aware that the temperature setting must consider the safety risk to occupants associated with exposure to hot water and the control of pathogen in your water system.

Add a comment (optional)

Discard Changes Save Changes

#### Edit Alert Thresholds



Mixing Valve  
Edit Alert Thresholds

Out of Range Alerts

LOW TEMPERATURE 96°F

HIGH TEMPERATURE 145°F

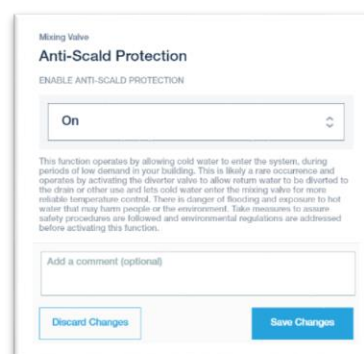
Set this warning to a value below the mixing valve's set point. This will prompt an alert if the temperature drops below this setting.

Set this warning to a value above the mixing valve's set point. This will prompt an alert if the temperature exceeds this setting.

Add a comment (optional)

Discard Changes Save Changes

#### Anti-Scald Protection



Mixing Valve  
Anti-Scald Protection

ENABLE ANTI-SCALD PROTECTION

On

This function operates by allowing cold water to enter the system, during periods of low demand in your building. This is likely a rare occurrence and operates by activating the diverter valve to allow return water to be diverted to the drain or other use and lets cold water enter the mixing valve for more reliable temperature control. There is danger of flooding and exposure to hot water that may harm people or the environment. Take measures to secure safety procedures are followed and environmental regulations are addressed before activating this function.

Add a comment (optional)

Discard Changes Save Changes

Figure 55 – Mixing Valve

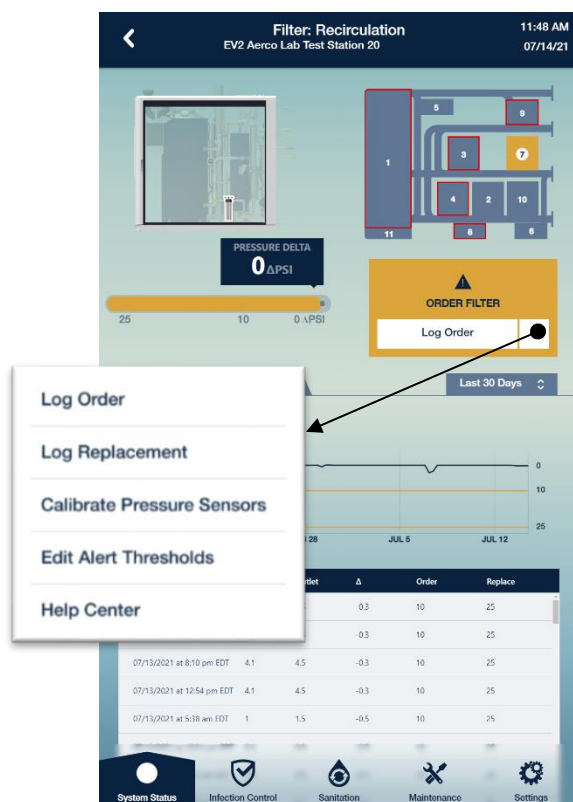


### 10.3.5 Filters: Cold Water and Recirculation

The 5µm integrated filters promote proper function of the UV systems by minimizing sediment to allow UV light to reach any microorganisms. They also remove sediment that would otherwise enter the DHW system to create surfaces for biofilm to grow, or to feed the biofilm nutrients.

The **Filter: Cold Water** and **Filter: Recirculation** screens show the component's current status and pressure drop. Options include logging an order or replacement, calibrating the pressure sensors and editing alert thresholds.

#### Log Order



Filter: Recirculation

#### Log Order

☐ I acknowledge that the filter(s) has been ordered or is available in inventory.

There are five filters, P/N XXXXX, used in the filter housing. Use this activity to document that you are prepared to replace the filters before their end of life.

Add a comment (optional)

[Discard Changes](#) [Save Changes](#)

#### Log Replacement

Filter: Recirculation

#### Log Replacement

☐ I acknowledge that the filter(s) have been replaced

Use this activity to document that you have changed or cleaned the filters to bring the filter system's pressure drop back within the filter's loading specification. Filter replacement requires a qualified technician following the filter replacement procedure in the manual.

Add a comment (optional)

[Discard Changes](#) [Save Changes](#)

#### Calibrate Pressure Sensors

#### Edit Alert Thresholds

Filter: Recirculation

### Calibrate Pressure Sensors

Sensor calibration is generally not necessary unless a sensor fails and requires replacement. However, you may run this process at your discretion. Sensor replacement requires a qualified technician following the pressure sensor replacement procedure in the manual. Follow the process below to continue:

- ☐ Evacuate all air from the entire system and allow a continuous flow of water for a minimum of 10 minutes.
- ☐ Close the isolation valves on the two outlets of the system, the ball valve for the high and tempered outlets
- ☐ Close the ball valve for the recirc inlet to the system

At this point the pressure on both sides of the filter will equalize and you are ready to start the calibration

Add a comment (optional)

Cancel Start Calibration

Booster Pump

### Edit Alert Thresholds

LOW PRESSURE

6 FT

Range is 0 to 7 ft. The default is 0 ft; When set to 0 ft the alert may be interpreted as an indicator that the system was under vacuum

HIGH PRESSURE

40 FT

Range is 7 to 30 ft. The default is 15 ft. Set this to a value higher than the pump's set point value

Add a comment (optional)

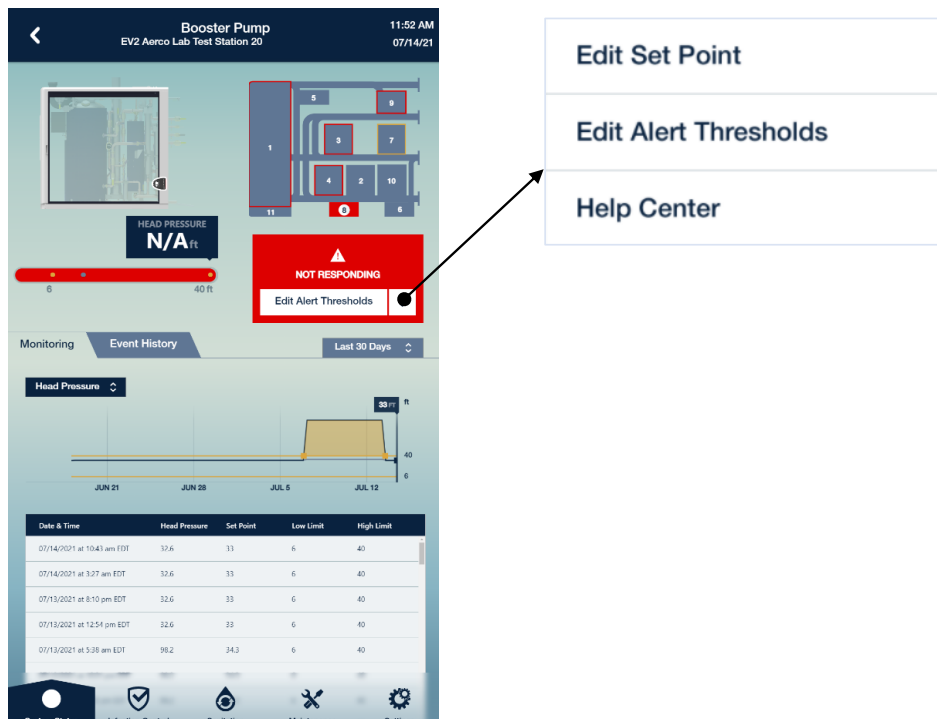
Discard Changes Save Changes

Figure 56 – Cold Water Filter

### 10.3.6 Booster Pump

The booster pump compensates for internal pressure drops between the cold-water inlet and the outlets. This ensures that there is virtually no pressure drop across the system.

The **Booster Pump** screen shows the component's current status and PSI pressure. Options include editing the current Set Point and editing alert thresholds.



### Edit Alert Thresholds

Filter: Recirculation

#### Edit Alert Thresholds

ORDER FILTER

▼ 10 ΔPSI ▲

Order filter text... tellus ac cursus  
commodo, tortor mauris  
condimentum

REPLACE FILTER

▼ 25 ΔPSI ▲

Replace filter text...sce dapibus, tellus  
ac cursus commodo, tortor mauris  
condimentum nibh, ut.

Add a comment (optional)

[Discard Changes](#) [Save Changes](#)

### Edit Set Point

Booster Pump

#### Edit Set Point

SET POINT PRESSURE

▼ FT ▲

This value is defaulted to 14 and adjustable from 7 ft to 14 ft. The pump speed  
will vary to maintain the pressure setting

Add a comment (optional)

[Discard Changes](#) [Save Changes](#)

Figure 57 - Booster Pump

## 10.3.7 Diverter Valve

The **Diverter Valve** screen shows the component's current status and if the valve is open or closed. Options include editing the adjusting the valve and coordinating a system flush.



[Adjust Valve](#)

[System Flush](#)

[Help Center](#)

### Adjust Valve

### System Flush

Diverter Valve  
Adjust Valve

OPEN VALVE  
▼ 0% ▲

DURATION  
▼ 5 MIN ▲

There is danger of flooding and exposure to hot water that may harm people or the environment. Take measures to assure safety procedures are followed and environmental regulations are addressed before opening this valve

Add a comment (optional)

Discard Changes
Save Changes

Diverter Valve  
Configure System Flush

DISABLE HEATING ☒

Save energy by not heating water while the system flush is in progress.

OPEN BLOWDOWN VALVE (STAGE 1)  
▼ 2 MIN ▲

Purge the water heater before the system flush begins

OPEN DIVERTER VALVE  
▼ 90 MIN ▲

Set the duration of the system flush

OPEN BLOWDOWN VALVE (STAGE 2)  
▼ 2 MIN ▲

Purge the water heater again after the system flush finishes


Cancel
Confirm & Start

Figure 58- Diverter Valve

### 10.3.8 Blowdown Valve

The **Blowdown Valve** screen shows the component's current status and whether the valve is open or closed. Options include starting the Blowdown Cycle and editing the schedule.

Blowdown Cycle  
EV2 Aero Lab Test Station 20  
11:58 AM  
07/14/21



VALVE  
0%  
CLOSED OPEN  
VALVE CLOSED  
Tap the actions menu to start or schedule a Blowdown Cycle  
Actions

Event History  
Last 30 Days

Event	Activity
10:00	IO Board Resumed Operation for 15, 3621 at 10:00 AM EDT 2 Comments 1 hour ago by SYS
10:01	IO Board Resumed Operation for 15, 3621 at 10:01 AM EDT 2 Comments 4 hours ago by SYS
10:02	IO Board Resumed Operation for 15, 3621 at 10:02 AM EDT 2 Comments 3 hours ago by SYS
10:03	IO Board Resumed Operation for 15, 3621 at 10:03 AM EDT 2 Comments 17 hours ago by SYS
10:04	IO Board Resumed Operation for 15, 3621 at 10:04 AM EDT 2 Comments 1 day ago by SYS
10:05	IO Board Resumed Operation for 15, 3621 at 10:05 AM EDT 2 Comments 2 days ago by SYS
10:06	IO Board Resumed Operation for 15, 3621 at 10:06 AM EDT 2 Comments 2 days ago by SYS

System Status
Infection Control
Sanitation
Maintenance
Settings

Start Blowdown Cycle  
Edit Schedule  
Help Center

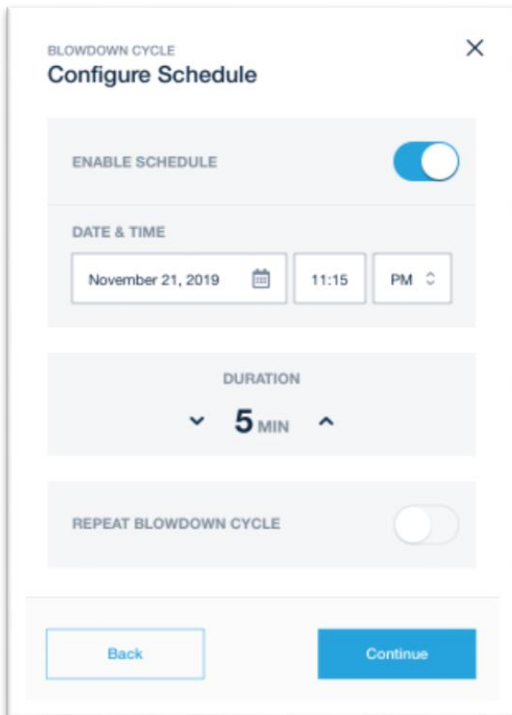
Disclaimer  
Disclaimer Notice  
Before editing the scheduled blowdown cycle, please review and accept the following disclaimer notice:  
**Warning! Risk of severe scalding!**  
The blowdown cycle risks discharging scalding water into the mechanical room and water at excessive temperatures into the drain. Only qualified and authorized personnel who fully understand this function's operation, output and risks, should use this programming menu function. Always read and follow the Instruction and Operation Manual (IOM).  
The owner or manager of this domestic hot water heating system is solely responsible for determining the safe and appropriate measures to protect people, drains equipment and the environment from exposure to high temperature water, flooding, scalding, burning, thermal shock or other hazards, and to control waterborne bacteria from the system.  
By pressing 'ACCEPT', you attest that you are authorized, qualified and in full compliance with protocols, safety practices and requirements, and do you accept full legal liability and assume full responsibility for selecting programming menu functions (including water temperature) that are safe and appropriate for the water drainage system in the facility and as it enters the external environment.  
Exit Accept

L-OMM-0003\_A • 10/8/2021

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Page 80 of 157

### Configure Schedule





**BLOWDOWN CYCLE** ×

**Configure Schedule**

ENABLE SCHEDULE ☒

DATE & TIME

November 21, 2019  11:15 PM 

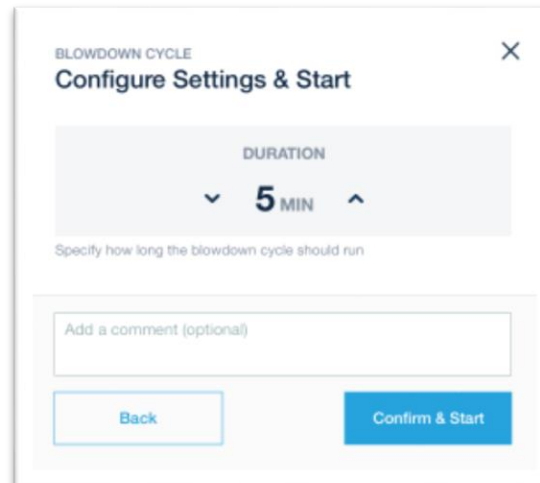
DURATION

▼ 5 MIN ▲

REPEAT BLOWDOWN CYCLE ☐

[Back](#) [Continue](#)

### Start Blowdown Cycle



**BLOWDOWN CYCLE** ×

**Configure Settings & Start**

DURATION

▼ 5 MIN ▲

Specify how long the blowdown cycle should run

Add a comment (optional)

[Back](#) [Confirm & Start](#)

Figure 59 - Blowdown Valve

## 10.3.9 Sanitation Pump

The **Sanitation Pump** screen shows the current status and provides options for starting or scheduling sanitation. The Element can perform three (3) types of sanitation:

- **Sanitation Loop Conditioning:** Eliminates thermal stacking in the water heater volume
- **Water Heater Sanitation Loop:** Thermal self-disinfection of the water heater volume
- **Full System Sanitation:** Thermal disinfection of the DHW loop

### 10.3.9.1 Sanitation Loop Conditioning

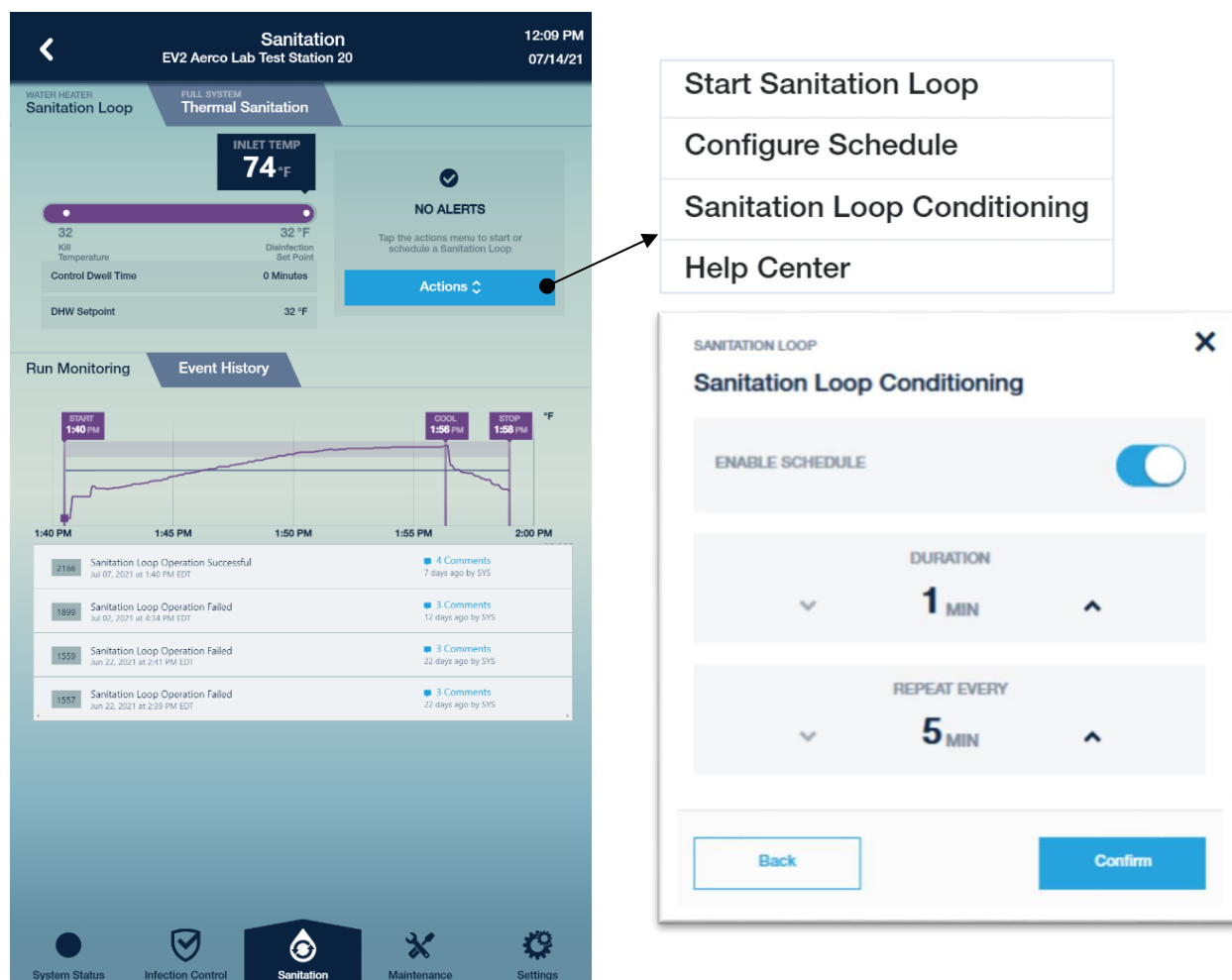


Figure 60 - Sanitation Loop Conditioning

Set to enable schedule. Set the conditioning cycle duration and interval between cycles and select Confirm to begin.

### 10.3.9.2 Water Heater Sanitation

**NOTE:** Domestic hot water should be stored above 140°F (60°C) to prevent pathogen proliferation. However, system demand, sizing, stacking, and setpoints may prevent that. Furthermore, the bottom of the tank is susceptible to biofilm growth given the potential for sediment settling. It is recommended to regularly perform a water heater sanitation cycle at elevated temperatures for a specific duration in order to be confident of pathogen removal. The temperature and dwell time in lab environments have been shown to be effective in reducing microbial populations including Legionella, however in the field there are many different parameters to account for including the insulating properties of biofilm, thermal loss through the system, thermal resistance of various bacteria, etc.

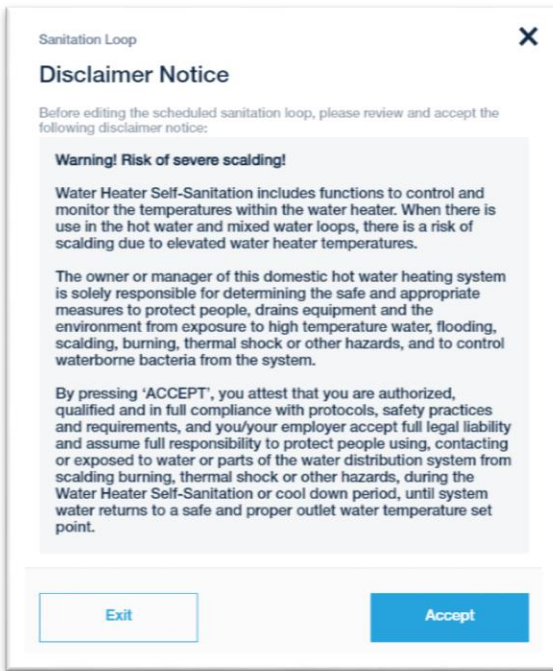
It is generally agreed that in a laboratory setting, a temperature of 122°F (30°C) results in an equilibrium point where certain species of Legionella are proliferating and dying at the same rate. Legionella populations begin to reduce at higher temperatures and per the following texts, Legionella die rapidly at temperatures above 158°F (70 °C):

ASHRAE. 2020. Guideline 12 – Managing the Risk of Legionellosis Associated with Building Water Systems

USEPA. 2016. [Technologies for Legionella Control in Premise Plumbing Systems](#): Scientific Literature Review. EPA 810-R-16-001. US EPA Office of Water.

Regular testing for Legionella and regular water heater sanitation cycles in compliance with ASHRAE 188 is recommended as part of your building's Water Management Plan.

Before starting the sanitation loop, review and accept the disclaimer notice.



### **WARNING:**

There is a risk of severe scalding with raising the temperature of the water heater. Only authorized personnel should initiate a water heater sanitation loop cycle.



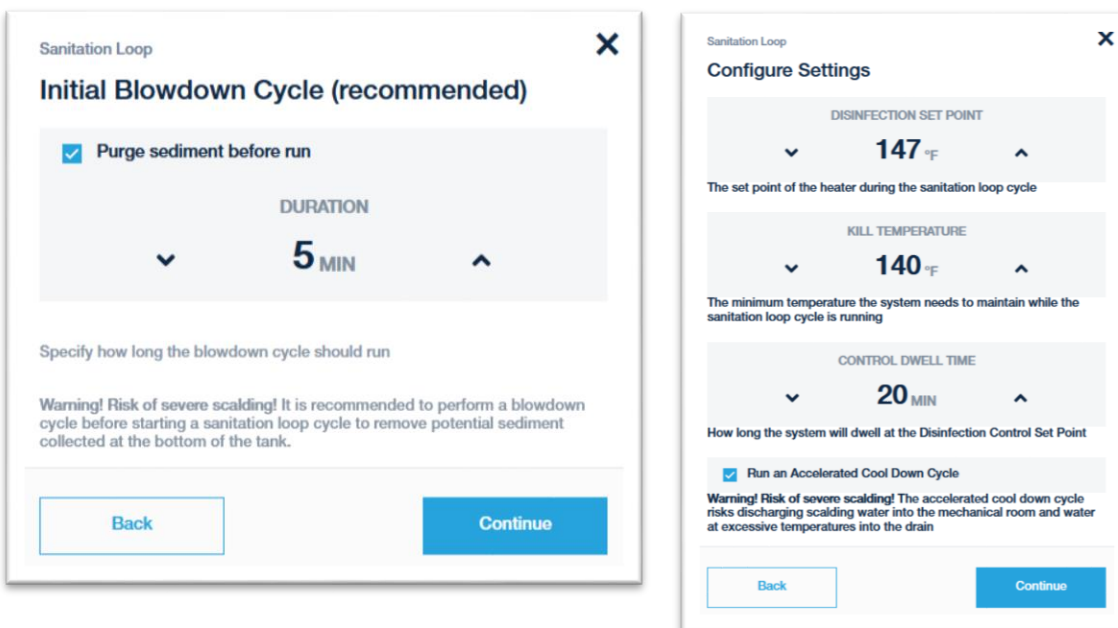


Figure 61 - Sanitation Loop

**CAUTION**

Discharging water at elevated temperatures may cause scalding.  
Discharging water at elevated temperatures into the DWV system may cause drain line damage. Follow local codes and regulations. A corresponding discharge of cold water may be needed in order to temper the water.

Before performing a water heater sanitation loop, it is recommended to perform a blowdown cycle to remove any collected sediment at the bottom of the water heater tank. Physically removing potential biofilm will assist in disinfection. It is unknown how much sediment is present, so set the duration based on the experience of the last blowdown cycle and observe how long it took to have discharge without sediment present.

Next, set the temperature and duration for the sanitation loop. The *disinfection setpoint* is the control signal given to the water heater to raise the temperature temporarily. The *kill temperature* is the control measure to ensure that a minimum temperature is reached. Once the kill temperature is reached, the timer begins associated with the *control dwell time*. If the water heater temperature goes below the kill temperature during the sanitation loop for a time period, the cycle will fail and the setpoint will return to the previous setting.

**Note:** Perform sanitation loop during a period of low demand to better control temperature.

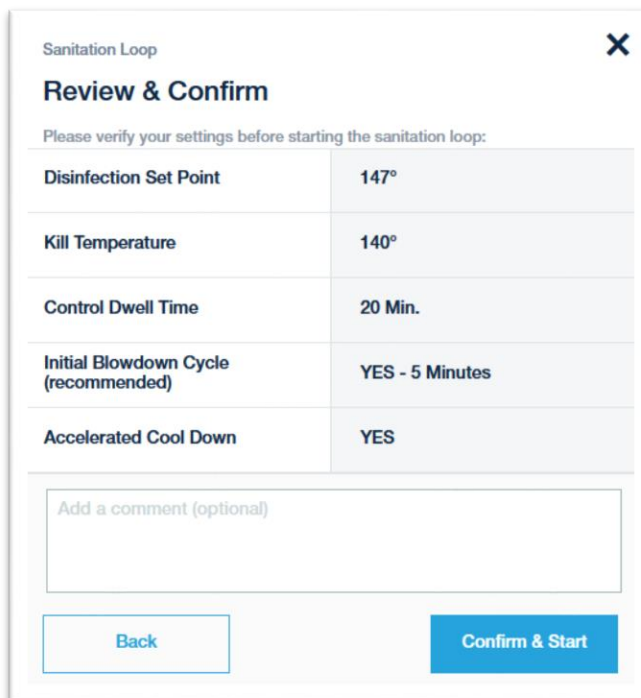
There is the option of an *Accelerated Cool Down Cycle* where the volume returns to setpoint quickly by purging the hot water from the volume and bringing in cold makeup water. The duration of the cycle depends on the temperatures set during the sanitation loop and the incoming cold water. Alternatively, if the accelerated cool down cycle is not selected, the water will remain at temperature with the setpoint returned to the previous setting.

**WARNING**

A demand for hot water may cause scalding as downstream mixing valves and fittings may not be able to compensate for the elevated temperature.



The Element's mixed output compensates for this rise in temperature, so the temperature will be controlled to the mixed output setpoint and control limits once reaching steady state.



The screenshot shows a 'Sanitation Loop' window with a close button (X) in the top right corner. The title is 'Review & Confirm'. Below the title is a prompt: 'Please verify your settings before starting the sanitation loop:'. A table lists the following settings:

Disinfection Set Point	147°
Kill Temperature	140°
Control Dwell Time	20 Min.
Initial Blowdown Cycle (recommended)	YES - 5 Minutes
Accelerated Cool Down	YES

Below the table is a text input field with the placeholder 'Add a comment (optional)'. At the bottom are two buttons: 'Back' and 'Confirm & Start'.

**Figure 62 - Sanitation Loop**

A confirmation screen will display to review the settings provided. Adding a comment to the process will include it in the generated event.

### 10.3.9.3 Full System Thermal Sanitation

The **Thermal Sanitation** screen shows the current status and allows the user to start a Thermal Sanitation or Add More Time.

It is recommended to include full system thermal sanitation cycles and regular testing for Legionella in your building's Water Management Plan, in compliance with ASHRAE 188.

### 10.3.10 Monitoring

Most components allow information to be monitored through the **Monitoring** tab of each menu. The **Monitoring** menu records previous variables and allows users to view previous temperatures from various timeframes.

### 10.3.11 Event History

Each component allows information to be stored and reviewed in the **Event History** tab of each menu. The **Event History** displays open and closed requests and allows users to add comments as needed:

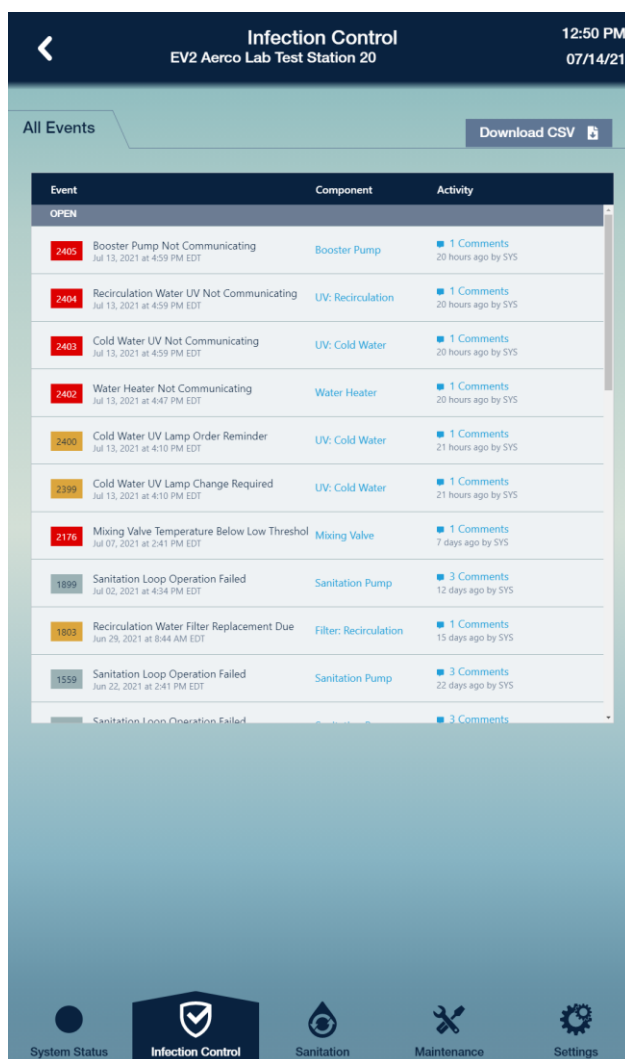
Monitoring		Event History	Last 30 Days
Event	Activity		
1828 Water Heater Communication Reestablished Jun 29, 2021 at 3:52 PM EDT	2 Comments 7 days ago by SYS		
1824 Water Heater Temperature Returned To Allowable Range from Jun 29, 2021 at 2:23 PM EDT	2 Comments 15 days ago by SYS		
1574 Water Heater Temperature Returned To Allowable Range from Jun 23, 2021 at 9:51 AM EDT	2 Comments 15 days ago by SYS		
1575 Water Heater Communication Reestablished Jun 23, 2021 at 9:55 AM EDT	2 Comments 15 days ago by SYS		
1577 SET failed Jun 23, 2021 at 10:55 AM EDT	1 Comments 21 days ago by SYS		
1576 Water Heater Temperature Setpoint Updated Jun 23, 2021 at 10:55 AM EDT	1 Comments 21 days ago by SYS		
1573 Water Heater Temperature Below Low Threshold Setpoint Jun 23, 2021 at 9:51 AM EDT	1 Comments 21 days ago by SYS		
1432 Water Heater Communication Reestablished Jun 18, 2021 at 3:54 PM EDT	2 Comments 21 days ago by SYS		
1412 Water Heater Temperature Returned To Allowable Range from Jun 18, 2021 at 8:48 AM EDT	2 Comments a month ago by SYS		
1390 Water Heater Communication Reestablished Jun 17, 2021 at 4:07 PM EDT	2 Comments a month ago by SYS		
1384 Water Heater Temperature Returned To Allowable Range from Jun 17, 2021 at 3:31 PM EDT	2 Comments a month ago by SYS		

System Status
Infection Control
Sanitation
Maintenance
Settings

Figure 63 - Event History

### 10.3.12 Infection Control

Infection Control displays all events related to the Element. This list shows the event, component and activity beginning with the most recent activity:



The screenshot shows the 'Infection Control' interface for 'EV2 Aerco Lab Test Station 20'. It displays a list of events under the 'All Events' tab. The events are sorted by date, with the most recent at the top. Each event entry includes an event number, a description, a component, and a link to view comments.

Event	Component	Activity
OPEN		
2405 Booster Pump Not Communicating Jul 13, 2021 at 4:59 PM EDT	Booster Pump	1 Comments 20 hours ago by SYS
2404 Recirculation Water UV Not Communicating Jul 13, 2021 at 4:59 PM EDT	UV: Recirculation	1 Comments 20 hours ago by SYS
2403 Cold Water UV Not Communicating Jul 13, 2021 at 4:59 PM EDT	UV: Cold Water	1 Comments 20 hours ago by SYS
2402 Water Heater Not Communicating Jul 13, 2021 at 4:47 PM EDT	Water Heater	1 Comments 20 hours ago by SYS
2400 Cold Water UV Lamp Order Reminder Jul 13, 2021 at 4:10 PM EDT	UV: Cold Water	1 Comments 21 hours ago by SYS
2399 Cold Water UV Lamp Change Required Jul 13, 2021 at 4:10 PM EDT	UV: Cold Water	1 Comments 21 hours ago by SYS
2176 Mixing Valve Temperature Below Low Threshold Jul 07, 2021 at 2:41 PM EDT	Mixing Valve	1 Comments 7 days ago by SYS
1899 Sanitation Loop Operation Failed Jul 02, 2021 at 4:34 PM EDT	Sanitation Pump	3 Comments 12 days ago by SYS
1803 Recirculation Water Filter Replacement Due Jun 29, 2021 at 8:44 AM EDT	Filter: Recirculation	1 Comments 15 days ago by SYS
1559 Sanitation Loop Operation Failed Jun 22, 2021 at 2:41 PM EDT	Sanitation Pump	3 Comments 22 days ago by SYS
Sanitation Loop Operation Failed		3 Comments

At the bottom of the interface, there is a navigation bar with icons for System Status, Infection Control (selected), Sanitation, Maintenance, and Settings.

Figure 64 - Infection Control

### 10.3.13 Comments

Users have the option to add comments within the Event History. Open Events and closed Events display a log of comments along with date and timestamp. To view, add or edit a comment select the component, scroll to the **Event History** tab and select the desired Event. In the Activity column, click the blue link.

Event	Activity
OPEN	
CLOSED	
2440 IO Board Resumed Operation Jul 14, 2021 at 9:05 AM EDT	2 Comments 4 hours ago by SYS

The example below displays previous comments along with the option to reopen (closed) events or add a new comment:

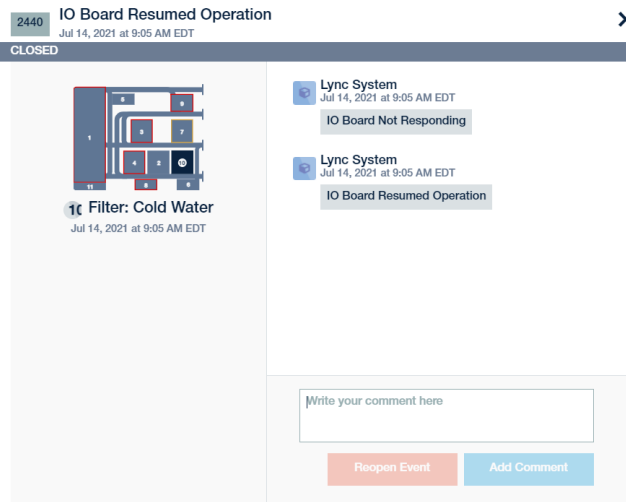


Figure 65 - Comments

## 10.4 Settings

The Settings menu allows users to create and manage user accounts, edit network connection, change unit details, update software and create system backups. The following section will provide information on how to edit the settings.



Figure 66 - Settings

### 10.4.1 User Accounts

Create and manage user accounts by navigating the menu as referenced below:

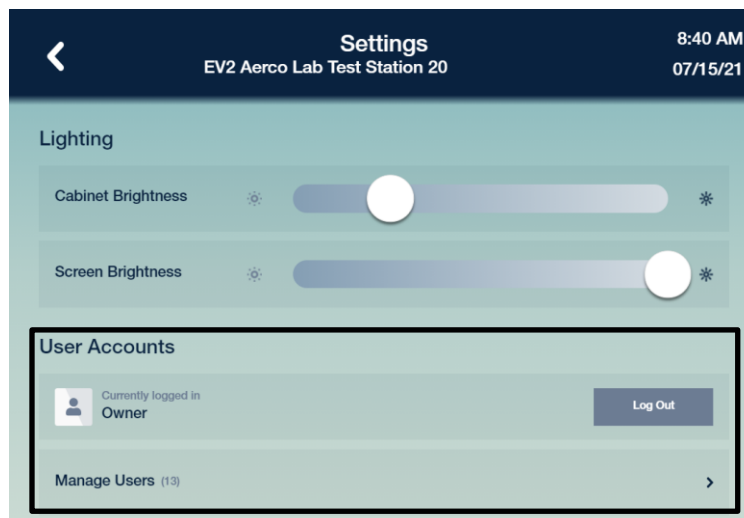
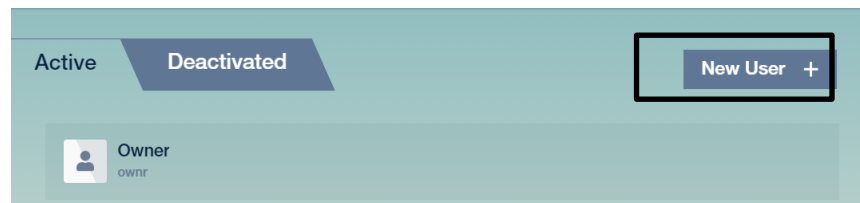


Figure 67 - User Accounts

To Create a New User select **Manage Users > New User**.



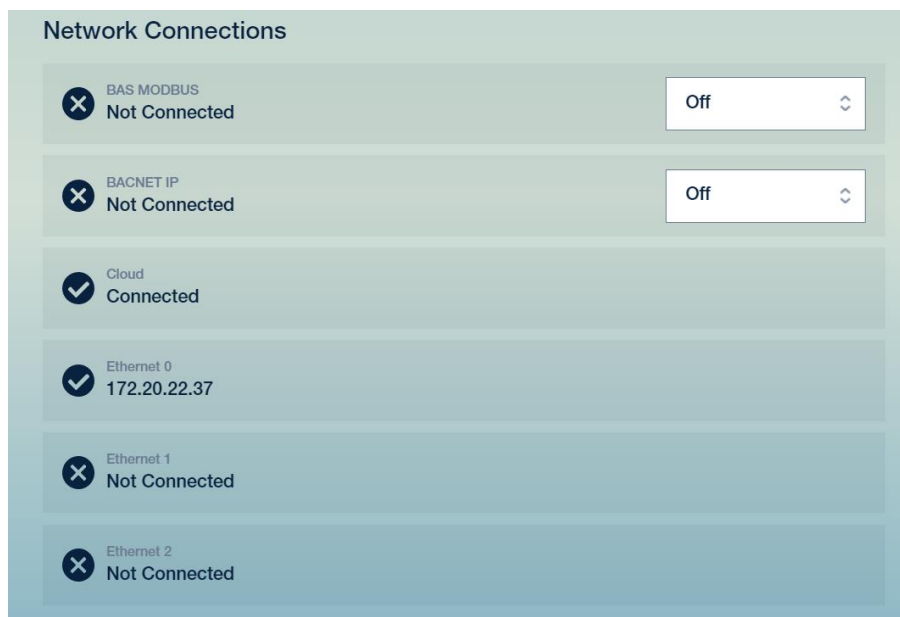
1. Fill in the required information and select **Continue**:

A screenshot of a 'Add New User' form. The form has a title bar with a close button (X). It contains five input fields: 'FIRST NAME', 'LAST NAME', 'USERNAME', 'PHONE NUMBER', and 'ROLE'. Each of the first four fields has a red border and a red error icon (a circle with an exclamation mark) to its right. Below each of these fields is a red error message: 'NAME MUST BE BETWEEN 1 AND 50 CHARACTERS' for the first three, and 'PHONE NUMBER MUST BE VALID' for the phone number field. The 'ROLE' field has a dropdown arrow and an information icon (i). At the bottom of the form are two buttons: 'Cancel' and 'Continue'.

2. The system then prompts the user to create a 4-digit pin number.

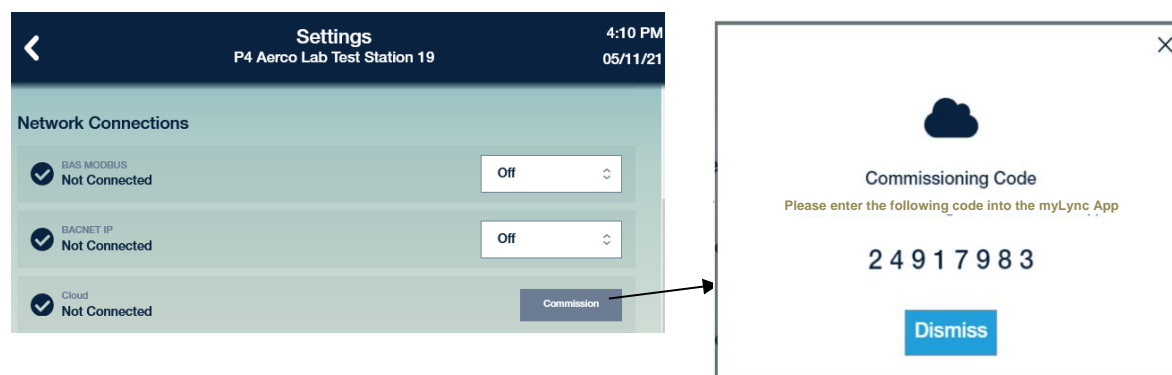
### 10.4.2 Network Connections

Network connection settings can be viewed in the screen below.

**Figure 68 - Network Connections**

### 10.4.3 Cloud Connectivity

To experience the full benefit of the Element through the myLync remote experience, connect the unit to the cloud by way of local network connection. This is done by Cloud-Commissioning the unit. Once a connection to the internet has been established and you have created a site within the myLync app, click on the **Commission** button as shown below.

**Figure 69 - Cloud-Commission Unit**

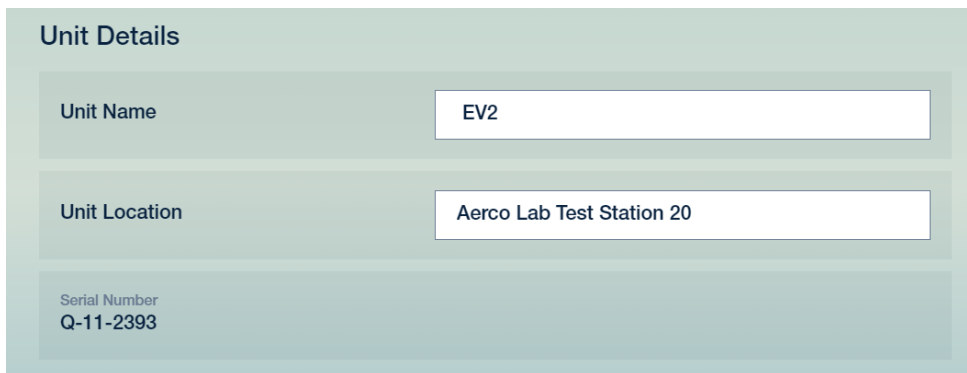
This creates a unique, temporary cloud commissioning code. Add a unit to the site within the myLync app and when prompted, enter the code to link the unit with the site, building, or plant.

#### **WARNING**

Watts is not responsible for alert failures or loss of remote control connectivity due to external connectivity or power issues.

### 10.4.4 Unit Details

Unit details, serial number and full model number are shown further down the settings page.



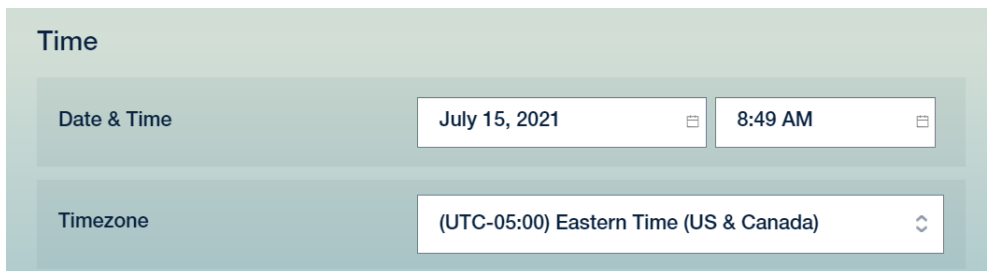
Unit Details

Unit Name	EV2
Unit Location	Aerco Lab Test Station 20
Serial Number	Q-11-2393

Figure 70 - Unit Details

### 10.4.5 Time

Select the boxes as shown below to change date, time and time zone.



Time

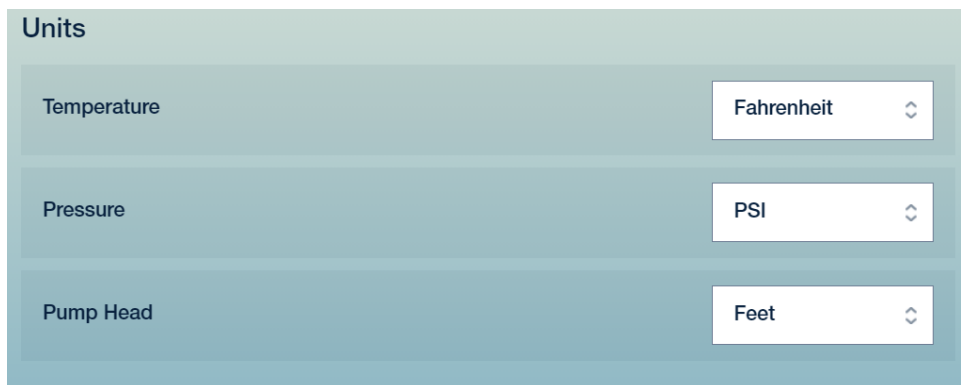
Date & Time	July 15, 2021	8:49 AM
Timezone	(UTC-05:00) Eastern Time (US & Canada)	

Figure 71 - Time and Date

### 10.4.6 Units

Units displayed can be changed in the drop-down menus below. Temperature can be displayed in either Fahrenheit or Celsius; Pressure in PSI or Bar; and Pump Head in Feet or Meters.

**Note:** The units displayed in the mobile experience are specific to the user.



Units

Temperature	Fahrenheit
Pressure	PSI
Pump Head	Feet

Figure 72 - Units

## 10.4.7 Software Update

### 10.4.7.1 Installing Updates

To update software on the Element click **Install Update** and follow the prompts. Perform a cloud update if the unit is cloud-commissioned, or use a file loaded onto a USB memory stick.

The current system can be backed up onto a USB memory stick or restored from a previous backup. This is typically only necessary for units that are not cloud-commissioned as the data is already backed up in the secure Azure cloud servers while connected to the network.

Previous backups and versions of EdgeSC firmware can be managed from this screen.

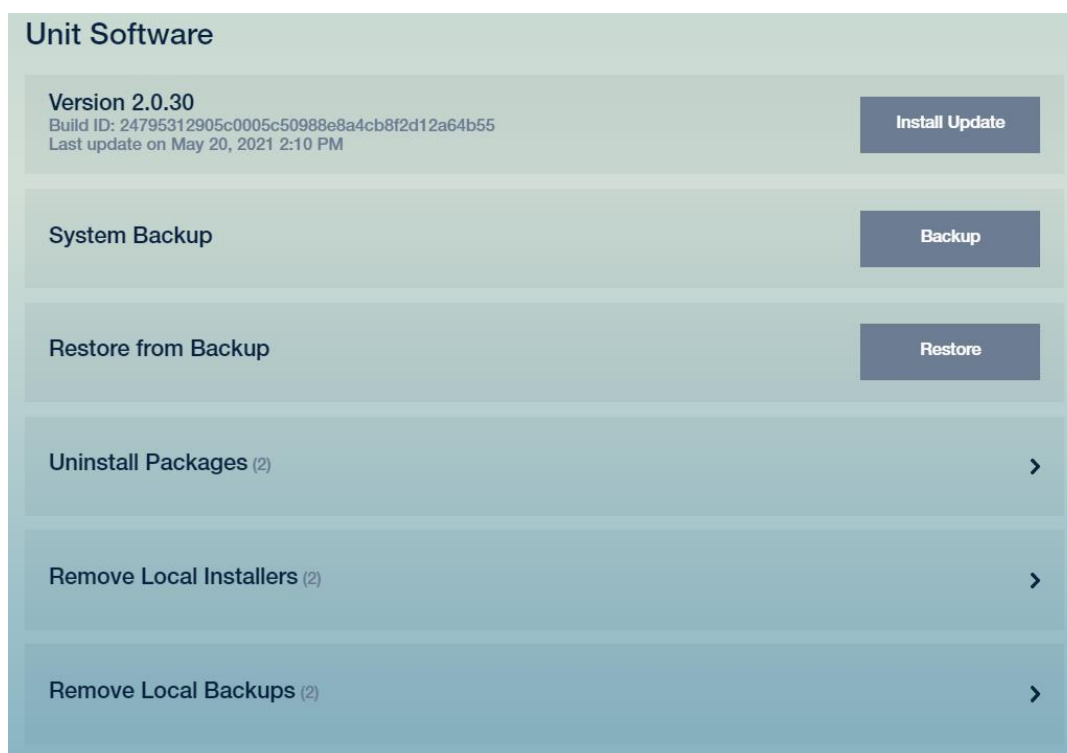


Figure 73 - Unit Software

### 10.4.7.2 System Backup

To perform a system backup, plug in the USB memory stick. Select **Backup** in the System Backup menu. Begin the Back Up process by selecting **Start Backup** on each menu prompt.

### 10.4.7.3 Presence Sensor and Screen Dimming

The screen will dim approximately 5 minutes after the Element does not detect a person in front of it. The screen may not dim because either an alert needs to be reviewed or something has changed in the surrounding environment.

## 10.5 BAS Modbus Points

Modbus can be utilized to connect to a remote BAS or BMS in order to read (not write to) Element data.



### 10.5.1 Communication Specification

Communication Protocol	Modbus over RS485
Physical Layer	RS485 Two-Wire plus Signal Ground
Baud Rate	2400, 9600, 19200, 57.6k, 115k) (default 19200 bps)
Recommended Cable	18 AWG Shielded Twisted-Pair (STP)
Transmission Mode	RTU or ACSII (default RTU)
Maximum Cable Length	Without terminating resistors
	- 115,000 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
	- 115,000 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)

### 10.5.2 Troubleshooting

If there is no communication, check the following:

- Check that the polarity on the Modbus + and - terminals is correct
- Check that the Modbus GDN terminal is securely connected.
- Check that the Baud Rate on both devices is the same.

If the communication is intermittent, check the following:

- Check that the communication cable is twisted pair type.
- Reliable communication depends on the cable length & Baud Rate used. Long cable length may require a lower baud rate.

### 10.5.3 Modbus Points List

The Modbus communication point list is stated below:

**TABLE 5-1: Modbus points list**

name	address	type	length	topic
bas_modbus_id	0x0001	holding	1	system/bas_modbus_id
bas_modbus_baud	0x0002	holding	2	system/bas_modbus_baud
bas_modbus_data_bits	0x0004	holding	1	system/bas_modbus_data_bits
bas_modbus_stop_bits	0x0005	holding	1	system/bas_modbus_stop_bits
bas_modbus_parity	0x0006	holding	1	system/bas_modbus_parity
bas_modbus_commit_settings	0x0007	holding	1	
bas_modbus_last_connect	0x0008	input	2	system/bas_modbus_last_connect
bacnet_id	0x0009	holding	1	system/bacnet_id
bacnet_commit_settings	0x000A	holding	1	
snooze_timestamp	0x000B	input	2	system/snooze_timestamp
occupancy_detected	0x0064	input	1	enclosure/occupancy_detected
ambient_light_level	0x0065	holding	1	enclosure/ambient_light_level
cold_inlet_actual_temp	0x00C8	input	1	cold_inlet/actual_temp
cold_sediment_status	0x012C	input	1	cold_inlet/sediment_filter/status
cold_sediment_pre_pressure	0x012D	input	1	cold_inlet/sediment_filter/pressure_before
cold_sediment_post_pressure	0x012E	input	1	cold_inlet/sediment_filter/pressure_after
cold_sediment_pressure_delta	0x012F	input	1	cold_inlet/sediment_filter/pressure_delta
cold_sediment_replace_pending	0x0130	input	1	cold_inlet/sediment_filter/replace_pending
cold_sediment_order_pending	0x0131	input	1	cold_inlet/sediment_filter/order_pending
cold_sediment_baseline_pending	0x0132	input	1	cold_inlet/sediment_filter/baseline_pending
cold_sediment_pressure_baseline	0x0133	input	1	cold_inlet/sediment_filter/pressure_baseline
cold_sediment_percent_remaining	0x0134	input	1	cold_inlet/sediment_filter/percent_remaining
cold_sediment_filter_ordered	0x0139	input	1	cold_inlet/sediment_filter/filter_ordered
cold_sediment_replace_threshold	0x013A	holding	1	cold_inlet/sediment_filter/replace_threshold
cold_sediment_order_threshold	0x013B	holding	1	cold_inlet/sediment_filter/order_threshold
anti_scaling_status	0x0190	input	1	cold_inlet/anti_scaling/status
anti_scaling_media_lifetime	0x0191	input	1	cold_inlet/anti_scaling/media_lifetime
anti_scaling_media_life_rem	0x0192	input	1	cold_inlet/anti_scaling/media_life_rem
anti_scaling_percent_remaining	0x0193	input	1	cold_inlet/anti_scaling/percent_remaining
anti_scaling_order_threshold	0x0198	holding	1	cold_inlet/anti_scaling/order_threshold
anti_scaling_replace_threshold	0x0199	holding	1	cold_inlet/anti_scaling/replace_threshold
booster_pump_status	0x01F4	input	1	cold_inlet/booster_pump/status
booster_pump_error_code	0x01F5	input	1	cold_inlet/booster_pump/error_code
booster_pump_actual_pressure	0x01F6	input	1	cold_inlet/booster_pump/actual_pressure
booster_pump_setpoint_pressure	0x01F7	holding	1	cold_inlet/booster_pump/setpoint_pressure
booster_pump_low_threshold	0x01F8	holding	1	cold_inlet/booster_pump/low_threshold
booster_pump_high_threshold	0x01F9	holding	1	cold_inlet/booster_pump/high_threshold
cold_uv_status	0x0258	input	1	cold_inlet/uv_disinfect/status

**TABLE 5-1: Modbus points list**

name	address	type	length	topic
cold_uv_error_code	0x0259	input	1	cold_inlet/uv_disinfect/status_info
cold_uv_percent_remaining	0x025A	input	1	cold_inlet/uv_disinfect/percent_remaining
cold_uv_lamp_op_time	0x025B	input	1	cold_inlet/uv_disinfect/lamp_op_time
cold_uv_lamp_life_rem	0x025C	input	1	cold_inlet/uv_disinfect/lamp_life_rem
cold_uv_cumulative_op_time	0x025D	input	1	cold_inlet/uv_disinfect/cumulative_op_time
cold_uv_order_threshold	0x025E	holding	1	cold_inlet/uv_disinfect/order_threshold
cold_uv_replace_threshold	0x025F	holding	1	cold_inlet/uv_disinfect/replace_threshold
recirc_inlet_actual_temp	0x02BC	input	1	recirc_inlet/actual_temp
recirc_diverter_setpoint_position	0x0320	holding	1	recirc_inlet/diverter_valve/manual_setpoint_position
recirc_diverter_actual_position	0x0321	input	1	recirc_inlet/diverter_valve/actual_position
recirc_diverter_operation_status	0x0322	input	1	recirc_inlet/diverter_valve/operation_status
recirc_sediment_status	0x0384	input	1	recirc_inlet/sediment_filter/status
recirc_sediment_pre_pressure	0x0385	input	1	recirc_inlet/sediment_filter/pressure_before
recirc_sediment_post_pressure	0x0386	input	1	recirc_inlet/sediment_filter/pressure_after
recirc_sediment_pressure_delta	0x0387	input	1	recirc_inlet/sediment_filter/pressure_delta
recirc_sediment_replace_pending	0x0388	input	1	recirc_inlet/sediment_filter/replace_pending
recirc_sediment_order_pending	0x0389	input	1	recirc_inlet/sediment_filter/order_pending
recirc_sediment_baseline_pending	0x038A	input	1	recirc_inlet/sediment_filter/baseline_pending
recirc_sediment_pressure_baseline	0x038B	input	1	recirc_inlet/sediment_filter/pressure_baseline
recirc_sediment_percent_remaining	0x038C	input	1	recirc_inlet/sediment_filter/percent_remaining
recirc_sediment_replace_threshold	0x0391	holding	1	recirc_inlet/sediment_filter/replace_threshold
recirc_sediment_order_threshold	0x0392	holding	1	recirc_inlet/sediment_filter/order_threshold
recirc_sediment_filter_ordered	0x0393	input	1	recirc_inlet/sediment_filter/filter_ordered
recirc_uv_status	0x03E8	input	1	recirc_inlet/uv_disinfect/status
recirc_uv_error_code	0x03E9	input	1	recirc_inlet/uv_disinfect/status_info
recirc_uv_percent_remaining	0x03EA	input	1	recirc_inlet/uv_disinfect/percent_remaining
recirc_uv_lamp_op_time	0x03EB	input	1	recirc_inlet/uv_disinfect/lamp_op_time
recirc_uv_lamp_life_rem	0x03EC	input	1	recirc_inlet/uv_disinfect/lamp_life_rem
recirc_uv_cumulative_op_time	0x03ED	input	1	recirc_inlet/uv_disinfect/cumulative_op_time
recirc_uv_order_threshold	0x03EE	holding	1	recirc_inlet/uv_disinfect/order_threshold
recirc_uv_replace_threshold	0x03EF	holding	1	recirc_inlet/uv_disinfect/replace_threshold
hot_supply_actual_temp	0x044C	input	1	hot_supply/actual_temp
water_heater_status	0x04B0	input	1	hot_supply/water_heater/status

## 11 LYNC Q WATER HEATER OPERATION

### 11.1 Temperature and Pressure Relief Valve(s)

A Temperature and Pressure Relief Valve(s) sized in accordance with ASME Boiler and Pressure Vessel Code, Section IV HLW is installed in the tank.

#### **WARNING!**

Secure relief valve discharge pipe to a suitable floor drain so hot water does not splash during discharge. Hot water discharge can result in property damage, personal injury or death.

- Follow the temperature and pressure relief valve manufacturer's installation instructions and all local, regional and national codes applicable to temperature and pressure relief valve installation and discharge piping.
- The relief valve discharge pipe must not be smaller than the relief valve opening and must be secured to prevent it from lifting out of the drain under discharge pressure and must be routed to allow complete drainage of the valve and line.
- Do not plug the relief valves or install a reducing coupling, valve or other restriction in the relief valves discharge lines, as this will eliminate the critical water temperature and pressure protection it provides.
- Thermal Expansion - A relief valve that periodically discharges may result from thermal expansion if Element is installed in a system closed by components, such as a backflow preventer or check valve in the cold water supply. These systems must be provided with means to control expansion. Contact a water heater or plumbing professional to resolve this situation.

#### **WARNING!**

Do not plug relief valve(s), use discharge piping smaller than valve opening, or install a reducing coupling, valve or other restriction in the relief valve discharge line. Failure to comply with these requirements can prevent the relief valve from providing its intended temperature and pressure protection, which may result in a sudden loss of pressure containment that can cause property damage, exposure to hazardous materials, personal injury or death.

### 11.2 Electronic Low Water Cut-Off

When the water level is above the electrode position in the tank, pushing the RESET button will energize the control (LED will be lit). The control remains energized until the water level drops below the electrode position (LED will not be lit). Unless otherwise specified, there is a three-second time delay on decreasing water level. Water level must be below tank probe location for full three seconds before control de-energizes. In the event that a low water condition occurs, a failure message will be displayed on the controller touch-screen. This failure lockout can be reset by pressing the LWCO RESET button located on the front control panel. Once the LWCO control board has been reset, the Main Reset button located on the front control panel can be reset as well.

The Electronic Low Water Cut-Off probe is located in the top head of each Element.

**WARNING!**

Turn off all electrical service to the unit before accessing the limit or other controls inside the control cabinet or burner vestibule. Close and fasten the control cabinet and burner vestibule cover before restoring electrical service. The cabinet and burner vestibule contain High Voltage wiring and terminals. If the electrical service is not turned off and these terminals are touched, a dangerous shock causing property damage, personal injury or death could occur.

### 11.3 Operating Temperature Control

An adjustable digital operating control is located in the front control panel. This control is continuously updated by the EdgeSC controller so any adjustment will be reset unless there is a communication error. It is not recommended to adjust the water heater temperature directly onto the Lync Q water heater unless performing troubleshooting.

### 11.4 High Water Temperature Limit

The Electronic Operating Control System (EOS) includes a single probe that contains the limit and operating sensors. Since both sensors are in the same location in the heated storage tank, the EOS checks to be sure their output is within a degree or two of each other. If not, or if the maximum water temperature exceeds 200°F, the EOS will lockout and the manual Reset button on the control panel must be pressed before the water heater will resume operation.

## 11.5 Electronic Operating System (EOS)

The Electronic Operating System (EOS) consists of three components:

- The Platform Ignition Module (PIM)
- A plug-in ID card,
- The Control Display.

The PIM is connected to the control display using an RJ485 patch cable. This cable provides all communication between the PIM and display as well as power to the display.

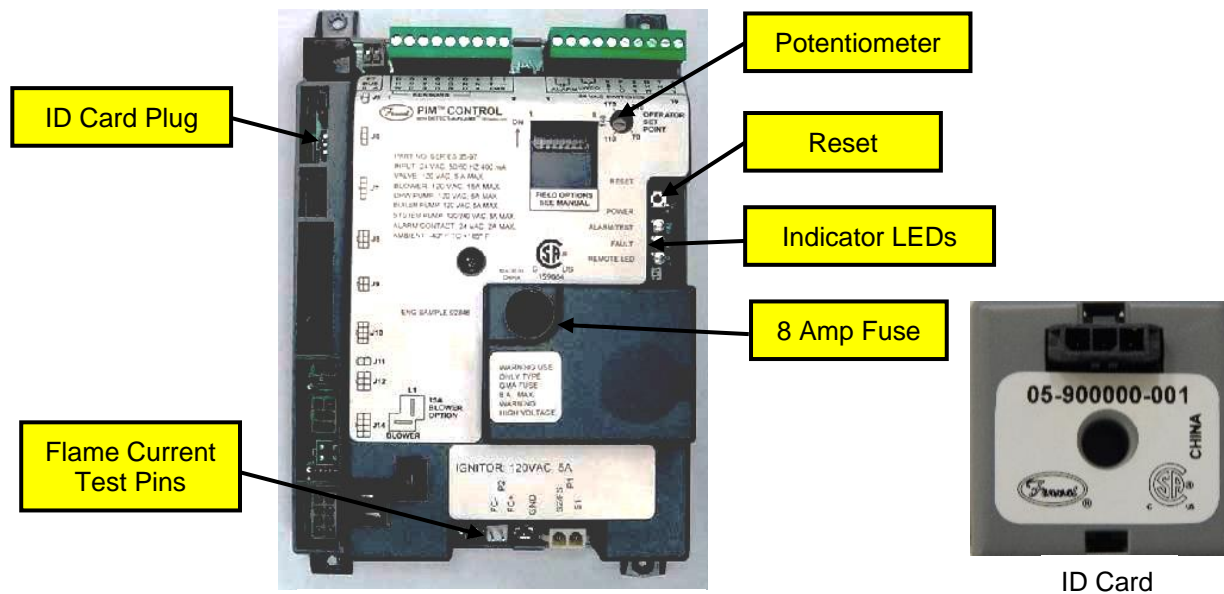


Figure 74 Platform Ignition Module (PIM)

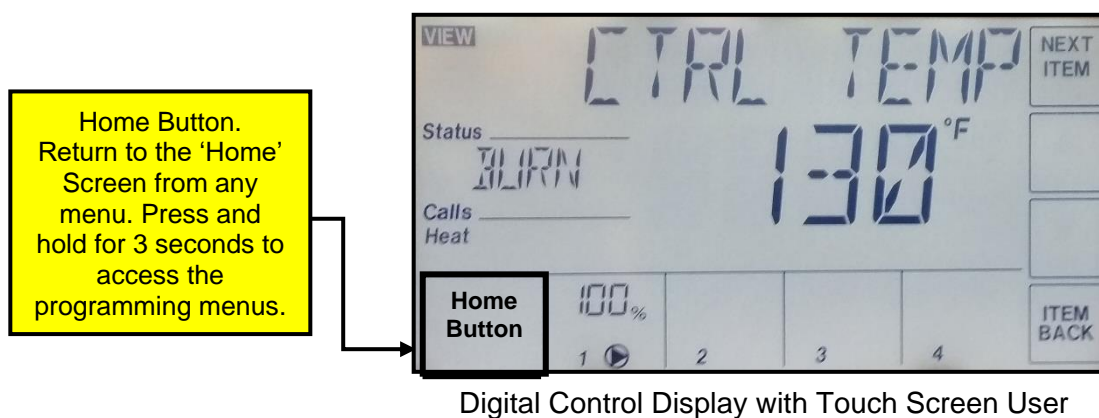


Figure 75 Touch Screen User Interface (BTC II)

### 11.5.1 Touch Screen User Interface

The EOS touchscreen provides one-touch access to view and adjust various Menu setpoints. The touchscreen displays Status Fields, Items, Water Heater Output and Number Fields. It also contains buttons for navigation & adjustment, and the Home Button to access menu selections.

### 11.5.2 Status Field Display

The Status Field displays the current operating status of the control display. Most items in the status field are only visible when in the View Menu or an alarm condition is present.

Item	Description
<b>SANI</b>	Sanitation Mode: Momentarily energizes a field installed sanitation pump and operates the water heater at an elevated setpoint temperature.
<b>HAND</b>	Hand Mode: allows user to manually control the operation and firing rate of the burner.
<b>OFF</b>	System has been disabled in the Manual Override Menu.
<b>PURG</b>	Purge: Individual pumps have been activated in the Manual Override Menu.
<b>IDLE</b>	EOS is Idle due to no demand for heat.
<b>ARSW</b>	EOS is attempting to purge but waiting for air proving switch to prove blower air flow.
<b>PREP</b>	EOS is Pre-Purging the burner system.
<b>IGN</b>	Hot Surface Igniter is hot and gas valve has opened to attempt ignition (4 seconds).
<b>BURN</b>	Burner has ignited and flame has been sensed.
<b>POST</b>	The Call for Heat has ended and the EOS is Post-Purging the burner system.

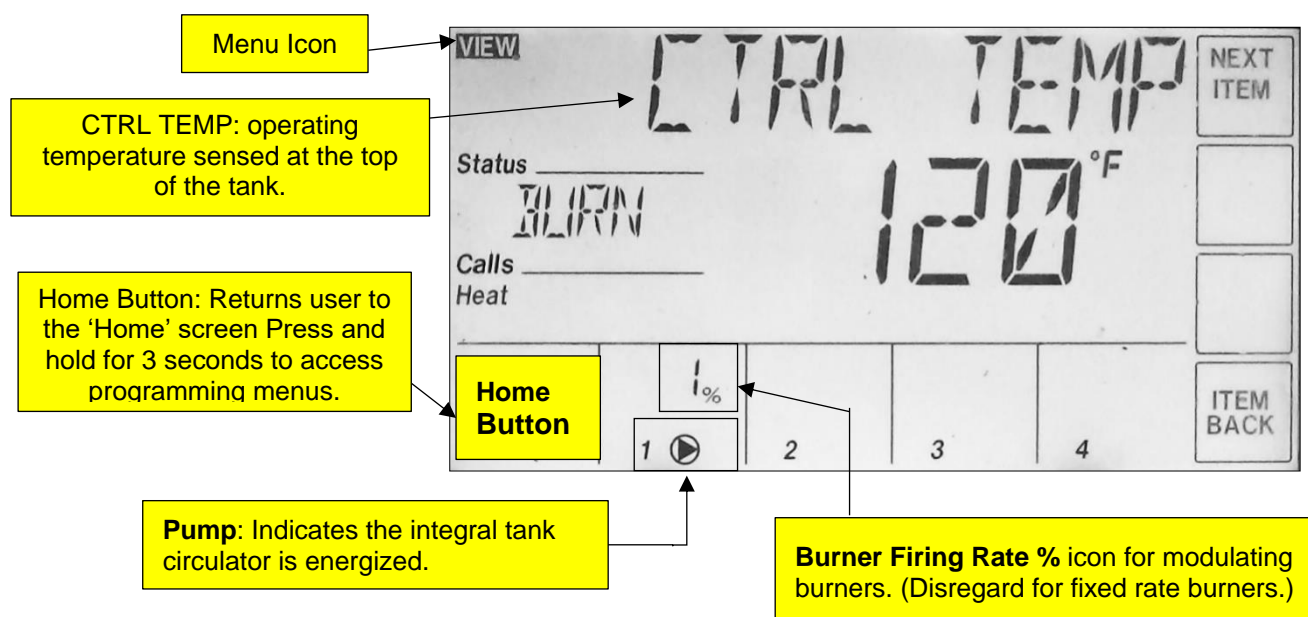
### 11.5.3 Operational Sequence Field Display

The EOS displays the following burner operational sequence, ignition status, timings, temperatures and values:

Item	Value Displayed	Description
<b>SATISFIED</b>	<b>°F</b>	No Call For Heat based on temperature at the top of the tank
<b>CALL FOR</b>	<b>HEAT</b>	Initiated when the temperature sensed at the control sensor at the top of the tank is 5 degrees less than the setpoint temperature.
<b>BLOWER</b>	<b>mm:ss</b>	Displays the pre-purge time countdown until the igniter heat up begins
<b>IGNITION</b>	<b>mm:ss</b>	Displays heat up time until gas valve opens
<b>CURRENT</b>	<b>0 - 10.0 <math>\mu</math>A</b>	Flame Current ( $\mu$ A)
<b>CTRL TEMP</b>	<b>°F</b>	Flame is established and the temperature sensed at the control sensor at the top of the tank is displayed.
<b>BLOWER</b>	<b>mm:ss</b>	When call for heat has ended the post purge time countdown is displayed.



### 11.5.4 View Menu (Home Screen - Default Display)



**Figure 76 - Home Screen - Default Display**

The **VIEW** menu is the default display (home screen) of the EOS control system and displays general operation and status information. The default display includes a **Burner** firing rate % icon for modulating Elements (disregard for fixed rate burners), a **Pump** icon visible whenever the integral tank circulator is energized, and Failure Messages for alarms or error conditions.

Use the **NEXT ITEM** and **ITEM BACK** buttons to scroll and view the View Menu Item Fields and their associated values. The Item Field descriptions are listed below:

Item Field	Description
<b>SETPOINT</b>	Display screen displays the current operating setpoint but does not allow the user to make changes in this menu.
<b>VENT</b>	Displays the current flue gas temperature as measured by the flue gas sensor located in the flue outlet.
<b>TANK TOP</b>	Displays the current temperature at the top of the Element's tank as measured by the operating control sensor located near the hot outlet.
<b>TANK BOT</b>	Displays current temperature at the bottom of tank as measured by the control sensor responsible for regulating the operation of the integral tank circulator.
<b>TANK ΔT</b>	Displays temperature difference between TANK TOP and TANK BOT sensors.
<b>FLAME CUR</b>	Displays burner flame current in approximate $\mu\text{A}$ dc. Since this is an approximation it is recommended that a flame current measurement be taken at the PIM control board using a micro-amp meter.
<b>TIME</b>	Displays the real time as programed in the TIME menu.



### 11.5.5 Control System Menus

The control display has multiple access levels. System critical settings will not be available for adjustment. Settings that can be adjusted will display UP and DOWN arrows on the right side of the display. These programmable menu items are located in the Control System Menu.

To access the Control System Menu:

1. Press and hold the **HOME** button for 3 seconds.
2. Press **NEXT ITEM** to navigate to the next menu. Touch **ITEM BACK** to go reverse.
3. Press **ENTER** to change user accessible menu item settings in the control system menus.
4. Most settings are in the USER access level. Other setting will be located in the INSTaller or ADVanced access level depending on the necessity for field adjustment. See Section 10.12: *Using Tool Box Menu* for details.

Menu	Description
<b>SETUP</b>	Displays and modifies the temperature control setpoints for the burner, integral tank circulator and the SANI functions
<b>SOURCE</b>	Displays factory programmed settings which can be adjusted with the the up and down arrows
<b>MONITOR</b>	Displays operational information such as water and vent temperatures, hours of operation, and number of cycles
<b>TIME</b>	Sets the time, day and year. Setting the time is necessary when using the scheduled setback
<b>SCHEDULE</b>	Allows the user to create a schedule for reducing the water heater's setpoint when a building is unoccupied for a period of time
<b>NETWORK</b>	Displays and modifies parameters for creating a Modbus communication connection with the water heater
<b>OVERRIDE</b>	Allows the user to assume manual control of the burner operation and pumps
<b>TOOLBOX</b>	Displays alarm message history. Changes User access level and reset to factory default settings

**Figure 11-4 - Control System Menu Descriptions**

### 11.5.6 Changing the Vent Material Type (ADVanced Level Access)

If the cold inlet water temperature is above 100°F, the use of solid CPVC, Polypropylene or Stainless Steel venting is required, and the vent limit switch must be adjusted for the higher temperature rating allowed by these vent materials.

**To Change Vent Type Value:**

1. From the **VIEW** menu, press and hold the **HOME** button for 3 seconds to enter the **CONTROL SYSTEM** menu. The first menu displayed is **SETUP** menu.
2. Touch the **NEXT ITEM** or **ITEM BACK** buttons to navigate to the **TOOLBOX** menu.
3. Touch the **ENTER** button to display the **ACCESS** screen.
4. Depending on control software version, the ADVANCED level can be selected using the **UP** and **DOWN** buttons. Subsequent software revisions will require that button #4 (bottom right corner) be pressed and held in order to place the control in the ADVANCED access level.

5. Exit the menu by pressing the **HOME** button.
6. Use the **NEXT ITEM** or **ITEM BACK** buttons to navigate to the **SOURCE** menu.
7. Enter the **SOURCE** menu.
8. Use the **NEXT ITEM** or **ITEM BACK** buttons to navigate to the **VENT TYPE** menu.
9. Using the **UP** or **DOWN** arrow buttons, select between the four choices: PVC (default setting), PPS, CPVC or SS.
10. To save, use the **NEXT ITEM** or **ITEM BACK** buttons or press the **HOME** button.

### 11.5.7 Changing the Operating Setpoint (USER Level Access)

The unit operates to satisfy the stored water temperature setpoint of the EOS control. The value of the controls' setpoint is the desired stored tank water temperature. Elements ship with a factory setpoint of 120°F.

Although the setpoint can be displayed in the VIEW menu, it is necessary to enter the **CONTROL SYSTEM** MENU in order to make adjustments to the water heater's setpoint and other operational parameters.

#### To Change the Operating Setpoint:

1. From the VIEW MENU, press and hold the **HOME** button for 3 seconds to enter the Control System Menu. The first menu displayed is the SETUP MENU.
2. Touch the **ENTER** button to display the SETPOINT MENU.
3. Adjust the setpoint value using the **UP** and **DOWN** arrow buttons.
4. To save the new value, touch the **NEXT ITEM** or **ITEM BACK** buttons or exit the menu by pressing the **HOME** button.

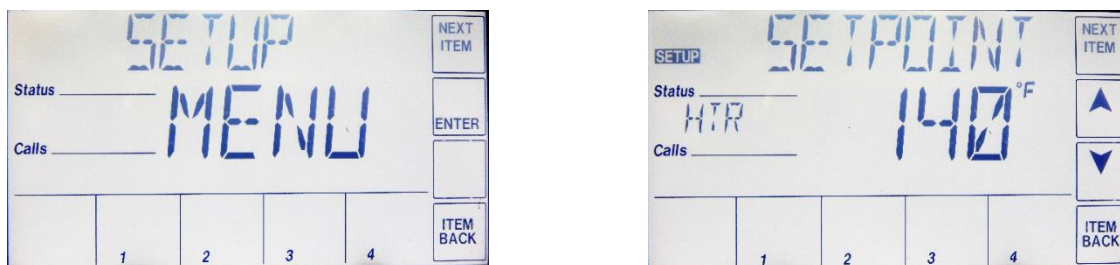


Figure 77 - Changing the Setpoint

### 11.5.8 Setting the Real Time Clock (User & Installer Level Access)

The TIME MENU allows the user to program the time of day, the date and the year. A 12 or 24 hour time clock as well as daylight saving time can be selected. When selected, the time clock can be displayed in the VIEW MENU.

1. Press and hold **HOME** button for 3 seconds to enter **CONTROL SYSTEM** Menu. Use the **NEXT ITEM** button to scroll to the **TIME** menu. Press **ENTER** button to enter **TIME** menu.
2. Use the **NEXT ITEM** button to move to the first screen. Use the UP & DOWN arrow buttons to set the hour, then press the **NEXT ITEM** button to enter the value and move to the minute.

Once the parameters for the time screen have been entered, move to the date and year screen and enter settings in the same manner.

- To display the real time clock in the **VIEW** menu, select daylight saving time or choose between a 12 and 24 hour clock, use the **NEXT ITEM** button to move to the correct screen and then the arrow button to select. Save and exit the menu by pressing the **HOME** button.

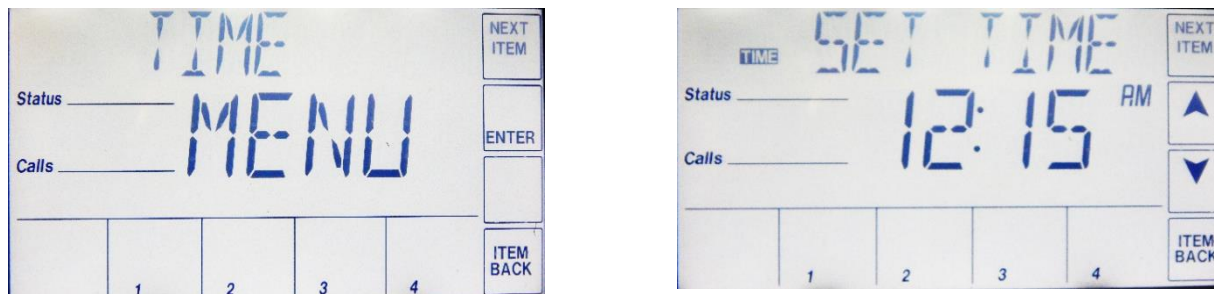


Figure 78 - Setting the Clock

### 11.5.9 Scheduled Setback (USER Level Access)

The **SCHEDULE MENU** allows the user to program the unit to automatically lower, or setback, the operating setpoint when a facility is not occupied, or the use of hot water is curtailed.

- Press and hold the **HOME** button for 3 seconds to enter the Control System Menu. Use the **NEXT ITEM** button to scroll to the **SCHEDULE** menu. Activate the schedule function by first turning on the **HEAT SCHD** using the arrow buttons.
- There are four setback schedule types: 24hr, 5-2, 5-11 and 7DAY. The 24hr schedule (default) is a daily schedule that will follow the same program every day of the week. All other schedule types are selected using the arrow buttons. The 24hr schedule allows for a 2 or 4 EVENT/DAY. The 2 event day provides for one occupied time and one unoccupied time per day. The 4 event day allows for two occupied times and two unoccupied times per day.

**NOTE:** Unoccupied setpoints are programed in the same manner as occupied setpoints.

For example, a 24hr type and a 4 event day schedule might look like this:

- The 1<sup>st</sup> occupied time begins at 6:00am and the 1<sup>st</sup> unoccupied time begins at 11:00am; therefore, the occupied setpoint will be used between 6:00am and 11:00am.
- The 2<sup>nd</sup> occupied period begins at 4:00pm; the 2<sup>nd</sup> unoccupied time begins at 10:00pm.
- Between the 1<sup>st</sup> unoccupied time of 11:00am and the beginning of the 2<sup>nd</sup> occupied period, the unoccupied setpoint will be used.
- At 4:00pm the 2<sup>nd</sup> occupied period will begin and continue until 10:00pm.
- From 10pm until 6:00am, the unoccupied setpoint will then be used.

Note: Schedule times are identified as occupied (**Occ**) or unoccupied (**UnOcc**) here.

- The 5-2 schedule type provides for a 2 or 4 EVENT/DAY but also allows for one schedule to be followed Monday–Friday and another on Saturday and Sunday.
- The 5-11 schedule type provides for a 2 or 4 EVENT/DAY but also allows for one schedule to be followed Monday–Friday, another on Saturday and another on Sunday.
- The 7DAY schedule type allows for a 2 or 4 EVENT/DAY for all 7 days of the week.

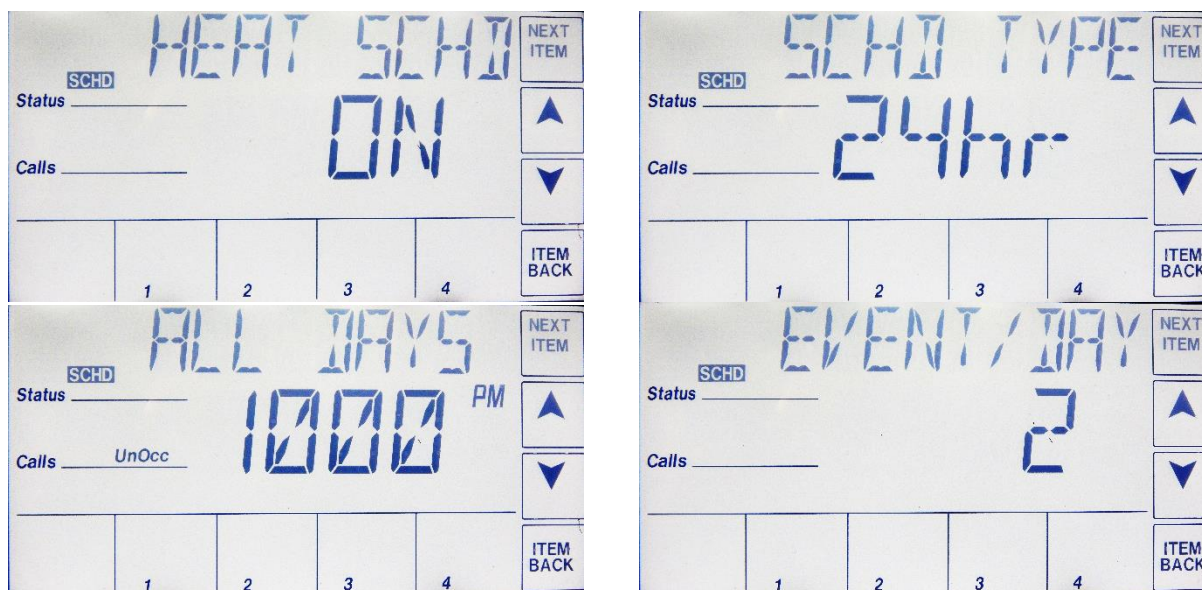


Figure 79 - Scheduled Setback

#### 11.5.10 Using the Manual Override Menu (ADVanced Level Access)

The **OVERRIDE MENU** controls the integral tank circulator and optional SANI pump; it is useful during initial commissioning as well as anytime burner adjustment is necessary.

**To access the Manual Override menu and enter the Advanced Level access:**

1. Press and hold the **HOME** button for 3 seconds.
2. Touch the **NEXT ITEM** or **ITEM BACK** button to navigate to the **TOOLBOX** menu.
3. Touch the **ENTER** button to display the ACCESS screen.
4. Depending on the control software version, the ADVANCED level can be selected using the **UP** and **DOWN** arrow buttons. Subsequent software revisions will require pushing button #4 (bottom right corner) to place the control in the ADVANCED access level.
5. Exit the menu by pressing the **HOME** button.
6. Use the **NEXT ITEM** or **ITEM BACK** buttons to navigate to the **OVERRIDE** menu.
7. Enter the OVERRIDE MENU. Using the arrow buttons, select between the three choices. The default setting is **AUTO**. In the **AUTO** position the operating temperature control will work to control the water temperature based on the active setpoint. When manual control of water heater operation is complete, always return this parameter to the **AUTO** setting.
8. The second setting is **OFF**. This will stop all control function and prevent the burner from operating.
9. The third setting is **HAND**. Once enabled, use the **NEXT ITEM** button to scroll to the next screen. The **TIMEOUT** setting is a safety precaution that will disable the override function at the end of the specified time period if the **MAN OVR** setting is not returned to AUTO.
10. The next screen is **SAN PUMP**. To force on the SANI pump, turn this setting to **ON**.
11. The next screen is **HTR PUMP**. To force on the integral tank circulator, turn this setting to **ON**.
12. The next screen is **HTR MOD**. This setting will override the operating control and using the up and down arrow buttons, force the burner to fire at the selected firing rate. This function is useful when tuning the operation of the burner at a range of firing rates.



NOTE: If the **HTR MOD** control is activated while the burner is firing, the burner will shut down and recycle.

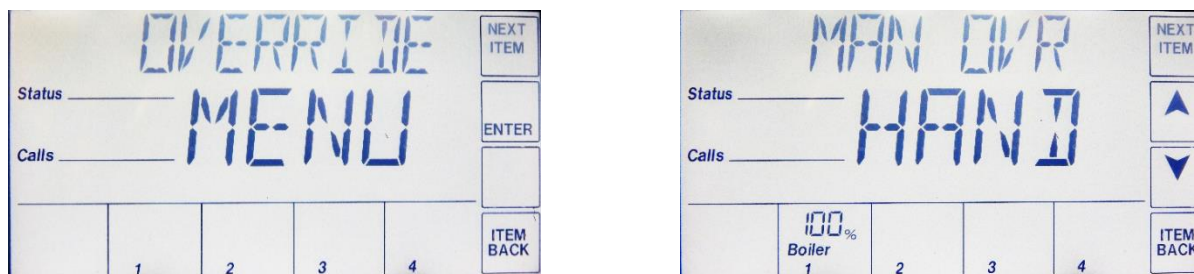


Figure 80 - Manual Override Menu

### WARNING!

When adjustments are complete and before putting the Element into service, return the MAN OVR function to "AUTO". Failure to return the MAN OVR function to "AUTO" can cause high water temperatures that can result in property damage, scalding, other serious injury or death.

#### 11.5.11 Potentiometer (Operating Setpoint for Standalone Operation)

The PIM Ignition Control will continue to operate the Element at a 120° internal setpoint should the touch screen control fail, or communication between the two devices is interrupted. This internal setpoint can be adjusted using the potentiometer to maintain a different operating temperature under these circumstances if desired. This feature is intended to be used on a temporary basis, since accuracy of temperature control is dependent upon the touch screen control.

**IMPORTANT:** At the time of commissioning, It is recommended that the startup technician adjust the potentiometer to desired setpoint displayed in the **OPERATOR** screen located in the **SOURCE** control system menu. The standalone setpoint can be adjusted independently of the touchscreen but a specific setting may be difficult to achieve on the PIM.

**NOTE:** If the operating setpoint is ever changed after initial commissioning, the potentiometer should be readjusted as well.



Figure 81 - Setting the Setpoint

#### 11.5.12 Using Tool Box Menu

The **TOOL BOX** menu contains several adjustable parameters as well as up to 15 previously logged alarm messages.

1. The first screen in the Tool Box is for the **ACCESS** level. The three choices available here are USER, INSTaller and ADVanced. Depending on the control software revision, the ADVanced level can be selected using the UP and DOWN arrow buttons for the first revision. Subsequent software revisions require button 4 (bottom right corner) be pressed and held to place the control in the ADVanced access level. Consult factory before changing any settings requiring

an ADVanced access level. Depending on the access level selected, different parameters will become visible and adjustable. Selecting the appropriate access level will make menu navigation easier and minimize the possibility that parameters will be unintentionally changed.

2. The second screen will display the software revision for the touch panel display. Press the **ENTER** button to view.
3. The third screen allows the user to turn the display backlight ON continuously, OFF or TMPY (keeps the backlight on only during use).
4. The fourth screen allows the user to choose between Fahrenheit and Celsius.
5. The screens following the fourth screen will display up to 15 of the most recent alarm messages as well as time and date of the failure, beginning with the most recent.

### 11.5.13 Basic Operational Reference Information

**Ext Enable:** Terminals R1 – R2, Jumper to enable. Units ship with jumper on this. An external enable/disable can be attached to this. You can monitor the state of this input. 1 = enabled.

- **Upper Tank Temp:** is a temperature probe in the top of the tank.
- **High Limit Temp:** is a 2nd sensor in the same mechanical probe as the **Upper Tank Temp** probe. This is used as a safety.
- **Lower Tank Temp:** Temperature of the mid-section of the tank, this sensor controls the integral tank circulator pump.
- **Vent Temp:** Temperature of the Flue gasses exiting the water heater.
- **Modulation:** Represents the signal sent to fan motor. *(Not used on LC4Q prefix models)*
- **Pump Status:** This is the integral circulating pump ON/OFF.
- **Pump Runtime:** Hours on for integral circulating pump.

#### Discrete connections:

Enable/Disable: R1 – R2 (Input to water heater) Closed = ENABLE.

Alarm: A1 & A2 (Output from water heater) Closed = ALARM.

Remote Equipment / Burner ON: P1 – P2 (Output from water heater) Closed – water heater is heating.

Remote Proving: C1 – C2 (Input to water heater).

- **Closed** = Remote device is ready, it is OK to operate the burner.
- **Open** = Remote device is not ready. If the water heater has a call for heat, this will cause an error if not resolved within a few minutes.

### 11.5.14 Potentiometer (Adjusting the Setpoint)

The Platform Ignition Module (PIM) will continue to operate the Element at a 120 degree internal factory setpoint should the touch screen control fail, or communication between the two devices is interrupted. This internal setpoint can be adjusted using the potentiometer to maintain a different operating temperature under these circumstances if desired.

#### To Adjust The PIM Potentiometer Set-point:

1. Press and hold the **HOME** button for 3 seconds to display the **SETUP** Menu.
2. Use the **NEXT ITEM** or **ITEM BACK** buttons to navigate to the **TOOLBOX** menu. Press **ENTER** to display the **ACCESS** menu.
3. Use the **UP** or **DOWN** arrow buttons to select the **INSTALLER** setting.
4. Press the **HOME** button to return to the **TOOLBOX** menu, then use the **NEXT ITEM** or **ITEM BACK** buttons to navigate to the **SOURCE** menu.
5. Press **ENTER** to enter the source menu and use the **NEXT ITEM** or **ITEM BACK** buttons to navigate to the **OPERATOR** screen to display the potentiometer set-point.
6. Open the hinged upper panel of the control enclosure and locate the potentiometer on the PIM Ignition Module.
7. Use a small screwdriver to manually adjust the PIM Potentiometer to a desired stand-alone setpoint temperature as you view the adjusted temperature setting in the **OPERATOR** screen.
8. Exit the menu by pressing the **HOME** button.

## 11.6 Sequence of Operation

#### Incoming 120VAC:

- a. Full time power to the Fuse
- b. Full time power to the Main Control Switch

**Power On** - When the main control switch is turned on:

- a. 120V is applied to the step-down transformer (24V)
- b. 120V is applied to the L.W.C.O. terminal L1 (if used)
- c. 24V and 120V is applied to the Platform Ignition Module (PIM). The circulator, blower and HSI circuits are 120V.
- d. The PIM performs a processor and memory self-test to insure proper operation. The PIM confirms the presence of a valid ID card which matches the configuration previously stored in memory. If the valid ID card is not present, the PIM generates a diagnostic fault. The non-volatile memory is checked for an active lockout condition. A lockout indicates the previous attempt to light was unsuccessful, or a hi-limit or other system fault occurred. The PIM stays in lockout until a manual reset is performed.

**Control Device Pre-check** – The following control circuits are checked for closer before the control system will initiate a Call for Heat.

- a. The PIM continuously monitors the flame status to verify no flame is present during Standby. If an erroneous flame is detected, the PIM generates a flame error fault.

- b. The Electronic Low Water Cut-Off control is a self-contained electronic device which senses the presence of water at the top of the storage tank. When the presence of water is confirmed, the contacts close on the ELWCO and is sensed by PIM control.
- c. The High Temperature Limit is combined in a common probe body with the upper tank sensor. The PIM will compare the high limit thermistor temperature with the upper tank thermistor temperature. If the two temperatures are not the same, a sensor failure will result.
- d. When the High Temperature Limit operation has been verified by comparison, the limit temperature will then be confirmed to be under the maximum allowable temperature.
- e. Terminals P1-P2 are closed to activate any connected remote devices.
- f. The circuit between Terminals C1-C2 is closed by any connected remote proving switches, enabling the water heater to continue the sequence of operation.

**Call For Heat** - If the operating control senses that the temperature at the upper tank sensor is below the water heater setpoint and the previous control interlocks and safeties are satisfied, the following sequence will begin:

- a. Terminals P1-P2 are closed to activate any connected remote devices.
- b. The circuit between Terminals C1-C2 is closed by any connected remote proving switches, enabling the water heater to continue the sequence of operation.
- c. The High Gas Pressure and Low Gas Pressure Switch (if equipped) are energized and their monitored pressures are proved. The individual safety circuits will close when satisfied and be sensed by the PIM control.
- d. When the burner blower is energized and operation is verified to close within 60 seconds to prove flow.
- e. The ignition pre-purge delay takes place.
- f. The voltage level of the 24 VAC supply input is confirmed to be above 18.0 VAC.
- g. The Ignition cycle begins.
- h. **Heat-Up** - Following the pre-purge delay, the hot surface igniter will be energized:
  - i. The flame control will send 120V to the hot surface igniter for approximately 20 seconds.
  - j. The HSI Element proving current is verified.
- k. The heat-up delay takes place to allow the hot surface element to reach ignition temperature.

**Ignition** - When dwell time is completed a 4-second Trial for Ignition (TFI) period is initiated:

- a. Gas Safety Valves are energized.
- b. The hot surface element is de-energized during the last second of the TFI period.
- c. During TFI the flame safeguard control will monitor the flame using flame rectification through the hot surface igniter.
- d. If the flame control senses the presence of flame before the end of the TFI period, the igniter will be de-energized and the flame control will continue to monitor the flame, through the igniter, until the operating thermostat ends the call for heat condition.

## Heating

- a. The flame status, airflow switch, LWCO switch, water pressure switch and other safety switches are continually monitored for proper state.



- b. The High Limit sensor is confirmed to read below the High Limit set-point.
- c. The temperature of water in the tank is compared to the temperature control setpoint to determine when to begin firing in heating mode.
- d. The water heater remains in heating mode and, with extended operation, condensation begins to fill the condensation trap and drain line; (a normally operating booster water heater does not create condensation). The water heater stops firing when the tank water temperature matches the temperature control setpoint.
- e. The gas valve(s) are immediately disabled.
- f. A Blower Post-purge is completed and the control proceeds to Standby mode.

**Integral Circulating Pump** – The circulating pump is controlled independently of the call-for-heat.

- a. When the main control switch is turned on, the control system will continuously monitor the water temperature in the tank and attempt to maintain a uniform water temperature within the tank by using the integral circulating pump.
- b. If the temperature sensed in the tank drops 5 degrees or more below the temperature set-point, the pump is energized and a pump circulator icon will illuminate on the control display touch screen.
- c. The operation of the integral circulating pump may occur before, during or after the call-for-heat period.

### Flame Failure / Flame Loss

- a. If the igniter fails to sense flame during an attempt to light the burner (Ignition Trail Fail), the ignition control will end the ignition sequence and the gas valve will be closed. Immediately following the end of the first failed ignition cycle, a new ignition sequence will be initiated to attempt to relight the burner. The standard Element configuration allows for three ignition failures before lockout. Since Elements include the CSD-1 option, this ignition failure will result in a lockout and require manual reset to attempt operation again.

If the burner successfully lights and operates but the flame is lost, the gas valve will be closed and the blower will continue to operate in order to purge any remaining combustion products from the water heater. Since Elements include the CSD-1 option, this flame loss will result in a lockout and require manual reset to attempt operation again. The standard Element configuration allows for three (Main Flame Loss) occurrences before lockout. Following each (Main Flame Loss) the PIM will purge and initiate the ignition sequence until the maximum of three flame loss events occur.

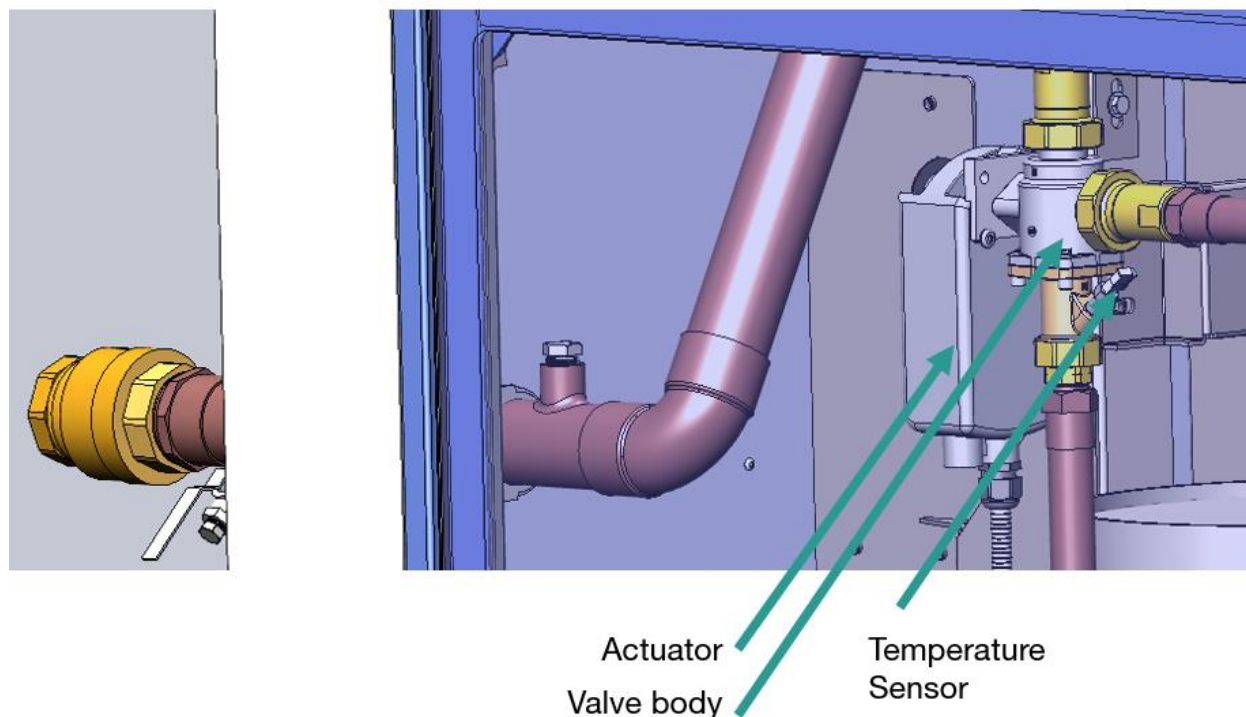
## 12 DIGITEMP JR. MIXING VALVE

### 12.1 Description

DigiTemp Jr is a digital mixing valve that provides user-directed control and monitoring water distribution. It includes an electronic Control Module featuring a color touch screen digital display to select desired outlet water temperature, an electronically actuated valve that mixes hot and cold water, a quick response temperature sensor and check valves. DigiTemp Jr monitors mixed outlet temperature. It also features a user programmable high temperature Sanitization mode to help limit water borne bacteria as part of a user-directed and controlled thermal eradication protocol.

Adjustment of DigiTemp Jr is the responsibility of the owner and installer and must be done by qualified personnel in accordance with the manufacturer's instructions, and complying with all governmental requirements, building and construction codes and standards. It is recommended to install the Element as part of an ASSE compliant water distribution system, including mixing valves and/or temperature limiting devices at all point-of-use fixtures (faucets, sinks, tubs, showers, etc.) that are approved to ASSE 1016, 1069, 1070 and 1071.

The DigiTemp Jr owner/user is responsible for maintaining proper water quality and condition, and deciding what temperature is appropriate for distribution users and facility.



**Figure 82 – DigiTemp Jr Valve.**

**Note: Controller is detached from and placed in the front of the unit.**

#### 12.1.1 Repair

As a pre-installed subsystem of Element, the following is intended for repairing the DigiTemp Jr valve and controller.

## WARNING!

The procedure below carries exposes personnel to the following hazards:

- Hot water and scalding
- Burns and hot surfaces
- Electrical shock and electrocution

Failure to follow all installation requirements risks possible death, personal injury, property damage, and failure of DigiTemp Jr to perform as intended.

Use ONLY with a potable water distribution system free of debris, foreign materials, corrosive chemicals or substances, and other adverse conditions.

DigiTemp Jr is electrically powered. ALWAYS take proper precautions to recognize, evaluate, and control electricity hazards during use and service/maintenance.

## To connect Power supply

1. Press down on top of the front cover and pull out and down
2. Lift the front cover up and away from the controller
3. Loosen the screws at the front of the wiring cover
4. Pull wiring cover straight out from the wiring chamber
5. Connect live wire to terminal marked "L" and neutral wire to terminal marked "N".
6. Re-assemble in reverse order.

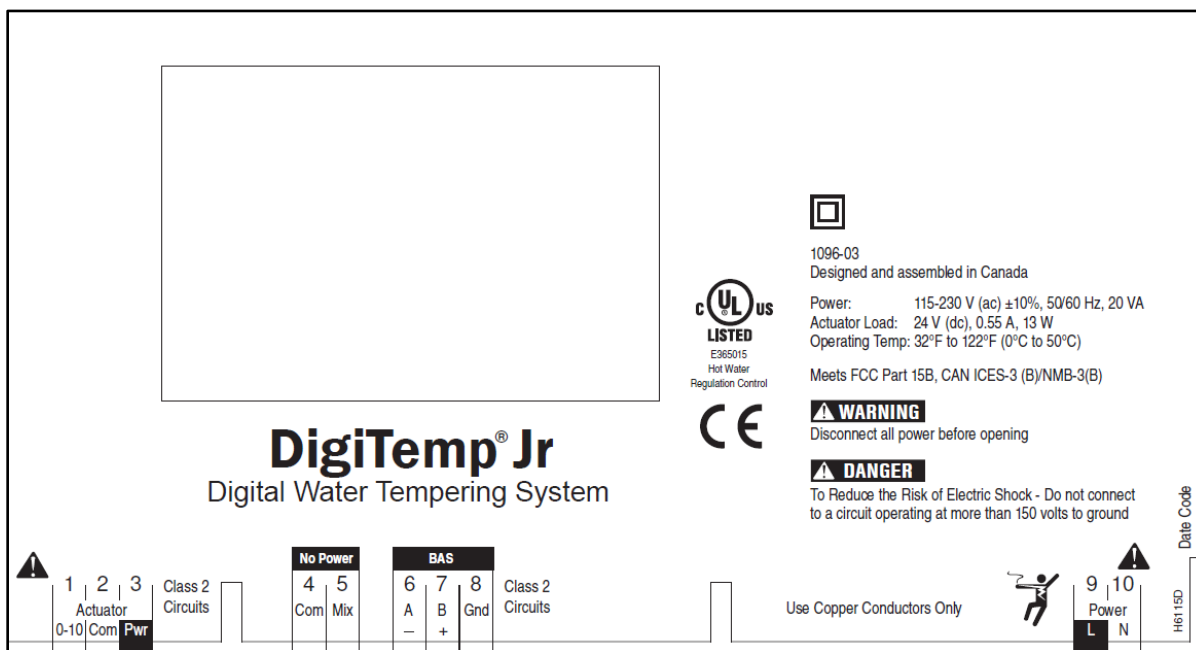


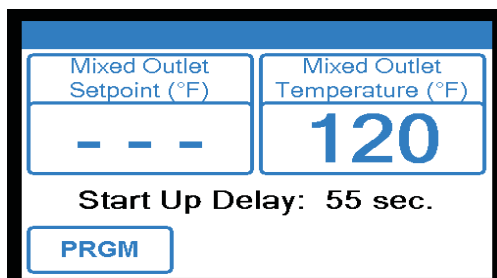
Figure 12-2 - DigiTemp Jr Control Unit Connections

## 12.2 Setup and Programming

NOTE: During normal operation, there is no need to separately program the DigiTemp Jr controller. The Edge SC performs all necessary Modbus calls from the primary controller. The following is provided for troubleshooting purposes.

In the event of a power cycle of Element, there is a potential risk of some of the configurations specific to Element being reset, however this is typically due to a non-volatile memory (NVM) error. Contact your Lync service representative if that error is given.

When powered up, the display will show a 100 second countdown timer and read:



**NOTE:** The control will begin mixing operations automatically after 100 seconds. During that time the user may adjust setting and configure the control by pressing the **PRGM** menu. If the user does nothing, the control automatically routes to the home screen and begins normal operation. Attempting to program the device at this time will reset the 100 second clock.

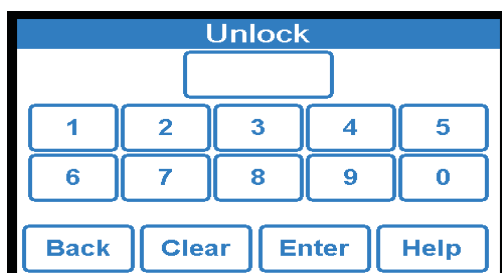
To program the system, press the **PRGM** button. The **Programming** screen appears.



### 12.2.1 To Create a Passcode:

DigiTemp Jr comes programmed with the default passcode **1017**. For added security, and to help prevent unauthorized access, it is recommended that you create a unique 4 digit passcode as outlined below.

On the Programming menu, press the **UNLOCK** icon. The Unlock function screen appears and you are prompted to enter the passcode:



#### Creating your own passcode:

- Enter the default passcode 1017 and press the Help icon.
- Enter a new 4-digit passcode and press Enter (make sure to keep new code secure).
- Re-enter the new passcode and press Enter again to finalize the passcode change.

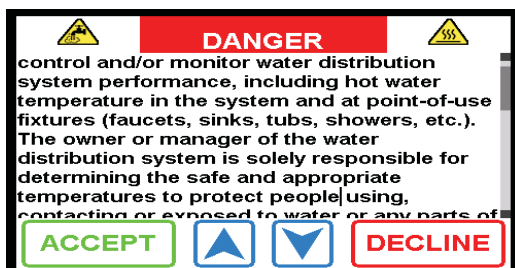
**NOTE:** If you make a mistake entering your passcode and it does not match, **????** appears.

### 12.2.2 To Unlock the System:

To unlock the system, on the Unlock screen, enter your new passcode and then press **Enter**.

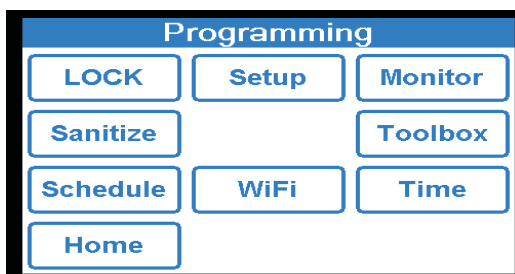
**NOTE:** To clear your entry and start again, press **CLEAR**. To go back to the Programming menu, press **BACK**. If you did not set your own passcode, enter default passcode **1017**.

When the passcode is entered, you are directed to the liability acceptance screen:



Press **ACCEPT** to access system functions. Pressing **DECLINE** means you will not be able to change system settings and you accept all default settings (including outlet water temperature of 140° F/ 160° C). You will be returned to the **Programming** screen.

When you press **ACCEPT**, the Programming screen appears.



### 12.2.3 System Setup Menu

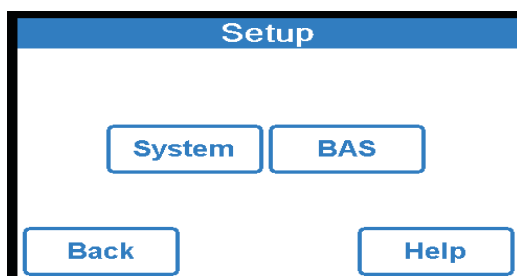
#### **WARNING!**

The next steps involve selecting or adjusting the mixed outlet water temperature, the hot water temperature in the water distribution system 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 or exposed to water or any parts of the water distribution system from scalding, burning, thermal shock or other hazards, and to control water- borne bacteria in the system.

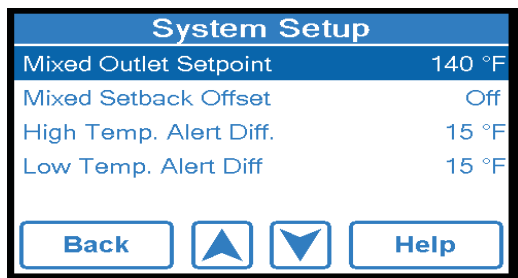
Only qualified and authorized personnel who fully understand each function's operation, output and risks should use Programming Menu functions.

Always read and follow the User Guide & Instruction Manual.

Press **SETUP**; the Setup screen now appears.



You can setup the operation of the system by pressing the **System** button. To setup operation of the system, continue with the system setup.



**NOTE:** Mixed Setback Offset is only available if a schedule is selected.

#### 12.2.4 Selecting and Setting the Outlet Water Temperature Setpoint:

##### **WARNING!**

BEFORE setting mixed outlet water temperature or electing default temperature, point-of-use mixing valves and/or temperature limiting devices **MUST** be installed at all fixtures (faucets, sinks, tubs, showers, etc.)

Set the safe, appropriate and desired outlet water temperature for your users, application and facility by pressing **Mixed Outlet Setpoint** on the System Setup menu and then using the **SLIDER** or **UP** and **DOWN** arrows until the selected temperature is displayed. Press **Accept**.



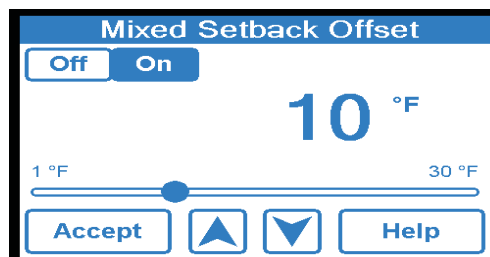
##### **WARNING**

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 water-borne bacteria in the system.

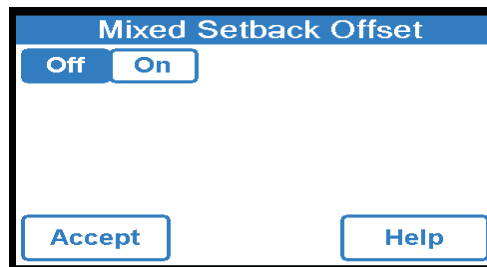
Once the desired temperature is selected, press the **Accept** icon to apply the setting. The System Setup screen reappears.

**NOTE:** The setpoint is controlled by the Edge SC controller. Expect the setpoint to be reset and changed based on Edge SC programming after any local changes at the controller.

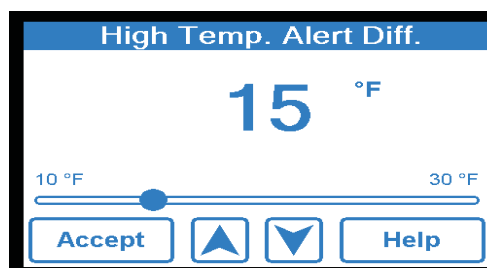
To turn on the **Mixed Setback Offset** feature (sets temperature lower during unoccupied period), press **On** and **Accept**. Change the temperature using the slider or by pressing the **UP** or **DOWN** arrows, then press **Accept** when done.



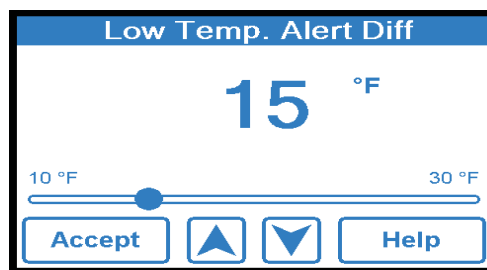
To turn the Mixed Setback Offset feature off, press **Mixed Setback Offset** on the **System Setup** menu and press **Off** and **Accept**.



To change the high temperature alert differential, press **High Temp. Alert Diff.** in the **System Setup** menu. Use slider or **UP** or **DOWN** arrows to set high temperature alert differential, then **ACCEPT**.



To change low temperature alert differential, press **Low Temp. Alert Diff.** in the **System Setup** menu. Use slider or **UP** or **DOWN** arrows to set low temperature alert differential, then **ACCEPT**.



**NOTE:** If finished, the system will return to a locked state if not touched for 100 seconds. Or, press the **BACK** icon twice to return to the **Programming** menu, then press **LOCK**.

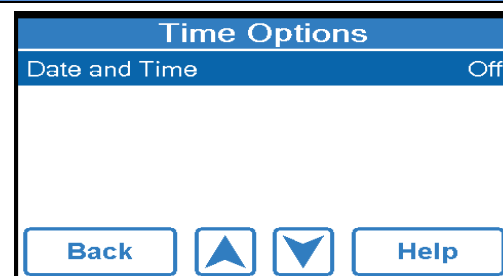
When the system is locked, the **Programming** screen displays the **UNLOCK** icon.



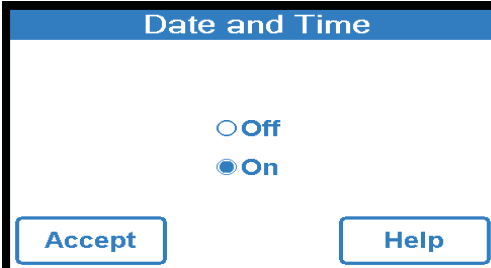
## 12.3 Time Function

Press the **TIME** icon on the **Programming** Menu to access the Time Function.

To turn on the **Date & Time** functionality, press **Date & Time** from the Time Options menu.

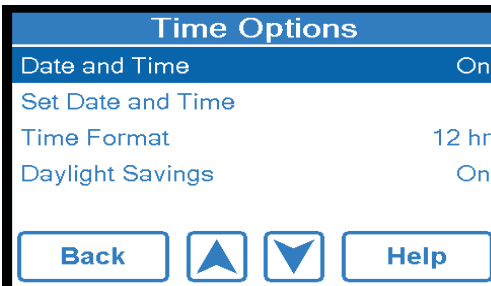


Once in the **Date and Time** menu, toggle the radio button to **ON** and then press **Accept**.




The screenshot shows the 'Date and Time' menu. At the top is the title 'Date and Time'. Below it are two radio buttons: 'Off' (unselected) and 'On' (selected). At the bottom are two buttons: 'Accept' and 'Help'.

To set date and time, press **Set Date and Time** from the **Time Options** menu.



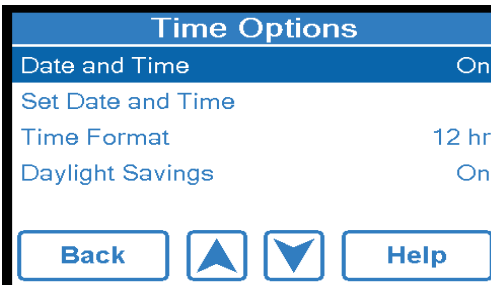
The screenshot shows the 'Time Options' menu. At the top is the title 'Time Options'. Below it is a list of options: 'Date and Time' (On), 'Set Date and Time', 'Time Format' (12 hr), and 'Daylight Savings' (On). At the bottom are four buttons: 'Back', an up arrow, a down arrow, and 'Help'.

To set date and time, select month, date, year, hour, minute and AM/PM icons one at a time and change with **UP** or **DOWN** arrows, then press **Accept**.



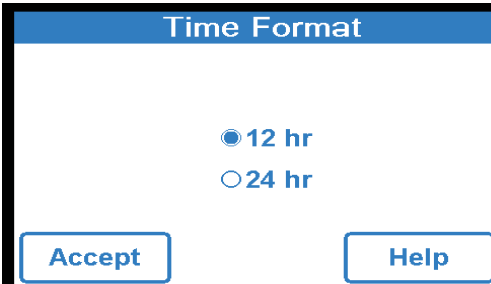
The screenshot shows the 'Set Date and Time' menu. At the top is the title 'Set Date and Time'. Below it are six buttons arranged in two rows: 'Jan', '04', '2018' in the first row, and '5', '03', 'PM' in the second row. At the bottom are four buttons: 'Accept', an up arrow, a down arrow, and 'Help'.

To select the time format, press **Time Format** from the **Time Option** menu.



The screenshot shows the 'Time Options' menu. At the top is the title 'Time Options'. Below it is a list of options: 'Date and Time' (On), 'Set Date and Time', 'Time Format' (12 hr), and 'Daylight Savings' (On). At the bottom are four buttons: 'Back', an up arrow, a down arrow, and 'Help'.

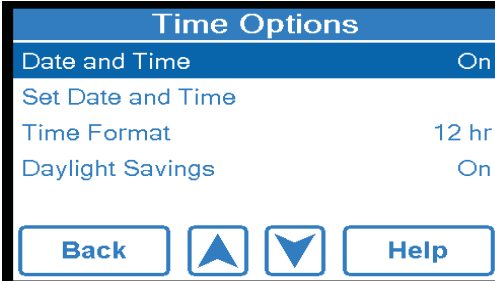
To select time format, toggle to the **12hr** or **24hr** radio button and press **Accept**.



The screenshot shows the 'Time Format' menu. At the top is the title 'Time Format'. Below it are two radio buttons: '12 hr' (selected) and '24 hr' (unselected). At the bottom are two buttons: 'Accept' and 'Help'.

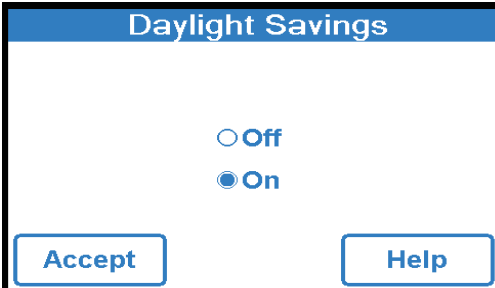


To select daylight savings time, press **Daylight Savings** from the **Time Options** menu.




The screenshot shows the 'Time Options' menu. It has a title bar 'Time Options'. Below it, there are four items: 'Date and Time' with a status 'On', 'Set Date and Time', 'Time Format' with a status '12 hr', and 'Daylight Savings' with a status 'On'. At the bottom, there are four buttons: 'Back', an up arrow, a down arrow, and 'Help'.

Once in the **Daylight Savings** menu, toggle the **On** radio button and press **Accept**.



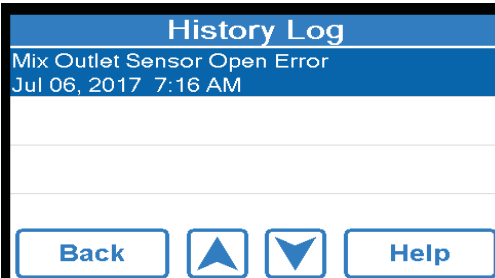
The screenshot shows the 'Daylight Savings' menu. It has a title bar 'Daylight Savings'. In the center, there are two radio buttons: 'Off' and 'On'. The 'On' radio button is selected. At the bottom, there are two buttons: 'Accept' and 'Help'.

To view the control type information for your controls, press **Firmware** from the **Toolbox** menu and then press **Back**.



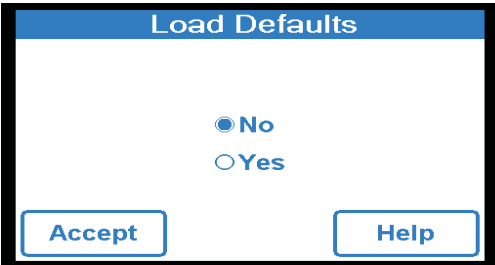
The screenshot shows the 'Firmware' menu. It has a title bar 'Firmware'. Below it, there is a text line 'View the Control Type information for your control.' followed by 'Software Version: J1267H SVN 408'. At the bottom, there is a single button 'Back'.

To access the history log, press **History Log** from the **Toolbox** menu then press **Back**.



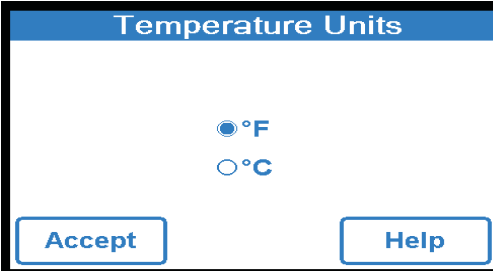
The screenshot shows the 'History Log' menu. It has a title bar 'History Log'. Below it, there is a text line 'Mix Outlet Sensor Open Error' followed by 'Jul 06, 2017 7:16 AM'. Below this, there is a large empty rectangular area. At the bottom, there are four buttons: 'Back', an up arrow, a down arrow, and 'Help'.

To select load default, press **Load Defaults** from the **Toolbox** menu. Toggle the radio button to **No** for no load or **Yes** for Load Defaults, then **Accept**.



The screenshot shows the 'Load Defaults' menu. It has a title bar 'Load Defaults'. In the center, there are two radio buttons: 'No' and 'Yes'. The 'No' radio button is selected. At the bottom, there are two buttons: 'Accept' and 'Help'.

To select load temperature units of measure, press **Temperature Units** in the **Toolbox** menu. Toggle the radio button to °F for Fahrenheit or °C for Celsius, then press **Accept**.

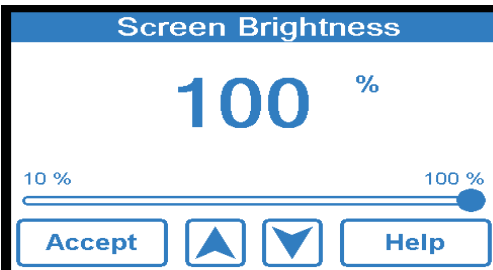


Temperature Units

☒ °F  
☐ °C

Accept Help

To adjust the screen brightness, press **Screen Brightness** from the **Toolbox** menu. Move the slider or use the **Up** or **Down** arrows to adjust the brightness, press **Accept**.



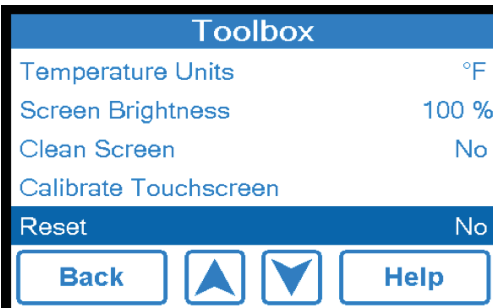
Screen Brightness

100 %

10 % 100 %

Accept [Up Arrow] [Down Arrow] Help

To clean dirty screen, press **Clean Screen** on the **Toolbox** menu.

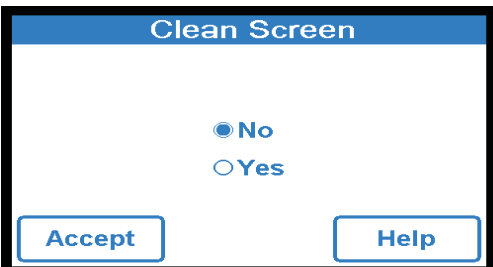


Toolbox

Temperature Units	°F
Screen Brightness	100 %
Clean Screen	No
Calibrate Touchscreen	
Reset	No

Back [Up Arrow] [Down Arrow] Help

Toggle the radio button to **Yes** to lock the screen to clean, or press **No** to keep it unlocked, then **Accept**.

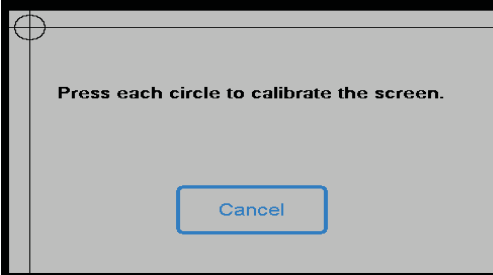


Clean Screen

☒ No  
☐ Yes

Accept Help

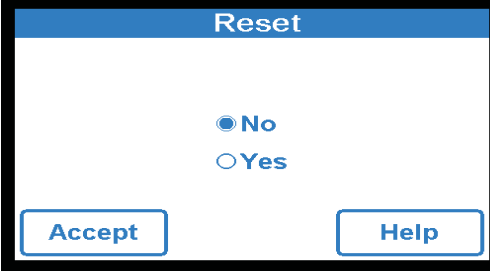
To calibrate the touchscreen, press **Calibrate Touchscreen** on the **Toolbox** menu. Press each circle to calibrate the touch screen.



Press each circle to calibrate the screen.

Cancel

To reset all, press **Reset** on the **Toolbox** menu. Toggle the radio button to **Yes** or toggle to **No** to retain the current settings.



A screenshot of a software dialog box titled "Reset". The dialog has a blue header bar with the word "Reset" in white. Below the header, there are two radio buttons: "No" (which is selected, indicated by a blue dot) and "Yes" (which is unselected, indicated by an empty circle). At the bottom of the dialog, there are two buttons: "Accept" on the left and "Help" on the right. The entire dialog is enclosed in a black border.

## 13 AQUASOLVE ANTI-SCALE OPERATION AND MAINTENANCE

The Lync AquaSolve Anti-Scale System prevents scale formation on internal plumbing surfaces by transforming the normal dissolved hardness minerals into undissolved crystal microparticles. These crystals stay suspended in the water and have a greatly reduced ability to react and attach to surfaces, minimizing scale buildup in pipes, water heaters and on fixtures and glass.

AquaSolve Anti-Scale is not a water softener or a chemical additive (like an anti-scalant or sequestrants). It is a scale prevention device with proven third-party laboratory test data and years of successful residential and commercial installation. AquaSolve Anti-Scale is the one water treatment device that effectively provides scale protection and is a great salt free alternative to water softening (ion exchange) or scale sequestering chemicals. Laundry and warewashing chemistry will like-wise require adjustments.

### 13.1 AquaSolve Anti-Scale Benefits

AquaSolve Anti-Scale provides chemical-free scale prevention and protection by converting hardness minerals into harmless, inactive microscopic crystals, thus making it an effective alternative water softener technology. Its advantages include:

- Virtually maintenance free – no control valve.
- Environmentally friendly - no salt or chemicals to add, no electricity and no wastewater.
- Improves efficiency of all water using appliances – both hot\*\* and cold. NOTE: For hot water applications where feed water temperature is 100° - 140°F (38° - 60°C), please contact your local Lync representative.
- Safe for landscaping and lawn watering, no need for costly bypass plumbing.
- Compatible with all on-site and community wastewater treatment systems.
- Perfect for towns or communities where water softeners are banned or restricted.
- Does not remove minerals or add sodium to the water supply.
- Can be installed as pre-treatment to commercial reverse osmosis systems (contact your local Lync representative for further details).

#### **WARNING!**

Do not use water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system. Systems are certified through WQA against NSF 61, CSA B483.1, and to NSF 372 for Lead Free compliance.

### 13.2 Specifications

The AquaSolve Anti-Scale system must operate in an upflow manner and does not require additional water to backwash, flush, or regenerate once put into service. The system does not require any chemical additives and does not require electricity for operation.

### 13.3 Standards

Independent scientific testing has confirmed Template Assisted Crystallization (TAC) technology provides scale reduction of over 95%. Testing was conducted under protocol based on DVGW W512 test to assess control of scale formation.

**NOTE:** Spotting may occur on external plumbing surfaces.

The AquaSolve Anti-Scale system performs best in single pass potable water applications with no additional chemical additives. Depending on hardness, soft scale spotting may occur. Soft scale spots in most cases can be easily wiped down with a damp cloth and will not form hard scale deposits. A Point of Use (POU) Water Softener should be used on mandatory spot-free applications (e.g. glass stemware, dishware).

### CAUTION

Do not let the system freeze. Damage to the tank may result.

System must be operated in a vertical position. Do not lay it down during operation.

Place system on a smooth, level surface. Because system operates in an upflow, fluidized bed mode, a level surface is more important than with a softener or media filter.

A bypass valve should be installed on every system to facilitate installation and service.

Observe all local plumbing and building codes when installing the system.

AquaSolve Anti-Scale must be the last stage in the treatment chain. Do not install any filters after AquaSolve Anti-Scale or before any devices for which scale prevention is required. POU filters, e.g. carbon, RO or Ultraviolet (UV) are exempt from this requirement.

Do not apply any other anti-scalants before or after AquaSolve Anti-Scale.

The addition of soaps, chemicals, or cleaners, before or after AquaSolve Anti-Scale treatment, may reverse its anti-scale treatment effects and/or create water with a heavy residue or spotting potential. Any adverse conditions caused by the addition of soaps, chemicals, or cleaners are the sole responsibility of the end user.

AquaSolve Anti-Scale is not a water softener and does not soften the water. Water treatment chemistry (e.g. antiscalants, sequestrants, soaps, chemicals or cleaners etc.) will most likely have to be changed to be compatible with AquaSolve Anti-Scale treated water. Laundry and ware-washing chemistry will likewise require adjustments.

## 13.4 Equipment Specifications

AquaSolve Anti-Scale systems are complete, self-contained, and come ready to use. Review operating pressures, temperatures and water chemistry limitations to ensure compatibility.

**NOTE:** Water with heavy dirt and debris may require filtration prior to AquaSolve Anti-Scale.

### WARNING!

Due to the unique properties of AquaSolve Anti-Scale, there are some unique requirements for using AquaSolve Anti-Scale in conjunction with other forms of water treatment:

Feed Water Chemistry Requirements	
<b>pH</b>	6.5-8.5
<b>Hardness (max)</b>	30 grains (513 ppm CaCo3) <sup>1</sup>
<b>Alkalinity</b>	100 ppm
<b>Water Pressure</b>	15 psi to 150 psi (1.03 to 10.34 bar)
<b>Temperature</b>	40°F to 100°F (5°C to 38°C)
<b>Free Chlorine</b>	< 1 ppm

Feed Water Chemistry Requirements	
<b>Chloride</b>	200 ppm
<b>Iron (max)</b>	0.3 ppm <sup>1</sup>
<b>Manganese (max)</b>	0.05 ppm <sup>2</sup>
<b>Copper</b>	1.3 ppm <sup>3</sup>
<b>Oil &amp; H<sub>2</sub>S</b>	Must be Removed Prior to AquaSolve Anti-Scale
<b>Total Phosphates</b>	< 3.0 ppm
<b>Sulfate</b>	< 250 ppm
<b>Silica (max)</b>	20 ppm <sup>4</sup>
<b>TDS</b>	1500 mg/l <sup>5</sup>

<sup>1</sup> Just as with conventional water softening media, AquaSolve Anti-Scale media needs to be protected from excess levels of certain metals that can easily coat the active surface, reducing its effectiveness over time. Public water supplies rarely, if ever, present a problem, but if the water supply is from a private well, confirm that the levels of iron (Fe) and manganese (Mn) are less than 0.3 mg/L and 0.05 mg/L, respectively.

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<sup>3</sup> Pursuant to the EPA drinking water standards, the copper concentration permitted is up to 1.3 ppm. Typically originating from new copper plumbing, high levels of copper can foul AquaSolve Anti-Scale media. For applications with copper concentration greater than 1.3 ppm, please consult Watts Water Quality Technical Service. To further minimize any problem with excess copper, avoid applying excessive flux on the inner surfaces of the pipe and use a low-corrosivity water soluble flux listed under the ASTM B813 standard.

<sup>4</sup> AquaSolve Anti-Scale media does not reduce silica scaling. While silica tends to have a less significant effect on scale formation than other minerals, it can act as a binder that makes water spots and scale residue outside the plumbing system difficult to remove. This 20 ppm limitation is for aesthetic purposes.

<sup>5</sup> All other contaminants must meet the requirements of the USEPA Safe Drinking Water Act. Specific Mineral and Metal MCL's, identified in Watts published Feed Water Chemistry Requirements, supersedes the USEPA SDWA.

**NOTE:** Systems using AquaSolve Anti-Scale technology prevent scale formation inside the plumbing system at influent hardness levels of 30 grains per gallon of calcium carbonate and less. Due to variances in water chemistry, certain aesthetic conditions external of the plumbing system may not be attained. AquaSolve Anti-Scale is designed for the treatment of potable water that meets the requirements of the current USEPA Safe Drinking Water Act.

Mechanical Specifications		
Model	LM8414TM-COM	LM8416TM-COM
Dry Weight	124 lbs / 56 kg	145 lbs / 66 kg
Service Weight	458 lbs / 208 kg	550 lbs / 250 kg
Inlet/Outlet Connection	2" FNPT	2" FNPT

Replacement Media		
A	M8414-COM-RM	Replace media every 3 years
B	M8416-COM-RM	Replace media every 3 years

Dimensions (nominal - inches)		
Model	LM8414TM-COM	LM8416TM-COM
A	14	16
B	73.1	73.1

Max. Service Flow (gpm) vs. Water Temp. (°F)							
System	40°	45°	50°	55°	60°	65°	70°
LM8414TM	40	44	48	50	50	50	50
L M8416TM	45	51	56	59	63	69	75

Intermittent Duty Systems	
LM8414TM-COM	50 gpm at all temperatures
LM8416TM-COM	75 gpm at all temperatures

Max. Flow Rate*		
LM8414TM-COM	50 gpm	189 lpm
LM8416TM-COM	75 gpm	284 lpm

\*Exceeding maximum flow can reduce effectiveness and void warranty.

Pressure drop at peak flow rate is less than 22 psi.

Pressure drop reading taken with inlet and outlet gauges installed at a common elevation and 80 degree feed water.

## 14 LYNC UV

The Lync UV™ systems provides protection against microbiological contamination in water. Disinfection of water with Lync UV is a simple, rapid physical process. When contaminated water is exposed to a SmartStream™ 254 nanometer UV light, the UV light penetrates the cell walls of microorganisms and disrupts their genetic deoxyribonucleic acid (DNA) material. This quickly inactivates microorganisms by destroying their ability to replicate and infect.

### To install the Lync UV:

1. Install the quartz sleeve into the UV chamber. **DO NOT** touch the quartz sleeve with your fingers. Hold it with a paper towel.
2. Install the quartz sleeve O-ring onto the visible end of the quartz sleeve. Screw the quartz sleeve nut onto the quartz sleeve port thread and tighten hand tight.
3. Install the ultraviolet lamp into the quartz sleeve. **DO NOT** touch the lamp with your fingers. Hold it with a paper towel.
4. Insert the lamp power lead wire into the receptacle on the lamp's glow cap.

### **WARNING:**

This appliance contains a UV-C emitter (UV lamp). Unintended use of the appliance or damage to the housing may result in dangerous UV-C radiation escaping. UV-C radiation may, even in small doses, can harm eyes and skin. Damaged appliances must not be operated. Do not operate the UV-C emitter when it is removed from the appliance enclosure. The appliance must be disconnected from the power supply before replacing the UV-C emitter. **DO NOT** look directly at the UV-C emitter while it is on. Permanent serious eye injury could occur.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

The Watts UV™ line of ultraviolet disinfection systems provide protection against microbiological contamination in water for residential and commercial applications. Disinfection of water with Lync UV™ is a simple, rapid physical process. When contaminated water is exposed to the Lync UV's™ 254 nanometer UV light, the UV light penetrates the cell walls of microorganisms and disrupts their genetic deoxyribonucleic acid (DNA) material. This quickly inactivates microorganisms by destroying their ability to replicate and infect.



## 15 FILTER MAINTENANCE

### 15.1 Cold Filter

The Element uses a Flow-Max® filter cartridge, model no: **FM-5-975**. Flow-Max cartridges are washable and reusable, five micron and reduce filtration costs. For best results, direct spray into pleats to dislodge sediment. Alternatively, allow the cartridge to dry and brush off filter cake from the surface of the media.



#### Specifications:

Max Pressure	40 PSID
Recommended Change Out	20-30 PSID

### 15.2 Recirculation Filter

The Element uses a Harmsco®, high temperature pleated cartridge for high capacity filtration; model no: **HC/40-5HT**.

#### Specifications:

Temperature	Up to 200° F (90° C)
Recommended Change Out	25 PSI Δ P (1.7 bar)

### 15.3 Cleaning

Clean cartridges with pressure nozzle using standard hose. Direct spray at an angle to remove particulate. Follow these directions for best results:

**Oils in aqueous solutions:** Soak cartridges in a solution of tri-sodium phosphate or similar strong detergent (2 lbs. to 10 gallons of water). Soak up to 12 hours. Rinse after soaking.

**Organic matter and algae in aqueous solution:** Use tri-sodium phosphate or similar strong detergent as described above, plus 1 pint of liquid chlorine to kill organic matter and algae. Soak cartridges 1 hour or longer until surface is no longer slippery. Rinse after soaking.

**Calcium & mineral deposits:** Follow directions for oils described above. Rinse cartridges thoroughly for approximately 10 minutes in a solution of one part muriatic acid to 20 parts of water. Rinse cartridge thoroughly with water.

#### CAUTION

Remove all oils and organic matter with detergent before rinsing cartridges with acid soak for mineral removal. Flush cartridges with water after muriatic or tri-sodium phosphate baths. Generally, it is not possible to clean cartridges filtering petroleum-based liquids, toxic substances and when using one micron and sub-micron cartridges.

## 16 MAINTENANCE

Regular service and routine maintenance must be performed by a qualified service agency or maintenance provider to ensure safe, reliable and efficient operation. To ensure proper maintenance, the following instructions should be posted near the appliance and maintained in legible condition. Verify proper operation after servicing.

### 16.1 Lync Q Water Heater Communications and Diagnostics

#### 16.1.1 Indicators

The PIM has three LED indicators to display operational status and to help diagnose system error conditions:

- **Green LED – Power:** Indicates the PIM module is receiving 24 VAC power.
- **Amber LED – Alarm/Test:** Indicates the PIM is in Commission Test Mode or that a diagnostic alarm (fault) is present.
- **Red LED – Diagnostic Code:** Normally off. During a control or system fault condition, this LED flashes the error codes.

#### 16.1.2 Alarm Messages – Diagnostic Codes (Flashes)

MESSAGE	DESCRIPTION	LED Flashes	MODBUS CODE
ID CARD	The ID card is connected to the PIM control board when the system is initialized for the first time, the ID card selects the control profile to be used. An ID card error may occur when the original card is replaced with an incorrect card or has been disconnected from the PIM control board.	Red LED ON, Green LED OFF	20
INTERNAL FAIL	The PIM control board may have failed. Replace the control board if manually resetting the control does not correct the fault.	Red LED ON	21
CTL SETUP FAIL	Reset defaults in the TOOL BOX menu. If unable to correct, replace the control display.	N/A	1
VENT LIM	Vent temperature sensor is approaching the programmed limit, forcing burner to operate at reduced firing rate.	N/A	5
AIR FLOW FAIL	Blower is not reaching the minimum speed for purge and burner operation. This may be caused by a faulty blower.	1	9
FLAME FLSE	Usually caused by a leaky gas valve which propagates a flame after the call for heat cycle has ended. Check for leakage through the gas valve, or replace flame control.	2	19
FLAME FAIL	Burner failed to light, or no flame signal detected. If the burner fails to light it is likely that the hot surface igniter (HSI) is faulty or the burner fuel/air mixture is out of adjustment. If the burner lights but immediately goes out, check for inadequate gas supply, faulty gas valve/regulator or poorly adjusted combustion.	3	15
FLAME LOSS	Flame loss can be caused by a faulty igniter, damaged refractory or combustion that becomes poorly adjusted as the burner modulates to higher inputs.	3	16

MESSAGE	DESCRIPTION	LED Flashes	MODBUS CODE
LOW HSI	The PIM control board is not sensing the correct amp draw from the HSI (Hot Surface Igniter). This is most likely caused by a faulty or disconnected igniter.	4	
LOW 24VAC	The 24VAC supply to the PIM control is below threshold for reliable control operation. May be caused by low voltage to the water heater or a faulty 120/24VAC supply transformer.	5	17
VENT MAX	The vent temperature sensor is used to protect low temperature vent systems from damage caused by high flue gas temperatures. When this alarm occurs, first confirm that the vent material is suitable for the application as well as the limit setting for this control. When this product is operated with high return or inlet water temperature, the flue gas can exceed the rating of low temperature vent systems.	6	18
HTR MAX	Water temperature has exceeded safety limit. May be caused by a sensor failure or a faulty control board.	7	11
HTR TOP	Indicates problem with top temperature sensor, possibly a shorted wire or failed sensor. <b>NOTE:</b> The top sensor and the high limit sensor are located in the same probe body.	8	14
HI LIMIT	Indicates problem with high limit temp sensor, possibly a shorted wire or failed sensor. <b>NOTE:</b> The top sensor and the high limit sensor are located in the same probe body.	8	14
HTR BOT	Indicates a problem with the bottom temperature sensor, possibly a broken or shorted sensor wire or failed sensor.	8	
VENT	Indicates a problem with the vent temperature sensor, possibly a broken or shorted sensor wire or failed sensor.	8	
LOGASPRES FAIL	The low gas pressure safety switch (optional) is not sensing minimum gas pressure required for safe operation. Check the gas pressure to ensure that the minimum is available. If the gas pressure is adequate check for fluctuating gas pressure or a faulty pressure switch.	9	
REM PROV FAIL	The remote proving circuit is designed to check for the operation of ancillary mechanical room equipment such as a fresh air damper or flow switch. Check for the proper function and correct wiring of such equipment.	10	
LOW WATER FAIL	The low water cutoff is not sensing water at its probe. May be caused by a faulty low water board or sensor	12	
HTR LOST	Possible bad connection between the PIM control and the digital control display, or failure of either device.	14	
HIGASPRES	Check gas pressure to ensure that building supply does not exceed value on the water heater rating plate. If within rated limit, check for faulty pressure switch.	15	

### 16.1.3 Fuse

The 24 VAC input and output circuits of the PIM are protected by an 8.0 Amp fuse.

#### 16.1.4 Self-Check/Control Failure

The PIM confirms the integrity of the gas valve relay contacts to insure safety. It also monitors the processor memory and software execution for proper program flow. If the control detects an error in its software or hardware, all outputs are turned off and the LED displays a steady ON condition. If this condition persists after an attempt to restart then the control must be replaced.

#### 16.1.5 System Safety Checks

The PIM monitors the safety switches, temperature sensors, supply voltage, and blower speed and will go to soft lockout until the error condition is corrected. Individual LED diagnostic codes or messages on the RS485 communicates problem information for efficient troubleshooting.

#### 16.1.6 Flame Current Measurements

The PIM supports direct measurement of flame signal strength using the flame current test pins (FC+, FC-) on connector P2. Flame current may be measured by a micro-ammeter, or alternately by using a standard digital voltmeter. The signal on P2 is calibrated to 1 micro-amp/volt, so flame current in micro-amps can be directly read on the volts scale.

The user interface displays an approximation of flame current up to 5 micro-amps.

#### 16.1.7 Non-Volatile Lockout/Manual Reset

The PIM normally allows for volatile ignition lockout where a lockout condition is reset by a loss in 24VAC power or the call for heat demand. In certain applications or where required by standards (such a CSD-1), it can be configured through the parameter settings for non-volatile lockout after ignition failure. In this case the lockout may only be reset by the on-board manual reset button, or the remote reset input.

#### 16.1.8 ID Card

The PIM determines its operating parameters by reading the identification code of an external plug-in ID card. The ID card is connected to the PIM at the J6 connector.

**NOTE:** ID card must be present for the PIM and unit to operate. This card selects the proper settings in the PIM's memory for various Lync LC-Q models. The first time a PIM is powered up attached to an ID card, the ID card setting is stored in non-volatile memory. Once set, the PIM only operates with the correct ID card installed that matches its internal ID settings. The PIM verifies the ID card at power-up and on each heating cycle.

#### 16.1.9 Error Codes

Code	Description
0	No Error
<b>Control Display Errors</b>	
1	EEPROM
2	Outdoor Sensor
3	Supply Sensor
4	DHW Sensor
5	Vent Limiting
6	FTBus Communication

PIM Errors	
7	LWCO
8	Remote Proof
9	Air Pressure
10	Low Gas Pressure
11	Boiler Outlet/Tank Top Sensor
12	Boiler Inlet/Tank Bottom Sensor
13	Vent Sensor
14	Hi-Limit Sensor
15	Ignition Failure
16	Flame Loss
17	Vent Hi-Limit
18	Boiler/Tank Hi-Limit
19	False Flame
20	OEM Card
21	Internal Failure
22	Hi-Delta
23	Not used
24	Low Voltage
25	Blower Speed
26	High Gas Pressure
tN4 Errors (related to communication between multiple heaters in a linked system)	
27	Master Lost
28	Device Lost
29	Device Duplicate
30	Device Error

## 16.1.10 Maintenance Schedule

### 16.1.10.1 Annually (Every 12 Months)

1. Schedule annual service call by qualified service agency.
2. Check for piping leaks around pumps, relief valves, and tank connections. Repair, if found.
3. Check to ensure area is free from combustible materials, gasoline, and other flammable vapors or liquids.
4. Visually inspect venting system for proper function, deterioration or leakage.
5. Check temperature and pressure relief valve. Refer to manufacturer's instructions on valve.
6. Inspect condensate drain and ensure condensate is directed to an appropriate condensate system or drain, as required by local codes.
7. Check all operation of safety devices. Refer to manufacturer's instructions.
8. Inspect burner and gas train components for wear or deterioration.

9. Check the electronic-ignition system for quick ignition and proper flame signal.
10. Check gas safety shut-off valves for proper operation and tightness.
11. Follow startup procedure in this Installation, Operation & Maintenance manual.

#### **16.1.10.2 Semi-Annually (Every 6 Months)**

1. Test Low-water-cut-off (if equipped). Refer to manufacturer's instructions and reset.
2. Test the electronic-ignition flame failure detection system. Refer to manufacturer's instructions and reset.

#### **16.1.10.3 Monthly**

1. Check condensate drain system and refill the condensate neutralizer with replacement media (change interval as needed).
2. Visually inspect venting system for proper function, deterioration or leakage.
3. Confirm the low-water cutoff and alarm are operating.

#### **16.1.10.4 Daily**

1. Check for and remove any obstruction to the flow of combustion or ventilation air to the unit.
2. Ensure area is free from combustible materials, gas, and other flammable vapors or liquids.
3. Check gauges, monitors and indicators.

#### **16.1.10.5 As Required**

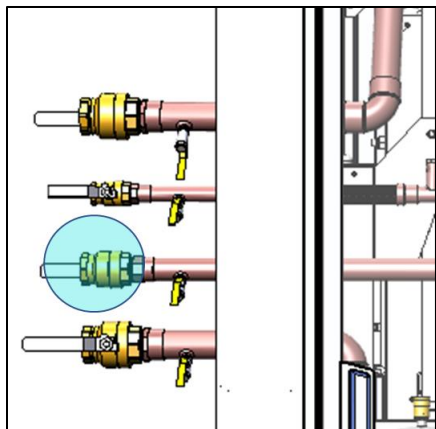
Flush and clean tank as required using the blowdown cycle with the unit valved off from service and vented. Upon refill and restart, ensure any trapped air is removed.

## **16.2 Cold and Recirc Sediment Filter Maintenance**

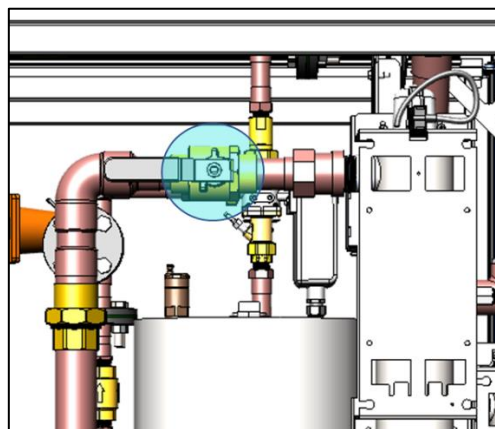
The Edge SC will inform users when the cold or recirc filters should be ordered and replaced, based on pressure drop due to collected sediment and foreign material within the system.

### **16.2.1 Changing Recirc Filter**

1. Close the upstream return ball valve (Figure 83) and downstream ball valve (Figure 84).

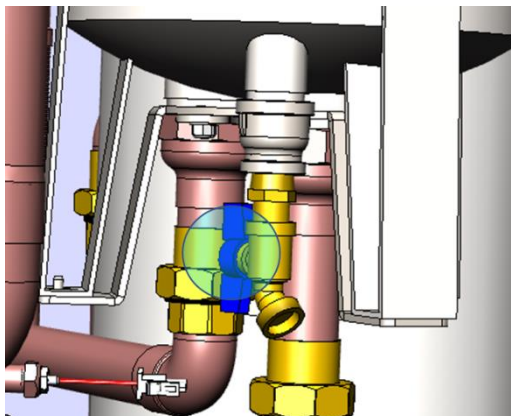


**Figure 83- Upstream Return Valve**

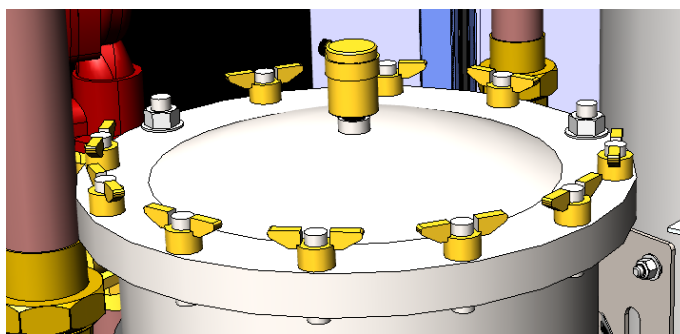


**Figure 84 - Downstream Return Valve**

2. Drain bottom of filter from the hose connection. Air will vent from top of filter housing.



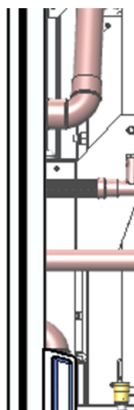
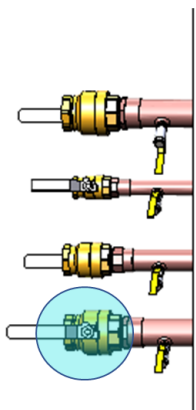
3. Remove all wingnuts and screws from the filter housing cover.



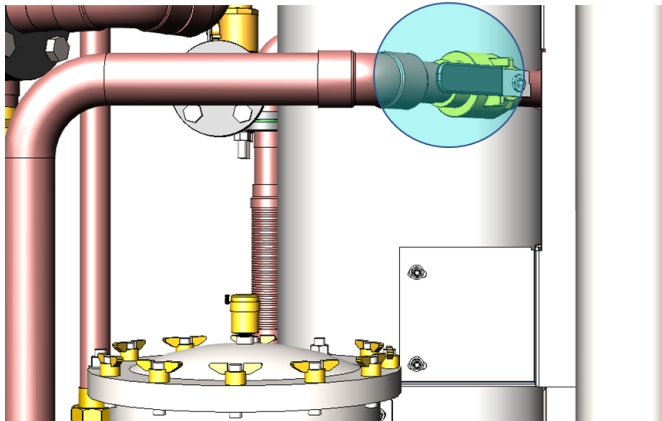
4. Open and remove filter from the housing. Clean or replace with new filter cartridge.
5. Replace filter housing cover.
6. Slowly open ball valves and allow line to fill. Check for leaks.

### 16.2.2 Changing Cold Filter

1. Close the upstream return ball valve (Figure 85) and downstream cold inlet ball valve (Figure 86) after the cold UV system.



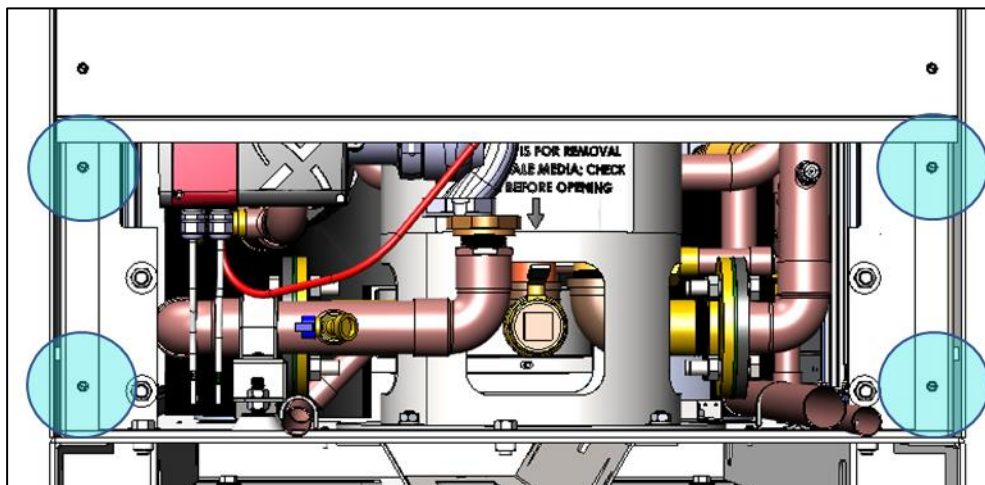
**Figure 85**



**Figure 86**

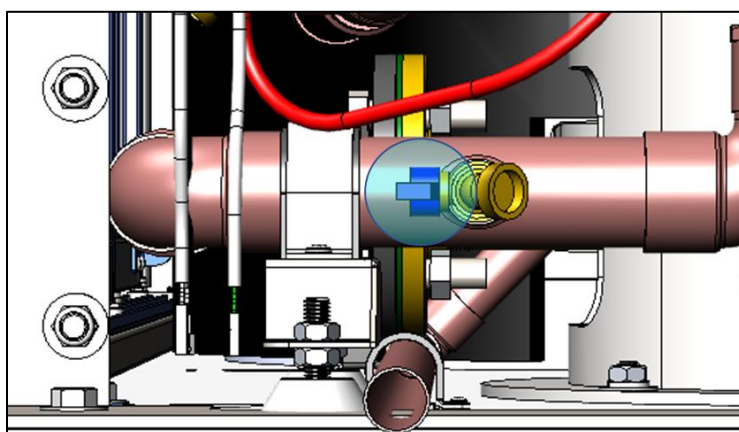
2. Remove the bottom rear panel.



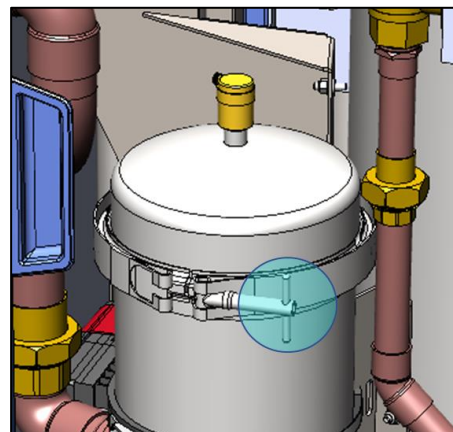


**Figure 87 - Rear Panel with Locations of Panel Screws Highlighted**

3. Open the hose connection to drain the filter, UV, and AquaSolve (Figure 88).
4. Remove the clamp on the filter housing (Figure 89) and remove lid.
5. Remove and clean or replace the (5) filter cartridges as needed.
6. Assembly is the same as disassembly.
7. Slowly open the ball valves to refill the line.



**Figure 88**



**Figure 89**

## 16.3 AquaSolve Maintenance

The AquaSolve media needs to be replaced every 3 years or sooner, depending on water conditions. The Edge SC will inform users based on the defined reminder period as well as when it is recommended to ensure media is on hand. The media are composed of small pellets that are best collected by way of a sieve or a rice bag. Do not dispose into the drain, but rather into a refuse container.



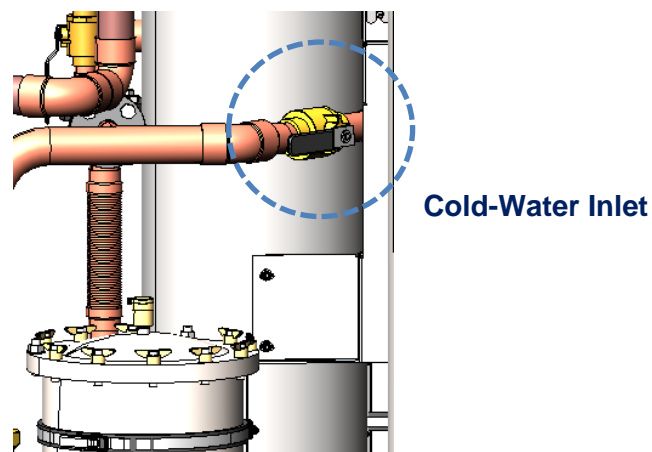
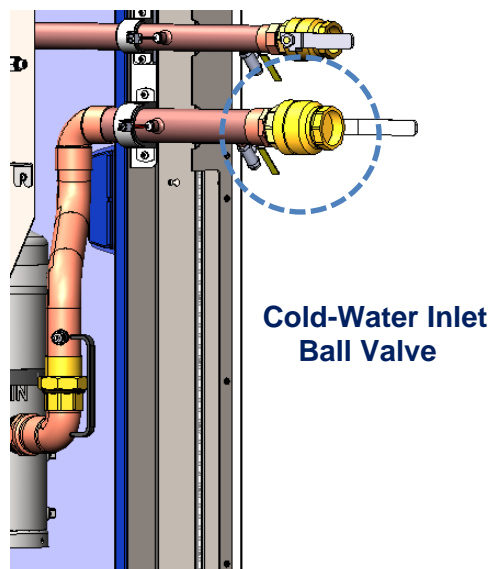
### 16.3.1 Replacing the Media

1. Remove the rear panels from Element unit. Each handle panel has 4 wingnuts along the edges that need to be removed. The bottom panel has 4 screws in the corners.



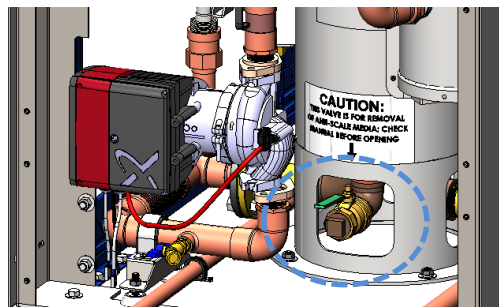
**Figure 90 – Removing Rear Panel**

2. Isolate the AquaSolve tank by closing flow at the cold-water inlet ball valve and cold-water water heater inlet as shown.



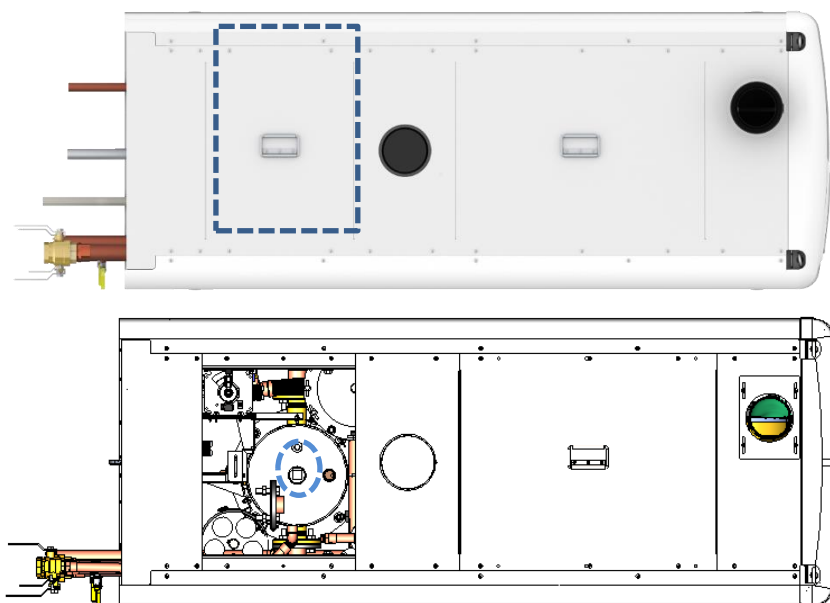
3. Remove drain plug from AquaSolve ball valve.

4. Connect drain pipe to AquaSolve ball valve.
5. Vent the AquaSolve tank at the top, center inlet.
6. Open ball valve to drain tank and capture media into a rice bag or sieve for disposal. Open cold-water inlet for 1 minute to flush potential media into suspension to drain.
7. Close ball valve and cold-water inlet.



**AquaSolve Ball Valve**

8. Open the rear top hatch. Attach AquaSolve media reservoir to the top of the vent.
9. Refill the unit with AquaSolve media M8414-COM-RM at the vent.
10. Slowly open cold-water inlet and fill to top of the vent. Close the inlet and close the vent.
11. Log media replacement in the Element Edge SC control system.

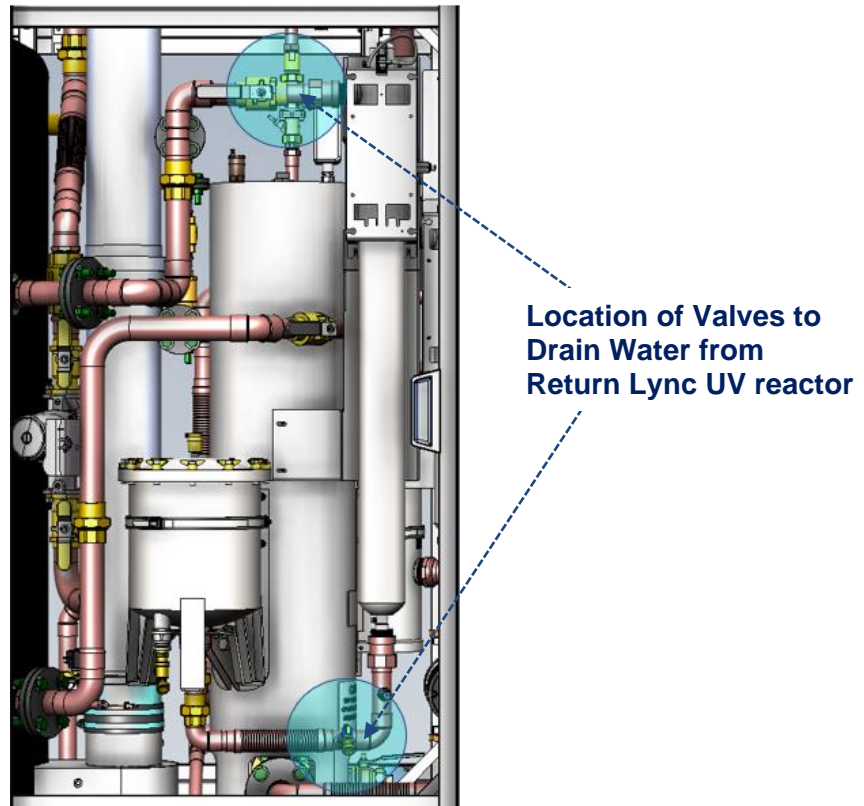


**Rear-Top Hatch and Top Vent**

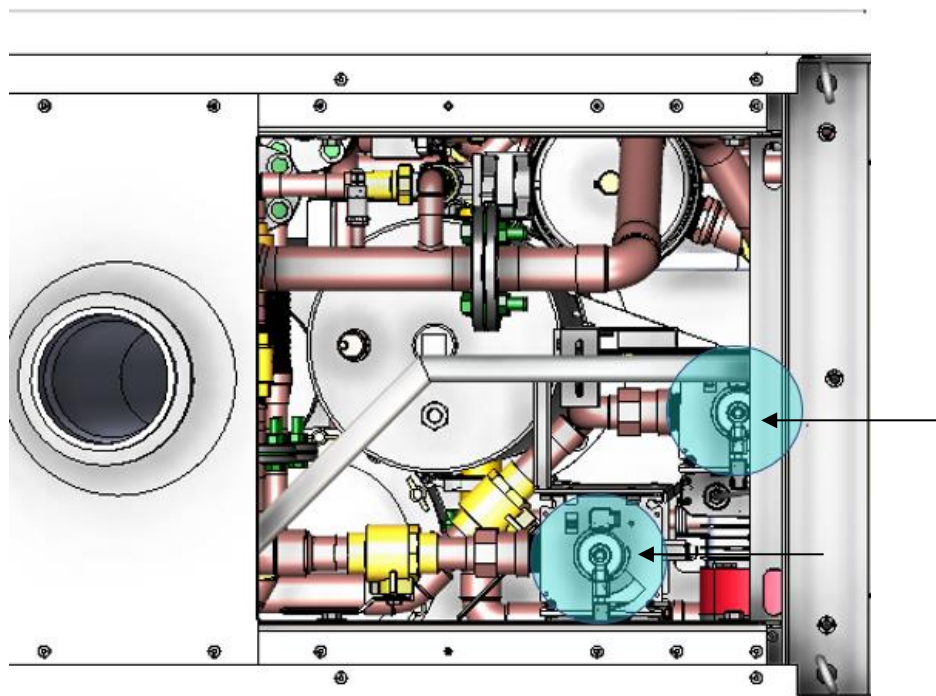
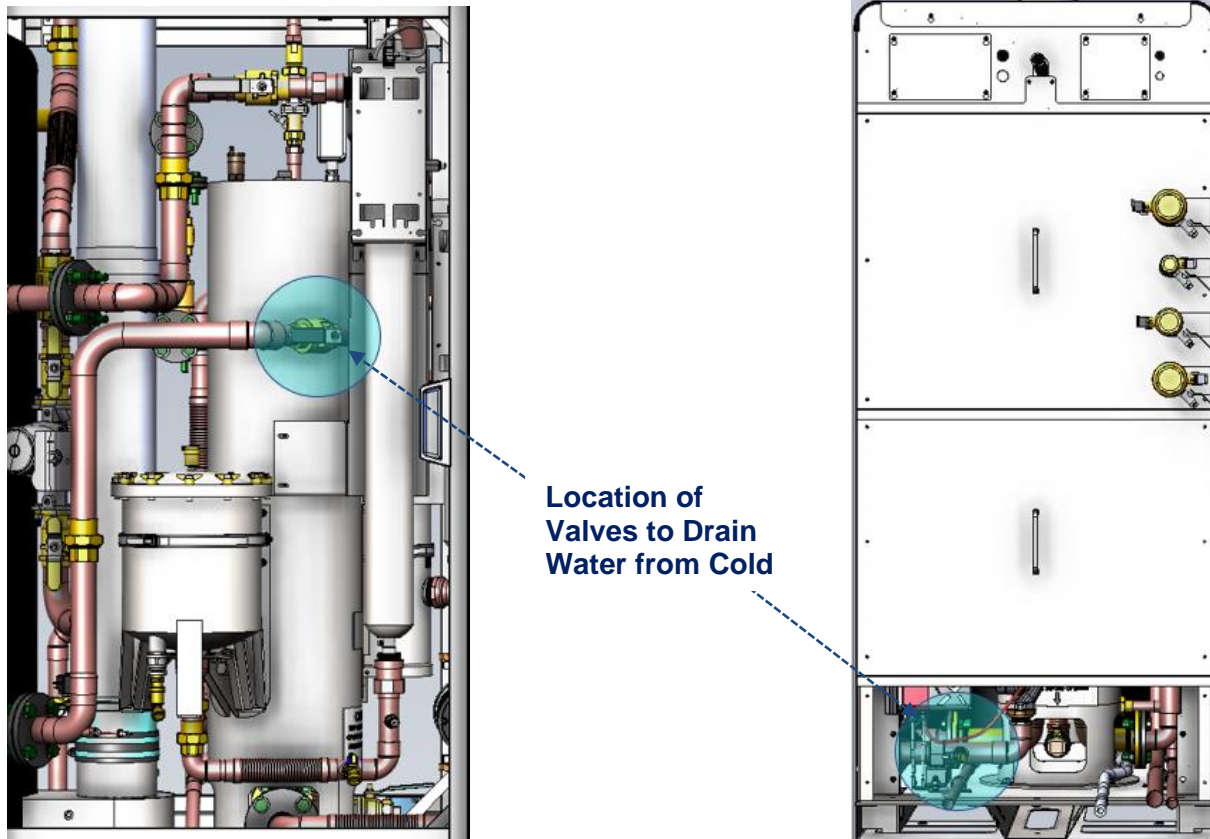
## 16.4 Lync UV Systems Maintenance

The Edge SC will inform users when a bulb should be ordered and when it requires replacement (every 9,000 hours). When a bulb or quartz tube needs to be replaced:

1. Isolate the Element from the DHW system and depressurize. De-energize Element.
2. For the recirc water UV:
  - a. Close the ball valve downstream (near the top) of the UV assembly.
  - b. Connect a hose to the drain outlet upstream (near the bottom) of the UV assembly.
  - c. Open drain valve. The air vent above the recirc filter will open and allow branch to drain.
  - d. Close drain valve and remove hose.

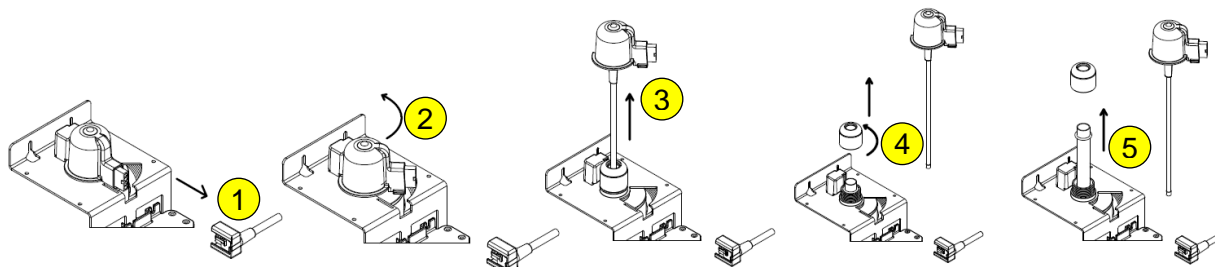


3. For the cold water UV:
  - a. Close the ball valve downstream (near the top) of the UV assembly.
  - b. Connect a hose to the drain outlet upstream (near the bottom) of the UV assembly.
  - c. Open the drain valve. The air vent above the recirc filter will open and allow the branch within Element to drain. This will also drain the AquaSolve chamber.
  - d. Close drain valve and remove hose.



**Top view location of Lync UV reactor assemblies**

4. Remove the two rear top hatches to expose the tops of both UV assemblies. Place an absorbent cloth around the port to catch any water discharge.



5. Disconnect the lamp lead wire from the glow cap electrical port (Figure 1).
6. Rotate the glow cap counterclockwise to unlock it from the mounting bracket (Figure 2).
7. Pull up on the glow cap to remove the lamp from the quartz sleeve (Figure 3). If not replacing the quartz, sleeve proceed to step 13.
8. Grip the quartz sleeve nut with your hand and unscrew counterclockwise until it can be lifted from the reactor chamber's threaded port (Figure 4).
9. Remove the quartz sleeve from the reactor chamber (Figure 5).
10. Remove all components from packaging and inspect for any damage, cracks, or scuffs.
11. Fully insert a new quartz sleeve into the reactor chamber and install the O-ring over the quartz sleeve. Press the O-ring down over the quartz sleeve until it is seated in the bevel of the stainless steel reactor chamber's threaded port.

**NOTE:** DO NOT touch the quartz sleeve with your fingers as fingerprint residue will cause the sleeve to prematurely fail. Hold it with a paper towel or soft, clean cloth.

12. Install the quartz sleeve nut onto the threaded port of the reactor chamber. Screw the nut on clockwise and tighten hand tight.
13. Insert a new lamp into the quartz sleeve.  
**NOTE:** DO NOT touch the lamp with your fingers as fingerprint residue will cause the sleeve to prematurely fail. Hold it with a paper towel or soft, clean cloth.
14. Gently press down on the glow cap and rotate it clockwise until it locks in place on the mounting bracket
15. Reconnect the lamp lead wire to the new lamp.
16. Open the rear shut-off valves and check for leaks. Repair leaks as needed.
17. Re-energize the Element.

## 16.5 Component Maintenance and Troubleshooting

### 16.5.1 Sanitation Pump

Lync Part Number: 69378

#### Failure to operate

When pump is first started, the shaft may rotate slowly until water has fully penetrated the bearings. If the pump does not run, the shaft can be rotated manually. To accomplish this, switch off the power supply, and close the isolation valves on each side of the pump. Remove the indicator plug in the middle of the nameplate. Insert a small flat-blade screwdriver into the end of the shaft, and gently turn until the shaft moves freely. Replace and tighten the plug. Open the isolating valves and wait 2 to 3 minutes for the system pressure to equalize before starting the pump.

After a long shutdown period, multispeed pumps should be started on speed 3 and then adjusted to the regular setting.



## 16.5.2 Booster Pump

Lync Part Number: 24695

### 16. Fault finding



**Warning**

*Before dismantling the pump, drain the system or close the isolating valve on either side of the pump. The pumped liquid may be scalding hot and under high pressure.*

#### 16.1 Grundfos Eye operating indications

Grundfos Eye	Indication	Cause
	No lights on.	Power off. Pump not running.
	Two opposite green indicator lights running in the direction of rotation of the pump.	Power on. Pump running.
	Two opposite green indicator lights permanently on.	Power on. Pump not running.
	One yellow indicator light running in the direction of rotation of the pump.	Warning. Pump running.
	One yellow indicator light permanently on.	Warning. Pump stopped.
	Two opposite red indicator lights flashing simultaneously.	Alarm. Pump stopped.
	One green indicator light in the middle permanently on (in addition to another indication).	Remote-controlled. The pump is currently being accessed by Grundfos GO Remote.

#### 16.2 Signalling communication with remote control

The center indicator light in the Grundfos Eye will indicate communication with Grundfos GO Remote.

The table below describes the desired function of the center indicator light.

Case	Description	Signalling by the center indicator light
Wink	The pump in question is highlighted in the Grundfos GO Remote display. To inform the user of the location of the highlighted pump, the center indicator light will flash four or five times once to signal "I am here".	Four or five quick flashes once to signal "I am here". 
Push me	The pump in question is selected/opened in the Grundfos GO Remote menu. The pump will signal "Push me" to ask the user to select the pump/allow the pump to exchange data with Grundfos GO Remote. The indicator light will flash continuously until a pop-up window asks the user to press [OK] to allow communication with Grundfos GO Remote.	Flashing continuously with 50 % duty cycle. 
I am connected	The indicator light is signalling that the pump is connected to Grundfos GO Remote. The indicator light is permanently on as long as the pump is selected in Grundfos GO Remote.	Indicator light permanently on. 

### 16.3 Fault finding

A fault indication can be reset in one of the following ways:

- When the fault cause has been eliminated, the pump will revert to normal duty.
- If the fault disappears by itself, the fault indication will automatically be reset.
- The fault cause will be stored in the pump alarm log.

Warning and alarm codes	Fault	Automatic reset and restart?	Corrective actions
Pump communication fault (10) Alarm	Communication fault between different parts of the electronics.	Yes	Replace the pump, or call GRUNDFOS SERVICE for assistance. Check if the pump is running in turbine operation. See code (29) Forced pumping.
Forced pumping (29) Alarm	Other pumps or sources force flow through the pump even if the pump is stopped and switched off.	Yes	Switch off the pump on the main switch. If the light in the Grundfos Eye is on, the pump is running in forced-pumping mode. Check the system for defective non-return valves and replace, if necessary. Check the system for correct position of non-return valves, etc.
Undervoltage (40, 75) Alarm	Supply voltage to the pump too low.	Yes	Check that the power supply is within the specified range.
Blocked pump (51) Alarm	The pump is blocked.	No	Dismantle the pump, and remove any foreign matter or impurities preventing the pump from rotating.
Dry running (57) Alarm	No water at the pump inlet or the water contains too much air.	No	Prime and vent the pump before a new start-up. Check that the pump is operating correctly. If not, replace the pump, or call GRUNDFOS SERVICE for assistance.
High motor temperature (64) Alarm	Temperature in stator windings too high.	No	Check the winding resistance according to the <a href="#">MAGNA3 service instructions</a> .
Internal fault (72, 84, 155, 157) Warning/alarm	Internal fault in the pump electronics.	Yes	Replace the pump, or call GRUNDFOS SERVICE for assistance.
Overvoltage (74) Alarm	Supply voltage to the pump too high.	Yes	Check that the power supply is within the specified range.
Communication fault, twin-head pump (77) Warning	Communication between pump heads disturbed or broken.	Yes	Check that the second pump head is powered or connected to the power supply.
Internal sensor fault (88) Warning	The pump is receiving a signal from the internal sensor which is outside the normal range.	Yes	Check that the plug and cable are connected correctly in the sensor. The sensor is located on the back of the pump housing. Replace the sensor, or call GRUNDFOS SERVICE for assistance.
External sensor fault (93) Warning	The pump is receiving a signal from the external sensor which is outside the normal range.	Yes	Does the electrical signal set (0-10 V or 4-20 mA) match the sensor output signal? If not, change the setting of the analog input, or replace the sensor with one that matches the setup. Check the sensor cable for damage. Check the cable connection at the pump and at the sensor. Correct the connection, if required. The sensor has been removed, but the analog input has not been disabled. Replace the sensor, or call GRUNDFOS SERVICE for assistance.

#### Caution

*If the power supply cable is damaged, it must be replaced by the manufacturer, the manufacturer's service partner or a similarly qualified person.*



## 17. Sensor

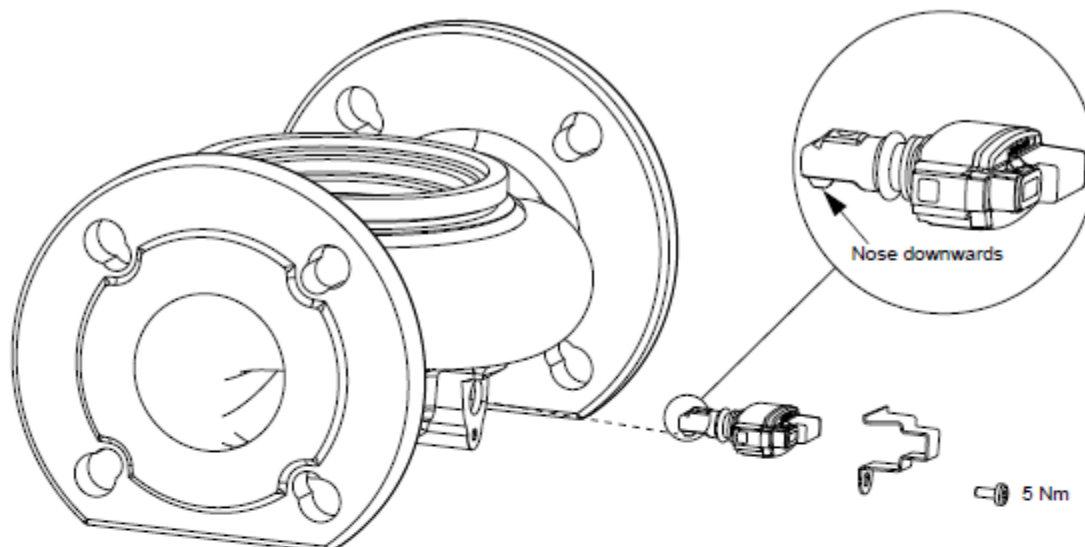


Fig. 39 Correct position of sensor

During maintenance and replacement of the sensor, it is important that the sealing cap is fitted correctly on the sensor housing.

Tighten the screw holding the clamp to 3.7 ft-lbs (5 Nm).



### Warning

*Before replacing the sensor, make sure that the pump is stopped and that the system is not pressurized.*

## 17.1 Sensor specifications

### 17.1.1 Pressure

Maximum differential pressure during operation	29 psi / 2 bar / 0.2 MPa
Accuracy +32 to +185 °F (0 to +85 °C)	2 %*
Accuracy +14 to +32 °F and +185 to +266 °F (-10 to 0 °C and +85 to +130 °C)	3 %*

\* Full scale.

### 17.1.2 Temperature

Temperature range during operation	+14 to +266 °F (-10 to +130 °C)
Accuracy	± 3.6 °F (± 2 °C)

## 16.5.3 Blowdown Valve

Lync Part Number: 92158

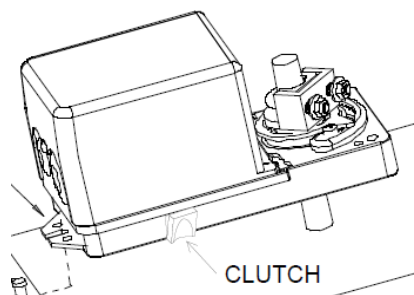
1. After disconnecting the supply voltage and discharging the pressure, inspect the valve.
2. Clean and inspect all the internal parts and replace them if necessary.
3. Remount all the parts making up the solenoid valve with care, paying great attention to the correct position of each part and protecting the sealing surfaces.
4. Check for tightness and correct operation.

### 16.5.4 Diverter Valve

Lync Part Number: 92159

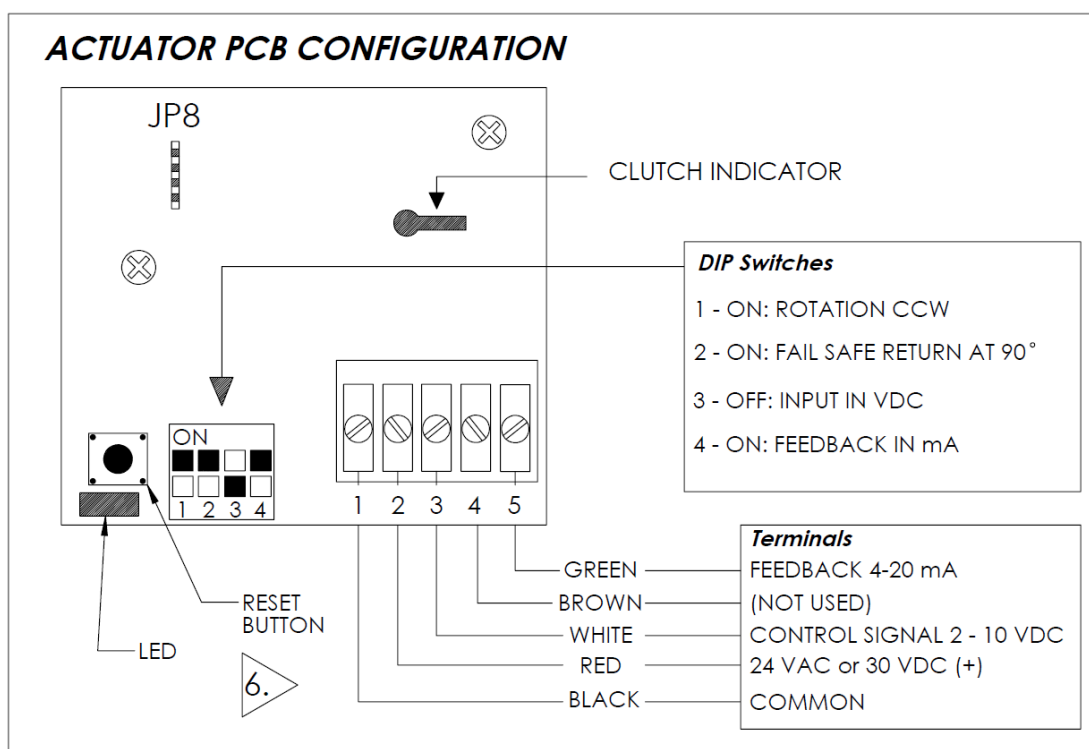
#### **WARNING**

Do not press the clutch while actuator is powered



**Location of Clutch**

#### **ACTUATOR PCB CONFIGURATION**



**PC Board**

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**16.5.4.1 Stroke Adjustment**

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1. Apply power and WAIT FOR LED TO TURN OFF (around 10 seconds).
2. Press the reset button to start auto-stroke process. The LED should illuminate.
  - a. First option: The actuator will then travel in both directions to find its limit and position itself according to the demand. The LED will extinguish, the process is complete.
  - b. Second option: When the desired start position is reached, press and release the reset button. The actuator will now go the end position. (you can also press and release the reset button when it reaches the end position) The LED will extinguish, and the process is complete.

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**16.5.4.2 Zero and Span Calibration**

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This feature is applicable to analog control signal only.

1. Remove power and put all dip switches "OFF". (factory preset).
2. Apply power and, within 10 seconds press and hold the reset button until the LED blinks once. The Zero and span calibration process then start.
3. Release the reset button. The LED is now constantly illuminated.
4. Apply new minimum voltage. It can be any value between 0 to 7 Vdc, with an external 0 to 10 volt supply (ex: MEP).
5. Press and release the reset button to memorize the new minimum voltage. The LED blinks.
6. Apply new maximum voltage. It can be any value between 3 to 10 Vdc, this value should be greater than the new minimum value.
7. Press and release the reset button to memorize the new maximum voltage. The LED blinks. The Zero and span calibration process is complete.

## APPENDIX

### Appendix A. Status, Fault Messages

The Element provides alerts to users via email, SMS, and push notifications through the myLync app. These messages can be configured by the user in myLync to appear through the different means of communication.

Log into the myLync web app. Click on the top right into your profile. Scroll down to find the Notifications section. Set your preferences accordingly.



The Element will provide notification of system alerts and errors. Many alerts are generated from the Edge SC itself based on incoming data. The following is a list of errors and codes that are generated directly from the different subsystems.

#### Lync Q Water Heater Error Codes:

Error #	Description
1	Technical service required on heater. Error #1
5	High exhaust temperature from heater
6	Technical service required on heater. Error #6
7	Low water level detected at heater
8	Interlock not proving, technical service required on heater or interlocked devices
9	Air flow proving switch not closing
10	Low gas pressure detected
11	Tank Top Sensor error. Technical service required on heater
13	Vent Sensor error
14	High Limit Sensor error. Technical service required on heater
15	Ignition Failure error. Technical service required on heater
16	Flame Loss error. Technical service required on heater
17	Vent Temperature High Limit.
19	False Flame error. Technical service required on heater
21	Heater fault. Perform power cycle of unit
24	Low voltage at heater
25	Detected blower speed too low at heater
26	High gas pressure detected at heater

**Lync UV System Error Codes:**

Error #	Description
UVLVRAT_2	The UV system is not sufficiently disinfecting. Check bulb life, clean quartz sleeve, clean UV sensor window, or check UV sensor connection.

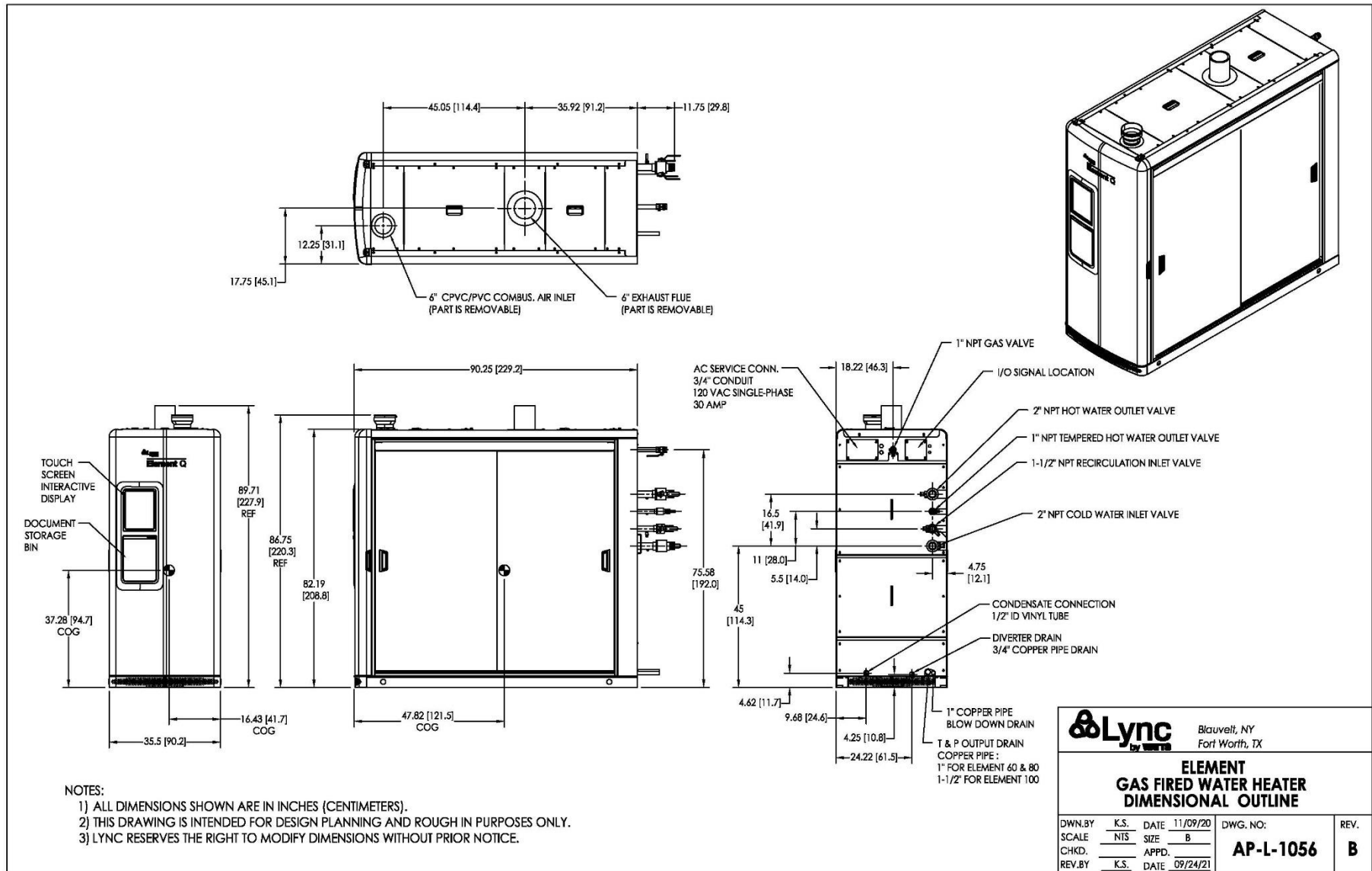
**DigiTemp Jr Mixing Valve Error Codes:**

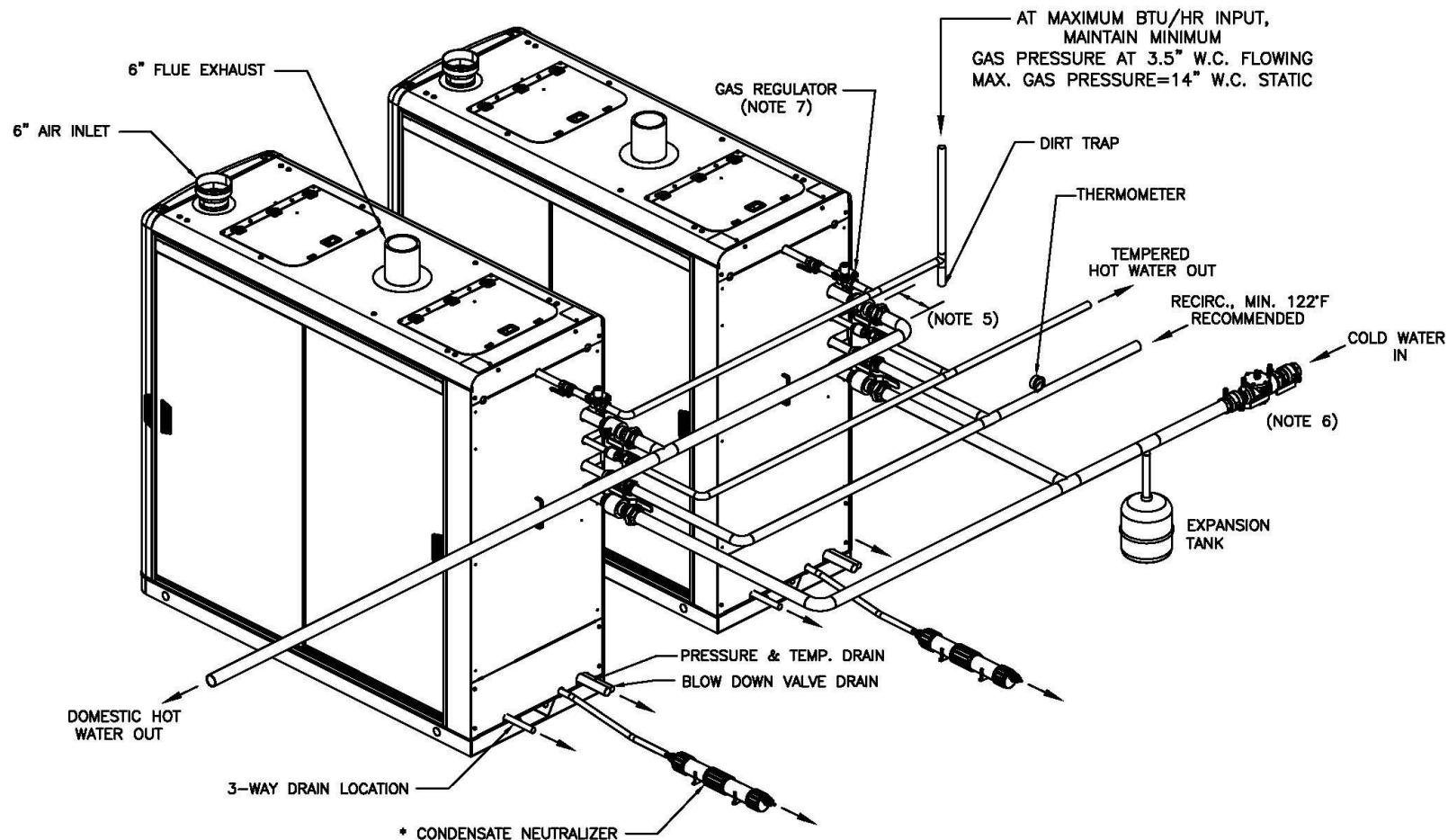
Error #	Description
1	Mixing valve NVM memory error. Technical service required.
2	Mixing valve temperature sensor failure. Technical service required.
3	Mixing valve size selection is not set. See IOM.

**Booster Pump Error Codes:**

Error #	Description
4	Too many booster pump restarts
7	Too many booster pump shutdowns
29	Reverse flow detected at booster pump
48	Booster pump Overload
66	Booster pump control electronics temperature high
67	Booster pump internal temperature too high
68	Booster pump water temperature high

## Appendix B. Diagrams



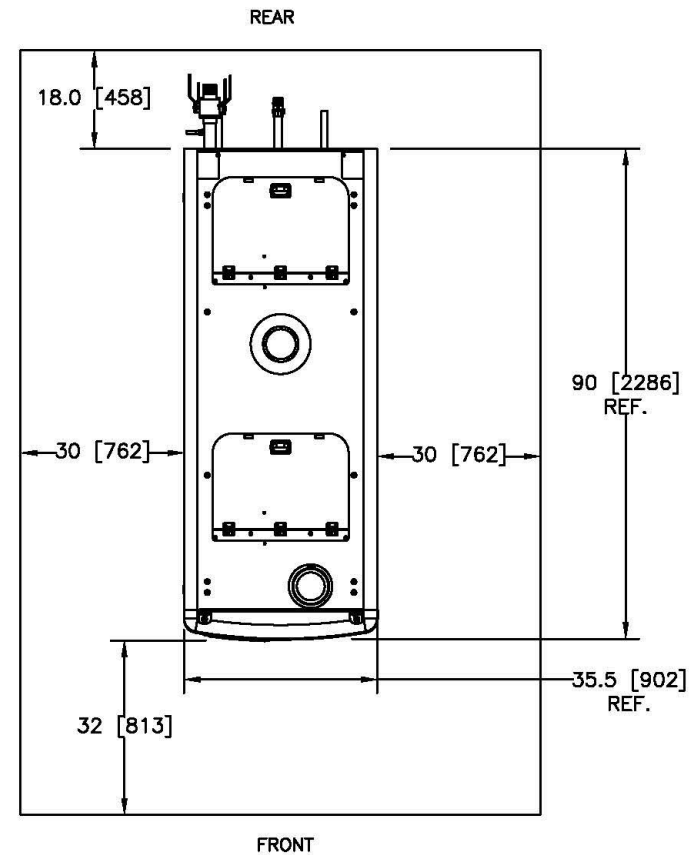
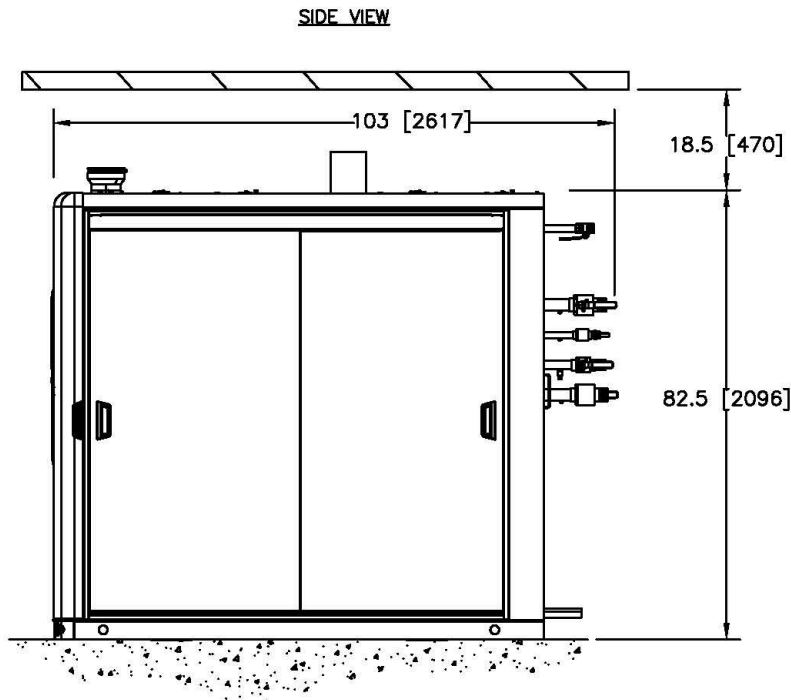


**NOTES:**

1. FOR ACTUAL SIZES AND LOCATIONS OF PIPING AND OTHER CONNECTIONS TO THE HEATER, SEE DIMENSIONAL DRAWING.
2. ALL DRAINS AND CONDENSATE HOSE SHOULD BE ARRANGED TO PERMIT THE FLUIDS TO DRAIN FREELY, BY GRAVITY, TO A FLOOR DRAIN. RELIEF VALVE DISCHARGE SHOULD BE PIPED TO THE NEAREST FLOOR DRAIN. WHEN NO FLOOR DRAIN IS AVAILABLE, THE RELIEF VALVE DISCHARGE SHOULD BE PIPED VERTICALLY TO A HEIGHT OF AT LEAST 6" ABOVE THE FLOOR BUT NOT LESS THAN 2 PIPE DIAMETERS.
3. ALL (\*) ITEMS ARE INCLUDED SEPARATELY IN SHIPMENT.
4. THIS IS A TYPICAL INSTALLATION DRAWING. LOCAL CODES AND AUTHORITIES SHOULD BE CONSULTED.
5. LOCATE WATER INLET AND OUTLET FITTINGS (i.e. UNIONS, ELBOWS, ETC.) A MINIMUM OF 6" FROM WATER HEATER FITTINGS, TO PREVENT INTERFERENCE WITH REMOVAL OF HEATER PANELS.
6. IF PERMITTED BY LOCAL CODES, A CHECK VALVE MAY BE USED IN PLACE OF A BACKFLOW PREVENTER.
7. AT 14" W.C. OR BELOW, A GAS REGULATOR IS OPTIONAL UNLESS REQUIRED BY LOCAL CODE.

<b>Lync</b> Blauvelt, NY Fort Worth, TX	
ELEMENT GAS FIRED WATER HEATER SINGLE UNIT INSTALLATION	
DWN. BY <u>K.S.</u> DATE <u>082520</u> SCALE <u>NTS</u> REV. DATE _____	SD-A-1211 REV. A





INSTALLATION CLEARANCES:

- 1) THIS APPLIANCE MAY BE INSTALLED ON COMBUSTIBLE FLOORING
- 2) MINIMUM CLEARANCES TO ADJACENT CONSTRUCTION ARE SHOWN.  
MINIMUM FLOOR TO CEILING HEIGHT IS 101 [2565].

NOTE:

1. ALL DIMENSIONS SHOWN ARE IN INCHES [CENTIMETERS].
2. CLEARANCE DIMENSIONS ARE MINIMUMS RECOMMENDED BY LYNC. LOCAL CODES AND AUTHORITIES SHOULD BE CONSULTED.

LYNC RESERVES THE RIGHT TO MODIFY DIMENSIONS WITHOUT PRIOR NOTICE



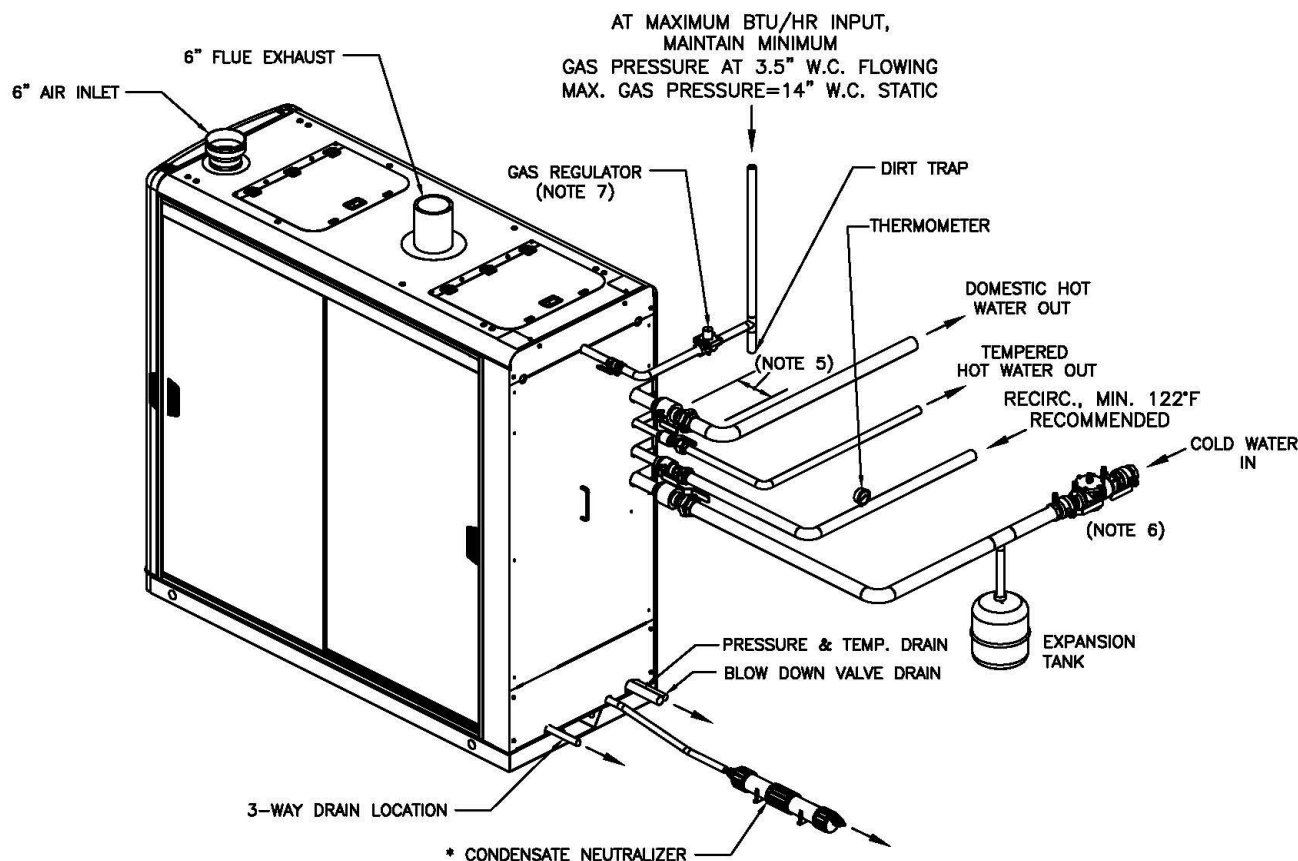
ELEMENT – SINGLE UNIT  
CLEARANCE DIMENSIONAL DRAWING

DWN. BY K.S. DATE 090420  
SCALE \_\_\_\_\_  
CHKD. \_\_\_\_\_ APPD. \_\_\_\_\_  
REV. DATE \_\_\_\_\_

SD-L-1213

REV.  
A





**NOTES:**

1. FOR ACTUAL SIZES AND LOCATIONS OF PIPING AND OTHER CONNECTIONS TO THE HEATER, SEE DIMENSIONAL DRAWING.
2. ALL DRAINS AND CONDENSATE HOSE SHOULD BE ARRANGED TO PERMIT THE FLUIDS TO DRAIN FREELY, BY GRAVITY, TO A FLOOR DRAIN. RELIEF VALVE DISCHARGE SHOULD BE PIPED TO THE NEAREST FLOOR DRAIN. WHEN NO FLOOR DRAIN IS AVAILABLE, THE RELIEF VALVE DISCHARGE SHOULD BE PIPED VERTICALLY TO A HEIGHT OF AT LEAST 6" ABOVE THE FLOOR BUT NOT LESS THAN 2 PIPE DIAMETERS.
3. ALL (\*) ITEMS ARE INCLUDED SEPARATELY IN SHIPMENT.
4. THIS IS A TYPICAL INSTALLATION DRAWING. LOCAL CODES AND AUTHORITIES SHOULD BE CONSULTED.
5. LOCATE WATER INLET AND OUTLET FITTINGS (i.e. UNIONS, ELBOWS, ETC.) A MINIMUM OF 6" FROM WATER HEATER FITTINGS, TO PREVENT INTERFERENCE WITH REMOVAL OF HEATER PANELS.
6. IF PERMITTED BY LOCAL CODES, A CHECK VALVE MAY BE USED IN PLACE OF A BACKFLOW PREVENTER.
7. AT 14" W.C. OR BELOW, A GAS REGULATOR IS OPTIONAL UNLESS REQUIRED BY LOCAL CODE.

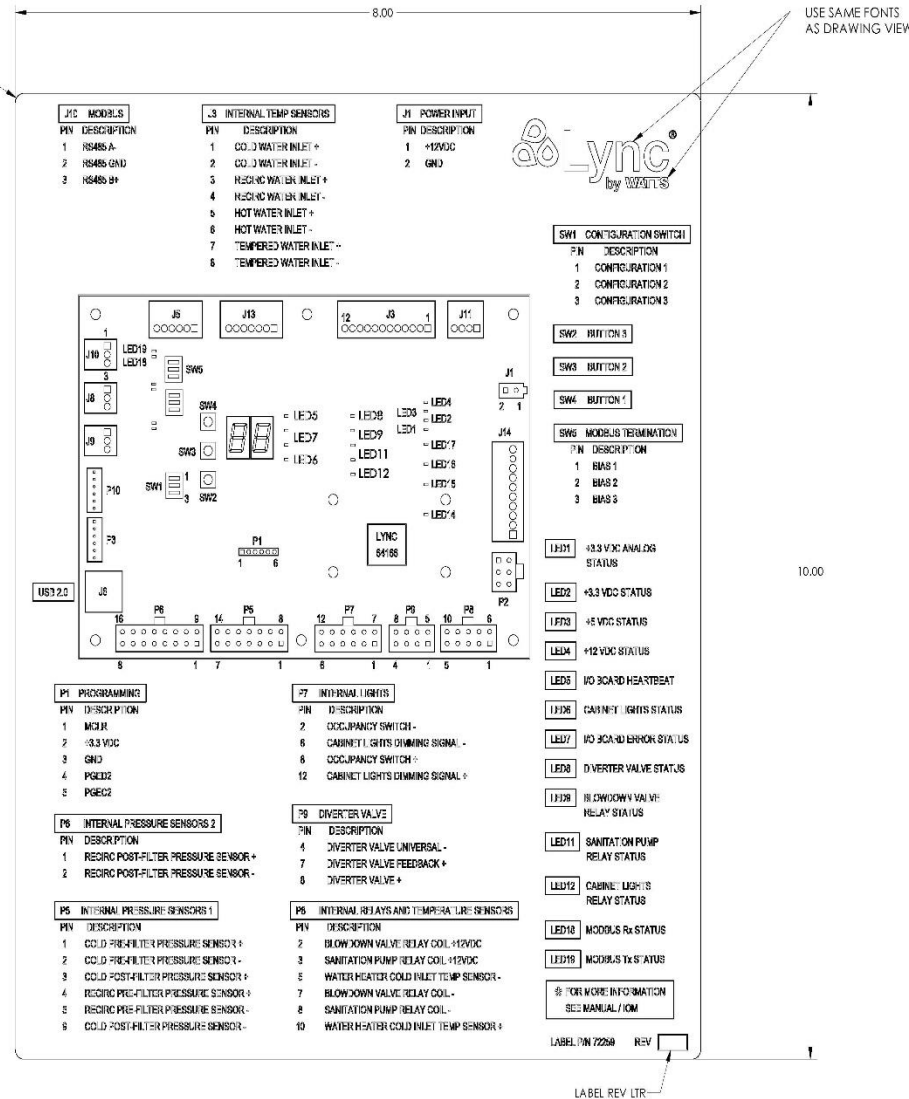
		Blauvelt, NY Fort Worth, TX	
QUEST GAS FIRED WATER HEATER SINGLE UNIT INSTALLATION			
DWN. BY <u>K.S.</u> DATE <u>082520</u>		SD-L-1214	REV. A
SCALE <u>NTS</u>			
REV. DATE _____			

NOTES:

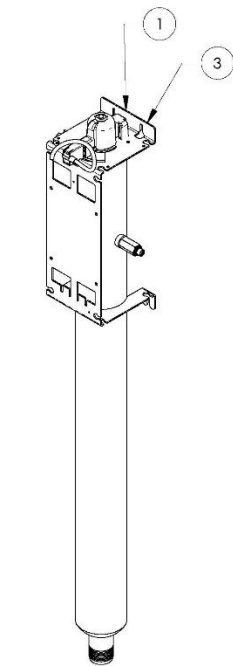
1. LABEL TO BE P-258S-2 MIL WHITE POLYESTER.
2. LETTERING TO BE BLACK, AERIAL FONT, NARROW UNLESS OTHERWISE SPECIFIED.
3. LABEL TO HAVE PRESSURE SENSITIVE ADHESIVE BACKING 3M 344 GRADE OR EQUIVALENT.
4. LETTERING TO BE .08 HIGH UNLESS OTHERWISE SPECIFIED.
5. LETTERING TO BE CENTERED IN DESIGNATED AREAS AS SHOWN.
6. FINISH TO BE 1 MIL CLEAR POLYESTER LAMINATION

(4X R.10)

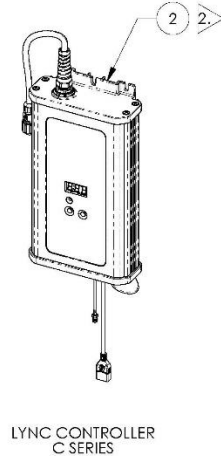
USE SAME FONTS  
AS DRAWING VIEW



- NOTES:  
1. REFER TO WORK INSTRUCTIONS: LNC-0005  
2. THE CONTROLLER WILL BE MOUNTED ON A HIGHER LEVEL: 24686  
3. CABLES WILL BE ASSEMBLED ON A HIGHER LEVEL: 29532



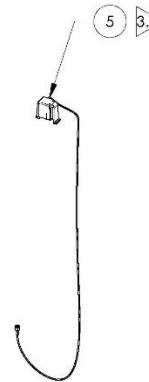
UV SMARTSTREAM  
REACTOR ASSEMBLY



LYNC CONTROLLER  
C SERIES



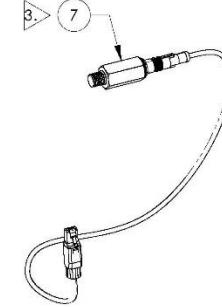
LYNC UV TOP END PLATE  
LAMP CABLE ASSEMBLY



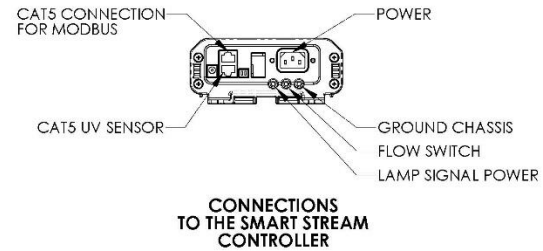
LYNC RFID  
CABLE ASSEMBLY



LYNC FLOW SENSOR  
CABLE ASSEMBLY



LYNC UV SENSOR  
CABLE ASSEMBLY



REPLACEMENT PARTS

PART NUMBER	DESCRIPTION	24751-1/ QTY	24751-2/ QTY
68110026	LYNC CONTROLLER, C SERIES	1	1
68108263	SMART STREAM QUARTZ SLEEVE	1	-
68108261	SMART STREAM QUARTZ SLEEVE	-	1
68108282	SMART STREAM LAMP 4X42.7	1	-
68108281	SMART STREAM LAMP 4X31	-	1
68108254	SMART STREAM QUARTZ SLEEVE ORING	1	1

ITEM NO.	PART NUMBER	OEM PART NUMBER	DESCRIPTION
1	24724-1	68110332	UV SMARTSTREAM ASSY, 50 GAL, ELEMENT
2	24724-2	68110026	UV SMARTSTREAM CONTROLLER, 50 GAL, ELEMENT
2	24724-3	68110331	UV SMARTSTREAM ASSY, 25 GAL, ELEMENT
3	24724-4	68110026	UV SMARTSTREAM CONTROLLER, 25 GAL, ELEMENT
4	24724-5	68110368	LYNC UV TOP END PLATE LAMP CABLE ASSEMBLY
5	24724-6	68110377	LYNC RFID CABLE ASSEMBLY
6	24725-7	68110378	LYNC FLOW SENSOR CABLE ASSEMBLY
7	24724-8	68110381	LYNC UV SENSOR CABLE ASSEMBLY

THIRD ANGLE PROJECTION  
C  
DATE: 9/30/20  
BY: [Signature]  
CHECKED: [Signature]  
APPROVED: [Signature]

**Lync**  
by WATTS

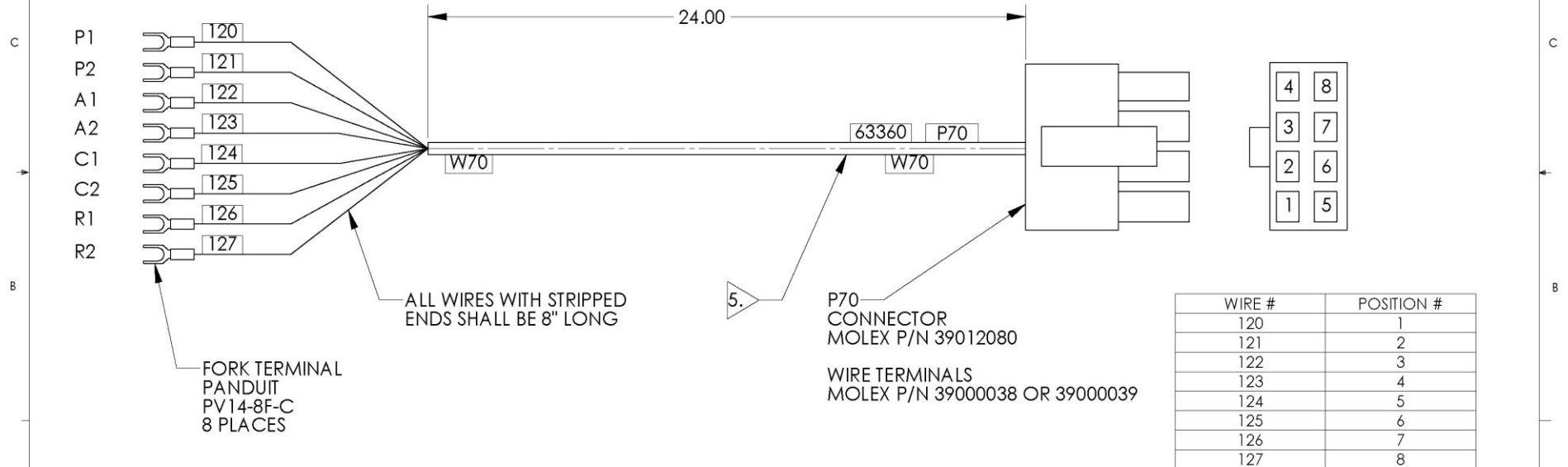
Blauvelt, NY  
Fort Worth, TX

ALL DIMENSIONS ARE IN INCHES AND ALL TOLERANCES ARE  
AS FOLLOWS UNLESS OTHERWISE SPECIFIED:  
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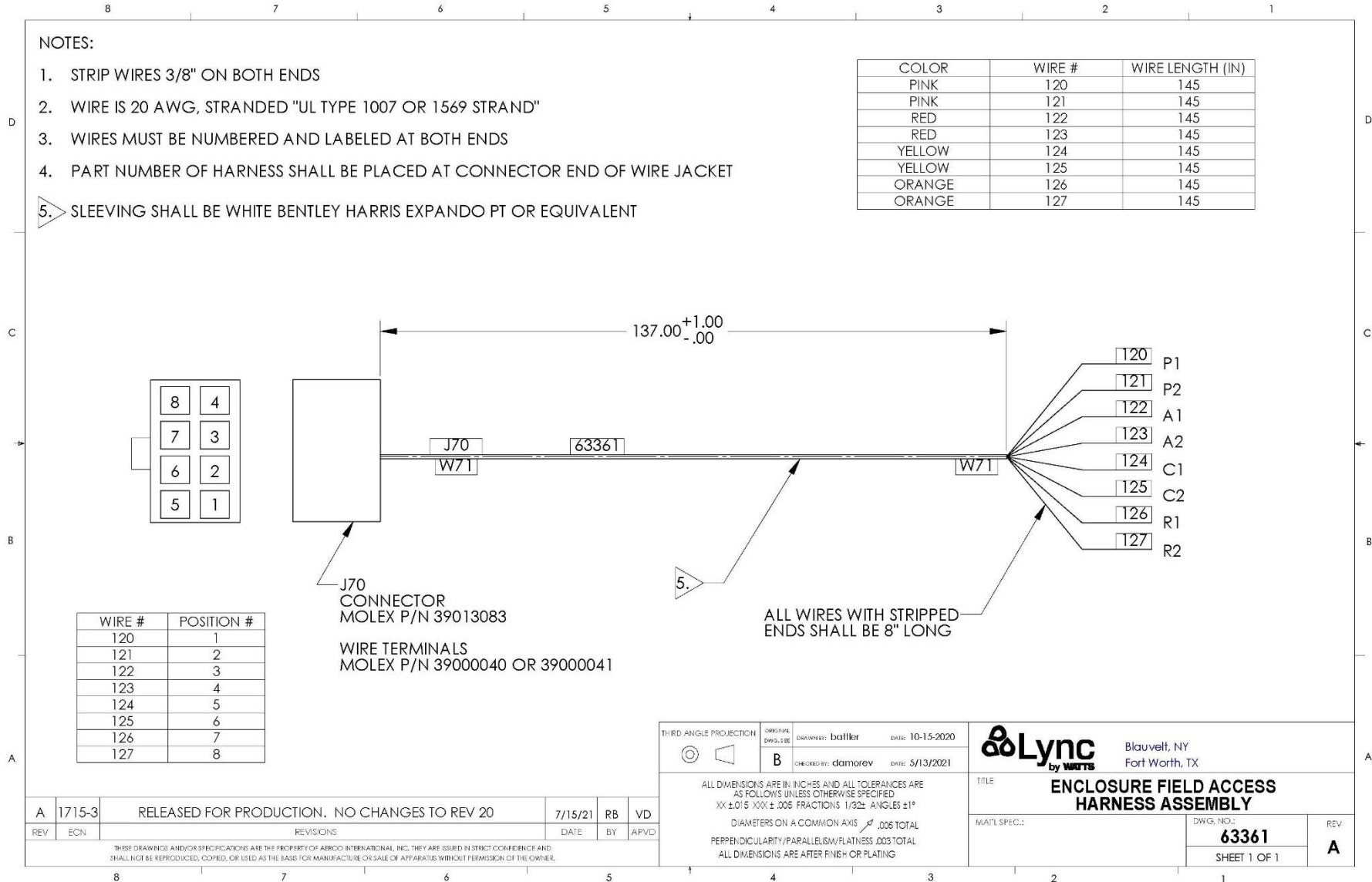
NOTES:

1. STRIP WIRES 3/8" ON BOTH ENDS
2. WIRE IS 20 AWG, STRANDED "UL TYPE 1007 OR 1569 STRAND"
3. WIRES MUST BE NUMBERED
4. PART NUMBER OF HARNESS SHALL BE PLACED AT CONNECTOR END OF WIRE JACKET
5. SLEEVING SHALL BE WHITE BENTLEY HARRIS EXPANDO PT OR EQUIVALENT
6. WIRE LENGTH TOLERANCE: +1.00, -0.00

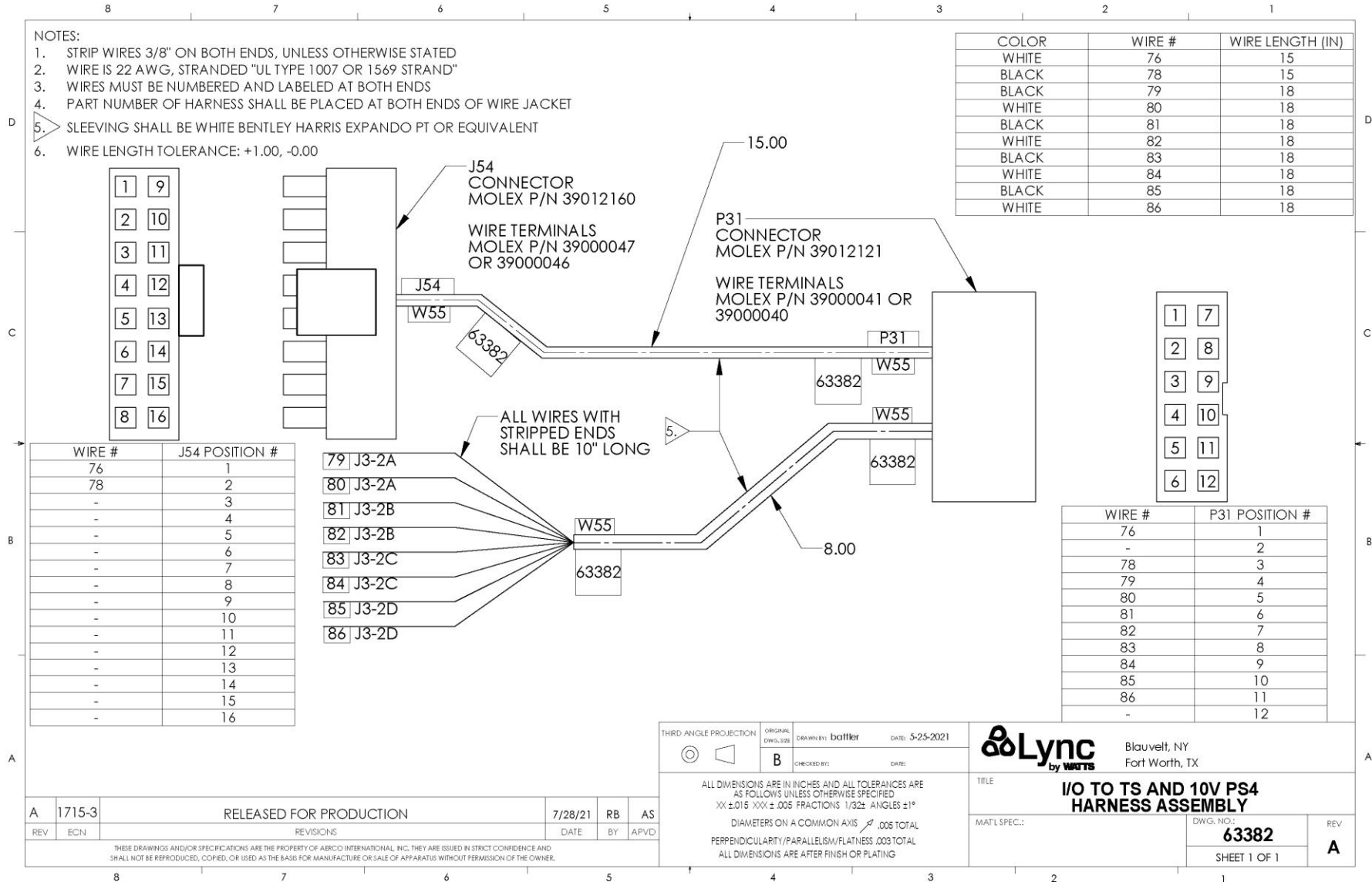
COLOR	WIRE #	WIRE LENGTH (IN)
PINK	120	32
PINK	121	32
RED	122	32
RED	123	32
YELLOW	124	32
YELLOW	125	32
ORANGE	126	32
ORANGE	127	32



THIRD ANGLE PROJECTION		ORIGINAL DWG. SIZE	DRAWN BY: battler	DATE: 10-14-2020	<b>Lync</b> by WATTS	Blauvelt, NY Fort Worth, TX
		B	CHECKED BY: kurzman	DATE: 5-12-2021		
<p>ALL DIMENSIONS ARE IN INCHES AND ALL TOLERANCES ARE AS FOLLOWS UNLESS OTHERWISE SPECIFIED  XX ±.015 XXX ±.005 FRACTIONS 1/32± ANGLES ±1°  DIAMETERS ON A COMMON AXIS .005 TOTAL  PERPENDICULARITY/PARALLELISM/FLATNESS .003 TOTAL  ALL DIMENSIONS ARE AFTER FINISH OR PLATING</p>					<p><b>CONQUEST FIELD ACCESS HARNESS ASSEMBLY</b></p>	
<p>THESE DRAWINGS AND/OR SPECIFICATIONS ARE THE PROPERTY OF AERCO INTERNATIONAL, INC. THEY ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE REPRODUCED, COPIED, OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT PERMISSION OF THE OWNER.</p>					<p>DWG. NO.: <b>63360</b></p> <p>SHEET 1 OF 1</p>	
A 1715-3		RELEASED FOR PRODUCTION		7/8/21	RB	NK
REV	ECN	REVISIONS		DATE	BY	APVD







## Appendix C. User Permissions Table

				New User	Owner	Chief Engr	Facilities Manager	Infection Control	Maint. Tech.	Technical Customer Support	Service Contractor	Water Mgmt Contractor
#	Unit and Remote Experiences	Menu Location	Permission Type									
4	Component Detail Screen - Change Settings	System Status	Edit	N/A	Yes	Yes	Yes	Yes	No	Yes	No	No
5	System Settings Screen	Settings	View	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	System Settings - Change Settings	Settings	Edit	N/A	Yes	No	Yes	Yes	No	Yes	No	No
9	Sanitation Loop - Change Scheduled Operation	Sanitation	Edit	N/A	Yes	No	Yes	Yes	No	Yes	No	No
10	Sanitation Loop - Run Manual Operation	Sanitation	Run/ Execute	N/A	Yes	No	Yes	Yes	No	Yes	No	Yes
11	Sanitation Loop - (Re)Authorize Operation	Sanitation	Run/ Execute	N/A	Yes	No	Yes	Yes	No	Yes	No	Yes
13	System Flush - Change Scheduled Operation	System Status	Edit	N/A	Yes	No	Yes	No	No	Yes	No	No
14	Heater Blowdown Screen	System Status	View	N/A	Yes	Yes	Yes	Yes	Yes	Yes	No	No
15	Heater Blowdown - Change Scheduled Operation	System Status	Edit	N/A	Yes	No	Yes	No	Yes	Yes	No	No
16	Heater Blowdown - Run Manual Operation	System Status	Run/ Execute	N/A	Yes	No	Yes	No	Yes	Yes	Yes	No
17	Thermal Shock Screen	Sanitation	View	N/A	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
18	Thermal Shock - Run Manual Operation	Sanitation	Run/ Execute	N/A	Yes	No	Yes	No	Yes	Yes	No	Yes
19	Chemical Shock Screen	N/A	View	N/A	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
20	Chemical Shock - Run Manual Operation	N/A	Run/ Execute	N/A	Yes	No	Yes	No	Yes	Yes	No	Yes
22	Maintenance Screens - Export Report	Maintenance	View/ Run/ Export	N/A	Yes	Yes	Yes	Yes	Yes	Yes	No	No
23	Infection Control Screens	Infection Control	View	N/A	Yes	Yes	Yes	Yes	No	Yes	No	Yes
24	Infection Control Screens - Export Report	Infection Control	View/ Run/ Export	N/A	Yes	Yes	Yes	Yes	No	No	No	Yes
25	Change Temperature Setpoints	System Status	Edit	N/A	Yes	No	Yes	No	Yes	Yes	Yes	Yes
26	Change Temperature Notification Thresholds	System Status	Edit	N/A	Yes	No	Yes	No	No	Yes	No	No
27	Record a Scheduled Maintenance Operation	System Status	Edit	N/A	Yes	No	Yes	No	Yes	Yes	Yes	Yes
28	Change Component Lifetime Configuration	System Status	Edit	N/A	Yes	No	Yes	No	No	Yes	No	No
31	System Events - Close & Re-Open	System Status	Edit	N/A	Yes	Yes	Yes	Yes	Yes	Yes	No	No
33	Create New Organization	Mobile / Web	Location Mgmt	No	Yes	No	No	No	No	Yes	No	No
34	Change Organization Name	Mobile / Web	Location Mgmt	N/A	Yes	No	No	No	No	Yes	No	No
35	Delete an Organization	Mobile / Web	Location Mgmt	N/A	Yes	No	No	No	No	No	No	No

36	Transfer Ownership	Mobile / Web	Device Mgmt	N/A	Yes	No	No	No	No	No	No	No
37	Create, Edit, and Delete New Site/Building/Plant	Mobile / Web	Location Mgmt	N/A	Yes	Yes	Yes	No	No	Yes	No	No
38	Manage User Access/Permission Levels	Mobile / Web	User Mgmt	N/A	Yes	Yes	Yes	No	No	Yes	No	No
42	Commission new unit	System Status	Device Mgmt	Yes	Yes	Yes	Yes	No	No	Yes	No	No
45	Decommission a Unit	System Status	Device Mgmt	N/A	Yes	No	Yes	No	No	Yes	No	No
52	Create New User	System Status	User Mgmt	N/A	Yes	No	Yes	No	No	No	No	No
53	View Other User Profiles	System Status	User Mgmt	N/A	Yes	Yes	Yes	No	Yes	No	No	No
55	Disable User	System Status	User Mgmt	N/A	Yes	No	Yes	No	No	Yes	No	No
58	View/Export Infection Control/Sanitation Report	N/A	View/ Run/ Export	N/A	Yes	Yes	Yes	Yes	No	No	No	Yes
57	Request and Export Wellness Report - PDF	Mobile / Web	View/ Run/ Export	N/A	Yes	Yes	Yes	Yes	No	No	No	Yes



## Appendix D. Change Log

Change Log		
Date	Description	Changed By
10/12/2021	Rev A: Initial Release	Linley T