


Stainless Steel Condensing Boiler Connection Instructions To Additional Heating Devices Kit #55002875

Kit installation shall be completed by qualified agency.

 WARNING
<p>Fire, explosion, asphyxiation and electrical shock hazard. Improper installation could result in death or serious injury. Read this instruction and understand all requirements, including requirements of authority having jurisdiction, before beginning installation. Installation not complete until appliance operation is verified per Installation, Operation & Maintenance Manual provided with boiler.</p>

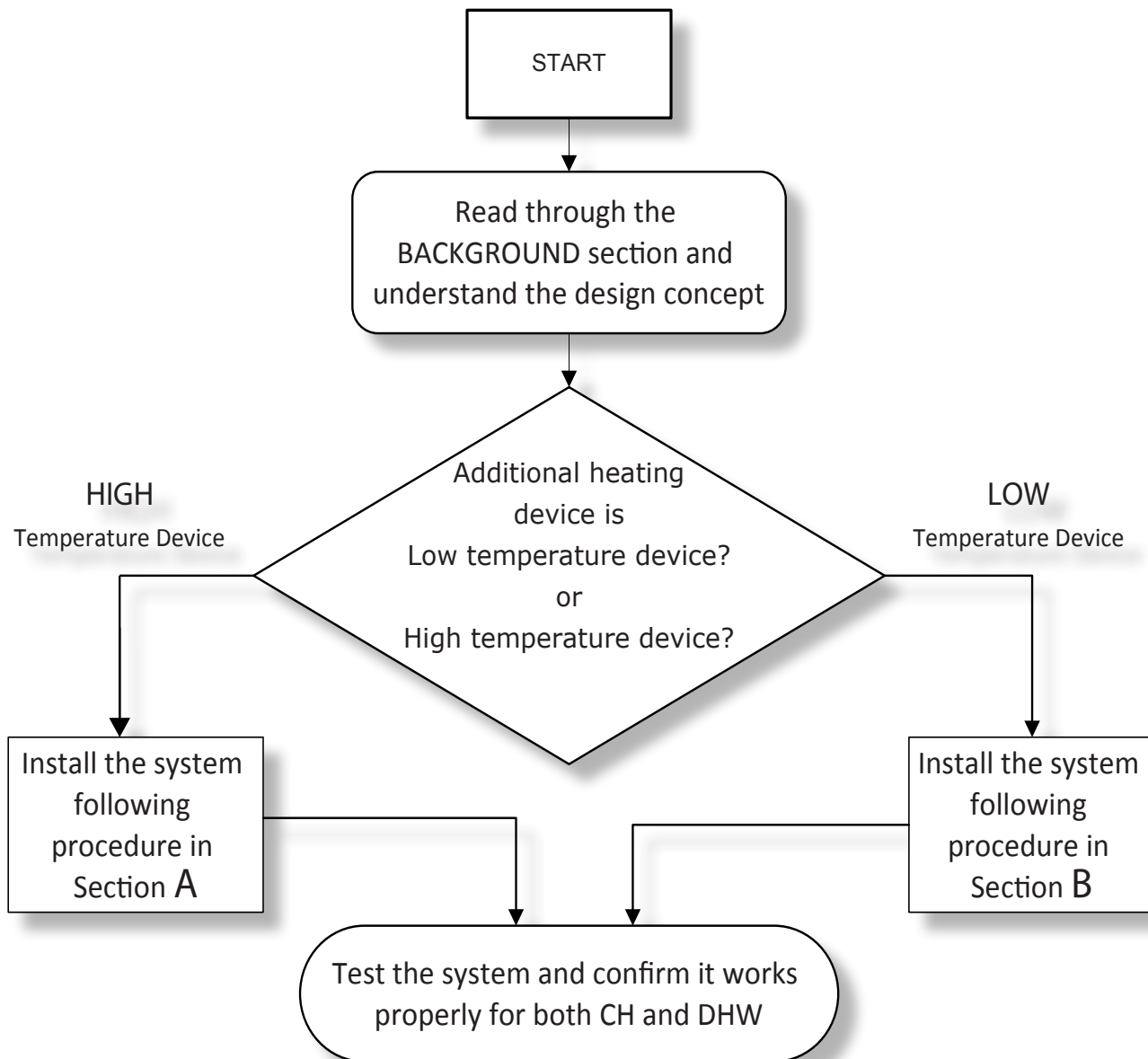
Boiler installation shall conform to requirements of authority having jurisdiction or in absence of such requirements:

- United States
 - National Fuel Gas Code, ANSI Z223.1/NFPA 54.
 - National Electrical Code, NFPA 70.
- Canada
 - Natural Gas and Propane Installation Code, CAN/CSA B149.1.
 - Canadian Electrical Code, Part I, Safety Standard for Electrical Installations, CSA C22.1

TABLE 1 - Parts Supplied With Kit		
Description	Part	Qty
AR822 Control	Z140C	2
System Sensor	240008465	1
System Sensor Well	240008466	1
Well Clip	240008467	1
Kit Instructions	240010355	1

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BACKGROUND

Application Concept

- I. Kit is for applications that employ ECR Stainless Condensing boiler to work with an additional heating device.
- II. If the additional heating device can constantly supply hot water at 165°F or HIGHER, it is considered a HIGH Temperature Heating Device. Follow installation procedure in **SECTION A**. Following are common High Temperature Heating Devices
 - Indoor wood water boiler
 - Outdoor wood water boiler
 - Electric boiler
- III. If Additional Heating Device only constantly supplies hot water at LESS THAN 165°F, it is considered a LOW Temperature Heating Device. Follow installation procedure in **SECTION B**. Following are common Low Temperature Heating Devices.
 - Geothermal hot water heating device
 - Solar water heating device
 - Electric hot water heat pump
- IV. Heating capacity of the additional heating device will be fully utilized when available.
- V. Stainless Condensing boiler will fire only when the additional heating device cannot satisfy heat demand.

Water Flow Arrangement

- VI. The piping connection establishes flow where water flows through the two heating devices (Stainless Condensing boiler and Additional Heating Device) in a sequential manner. The goal is to make the two heating units work together at the maximum possible system heating efficiency.

If the additional heating device is a HIGH temperature device, return water goes into the Stainless Condensing boiler first. The purpose is to have the stainless condensing boiler work in the condensing regime as much as possible. **SECTION A.**

If the additional heating device is a LOW temperature heating device, return water flows into additional heating device first to fully utilize the capacity of the additional heating device. **SECTION B.**

- VII. The water flow arrangement takes advantage of the Stainless Steel Condensing boiler's built in primary loop and internal water pump.

Water Temperature Control

- VIII. The system is configured so the Stainless Condensing boiler control system will modulate its firing rate to sustain Supply Water Temperature at the setting point in all conditions.
 - When Additional Heating Device is supplying heat at its full capacity.
 - When Additional Heating Device is supplying heat at reduced capacity.
 - When Additional Heating Device is not supplying heat.

Heating Priority Establishment

- IX. The two heating units are configured to supply heat in the following manner.
 - When the Additional Heating Device alone CANNOT maintain supply water temperature at or higher than the temperature set point of the Stainless Condensing boiler, the Stainless Condensing boiler will fire.
 - When the Additional Heating Device alone CAN maintain a supply water temperature higher than the temperature set point of the Stainless Condensing boiler, the Stainless Condensing boiler will NOT fire.

SECTION A**Stainless Condensing boiler working with HIGH Temperature Heating Device****A1. Pipe the system**

- 1-1. Pipe the heating system and install all required components following installation instructions of Additional Heating Device, i.e. a wood boiler.
- 1-2. Connect the Additional Heating Device and Stainless Condensing boiler together as shown in Figure A1. If the Additional Heating Device can be pressurized.
- 1-3. Install Stainless Condensing boiler System Sensor on the supply side of the piping (supply side of Additional Heating Device) as shown in Figure A1. If the Additional Heating Device CAN NOT be pressurized (i.e. and open system) connect the Stainless Condensing Boiler and Additional Heating Device as shown in Figure A2.
- 1-4. All near boiler piping requirements of the Additional Heating Device have to be satisfied. Refer to installation and operation manuals of the Additional Heating Device.
- 1-5. Manufacture recommends Additional Heating Device bypass valve. Close the bypass valve when Additional Heating Device is used. When Additional Heating Device will **not** supply heat for extended period of time, **open** the bypass valve. This is important when Additional Heating Device is an outdoor wood boiler. Water from the system will not be cooled from circulating through the unused system.
- 1-6. Install expansion tank, air vent, and filling pipe at upstream (inlet) side of system pump.

A2. Connect Electrical Wires

- 2-1. Follow instructions in Additional Heating Device manuals when wiring
 - (1) all high voltage wires and
 - (2) Low voltage wires other than Call For Heat wire.
- 2-2. Follow instructions in Stainless Condensing boiler Installation, Operation and Maintenance Manual when connecting
 - (1) all high voltage wires and
 - (2) Low voltage wires other than Call For Heat wire.
- 2-3. Connect system pump to Additional Heating Device, if applicable.
- 2-4. All zone pumps and zone valves, if controlled by heating device, should be connected to and controlled by the Additional Heating Device, if applicable.

- 2-5. Remove or deactivate Low Limit control on Additional Heating Device, if available.

A3. Connect CH Call For Heat Wires

- 3-1. Install one of the supplied call for heat controls, AR822, onto wall.
- 3-2. Remove jumper in AR822 between Terminal-L1 and Terminal-3.
- 3-3. Connect Additional Heating Device and Stainless Condensing boiler. See Figure A3.
 - Connect two wires, from room thermostat or from zone control board, to input T-Terminals (Terminal-R and Terminal-W) in AR822.
 - Connect Terminal-5 and Terminal-6 in AR822 to Stainless Condensing boiler CH T-T terminals.
 - Connect Terminal-3 and Terminal-4 in AR822 to CH T-T input of Additional Heating Device.
 - Connect line voltage wires to Terminal-L2 and Terminal-L1 in AR822.

A4. Connect DHW Call For Heat wires, if applicable

- 4-1. Install supplied call for heat control, AR822, onto wall.
- 4-2. Remove jumper in AR822 between Terminal-L1 and Terminal-3.
- 4-3. Connect Additional Heating Device and Stainless Condensing boiler following Figure A4.
 - Connect two wires, from hot water tank thermostat or from zone control board, to input T-Terminals (Terminal-R and Terminal-W) in AR822.
 - Connect Terminal-5 and Terminal-6 in AR822 to Stainless Condensing boiler CH T-T terminals.
 - Connect Terminal-3 and Terminal-4 in AR822 to CH T-T input of Primary Heating Device.
 - Connect line voltage wires to Terminal-L2 and Terminal-L1 in AR822.

A5. Setting the Additional Heating Device

- 5-1. Set CH supply temperature setting of Additional Heating Device according to heating system requirement, i.e. 170°F.
- 5-2. Set DHW supply temperature setting of Additional Heating Device according to hot water tank requirement, i.e. 180°F.

A6. Set The Stainless Condensing Boiler CH

- 6-1. Set stainless Condensing boiler to be Master boiler in Cascade mode. Change S4-switch to ON position, (away from S4 mark on control board). See Figure A5.
- 6-2. Change boiler address to Cascade 1 following procedure below.
- Press down and hold "Enter" button and immediately press down and hold "Menu" button for 5 seconds to enter into Installer Menu.
 - Use arrow keys to go to "Boiler Config"
 - Press "Enter" key
 - Press "Enter" key again. The number after "Boiler Address:" will be flashing.
 - Use arrow keys to change this number to 1.
 - Press "Enter" key, number will stop flashing.
 - Press "Menu" key twice to exit Installer Menu.
 - CASCADE 1 should appear on user interface.
- 6-3a Set System Temperature Setting for Stainless Condensing boiler. If outdoor reset is activated (CH Mode 1 or CH Mode 2) and if heating system requires a reset curve different from the default curve.
- Change Outdoor Reset curve. Detailed instructions can be found in boiler Installation, Operation and Maintenance Manual (IOM).
 - Set "Boiler Max" parameter to about 20°F lower than setting point of Additional Heating Device, i.e. 150°F.
- 6-3b If outdoor reset function is deactivated (CH mode 0), follow procedure below to set System Temperature Setting point.
- Press "Menu" button.
 - Scroll down to "Setting" using arrow keys.
 - Press "Enter" key.
 - Press "Enter" key again. The number after "Cascade CH Setting" will be flashing.
 - Use arrow keys to change this number to about 20°F lower than setting point of Additional Heating Device, i.e. 150°F.
 - Press "Enter" key. Number will stop flashing.
 - Press "Menu" key twice to exit setting mode.

A7. Set The Stainless Condensing Boiler DHW Setting

- 7-1 Set DHW supply temperature setting of stainless condensing boiler to temperature about 10°F lower than corresponding DHW setting point on Additional Heating Device, i.e. 170°F.

A8. Create CH call for heat and verify system works as intended.**A9. Create DHW call for heat, if applicable, and verify system works as intended.**

Figure A1 - Piping for Stainless Condensing Boiler and High Temperature Additional Heating Device

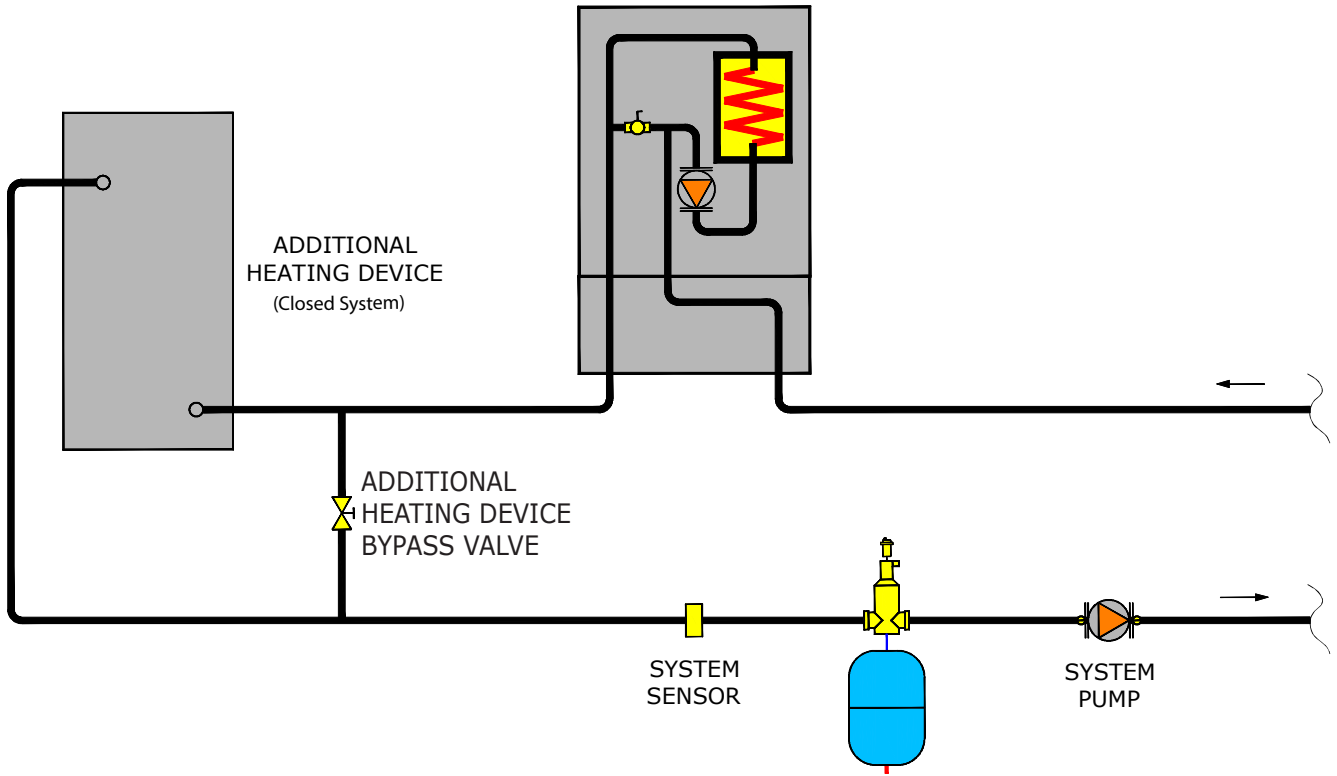


Figure A2 - Piping for Stainless Condensing Boiler and Open System, High Temperature Additional Heating Device (Cannot be pressurized)

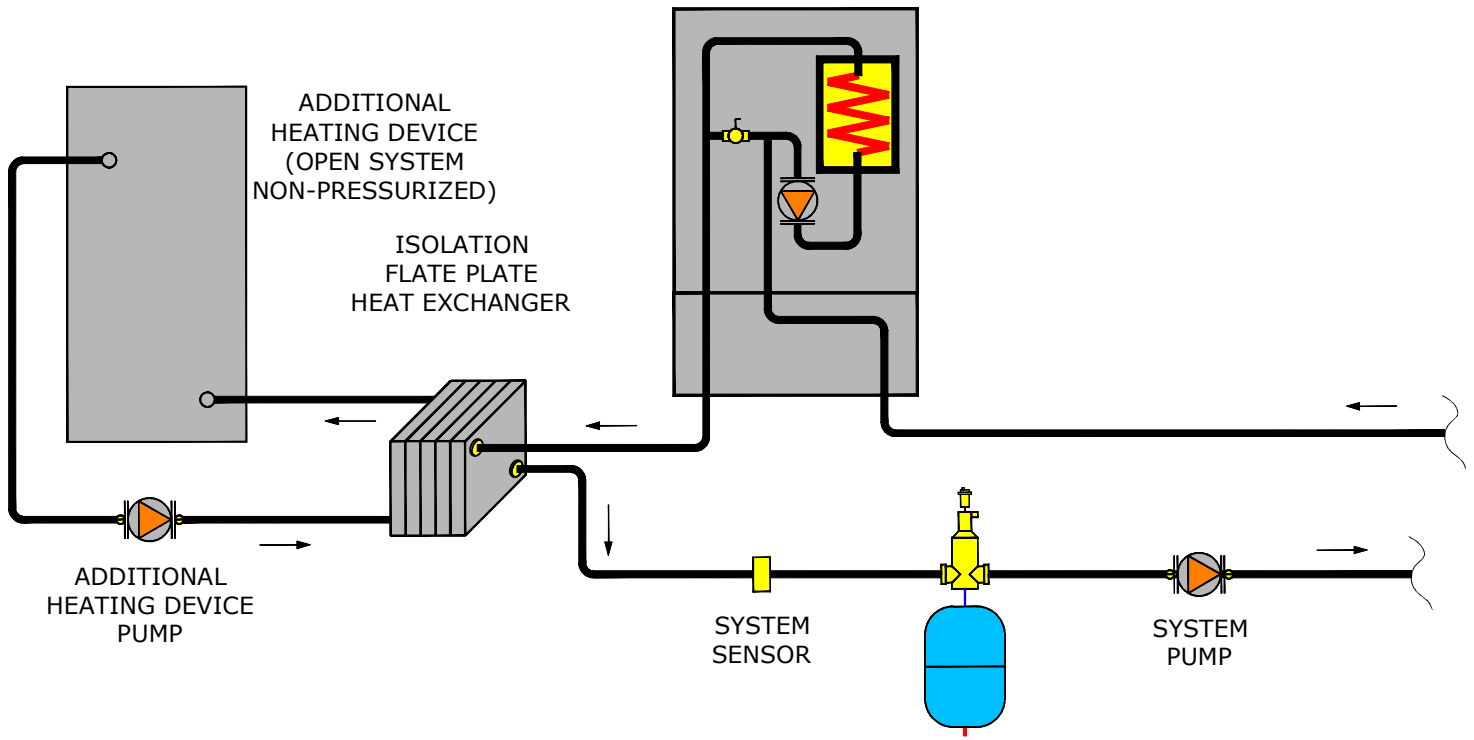
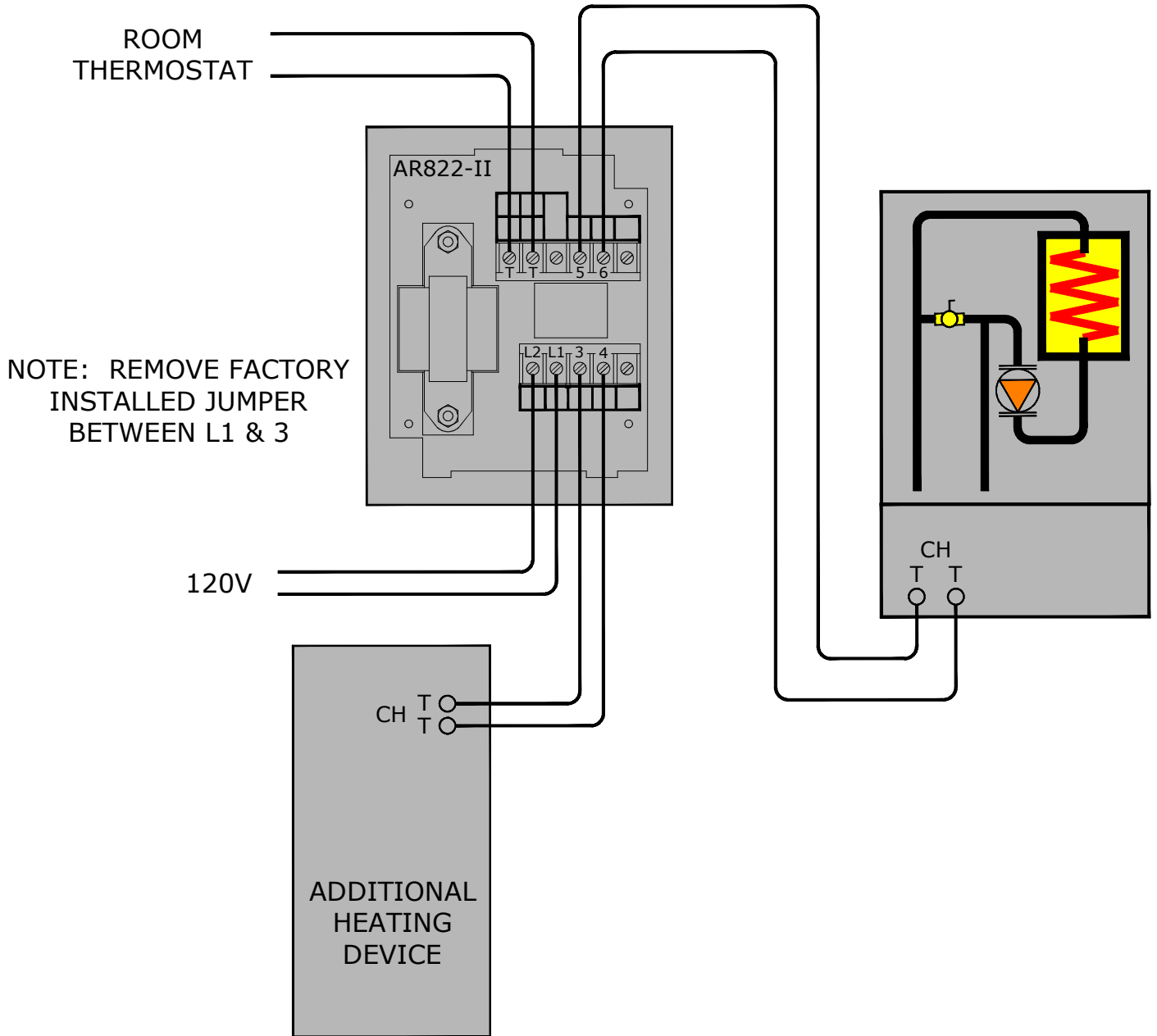


Figure A3 - Call for Heat wiring Connection for Stainless Condensing Boiler working with High Temperature Additional Heating Device



SECTION A - STAINLESS CONDENSING BOILER OPERATING WITH HIGH TEMPERATURE HEATING DEVICE

Figure A4 - Call for HDW wiring Connection for High Temperature Additional Heating Device

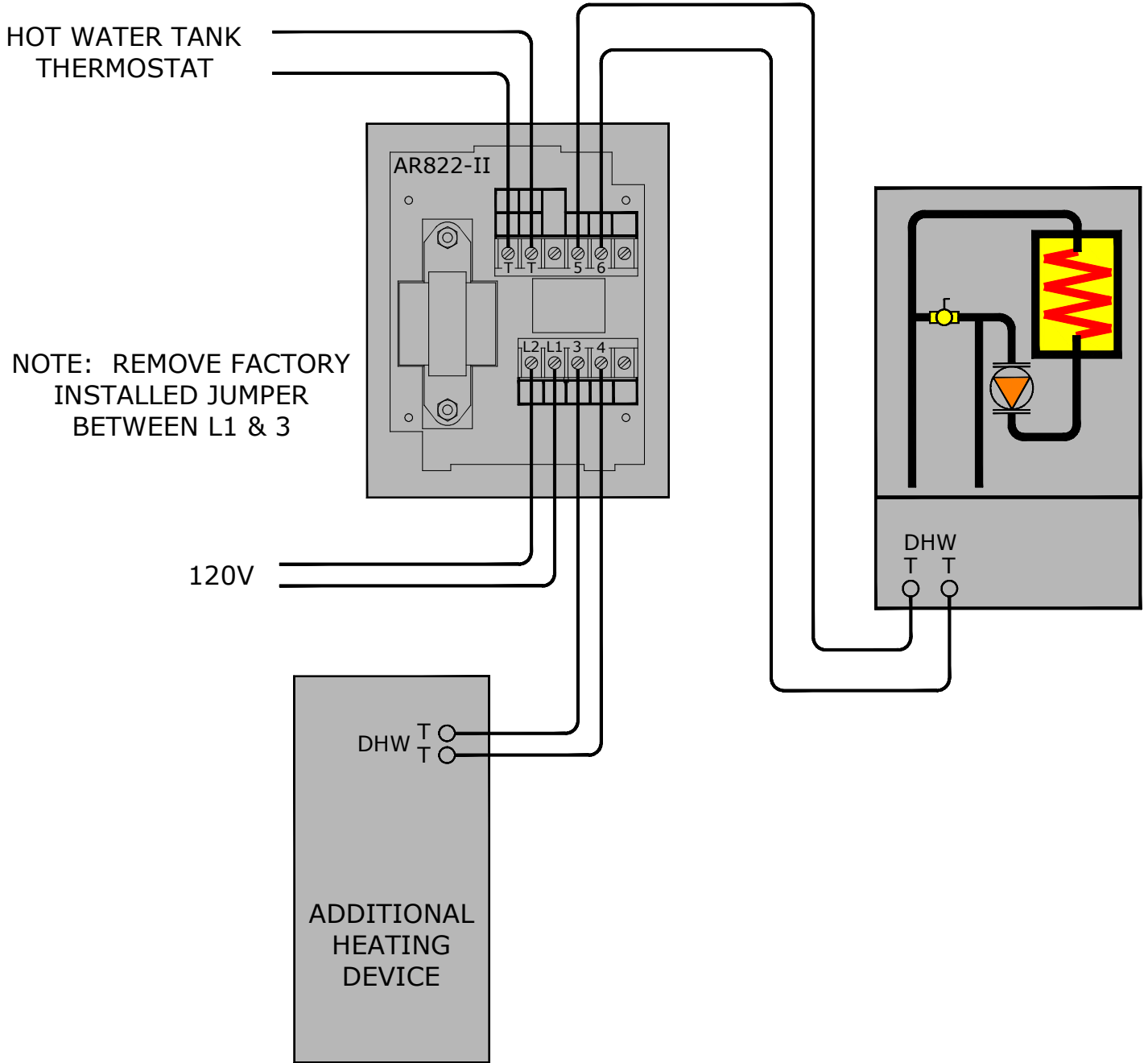
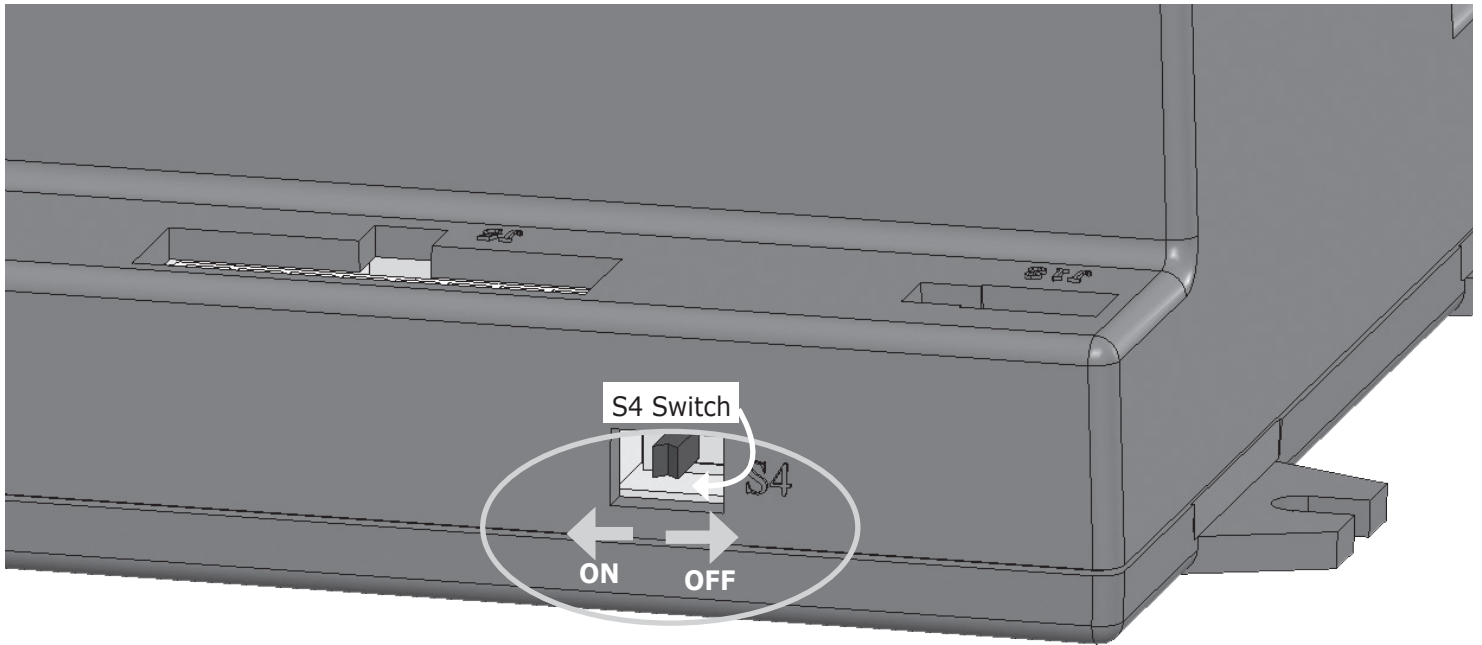


Figure A5 - Argus Control S-4 Switch



SECTION B**Stainless Condensing boiler working with LOW Temperature Heating Device****B1. Pipe The System**

- 1-1. Pipe the heating system and install all required components following requirements of the Additional Heating Device.
- 1-2. Connect Additional Heating Device and Stainless Condensing boiler together as shown in Figure B1, if the Additional Heating Device is a closed system (can be pressurized).
If the Additional Heating Device is an open system (CANNOT be pressurized), pipe the Stainless Condensing Boiler and Additional Heating Device as shown in Figure B2.
- 1-3. All piping requirements of Additional Heating Device shall be satisfied. Refer to installation and operation manuals of the Additional Heating Device.
- 1-4. Manufacture recommends use of The Additional Heating Device bypass valve. The bypass valve should be closed when Additional Heating Device is used. When Additional Heating device does not supply heat for extended period of time, **open** this bypass valve. This is important when Additional Heating Device is an outdoor device. Water from the system will not be cooled from circulating through the unused system.
- 1-5. Install the expansion tank at the upstream (inlet) side of the system pump.

B2. Connect Electrical Wires

- 2-1. Follow the instructions in Additional Heating Device manuals when wiring
 - (1) all high voltage wires and
 - (2) low voltage wires other than Call For Heat wire.
- 2-2. Follow instructions in Installation, Operation and Maintenance Manual of the Stainless Condensing boiler when connecting
 - (1) all high voltage wires and
 - (2) Low voltage wires other than the Call For Heat wire.
- 2-3. Power the system pump by heating zone control board if applicable. If there is no heating zone control board in the heating system, power the system pump with the Stainless Condensing boiler. Use relays to prevent current over draw.
- 2-4. All zone pumps and zone valves should be controlled by either the heating zone control board or the Stainless Condensing boiler.

- 2-5. If there is a Low Limit control on the Additional Heating Device, such low limit control has to be removed or deactivated.

B3. Connect CH Call For Heat Wire

- 3-1. Install supplied call for heat control, AR822, onto wall.
- 3-2. Remove jumper in AR822 between Terminal-L1 and Terminal-3.
- 3-3. Connect Additional Heating Device and Stainless Condensing boiler. Refer to Figure B3.
 - Connect two wires, from room thermostat or from zone control board, to input T-Terminals (Terminal-R and Terminal-W) in AR822.
 - Connect Terminal-5 and Terminal-6 in AR822 to Stainless Condensing boiler CH T-T terminals.
 - Connect Terminal-3 and Terminal-4 in AR822 to CH T-T input of Additional Heating Device.
- 3-4. Connect line voltage wires to Terminal-L2 and Terminal-L1 in AR822.

B4. Connect DHW Call For Heat wire, if applicable

- 4-1. Install one of the supplied call for heat controls, AR822, onto wall.
- 4-2. Remove jumper in AR822 between Terminal-L1 and Terminal-3.
- 4-3. Connect Additional Heating Device and Stainless Condensing boiler. Refer to Figure B4.
 - Connect two wires, from hot water tank thermostat or from zone control board, to input T-Terminals (Terminal-R and Terminal-W) in AR822.
 - Connect Terminal-5 and Terminal-6 in AR822 to Stainless Condensing boiler DHW T-T terminals.
 - Connect Terminal-3 and Terminal-4 in AR822 to DHW T-T input of Additional Heating Device.
 - Connect line voltage wires to Terminal-L2 and Terminal-L1 in AR822.

B5. Setting the Additional Heating Device

- 5-1 Set CH Supply Temperature Setting of Additional Heating Device to value close to maximum possible setting, i.e. 160°F.
- 5-2 Set DHW Supply Temperature Setting of Additional Heating Device to value close to maximum possible setting, i.e. 160°F.

B6. Set the Stainless Condensing Boiler

- 6-1 Set CH Supply Temperature Setting point for Stainless Condensing boiler according to heating system requirement, i.e.175°F. Detailed instructions are available in the IOM of Stainless Condensing boiler.
- 6-2 Set DHW supply temperature setting of Stainless Condensing boiler to temperature required for hot water tank, i.e. 180°F.

B7. Create CH call for heat and verify the system works as intended.**B8. Create DHW call for heat and verify the system works as intended.**

Figure B1 - Stainless Condensing Boiler with Low Temperature, Closed System Additional Heating Device (Can be pressurized)

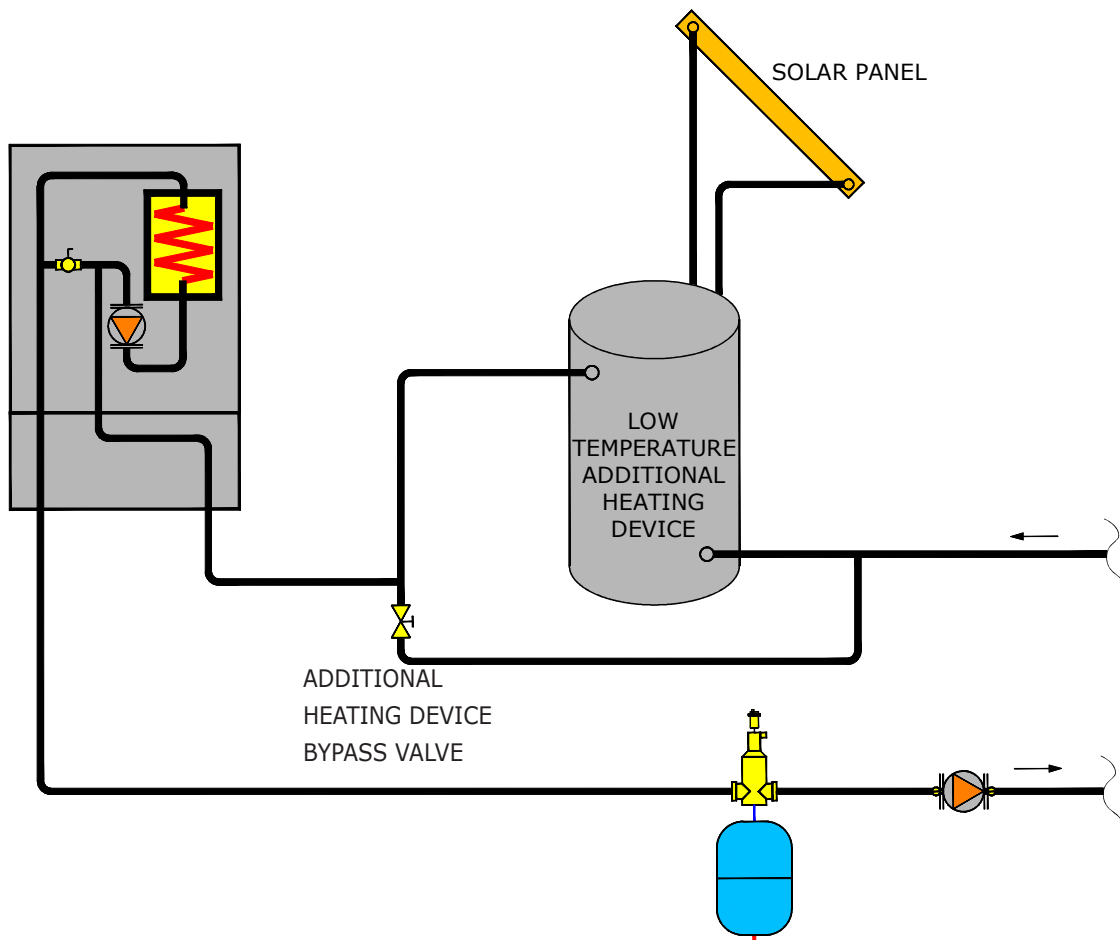


Figure B2 - Stainless Condensing Boiler with Low temperature, Open System Additional Heating Device (CANNOT be pressurized)

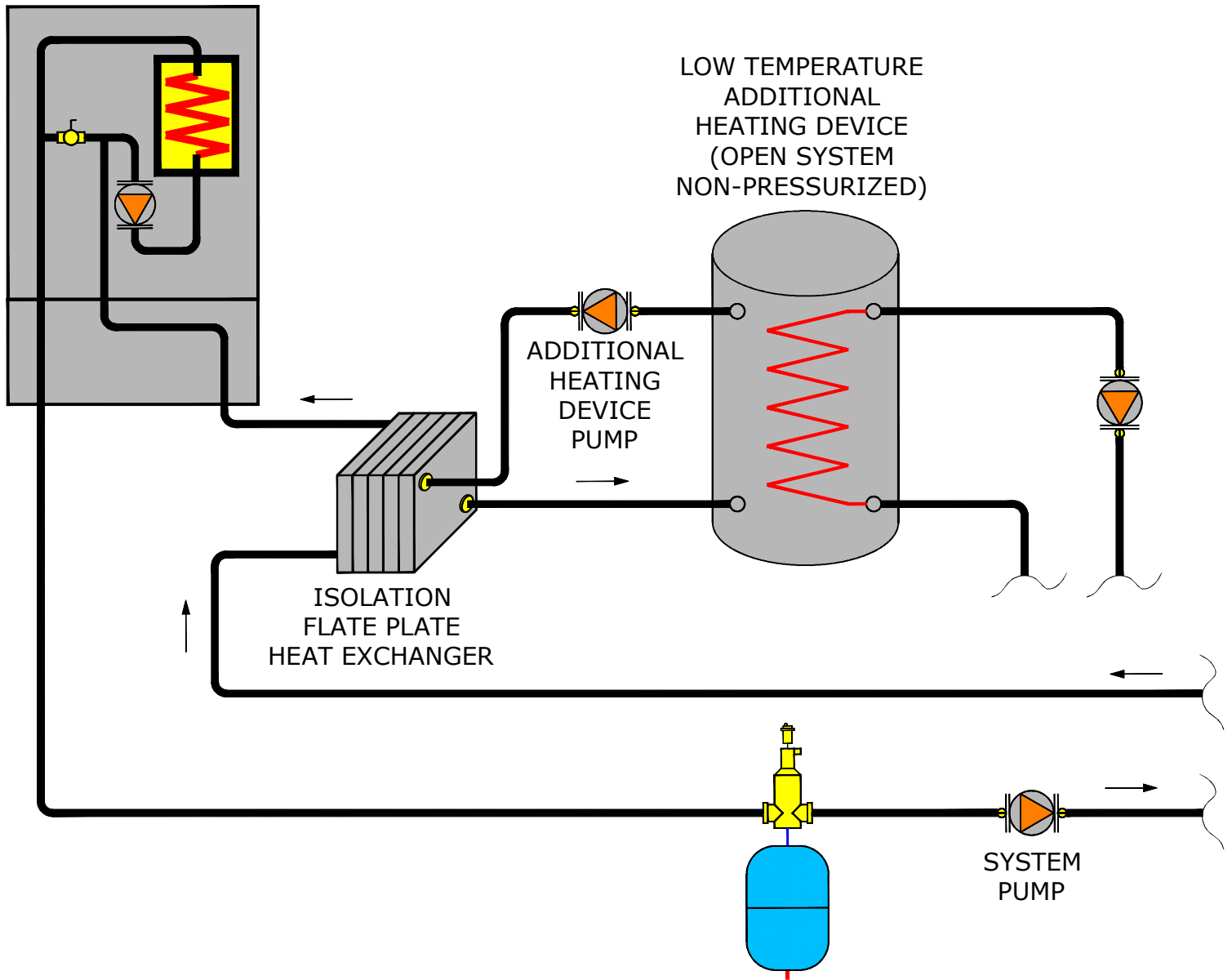


Figure B3 - Wiring Call for Heat Stainless Condensing Boiler with Low Temperature Additional Heating Device

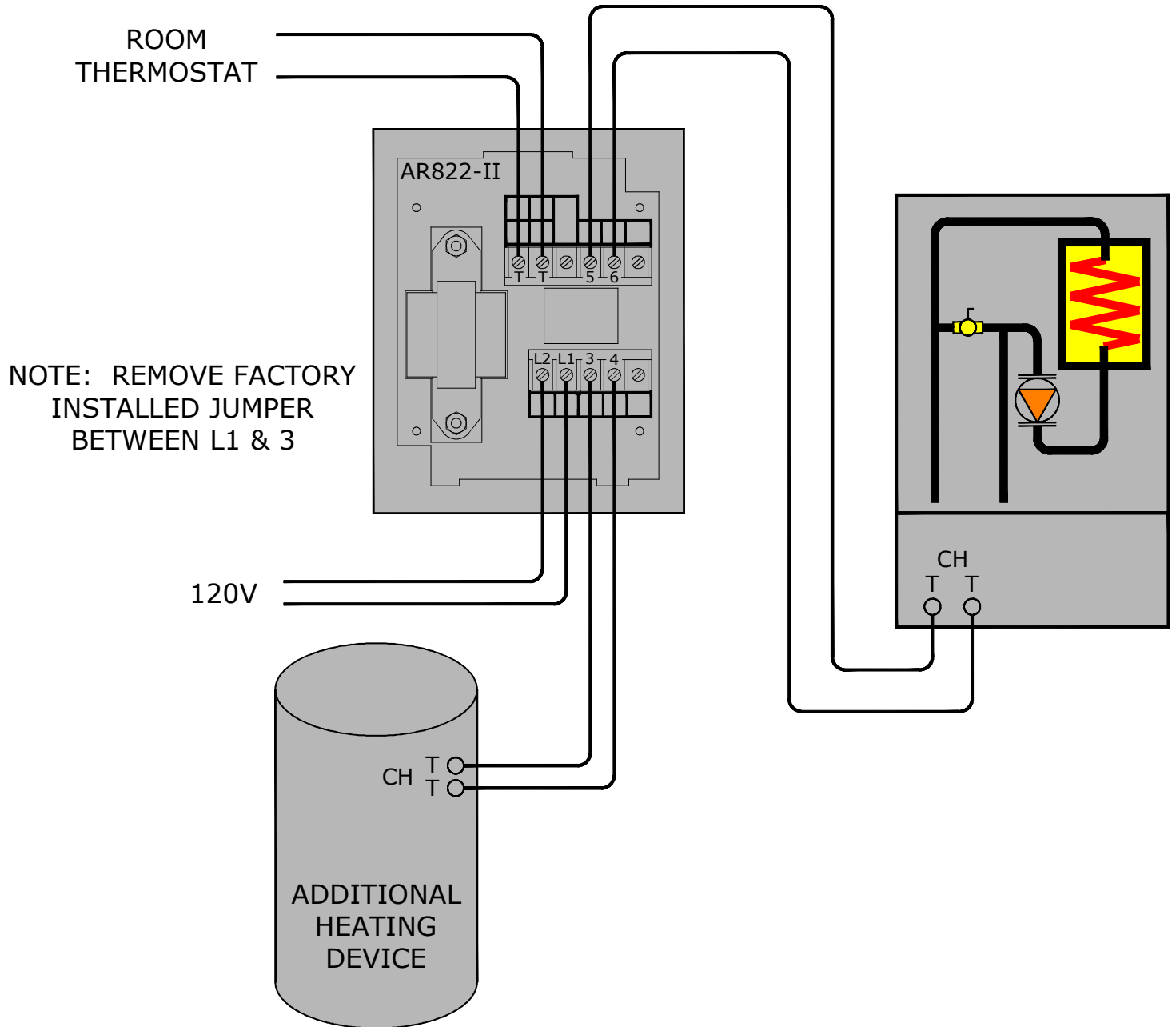


Figure B4 - Wiring DHW Stainless Condensing Boiler with Low Temperature Additional Heating Device

