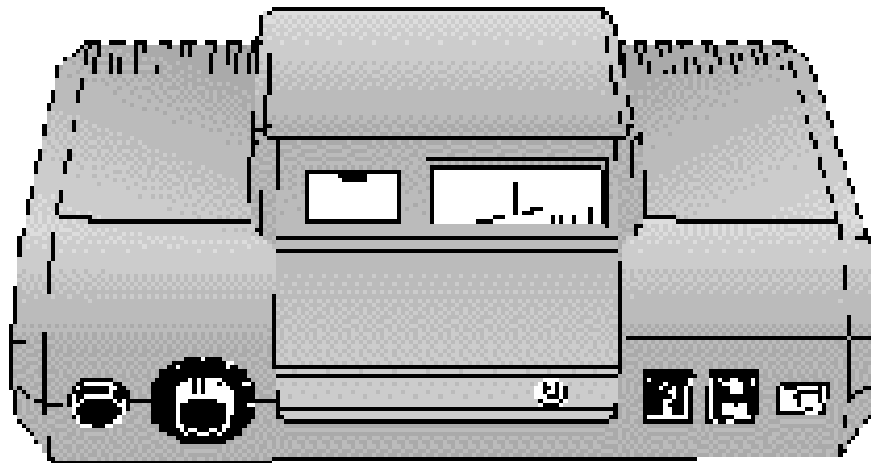


# Installation and Operating Manual

Logomatic HS2109



**Save These Instructions !**

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**You should have the following components packaged in the box:**

- 1 HS2109 control.
- 1 Chrome logamatic well.
- 1 Metal clip to secure DHW tank probe.
- 6 Plastic strain relief clips for field wiring.



The Buderus HS2109 control panel integrates the functions of a high limit boiler control with a built-in manual reset high limit for control of a burner, of a space heating circulator or multi-zone relay panel and of an indirect fired tank charging circulator. A L8148A aquastat is not needed on oil fired equipment when using the HS2109.

The HS2109 provides either a 120 V output or dry contacts to fire the boiler, a 120 V output to power a space heating circulator or a multi-zone relay panel for space heating and a 120 V output for the tank charging circulator. T-T contacts are provided to fire the burner on a call for space heating. The control is also equipped with a sensor for measuring domestic hot water (DHW) temperature. The control will automatically fire the burner on a call for DHW based on sensor input. (The control does not require an additional input signal to fire the burner for DHW production).

The HS2109 provides the following features:

- General ON/OFF switch to control entire heating system.
- Adjustable boiler aquastat.
- Built-in manual reset high limit for additional safety (trips at 230°F).
- Manual summer/winter change-over switch.
- Dial to set the desired DHW temperature.
- Option for DHW priority using an internal dip switch.
- Automatic 4 minute post purge into the DHW tank.
- Built-in freeze protection for the DHW tank, even with the tank temperature turned off. (Heats the DHW tank back to 60°F if the temperature fell below 40°F).
- Option for continuous operation of the heating circulator or shut down with 10 minute post-purge after a call for heat is satisfied. Option is selected using an internal dip switch.
- Built-in boiler temperature read-out and optional burner hours runmeter.
- Built-in pump logic to prevent condensate formation in the boiler.

## 2 Mounting Instructions

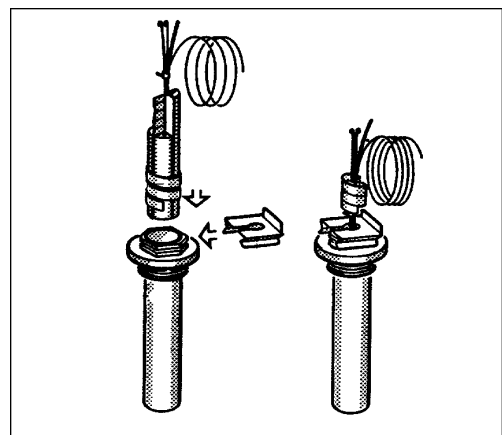
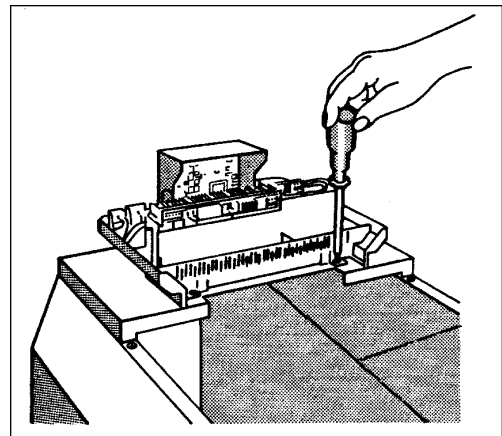
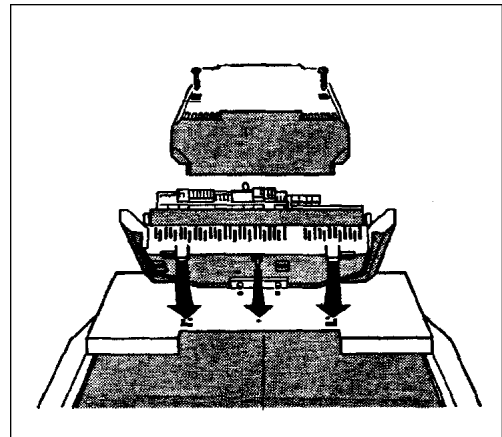
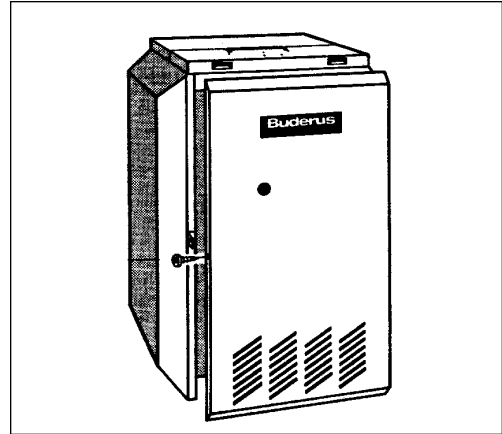
- Remove the front panel of the boiler.
- Only necessary with the G124X, G224E, G234X and G334X boilers.
- Remove the two screws and housing from the top of the Logamatic.
- Insert the two front feet of the control into the holes provided on the top of the boiler. Then, firmly push down on the rear of the control until it snaps into place.
- Fasten the control to the boiler jacket using the two screws as shown.
- Each HS2109 has a probe bundle hard wired to the control. This bundle consists of 2 copper capillaries, a black sleeved capillary and a thermistor (FK). Install the probes per the following boiler specific instructions.
- **G115, G205, G305/G315:** Replace brass well with the chrome Logamatic well. Insert the complete bundle into this well.
- **G124X:** Unwrap the probes. Remove the copper sleeve from one of the capillaries. Locate the well on the G124X boiler and carefully remove 2 spacers from the well. Strap the black sleeved capillary on supply manifold and insulate. Install the 3 other probes in with the Honeywell capillary.
- **G234X/G334X:** Move the tridicator from the boiler to the supply piping and replace with the chrome Logamatic well. Insert complete probe bundle into the Logamatic well.
- **Installation of the DHW tank probe:** The HS2109 is supplied with a probe to measure DHW tank temperature. This probe is hard wired to the control with a grey plug inserted in the control. Install the DHW probe as described below:

Refer to Tank Installation Manuals for details.

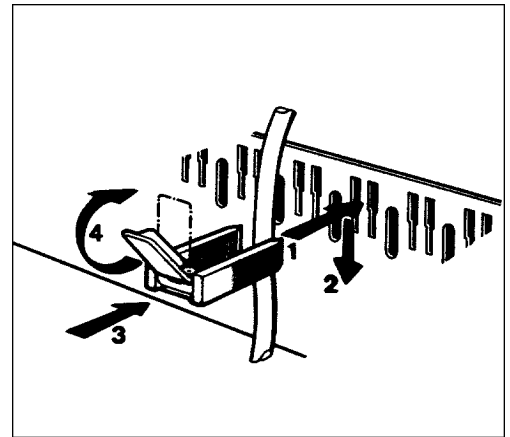
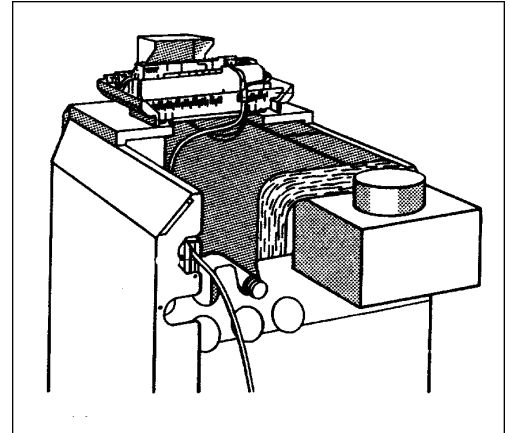
**Horizontal tanks:** Strap probe under the mounting clip provided on the clean-out cover of the tank.

**Vertical tanks:** Insert probe in tank sensor well with additional spacers for blocking.

**Non-Buderus tanks:** Install probe in proper sensing location. Do not use the aquastat supplied with that tank.



- Electrical connections must be made according to the wiring diagrams (See pages 10-19).
- All the wires should be routed through the cable raceway at the rear of the boiler. Rear panel jacket may be modified per local code. Route the wires on top of the insulation to the back of the control.
- Use the white strain reliefs provided to lock all cables into place on the back of the control.



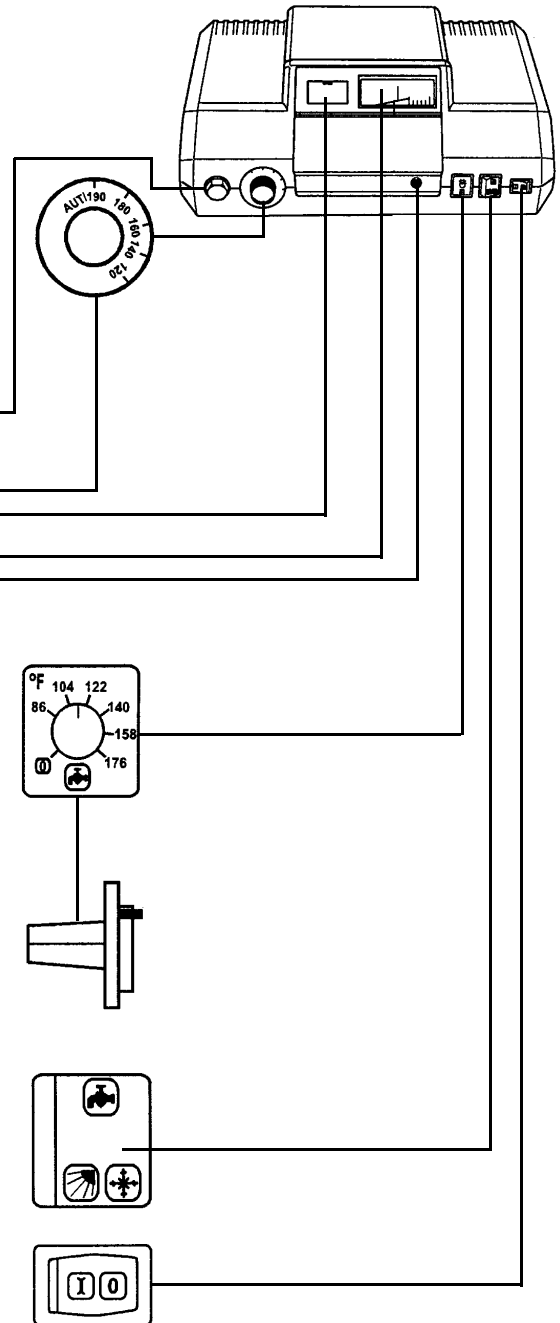
# 3 HS2109 Operating Instructions

## Information before start-up:

- Turn on the emergency switch outside the boiler room.
- Please observe the detailed instructions for the operation of the boiler, burner and control panel before initial system operation.
- Your heating contractor will demonstrate how to operate the heating system in detail.
- Please note: The DHW tank may first be heated upon initial start up. Space heating will start after the DHW tank has reached its desired temperature.

## Switch Identification and Start-up Settings:

- Manual high limit reset aquastat.
- Adjustable boiler aquastat. Set AUT(=190°F).
- Burner hours runmeter. (optional)
- Boiler thermometer read-out.
- Built-in 10 amp fuse.
- DHW Temperature Dial Set dial to desired DHW temperature.  
Minimum setting: 86°F; maximum setting 140°F.  
(Internal stop provided at 140°F to prevent scalding.)  
Removal of stop permits a maximum temperature of 176°F: severe risk of scalding!  
Turn off DHW: Set DHW dial to 0.
- Summer/Winter Change-over Switch.  
☒ Summer Operation: DHW Heating only.  
☒ Winter Operation: Space Heating and DHW Heating.
- ON/OFF Switch  
Set switch to **I** for "ON", to **O** "OFF".



**Note:** The adjustable boiler aquastat should be set at least 15 to 20°F above the desired DHW temperature.

**Warning:** Hot Water can scald! Buderus Hydronic Systems, Inc. strongly recommends the use of a thermostatic valve on the outlet of the DHW storage tank to prevent scalding.

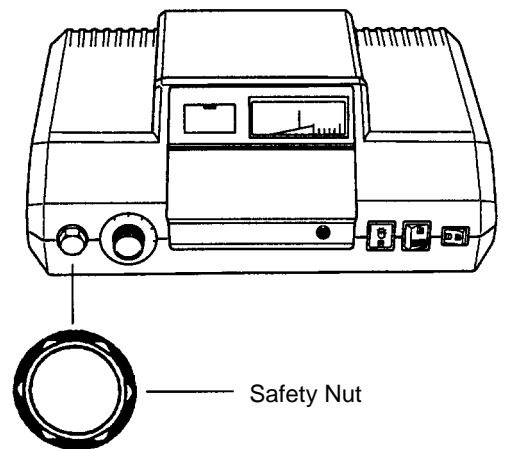
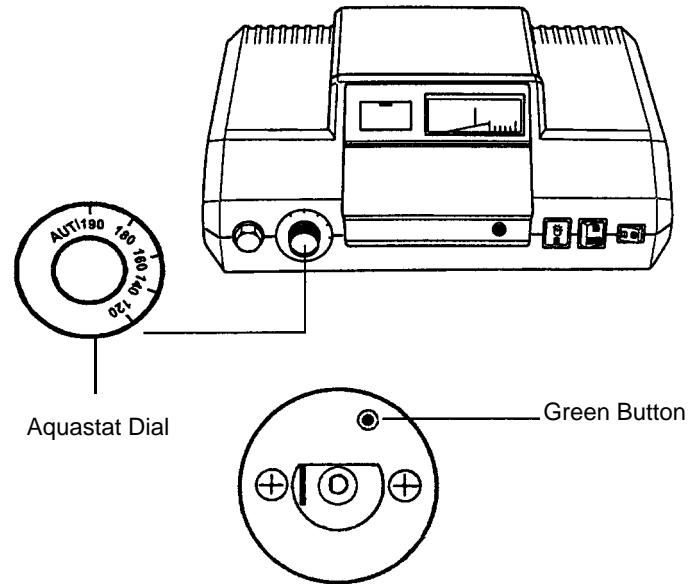
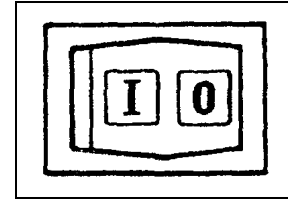
1. Remove the dark green HC (Heating Circulator) plug connected to terminals 61 and 63, and remove the grey TC (Tank Circulator) plug connected to terminals 24 and 25.
2. Switch the control on with the main power switch (I Position).
3. Set the summer/winter switch to the winter setting. (Refer to page 7 for switch identification).
4. Turn up any room thermostat to create a "call for heat". Turn down the dial to set the DHW temperature. The burner should fire now unless the boiler is already at high temperature.
5. Remove the black aquastat dial by inserting a small screwdriver behind the dial and gently force this dial away from the control.
6. Push the green button in with screwdriver or similar instrument to bypass the adjustable boiler aquastat. Hold the green button until the STB or manual reset high limit trips. This happens at approximately 230°F.
7. Disconnect all power to the control. Reinstall the HC and TC plugs and run the circulators to remove the excess heat from the boiler.

**To reset the manual high limit (STB),** remove the safety nut and press the reset button underneath.

8. Reset all switches and thermostat back to their original positions.

**To Resume Normal Operation:**

Switch the control on with the main power switch (I position).



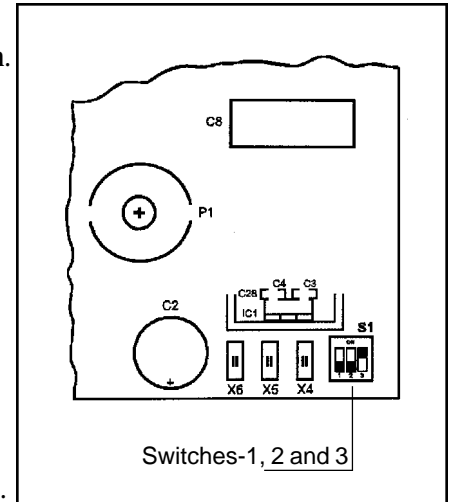


# 5 Installation instructions

The following adjustments can only be made by the installing contractor. It permits the contractor to customize the control for the particular installation.

Notice: Turn off all power before opening the control panel. All work which involves opening the control panel must be carried out by a trained technician.

Dip switches 1, 2 and 3 are located on the front lower left side of the main circuit panel. For easier access, you can remove the front control module.



## Settings for Space Heating Operation. (Switch 1)



### Switch 1 Position 1

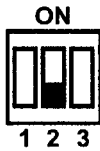
After a call for heat is satisfied, the space heating terminal HC (61 and 63) is deenergized and its circulator stops running after a 10 minute post-purge cycle.

### Switch 1 Position ON (Factory Setting)



The space heating terminals 61 and 63 will be powered continuously and will only shut off during a call for DHW (if prioritized with Switch 2 in left position) or during summer mode.

## Settings for DHW Priority. (Switch 2)



### Switch 2 Position 2 (Factory Setting) (DHW Priority)

On a call for DHW, the space heating is deenergized for DHW priority.

### Switch 2 Position ON (No DHW Priority)

On a call for DHW, the space heating continues to operate. Longer heat-up times for DHW may result.



**Note:** Refer to application drawings on pages 13 to 19 for recommended switch settings 1 and 2.

## Settings for pump logic (Switch 3)



### Switch 3 Position 3

No pump logic for DHW heating, the tank circulator starts immediately on a call for DHW.

### Switch 3 Position ON

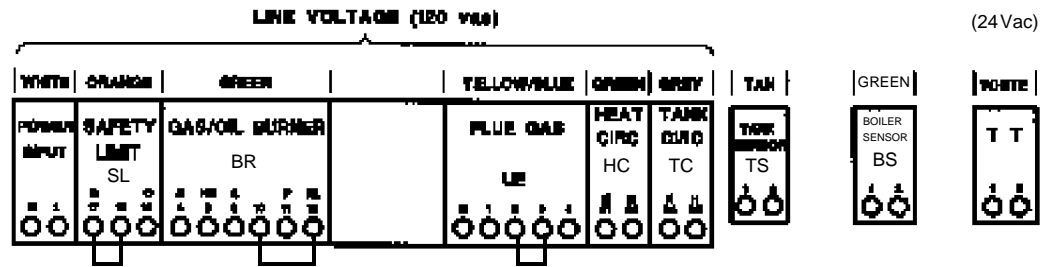
The tank circulator starts once the boiler reaches a temperature of 113°F on a call for DHW.



**Note 1:** The HS2109 has a built-in non-adjustable pump logic setting of 113°F for space heating. The control shuts down circulators during burner operation until the boiler reaches this temperature.

**Note 2:** The HS2109 has built-in non-adjustable minimum burner off setting of 122°F.

## HS2109 Wiring Terminals



### Line Voltage (120-Vac) connections:

- |                  |   |
|------------------|---|
| White (Line PWR) | Power input:<br>Connect 120-vac power source to L and N.  |
| Orange (SL)      | Safety connection:<br>Terminals 17 and 18 There is a factory-installed jumper between terminals 17 and 18. This jumper must stay in place unless a low-water cutoff is used. When using a low-water cutoff, remove the jumper and connect the normally closed contacts on the low-water cutoff to terminals 17 and 18 (120V Rating).<br>Terminal 19 Cannot be used. |
| Green (BR)       | Burner connection:<br>Terminal 4 Common neutral<br>Terminal 8 Requires 120-vac input to operate the hours run meter<br>Terminal 9 Not used<br>Terminal 10/11 Dry contact closure for burner firing<br>Terminal 12 Constant 120-vac voltage<br>(See pages 10 and 11 for specific application wiring diagrams for burner circuit)                                     |
| Yellow/Blue (UE) | Flue gas testing:<br>Not used in U.S. <b>Do not</b> remove factory installed jumper between terminals 2 & 3.  |
| Green (HC)       | Space heating circuit:<br>120-vac power output on terminals 61 (N) and 63 (H) for space heating pump(s).<br>Not to exceed 5 amp draw. If multiple space-heating pumps are used, refer to specific application wiring diagrams provided in this manual (pages 12-19).  |
| Grey (TC)        | Domestic water circulator:<br>120-vac power output on terminals 24 (N) and 25 (H) for DHW production.   |

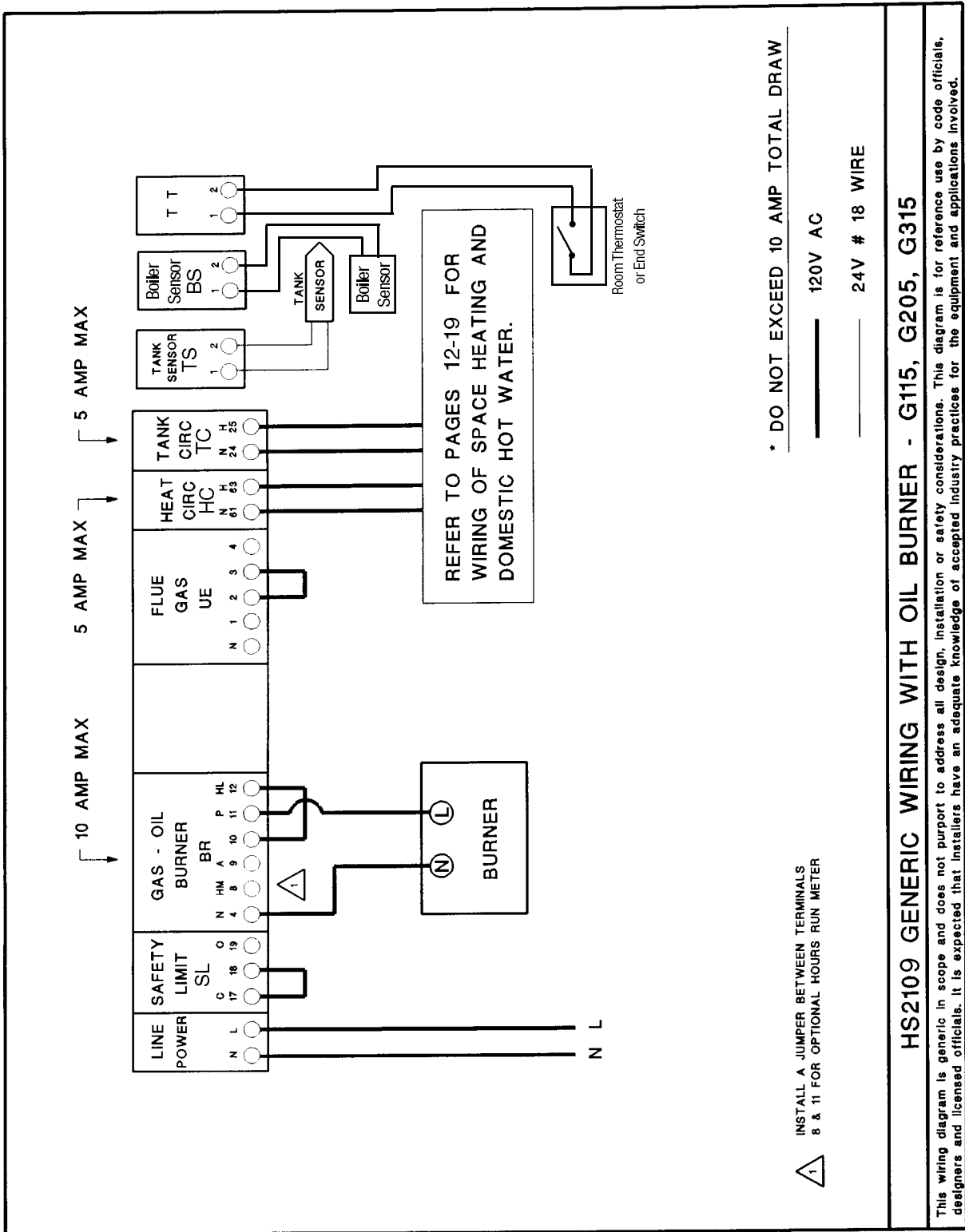
### Low Voltage Connections:

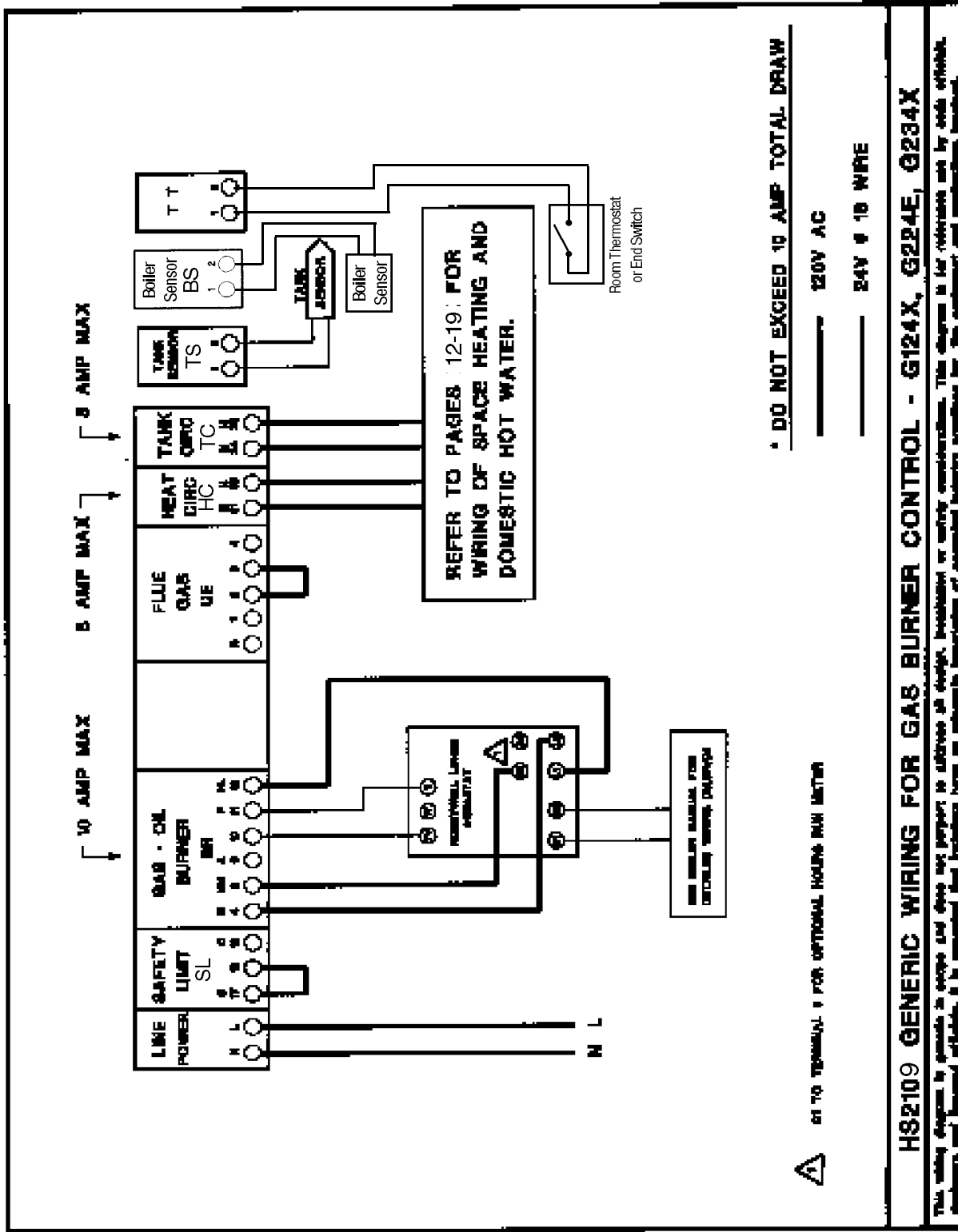
- |            |   |
|------------|---|
| White (TT) | 24 vac connection. The T-T terminals are used as a heat demand signal from a thermostat, aquastat or end switch. On a call for heat the HS2109 will energize terminal 11 to fire the boiler.  |
| Tan (TS)   | Domestic tank sensor:<br>The TS tank sensor and terminal plug are supplied with the HS2109. For SU and ST series tanks the TS sensor is inserted into the immersion well in the tank. For L and LT series the sensor is surface mounted on the front of the tank using the bracket provided on the tank. Sensor wire can be extended if necessary, using 18 AWG wire. |

Note: If no DHW, install jumper on TS1-2 terminals.

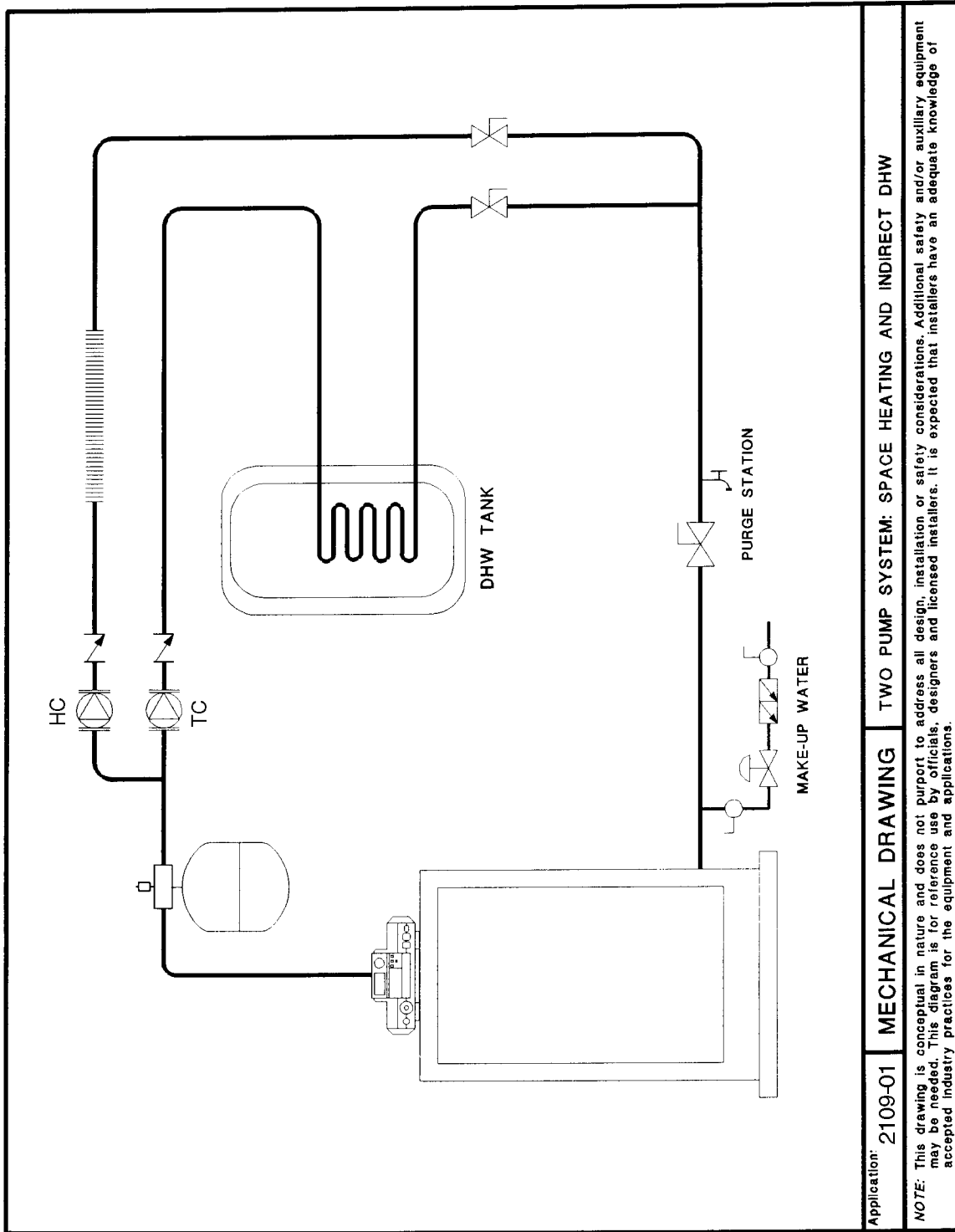
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|------------|--|
| Green (BS) | Boiler sensor:<br>This BS sensor is part of the boiler sensor bundle measuring boiler temperature. |
|------------|--|

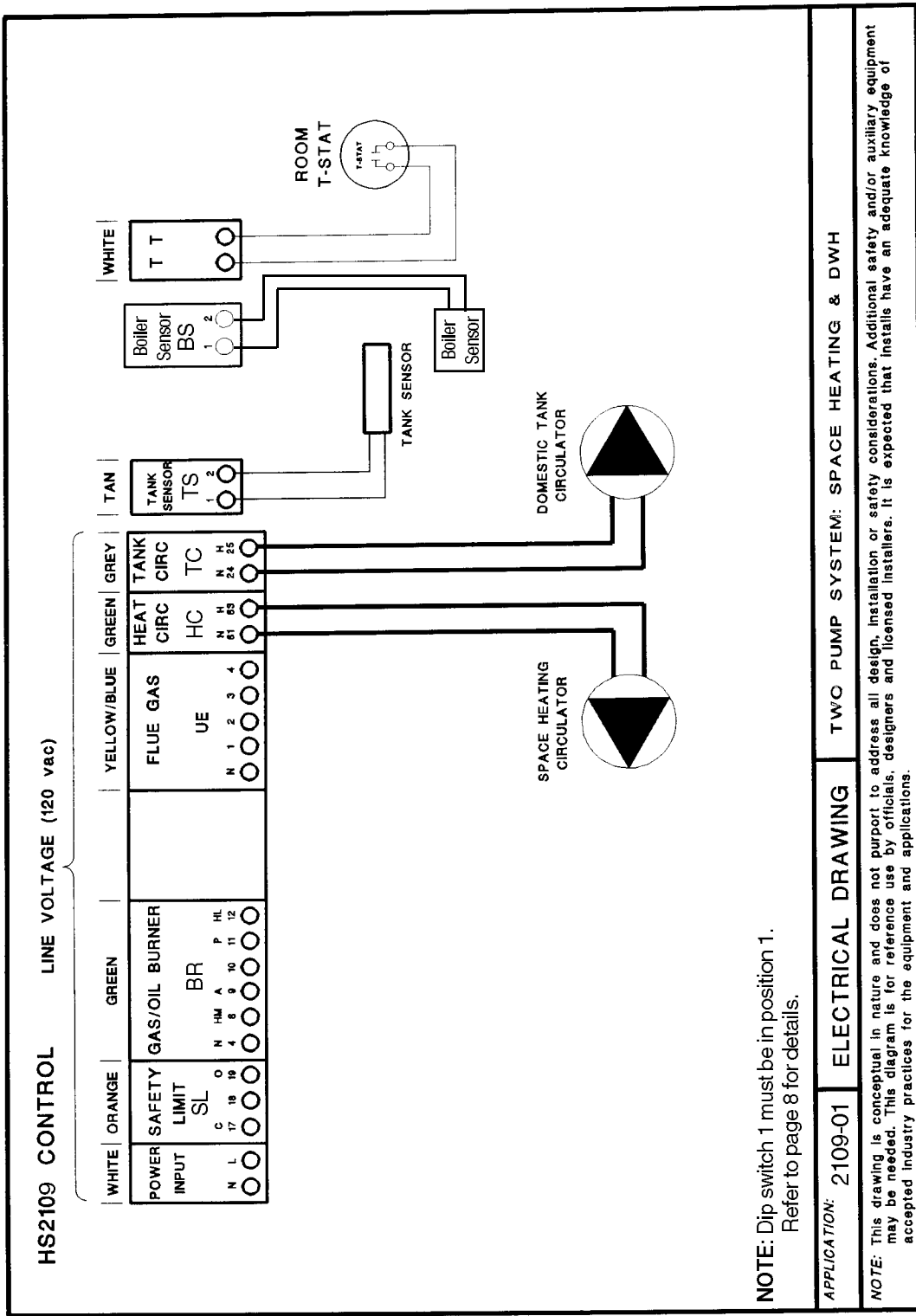
# 6 Wiring Diagrams



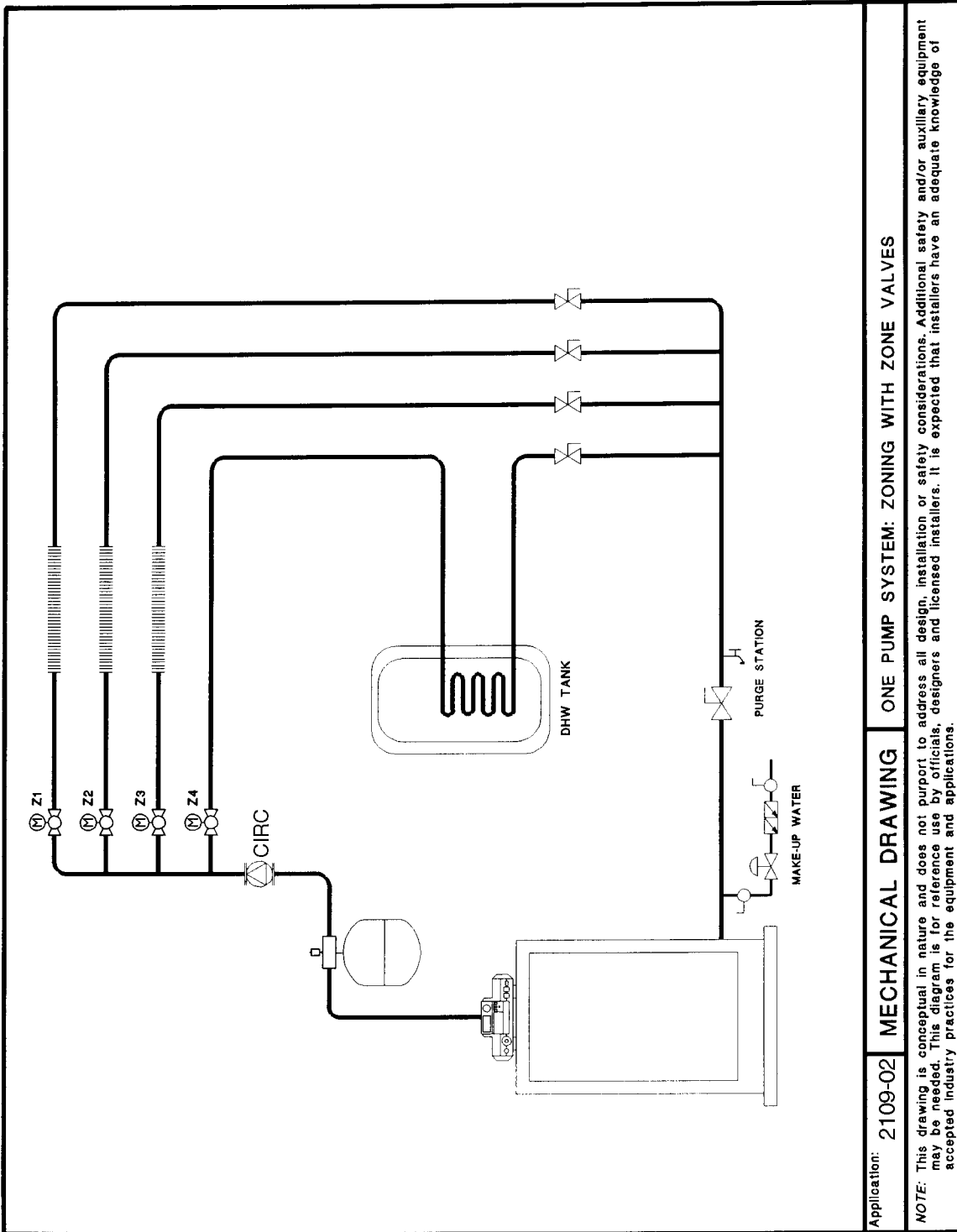


# 7 Application Diagrams



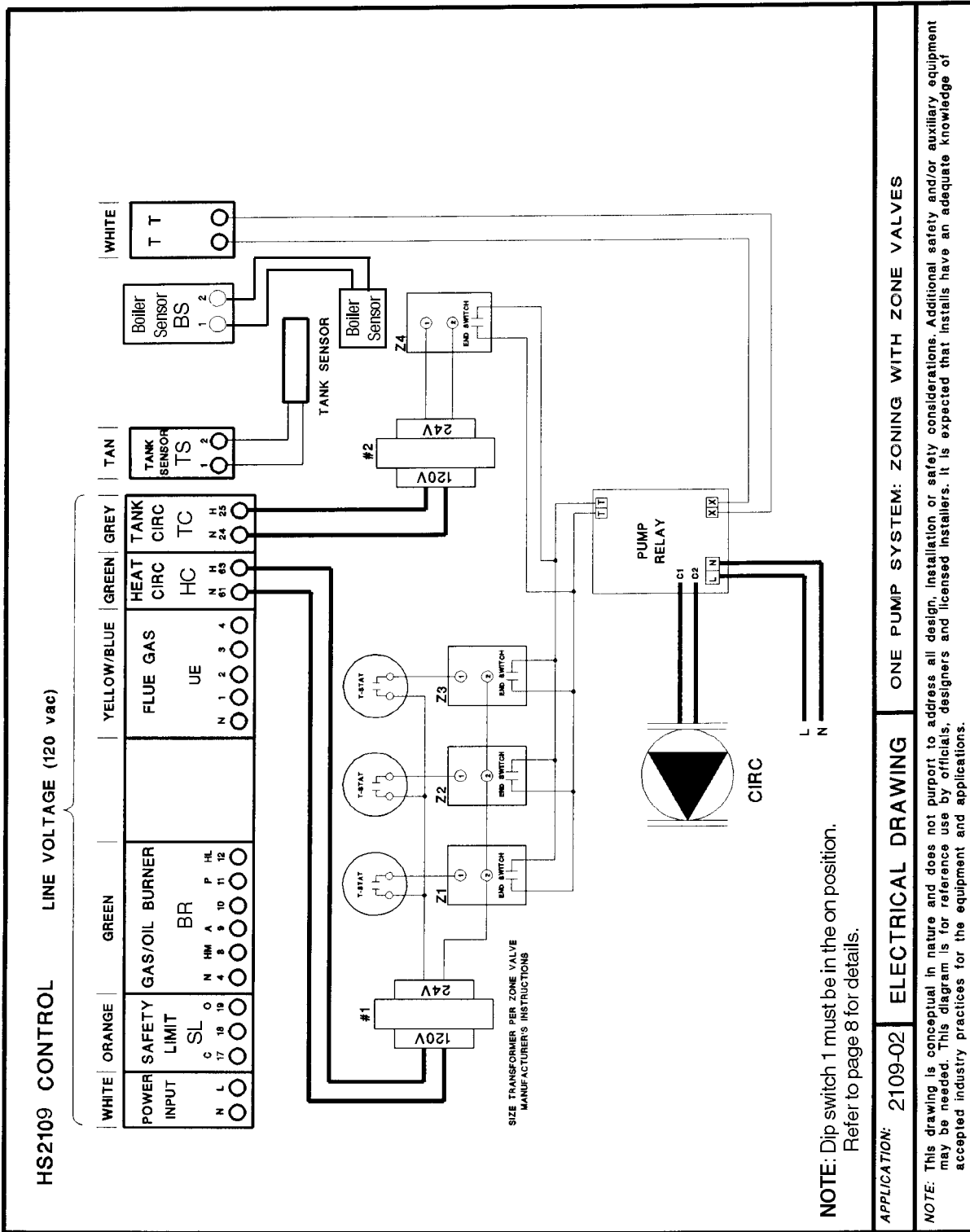


# 7 Application Diagrams



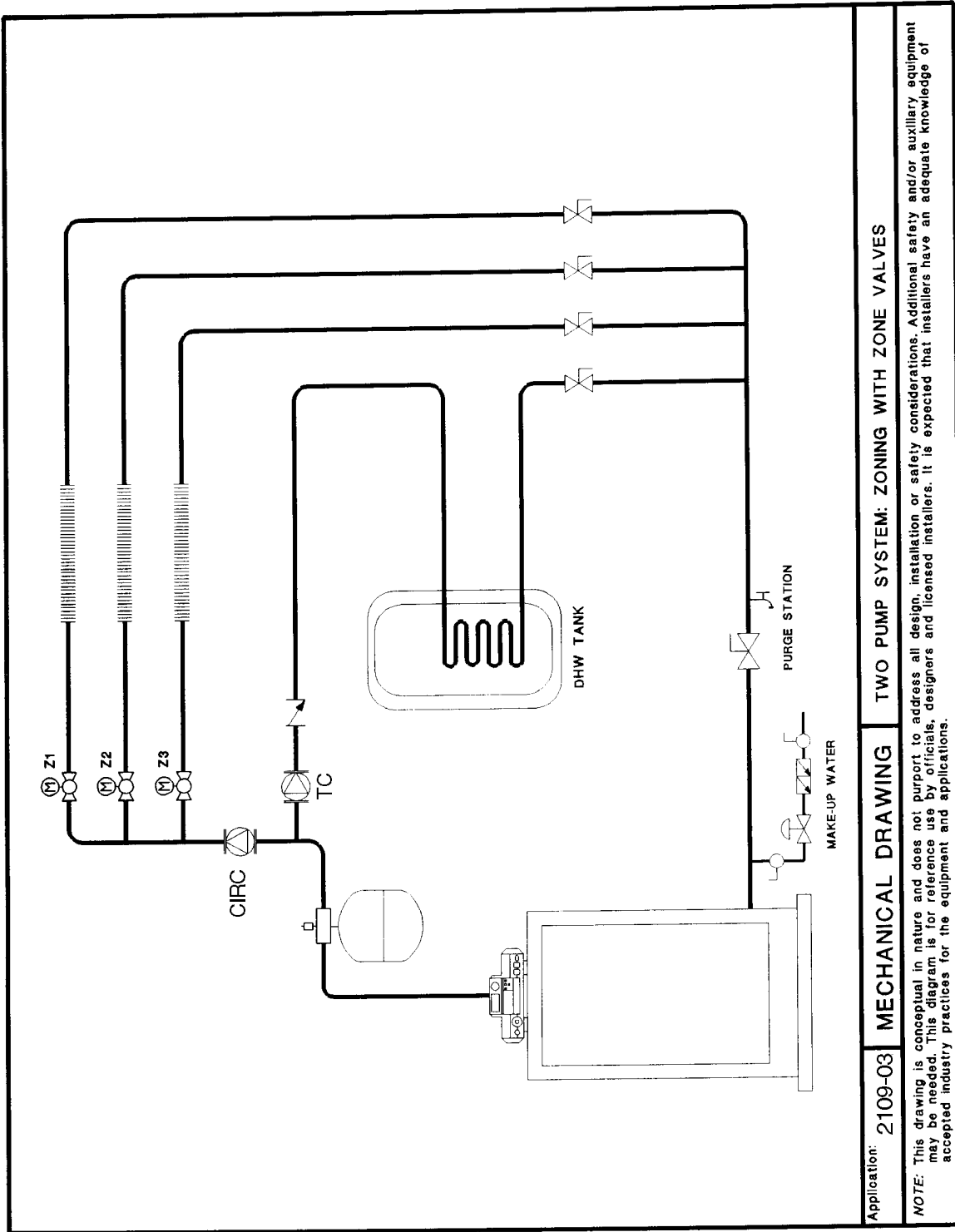
Application: 2109-02 MECHANICAL DRAWING ONE PUMP SYSTEM: ZONING WITH ZONE VALVES

NOTE: This drawing is conceptual in nature and does not purport to address all design, installation or safety considerations. Additional safety and/or auxiliary equipment may be needed. This diagram is for reference use by officials, designers and licensed installers. It is expected that installers have an adequate knowledge of accepted industry practices for the equipment and applications.



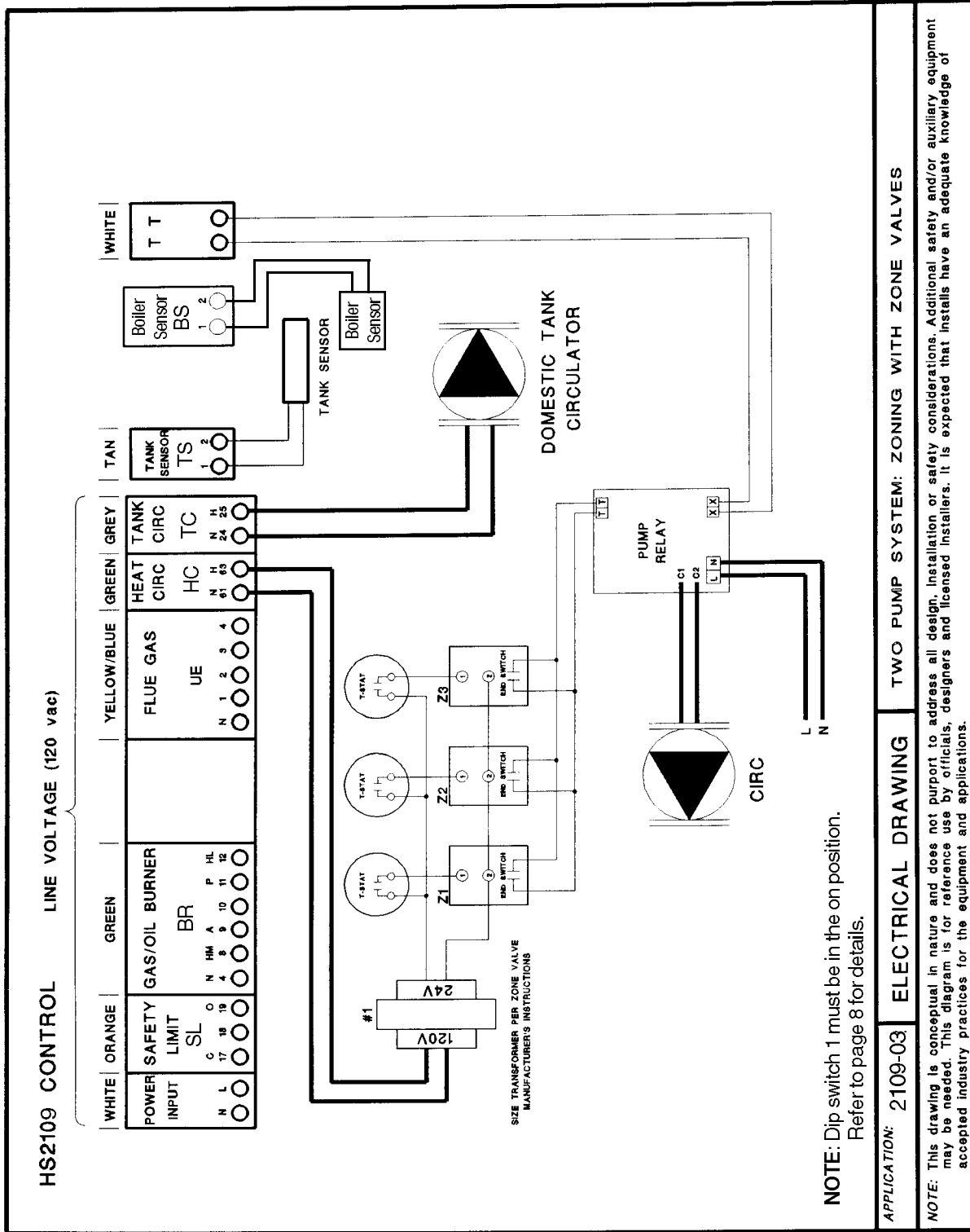


# 7 Application Diagrams

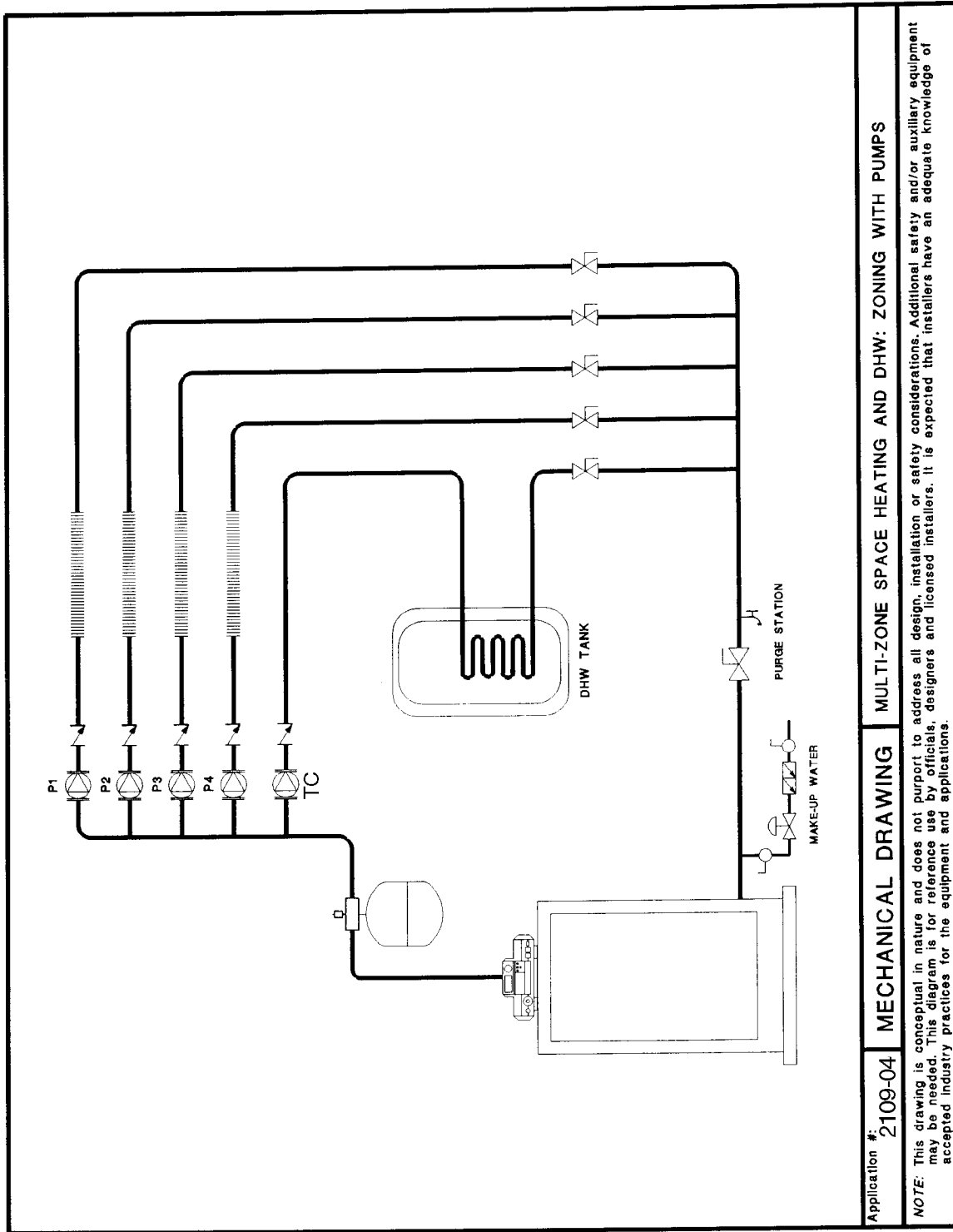


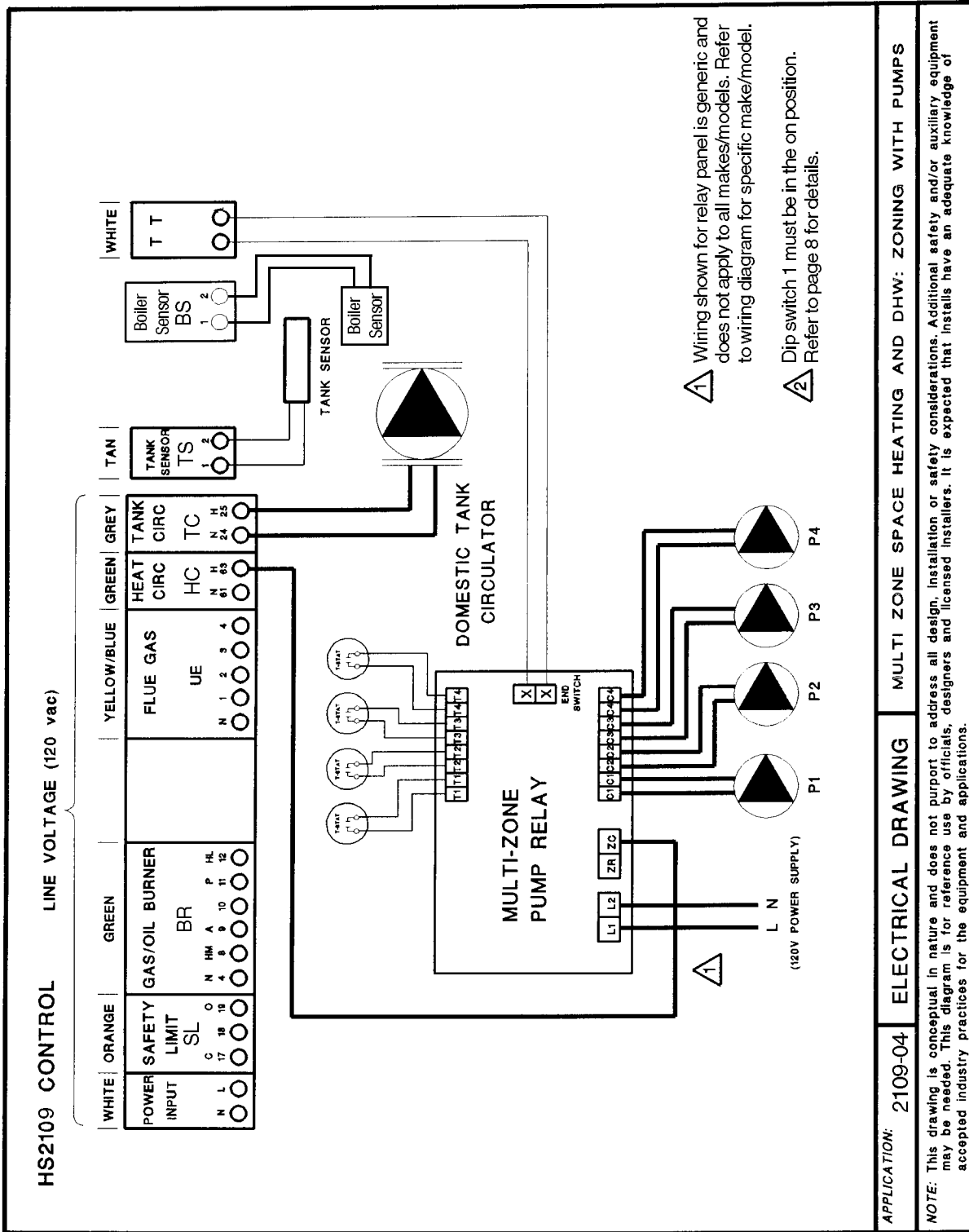
Application: 2109-03 MECHANICAL DRAWING TWO PUMP SYSTEM: ZONING WITH ZONE VALVES

NOTE: This drawing is conceptual in nature and does not purport to address all design, installation or safety considerations. Additional safety and/or auxiliary equipment may be needed. This diagram is for reference use by officials, designers and licensed installers. It is expected that installers have an adequate knowledge of accepted industry practices for the equipment and applications.



# 7 Application Diagrams





# 7 Trouble Shooting Procedures

## **Burner Does NOT Fire:**

1. Check manual reset high limit. Reset if necessary: see page 6.
2. Check burner reset. Reset only once, then call service company.
3. Check for kinked capillaries.
4. Check system I/O switch. Set switch in I position.

## **No DHW Heating:**

1. Check setting on DHW Temperature dial.
2. Check system I/O switch. Set switch in I position.
3. Check setting of adjustable aquastat dial: set above 140°F.
4. Check power to tank circulator: check voltage at TC terminals 24 and 25.
5. Check manual reset high limit. Reset if necessary: see page 6.

## **No Space Heating:**

1. Check manual reset high limit. Reset if necessary: see page 6.
2. Check system I/O switch. Set switch in I position.
3. Check summer/winter switch. Set in winter mode position.
4. Check internal dip switches against recommendations on pages 13-19.
5. Check setting of adjustable aquastat dial: Set above 140°F.
6. Check power to space heating terminals HC 61 and 63.

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**Boiler installed by:**  
(contractor's address)

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**Boiler installed on:**  
(date of installation)

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**Buderus**  
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