

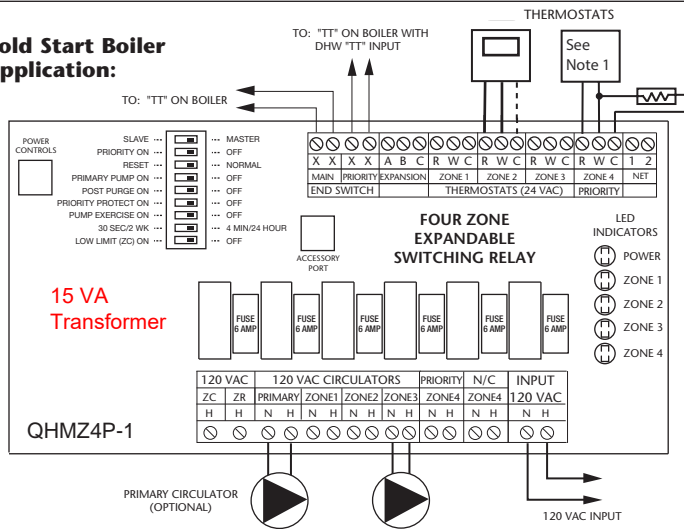


# Instruction Sheet

## QHMZ4P-1 Switching Relay

EFFECTIVE: May 20, 2015

### Cold Start Boiler Application:

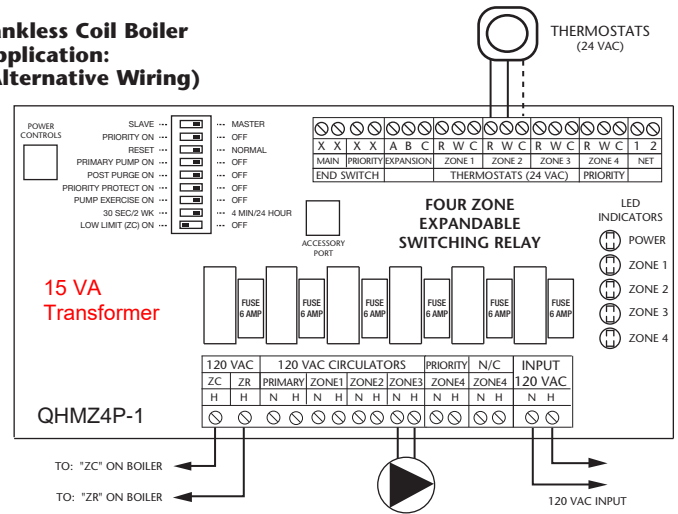


### For Cold Start Boiler Application

**Operation:** When any thermostat calls for heat, the appropriate circulating pump is energized and the isolated end switch (X and X) will start the boiler.

Note 1: When using power stealing thermostats, a Resistor (1K $\Omega$ , 1/2 W) may be needed between "W" and "C" terminals.

### Tankless Coil Boiler Application: (Alternative Wiring)



### For Tankless Coil Boiler Application (Alternative Wiring)

**Operation:** When any thermostat calls for heat, the boiler will be enabled and appropriate circulating pump is energized when the boiler temperature is above the set low limit and low limit (ZC) dip switch is set to on. **ZC and ZR Terminals:** Connect terminal ZC to ZC terminal on the aquastat control. Connect ZR to ZR terminal on the aquastat control. Confirm polarity is consistent between boiler aquastat and switching relay.

**WARNING:** When using Alternative Wiring diagram, wiring instructions must be followed so power originates from the boiler aquastat. Failure to follow these wiring instructions may result in a secondary source of power being connected to the boiler that may activate it under certain circumstances, causing injury or death.

### For Both Cold Start Boiler Application and Tankless Coil Boiler Application (Alternative Wiring)

**Priority Operation:** When the priority dip switch is set to ON and the priority zone is actuated, all other zones will stop operation until priority zone is satisfied. When not switched to priority, all zones will operate independently.

**Mode Operation:** When the dip switch is set to NORMAL, the end switch relay will be energized if any zone is in operation. When the switch is set to RESET, the end switch relay will only be energized if the priority zone is in operation, or through the operation of a plug-in reset control.

**Primary Pump Operation:** When the dip switch is set to OFF, the primary circulating pump output will energize when any zone calls for heat, except the priority zone. When the dip switch is set to ON, the primary circulating pump output will energize when any zone calls for heat.

**Post Purge Operation:** When the dip switch is set to ON, the priority zone output will stay energized for 2 minutes after its thermostat or aquastat is satisfied, but not operate the boiler.

**Priority Protection Operation:** When the dip switch is set to ON, and if the priority zone calls continuously for more than one hour, power is returned to all the other zones, allowing each zone to function independently. Once the priority zone is satisfied, the control's auto-reset is activated and the priority zone is again allowed to have priority for up to one hour starting from when it calls next.

**Pump Exercise Operation:** When the dip switch is set to ON, the solid state timer cycles all the circulating pumps that are attached to the Expandable Switching Relay at the selected time interval. The time interval can be set for the pumps to run for either 30 seconds every 2 weeks or for 4 minutes every 24 hours.

**Low Limit (ZC) Operation:** When the dip switch is set to ON and the boiler drops below the set low limit (terminal ZC connected to boiler),

all zone circulating pumps will stop. When the boiler rises above the set low limit, the zone circulating pumps are allowed to operate.

**End Switches (Dry Contacts):** The main end switch closes when any zone thermostat calls for heat and the mode switch is set to NORMAL. The main end switch also closes when the mode switch is set to RESET and a PC Series boiler reset power control is calling for heat. The priority end switch closes only when the priority zone thermostat or aquastat is calling for heat.

**Expansion Connections:** Set the expansion switch to MASTER on the switching relay that has the designated priority zone or is utilizing the PC Series plug-in option. Set all other daisy chained controls to SLAVE. Using thermostat wire (18-22 gauge) connect between terminals A, B, C on the master control to the corresponding A, B, C on the SLAVE control(s). Controls may be daisy chained up to 20 zoning panels using any combination of -EXP controls (120 zones if all are 6 zone panels).

#### Thermostat Input (24 vac):

- R** Hot side of transformer. Connect to **R** on thermostat.
- W** Switched **R** signal from thermostat. Connect to **W** on thermostat.
- C** Common side of transformer. Connect to **COM** on thermostat (optional).
- NET** Network terminals 1 & 2 are tied together for wiring convenience when using communicating style thermostats (optional).

#### 120 VAC Connections (N is Neutral, H is Hot):

- Power Input** Connect 120 Volt AC power
- Primary** Primary Pump (optional)
- Zone 1-3** Circulator Zones
- Priority Zone 4** Priority Zone (if enabled) or Zone 4
- N/C Zone 4** Normally closed terminals for the Priority Zone. Will deactivate on a Priority Zone call.

#### Specifications:

PRODUCT NUMBER	NUMBER OF ZONES	INPUT VOLTAGE	MAXIMUM COMBINED LOAD	TYPE 1 ENCLOSURE WIDTH	HEIGHT	DEPTH
QHMZ4P-1	4 with Priority	120/60/1 VAC	20 amps	10 $\frac{3}{4}$ "	7"	2 $\frac{3}{4}$ "

All circulator relay connections, including ZC/ZR, are rated 1/3 hp (6 FLA, 36 LRA) at 120 VAC. End switch connections are rated 24 VAC, 1 amp. All thermostat connections supply a 24 VAC class 2 output.

**WARNING:** Wiring connections must be made in accordance with all applicable electrical codes. Use copper wire only. 120 VAC wiring must have a minimum temperature rating of 75°C. Failure to follow this instruction can result in personal injury or death and/or property damage. 12-18 gauge wire recommended for 120 VAC connections, 14-22 gauge wire for thermostat connections, and 14-22 gauge wire for 24 VAC source connections.

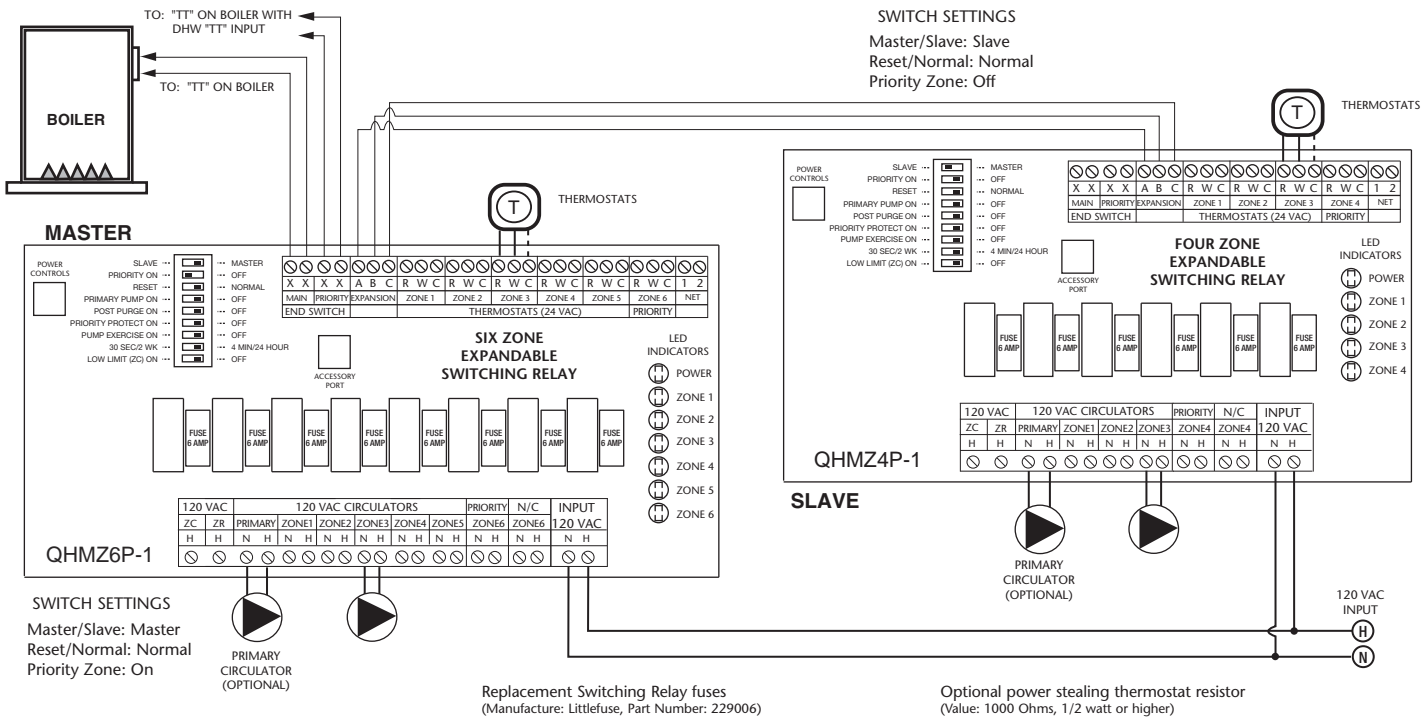
**Dip Switch Settings:**

SLAVE	—	<input type="checkbox"/>	—	MASTER
ZONE PRIORITY ON	—	<input type="checkbox"/>	—	OFF
RESET	—	<input type="checkbox"/>	—	NORMAL
PRIMARY PUMP FUNCTION ON	—	<input type="checkbox"/>	—	OFF
POST PURGE ON	—	<input type="checkbox"/>	—	OFF
PRIORITY PROTECTION ON	—	<input type="checkbox"/>	—	OFF
PUMP EXERCISE ON	—	<input type="checkbox"/>	—	OFF
30 SEC/2 WK	—	<input type="checkbox"/>	—	4 MIN/24 HOUR
LOW LIMIT (ZC) ON	—	<input type="checkbox"/>	—	OFF

**Troubleshooting:**

- **Problem:** Digital thermostats do not work correctly when connected to a switching relay.
- **Solution:** Some thermostats are a "Power Stealing" type which means they are powered by the switching relay with just 2 wires (R & W). A resistor may be needed in order to have the thermostat work properly. This resistor should be placed between the W & C (common) terminals of the switching relay. If the thermostat manufacturer does not supply a resistor, a 1000 ohm 1/2 watt resistor has proven to work with most models and is readily available at electronic supply outlets (e.g. Radio Shack). If the thermostat is battery powered, then check that the batteries are fresh and installed correctly.
- **Problem:** No heat in a zone or room of building.
- **Solution:** LED diagnostic lights will help find a component that is not working properly. The green LED should always be on, indicating that power is connected and the solid-state fuse is good. When there is a call for heat, the red LED will come on indicating power to the zone circulator. This indicates the thermostat is working correctly. If the red LED does not come on, then check the thermostat and thermostat wiring for errors.

**2 Expandable Switching Relays Connected Together**



**Wiring Diagram for Thermostats that require an external transformer**

Some thermostats such as WIFI thermostats may draw more power than the QHMZ4P-1's built-in transformer can deliver. A field supplied external transformer may be required to power these thermostats.

