WATTS® INDUSTRIES

Low Water Cut-Offs

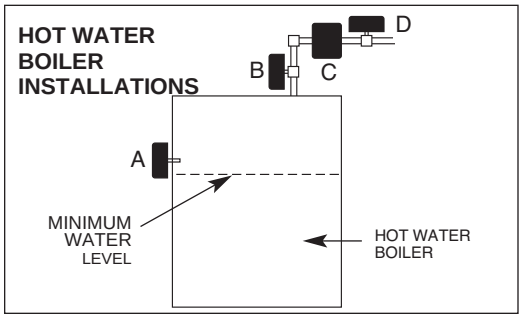
OEM 170 / 550 / 650 / 750

120 VAC Operating Voltage

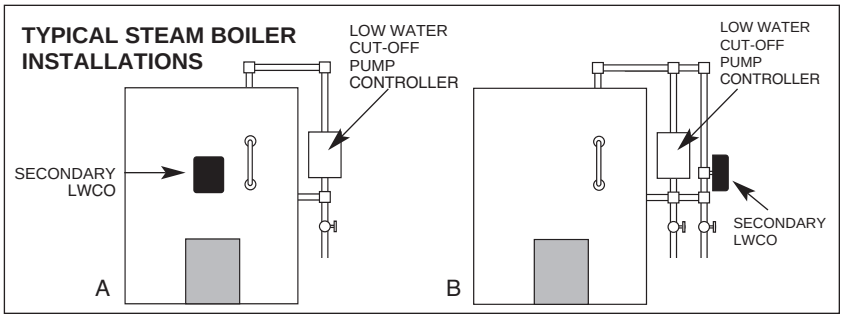
- Automatically shuts off burner in a low water condition to prevent boiler damage.
- Low maintenance. No moving parts to wear stick or hang up, as in float devices.
- Test button (OEM 550 & 650) allows the burner circuit and control to be tested without lowering the water level.
- Manual reset feature (OEM 550 & 750) will not lock out in power failures.

WARNING: To prevent electrical shock or equipment damage, power must be off during installation or servicing of the control. To prevent serious burns, the boiler should be thoroughly cooled before installing or servicing control. Only qualified personnel may install or service the control in accordance with local codes and ordinances. Read instructions completely before proceeding.

1. Where To Install

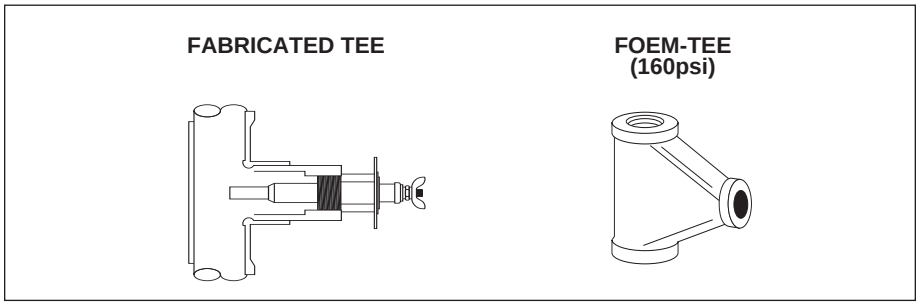


HOT WATER BOILERS: Probe must be installed at or above the minimum safe water level established by the boiler manufacturer. The probe may be installed directly in the boiler (A) if a suitable tapping is available, in the riser (B), in the header horizontally (C), or in the header vertically (D).



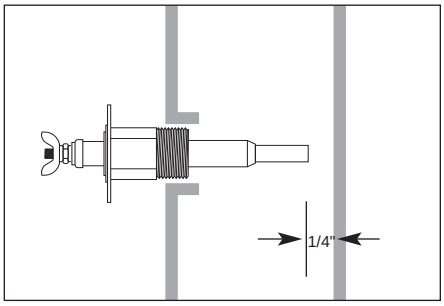
STEAM BOILERS (Secondary) : OEM 550/750 Only. Control must be installed in a suitable tapping provided in the boiler(A), or in an equalizing line(B). The control should be located below the level of the primary low water cut-off but above the lowest permissable water line as specified by the boiler manufacturer.
Note: For installations in equalizing lines, Watts recommends the use of FOEM Series or 1214C-2 Cast Iron Tees (see step 2).

2. Tee Options



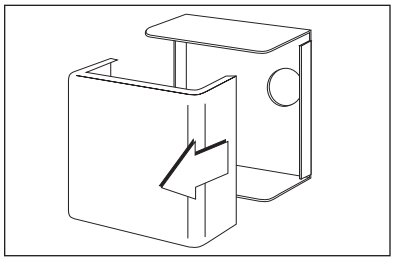
TEE MOUNTING: If a field fabricated tee is used, make sure that the tee drains thoroughly when the water level falls below it, and that it conforms to the spacing requirements described in Step 3. Models equipped with the shorter EL1214-SV probe can be installed in most standard reducing tees. Safgard cast iron tees are also available to accommodate all probe models (See page 4).

3. Probe Installation

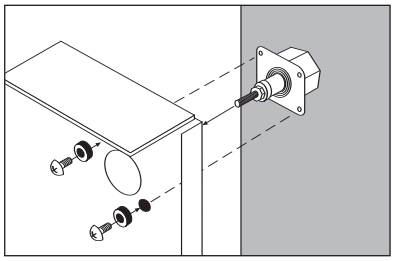


Check to insure 1/4" clearance from the probe to any surface within the boiler or tee. Apply pipe sealing compound to threads.
Note: Use of Teflon tape is not recommended.

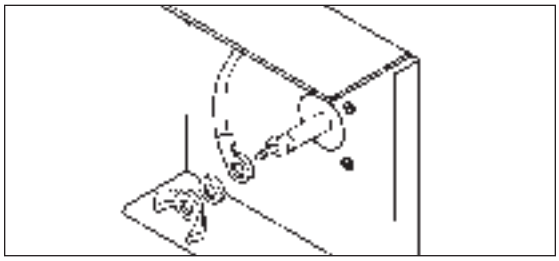
4. Control Mounting



Loosen the two control box cover binding head screws and remove the cover.



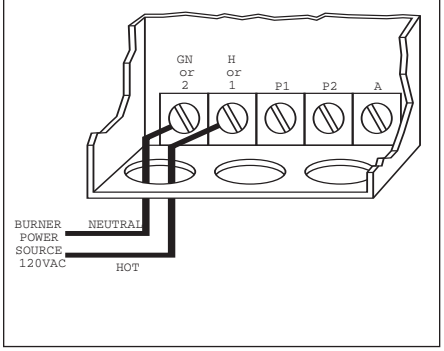
Assemble the control box to the probe flange and secure with the screws provided with the probe.



Connect the ring terminal wire lead to the probe terminal stud and secure with the lock washer and wing nut provided. *With the power removed,* proceed with installation and wiring according to Method A or B described on next page.

WIRING METHOD A: SAME POWER SOURCE FOR CONTROL AND BURNER CIRCUIT.

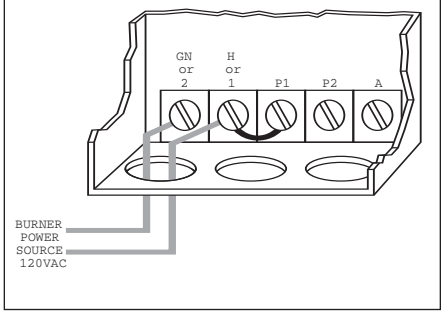
A1



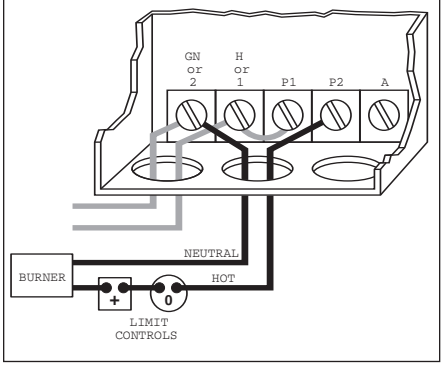
◀ A1 Connect the hot lead of the input voltage (120 VAC, 60 HZ) to terminal 1 (or H). Connect the neutral lead to terminal 2 (or GN). 120 VAC, 60 HZ must be supplied to terminals 1 (or H) and 2 (or GN) for internal operation of the control.

Install a jumper between A2 ▶ terminal 1 (or H) and terminal P1. Power from terminal P1 is supplied to terminal P2 through the control relay when water is at the probe.

A2



A3

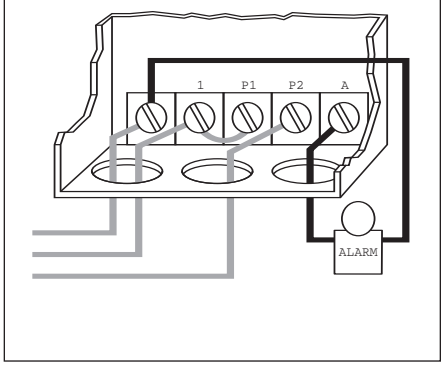


◀ A3 Connect terminal 2 (or GN) to burner circuit neutral. Connect terminal P2 to burner circuit in series with other limit controls. Consult boiler manufacturer instructions for proper terminal connections. Control should be wired in series with and before other circuits.

Optional alarm connection. Connect A4 ▶ alarm common to terminal 2 (or GN). Connect alarm hot to terminal A.

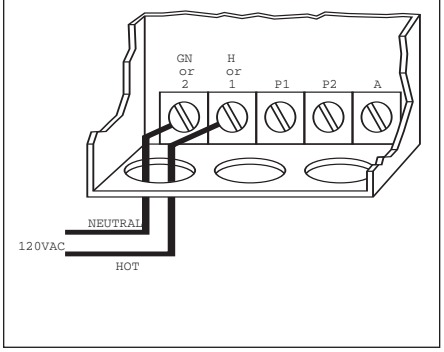
Upon completion of wiring, replace control box cover.

A4



WIRING METHOD B: SEPARATE POWER SOURCE FOR CONTROL AND BURNER CIRCUIT.

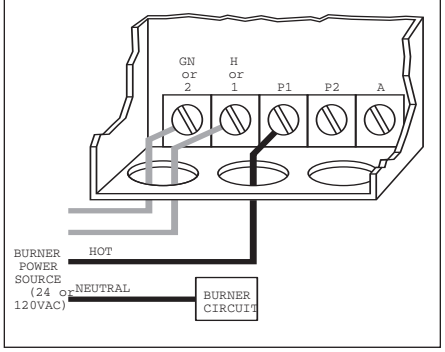
B1



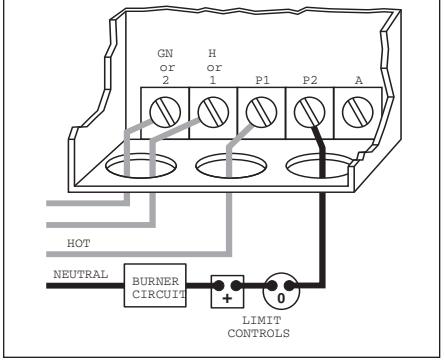
◀ B1 Connect the hot lead of the input voltage (120 VAC, 60 HZ) to terminal 1 (or H). Connect the neutral lead to terminal 2 (or GN). 120 VAC, 60 HZ must be supplied to terminals 1 (or H) and 2 (or GN) for internal operation of the control.

Connect hot lead from the 24 VAC or B2 ▶ 120 VAC burner power source to terminal P1. This terminal supplies power to terminal P2 in normal operating conditions when water is at the probe. Connect neutral to burner circuit. Note: consult boiler manufacturer instructions for proper terminal connections.

B2



B3

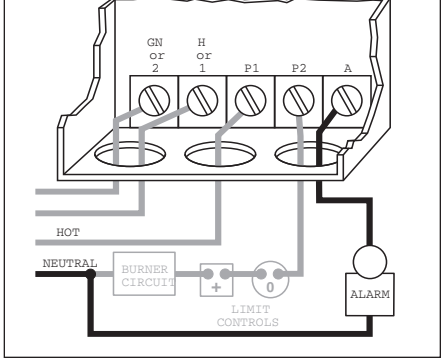


◀ B3 Connect terminal P2 to burner circuit in series with and before other limit controls.

Optional alarm connection. Connect B4 ▶ alarm hot to terminal A. Connect alarm common to neutral of the burner power source.

Upon completion of wiring, replace control box cover.

B4

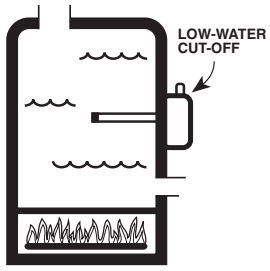


PRINCIPLE OF OPERATION

WATTS controls are electrically operated. A probe is installed in the boiler shell or an external manifold, and connected to the control unit. Water is used as a conductor to complete a circuit from the probe to the control unit.

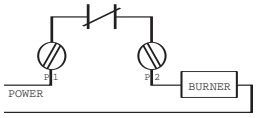
The control unit provides switching contacts to complete the burner control circuit and to operate an optional alarm or water feeder.

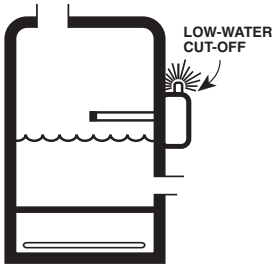
There are no moving parts to wear, stick or “hang up” in the harsh boiler environment. Because there is no float chamber to collect sediment, the result is greater safety and less maintenance.



NORMAL OPERATION

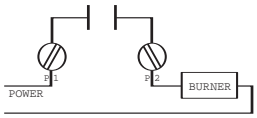
With water present at the probe, the control circuit is complete. Contact between terminals P1 and P2 completes the burner circuit, allowing for normal operation of the burner.





LOW WATER CONDITION

Whenever the water level falls below the probe, the control circuit is opened and the burner circuit is interrupted, shutting down the burner.



OPERATING INSTRUCTIONS

OEM 170: Automatic Reset

1. Turn on the power and set the thermostat to call for heat. The burner will fire immediately.

2. Slowly lower the water level below the probe. The burner will shut down.

OEM 650: Automatic Reset & Test Button

1. Turn on the power and set the thermostat to call for heat. The burner will fire immediately. The LED lamp should be off.

2. Push the test button on the top of the control to simulate a low water condition. The LED lamp will light and the burner will shut down within two seconds.

OEM 750: Manual Reset

1. Turn on the power and set the thermostat to call for heat. The burner will fire immediately. The LED lamps should be off.

2. Slowly lower the water level below the probe. The amber light will come on and the burner will shut down within two seconds.

3. Wait 3O seconds. The red LED lamp will come on indicating that the control is locked-out.

4. Raise the water above the probe. The red LED lamp will remain lit and the burner will not fire.

5. Push the RESET button to reset the control and restore burner operation.

OEM 550: Manual Reset & Test Button

Follow the operating instructions for the OEM 650 & 750 above.

Note: To test the manual reset feature on the OEM 550 without lowering the water level:

1. Push and hold down the TEST button. The red LED lamp will come on in approximately 3O seconds indicating that the control is locked-out.

2. Once the red LED is lit, release the TEST button. The burner will not fire.

3. Push the RESET button to reset the control and restore burner operation.

TROUBLE SHOOTING

IF THE BURNER DOES NOT SHUT DOWN

If the burner does not shut down when the water drops below the probe:

1. Remove power immediately and re-check wiring.

2. Remove power and check for adequate clearance from the probe to any surface within the boiler or tee.

IF THE BURNER DOES NOT FIRE

1. Make sure water is at probe and probe lead wire is properly secured to the terminal.

2. Check for proper ground between probe and boiler shell. Excessive use of Teflon tape or sealing compound may insulate the probe from the boiler shell.

3. Re-check wiring and test for correct incoming voltage.

IF THE RED LED LAMP IS ON

The red LED lamp indicates that the control is locked-out. This feature will activate if the boiler experiences a low water condition exceeding 30 seconds in duration. **IMPORTANT:** Do not reset control until the cause of the low water condition is corrected. **CAUTION: Do not add water until boiler is cool.**

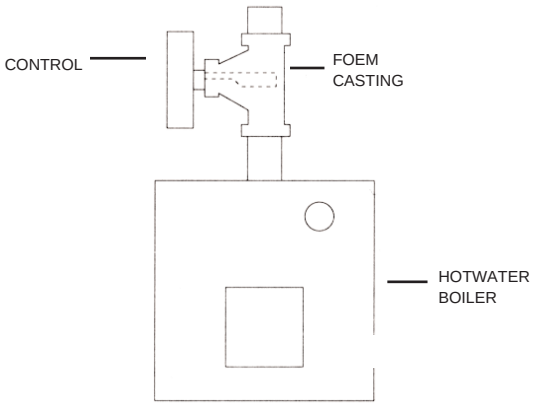
MAINTENANCE

To ensure optimum performance, inspect probe annually. Clean any scale or build-up from the probe using a scouring pad or steel wool. Re-install the probe and test control in accordance with the Operating Instructions.

FITTINGS

Controls equipted with the EL1214-SV Probe can be mounted in standard reducing tees (supplied by others). Model FOEM Manifolds are available for all probe models. 1" H.P. Reducing Tees are available for high pressure steam applications (use with model EL1214-SV probe only).

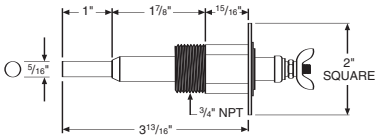
FOEM MANIFOLD



MODEL	PSI	SIZE
FOEM-1	160	1/1/2" x 1 1/2" x 3/4" NPT
FOEM-2	160	1" x 1" x 3/4" NPT
FOEM-3	160	1/1/4" x 1 1/4" x 3/4" NPT

PROBE DATA

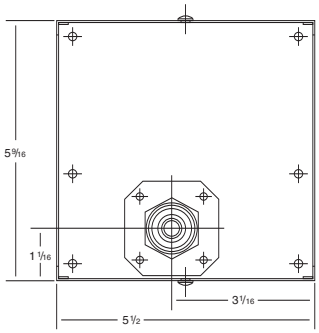
Test Pressure: 1000 PSI



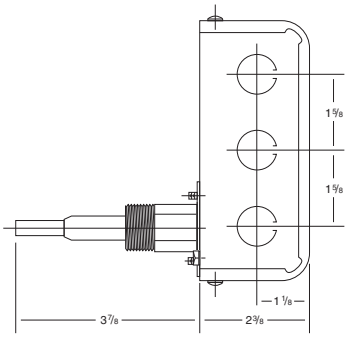
EL1214 – STANDARD MODEL – 3/4" NPT

For 1/2", order Model EL1220

DIMENSIONS



BACK



BOTTOM

SPECIFICATIONS

MAXIMUM PRESSURE: 250 PSI
INPUT VOLTAGE: 120 VAC, 60 HZ
SWITCH RATINGS: 5.8 FLA, 34.8 LRA
SWITCH CONTACTS: SPDT
ALARM CIRCUIT: 125 VA @ 120 VAC Pilot Duty

LISTED

LIMITED WARRANTY:

WATTS Industries Canada Inc. warrants each product against defects in material and workmanship for a period of one year from the date of original shipment. In the event of such defects within the warranty period, the Company will, at its option, replace or recondition the product without charge. This shall constitute the exclusive remedy for breach of warranty, and the Company shall not be responsible for any incidental or consequential damages, including, without limitation, damages or other costs resulting from labor charges, delays, vandalism, negligence, fouling caused by foreign material, damage from adverse water conditions, chemicals, or any other circumstances over which the Company has no control. This warranty shall be invalidated by any abuse, misuse, misapplication or improper installation of the product.

THE COMPANY MAKES NO OTHER WARRANTIES EXPRESS OR IMPLIED EXCEPT AS PROVIDED IN THIS LIMITED WARRANTY.

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