WEIL-McLAIN®

EG/PEG Series 6

EGH Series 5

Gas-Fired Boilers

Control Supplement – Universal Control Systems

Now With Built In
Low Water Cut Off Functionality
EG Water Only

For additional information, refer to . . .

EG • PEG • EGH Boiler manual

for EG/PEG – Natural gas only
for EGH – Natural or Liquefied Petroleum (Propane) gas
(tankless heater application optional)

⚠WARNING Installation and service of the boiler must be performed by a qualified installer or service technician. **Before installing**, read all instructions, including this supplement, the boiler manual and any related documents. Perform steps in the order given. Failure to comply can result in severe personal injury, death, or substantial property damage.

Part Number 550-142-304/0323

Please read this page first!

Hazard definitions

The following defined terms are used throughout these instructions to bring attention to the presence of hazards of various risk levels or to important information concerning the life of the product.

⚠ DANGER Indicates presence of hazards that **will result in severe** personal injury, death or substantial property damage.

⚠ WARNING Indicates presence of hazards that **can result in severe** personal injury, death or substantial property damage.

⚠ CAUTION Indicates presence of hazards that **will or can result in minor** personal injury or property damage.

NOTICE Indicates special instructions on installation, operation or maintenance that are important but not related to personal injury or property damage.

Note to the installer

⚠ WARNING Controls must only be installed by a Weil-McLain distributor or other qualified installer/service technician in accordance with this Supplement and all applicable codes and requirements of the authority having jurisdiction. Read this Control Supplement completely before beginning the installation. If the information in this Supplement is not followed exactly, a fire, explosion, carbon monoxide emission or other hazardous conditions can result, causing severe personal injury, death or substantial property damage.

⚠ WARNING This system is used on gas-fired boilers without vent dampers as shipped from the factory. This system is not offered for retrofit. Any attempt to apply the system components to boilers shipped for use with a different control system will not be covered under boiler warranty and can result in severe personal injury, death or substantial property damage.

NOTICE When calling or writing about the boiler, please have the boiler model number from the boiler rating label and the Consumer Protection (CP) number from the boiler jacket.

Table of contents

Start-up

⚠WARNING **DO NOT** proceed with boiler operation unless boiler and system have been filled with water and all instructions and procedures of previous manual sections have been completed. Failure to do so can result in severe personal injury, death or substantial property damage. Before starting the boiler, do the following:

- Read the Manual, Control Supplement and the **Operating instruction** procedure.
- Verify the boiler and system water level is correct (no more than 1/2 gauge glass or less than 1/4" above bottom of gauge glass). (steam boilers)
- Verify the boiler and system are **full of water**. (Water boilers)
- Verify the **Start-up preparation** in Boiler manual have been completed.

EG & PEG water boilers

Adjust boiler control settings

BOILER OPERATING TEMPERATURE

With power turned on, control module receives a signal from the temperature sensor / LWCO and displays boiler temperature. The control knob labeled **BOILER TEMP** is used to adjust the operating temperature set point, turning clockwise to increase temperature setting and counterclockwise to decrease. When the knob is turned to adjust temperature the display will brighten to indicate adjustment mode. After temperature is set to desired value, display will dim after approximately 5 seconds to indicate measurement mode.

ADJUST BOILER OPERATING TEMPERATURE TO DESIRED SET POINT

BOILER ECONOMY SETTING

To comply with Department of Energy regulations, the control module circulates available hot water before turning on the boiler to attempt to satisfy a call for heat. While attempting to satisfy the heat demand, the control module also monitors the boiler temperature changes via the temperature sensor / LWCO and determines whether or not the available hot water will satisfy the demand, adjusting the time delay to turn on the boiler until it determines that additional heat will be needed. The knob labeled **ECONOMY ADJUST** provides an adjustment between maximize (MAX) and minimize (MIN) the delay. The maximum (MAX) adjustment position should be used to maximize energy savings. Turning the knob counterclockwise decreases the delay time and should only be used in the event that the heated space becomes uncomfortable.

ADJUST ECONOMY TO DESIRED POSITION (MAX IS THE PREFERRED SETTING)

IMPORTANT

In accordance with Section 325 (f) (3) of the Energy Policy and Conservation Act, this boiler is equipped with a feature that saves energy by reducing the boiler water temperature as the heating load decreases. This feature is equipped with an override which is provided primarily to permit the use of an external energy management system that serves the same function.

THIS OVERRIDE MUST NOT BE USED UNLESS AT LEAST ONE OF THE FOLLOWING CONDITIONS IS TRUE:

- An external energy management system is installed that reduces the boiler water temperature as the heating load decreases.
- This boiler is part of a modular or multiple boiler system having a total input of 300,000 BTU/hr or greater.
- This boiler is equipped with a tankless coil.

Department of Energy – Compliance

This boiler is equipped with a control system that automatically adjusts a time delay period to turn on the boiler during a call for heat. This is accomplished by circulating available hot water in the system while measuring water boiler water temperature changes. The control calculates a suitable delay based on temperature measurements and turns the boiler on only after it determines that the demand for heat cannot be satisfied with the available hot water,
Due to the wide variety of controls used in boiler installations, this control is also equipped with an adjustment for the calculated time delay period (**ECONOMY ADJUST**). In the MIN position, the time delay is zero and the **IMPORTANT** notice below must be observed:

IMPORTANT

In accordance with Section 325 (f) (3) of the Energy Policy and Conservation Act, this boiler is equipped with a feature that saves energy by reducing the boiler water temperature as the heating load decreases. This feature is equipped with an override which is provided primarily to permit the use of an external energy management system that serves the same function.

THIS OVERRIDE MUST NOT BE USED UNLESS AT LEAST ONE OF THE FOLLOWING CONDITIONS IS TRUE:

- An external energy management system is installed that reduces the boiler water temperature as the heating load decreases.
- This boiler is part of a modular or multiple boiler system having a total input of 300,000 BTU/hr or greater.
- This boiler is equipped with a tankless coil.

Operation – Sequence

NOTICE Follow all procedures given in this manual and operating instructions when operating the boiler. Failure to do so could result in severe personal injury, death or substantial property damage.

1. **Standby:** With no call for heat, the vent damper and circulator are de-energized. No gas flows to pilot or main gas valve.
2. **Call for heat** (thermostat circuit closes):

   For water boilers, while attempting to satisfy the heat demand, the control module monitors the boiler temperature changes via the temperature sensor and determines whether or not the available hot water will satisfy the demand, only running the circulator. If additional heat is needed, the sequence continues. When DHW (if used) calls for heat, sequence above is bypassed.

   a. Vent damper and circulator energized if pilot status acceptable. Vent damper drives open. When vent damper end switch makes circuit, ignition control begins pilot ignition attempt.

   b. Ignition control checks for false flame signal: If ignition control senses pilot signal when no pilot gas should be present, control will lockout, requiring reset procedure as given in **Figure 1.**

3. **Pilot ignition:** Control module sparks the pilot and opens pilot valve in main gas valve.

   a. If pilot does light and control module senses flame current, spark generator is turned off and main valve opens.

   b. **Natural Gas** - If pilot does not light within 15 seconds, pilot valve is closed and spark generator is turned off. Control module waits 5 minutes, then attempts to ignite pilot again. This cycle will continue indefinitely if pilot ignition control does not sense pilot flame.

Operation – Sequence

4. **Main burner operation:**
   a. Control module monitors pilot flame current. If signal is lost, main valve closes, spark generator activates and sequence returns to step 4.
   b. If power is interrupted, control system shuts off pilot and main gas valves and restarts at step 1 when power is restored.
   c. In the event the limit control shuts down the boiler — The control module closes the main gas valve, but keeps the circulator operating and the vent damper open.
5. **Thermostat satisfied** (thermostat circuit opens) — Pilot and main gas valves are closed — Vent damper is de-energized, and cycles to closed position. Circulator is shut off.
6. Boiler is now in the standby mode.
7. Thermostat anticipator setting: Set thermostat heat anticipator as instructed on page 21.

Figure 1 Ignition control module sequence of operation — status light indications — EG Water Only

STEPS *(After Step 8, the cycle goes back to Step 1)*	Call for Heat?	POWER	TSTAT CIRC	LIMIT	DAMPER	FLAME	LWCO	Timing
1. Standby • Waiting for call for heat	NO	ON	OFF	OFF	OFF	OFF	OFF	—
2. Call for heat • Circulator on	YES	ON	ON	OFF	OFF	OFF	OFF	—
3. Limit circuit • Limit controls closed	YES	ON	ON	ON	OFF	OFF	OFF	—
4. Damper circuit • Damper proven open	YES	ON	ON	ON	ON	OFF	OFF	—
5. Flame proven * • Gas valve open • Ignitor remains on • Boiler producing heat	YES	ON	ON	ON	ON	ON	OFF	15 sec
6. Limit cycle • Limit circuit open • Gas valve closed	YES	ON	ON	OFF	OFF	OFF	OFF	—
7. Flame outage * • Flame out • Boiler recycles	YES	ON	ON	ON	OFF	OFF	OFF	—
8. Thermostat satisfied • Circulator off	NO	ON	OFF	ON	OFF	OFF	OFF	—
9. Circulator exercise routine • Circulator turns on for 30 seconds if boiler not operated for 30 days	NO	ON	OFF	OFF	OFF	OFF	OFF	30 sec
10. LWCO circuit • LWCO circuit open	YES/NO	OFF	OFF	OFF	OFF	OFF	ON	—

ON = ON OFF = OFF

* See Page 5, Items 3b for controls response to failure to prove pilot flame.

Control will lockout under the following conditions:
- Line voltage polarity is reversed
- Stray voltage is sensed on thermostat line
- Damper end switch not proven within 5 minutes from thermostat call for heat
- Flame is sensed when it shouldn't be there

Control will reset after these lockouts :
- 1 hour waiting period
- Opening and closing of thermostat circuit for 2 to 20 seconds
- Removal of 120VAC power for 2 to 20 seconds

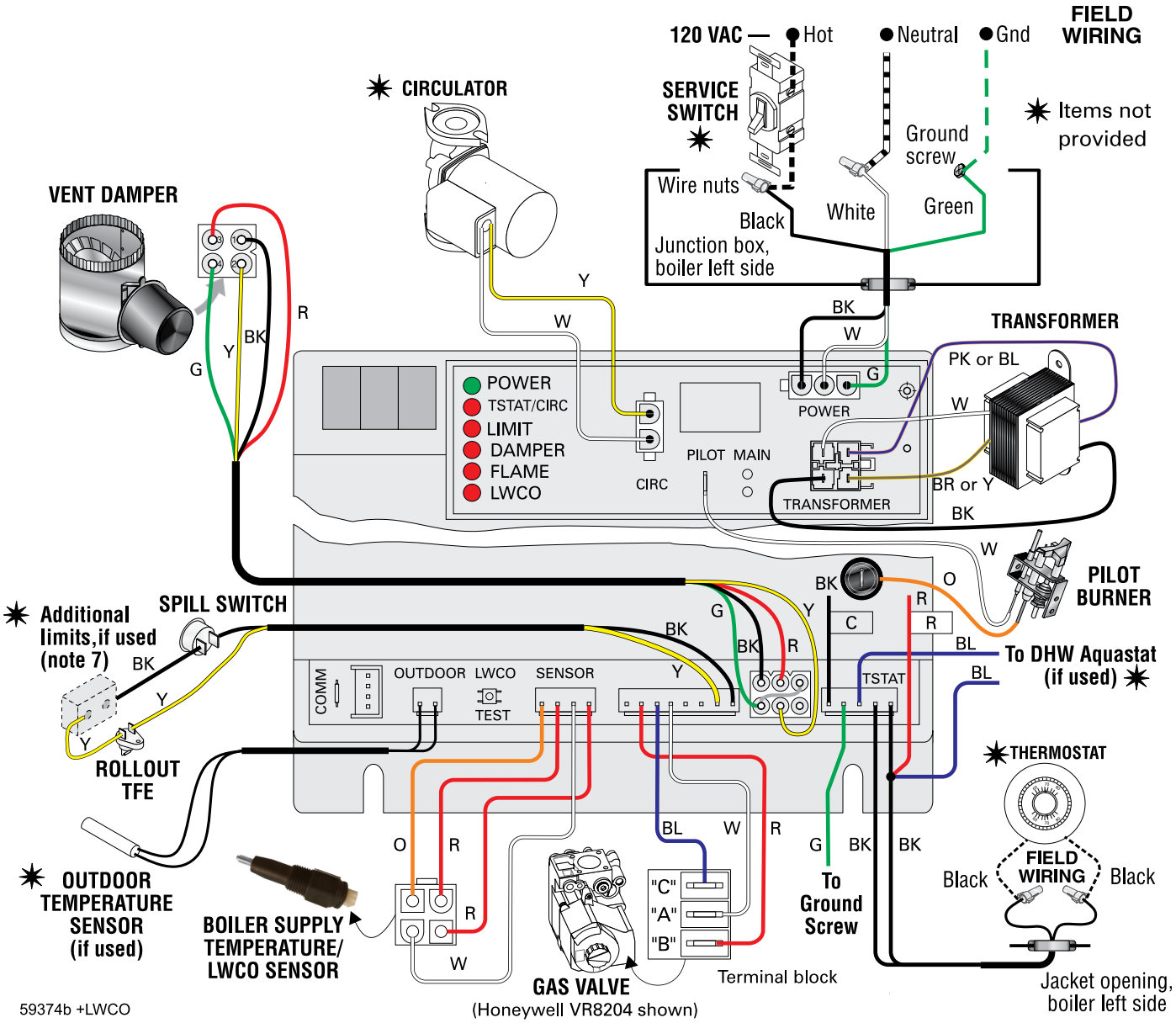
Control installation

EG-30 through EG-75 water boilers without tankless heaters Schematic wiring diagram

⚠CAUTION ***DO NOT connect directly from 3-wire zone valves to the T-T terminals on the boiler***. When using 3-wire zone valves, install an isolation relay. Connect the zone valve end switch wires to the isolation relay coil. Connect the isolation relay contact across the boiler T-T terminals. Failure to comply can result in damage to boiler components or cause unreliable operation, resulting in possible severe property

NOTICE

- The control module is polarity-sensitive to the incoming 120VAC power. If polarity is reversed, control will flash the **POWER** light when powered and will not cycle boiler.
- All contacts shown without power applied.
- Connector and status light locations/orientations may vary.



Control installation *(Continued)*

EG-30 through EG-75 water boilers without tankless heaters

Ladder wiring diagram

⚠WARNING **Electrical shock hazard** — can cause severe injury or death. Disconnect power before installing or servicing.

Legend for ladder wiring diagram

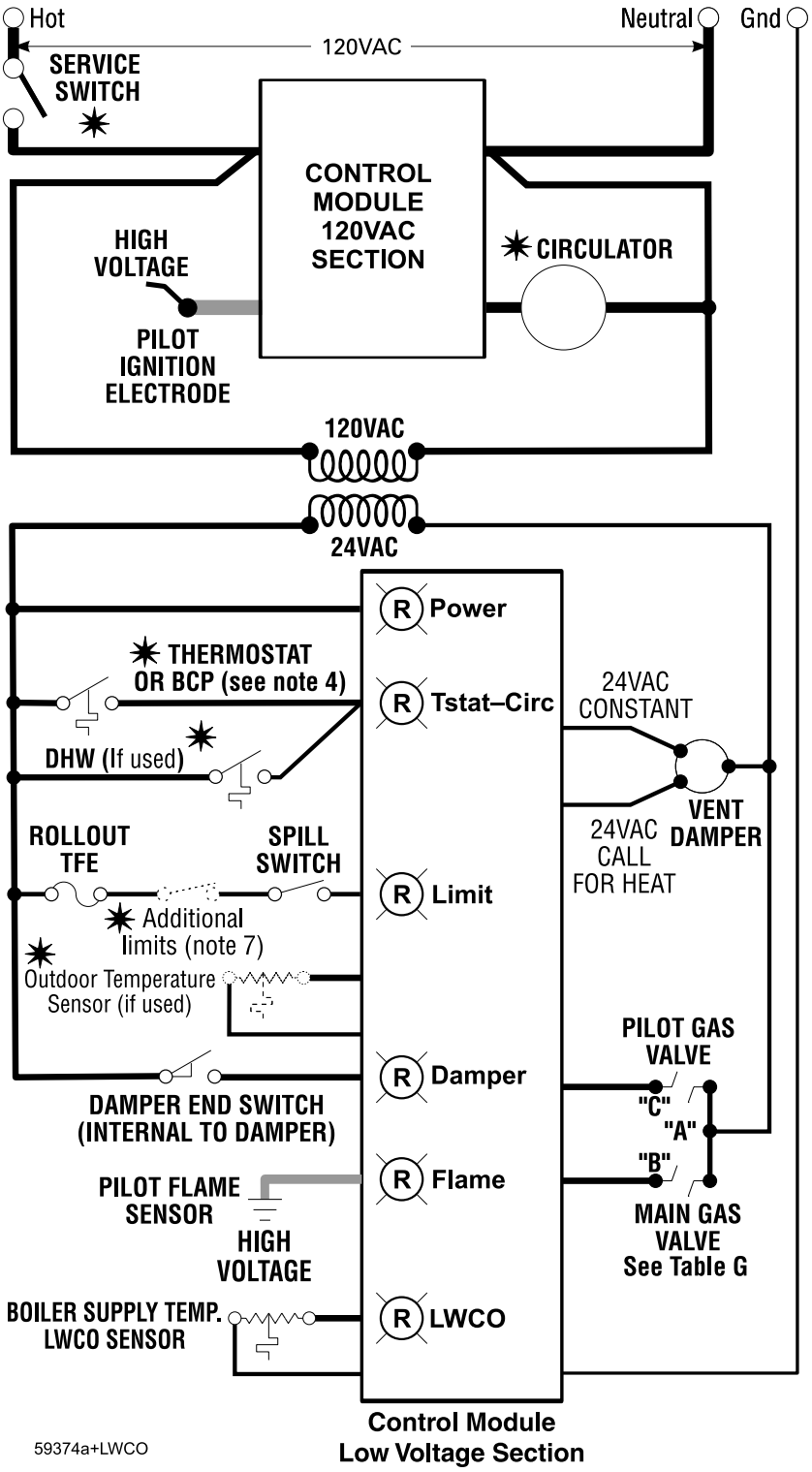
- 120 VAC field wiring
- Low voltage field wiring
- 120 VAC factory wiring
- Low voltage factory wiring
- High voltage spark ignition wiring
- Ground connectors

Table G: Gas valve terminals and anticipator settings

Gas valve	"A"	"B"	"C"	Anticipator amps
Honeywell VR8204	MV/PV	MV	PV	0.6
Honeywell VR8304	MV/PV	MV	PV	0.8
White-Rodgers 36E	2	1	3	0.64
White-Rodgers 36C	2–4 *	1	3	0.7

* Terminals 2–4 are factory-jumpered on the White-Rodgers 36C gas valve.

1. All wiring must be installed in accordance with:
   A. U.S.A. — NEC - ANSI/NFPA 70 – latest edition. And any other national, state, or local code requirements. Boiler must be electrically grounded as required by National Electrical Code ANSI/NFPA 70.
   B. Canada — C.S.A. C22.1 C.E.C. Part 1 and any other national, provincial, or local code requirements.
2. Pilot lead wires are not field replaceable. Replace pilot assembly if necessary.
3. If any of the original wire as supplied with the appliance must be replaced, use minimum 105 °C wire or equivalent. Exception — wires to a rollout TFE must be 200 °C or equivalent.
4. Thermostat anticipator setting (single zone) — see Table G for anticipator setting, depending on which gas valve is installed in boiler.
5. For multiple zoning, use either zone valves or circulators. Refer to the component manufacturer's instructions and this manual for application and wiring suggestions.
6. Refer to control component instructions packed with the boiler for application information.
7. Wire any additional limit controls (low water cut-off, additional high limit, etc.) in series with boiler rollout TFE and spill switch as shown.



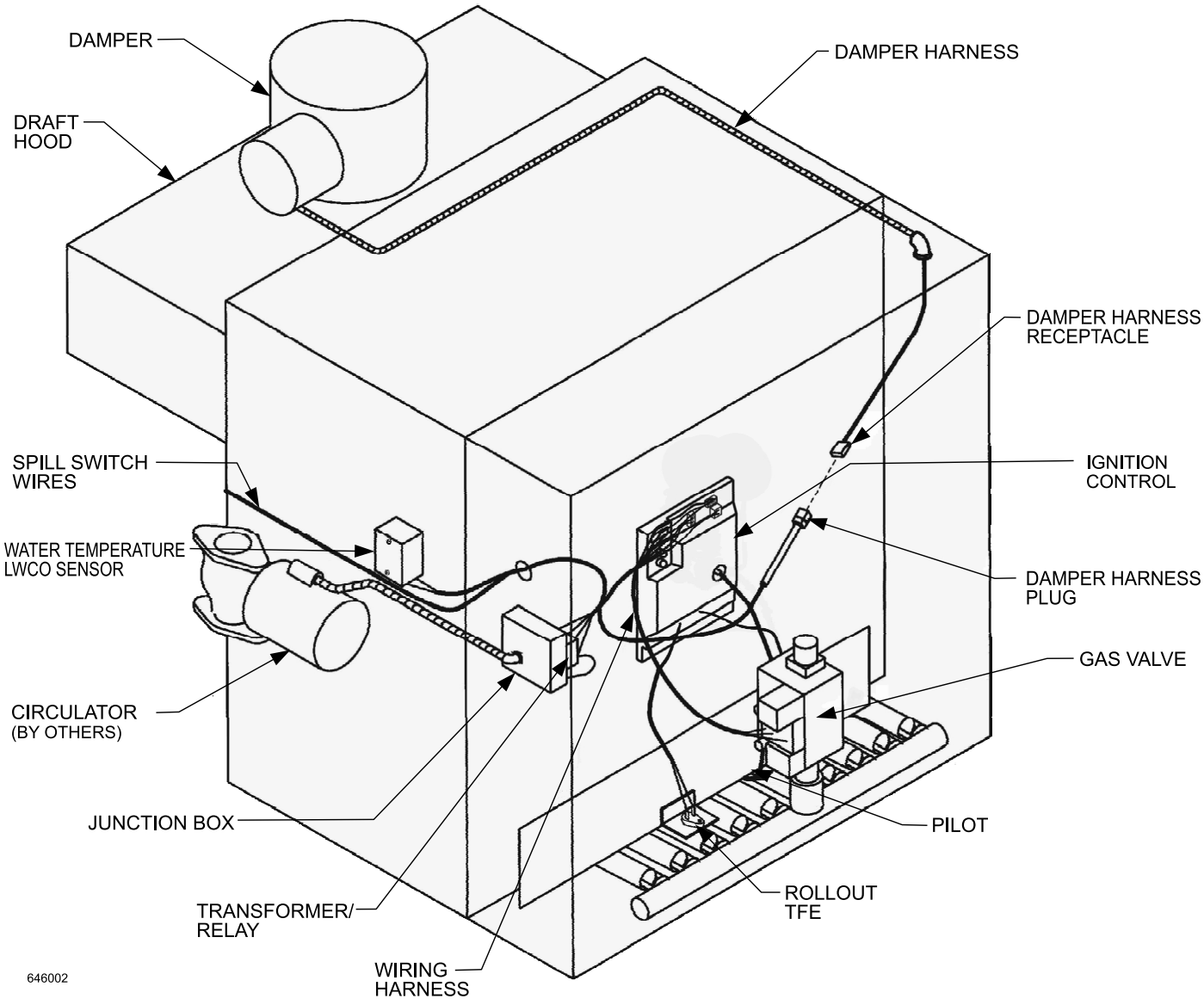
Control installation *(Continued)*

EG-30 through EG-75 water boilers without tankless heaters

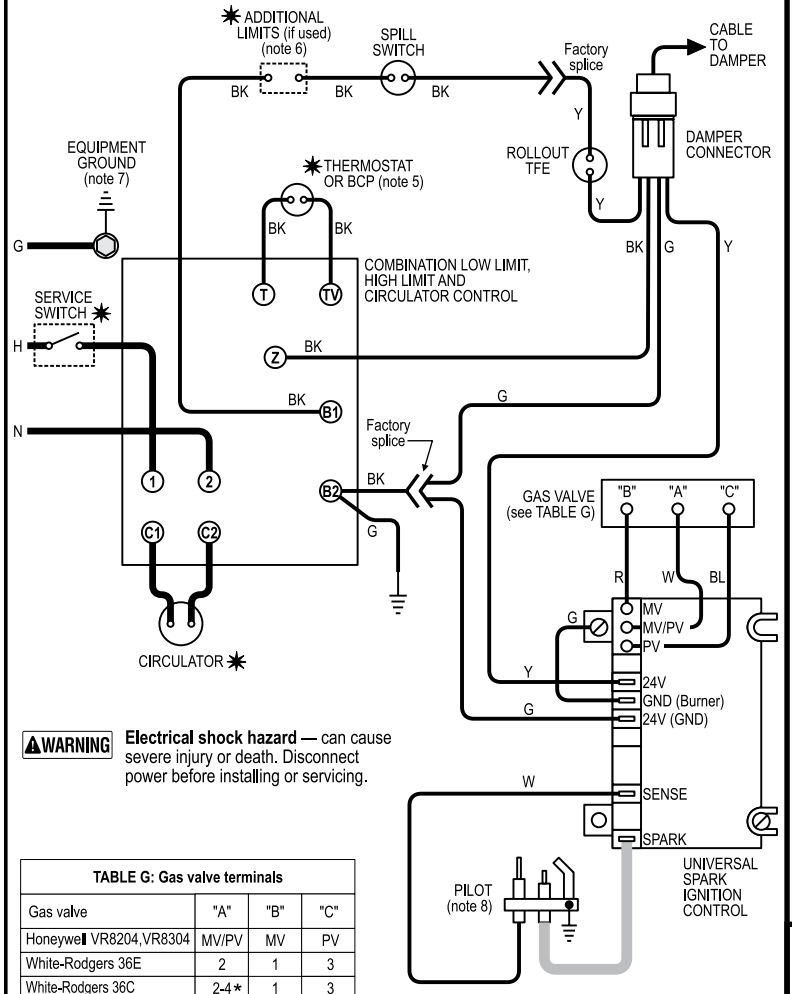
⚠WARNING For your safety, turn off electrical power supply and turn off external gas supply valve before attempting to work on the boiler. Failure to comply can result in severe personal injury, death or substantial property damage.

1. Mount and wire controls per wiring diagram, page 9, and Figure 2.
   a. Attach junction box inside left jacket panel with #8-32 x ½" machine screws provided.
   b. Install transformer with plug-in relay receptacle and relay.
   c. Operating and limit circuit wiring must be 18 gauge or heavier.
2. Bring supply wiring to boiler. Must be 14 gauge or heavier.
3. Proceed to page 20.

Figure 2 EG-30 through EG-75 water boilers without tankless heaters



Schematic Wiring Diagram



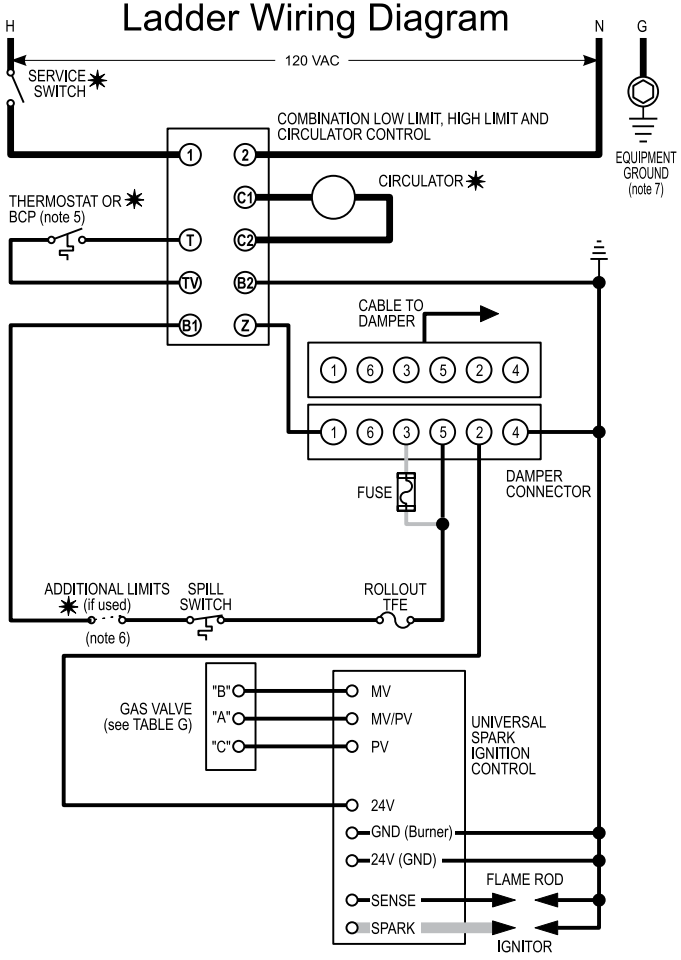
⚠WARNING **Electrical shock hazard —** can cause severe injury or death. Disconnect power before installing or servicing.

TABLE G: Gas valve terminals

Gas valve	"A"	"B"	"C"
Honeywell VR8204,VR8304	MV/PV	MV	PV
White-Rodgers 36E	2	1	3
White-Rodgers 36C	2-4 *	1	3
Robertshaw 7200	C	M	P

(* Factory jumpered)

Ladder Wiring Diagram



EG 30 – 75

- Intermittent pilot
- Natural gas
- Forced hot water
- With tankless heater

Notes

1. All wiring must be installed in accordance with:
   A. U.S.A. — N.E.C. And any other national, state, or local code requirements.
   B. Canada — C.S.A. C22.1 C.E.C. Part 1 and any other national, provincial, or local code requirements.
2. All contacts shown without power applied (off-shelf condition).
3. If original rollout TFE wire as supplied with the appliance must be replaced, type 200°C wire or its equivalent must be used. If other original wire as supplied with the appliance must be replaced, type 105°C or its equivalent must be used.
4. Refer to control component instructions packed with boiler for application information.
5. Thermostat – For single-zone systems, set anticipator to 0.20 amps. For multiple-zone systems using zone valves or circulators, refer to component manufacturer's instructions for wiring and thermostat anticipator setting.
   BCP – For BCP connection in place of thermostat, refer to BCP installation/operation manual.
6. L.W.C.O., additional high limit, etc., wired in series.
7. ⏚ Denotes field-installed chassis ground.
8. Pilot leadwires are not field replaceable. Replace pilot assembly if necessary.

Legend

- 120 VAC FIELD WIRING
- LOW VOLTAGE FIELD WIRING
- 120 VAC FACTORY WIRING
- LOW VOLTAGE FACTORY WIRING
- IGNITION CABLE
- ✷ Items not provided

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Part Number 550-223-815/0406

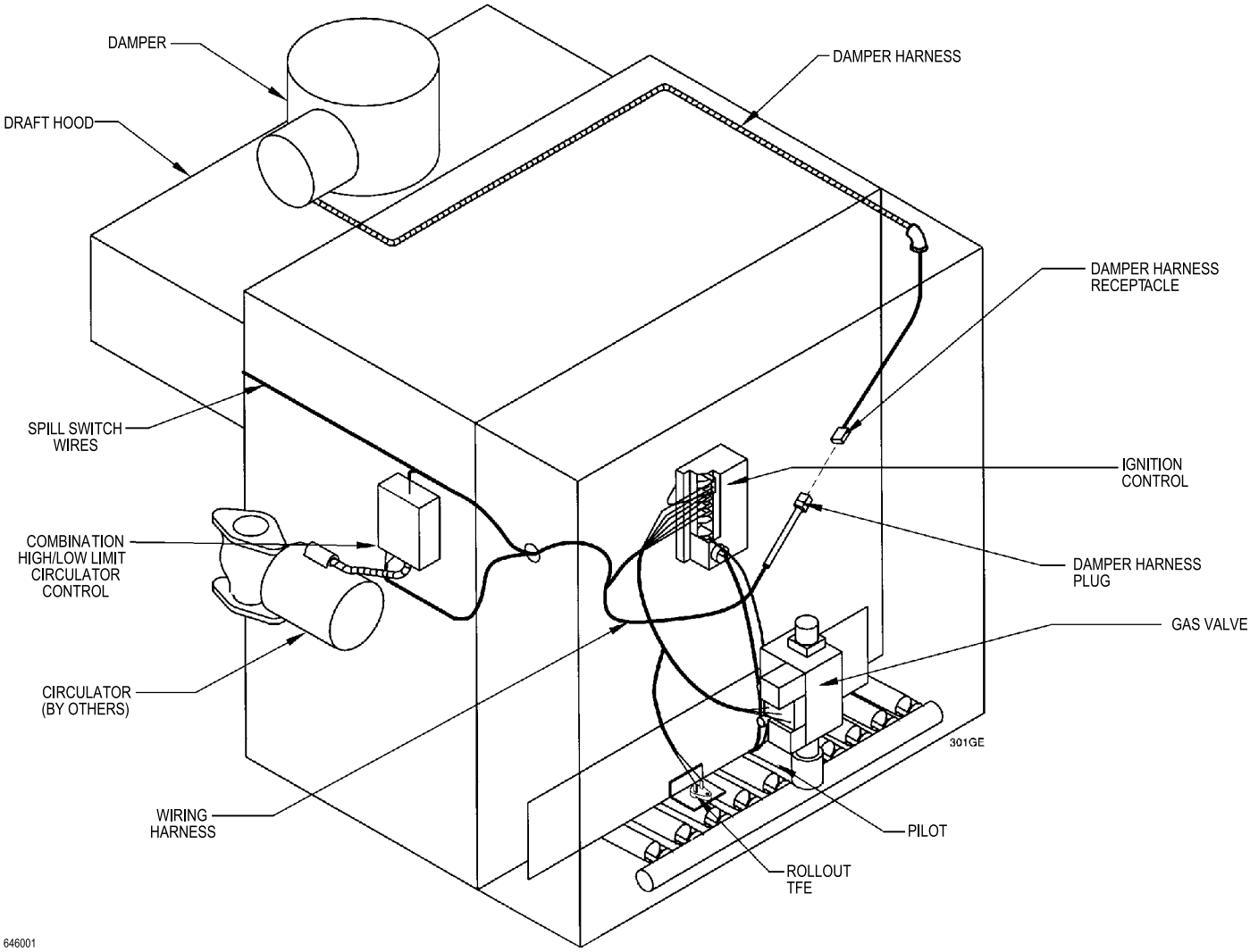
Control installation *(Continued)*

EG-30 through EG-75 water boilers with tankless heaters

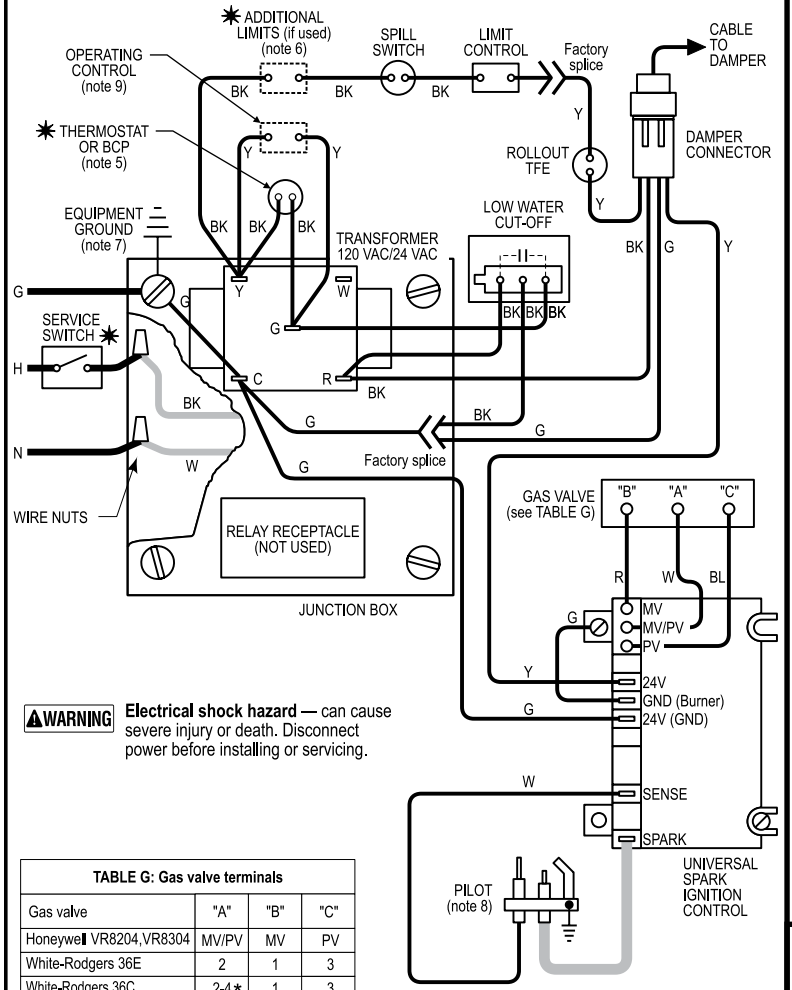
⚠WARNING For your safety, turn off electrical power supply and turn off external gas supply valve before attempting to work on the boiler. Failure to comply can cause severe personal injury, death or substantial property damage.

1. Mount and wire controls per wiring diagram, page 11, and Figure 3.
   a. Install combination limit control and relay in tapping. See Boiler Manual control tapping table. Operating and limit circuit wiring must be 14 gauge or heavier.
2. Bring supply wiring to boiler. Must be 14 gauge or heavier.
3. Proceed to page 20.

Figure 3 EG-30 through EG-75 water boilers with tankless heaters



Schematic Wiring Diagram



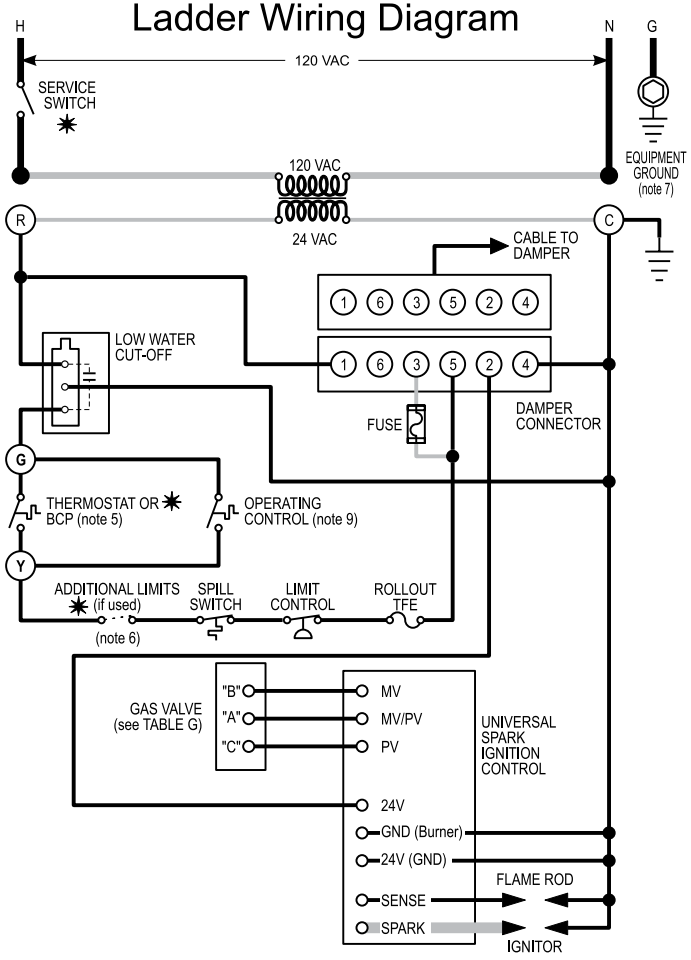
⚠WARNING **Electrical shock hazard —** can cause severe injury or death. Disconnect power before installing or servicing.

TABLE G: Gas valve terminals

Gas valve	"A"	"B"	"C"
Honeywell VR8204,VR8304	MV/PV	MV	PV
White-Rodgers 36E	2	1	3
White-Rodgers 36C	2-4 *	1	3
Robertshaw 7200	C	M	P

(* Factory jumpered)

Ladder Wiring Diagram



EG 30 – 75
PEG 30 – 65

- Intermittent pilot
- Natural gas
- Steam with or without tankless
- Probe-type low water cut-off

Notes

1. All wiring must be installed in accordance with:
   A. U.S.A. — N.E.C. And any other national, state, or local code requirements.
   B. Canada — C.S.A. C22.1 C.E.C. Part 1 and any other national, provincial, or local code requirements.
2. All contacts shown without power applied (off-shelf condition).
3. If original rollout TFE wire as supplied with the appliance must be replaced, type 200°C wire or its equivalent must be used. If other original wire as supplied with the appliance must be replaced, type 105°C or its equivalent must be used.
4. Refer to control component instructions packed with boiler for application information.
5. Thermostat – Set anticipator to match ampere draw of gas valve plus vent damper and ignition control.
   BCP – For BCP connection in place of thermostat, refer to BCP installation/operation manual.
6. L.W.C.O., additional high limit, etc., wired in series.
7. ⏚ Denotes field-installed chassis ground.
8. Pilot leadwires are not field replaceable. Replace pilot assembly if necessary.
9. Operating control required with tankless heater.

Legend

- 120 VAC FIELD WIRING
- LOW VOLTAGE FIELD WIRING
- 120 VAC FACTORY WIRING
- LOW VOLTAGE FACTORY WIRING
- IGNITION CABLE
- ✷ Items not provided

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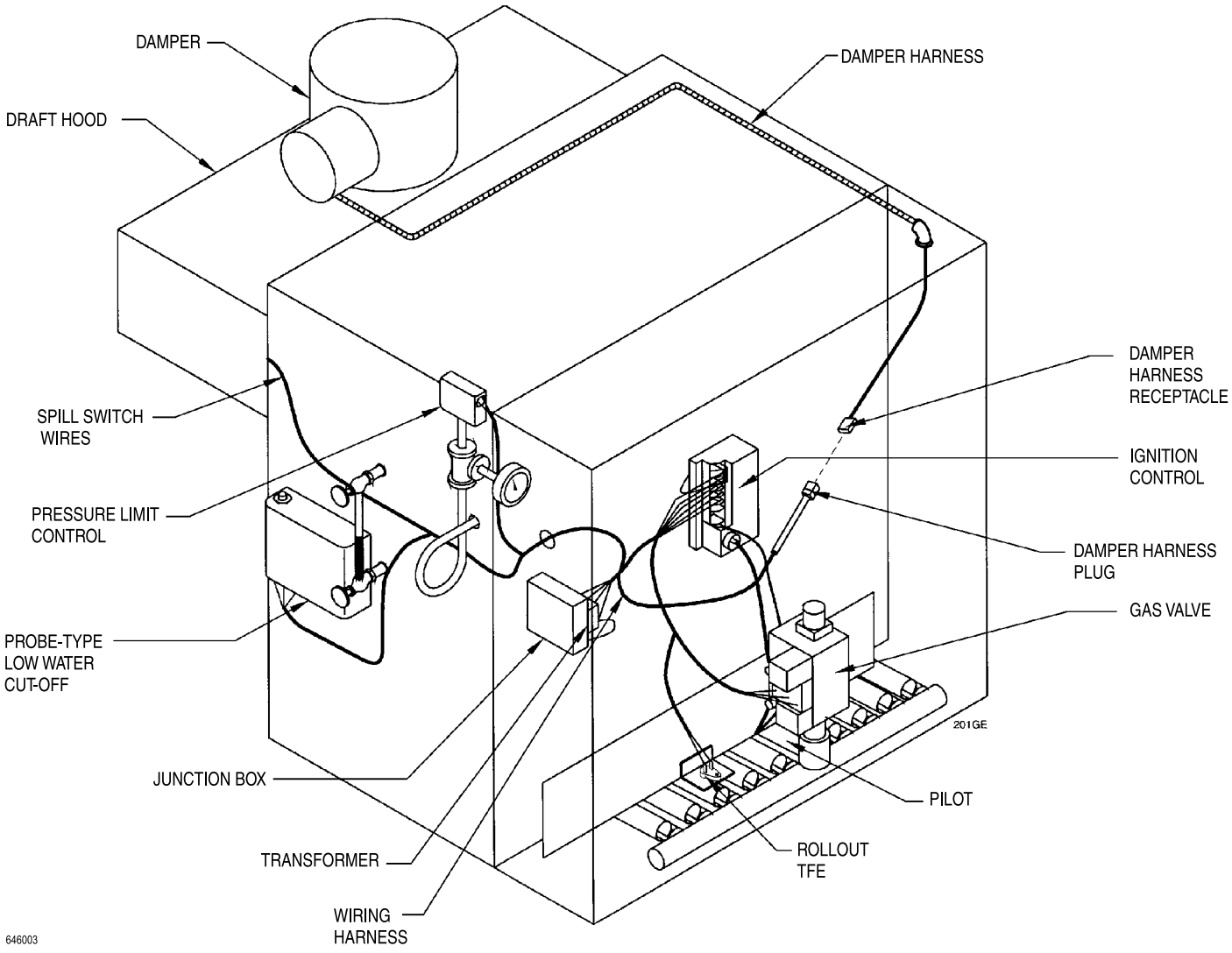
Control installation *(Continued)*

EG and PEG steam boilers with probe-type low water cut-off

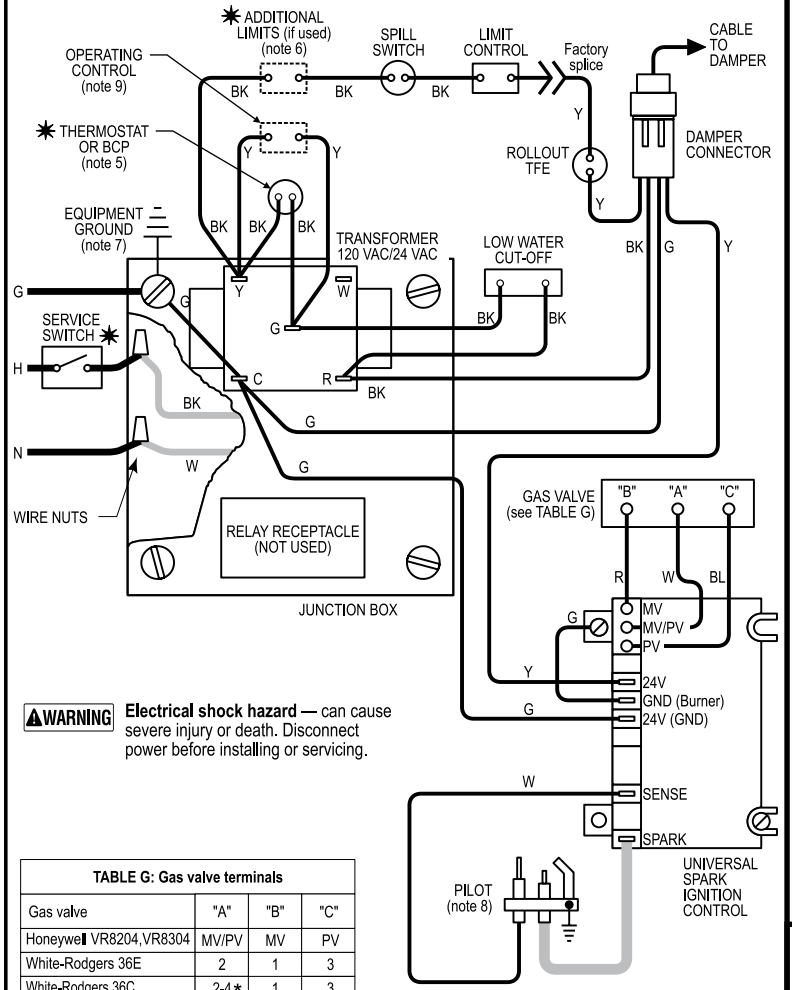
⚠WARNING For your safety, turn off electrical power supply and turn off external gas supply valve before attempting to work on the boiler. Failure to comply can cause severe personal injury, death or substantial property damage.

1. Mount and wire controls per wiring diagram, page 13, and Figure 4.
   a. Attach junction box inside left jacket panel with #8-32 x ½" machine screws provided.
   b. Install transformer with plug-in relay receptacle and relay.
   c. Operating and limit circuit wiring must be 18 gauge or heavier.
2. Bring supply wiring to boiler. Must be 14 gauge or heavier.
3. Proceed to page 20.

Figure 4 EG and PEG steam boilers with probe-type low water cut-off



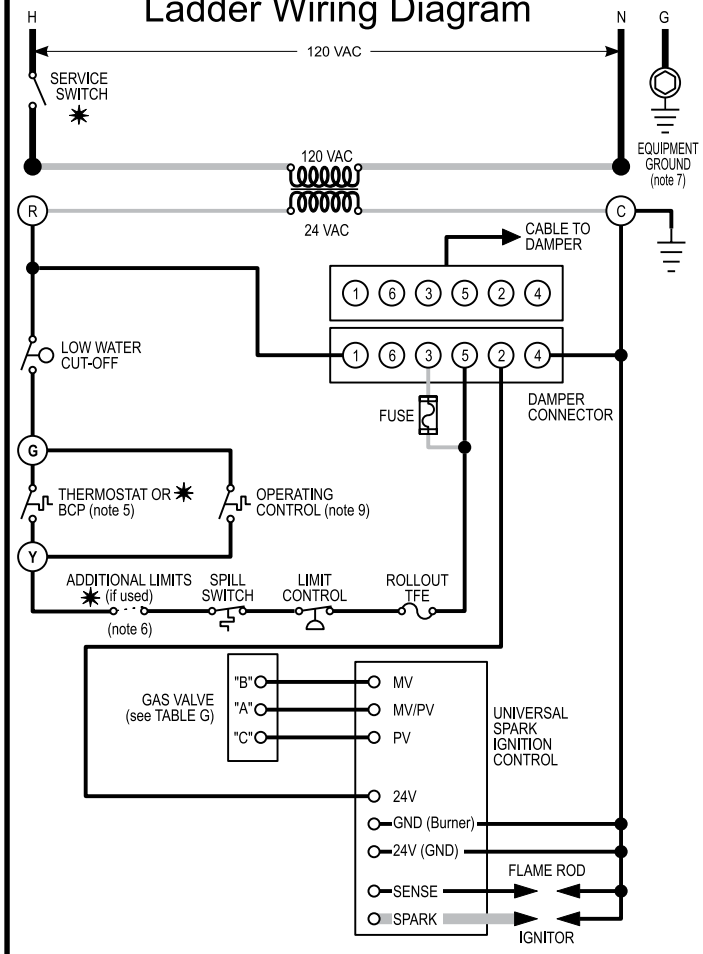
Schematic Wiring Diagram



⚠WARNING **Electrical shock hazard** — can cause severe injury or death. Disconnect power before installing or servicing.

TABLE G: Gas valve terminals			
Gas valve	"A"	"B"	"C"
Honeywell VR8204,VR8304	MV/PV	MV	PV
White-Rodgers 36E	2	1	3
White-Rodgers 36C	2-4 *	1	3
Robertshaw 7200	C	M	P
(* Factory jumpered)			

Ladder Wiring Diagram



EG 30 – 75

- Intermittent pilot
- Natural gas
- Steam with or without tankless
- Float-type low water cut-off

Notes

1. All wiring must be installed in accordance with:
   A. U.S.A. — N.E.C. And any other national, state, or local code requirements.
   B. Canada — C.S.A. C22.1 C.E.C. Part 1 and any other national, provincial, or local code requirements.
2. All contacts shown without power applied (off-shelf condition).
3. If original rollout TFE wire as supplied with the appliance must be replaced, type 200°C wire or its equivalent must be used. If other original wire as supplied with the appliance must be replaced, type 105°C or its equivalent must be used.
4. Refer to control component instructions packed with boiler for application information.
5. Thermostat – Set anticipator to match ampere draw of gas valve plus vent damper and ignition control.
   BCP – For BCP connection in place of thermostat, refer to BCP installation/operation manual.
6. L.W.C.O., additional high limit, etc., wired in series.
7. Denotes field-installed chassis ground.
8. Pilot leadwires are not field replaceable. Replace pilot assembly if necessary.
9. Operating control required with tankless heater.

Legend

- 120 VAC FIELD WIRING
- LOW VOLTAGE FIELD WIRING
- 120 VAC FACTORY WIRING
- LOW VOLTAGE FACTORY WIRING
- IGNITION CABLE
- ✷ Items not provided

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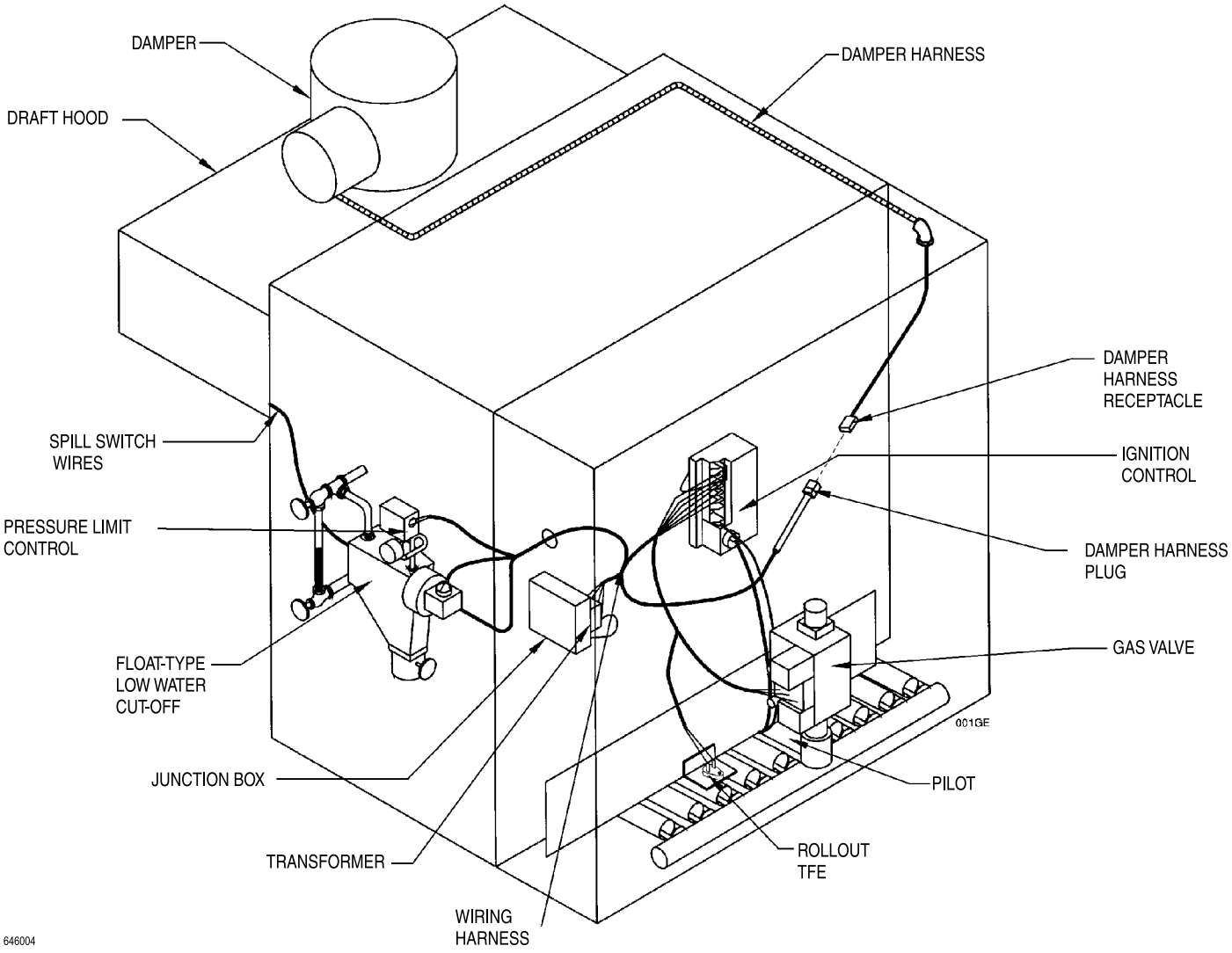
Control installation *(Continued)*

EG steam boilers with float-type low water cut-off

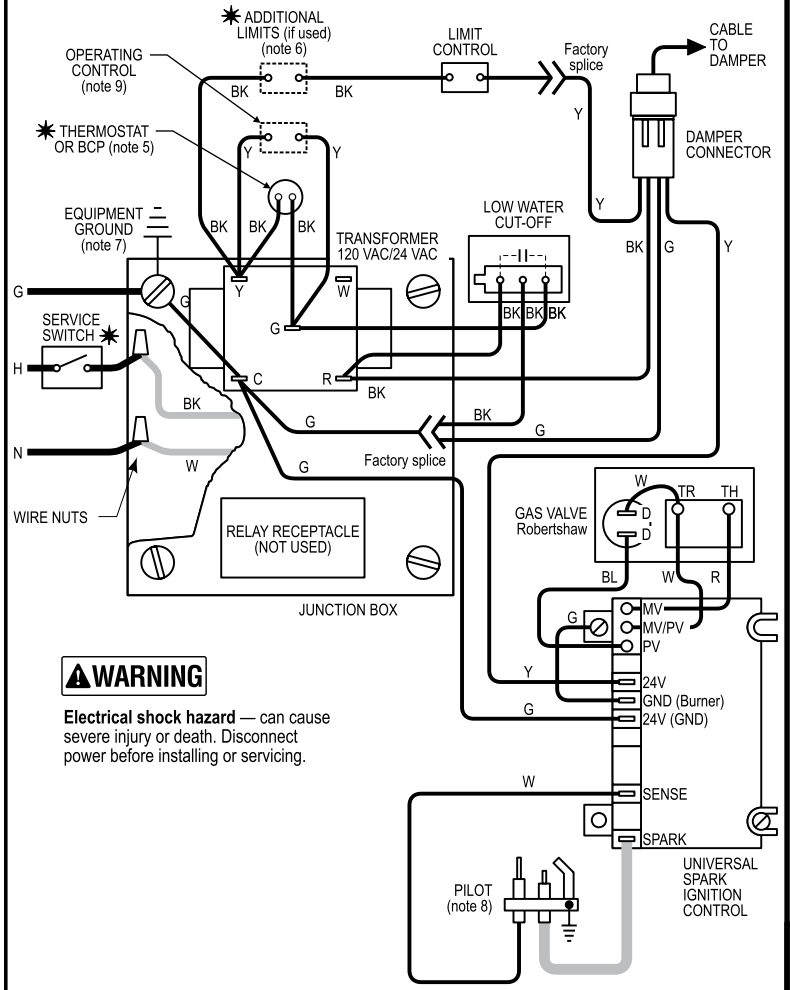
⚠WARNING For your safety, turn off electrical power supply and turn off external gas supply valve before attempting to work on the boiler. Failure to comply can cause severe personal injury, death or substantial property damage.

1. Mount and wire controls per wiring diagram, page 15 and Figure 5.
   a. Attach junction box inside left jacket panel with #8-32 x ½" machine screws provided.
   b. Install transformer with plug-in relay receptacle and relay.
   c. Operating and limit circuit wiring must be 18 gauge or heavier.
2. Bring supply wiring to boiler. Must be 14 gauge or heavier.
3. Proceed to page 20.

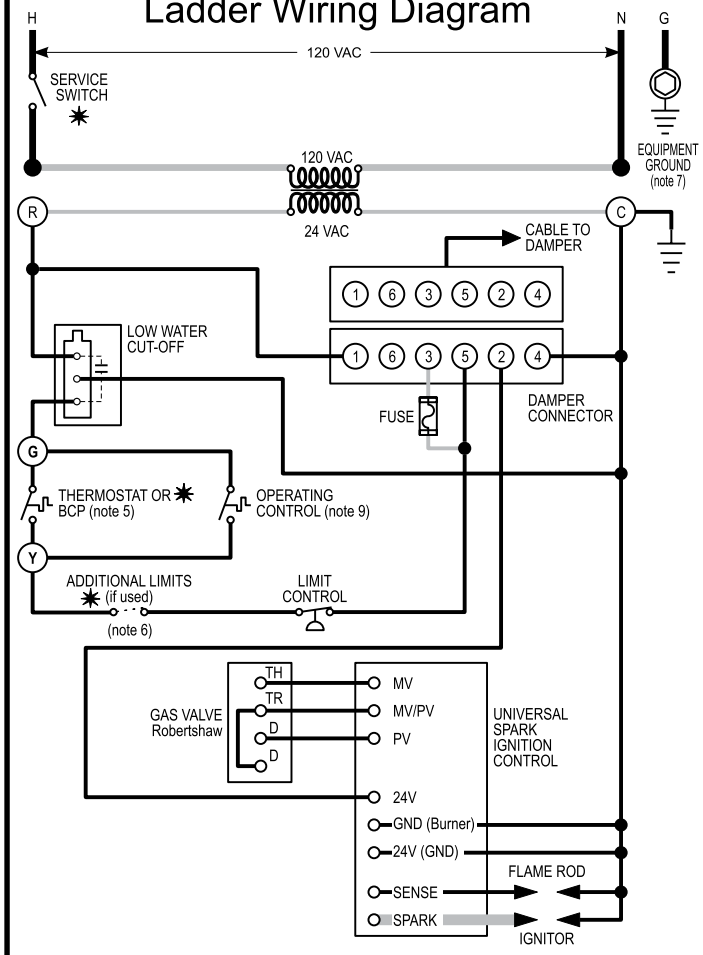
Figure 5 EG steam boilers with float-type low water cut-off



Schematic Wiring Diagram



Ladder Wiring Diagram



EGH 85 – 125

- Intermittent pilot
- Natural gas
- Steam with or without tankless
- Probe-type low water cut-off

Notes

1. All wiring must be installed in accordance with:
   A. U.S.A. — N.E.C. And any other national, state, or local code requirements.
   B. Canada — C.S.A. C22.1 C.E.C. Part 1 and any other national, provincial, or local code requirements.
2. All contacts shown without power applied (off-shelf condition).
3. If original rollout TFE wire as supplied with the appliance must be replaced, type 200°C wire or its equivalent must be used. If other original wire as supplied with the appliance must be replaced, type 105°C or its equivalent must be used.
4. Refer to control component instructions packed with boiler for application information.
5. Thermostat – Set anticipator to match ampere draw of gas valve plus vent damper and ignition control.
   BCP – For BCP connection in place of thermostat, refer to BCP installation/operation manual.
6. L.W.C.O., additional high limit, etc., wired in series.
7. Denotes field-installed chassis ground.
8. Pilot leadwires are not field replaceable. Replace pilot assembly if necessary.
9. Operating control required with tankless heater.

Legend

- 120 VAC FIELD WIRING
- LOW VOLTAGE FIELD WIRING
- 120 VAC FACTORY WIRING
- LOW VOLTAGE FACTORY WIRING
- IGNITION CABLE
- Items not provided

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Part Number 550-223-818/1210

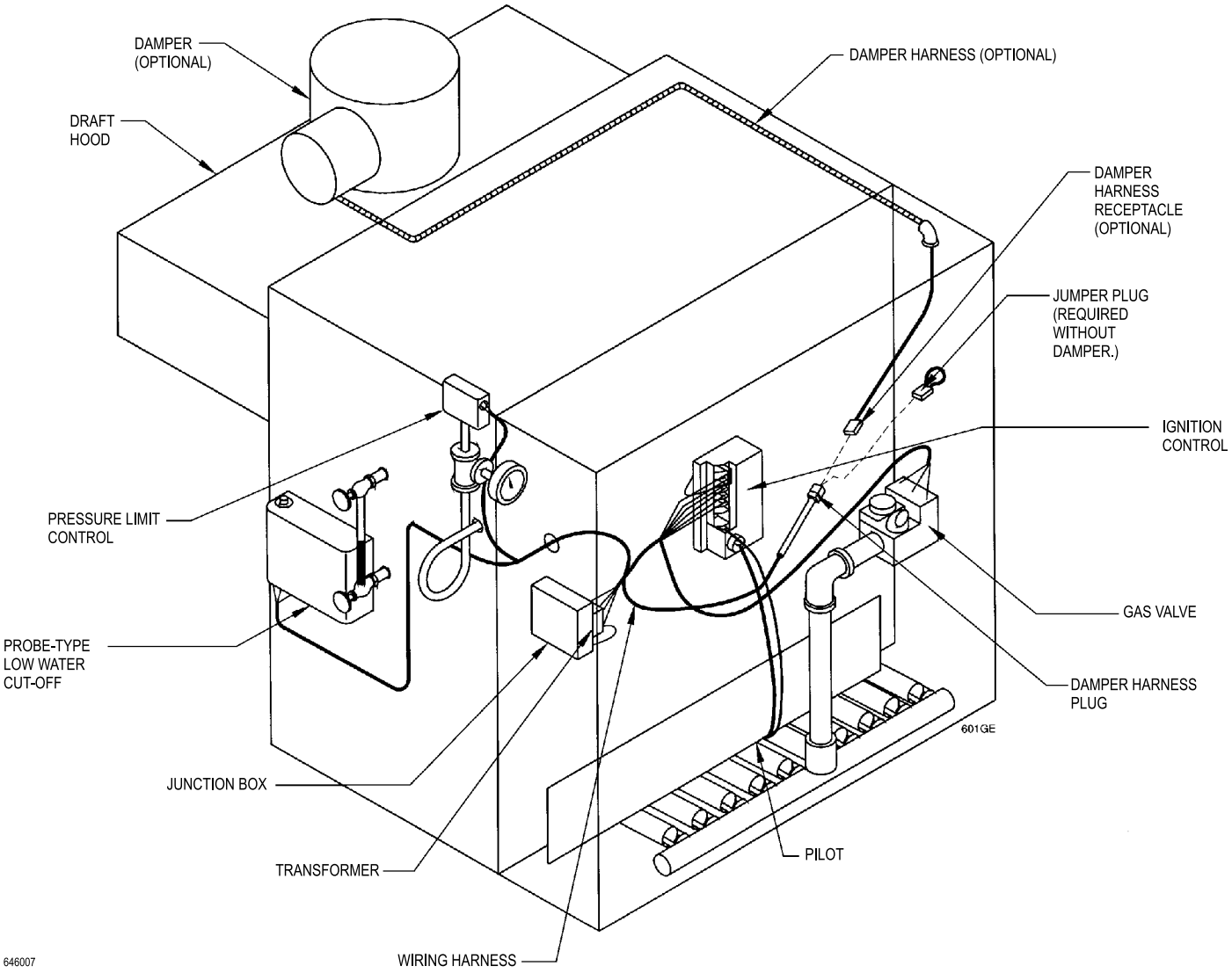
Control installation *(Continued)*

EGH steam boilers with probe-type low water cut-off

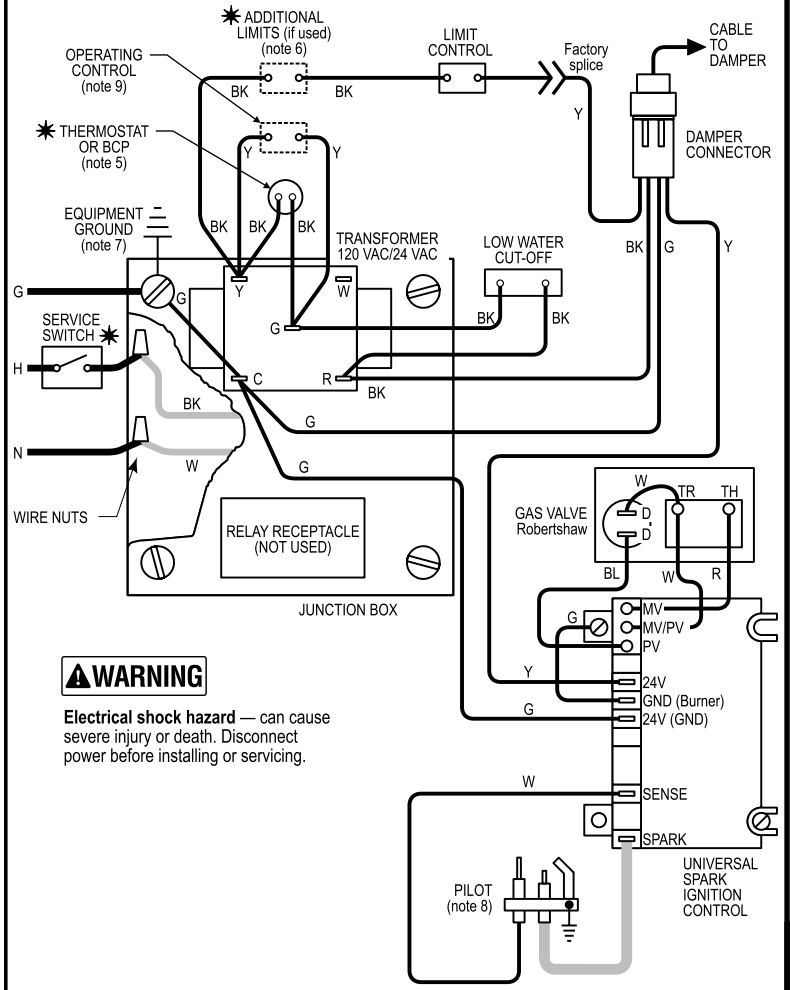
⚠WARNING For your safety, turn off electrical power supply and turn off external gas supply valve before attempting to work on the boiler. Failure to comply can cause severe personal injury, death or substantial property damage.

1. Mount and wire controls per wiring diagram, page 17, and Figure 6.
   a. Attach junction box inside left jacket panel with #8-32 x ½" machine screws provided.
   b. Install transformer with plug-in relay receptacle and relay.
   c. Operating and limit circuit wiring must be 18 gauge or heavier.
2. Bring supply wiring to boiler. Must be 14 gauge or heavier.
3. Proceed to page 20.

Figure 6 EGH steam boilers with probe-type low water cut-off



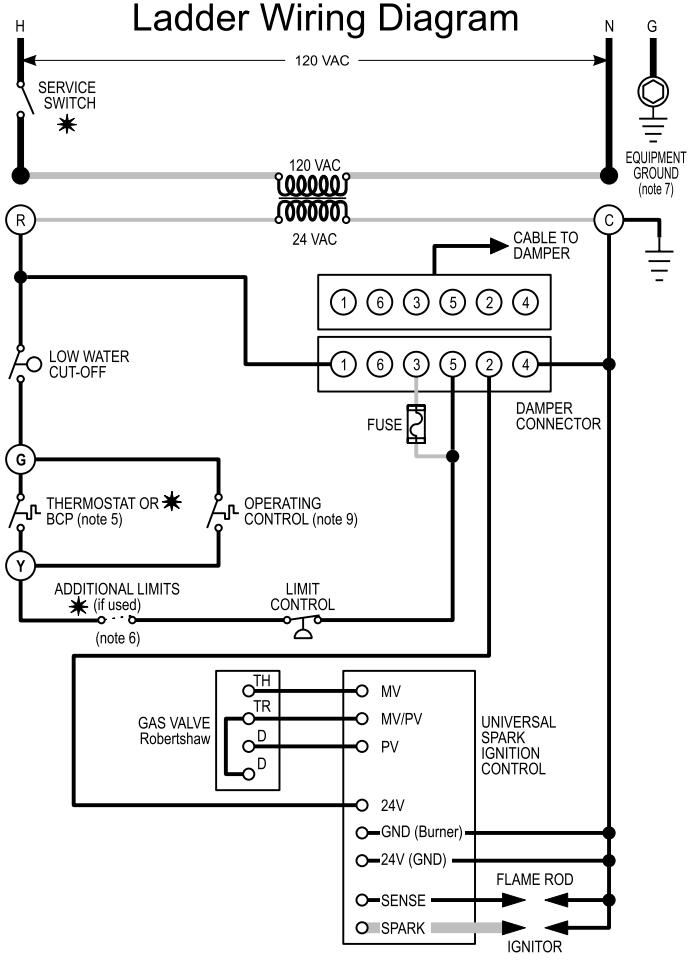
Schematic Wiring Diagram



⚠WARNING

Electrical shock hazard — can cause severe injury or death. Disconnect power before installing or servicing.

Ladder Wiring Diagram



Notes

1. All wiring must be installed in accordance with:

   A. U.S.A. — N.E.C. And any other national, state, or local code requirements.

   B. Canada — C.S.A. C22.1 C.E.C. Part 1 and any other national, provincial, or local code requirements.
2. All contacts shown without power applied (off-shelf condition).
3. If original rollout TFE wire as supplied with the appliance must be replaced, type 200°C wire or its equivalent must be used. If other original wire as supplied with the appliance must be replaced, type 105°C or its equivalent must be used.
4. Refer to control component instructions packed with boiler for application information.
5. Thermostat – Set anticipator to match ampere draw of gas valve plus vent damper and ignition control.

   BCP – For BCP connection in place of thermostat, refer to BCP installation/operation manual.
6. L.W.C.O., additional high limit, etc., wired in series.
7. Denotes field-installed chassis ground.
8. Pilot leadwires are not field replaceable. Replace pilot assembly if necessary.
9. Operating control required with tankless heater.

Legend

- 120 VAC FIELD WIRING
- LOW VOLTAGE FIELD WIRING
- 120 VAC FACTORY WIRING
- LOW VOLTAGE FACTORY WIRING
- IGNITION CABLE
- ✷ Items not provided

EGH 85 – 125

- Intermittent pilot
- Natural gas
- Steam with or without tankless
- Float-type low water cut-off

WEIL-McLAIN

Weil-McLain • 500 Blaine St. • Michigan City, IN 46360-2388

Part Number 550-223-817/1210

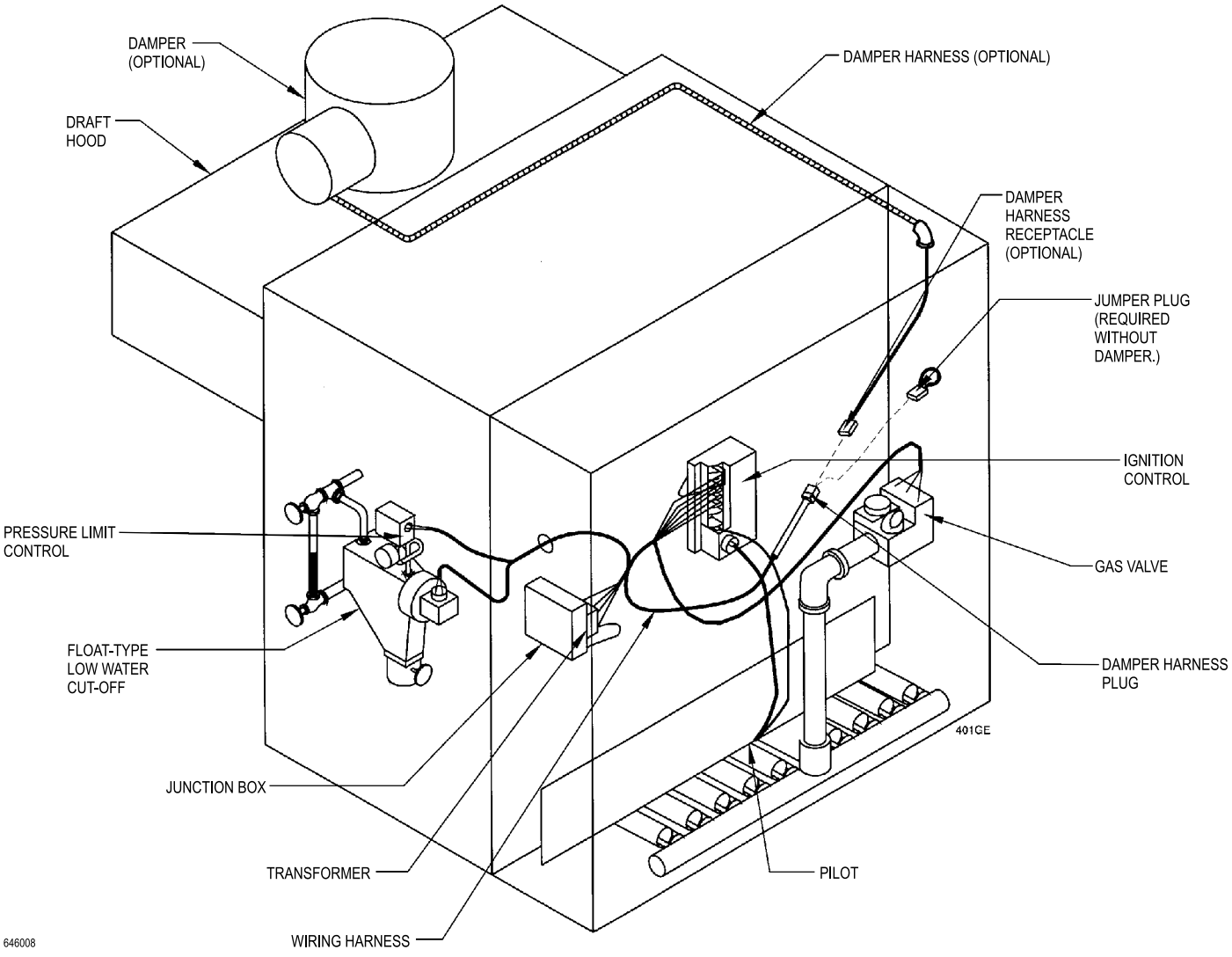
Control installation *(Continued)*

EGH steam boilers with float-type low water cut-off

⚠WARNING For your safety, turn off electrical power supply and turn off external gas supply valve before attempting to work on the boiler. Failure to comply can cause severe personal injury, death or substantial property damage.

1. Mount and wire controls per wiring diagram, page 19, and Figure 7.
   a. Attach junction box inside left jacket panel with #8-32 x ½" machine screws provided.
   b. Install transformer with plug-in relay receptacle and relay.
   c. Operating and limit circuit wiring must be 18 gauge or heavier.
2. Bring supply wiring to boiler. Must be 14 gauge or heavier.
3. Proceed to page 20.

Figure 7 EGH steam boilers with float-type low water cut-off



Damper installation

NOTICE If not installing a vent damper, proceed to page 21.

NOTICE Once damper is installed, boiler will not operate without a damper installed.

⚠WARNING Only dampers listed in the Replacement parts table on page 42 are approved for use on EG-30 through EG-75 Series 6 and PEG-30 through PEG-65 Series 6, using Universal Control Systems. Any other vent damper installed could result in severe personal injury or death.

The following boiler models must have damper installed:

- **EG-30 through EG-65, natural gas.**
- **PEG-30 through PEG-65, steam, natural gas.**

The following boiler models may have damper installed:

- **EG-75, natural gas.**
- **EGH-85 through EGH-125, natural or liquefied petroleum (propane) gas.**

Minimum clearances to combustibles

Provide a minimum of 6" between the vent damper and any combustible material. (Provide a minimum of 46" between jacket top and combustible ceiling for EG/PEG and EGH.) See EG • PEG • EGH Boiler manual for complete clearance requirements.

Installation

⚠ DANGER Damper must be installed directly on top of draft hood so that it serves only that boiler. Do not modify draft hood or damper, or make another connection between draft hood and damper or boiler except as noted below. This will void CSA certification and will not be covered by Weil-McLain warranty. Any changes will result in severe personal injury, death, or substantial property damage.

1. Install plug (packed in damper carton of 4" through 8" dampers) in hole in damper blade.
2. Install vent damper horizontally or vertically as shown in vent damper manufacturer's instructions. Vent damper must be installed so that it serves only one boiler and so damper blade indicator is visible to the user. See Figure 8.
3. Screws or rivets used to secure the vent damper to the draft hood must not interfere with rotation of the damper blade.
4. Install damper harness between damper actuator and knockout in jacket top panel. Use strain relief connectors and locknuts to secure both ends of the damper harness.

⚠CAUTION Keep wiring harness clear of all hot surfaces.

Figure 8 Vent damper assemblies

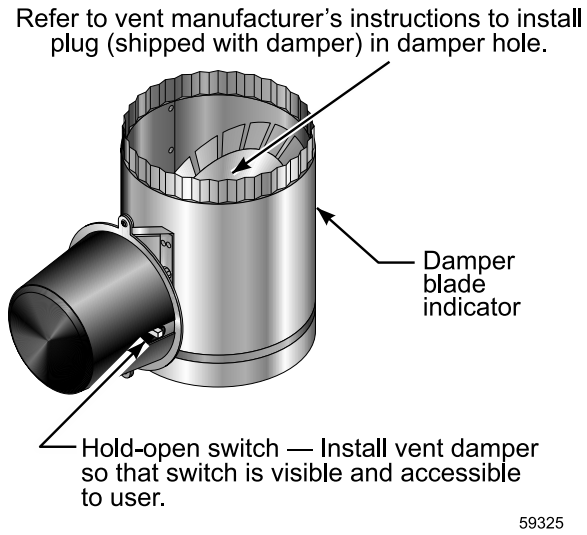
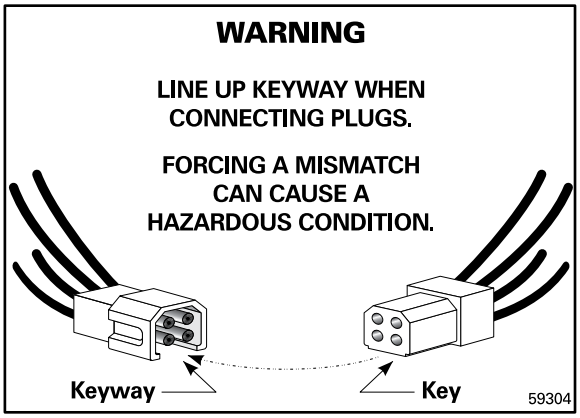


Figure 9 Vent damper harness plug warning label



5. Read and apply the harness plug warning label (Figure 9) so that it is visible after installation.
6. Plug damper harness receptacle into damper harness plug.

⚠ DANGER Bypassing (jumpering) vent damper will result in flue products such as carbon monoxide to escape into the house. This will result in severe personal injury or death.

⚠CAUTION After boiler has operated once, if either end of the harness is disconnected, the system safety shutdown will occur. The boiler will not operate until harness is reconnected.

NOTICE **Damper setting** — Damper hold open switch must be in "Automatic Operation" position for system to operate properly.

Checkout procedure

1. See pages 22–26 for "Operating instructions."
2. Raise room thermostat to call for heat. Damper actuator will slowly open damper.
3. When damper is fully open, main gas valve will open and main burners will ignite.

⚠ DANGER Damper must be fully open before main burners light. If damper does not fully open, flue products will escape into house, resulting in severe personal injury or death.

4. Lower thermostat setting. Main burner flames will go out, then damper will close.
5. Repeat steps 1 through 3 several times to verify operation.
6. Return thermostat to normal setting.

Room thermostat anticipator settings

Water without tankless heater — 0.40 amps

Water with tankless heater — 0.20 amps

Steam — Select based on gas valve and damper. See table below.

Boilers with United Technologies Ignition control (Control load of 0.10 amps is included in the values at right)	**Gas valve**	**Without damper** (amps)	**With damper** (amps)
	Honeywell VR8200	0.60	0.70
	Honeywell VR8300	0.80	0.90
	Robertshaw 7200ER	0.50	0.60
	Robertshaw 7000ERHC	0.80	0.90
	White-Rodgers 36E	0.40	0.50
	White-Rodgers 36C	0.70	0.80
Boilers with Honeywell Ignition control (Control load of 0.20 amps is included in the values at right)	**Gas valve**	**Without damper** (amps)	**Without damper** (amps)
	Honeywell VR8200	0.70	0.80
	Honeywell VR8300	0.90	1.00
	Robertshaw 7200ER	0.60	0.70
	Robertshaw 7000ERHC	0.90	1.00
	White-Rodgers 36E	0.50	0.60
	White-Rodgers 36C	0.80	0.90

Operating instructions — EG and PEG with Honeywell VR8204/VR8304 gas valve

FOR YOUR SAFETY READ BEFORE OPERATING

⚠WARNING If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

A. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.

B. BEFORE OPERATING, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor. See below.

C. Use only your hand to turn the gas control knob. Never use tools. If the knob will not turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

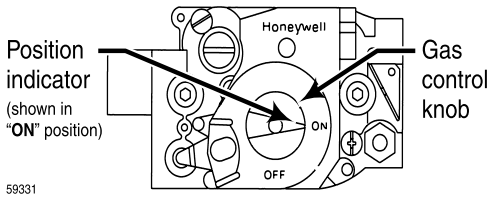
D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control, which has been under water.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

OPERATING INSTRUCTIONS

1. STOP! Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. Turn off all electrical power to the appliance.
4. Remove front panel.
5. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.
6. Turn gas control knob clockwise ↷ to "OFF."



7. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in the safety information above. If you don't smell gas, go to the next step.
8. Turn gas control knob counterclockwise ↶ to "ON."
9. Turn on all electric power to the appliance.
10. Set thermostat to desired setting.
11. If the appliance will not operate, follow the instructions "To Turn Off Gas To The Appliance" and call your service technician or gas supplier.
12. Replace front panel.

TO TURN OFF GAS TO THE APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove front panel.
4. Turn gas control knob clockwise ↷ to "OFF." Do not force.
5. Replace front panel.

550-223-041(0415)

Operating instructions — EG/PEG-30 through EG/PEG-50

. with White-Rodgers 36E gas valve

FOR YOUR SAFETY READ BEFORE OPERATING

⚠WARNING If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

A. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.

B. BEFORE OPERATING, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor. See below.

C. Use only your hand to turn the gas control knob. Never use tools. If the knob will not turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

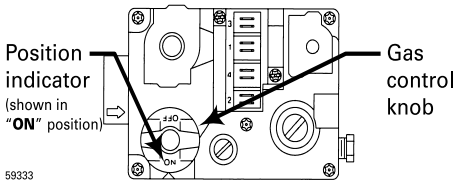
D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control, which has been under water.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

OPERATING INSTRUCTIONS

1. STOP! Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. Turn off all electrical power to the appliance.
4. Remove front panel.
5. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.
6. Turn gas control knob clockwise ↷ to "OFF."



7. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in the safety information above. If you don't smell gas, go to the next step.
8. Turn gas control knob counterclockwise ↶ to "ON."
9. Turn on all electric power to the appliance.
10. Set thermostat to desired setting.
11. If the appliance will not operate, follow the instructions "To Turn Off Gas To The Appliance" and call your service technician or gas supplier.
12. Replace front panel.

TO TURN OFF GAS TO THE APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove front panel.
4. Turn gas control knob clockwise ↷ to "OFF." Do not force.
5. Replace front panel.

550-223-042(0906)

Operating instructions — EG/PEG-30 through EG/PEG-50 . with Robertshaw 7200 gas valve

FOR YOUR SAFETY READ BEFORE OPERATING

⚠WARNING If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

A. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.

B. BEFORE OPERATING, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor. See below.

C. Use only your hand to depress or move the selector arm. Never use tools. If the selector arm will not depress or move by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

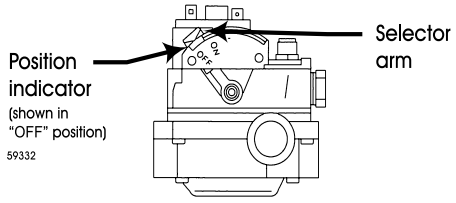
D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control, which has been under water.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

OPERATING INSTRUCTIONS

1. STOP! Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. Turn off all electrical power to the appliance.
4. Remove front panel.
5. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.
6. Depress and move selector arm left ↶ to "OFF." Note: Selector arm cannot be moved to "OFF" unless selector arm is depressed slightly. Do not force.



7. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in the safety information above. If you don't smell gas, go to the next step.
8. Move selector arm right ↷ to "ON."
9. Turn on all electric power to the appliance.
10. Set thermostat to desired setting.
11. If the appliance will not operate, follow the instructions "To Turn Off Gas To The Appliance" and call your service technician or gas supplier.
12. Replace front panel.

TO TURN OFF GAS TO THE APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove front panel.
4. Depress and move selector arm to "OFF." Do not force.
5. Replace front panel.

550-223-044(0511)

Operating instructions — EG/PEG-55, EG/PEG-65, EG-75

with White-Rodgers 36C gas valve

FOR YOUR SAFETY READ BEFORE OPERATING

⚠WARNING If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

A. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.

B. BEFORE OPERATING, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor. See below.

C. Use only your hand to depress or turn the gas control knob. Never use tools. If the knob will not depress or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

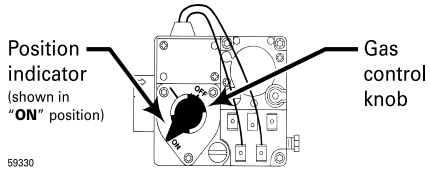
D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control, which has been under water.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

OPERATING INSTRUCTIONS

1. STOP! Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. Turn off all electrical power to the appliance.
4. Remove front panel.
5. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.
6. Depress gas control knob slightly and turn clockwise ↷ to "OFF." Note: Knob cannot be turned to "OFF" unless knob is depressed slightly. Do not force.



7. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in the safety information above. If you don't smell gas, go to the next step.
8. Turn gas control knob counterclockwise ↶ to "ON."
9. Turn on all electric power to the appliance.
10. Set thermostat to desired setting.
11. If the appliance will not operate, follow the instructions "To Turn Off Gas To The Appliance" and call your service technician or gas supplier.
12. Replace front panel.

TO TURN OFF GAS TO THE APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove front panel.
4. Depress gas control knob slightly and turn clockwise ↷ to "OFF." Do not force.
5. Replace front panel.

550-223-043(0906)

Operating instructions — EGH with Robertshaw 7000DERHC gas valve

FOR YOUR SAFETY READ BEFORE OPERATING

WARNING If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

A. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.

B. BEFORE OPERATING, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor. See below.

C. Use only your hand to depress or turn the gas control knob. Never use tools. If the knob will not depress or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

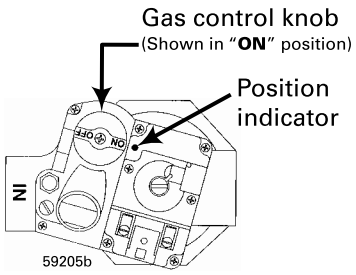
D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control, which has been under water.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

OPERATING INSTRUCTIONS

1. STOP! Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. Turn off all electrical power to the appliance.
4. Remove front panel.
5. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.
6. Turn gas control knob clockwise ↷ to "OFF."
7. When equipped with vent damper, verify damper blade is in full open position.
8. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in the safety information above. If you don't smell gas, go to the next step.
9. Turn gas control knob counterclockwise ↶ to "ON."
10. Turn on all electric power to the appliance.
11. Set thermostat to desired setting.
12. If the appliance will not operate, follow the instructions "To Turn Off Gas To The Appliance" and call your service technician or gas supplier.
13. Replace front panel.



TO TURN OFF GAS TO THE APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove front panel.
4. Turn gas control knob clockwise ↷ to "OFF." Do not force.
5. Replace front panel.

550-223-045(1209)

Troubleshooting

⚠ DANGER Burner access panel must be in position during boiler operation to prevent momentary flame rollout on ignition of main flame. Severe personal injury or substantial property damage will result.

⚠ WARNING Never jumper (bypass) any device except for momentary testing as outlined in Troubleshooting Charts. Substantial property damage and/or severe personal injury can occur.

⚠ WARNING Label all wires prior to disconnection when servicing controls. Wiring errors can result in improper and dangerous operation.

⚠ WARNING Verify proper operation after servicing. See vent damper manufacturer's instructions packed with vent damper for additional information. Failure to comply can result in severe personal injury, death or substantial property damage.

Before troubleshooting

1. Have a voltmeter that can check 120VAC, 24VAC, and a continuity tester.
2. Check for 120VAC (minimum 102 to maximum 132) to boiler.
3. Make sure thermostat is calling for heat and contacts (including appropriate zone controls) are closed. Check for 24VAC between thermostat wire nuts and ground.

Supply temperature/LWCO sensor

1. The boiler temperature/LWCO sensor is a resistance-type device.
2. The Table 1, shows the correct value for the sensor at various temperatures.
3. Use the resistance values at 32°F, 60°F, 70°F and 212°F to measure the sensor resistance at known temperatures (ice point, room temperature and sea level boiling point). For ice point and boiling point, insert the sensor in water at that temperature. Use an ohmmeter to read resistance value between thermistor # and thermistor common. (See Figure 13 for pin locations).

Figure 10 Supply temperature/LWCO sensor

Table 1 Supply temperature sensor resistance values

Sensor resistance values					
Temp (°F)	Sensor ohms		Temp (°F)	Sensor ohms	
	Min	Max		Min	Max
32	34265	37871	**120**	4517	4992
40	27834	30764	**130**	3698	4088
50	21630	23907	**140**	3043	3364
60	16944	18727	**150**	2517	2782
70	13372	14780	**160**	2091	2311
80	10629	11747	**170**	1744	1928
90	8504	9399	**180**	1461	1615
100	6847	7568	**190**	1229	1359
110	5545	6129	**200**	1038	1147

In event of vent damper failure:

If troubleshooting chart recommends replacing actuator and actuator is not immediately available, damper blade can be fixed in an open position to allow boiler operation. **Manually turning blade can cause actuator damage**. Follow these instructions only in case of no heat or damper actuator malfunction.

1. Move damper service switch to **Hold Damper Open** position. Apply call for heat to boiler. Damper blade should then rotate to open position and boiler will fire.
2. If step 1 does not open damper, manually rotate damper blade to open position using wrench or pliers on flat shaft between damper and actuator. Boiler will fire. Verify that damper service switch is in Hold Damper Open position (Figure 11, page 28).
3. **Do not leave vent damper permanently in this position.** Replace actuator immediately. If vent damper is left in open position, boiler will not operate at published efficiencies.

If troubleshooting chart recommends replacing actuator and actuator is not immediately available, damper blade can be fixed in an open position to allow boiler operation. Follow these instructions only in case of no heat or damper actuator malfunction. See Figure 11, page 28.

1. Turn off power to boiler.

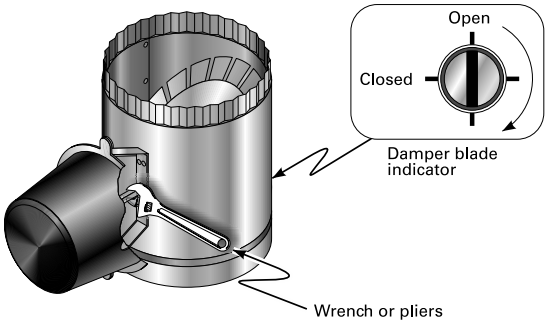
⚠ WARNING Failure to turn off power to boiler can result in severe personal injury, death or substantial property damage.

2. Refer to vent damper manufacturer's instructions for procedure to fix vent damper in open position.
3. Turn on power to boiler.

Troubleshooting – EG water boilers without tankless)

4. Using wrench or pliers on flat shaft section, manually rotate damper blade until green light turns on. Boiler will fire (Figure 11).
5. **Do not leave vent damper permanently in this position**. Replace actuator immediately. If vent damper is left in open position, boiler will not operate at published efficiencies.

Figure 11 Manually opening vent damper



NOTICE The information on this page and pages 30 through 36 apply only to spark-ignited pilot **EG** water boilers. These boilers are equipped with an ignition control module that has indicator lights to show control status. Charts **1** through **7**, pages 30 through 35, help you identify problems based on indicator light conditions.

Figure 12 EG - Water Ignition Control Module

Control module

⚠WARNING **Solder or water** splatter between plugs and circuit board can cause improper operation of control module. Place a shield over the boiler internal controls and components during installation. Failure to comply can result in severe personal injury, death or substantial property damage.

NOTICE Make sure **ground wiring** is installed per wiring diagram. Good grounding is extremely important for proper operation.

Control indicator lights — HARD LOCKOUT Summary (Flashing LED's)

MAY remove 120VAC power for more than 2 seconds to clear lockout OR ignition control will automatically restart sequence of operation after 1 hour waiting period after fault condition is cleared.

INDICATOR LIGHT	CONDITION
POWER Flashes once per second	120 VAC connection to boiler reversed.
Flash code 2*	Internal fault, microprocessor or memory.
Flash code 3*	Unused.
Flash code 4*	Unused.
Flash code 5*	Internal fault, water thermistors disagree.
Flash code 6* Flashes once per second	Internal fault, gas valve circuit.

* Flash code pattern: POWER LED flashes 2, 3, etc. times rapidly followed by 2 seconds off, then repeats.

ALL LED'S FLASHING	Failure to establish pilot flame after 4 attempts.
Solid LWCO LED	Low water condition occurred.

SOFT LOCKOUT Summary (Flashing LED's)

MAY remove 120VAC power for more than 2 seconds, cycle thermostat for between 2 and 20 seconds, OR ignition control will automatically restart sequence of operation after 1 hour waiting period.

INDICATOR LIGHT	CONDITION
POWER + TSTAT/CIRC	High voltage detected on TSTAT circuit.
POWER + DAMPER	Damper stuck closed or unable to close end switch within 45 seconds from TSTAT call.
POWER + FLAME	Flame sensed without call for heat or out of sequence during ignition trial.

CAUTION Summary (Flashing LED's)

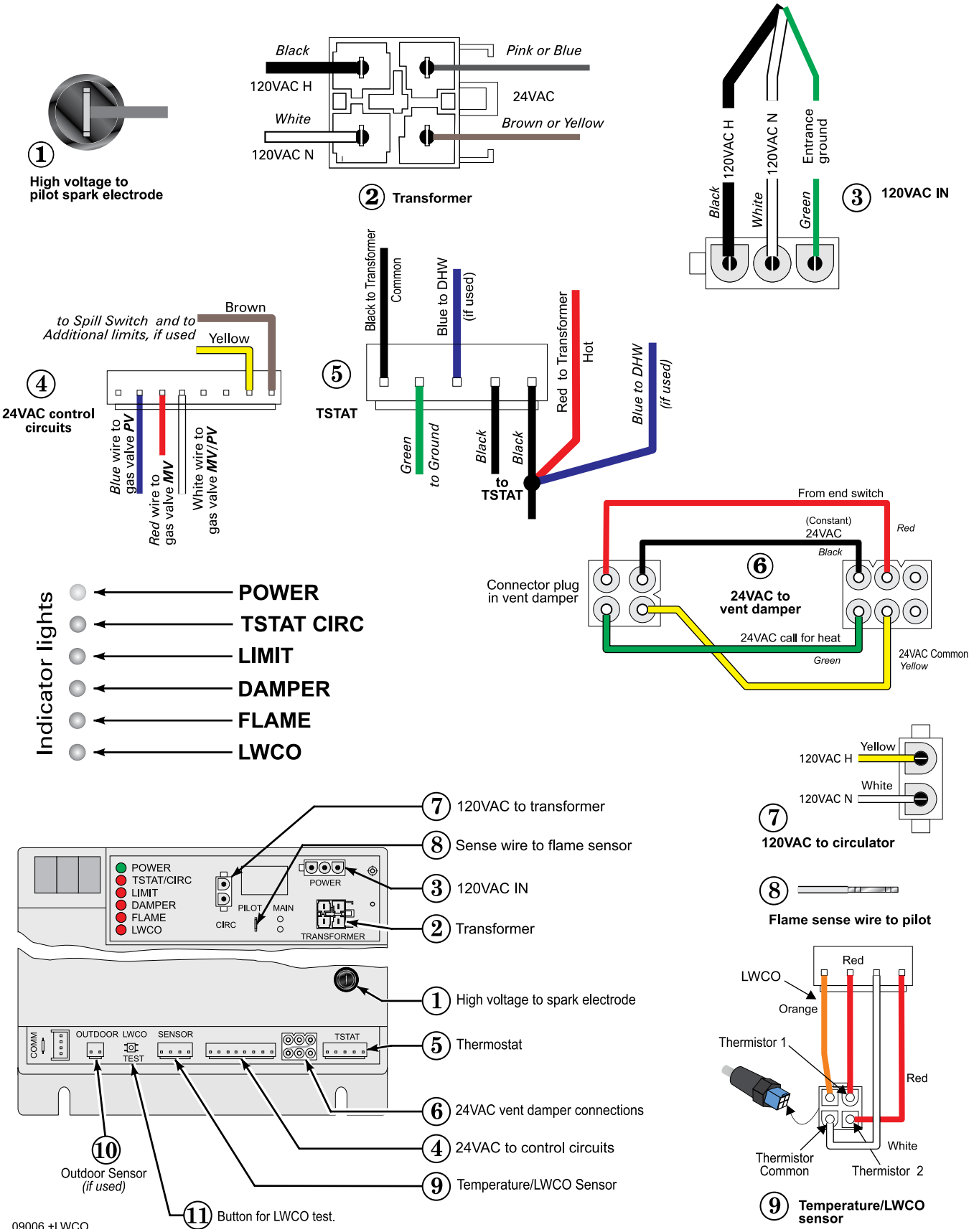
INDICATOR LIGHT	CONDITION
DAMPER	Damper end switch opened after it had been proven closed.
LIMIT	Fault detected in temperature sensing hardware.
FLAME	Flame loss or flame not sensed during trial for ignition.
LWCO	LWCO circuit approaching lockout state. Sensor requires maintenance. LWCO LED will flash 3 times when maintenance is required.

Troubleshooting the control module

See Figure 13, page 29, for location of harness plug receptacles and plugs on the control module.

Troubleshooting – (EG water boilers without tankless) cont.

Figure 13 Control module connections



Troubleshooting – (EG water boilers) continued

CHART 1 – Spark-ignited pilot – Troubleshooting POWER light status

– Usually indicates reversed 120VAC polarity if Power light flashes by itself –

⚠WARNING **Electrical shock hazard** — Wherever you see ▲ **TURN OFF POWER** ▲, follow the instructions. Failure to follow instructions can result in severe personal injury, death or substantial property damage.

Is **POWER** *light off?*

No → *Is* **POWER** *light . . .*

Yes → *Is* **POWER** *light . . .*

Is **POWER** *light . . .*

Flashing alone?	Flashing with another light?	On steady (NOT flashing)?
	TSTAT/CIRC light flashing → **Chart 2**	
	DAMPER light flashing → **Chart 3**	
	FLAME light flashing → **Chart 4**	**Chart 5**
	LWCO light solid → **Chart 7**	

For insufficient heat or no heat problem, go to **Chart 6,** page 35, if **Power** light is on steady, with no the light flashing.

- Usually indicates polarity on incoming **120VAC** power line is wrong.
- ▲ **TURN OFF POWER** ▲ at service switch or breaker, then reverse the HOT and NEUTRAL wires entering the boiler in the J-box.
- Restore **POWER** at service switch or breaker.

Is **POWER** *light flashing now?*

No → Boiler should now operate normally.

Yes → Have system checked by a licensed electrician.

If problem persists, call your local Weil-McLain sales representative.

- Make sure service switch or circuit breaker is on or fuses are good.
- Remove **120VAC IN** plug (Figure 15, Item 3, page 29) on control module.
- Using voltmeter, check across top and bottom pins of **120VAC IN** plug.

Does voltmeter indicate **120VAC***?*

No → Problem is with incoming electricity. Have licensed electrician repair circuit.

Yes →

- Reconnect **120VAC IN** plug.
- Remove **120VAC** transformer **PRIMARY** plug (Figure 15, Item 3, page 29) on control module.
- Using voltmeter, check across top and bottom pins of **PRIMARY** receptacle.

Does voltmeter indicate **120VAC***?*

No →

- Replace control module.
- Retest.

Yes →

- Reinstall **120VAC** transformer **PRIMARY** plug.
- Remove **24VAC** transformer plug (Figure 15, Item 3, page 29) on control module.
- Using voltmeter, check across pins of receptacle.

Does voltmeter indicate **24VAC***?*

No →

- Replace transformer.
- Retest.

Yes →

- Replace control module.
- Retest.

Troubleshooting – (EG water boilers) continued

CHART 2 – Spark-ignited pilot – TSTAT/CIRC & POWER light flashing

– Usually indicates 48 VAC on thermostat circuit (stray voltage) –

WARNING **Electrical shock hazard** — Wherever you see ▲ **TURN OFF POWER** ▲, follow the instructions. Failure to follow instructions can result in severe personal injury, death or substantial property damage.

- Disconnect the two external wires connected to the boiler thermostat leads. (two (2) black low voltage leads in J-box).
- Connect a voltmeter across the two incoming wires. Close each thermostat, zone valve and relay in the external circuit one at a time and check the voltmeter reading across the wires.
- There should NEVER be a voltage reading.
- If a voltage does occur under any condition, check and correct the external wiring. (This is a common problem when using 3-wire zone valves.)
- Once the external thermostat circuit wiring is checked and corrected if necessary, reconnect the external thermostat circuit wires to the boiler thermostat wires and allow the boiler to cycle.

Did you find a voltage across the two external thermostat circuit wires?

Yes

- Leave external boiler thermostat connection wires disconnected from boiler.
- Trouble shoot the external thermostat circuit until you find the source of the stray voltage. (Pay close attention to the wiring connections to 3-wire zone valves.)
- Correct the problem and repeat voltmeter test above, verifying there is no longer a voltage reading under any condition in the external thermostat circuit.

- Boiler should now operate per the normal sequence of operation shown in Figure 1, page 6.

No

- If no voltage is found under any condition of the external thermostat circuit, connect the two boiler thermostat connection leads together (or jumper the boiler aquastat T-T terminals).
- Turn off power to the boiler for 1 minute.
- Turn on power and allow boiler to cycle.

Do the **TSTAT** *and* **POWER** *lights still flash?*

No (return to the yes branch above)

Yes

- Replace control module.
- Retest.

Troubleshooting – (EG water boilers) continued

CHART 3 – Spark-ignited pilot – DAMPER light flashing

– If POWER light is flashing: Usually indicates vent damper failed to prove open within 5 minutes –

– If POWER light is steady: Usually indicates vent damper closed during run cycle –

⚠WARNING **Electrical shock hazard** — Wherever you see ▲ **TURN OFF POWER** ▲, follow the instructions. Failure to follow instructions can result in severe personal injury, death or substantial property damage.

- Reset boiler control by turning off power at service switch or turning down thermostat for at least 45 seconds.
- Thermostat should call for heat and appropriate zone valves open. The **TSTAT/CIRC** and **LIMIT** and lights should come on.

Does **Vent Damper** *operate?*

No → Yes

- Wait 45 seconds.

Does **Vent Damper** *operate?*

No → Yes

- Remove **Damper** plug (Figure 15, Item 6, page 29) from plug receptacle of control module.
- Place voltmeter leads across the top two pins (1 and 4) of the **Damper** receptacle.

Does the voltmeter indicate **24 VAC***?*

No → Yes

- Try reseating plug in module receptacle and restart.
- If vent damper still does not work, replace vent damper assembly or actuator.
- Retest.

Are the **TSTAT/CIRC** and **LIMIT** *lights on steady?*

Yes → No

- Replace control module.
- Retest.

- Make sure thermostat is calling for heat. If lights still don't come on, see Chart 6, page 35.

- Wait 5 minutes.

Is **PRESS SWITCH** *light still flash?*

No → Yes

- Boiler should be in normal operating sequence.
- Observe operation until thermostat is satisfied.

Does vent damper actuator indicator show damper is open?

No → Yes

- Replace vent damper assembly or actuator.
- Retest.

- Remove damper wiring plug at damper and firmly reconnect.
- Recheck boiler operation.
- If problem persists, replace vent damper assembly or actuator.

Troubleshooting – (EG water boilers) continued

CHART 4 – Spark-ignited pilot – FLAME & POWER light flashing

– Usually indicates flame sensed when it shouldn't be there –

WARNING **Electrical shock hazard** — Wherever you see ▲ **TURN OFF POWER** ▲, follow the instructions. Failure to follow instructions can result in severe personal injury, death or substantial property damage.

Are manual main shutoff valve and gas valve open?

No

- Leave main manual gas valve closed
- Turn off power to boiler at service switch or breaker.
- Wait at least 45 seconds.
- Turn on power to boiler.
- Restart boiler, following **Operating instructions** in this manual or on the boiler label.

Do **FLAME** *and* **POWER** *lights still flash?*

No

- ▲ TURN OFF POWER ▲ to boiler at service switch or breaker.
- Open main manual gas valve.
- Turn on power to boiler at service switch or breaker.
- Restart boiler per operating instructions.
- Perform start-up procedures in boiler manual to verify proper operation.

Yes

- Replace control module.
- Retest.

Yes

- Turn off power to boiler at service switch or breaker.
- Wait at least 45 seconds.
- Turn on power to boiler.
- Restart boiler, following **Operating instructions** in this manual or on the boiler label.
- Look through the pilot inspection port to see if the pilot is burning.

Is pilot burning?

No

- Allow boiler to continue cycling.

Are **FLAME** *and* **POWER** *lights flashing?*

No

- Boiler may now be operating normally.
- Perform start-up procedures in boiler manual to verify proper operation.

Yes

- Replace control module.
- Retest.

Yes

- Replace gas valve.
- Retest boiler.

Are **FLAME** *and* **POWER** *lights flashing?*

No

- Boiler should now operate normally.
- Original flashing **FLAME** light caused by gas valve not operating properly.
- See normal sequence of operation, **Figure 1,** page 6.

Yes

- Replace control module.
- Retest.

Troubleshooting – (EG water boilers) continued

CHART 5 – **Spark-ignited pilot** – **FLAME I**light flashing and **POWER** light on steady
ALSO — Troubleshooting failure to establish main flame

⚠WARNING **Electrical shock hazard** — Wherever you see ▲ **TURN OFF POWER** ▲, follow the instructions. Failure to follow instructions can result in severe personal injury, death or substantial property damage.

Are manual main shutoff valve and gas valve open?

No

- ▲ **TURN OFF POWER** ▲ to boiler at service switch or breaker.
- Open main manual shutoff valve and boiler gas valve (per **Operating instructions** in this manual). Wait at least 45 seconds.
- Turn on power at service switch or breaker. Allow boiler to cycle .

Does **FLAME** *light flash now?*

No

- Boiler should be in normal operating sequence.
- Observe operation until thermostat is satisfied and blower has completed its post-purge cycle.

Yes

- Verify inlet gas pressure at gas valve:
  Natural gas – 5.0" w.c. min./14.0" w.c. max
  Propane – 11.0" w.c. min./14.0" w.c. max

Is gas present at gas valve inlet and within above range?

Yes

- ▲ **TURN OFF POWER** ▲ to boiler at service switch or breaker.
- Remove base access panel.
- Verify pilot gas line is not kinked, obstructed or damaged and is correctly attached to pilot and gas valve.
- Verify pilot ignition electrode, electrode ceramic and spark lead wire from control are in good condition. Spark gap should be approximately 1/8".
- Correct any above problems, replacing pilot if burner or wiring is damaged.
- Reinstall base access panel to operate boiler for retest after any changes or corrections.
- If none of the above corrects problems, then replace the control module, reinstall base access panel, and retest.

No

- Contact gas supplier to correct pressure or gas supply.

Yes

- Is pilot flame visible through inspection ?

No

- Check the voltage across main gas valve terminals of the gas valve.

Is **24VAC** *present there?*

Yes

- ▲ **TURN OFF POWER** ▲ to boiler at service switch or breaker.
- Remove base access panel.
- Verify pilot burner is securely attached to pilot bracket, bracket is securely attached to cross-tie, and there is no corrosion on the ground path for flame sense.
- Verify that pilot flame rod, flame rod ceramic and lead wire from control module to flame rod are in good condition.
- Correct any above problems, replacing pilot if burner or wiring is damaged.

No

- If, none of the previous steps (including replacing pilot) corrects problem, then replace the control module, reinstall base access panel and retest.

Yes

- If the wiring from the control module to gas valve is intact, replace the control module.
- Retest.

No

- If the wiring from the control module to gas valve is intact, replace the control module and retest.

Yes

- Make sure ground wire terminal is securely fastened to control module mounting screw.
- Check the voltage across main gas valve terminals of the gas valve.

Is **24VAC** *present there?*

No

- Verify inlet gas pressure at gas valve:
  Natural gas – 5.0" w.c. min/14.0" w.c. max.
  Propane – 11.0" w.c. min./14.0" w.c. max.

Is gas present at gas valve inlet and within above range?

No

- ▲ **TURN OFF POWER** ▲ to boiler at service switch or breaker.
- Check flame signal – Detach lead from ignition control (**Figure 15, Item 8**, page 29).
- Connect **negative** lead of MICROAMMETER to control sense terminal (**Figure 15, Item 8**, page 29). Connect positive lead of MICROAMMETER to sense wire.
- DISCONNECT **red** wire connected to main gas valve terminal of the gas valve.
- Turn on power to boiler and allow to cycle. As soon as pilot is burning, the MICROAMMETER should read at least 1.0 microamp.

Is flame signal at least 1.0 microamp ?

No

- If, none of the previous steps (including replacing pilot) corrects problem, then replace the control module, reinstall base access panel and retest.

Yes

- If the wiring from the control module to gas valve is intact, replace the control module and retest.

Yes

Troubleshooting – (EG water boilers) continued

CHART 6 – Spark-ignited pilot – Insufficient heat or no heat (POWER light on steady)

WARNING **Electrical shock hazard** — Wherever you see ▲ **TURN OFF POWER** ▲, follow the instructions. Failure to follow instructions can result in severe personal injury, death or substantial property damage.

- Has it been at least 5 minutes since setting thermostat to call for heat? If not, wait 5 minutes. Is system heating?
- Is thermostat set to call for heat? Remove thermostat wires at boiler and check continuity across the two wires. If circuit isn't closed, check external thermostat (zone valve, relay, etc.) wiring. Correct problems and retry.
- Reconnect external thermostat wiring at boiler.

Is thermostat circuit closed (continuity across wires)?

No → *Are all red lights off?*

No → Wait 30 seconds. *Are all red lights off?*

No → Replace control module. Retest.

Yes → Wait 30 seconds. *Are all red lights off?*

Yes → Boiler is in standby. Set thermostat to call for heat and recheck operation. Verify **Sequence of operation, Figure 1,** page 6.

Yes → *Is boiler System circulator operating?*

No → Remove **CIRCULATOR** harness plug from **CIRCULATOR** plug receptacle (**Figure 15, Item 7**, page 29). Check with voltmeter across pins of control module receptacle. *Does voltmeter show* **120 VAC** *across pins?*

No → Replace control module. Retest.

Yes → Repair/replace circulator. Retest. Repair/replace wiring. Retest.

Yes → Wait 5 minutes. *Is* **FLAME** *light on?*

Yes → If you have sufficient heat – boiler should be in normal operating sequence. (See normal sequence of operation, **Figure 1**, page 6.

If you have less than sufficient heat – *Is vent or combustion air piping free of blockage?*

No → Correct conditions and recheck operation. See **Figure 1,** page 6 for normal sequence of operation.

Yes → Contact your Weil-McLain sales representative.

No → *Is* **LIMIT** *light on?*

No → Check limit switch contacts with continuity checker. *Are limit switch contacts closed?*

No → Wait for boiler water to cool to temperature 20 to 30 °F lower than temperature set on the limit switch. *Are limit switch contacts closed?*

No → Replace limit switch. Retest.

Yes → Boiler water temperature exceeded setting on limit switch with thermostat calling for heat. Boiler is OK. (See normal sequence of operation, **Figure 1,** page 6.)

Also check operation of setting limit (should be above 140°F).

Yes → *Check spill switch and rollout switch continuity – Are switches closed?*

No → Reset spill switch, or replace rollout switch.

DANGER

If rollout thermal fuse element or spill switch has opened, determine cause and correct condition. Failure to do so will result in severe personal injury, death or substantial property damage.

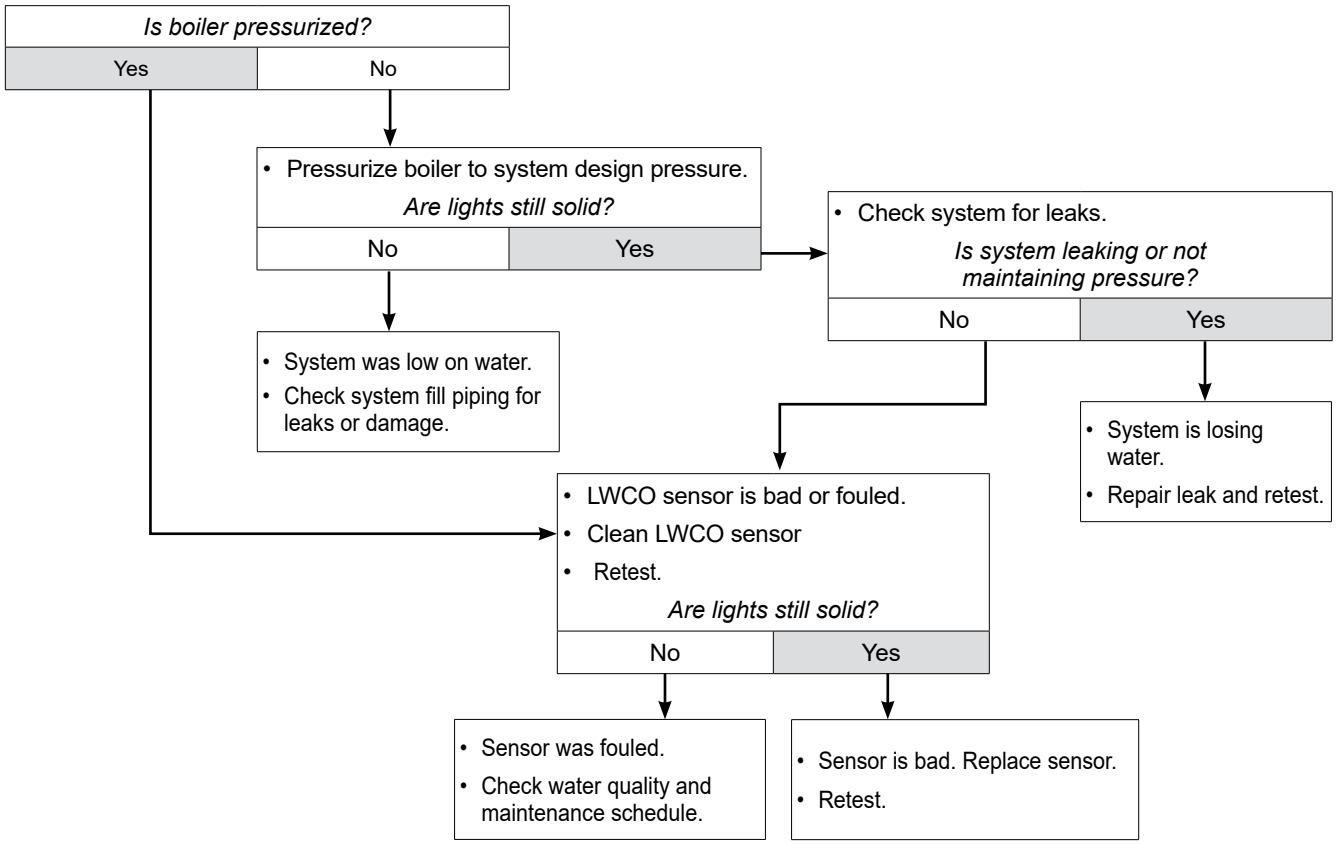
Yes → Check any other limit controls wired into the limit circuit. If all are OK, then replace control module. Retest.

Yes → Replace control module. Retest.

Troubleshooting – (EG water boilers) continued

CHART 7 — **Troubleshooting LWCO and POWER light Solid**

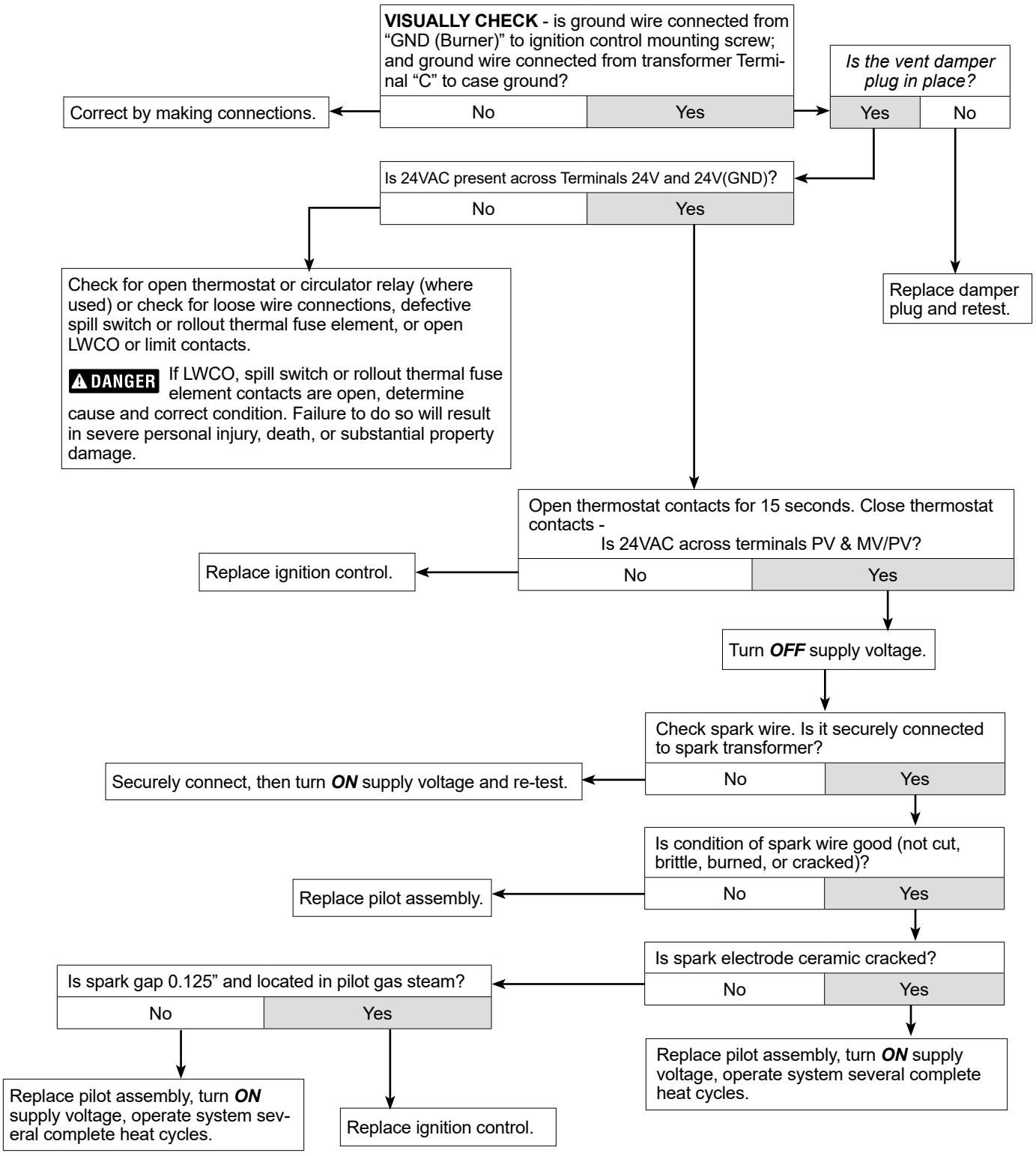
⚠WARNING **Electrical shock hazard** — Wherever you see ▲ **TURN OFF POWER** ▲, follow the instructions. Failure to follow instructions can result in severe personal injury, death or substantial property damage.



Troubleshooting – (EG, PEG & EGH steam boilers)

CHART 8 NO SPARK – System does not work – without vent damper

WARNING **Electrical shock hazard** — Wherever you see ▲ **TURN OFF POWER** ▲, follow the instructions. Failure to follow instructions can result in severe personal injury, death or substantial property damage.



Troubleshooting (EG, PEG & EGH steam boilers) continued

CHART 9 NO SPARK – System does not work – With vent damper

WARNING **Electrical shock hazard** — Wherever you see ▲ **TURN OFF POWER** ▲, follow the instructions. Failure to follow instructions can result in severe personal injury, death or substantial property damage.

Is damper harness securely plugged in at both ends?
- No → Secure connections.
- Yes → Is 24VAC present across terminals C and Y on transformer?
  - No → Check for loose wire connections or bad relay on transformer.
  - Yes → Is 24VAC present across terminals C and yellow wire between damper connector and rollout thermal fuse element?
    - No → Check for open thermostat or circ. relay (where used) or check for loose wire connections, defective spill switch or rollout thermal fuse element, or open LWCO or high limit contacts.

      DANGER If LWCO, spill switch or rollout thermal fuse element contacts are open, determine cause and correct condition. Failure to do so will result in severe personal injury, death, or substantial property damage.
    - Yes → Is damper rotated open?
      - No → Check for out of round stack section. Does motor rotate open?
        - No → Replace actuator.
        - Yes → Is 24VAC across terminals PV & MV/PV?
      - Yes → Is 24VAC across terminals PV & MV/PV?
        - No → Open thermostat contacts for 30 seconds. Damper will rotate to closed position. Close thermostat contacts. Damper will rotate to open position.
        - Yes → Is spark present now?
          - Yes → Re-test.
          - No → Turn ***OFF*** supply voltage. Check spark wire. Is it securely connected to ignition control?
            - No → Securely connect and turn ***ON*** supply voltage. Re-test.
            - Yes → Is condition of spark wire good (not brittle, burned, or cracked?
              - No → Replace pilot assembly.
              - Yes → Is the spark electrode ceramic cracked?
                - No → Is spark gap 0.125” and located in pilot gas stream?
                  - No → Replace pilot assembly.
                  - Yes → Replace ignition control.
                - Yes → Replace pilot assembly.

Turn ***ON*** supply voltage and operate system several complete cycles.

Is 24VAC across terminals PV & MV/PV?
- No → Check continuity of each wire in wiring harness to damper. Does continuity exist for each wire?
  - No → Replace damper wiring harness.
  - Yes → Remove damper harness from boiler wiring harness. TEMPORARILY install jumper between terminal 2 and terminal 5 on damper plug in boiler wiring harness. See Figure 14. Does boiler fire?
    - No → Replace ignition control.
    - Yes → Replace actuator.
- Yes → Is spark present now?

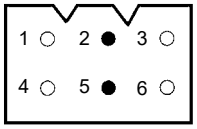
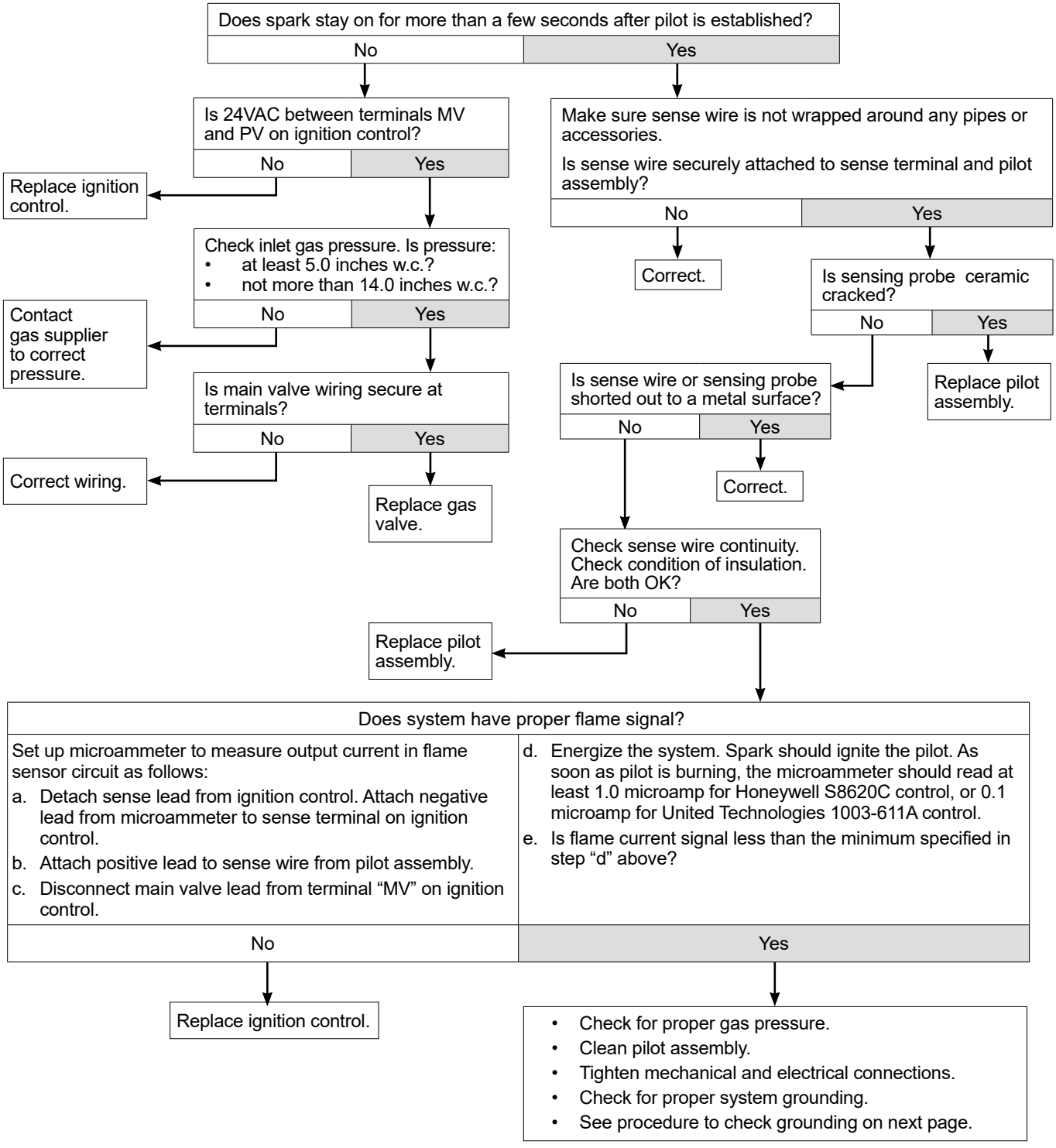


FIGURE 14

Troubleshooting – (EG, PEG & EGH steam boilers) continued

CHART 10 **PILOT LIGHTS – Main valve will not come on – With or without vent damper**

⚠WARNING **Electrical shock hazard** — Wherever you see ▲ **TURN OFF POWER** ▲, follow the instructions. Failure to follow instructions can result in severe personal injury, death or substantial property damage.



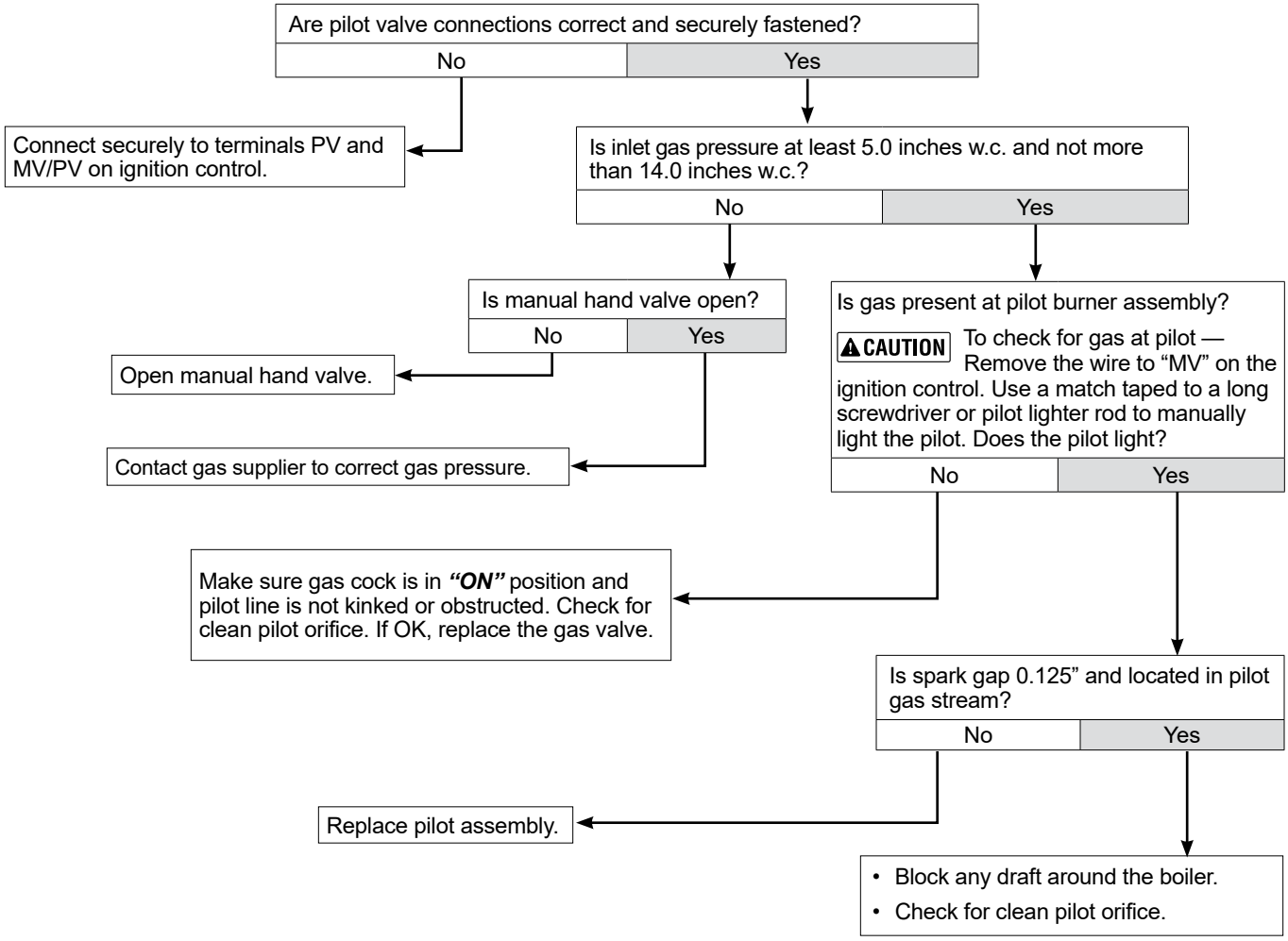
Troubleshooting – (EG, PEG & EGH steam boilers) continued

CHART 11 Procedure to check system grounding

Pilot assembly and ignition control must share common ground with main burner. Nuisance shutdowns are often caused by poor or erratic ground.

- Check for good metal-to-metal contact between pilot burner bracket and main burner, and between main burner and burner rest.
- Check ground lead from "GND (Burner)" terminal on ignition control to ignition control mounting screw, and from "C" on transformer to transformer case ground. Make sure connections are clean and tight. If wire is damaged or deteriorated, replace with No. 18 gauge moisture-resistant, thermoplastic-insulated wire with 105°C minimum rating.

CHART 12 PILOT LIGHTS — Main valve will not come on — With or without vent damper



NOTES

Replacement controls, dampers, gas valves and wire harness

⚠WARNING Only dampers listed below are approved for use on EG, PEG Series 6 and EGH Series 5 boilers. Any other damper installed can cause severe personal injury or death.

Description		Part number
EG 30 thru 75 and EGH 85 thru 125 — Common Components for both Steam and Water		
Damper assembly	5" — EG-30, EG-35, PEG-30, PEG-35	381-800-475
	6" — EG-40, EG-45, PEG-40, PEG-45	381-800-476
	7" — EG-50, EG-55, PEG-50, PEG-55	381-800-477
	8" — EG-65, EG-75, PEG-65	381-800-478
	9" — EGH-85	381-800-445
	10" — EGH-95, EGH-105	381-800-446
	12" — EGH-115, EGH-125	381-800-447
Damper actuator		510-512-337
Wire harness - Damper		591-391-795
EG 30 thru 75 ONLY — Common Components for both Steam and Water		
Pilot burner assembly		511-330-218
Gas valve, natural gas	½" x ½", sizes EG 30 thru 50	511-044-381
	¾" x ¾", sizes EG 55 thru 75	511-044-382
Pilot tubing with fittings 1/8" X 22-3/4" long		560-742-860
Rollout thermal fuse – 228° C		512-050-230
EG 30 thru 75 ONLY — Natural Gas (Water boilers only) No tankless heater		
Ignition Control Module		381-330-039
Supply Temperature Sensor LWCO		381-356-589
Wire harness - Sensor EG 30 thru 75 Water		591-392-106
Wire harness - Power J-Box to Module		591-391-975
Wire harness - Circulator (with molex)		381-356-528
Wire harness - Controls to Module		591-391-990
Wire harness - Thermostat		591-391-994
Control transformer 24VAC 40 VA		381-356-578
Outdoor temperature sensor kit (Includes sensor, wire harness & instructions.)		381-356-586

Replacement controls, dampers, gas valves and wire harness

⚠WARNING Only dampers listed below are approved for use on EG, PEG Series 6 and EGH Series 5 boilers. Any other damper installed can cause severe personal injury or death.

Description		Part number
EG 30 thru 75 ONLY — Natural Gas (Steam boilers only) With or without tankless heater		
UCS Ignition Control EG and EGH — Natural Gas		511-330-097
Control Limit with 1/2 NPT Well		510-312-250
Float Type LWCO		511-114-494
Wire harness	EG-30 thru 75 steam, float LWCO	540-130-961
Probe Type LWCO		510-811-403
Wire harness	EG-30 thru 75, PEG-30 thru 65 steam, probe LWCO	540-130-962
Transformer - relay 120/24VAC 40 VA		510-312-166
EG 30 thru 75 ONLY — Natural Gas (Water boilers only) With tankless heater		
UCS Ignition Control EG and EGH — Natural Gas		511-330-097
Control Limit		510-312-249
Wire harness	EG-35 thru 75 water with tankless heater	540-130-960
Immersion Well 3/4 NPT x 6.25		592-300-027
Transformer - relay 120/24VAC 40 VA		510-312-166
EGH 85 thru 125 ONLY — Natural Gas (Steam boilers only) With tankless heater		
UCS Ignition Control EG and EGH — Natural Gas		511-330-097
Wire harness	EGH steam, float LWCO	540-130-967
Wire harness	EGH steam, probe LWCO	540-130-968
Transformer - relay 120/24VAC 40 VA		510-312-166
EGH 85 thru 125 ONLY — Common Components for both Steam and Water		
Pilot burner assembly		511-330-218
Gas valve, natural gas	¾” x 1”, EGH 85 thru 95	511-044-286
	1” x 1”, EGH 105 thru 125	511-044-287
Pilot tubing with fittings 1/8” X 22-3/4” long		560-742-860

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