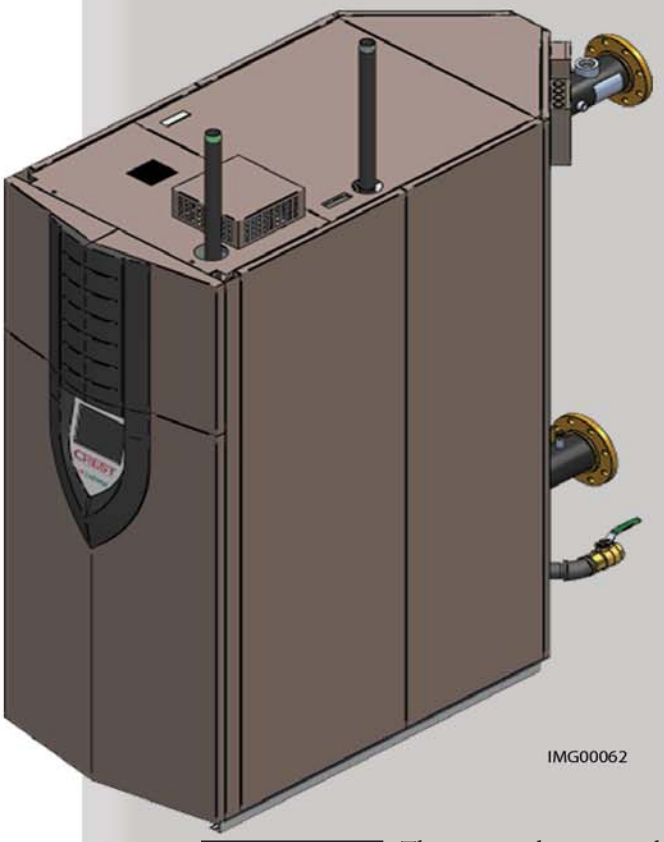
CREST®
CONDENSING BOILER

Dual Fuel Supplemental Manual
Models: FBD 2.5 - 6.0



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⚠ WARNING

This manual must only be used by a qualified heating installer / service technician. Read all instructions, including this manual along with the Crest Installation and Operation Manual, and the Crest Service Manual, before installing. Perform steps in the order given. Failure to comply could result in severe personal injury, death, or substantial property damage.

Save this manual for future reference.

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HIGH EFFICIENCY BOILERS & WATER HEATERS

CONTENTS

Hazard definitions

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

⚠ DANGER DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

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

Please read before proceeding

⚠ WARNING

Installer – Read all instructions, including this manual, the Crest Installation and Operation Manual and the Crest Service Manual, before installing. Perform steps in the order given.

User – This manual is for use only by a qualified heating installer/ service technician. Refer to the User's Information Manual for your reference.

Have this boiler serviced/inspected by a qualified service technician, at least annually.

Failure to comply with the above could result in severe personal injury, death or substantial property damage.

NOTICE

When calling or writing about the boiler – Please have the boiler model and serial number from the boiler rating plate.

Consider piping and installation when determining boiler location.

Any claims for damage or shortage in shipment must be filed immediately against the transportation company by the consignee.

Factory warranty (shipped with unit) does not apply to units improperly installed or improperly operated.

⚠ WARNING

Failure to adhere to the guidelines on this page can result in severe personal injury, death, or substantial property damage.

⚠ WARNING

If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

This appliance MUST NOT be installed in any location where gasoline or flammable vapors are likely to be present.

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 near by phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.
- Installation and service must be performed by a qualified installer, service agency, or the gas supplier.

When servicing boiler –

- To avoid electric shock, disconnect electrical supply before performing maintenance.
- To avoid severe burns, allow boiler to cool before performing maintenance.

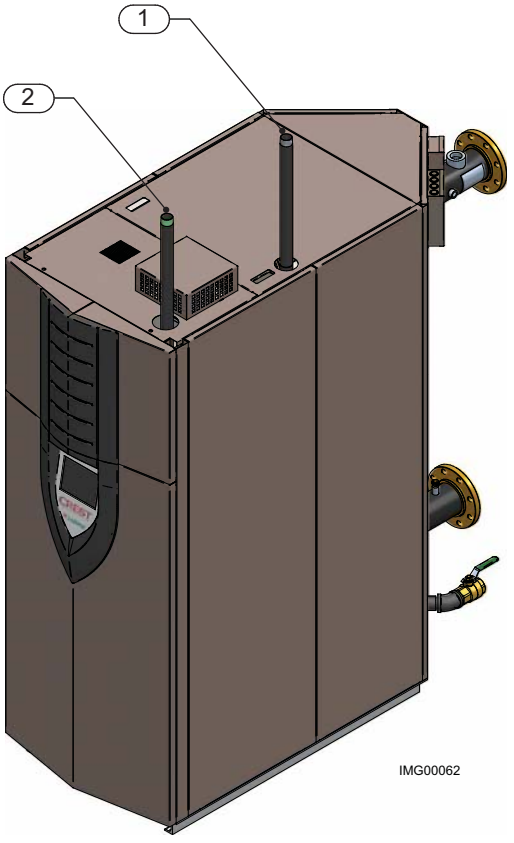
Boiler operation –

- Do not block flow of combustion or ventilation air to the boiler.
- Should overheating occur or gas supply fail to shut off, do not turn off or disconnect electrical supply to circulator. Instead, shut off the gas supply at a location external to the appliance.
- Do not use this boiler if any part has been under water. The possible damage to a flooded appliance can be extensive and present numerous safety hazards. Any appliance that has been under water must be replaced.

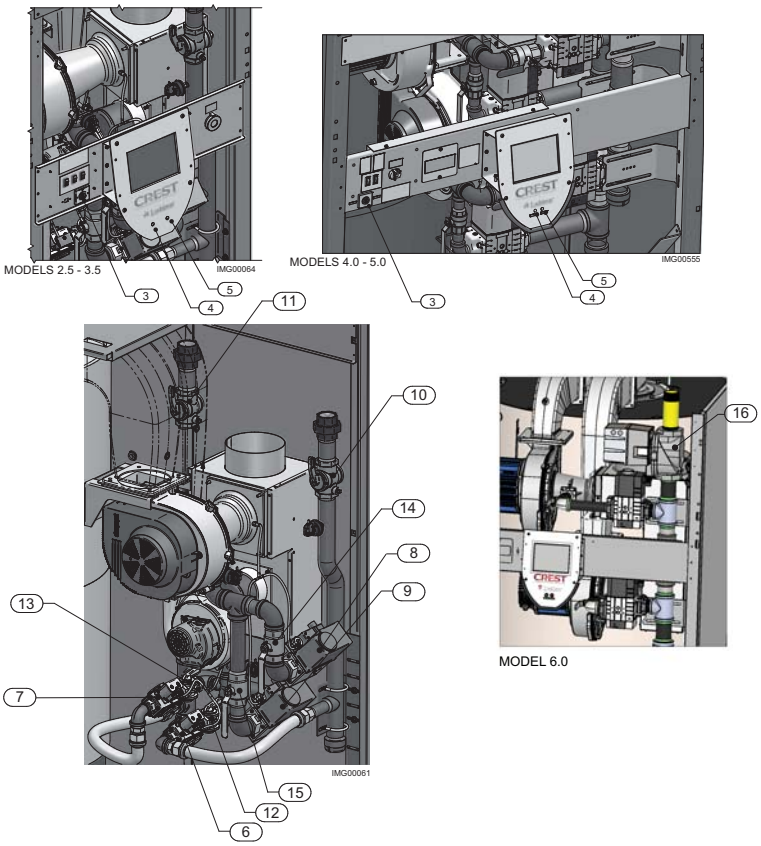
The Crest Dual Fuel - How it works...

1. **Propane gas connection**
   The propane gas connection pipe is a threaded black iron pipe connection. This pipe should be connected to the incoming gas supply to deliver propane gas to the boiler.
2. **Natural gas connection**
   The natural gas connection pipe is a threaded black iron pipe connection. This pipe should be connected to the incoming gas supply to deliver natural gas to the boiler.
3. **Fuel selection switch**
   Switches the unit between natural and propane gas.
4. **Natural gas indicator light (green)**
   Indicates that natural gas operation has been selected.
5. **Propane gas indicator light (red)**
   Indicates that propane gas operation has been selected.
6. **Small natural gas valve (Valve 1 Natural)**
   The small natural gas valve senses the negative pressure created by the blowers, allowing gas to flow only if the gas valves are powered and combustion air is flowing.
7. **Small propane valve (Valve 1 Propane)**
   The small propane gas valve senses the negative pressure created by the blowers, allowing gas to flow only if the gas valves are powered and combustion air is flowing.
8. **Large natural gas valve (Valve 2 Natural)**
   The large natural gas valve senses the negative pressure created by the blowers, allowing gas to flow only if the gas valves are powered and combustion air is flowing.
9. **Large propane gas valve (Valve 2 Propane)**
   The large propane gas valve senses the negative pressure created by the blowers, allowing gas to flow only if the gas valves are powered and combustion air is flowing.
10. **Natural shutoff valve**
    The natural shutoff valve is used to isolate the boiler gas train from the gas supply.
11. **Propane shutoff valve**
    The propane shutoff valve is used to isolate the boiler gas train from the gas supply.
12. **Natural ball valve (Valve 1)**
    The ball valve for natural valve 1 is used to isolate natural valve 1 from the propane gas supply.
13. **Propane ball valve (Valve 1)**
    The ball valve for propane valve 1 is used to isolate propane valve 1 from the natural gas supply.
14. **Natural ball valve (Valve 2)**
    The ball valve for natural valve 2 is used to isolate natural valve 2 from the propane gas supply.
15. **Propane ball valve (Valve 2)**
    The ball valve for propane valve 2 is used to isolate propane valve 2 from the natural gas supply.
16. **Proof of closure valve**
    An additional safety shutoff valve with proof of closure contacts is used on the Crest 6.0 model **only**.

Models **FBD 2.5 - 6.0**



Front View



Left Side (inside unit)

Ratings

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Crest AHRI Rating				
Model Number Note: Change "N" to "L" for L.P. gas models.	Input MBH (Notes 4 - 8)		Gross Output MBH (Note 1)	Net AHRI Ratings Water, MBH (Note 2)
	Min	Max		
FB(N,L,D)2500	125	2500	2300	2000
FB(N,L,D)3000	150	3000	2760	2400
FB(N,L,D)3500	200 / 290	3500	3220	2800
FB(N,L,D)4000	335 / 435	4000	3720	4043
FB(N,L,D)5000	500 / 833	5000	4650	3235
FB(N,L,D)6000*	600 / 950	6000	5520	4800

Other Specifications						
Appliance Water Content Gallons	Pipe Size Outlet	Pipe Size Inlet	Gas Inlet Size	Air Size	Vent Size (Note 3)	Weight w/Water (lbs.)
161	4"	4"	2"	8"	9"	3650
181	4"	4"	2"	10"	10"	4125
215	4"	4"	2"	10"	10"	4750
291	4"	4"	2 1/2"	12"	12"	6500
380	4"	4"	2 1/2"	14"	14"	8000
380	6"	6"	2 1/2"	14"	14"	8000

*For high altitude models the minimum input is 700 MBH (natural) and 1000 MBH (LP).

NOTICE Maximum allowed working pressure is located on the rating plate.

Notes:

1. The ratings are based on standard test procedures prescribed by the United States Department of Energy.
2. Net AHRI ratings are based on net installed radiation of sufficient quantity for the requirements of the building and nothing need be added for normal piping and pickup. Ratings are based on a piping and pickup allowance of 1.15.
3. Crest boilers require special gas venting. Use only the vent materials and methods specified in the Crest Installation and Operation Manual.
4. Standard Crest boilers are equipped to operate from sea level to 4,500 feet **only**. The boiler will de-rate by 2.2% for each 1,000 feet above sea level up to 4,500 feet.
5. High altitude Crest Models 2.5, 3.0 and 3.5 are equipped to operate from 3,000 to 12,000 feet **only**. The boiler will de-rate by 1.4% for each 1,000 feet above sea level up to 5,500 feet and 1.8% for each 1,000 feet above 5,500 feet. The operation given in this manual remains the same as the standard boilers. A high altitude label (as shown in FIG A.) is also affixed to the unit.

   De-rate values are based on proper combustion calibration and CO_2's adjusted to the recommended levels.
6. High altitude Crest Models 4.0 and 5.0 will not de-rate up to 5,500 feet.
7. The high altitude Crest 6.0 model will de-rate by 2.0% for each 1000 feet above sea level up to 5,500 feet.
8. For Crest Models 4.0, 5.0 and 6.0, installations above 5,500 feet contact the factory.
9. Ratings have been confirmed by the Hydronics Section of AHRI.

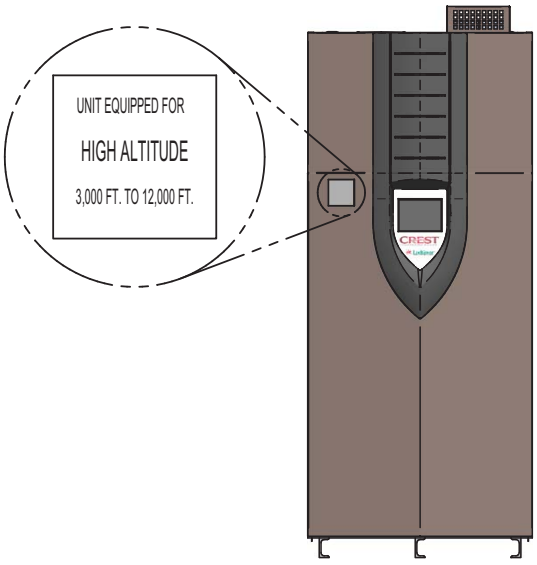


Figure A *High Altitude Label Location*

1 Gas connections

Assemble/install proof of closure valve (FBD 6000 model only)

NOTICE Before installing your FBD6000 boiler YOU MUST install the LP proof of closure assembly provided in the ship loose kit with the unit.

The ship loose kit inside the FBD6000 Dual Fuel contains parts required for assembly to the propane inlet gas train prior to connection to the incoming propane gas line. Reference FIG. 1-1 along with Table 1A for the required assembly order and identification of parts. Use pipe sealant approved for use with propane gas on all primary joints. Thread tape is recommended on all 1/8" pipe joints for the high and low gas pressure switches.

⚠ WARNING Failure to apply pipe sealing compound as detailed in this manual can result in severe personal injury, death, or substantial property damage.

Figure 1-1 *Proof of Closure Part Identification*

Note: Reference Table 1A.

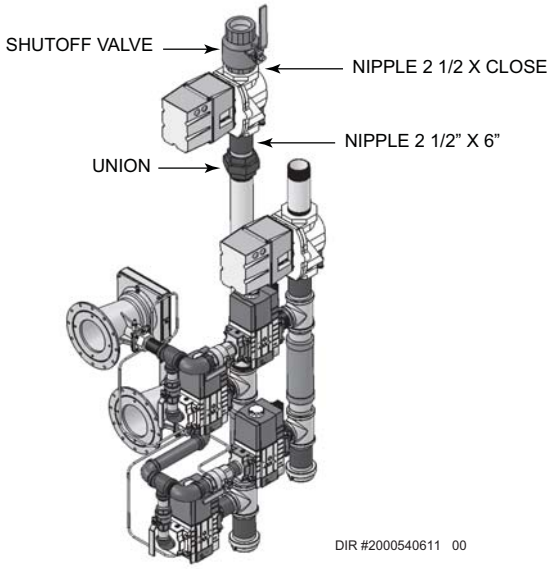
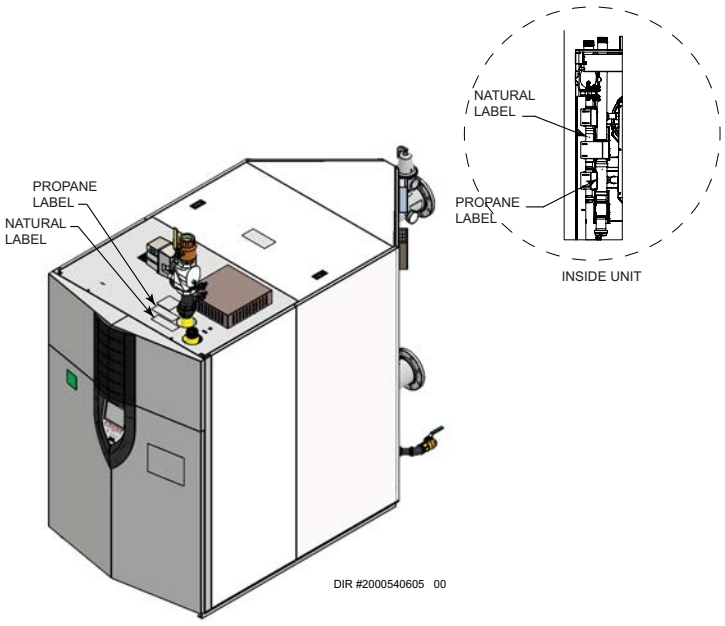


Table 1A *Ship Loose Kit Components*

Kit Components		
Material / Part No.	**Description**	**QTY.**
100134332	Tee, 1/8 NPT, CLS 150, BLK, Straight	2
100134403	Nipple, 1/8 NPT, X Close, SCH40 BLK	1
100134379	Bushing, HEX, 1/4 X 1/8 NPT, SCH40, BLK	1
100134327	Elbow, Street 90, 1/8 NPT, SCH40, BLK	1
100135488	Plug, HEX, 1/8 NPT, Brass	1
100134398	Nipple, 1/8 NPT X 2", SCH40, BLK	1
100161647	Switch, Pressure, 27" WC	1
100166123	Switch, Pressure, 3" WC	1
100273736	Valve, Actuator, Proof of Closure	1
100273737	Valve, Proof of Closure	1
100173738	Valve, Ball, 2-1/2, THRD, NPT	1
100134284	Nipple, 2-1/2 X Close, SCH40, BLK	1
100134241	Nipple, 2-1/2" NPT X 6" SCH40, BLK	1
100163145	Bushing, Wire, 7/8	1
100280830	Harness, Dual Fuel, GPS/POC Switch	1
100134283	Union, 2-1/2 NPT, SCH40, BLK	1

Labels on the top panel of the unit will identify the type of gas for each of the two (2) inlet gas trains (see FIG. 1-2). Verify this with the corresponding labels attached to the gas trains inside the boiler. The natural gas train will have a proof of closure valve already installed inside the boiler.

Figure 1-2 *Labels Located on the Top Panel of the Unit*

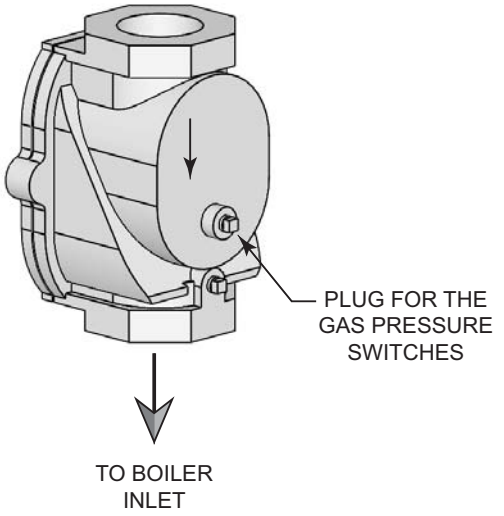


1 Gas connections *(continued)*

Assemble proof of closure valve

Reference FIG. 1-1 for assembly of the proof of closure valve. **Note:** DO NOT install the actuator portion of the proof of closure assembly at this time. Verify that when installing the proof of closure valve the directional arrow located on the valve body is pointing toward the boiler inlet gas piping (FIG. 1-3). Orient the proof of closure valve as shown in FIG. 1-3.

Figure 1-3 *Proof of Closure Valve Orientation*



Assemble the high and low gas pressure switch assembly

1. Remove the upper most pressure plug from the proof of closure valve body. Install high and low gas pressure assembly as shown in FIG. 1-4.
2. With the proof of closure actuator body oriented as shown in FIG. 1-5, loosen the two (2) screws to remove the metal access plate.
3. Remove the two (2) knockouts on the actuator (FIG. 1-5). Be sure to remove any parts of the knockout that may remain inside the actuator assembly.
4. Attach the proof of closure actuator to the proof of closure valve using the two (2) set screws which are part of the actuator assembly (FIG. 1-6). Make certain the actuator is fully seated to the valve body, see FIG. 1-6.

Figure 1-4 *High and Low Gas Pressure Switch Assembly*

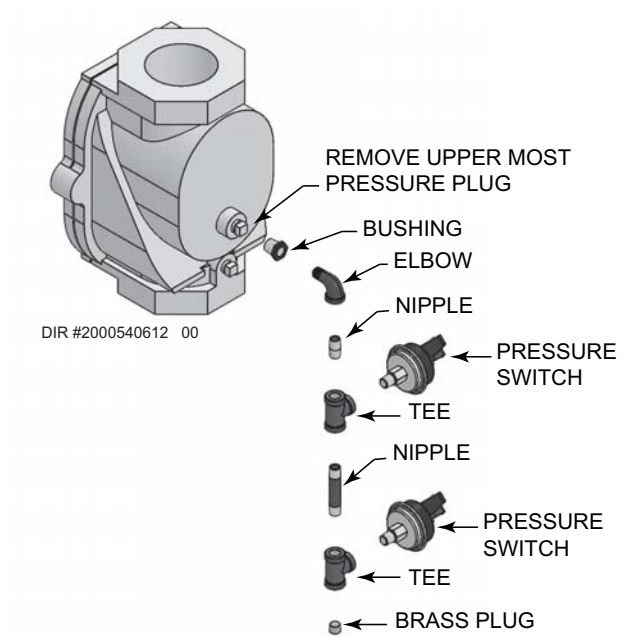


Figure 1-5 *Remove Cover and Knockouts for Wiring*

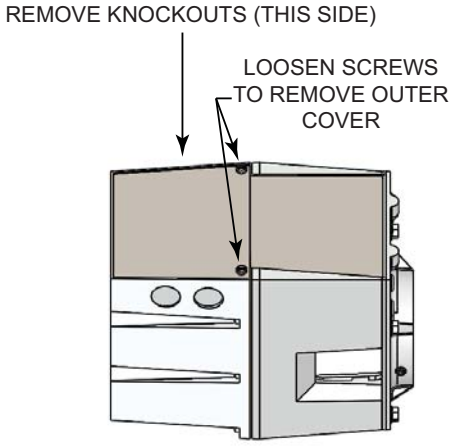
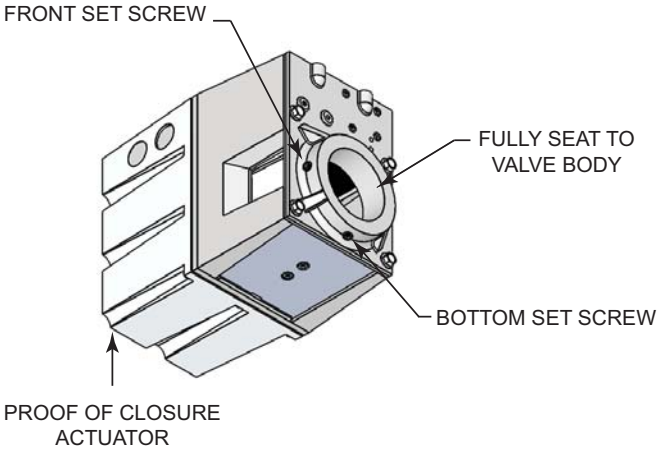


Figure 1-6 *Attach Proof of Closure Actuator to the Proof of Closure Valve*

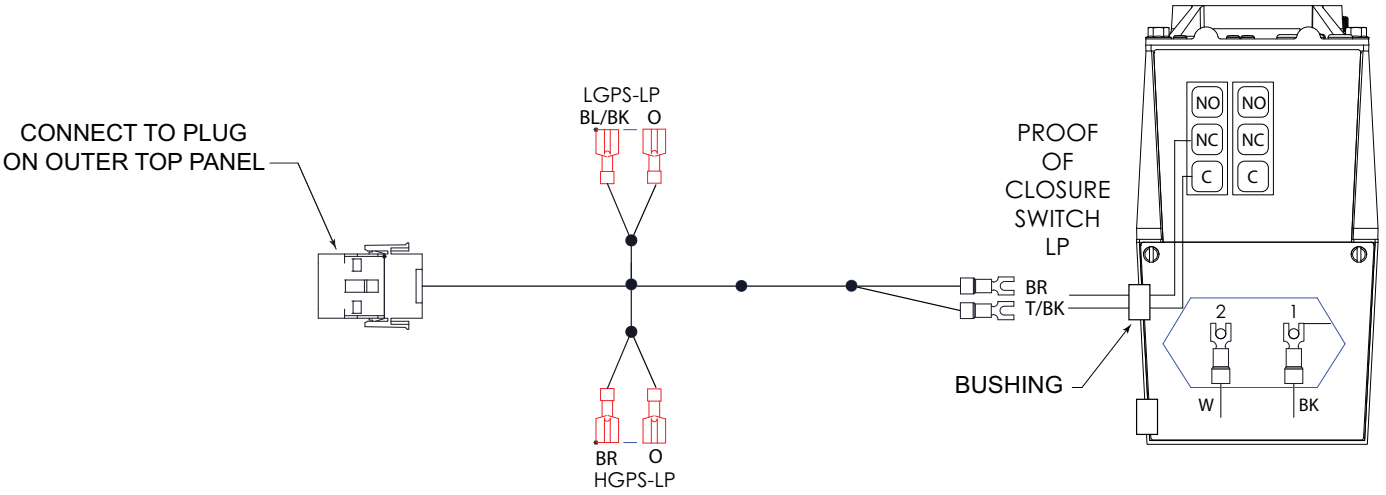


1 Gas connections

Wiring for the high and low gas pressure switches and proof of closure switch (reference FIG. 1-7)

1. Using the wire harness included in the ship loose kit, connect the 4-pin connector to the mating connector located on the top panel of the boiler.
2. Connect the BROWN and ORANGE wires to the (lower) low gas pressure switch.
3. Connect the BLUE and ORANGE wires to the (upper) high gas pressure switch.
4. Insert a 7/8" bushing into the knockout opening nearest the proof of closure switch in the actuator assembly.
5. Feed the two (2) BROWN wires from the pressure switch harness through the bushing and attach the "C" and "NC" terminals of the switch.

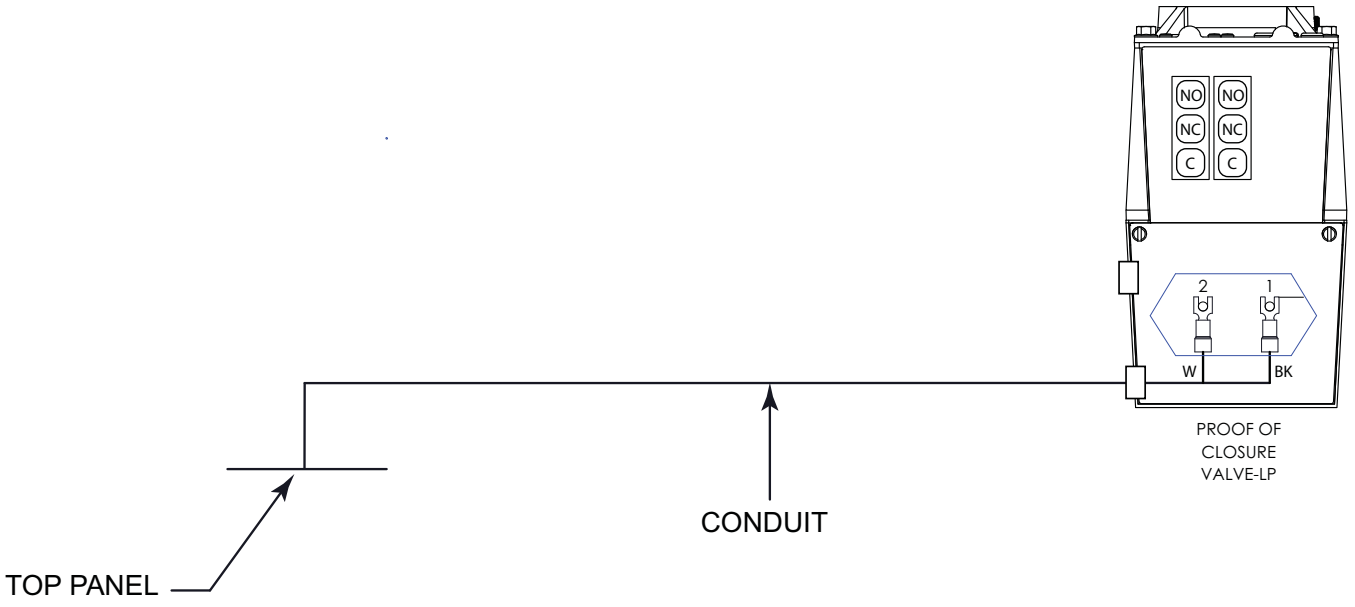
Figure 1-7 *High and Low Gas Pressure Switch Wire Harness*



Wiring for the proof of closure valve 120V power (reference FIG. 1-8)

1. Wiring and conduit for the 120V power to the actuator is attached to the outer top panel of the boiler.
3. Check and trim (if necessary) the conduit used to route the power wires from the top panel of the unit to the actuator assembly.
3. Attach the 90° conduit to the knockout opening nearest the power connections in the proof of closure actuator assembly.
4. Connect the BLACK wire to "1" and the WHITE wire to "2" as shown in FIG. 1-8.
5. Replace the metal access plate removed in Step #2 of the Assemble the High and Low Gas Pressure Switches Section.

Figure 1-8 *Proof of Closure Valve Wire Harness*



1 Gas connections *(continued)*

Table 1B *Natural Gas Pipe Size Chart*

TABLE - 1B
Capacity of Schedule 40 Metallic Pipe in Cubic Feet of Natural Gas Per Hour
(based on .60 specific gravity, 0.30" w.c. pressure drop)

Pipe Size (Inches)	Length of Pipe in Straight Feet													
	10	20	30	40	50	60	70	80	90	100	125	150	175	200
1/2	131	90	72	62	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3/4	273	188	151	129	114	104	95	89	83	79	70	63	58	N/A
1	514	353	284	243	215	195	179	167	157	148	131	119	109	102
1 1/4	1,060	726	583	499	442	400	368	343	322	304	269	244	224	209
1 1/2	1,580	1,090	873	747	662	600	552	514	482	455	403	366	336	313
2	3,050	2,090	1,680	1,440	1,280	1,160	1,060	989	928	877	777	704	648	602
2 1/2	4,860	3,340	2,680	2,290	2,030	1,840	1,690	1,580	1,480	1,400	1,240	1,120	1,030	960
3	8,580	5,900	4,740	4,050	3,590	3,260	3,000	2,790	2,610	2,470	2,190	1,980	1,820	1,700
4	17,500	12,000	9,660	8,270	7,330	6,640	6,110	5,680	5,330	5,040	4,460	4,050	3,720	3,460

Check inlet gas supply

⚠ WARNING DO NOT adjust or attempt to measure gas valve outlet pressure. Attempting to alter or measure the gas valve outlet pressure could result in damage to the valve, causing potential severe personal injury, death, or substantial property damage.

NOTICE The Dual Fuel Crest is equipped with two (2) inlet gas connections. Each connection must be checked to ensure proper operation.

The gas piping must be sized for the proper flow and length of pipe, to avoid excessive pressure drop. Both the gas meter and the gas regulator must be properly sized for the total gas load.

If you experience a pressure drop greater than 1 inch w.c. (249 Pa), the meter, regulator, or gas line is undersized or in need of service. Perform the steps below when checking inlet gas supply:

1. Turn the main power switch to the "OFF" position.
2. Shut off gas supply at the manual gas valve in the gas piping to the appliance.
3. Remove the 1/8" pipe plug on the flange to the factory supplied gas shutoff valve and install a suitable 1/8" fitting (field supplied) for the manometer tubing. Place the tubing of the manometer over the tap once the 1/8" fitting is installed as shown in FIG.'s 1-9 and 1-10.
4. Slowly turn on the gas supply at the factory installed manual gas valve.
5. Turn the power switch to the "ON" position.
6. Adjust the temperature set point on the control panel of the SMART TOUCH control module to call for heat or utilize Service Mode, see page 13 of this manual.
7. Observe the gas supply pressure as the burner fires at 100% of rated input. Percent of burner input will be displayed on the Modulation Screen.
8. Ensure inlet pressure is within specified range. Minimum and maximum gas supply pressures are specified in this section of the manual.
9. If gas supply pressure is within normal range and no adjustments are needed, proceed on to Step 11.
10. If the gas pressure is out of range, contact the gas utility, gas supplier, qualified installer or service agency to determine the necessary steps to provide proper gas pressure to the control.
11. Turn the power switch to the "OFF" position.
12. Shut off the gas supply at the manual gas valve in the gas piping to the appliance.
13. Remove the manometer from the pressure tap on top of the gas valve. Remove the 1/8" (3 mm) field supplied fitting and reinstall the pipe plug removed in Step 3.

1 Gas connections

⚠ WARNING Do not check for gas leaks with an open flame -- use the bubble test. Failure to use the bubble test or check for gas leaks can cause severe personal injury, death, or substantial property damage.

14. Turn on the gas supply at the manual gas valve.
15. Turn the power switch to the "ON" position.
16. Adjust the temperature set point on the control panel of the SMART TOUCH control module to the desired water temperature so the appliance will call for heat.
17. Check burner performance by cycling the system while you observe burner response. The burner should ignite promptly. Flame pattern should be stable. Turn system off and allow burner to cool, then cycle burner again to ensure proper ignition and flame characteristics.
18. Repeat Steps 1 - 17 for both natural and LP gas supply.

Gas Pressure

The gas pressure must remain between 4 inches w.c. (.99 kPa) minimum and 14 inches w.c. (3.5 kPa) maximum for Natural gas and between 4 inches w.c. (.99 kPa) minimum and 14 inches w.c. (3.5 kPa) maximum for LP gas during standby (static) mode and while in operating (dynamic) mode. If an in-line regulator is used, it must be a minimum of 10 feet (3 m) from the Crest boiler. It is very important that the gas line is properly purged by the gas supplier or utility company. Failure to properly purge the lines or improper line sizing, will result in ignition failure.

Ignition problems are especially noticeable in NEW LP installations and also in empty tank situations. This can also occur when a utility company shuts off service to an area to provide maintenance to their lines.

Gas valve replacement

The gas valve MUST NOT be replaced with a conventional gas valve under any circumstances. As an additional safety feature, the gas valves have flanged connections to the venturis and blowers.

⚠ WARNING Failure to follow all precautions could result in fire, explosion, or death!

⚠ WARNING DO NOT adjust or attempt to measure gas valve outlet pressure. Attempting to alter or measure the gas valve outlet pressure could result in damage to the valve, causing potential severe personal injury, death, or substantial property damage.

Figure 1-9 *Inlet Gas Supply Check_Natural*

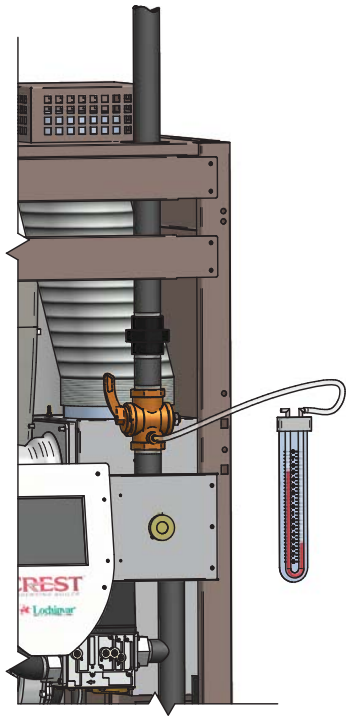
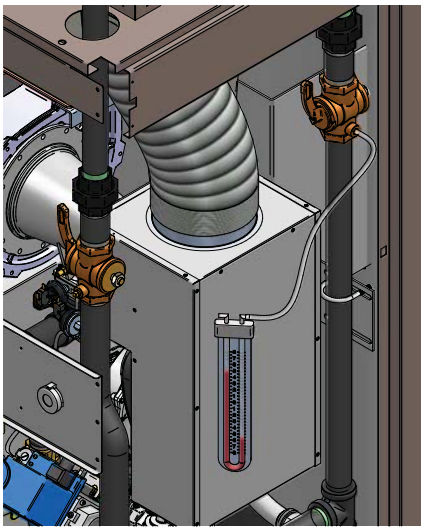


Figure 1-10 *Inlet Gas Supply Check_Propane*



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2 Start-up

Final checks before starting the boiler

- ❑ Read the Crest Service Manual to familiarize yourself with SMART TOUCH control module operation. Read this manual, page 9 for proper steps to start boiler.
- ❑ Verify the boiler and system are full of water and all system components are correctly set for operation.
- ❑ Verify the preparation procedures of Section 9 of the Crest Installation and Operation Manual have been completed.
- ❑ Verify electrical connections are correct and securely attached.
- ❑ Inspect vent piping and air piping for signs of deterioration from corrosion, physical damage or sagging. Verify air piping and vent piping are intact and correctly installed per this manual.

Start the boiler

1. Read and follow the Operating instructions in FIG. 2-1, page 12.

If boiler does not start correctly

1. Check for loose connections, blown fuse or service switch off?
2. Is external limit control (if used) open? Is boiler water temperature above 200°F (93°C)?
3. Is the boiler receiving a call for heat?
4. Is gas turned on at meter and boiler?
5. Is incoming gas pressure less than 4 inches w.c. (.99 kPa)?

If none of the above corrects the problem, refer to the Troubleshooting Section of the Crest Service Manual.

Check system and boiler

❑ Check water piping

1. Check system piping for leaks. If found, shut down the boiler and repair immediately. (See WARNINGS in the Crest Installation and Operation Manual (startup) regarding failure to repair leaks.)
2. Vent any remaining air from the system using manual vents. Air in the system will interfere with circulation and cause heat distribution problems and noise.

❑ Check vent piping and air piping

1. Check for gastight seal at every connection, seam of air piping, and vent piping.

⚠ WARNING Venting system must be sealed gastight to prevent flue gas spillage and carbon monoxide emissions, which will result in severe personal injury or death.

❑ Check gas piping

1. Check around the boiler for gas odor following the procedure in the Crest Installation and Operation Manual (connecting gas supply piping).

⚠ WARNING If you discover evidence of any gas leak, shut down the boiler at once. Find the leak source with a bubble test and repair immediately. Do not start the boiler again until corrected. Failure to comply could result in severe personal injury, death, or substantial property damage.

2 Start-up

Figure 2-1 *Operating Instructions*

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 does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner 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.

WHAT TO DO IF YOU SMELL GAS

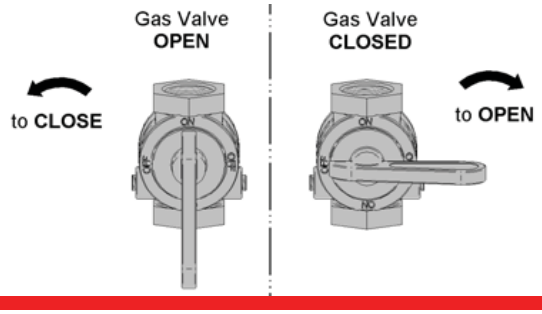
- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

C. Use only your hand to turn the gas control knob. Never use tools. If the handle 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.

OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
5. Remove front door.
6. Turn gas shutoff valve counterclockwise to "OFF". Handle will be perpendicular to pipe. Do not force.
7. Wait five (5) minutes to clear out any gas. If you then smell gas, **STOP!** Follow "B" in the safety information above this label. If you don't smell gas, go to next step.
8. Turn gas shutoff valve clockwise to "ON". Handle will be parallel to pipe.
9. Install front door.
10. Turn on all electric power to appliance.
11. Set thermostat to desired setting.
12. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.



TO TURN OFF GAS TO 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 door.
4. Turn gas shut off valve counterclockwise to "OFF". Handle will be perpendicular to pipe. Do not force.
5. Install front door.

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2 Start-up *(continued)*

Check flame and combustion

NOTICE A flame and combustion check must be performed on natural gas and then repeated on propane.

1. Turn the main power off to the boiler by placing the "On/Off" switch in the OFF position.
2. Remove the flue temperature sensor from the flue collector. **Note:** Combustion measurements will be made at this point.
3. Turn the main power on to the boiler by placing the "On/Off" switch in the ON position.
4. Navigate to the Service Maintenance Screen from the Home Screen by pressing the SETUP button, enter the installer password, and then using the scrolling menu feature on the left side, scroll down to the SERVICE MAINTENANCE button.
5. On the Service Maintenance Screen place heater into Service Mode by selecting the START button, then selecting **Set Gas Valve 1 - High**.
6. Insert the probe from a combustion analyzer into the hole left by the removal of the flue temperature sensor.
7. Once the heat exchanger has modulated up to rate, measure the combustion. The values should be in the range listed in Table 2A. CO levels should be less than 200 ppm for a properly installed unit. If the combustion is not within range reference the *Troubleshooting* Section in the Crest Service Manual for possible causes and corrective actions.
8. After **Gas Valve 1** is set, repeat the same procedure for the second gas train by selecting **Set Gas Valve 2 - High** on the Service Screen.
9. Once the heater analysis is complete, test the safety shutoff device by turning the manual shutoff valve to the OFF position and ensuring that the heater shuts down and registers an alarm. Open the manual shutoff valve and reset the control.
10. Repeat the same procedure for propane gas. Reference the Dual Fuel Switching Instructions on pages 10 and 11 of this manual.
11. Turn the main power off to the boiler and replace the flue temperature sensor into the flue pipe connection.
12. Place the boiler back into normal operation.

⚠ WARNING You must replace the flue gas temperature sensor to prevent flue gas spillage into the room. Failure to comply could result in severe personal injury, death, or substantial property damage.

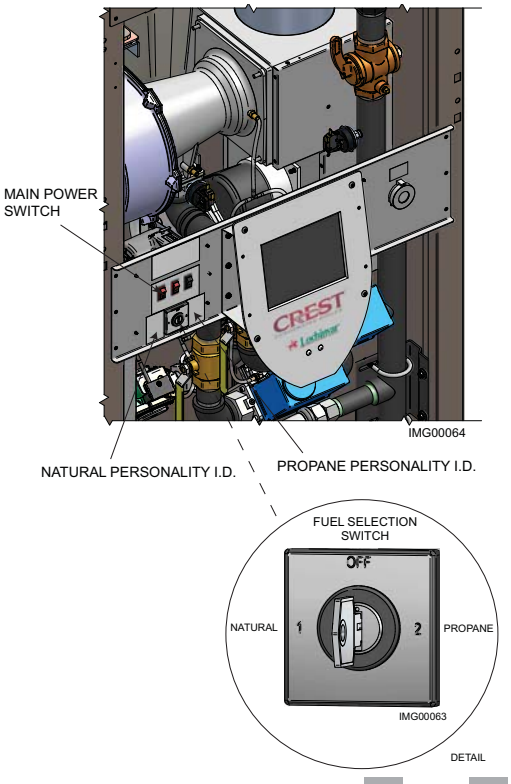
Dual fuel switching instructions

1. Turn the main power off to the boiler by placing the "On/Off" switch in the OFF position (FIG.'s 2-2A and 2-2B).
2. Using the fuel selector switch (FIG.'s 2-2A and 2-2B), select the desired fuel.

Table 2A *Flue Products Chart*

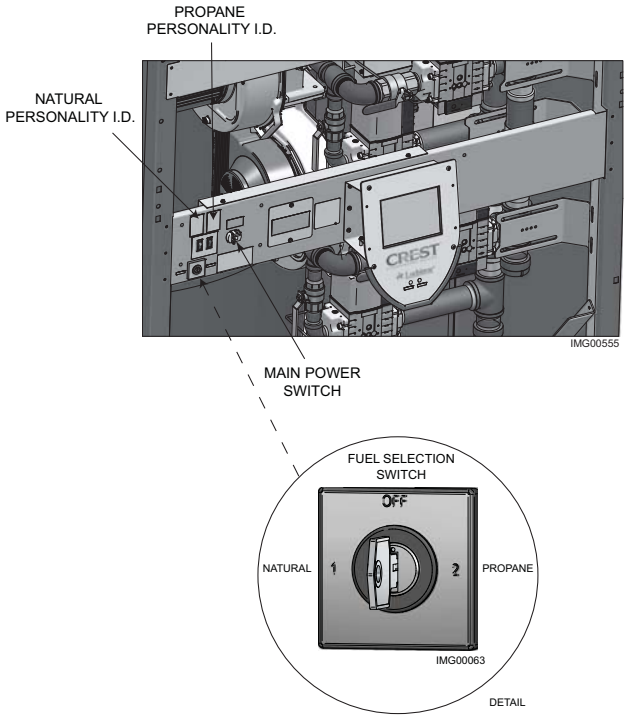
Flue Products	Natural Gas								
Units	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0	ALL
Gas Valve	CO_2 (%)	CO_2 (%)	CO_2 (%)	CO_2 (%)	CO_2 (%)	CO_2 (%)	CO_2 (%)	CO_2 (%)	O_2 (%)
Valve 1 High	4.8	4.6	5.2	4.5	4.9	5.4	6.2	5.9	14.2 - 9.2
Valve 1 Low	1.1	1.4	1.7	1.4	1.4	1.9	2.8	2.7	19.0 - 15.6
Valve 2 High	8.2	8.4	8.1	8.1	8.4	8.7	8.9	9.5	6.9 - 4.8
Valve 2 Low	7.8	7.6	7.5	7.1	7.4	8.8	8.1	8.2	8.9 - 4.9
Propane									
Valve 1 High	5.4	5.6	6.1	5.7	6.4	6.6	7.3	7.6	13.0 - 9.5
Valve 1 Low	1.4	1.6	2	1.8	2	2.8	4.8	4.3	19.2 - 13.3
Valve 2 High	10.7	10.5	10	9.8	10.2	11	10.2	11.3	6.3 - 3.8
Valve 2 Low	8.7	8.5	9.1	8.7	8.7	10.8	9.7	9.9	8.3 - 4.1
All set points should be within +/- 0.2%									

Figure 2-2A *Fuel Selector Switch - Models 2.5 - 3.5*



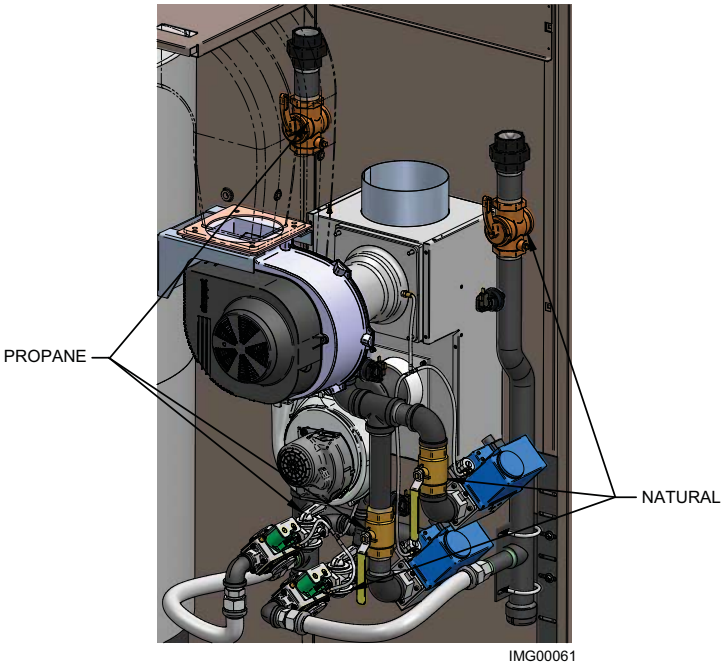
2 Start-up

Figure 2-2B *Fuel Selector Switch - Models 4.0 - 6.0*



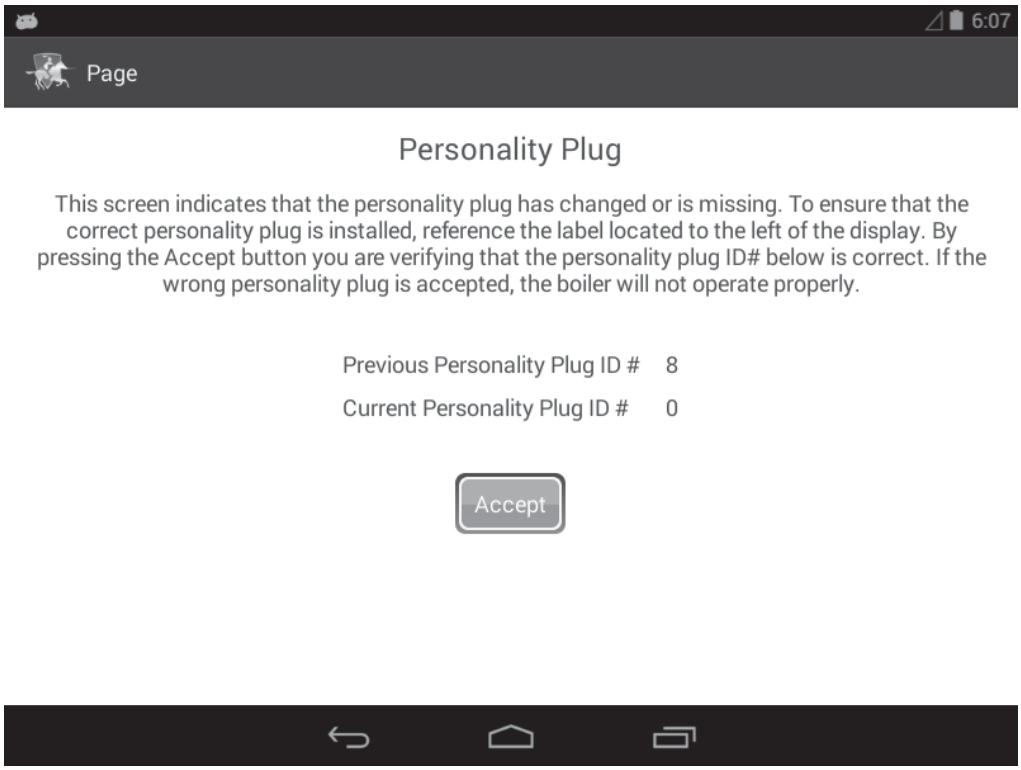
3. Turn off all ball valves (3 total) for the fuel not in use (FIG. 2-3).

Figure 2-3 *Ball Valves*



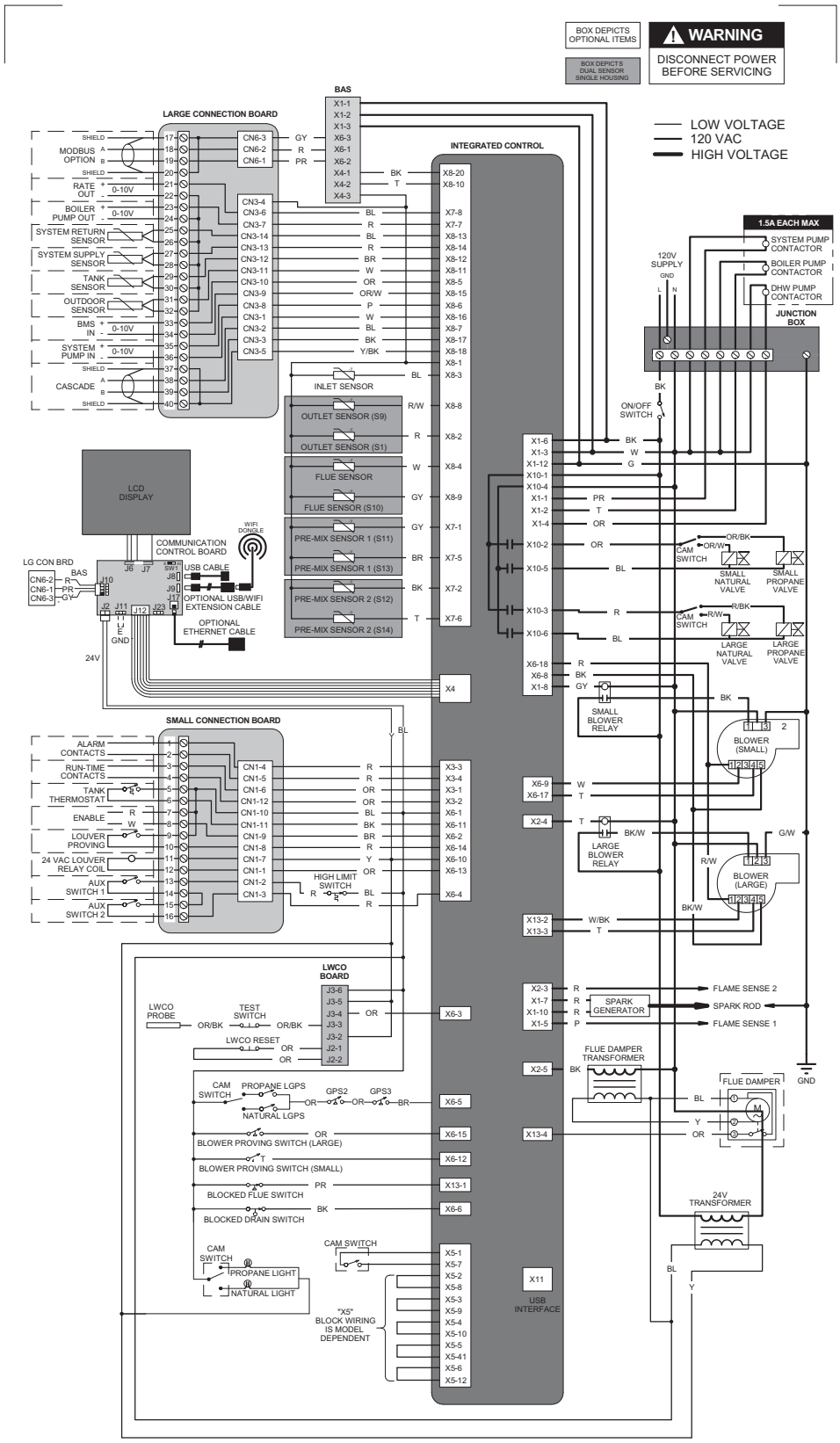
4. Turn on the ball valves for the ones in use (3 total).
5. Turn the main power ON.
6. Using the Touch Screen, accept the appropriate personality identification as shown in FIG. 2-4.

Figure 2-4 *Personality Plug Screen*



3 Diagrams

Figure 3-1 *Wiring Diagram_2.5 - 3.5 Models*



Notes:
1. All wiring must be installed in accordance with: local, state, provincial and national code requirements per either N.E.C. in USA or C.S.A. in Canada.
2. If any original equipment wire as supplied with the appliance must be replaced, it must be replaced with wire having same wire gauge (AWG) and rated for a minimum of 105℃. Exceptions: Replacement high vo ltage spark lead and ribbon cables must be purchased from the factory. Use of a non-approved spark lead or ribbon cables can lead to operational problems which could result in non-repairable damage to the integrated controller or other components.
3. Actual connector block locations may vary from those shown on diagrams. Refer to actual components for proper connector block locations when using diagrams to troubleshoot unit.

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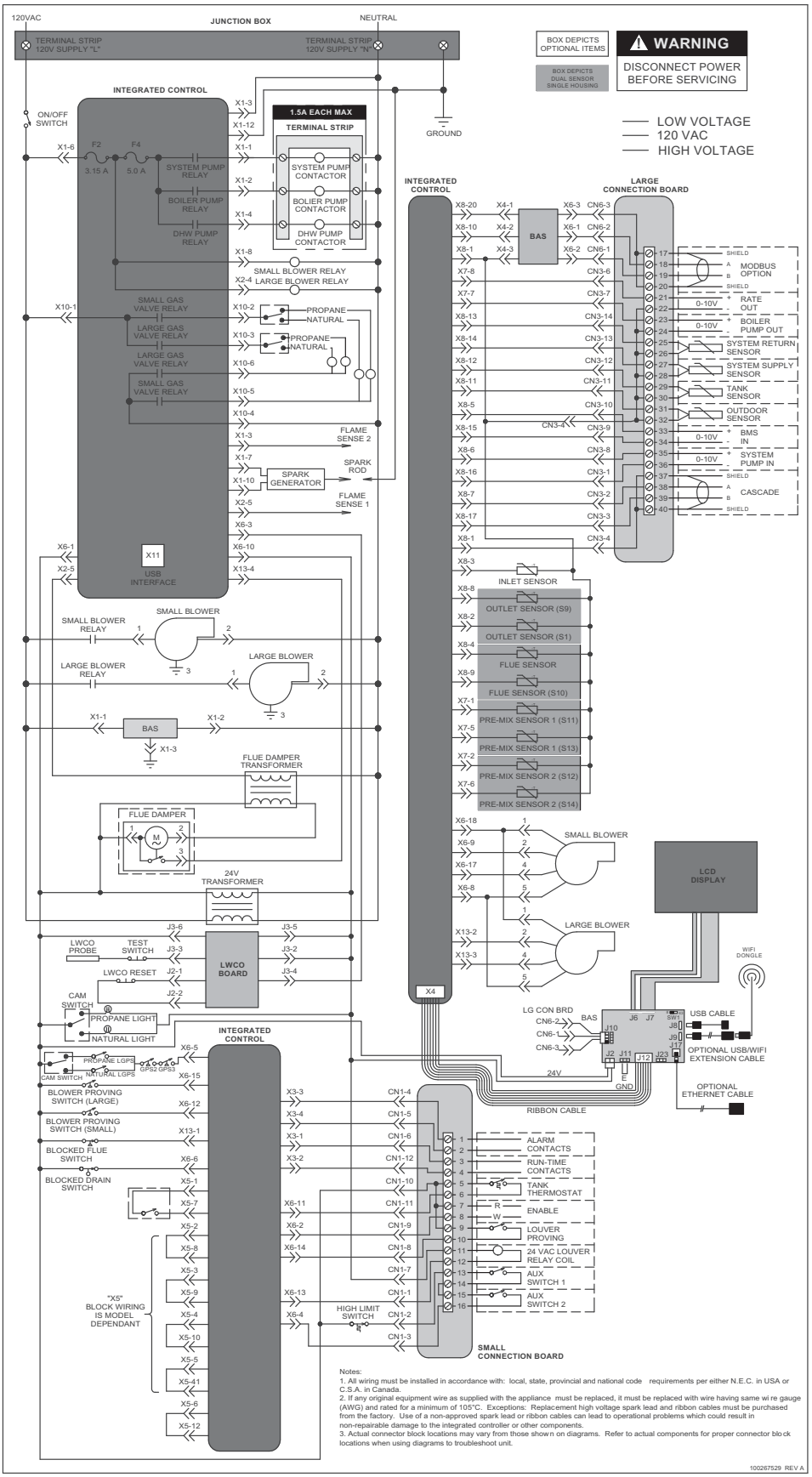
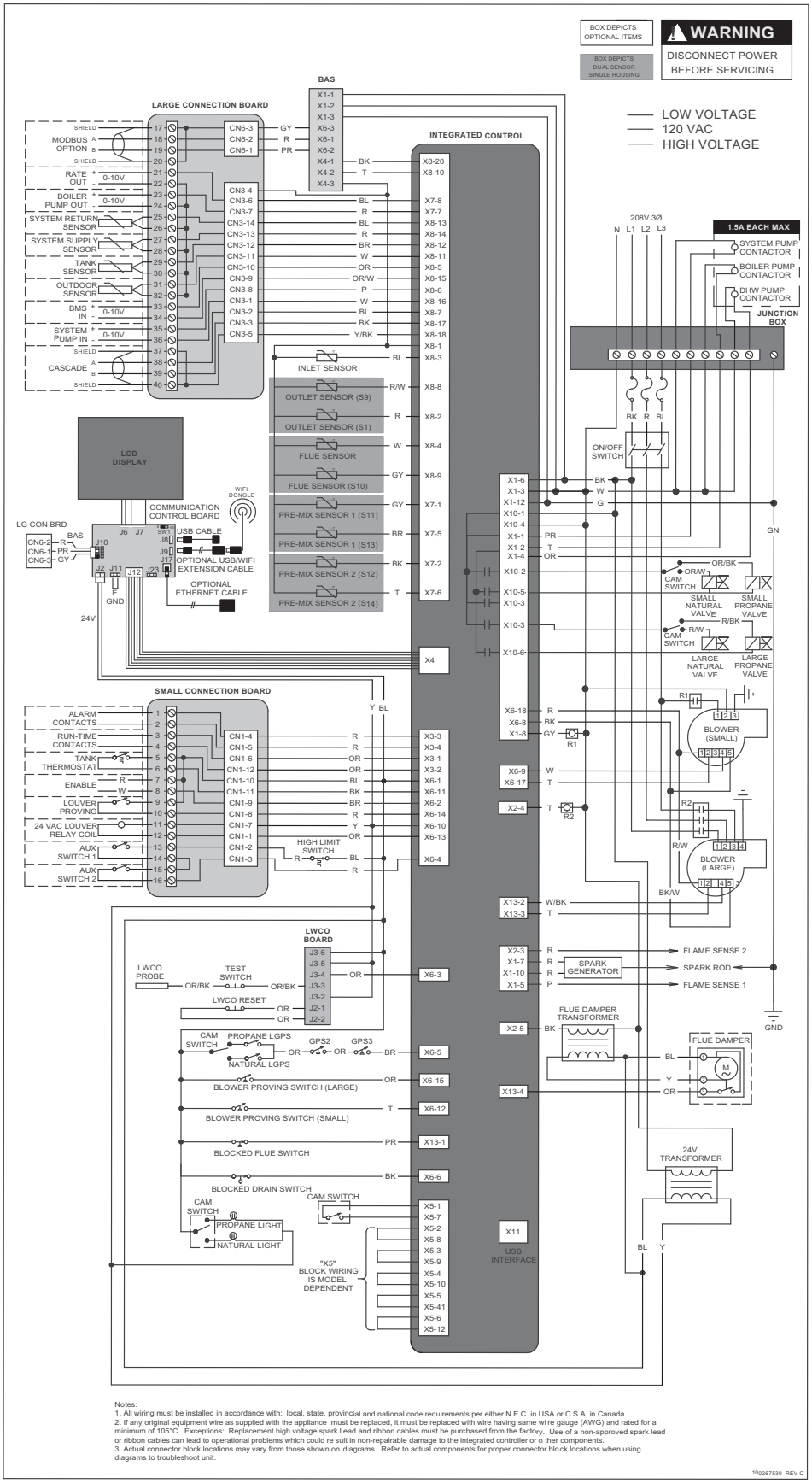
3 Diagrams

Figure 3-2 *Ladder Diagram_2.5 - 3.5 Models*



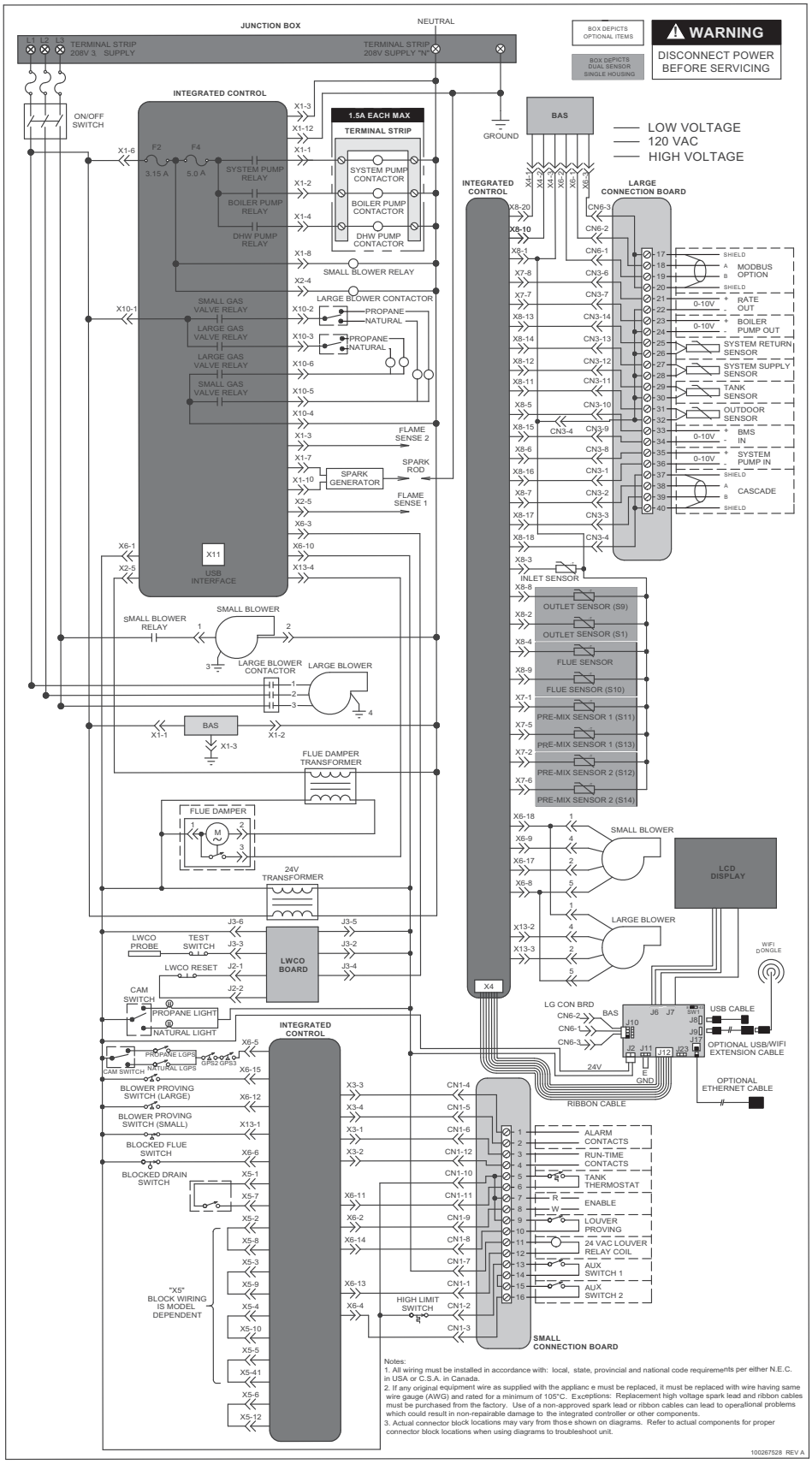
3 Diagrams *(continued)*

Figure 3-3 *Wiring Diagram_4.0 Model*



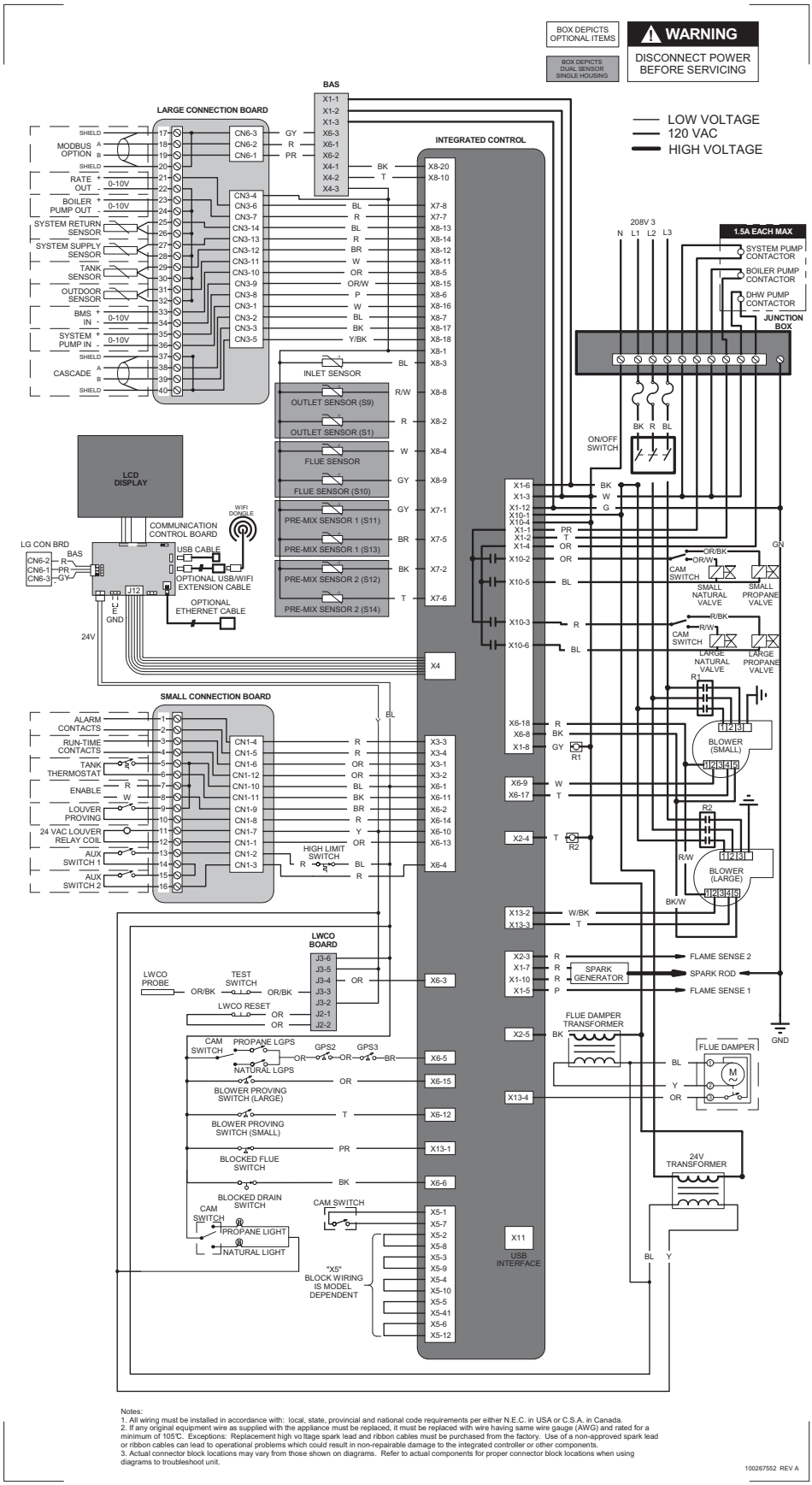
3 Diagrams

Figure 3-4 *Ladder Diagram_4.0 Model*



3 Diagrams *(continued)*

Figure 3-5 *Wiring Diagram_5.0 Model*



Notes:
1. All wiring must be installed in accordance with: local, state, provincial and national code requirements per either N.E.C. in USA or C.S.A. in Canada.
2. If any original equipment wire as supplied with the appliance must be replaced, it must be replaced with wire having same wire gauge (AWG) and rated for a minimum of 105ºC. Exceptions: Replacement high vo ltage spark lead and ribbon cables must be purchased from the factory. Use of a non-approved spark lead or ribbon cables can lead to operational problems which could result in non-repairable damage to the integrated controller or other components.
3. Actual connector block locations may vary from those shown on diagrams. Refer to actual components for proper connector block locations when using diagrams to troubleshoot unit.

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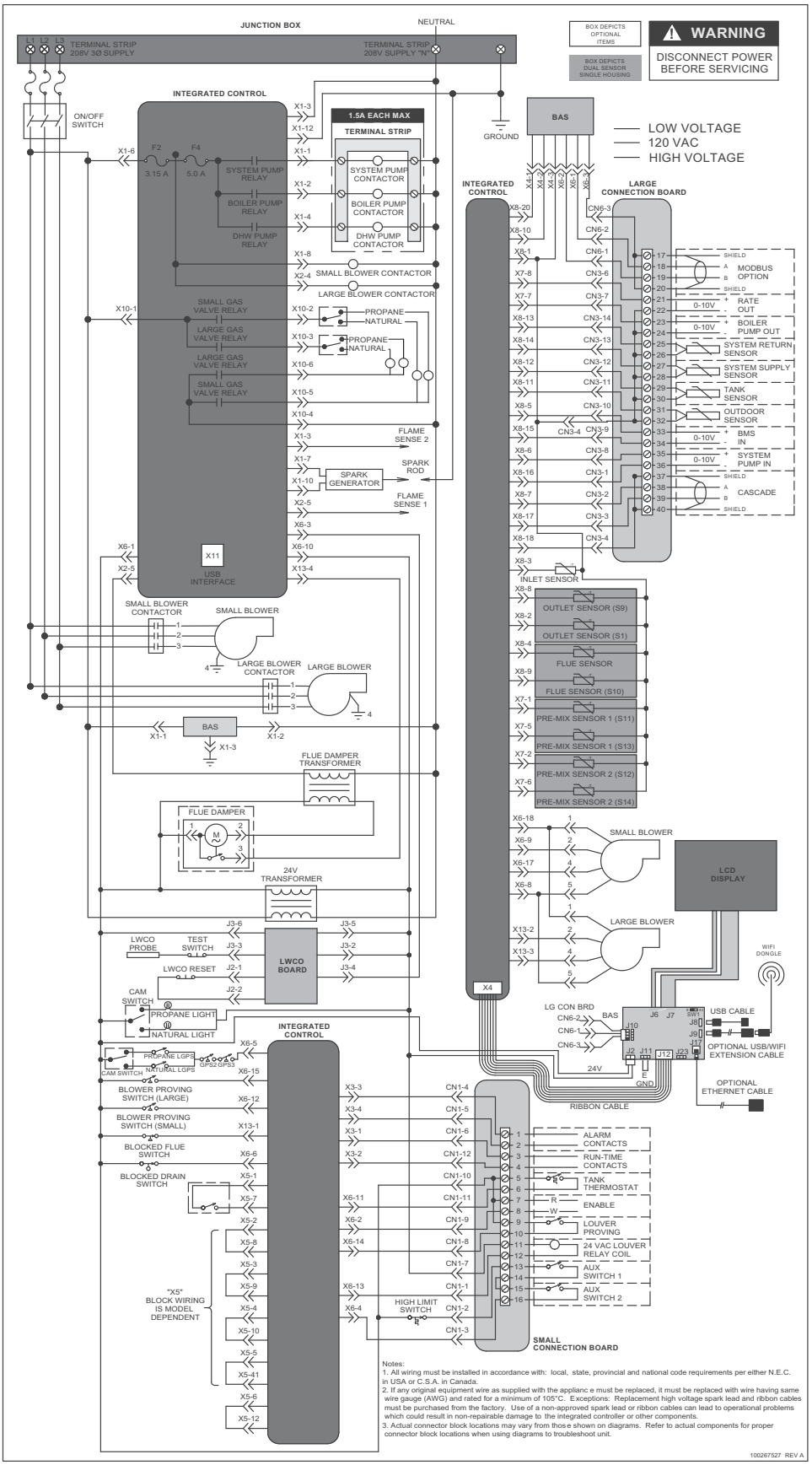
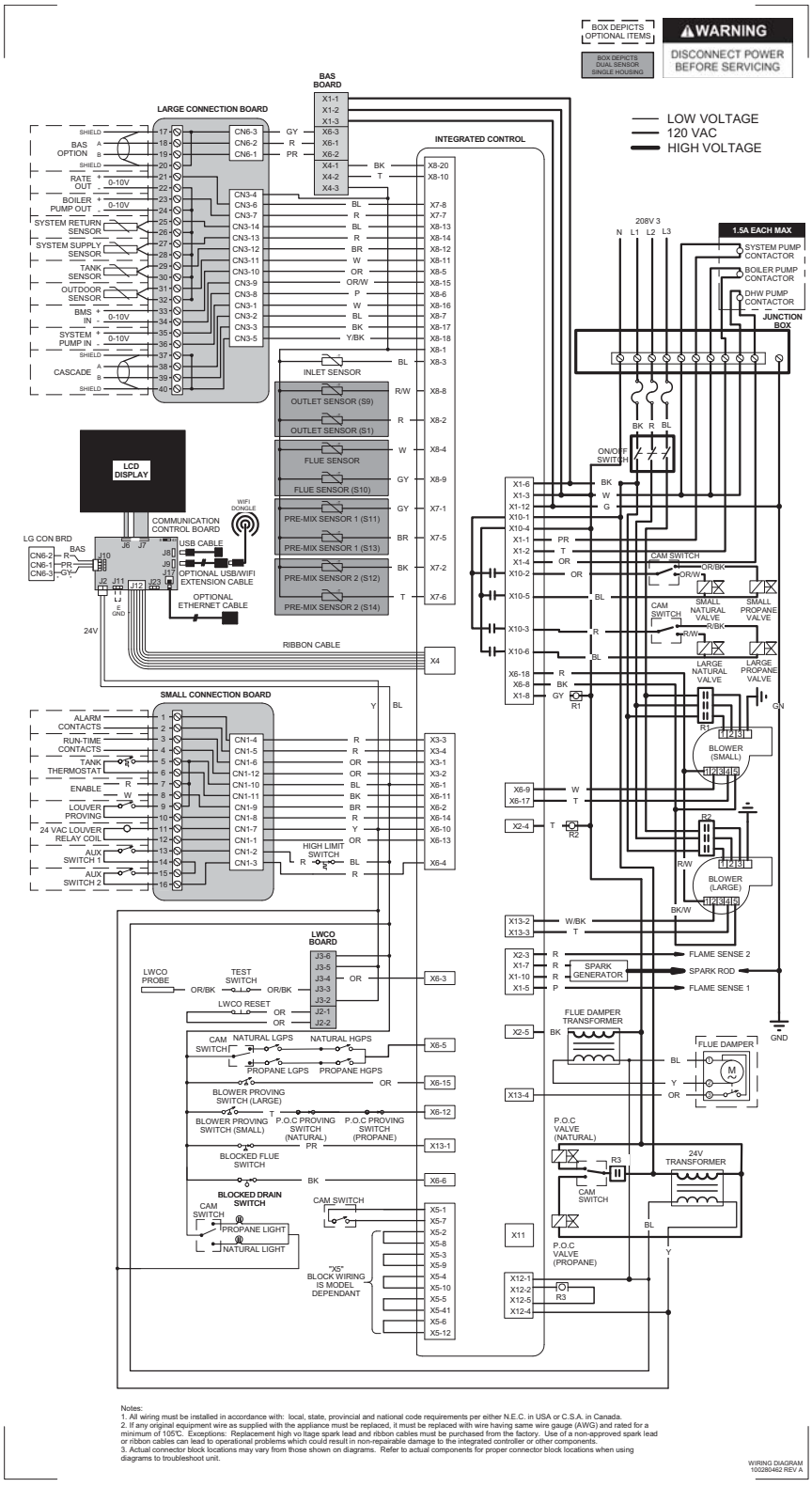
3 Diagrams

Figure 3-6 *Ladder Diagram_5.0 Model*



3 Diagrams *(continued)*

Figure 3-7 *Wiring Diagram_6.0 Model*



Notes:
1. All wiring must be installed in accordance with: local, state, provincial and national code requirements per either N.E.C. in USA or C.S.A. in Canada.
2. If any original equipment wire as supplied with the appliance must be replaced, it must be replaced with wire having same wire gauge (AWG) and rated for a minimum of 105°C. Exceptions: Replacement high vo ltage spark lead and ribbon cables must be purchased from the factory. Use of a non-approved spark lead or ribbon cables can lead to operational problems which could result in non-repairable damage to the integrated controller or other components.
3. Actual connector block locations may vary from those shown on diagrams. Refer to actual components for proper connector block locations when using diagrams to troubleshoot unit.

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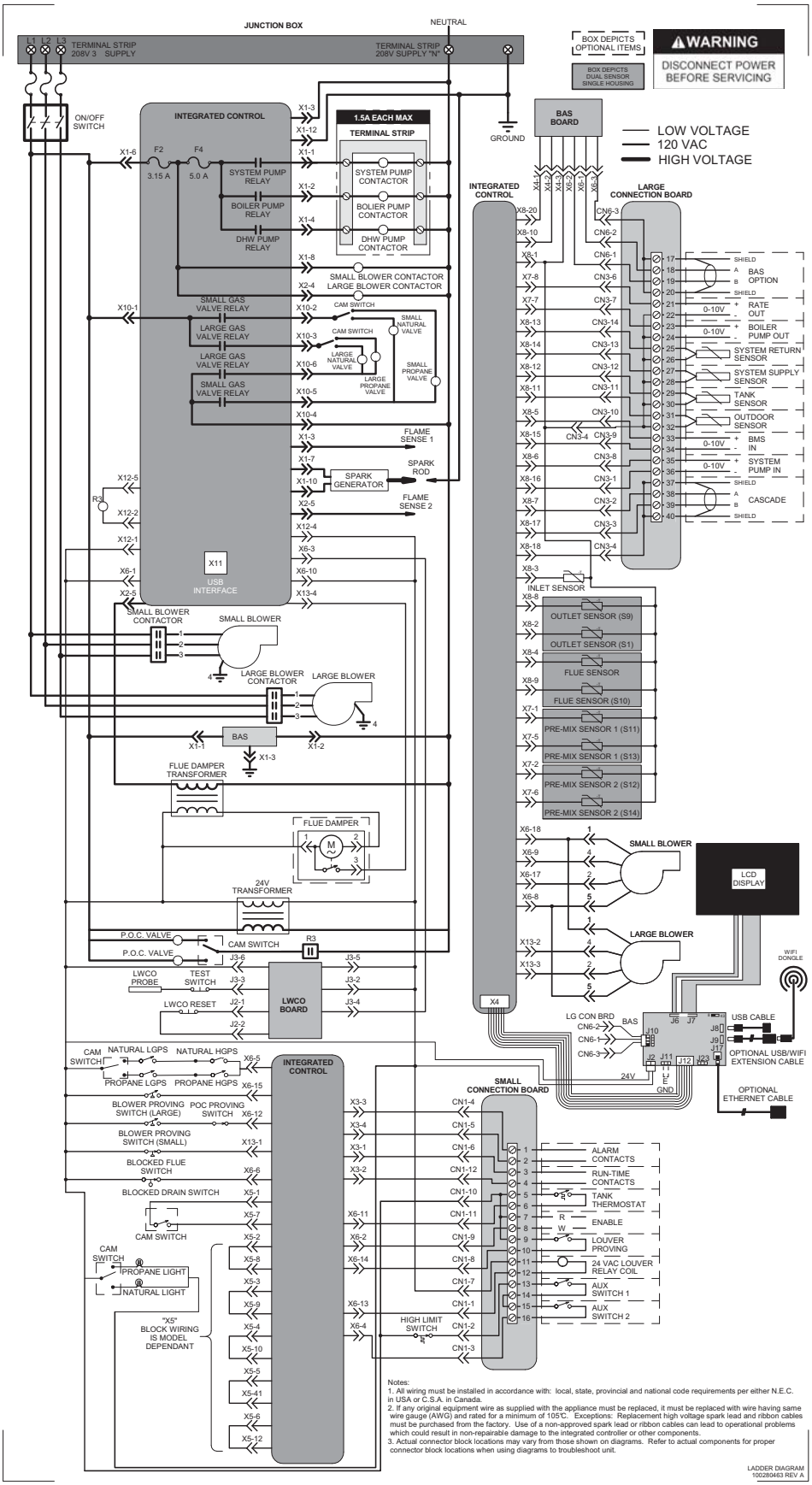
3 Diagrams

Figure 3-8 *Ladder Diagram_6.0 Model*



Notes

Revision Notes: *Revision A (ECO #C08841) initial release.*

Revision B (EC) #C10391) reflects the update of wiring and ladder diagrams on pages 12 and 13.

Revision C (ECO C11685) reflects the addition of models 4.0 and 5.0.

Revision D (Change #500001029) reflects the removal of Models 1.5 and 2.0 along with updates to the control.

Revision E (PCP #3000006270 / CN #500006404) reflects the addition of the 6.0 Btu model.

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