INSTALLATION INSTRUCTIONS

Ignition Control Replacement Kit RA161-2
For Use With
PGE/RPG Series
Gas Heating/Electric Cooling Package Unit

⚠ WARNING

Improper installation, adjustment, service, or maintenance can cause property damage, personal injury, or death. Consult a qualified installer, service agency, or the gas supplier for information or assistance.

Inspection of Shipment

If any damage to the contents of this kit is found at the time of delivery, proper notification should be made on the carrier's freight bill. Damage claims should be filed with the carrier at once. Claims of shortage should be filed with the manufacturer within 5 days.

Parts List

Qty	Description	Part Number
1	Ignition Control Board	46994-001
1	Adapter Plate (Hat Section)	44925-001
1	9-Pin x 6-Pin Adaptor Harness (Used when converting GCI-2)	44935-001
1	5-PIn Thermostat Harness (Used when converting either GCI-1 or GCI-2)	45573-001
1	6-Pin Adaptor Harness (Used when converting GCI-1)	45571-001
1	Flame Sensor Wire (white - 42" long)	W1242M2828A
1	Spark Electrode (3-Rod) (Used when converting GCI-1)	42446-001
1	Ignition Cable (High Voltage Supression)	41520-004
6	Screws - #8 x .50"	09049A009
4	Screws - #6-32 x .75" (Control to Hat Section)	09030A011

General

This kit contains the necessary parts to replace the Heatcraft GCI-1 (P/N 41521-001) and GCI-2 (P/N 43277-001) gas ignition control systems originally furnished on the gas heating/electric cooling package unit. The table below lists all model variations, including models using the GCI-2A ignition control. Read these installation instructions carefully and familiarize yourself with the package unit before installing any new components.

Model/Control Variations

Model	Original Ignition Control	Superceded By
(R)PGE10/12A*(-1,-2)	41521-001	RA161-2
(R)PGE10/12A*(-3,-4)	43277-001	RA161-2
(R)PGE10C*(-4)	43277-001	RA161-2
(R)PGE10/12B*(-1)	43277-001	RA161-2
(R)PGE10/12B*(-2)	44990-001 44832-001 45662-001	46994-001
(R)PGE10C*(-5)	44990-001 44832-001 45662-001	46994-001

Manufactured By
Allied Air Enterprises Inc.
A Lennox International Inc. Company
215 Metropolitan Drive
West Columbia, SC 29170

INSTALLATION

Unit Preparation

⚠ WARNING

Risk of electrical shock. Disconnect all remote power supplies before installing or servicing any portion of the system. Failure to disconnect power supplies can result in property damage, personal injury, or death.

1. Disconnect the main electrical power to the unit at the fuse box or service panel before proceeding with the conversion.
2. Remove the heating compartment access door panel.
3. Remove the control box cover.

⚠ CAUTION

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

4. Disconnect all wires and jack plugs from control board and remove board from unit.
5. If a jumper wire was used between the COOL and HEAT terminals on the original control, remove it and install it on the new control board.
6. Determine model of control board being replaced (GCI-1 or GCI-2). The model number is etched on the board. If the marking is illegible, then identify the board as follows:
   - **GCI-1** Board color is green. All terminal connections are .25" male quick connects.
   - **GCI-2** Board color is green. Uses a 9-pin jack plug and .25" male quick connects for thermostat connections.
   - **GCI-2A** Board color is tan. Uses a 6-pin jack plug and a 5-pin jack plug for thermostat connections. Physically smaller than GCI-1 or GCI-2 board. Retrofit kit is not required.
7. After determining the model of control board being replaced, choose the appropriate action from those provided below.
   - *Units Originally Equipped with GCI-1*

     Units originally equipped with GCI-1 controls used a 2-rod electrode that sensed the flame signal through the ignition cable. The new control requires a 3-rod electrode with a separate flame sense wire. It will be necessary to replace both the electrode and ignition cable. Both are included in this kit.

     Units originally equipped with GCI-1 controls had an **"Auxiliary Limit In"** connection on the board. This is the WHITE wire from the pressure switch to the existing GCI-1 board. **Remove and discard this wire.** The new control does not have an auxiliary limit input. If the auxiliary limit were to open, the control would respond as if the pressure switch had opened.

   - *Units Originally Equipped with GCI-2*

     Units originally equipped with GCI-2 controls used a 3-rod electrode that sensed the flame signal through a separate WHITE wire. One end of this wire is connected to the flame sense rod and the other is part of the 9-pin jack plug assembly. The new control has a dedicated connection on the board for flame sense and requires a different style wire assembly (included).

     Locate the WHITE flame sense wire. Disconnect from the electrode/flame sense assembly. Trace the wire to the 9-pin jack plug. Cut the wire as close to the plug as possible. Discard wire after removing.

     Units originally equipped with GCI-2 controls had an **"Auxiliary Limit In"** connection on the board. This is the WHITE wire from the pressure switch to the existing GCI-2 board. **Remove and discard this wire.** The new control does not have an auxiliary limit input. If the auxiliary limit were to open, the control would respond as if the pressure switch had opened.

Installation of Ignition Control Board

1. Mount the new ignition control board to the adapter plate using the four #6-32 x .75" screws.
2. Using the existing mounting holes (from the old ignition control board), attach the adapter plate to the vest panel using the four #8 x .50" sheet metal screws. The 5-pin connector should be at the top.
3. Plug the 5-pin thermostat jack plug into the control board. Connect the thermostat wires by matching wire colors.
4. When replacing a GCI-1 control, locate the 6-pin jack plug with four wires. Plug into the board and connect the following wires:

- ORANGE from rollout switch
- RED from gas valve
- TAN from auxiliary auto-reset limit
- YELLOW from pressure switch

5. Connect all remaining wires to the ignition control board.

6. Connect the flame sensor to the control board using the 42" white wire assembly. Route the wire through opening in back of control box.

7. Replace the control box cover.

8. Replace the heating compartment access door panel.

9. Reconnect the main electrical power to the unit.

After completing the conversion, cycle the heating and cooling systems on and off. Refer to the Installation Instructions or User's Information Manual shipped with the package unit for lighting and operating instructions.

OPERATION

The following applies to the unit after the new ignition control board has been installed.

Heating

Sequence of Operation

The following sequence describes the operation of the gas heat section.

1. When the thermostat calls for heat, the draft motor is energized by the 24-volt relay in the blower ignition control which closes the 24V contact to the draft motor.

2. When the speed of the draft motor reaches the proper RPM, the pressure switch closes to power the ignition control.

3. When PSW on blower/ignition control is energized, a pre-purge time is initiated (30 seconds nominal).

4. When pre-purge has expired, the blower/ignition control energizes the main gas valve and spark electrode/flame sensor for a period of 10 seconds. The blower/ignition control sparks for the full 10 seconds regardless of establishing flame and then looks for a signal from the electrode/flame sensor that a flame has been established.

5. Thirty seconds nominal after the initial trial for ignition, the circulation air blower starts. If the electrode/flame sensor does not sense that a flame has been established in the 10-second interval, the blower/ignition control opens the 24-volt contacts to the main gas valve, shutting it off.

6. The blower/ignition control is designed to repeat this "trial for ignition" a total of three times. If, at the end of the third trial, a flame still has not been established, then the blower/ignition control will try to light again 1 hour later. The 1 hour retry is indefinite. The blower/ignition control can be reset by interrupting the unit power or the thermostat circuit.

7. When the thermostat is satisfied, the draft motor and gas valve are de-energized. The blower motor continues to run for a short period after the furnace is shut down.

Blower Delay – Heating

The on/off delay of the circulating air blower is controlled by a timing circuit in the integrated blower/ignition control. Timings are not adjustable. Blower "ON" delay is 30 seconds after the burners are lit and blower "OFF" timing is 120 seconds after shutting down the burners.

Cooling

Upon each call for cool "Y", the combustion blower will operate for 10 seconds. This feature is designed to deter insect nesting in the vent pipe.

DIAGNOSTICS

The following blower/ignition control board LED codes will indicate normal or abnormal operations:

a)	**SLOW FLASH**	Normal operation, no call for heat
b)	**FAST FLASH**	Normal operation, call for heat
c)	**2 FLASH**	System lockout - failed to detect or sustain flame
d)	**3 FLASH**	Pressure switch open or closed, or auxiliary limit (located on blower housing) open
e)	**4 FLASH**	High limit or rollout switch open
f)	**5 FLASH**	Flame sensed and gas valve not energized
g)	**STEADY**	Internal failure (micro-controller failure; self-check)

Approximate Flashing Rate

SLOW	One flash per second
FAST	Two flashes per second
2 FLASH	Two flashes in 1 second with a 1-second pause
3 FLASH	Three flashes in 1.5 seconds with a 1-second pause
4 FLASH	Four flashes in 2 seconds with a 1-second pause
5 FLASH	Five flashes in 2.5 seconds with a 1-second pause