Gas Burner Manual Supplement

CG15 / CG25 / CG50 Optional Modulation Control Systems

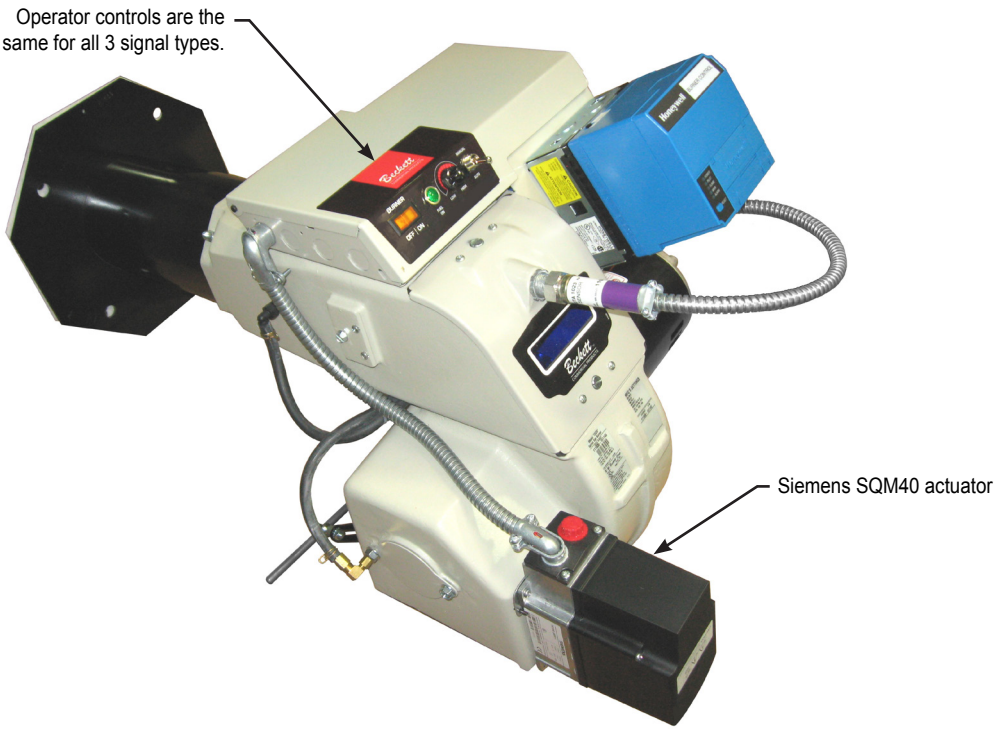
⚠ WARNING

Professional Installation and Service Required

Incorrect installation and mishandling of startup could lead to equipment malfunction and result in asphyxiation, explosion, or fire.

- This Gas Burner Supplement shall be used in conjunction with the Beckett 6104 BCG50 Installation Manual.
- This burner shall only be installed and prepared for startup by a qualified service technician who is trained and experienced in commercial gas burner system installation and operation.
- Carefully follow the wiring diagrams, control instruction sheets, flame safeguard sequence of operation, test procedures and all appliance manufacturer's directions that pertain to this installation.
- Perform all wiring in accordance with the National Electric Code ANSI/NFPA 70, Canada CSA C22.1 and all authorities having jurisdiction.
- If any of these items are not clear or are unavailable, call Beckett at 1-800-645-2876 for assistance.

Figure 1



I. Introduction

The CG15, CG25, and CG50 gas burners are available in three optional configurations that can be controlled by the three most popular modulation control signals: 135 Ohm, 4 – 20 mA, or 2 – 10 VDC. All three of these options use the Siemens SQM40 actuator for damper control. The SQM40 accepts any of those signals, so the difference between burners using any of those control signals is internal wiring of the burner, the control signal connections you make, and trim adjustments. When operating with any of these signals, the burner's firing rate responds in a direct proportional control manner, making them well suited for use with lead/lag or building automation system controls. The standard burner configuration for these modulation systems is with the junction box (shown in ***Figure 1***), but a panel enclosure is optionally available.

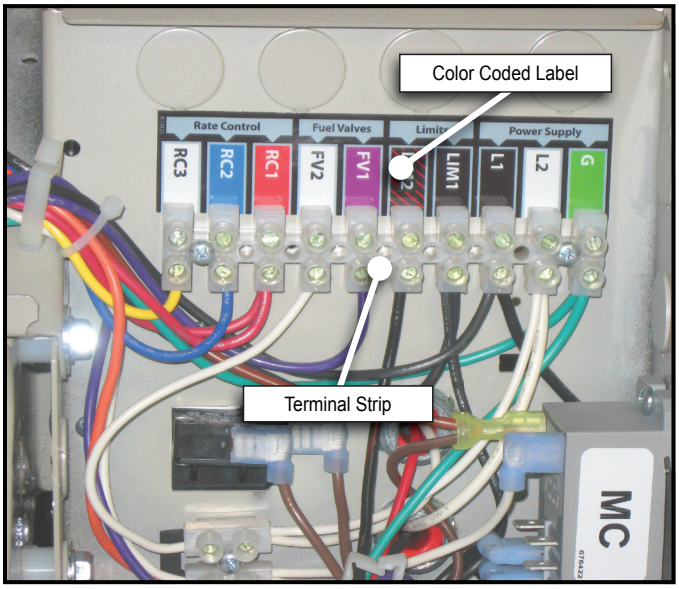
II. Wiring

⚠ WARNING **Electric Shock Hazard**

Turn off all electric power to the burner before servicing.

- If power is required for adjustments, use extreme care while working near live conductors.

Figure 2



For standard construction burners the junction box contains a color coded terminal strip showing connections for control system power (and blower motor power for 120 VAC blower motors), limit string connections, gas valve connections, and rate control connections. The terminal strip markings match the wiring diagram specific to your burner. All of your control connections are to be made to this terminal strip. For burners with blower motors operating at a voltage greater than 120 VAC the junction box will have a separate motor contactor section with its own power connections. Refer to the wiring diagram supplied with your burner for connection details.

III. Damper Motor Components

The damper motor positions for high fire and for low fire are set by adjustment of individual cams in a cam stack (Shown in ***Figure 3***). Only three of the cams in this motor are active, the red, black and green cams.

- The red cam limits the maximum position of the motor to the burner's high fire setting.
- The black cam limits the minimum position of the motor to the burner's low fire setting.
- The green cam could be used to set a third position, for example an off position for the damper. We do not use the green cam, but we recommend that it be set to the same position as the black cam.

Figure 3

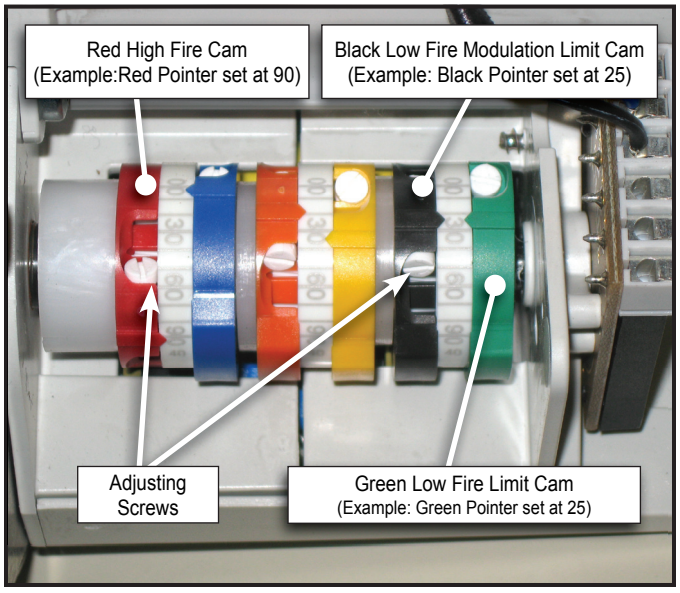
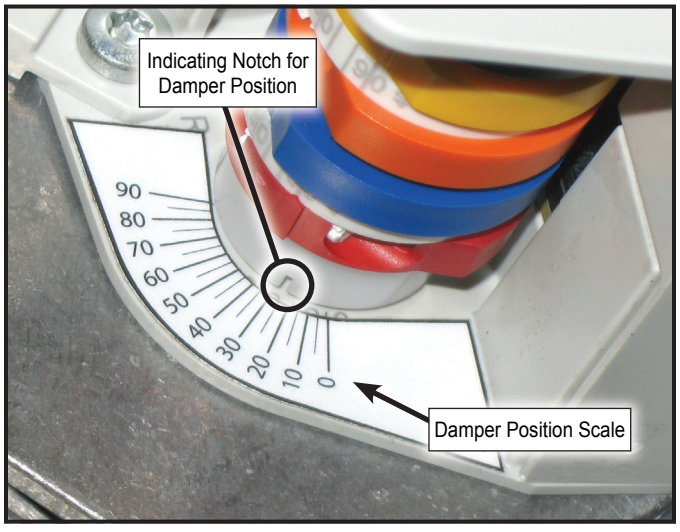


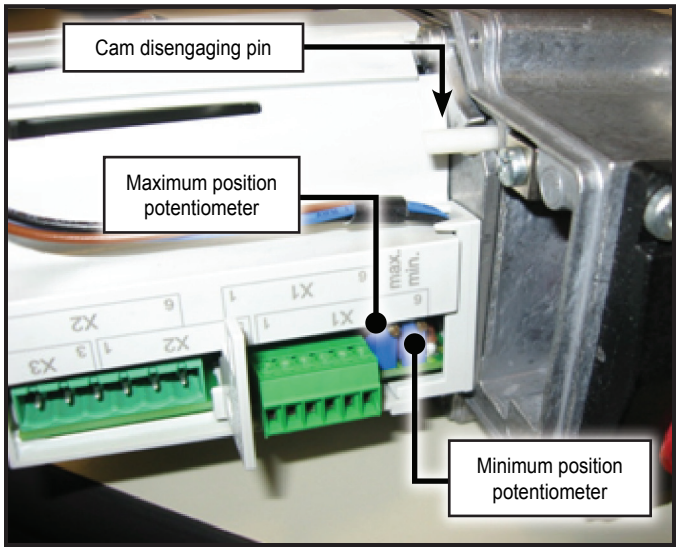
Figure 4



A notch in the white spacer at the base of the cam stack indicates the position of the damper by its alignment with the degree marker on the damper position label (Shown in ***Figure 4***). To set a cam, turn that cam's adjustment screw until the pointer on the cam aligns with the desired setting on the white spacer between cams.
The burner's damper can be manually rotated by disengaging the motor's gear train from the cam stack (Shown in ***Figure 5***).

1. Press in and towards the center of the motor on the cam disengaging pin. It will allow the damper to move while the cam remains stationary.
2. After adjusting the cams for high and low fire settings it is important to set the damper position between the adjusted limits. If the damper position is left outside the adjusted limits the actuator may not be engaged until the end of the first operating cycle.
3. **WARNING! Re-engage the pin by pushing it toward the side of the motor and allowing it to pop out to its original position, otherwise the motor will rotate without moving the damper**.

Figure 5



If the proportional controller signal does not fully open or close the damper to its high or low fire setting during modulation, or if modulation is not linear across the control range, it may be necessary to adjust the maximum or minimum position potentiometer in the damper motor (Shown in ***Figure 5***). See the SQM40 manual in the burner's literature package for detailed instructions. Note: Both potentiometers require 30 turns to span their range. Don't give up too soon.

IV. Adjustment Instructions

Modulating burners are provided with manual controls that allow set-up adjustment of the burner (***Figures 6 and 7***).

When the Manual / Auto switch is in the Manual position, control of the damper position is set by the firing rate potentiometer. When the Manual / Auto switch is in the Auto position the firing rate potentiometer has no effect on damper position, and the damper is controlled by the flame safeguard during start-up and shut-down and by the boiler's modulating control during the run interval.

For 135 OHM controls only, If the Manual/Auto switch is in the Manual position and the boiler pressure (or temperature) approaches the control limit set on the boiler's modulation control (or lead / lag or building automation system), that control will over-ride the manual control and drive damper position back to low. This feature can be used to limit the firing rate when warming up a cold boiler.

Figure 6

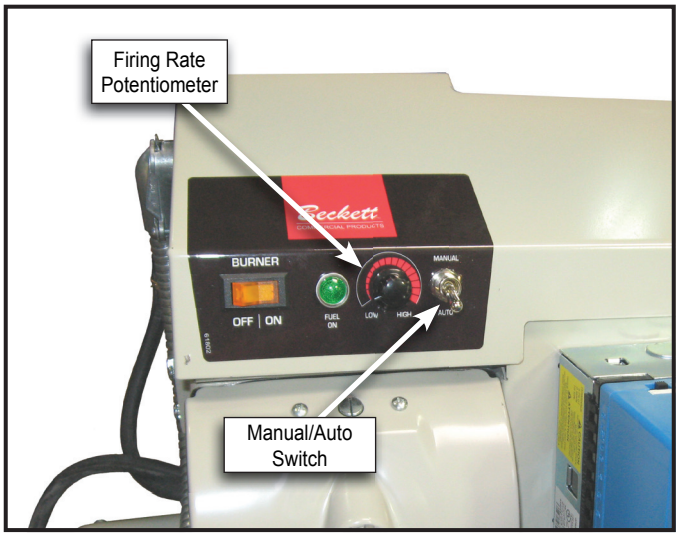
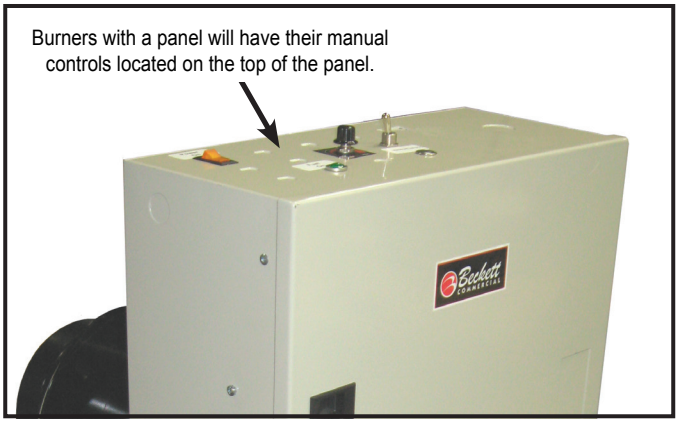


Figure 7



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