

Siemens SQN71 Conversion Kit

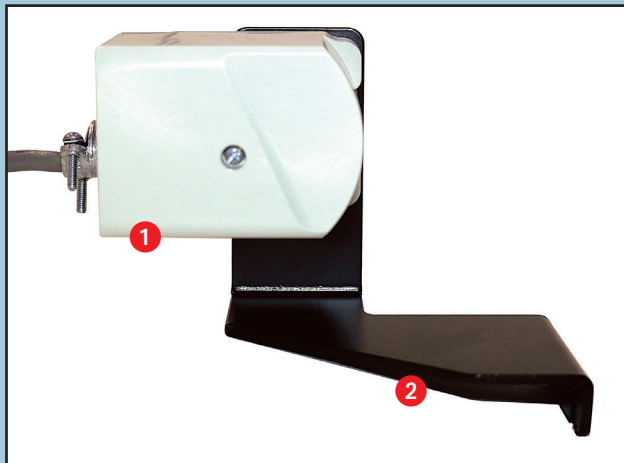
for Carlin Burner Models
701CRD, 702CRD, 801CRD
and 1050FFD (firing <20GPH)

**A Carlin Model 70200 Oil Primary Control
is Required for Proper Operation**

Installation Instructions and Settings

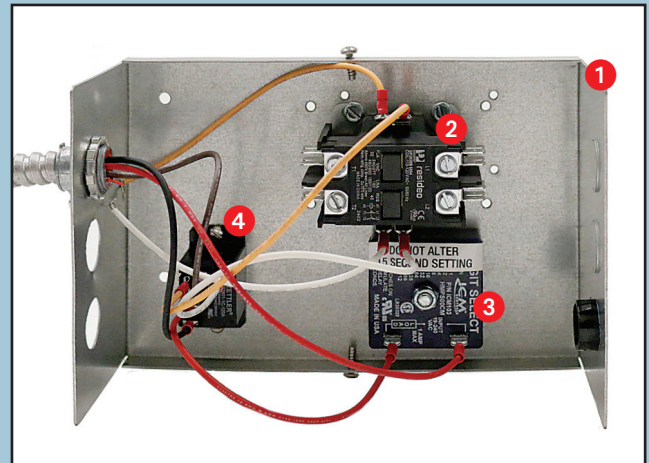
Part Number **51317S2**

Kit Includes



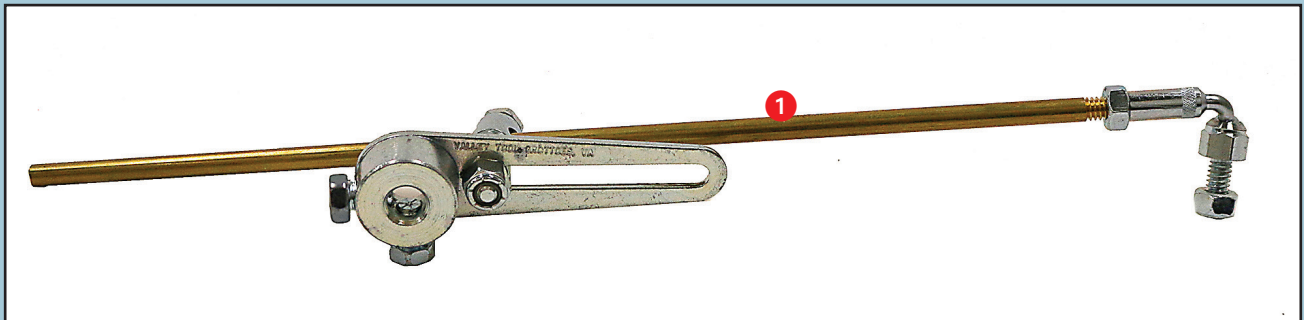
51317S1 Assembly

- ① Siemens SQN71
- ② Mounting Bracket



35840S1 Assembly

- ① Motor Contactor Enclosure
- ② Motor Contactor
- ③ 15 sec. Time Delay
- ④ Motor Relay



51541S Assembly

- ① Damper Motor Linkage Arm with Swivel



WARNING

Electrical shock hazard. To prevent electrical shock, death or equipment damage, disconnect power supply before installing or servicing kit. Only qualified personnel may install or service this kit in accordance with local codes and ordinances. Read instructions completely before proceeding.



CAUTION

To prevent serious burns, furnace should be thoroughly cooled before installing or servicing kit.

A Carlin Model 70200 Oil Primary Control is Required for Proper Operation

Installing Hardware and Wiring

NOTICE: Review all of the instructions before proceeding with installation.

- 1 Disconnect and verify that there is no power to the burner circuit or motor contactor.
- 2 In your existing motor contactor enclosure, disconnect all wiring to the motor contactor and contactor coil. If there is an oil valve relay in the existing enclosure, disconnect and remove those wires.
- 3 Remove any wiring that is supplied from the primary control from the existing motor contactor enclosure.
- 4 Remove the mounting bracket that holds the existing contactor enclosure from the burner chassis. Remove the enclosure from the bracket, reserving the two flat head screws that will be used to install the new enclosure (See Fig. 1).
- 5 Install new enclosure (35840S1 assembly) onto the bracket and then reinstall to the burner chassis.

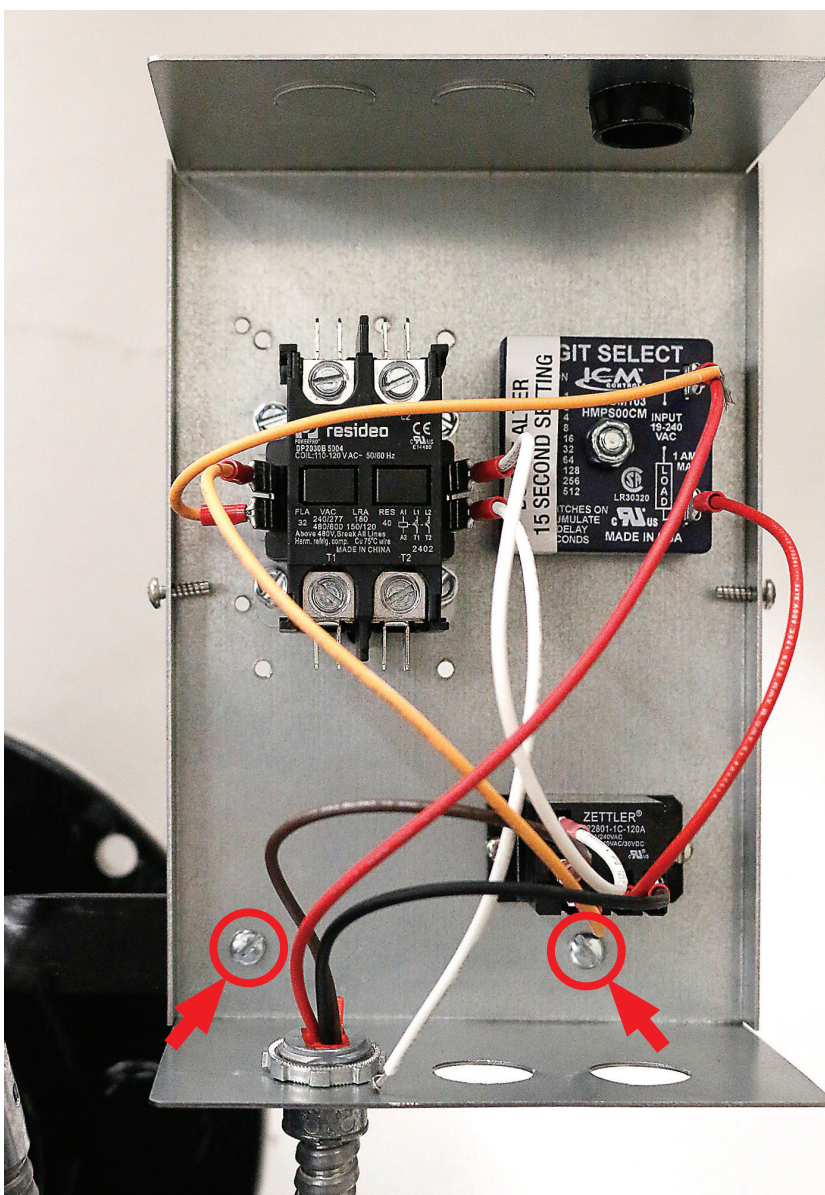


FIG. 1
Installed Motor Contactor Enclosure

- 6 Remove the Honeywell damper motor from the burner (including its wiring from the oil valve junction box). Install the Siemens damper motor/ bracket (51317S1 assembly) by starting the two screws supplied in the burner chassis then slide the bracket slots over them and tighten (see Fig. 2).

IF THE BURNER DOES NOT HAVE A 70200 OIL PRIMARY CONTROL, REPLACE THE EXISTING CONTROL WITH A CARLIN 70200 OIL PRIMARY CONTROL.

- 7 Install the wiring whip from the new contactor enclosure and the wiring from the Siemens motor into the oil valve junction box, and wire referring to wiring diagram CC7C1 provided (see page 6).
- 8 Remove existing linkage and replace with the new linkage assembly (51541S) provided. Ensure that the slide linkage portion (connected to damper motor) is installed tightly to the Siemens motor on the shaft (See Figs. 3 and 4). Disengage pin ① (see SQN71 Reference Guide on page 5) so motor shaft moves freely. Ensure that when the air shutter is fully open that the red cam ④ is at 90% on the damper positioning scale ③. If not, use the 7/16" bolt on the shaft to adjust. Ensure that the air shutter is fully closed when the blue cam ⑤ is at 0% on the damper positioning scale ③.

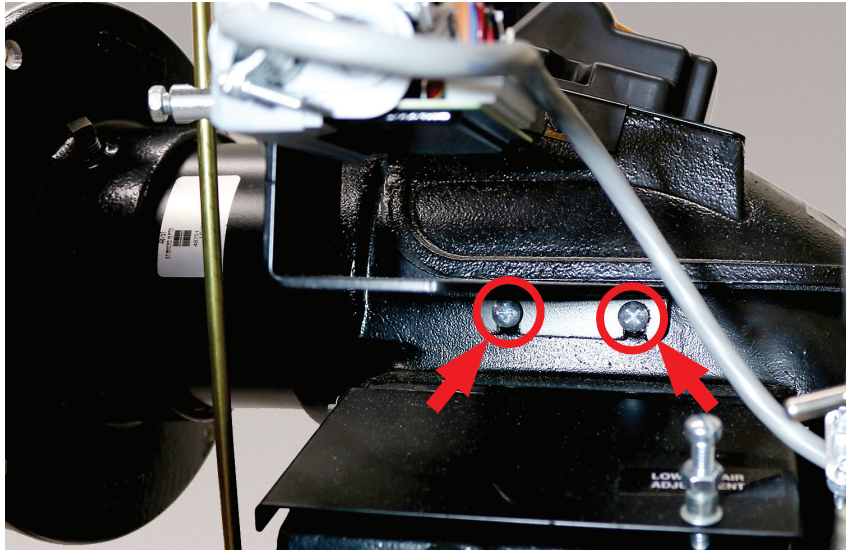


FIG. 2
Installed Siemens Damper Motor/Bracket Assembly

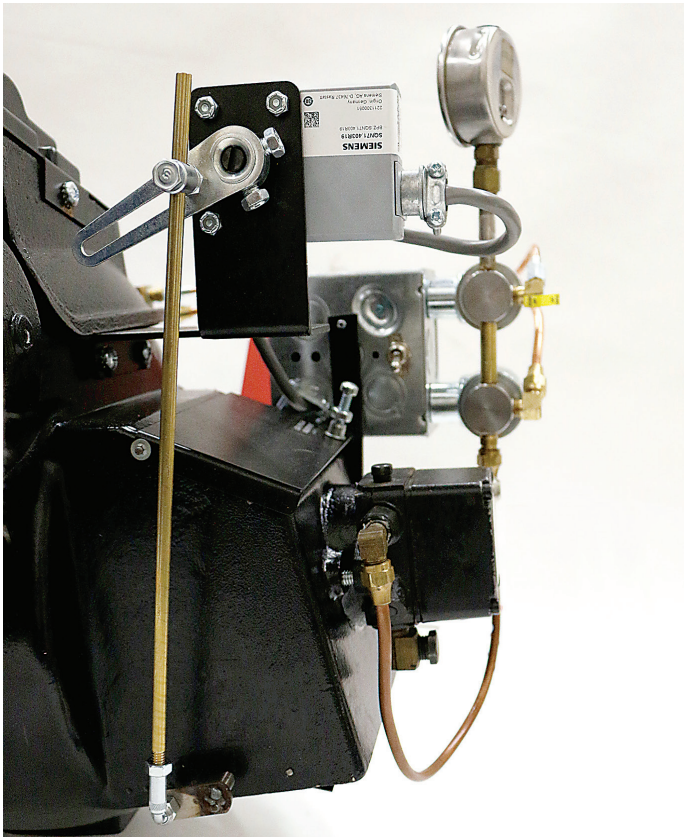


FIG. 3
Linkage position (roughly 8 o'clock) with Blue Cam @ 0% Closed Air Shutter

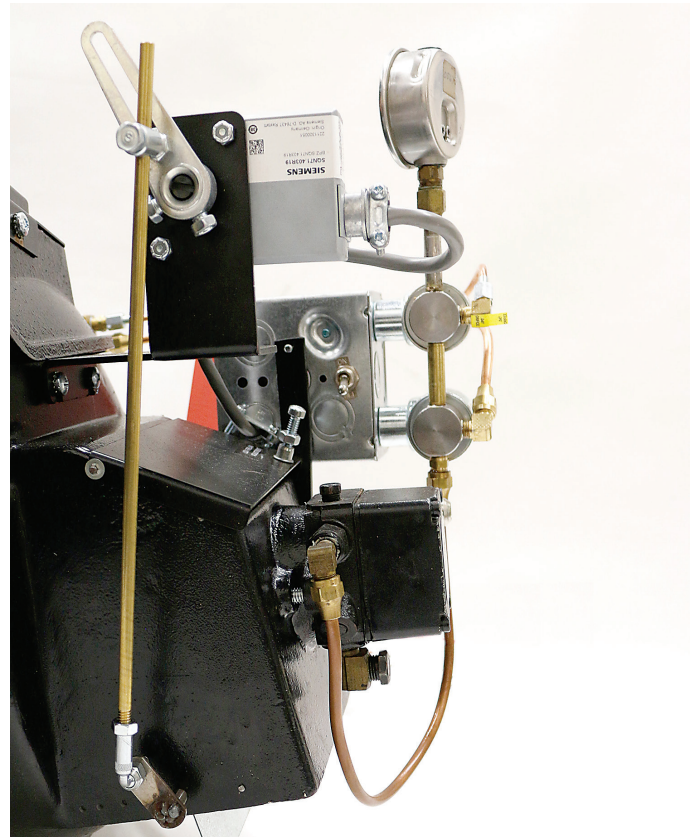


FIG. 4
Linkage position (roughly 11 o'clock) with Red Cam @ 90% Open Air Shutter

Setting Low Fire / Damper Motor Cam Settings

See Siemens SQN71 Reference Guide on page 5.

Adjusting While Burner is Off

- Using a small flat head screw driver, adjust the Blue Cam ⑤ on the Siemens damper motor to the appropriate settings.

801CRD and 1050FFD (under 20gph)

Set the Blue Cam at 0.

702/701CRD

Use the OEM Burner Setup Tables for low fire air starting points. If the appliance is not listed in the OEM guide, use the settings in Table 1.

- After setting the blue cam ⑤ Disengage the damper motor by pressing in the white pin ①.
- Rotate the motor beyond the desired setting using the scale ③ behind the Red Cam ④.
- Re-engage the motor using the white pin ①.
- When the burner is started, the damper will move to the adjusted position during Pre-Purge (valve delay). Use the scale ③ behind the Red Cam ④ to view your new setting.

Adjusting While Burner is Running

- With the burner running, set the Blue Cam to the number that matches the desired low fire air setting.

801 CRD and 1050 FFD (under 20 gph)

Set the Blue Cam at 0.

702/701 CRD

Use the OEM Burner Set Up Tables for low fire air starting points. If the appliance is not listed in the OEM guide, use the settings in Table 1.

- Drive the burner to high-fire (15 sec delay) then back to low fire. When the damper motor drives back to low fire the arm will stop at the desired setting. Use the scale ② behind the Red Cam ③ to view your new setting.

Orange Transition Cam

The Orange Cam ⑥ on the Siemens Modulating motor adjusts the transition point from low fire to high fire and vice versa. The transition point will either energize or de-energize the high fire solenoid located in the oil pump.

Typically, the Orange Cam ⑥ would be set half way between the low fire (Blue Cam) setting and high fire (Red Cam) setting. This may need to change depending on the appliance the burner firing in and the firing rate. If the low fire air setting is changed using the Blue Cam ⑤. It may be necessary to adjust the Orange Transition Cam ⑥.

If the transition between low fire and high fire is too rich (energizes solenoid too soon) causing a smokey transition or, if it is too lean (energizing solenoid too late) causing a loss of flame, the Orange Cam ⑥ can be adjusted using a small screwdriver.

A lower number on the scale will energize the valve sooner. Higher number will transition later.

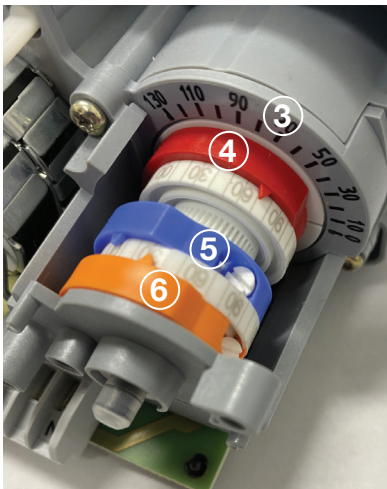
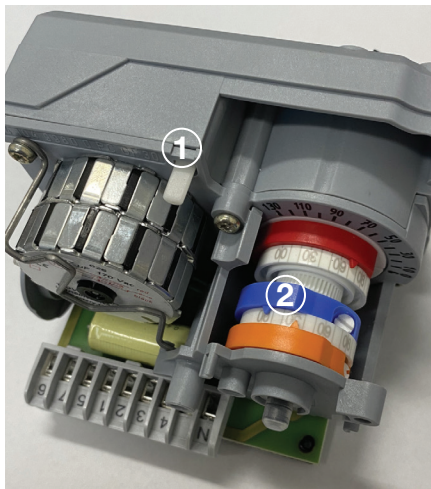
TABLE 1
SIEMENS BLUE CAM SETTINGS

Low Fire Air Setting	Siemens Blue Cam Setting
1/16"	7
1/8"	10
3/16"	12
1/4"	15
5/16"	20
3/8"	25
7/16"	27
1/2"	30
8/16"	35
5/8"	37
11/16"	39
3/4"	40

Sequence of Operation

- On a "Call for Heat", the 70200 will power the motor contactor starting the burner motor.
- After pre-purge the primary control will power the violet wire energizing the low fire solenoid(s) and the 15-second high fire delay timer.
- If there is a call for high fire, the Siemens motor will drive to high fire air and the Orange Cam at its current setting will energize the high fire solenoid. Adjust this as necessary for a smooth transition between low and high fire.
- Once the burner is in high fire, ensure that motor is not binding and trying to go past 90% on the Red Cam. If this occurs, adjust linkage (see step 8, page 3).
- If there is not a constant power supplied to L1 on the burner primary at the end of the call for heat, the burner will shut off. On the next call for heat during pre-purge, the Siemens motor will drive back to the low fire air Blue Cam setting.

SQN71 Reference Guide

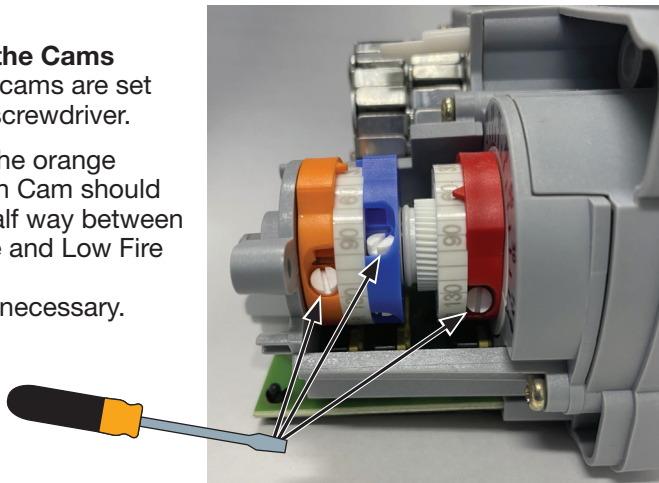


Reference Number	Description
1	Disengaging Pin (In the engaged position)
2	Cam Stack
3	Damper Position Scale (Damper position indicated by slit in the white ring)
4	Red Cam (High-Fire)
5	Blue Cam (Low-Fire)
6	Transition Cam (Shares adjustment scale with Blue Cam)

Setting the Cams

All three cams are set using a screwdriver.

NOTE: The orange Transition Cam should be set half way between High Fire and Low Fire to start. Adjust if necessary.



Replacing Cover

Before putting on the actuator cover, be sure the disengaging pin has been engaged.

SQN71 Motor Contactor Wiring

