

PILOT AND GAS CONTROL OPTIONS

PILOT IGNITION SYSTEMS

Models SCE, SSCBL, XE and PGBL only

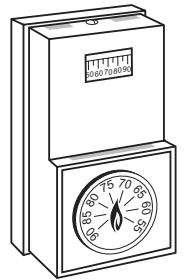
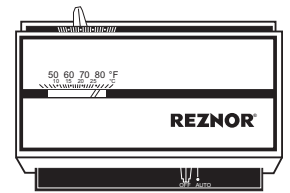
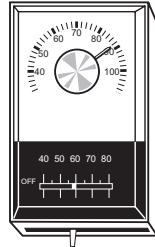
- OPTION AH1** • **MANUAL PILOT:** Manual match-lit pilot. Pilot remains on 100% of time until pilot gas flow is shut off. Certified for use with natural or propane gas. Not recommended for makeup air applications. (Moedl XE only)
- OPTION AH2** • **INTERMITTENT SPARK PILOT:** Automatic lighting of pilot with an electronic spark on a call for heat. Pilot gas flow is shut off between heat cycles. In the U.S., Option AH2 is approved for use with natural gas only on both indoor units only. In Canada, Option AH2 is approved for use with natural gas only on both indoor and outdoor units.
- OPTION AH3** • **INTERMITTENT SPARK PILOT WITH TIMED LOCKOUT:** Automatic lighting of pilot with an electronic spark on a call for heat. Pilot gas flow is shut off between heat cycles. This system also incorporates a lockout device which stops gas flow to the pilot if the pilot fails to light in 120 seconds. Reset of lockout requires manual interruption of the thermostat cycle. Approved for use with natural or propane gas.

GAS CONTROL SYSTEMS

(Available with either natural or propane unless noted otherwise.)

HEATING APPLICATION OPTIONS

- AG1** • **ONE-STAGE CONTROL:** Single-stage gas valve which cycles on at 100% fire on a call for heat by a remote single-stage thermostat. Thermostat is not included.
- AG10** • **ONE-STAGE CONTROL for Models PGBL and SSCBL Units with one, two or three furnace sections:** Each furnace is equipped with single-stage gas valve and relay. Each furnace cycles on at 100% fire on call for heat from remote single-stage thermostat. Thermostat is included. (Illustration, right)
- AG2** • **TWO-STAGE CONTROL:** Two-stage gas valve which fires at 100% or 50%, as required, on call by a remote two-stage thermostat. Thermostat is not included.
- AG11** • **TWO-STAGE HEATING CONTROL for Models PGBL and SSCBL Units with one, two or three furnaces:** Each furnace is equipped with a two-stage gas valve and relay. Two-stage gas valves fire at 100% or 50% as required, on call from remote two-stage thermostat. Thermostat is included. (Illustration, right)
- AG7** • **ELECTRONIC MODULATION (60°-85°F) for Models SCE, SSCBL, XE and PGBL only:** Solid state control system, providing close temperature control through related manifold pressure. On a call for heat from a remote electronic thermostat, controls modulate between 50% and 100%. Remote thermostat is included. (See amplifier, page 18) (Illustration, right)



MAKEUP AIR APPLICATION OPTIONS

Models SCE, SSCBL, XE and PGBL only

(For ductstat control illustrations Gas Control Section)

- AG3** • **TWO-STAGE CONTROL FROM DUCTSTAT (60°-110°F):** Two-stage gas valve which fires at 100% or 50% as required, on call from a unit-mounted, two-stage ductstat. **For PGBL AND SSCBL units with two furnace sections,** Option AG3 includes a two-stage valve on each furnace and two ductstats which provide for **FOUR-STAGE CONTROL**. **For PGBL and SSCBL units with three furnace sections,** Option AG3 includes a two-stage valve on each furnace and three ductstats which provide for **SIX-STAGE CONTROL**.*
- AG15** • **ELECTRONIC TWO-STAGE CONTROL USING DUCT-STAT (50°-130°F) WITH REMOTE TEMPERATURE ADJUSTMENT:** Same type of control as Option AG3, but the setpoint of the ductstat is adjustable from a remote temperature-selector. Includes factory-installed sensor and field-installed temperature-selector module with an adjustable stage-adder module. **For Model PGBL and SSCBL packages with two furnace sections,** Option AG15 includes a two-stage valve on each furnace and ductstat which provides for **FOUR-STAGE CONTROL**. Includes factory-installed sensor and field-installed remote temperature-selector module with three adjustable stage-
- adder modules. **For PGBL and SSCBL-packages with three furnace sections,** Option AG15 includes a two-stage valve on each furnace and ductstat which provides for **SIX-STAGE CONTROL**. Includes factory-installed sensor and field-installed remote temperature-selector module with five adjustable stage-adder modules.*
- AG16** • **ELECTRONIC TWO-STAGE CONTROL USING DUCT-STAT (50°-130°F) WITH REMOTE TEMPERATURE ADJUSTMENT AND TEMPERATURE DISPLAY:** Same as Option AG15, plus a digital (liquid crystal) temperature-display module that provides selectable set point and continuous display of sensor reading.*
- AG4** • **TWO-STAGE CONTROL FOR PGBL and SSCBL UNITS WITH TWO (2) FURNACES:** Each furnace is equipped with a single-stage gas valve. The gas valves are staged by a unit-mounted, two-stage ductstat (60°-110°F). The furnace nearest the blower is staged first and the downstream furnace is staged second. Applicable only to packaged systems with two furnace sections.*

***APPLICATION NOTE:** If the installation of a packaged unit with more than one furnace section requires that any of the controls in this table be used in conjunction with an override thermostat, additional factory-installed relays are required. Since this application is not covered by "normal" control sequence, the additional relays (Option BG2) must be specified.



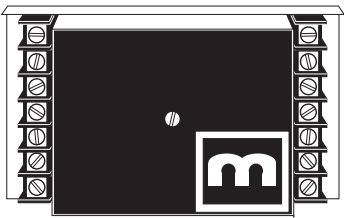
GAS CONTROL OPTIONS

MAKEUP AIR APPLICATION OPTIONS (cont'd)

Models SCE, SSCBL, XE and PGBL only


- AG17 • ELECTRONIC TWO-STAGE CONTROL FOR PGBL and SSCBL WITH TWO (2) FURNACE SECTIONS USING A DUCTSTAT (50°-130°F) WITH REMOTE TEMPERATURE ADJUSTMENT:** Same type of control as Option AG4, but the ductstat has a remote temperature selector. Includes factory-installed sensor and field-installed remote temperature-selector module with an adjustable stage-adder module.*
- AG18 • ELECTRONIC TWO-STAGE CONTROL FOR PGBL and SSCBL WITH TWO (2) FURNACE SECTIONS USING A DUCTSTAT (50°-130°F) WITH REMOTE TEMPERATURE ADJUSTMENT AND TEMPERATURE DISPLAY:** Same as Option AG17, plus a digital (liquid crystal) temperature-display module that provides selectable set point display and continuous display of sensor reading.*
- AG5 • THREE-STAGE CONTROL FOR PGBL and SSCBL UNITS WITH THREE (3) FURNACES:** Each furnace is equipped with a single-stage gas valve. The gas valves are staged in sequence by two (2) unit-mounted, two-stage ductstats (60°-110°F). The furnace nearest the blower is staged first, the center furnace is staged second, and the downstream furnace is staged last. Applicable only to packaged systems with three furnace sections.*
- AG19 • ELECTRONIC THREE-STAGE CONTROL FOR PGBL and SSCBL WITH THREE (3) FURNACE SECTIONS USING A DUCTSTAT (50°-130°F) WITH REMOTE TEMPERATURE ADJUSTMENT:** Same type of control as Option AG5, but the ductstat has a remote temperature selector. Includes factory-installed sensor and field-installed remote temperature-selector module with two adjustable stage-adder modules.*
- AG20 • ELECTRONIC THREE-STAGE CONTROL FOR PGBL and SSCBL WITH THREE (3) FURNACE SECTIONS USING A DUCTSTAT (50°-130°F) WITH REMOTE TEMPERATURE ADJUSTMENT AND TEMPERATURE DISPLAY:** Same as Option AG19, plus a digital (liquid crystal) temperature-display module that provides selectable set point and continuous display of sensor reading.*
- AG6 • MECHANICAL MODULATION (50°-100°F):** Nonelectric control system, hydraulic capillary-actuated. Upon sensing a requirement for heat, controls modulate between 50% and 100%. (Available with natural and propane gas on Model SSCBL/PGBL Sizes 400-800; available with propane gas on Model Series XE Sizes 75-400; available with natural gas on Model Series XE Sizes 75-350.)
- AG13 • MECHANICAL MODULATION (50°-100°F) WITH FULL FIRE BYPASS:** Mechanical modulation control is the same as Option AG6, except that the unit is also equipped with a parallel single-stage valve and relay. On call from a remote override thermostat, the single-stage gas valve cycles on at 100% fire. Override thermostat is not included. (Available with natural gas on Model Series RG/RP/RGB/RPB Sizes 75-350 and Model SSCBL Sizes 500, 600, and 700; available with propane gas on Model SSCBL/PGBL Sizes 400-800.)
- AG8 • ELECTRONIC MODULATION (55°-90°F) WITH DUCT-STAT:** Solid state control system, providing close temperature control through regulated manifold pressure. On a call for heat from a unit-mounted ductstat, controls modulate between 50% and 100%, as required. Models SSCBL and PGBL with two or three furnace sections include an outside air controller. When setpoint temperature is reached, one or two furnaces will be shut down providing 25% minimum system firing rate with two furnaces and 16-2/3% minimum with three furnaces. A room override thermostat (Option CL9) is available for use with this system.
- AG9 • ELECTRONIC MODULATION WITH DUCTSTAT AND REMOTE TEMPERATURE SELECTION:** Control is the same as Option AG8 except that the duct sensor setpoint may be reset from a remote selector. Models SSCBL and PGBL with two or three furnace sections include an outside air controller. When setpoint temperature is reached, one or two furnaces will be shut down providing 25%

Options AG7, AG8, AG9

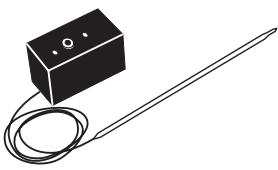


Amplifier (Maxitrol Model varies by Option and number of furnace sections)

Maxitrol A200 Signal Conditioner used in Options AG21 and AG40

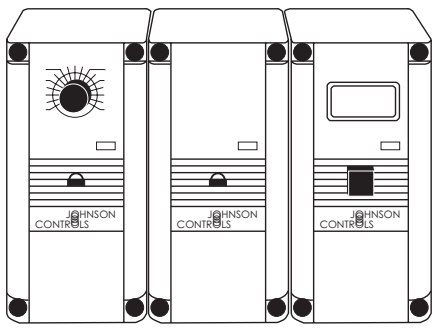


Options AG3, AG4, AG5



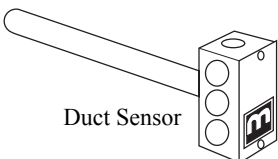
Unit-Mounted Ductstat P/N 41700 (quantity varies - see Option description)

Options AG15, AG16, AG17, AG18, AG19, AG20



A = Ductstat Temperature Module P/N 115848
 B = Stage Adder Module, P/N 115849 (quantity varies - see Option description)
 C = Digital Temperature Display Module, P/N 115852 (Options AG16, AG18 and AG20 only)

Options AG8, AG9



Duct Sensor

***APPLICATION NOTE:** If the installation of a packaged unit with more than one furnace section requires that any of the controls in this table be used in conjunction with an override thermostat, additional factory-installed relays are required. Since this application is not covered by "normal" control sequence, the additional relays (Option BG2) must be specified.

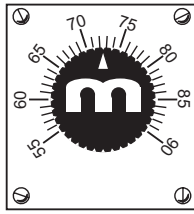
MINIMUM QUANTITY OF RELAYS (Option BG2) REQUIRED WHEN:		Model Series	PGBL SSCBL	AG3	AG4	AG5	AG15 AG16	AG17 AG18	AG19 AG20
• Pkg Model w/2 or 3 furnaces • with AG Option Listed (right) • plus Override Thermostat		Sizes	500, 600, 700, 800	4	2	N/A	4	2	N/A
			1050, 1200	6	N/A	3	6	N/A	3

GAS CONTROL OPTIONS

MAKEUP AIR APPLICATION OPTIONS (cont'd)

Models SCE, SSCBL, XE and PGBL only

minimum system firing rate with two furnaces and 16-2/3% minimum with three furnaces. Remote temperature selector is included. A room override thermostat (Option CL9) is available for use with this system. (See illustration, right)



AG21 • ELECTRONIC MODULATION WITH DDC CONTROL: Used with customer-supplied 4-20MA or 0-10V input signal. Includes Maxitrol A200 signal conditioner and special modulating gas regulator.

AG39 • ELECTRONIC MODULATION BETWEEN 20% - 28% AND 100% FIRING RATE: (Available with natural gas only on Model SCE Sizes 125-300 and Models SCE/SSCBL Size 400)

Description

Reznor® Option AG39 (patent pending) is an electronic modulation gas control that will provide precise control of discharge air temperature over an increased range of outside air conditions. It is now available on selected Models of Reznor gas furnaces.

This option allows the furnace input ratio to be fully modulated between 100% and 28 to 20%.

The part-load thermal efficiency of this system complies with and exceeds the current seventy-five percent minimum requirement of ASHRAE Standard 90.1 for part-load efficiencies. This system offers an average thermal efficiency over the range of modulation that is equal to or exceeds the full input rate thermal

efficiency.

Furnaces with Option AG39 require stainless steel burners, a stainless steel heat exchanger, and a stainless steel bottom pan. The gas train includes a single-stage gas valve, a modulating valve, and two gas pressure switches. The burner rack is equipped with one flash carryover and a regulated gas lighter tube system. The carryover lighter tube receives its gas supply through the regulator, simultaneously with the gas to the burner. Control of the system is through a Maxitrol #A1092 amplifier with a corresponding remote temperature dial (Maxitrol® #TD92-0509).

Sensor Location

The duct temperature sensor is factory installed in the cabinet leg. Although the sensor has a mixing tube, at this distance from the discharge it does not receive a true mix, so the temperature read by the sensor will be slightly higher than the actual air entering the ductwork. The system will provide comfort level heat if the selector is set slightly lower to compensate for this reading. The offset temperature will vary with the application. If a direct correlation of these two temperatures is required, move the duct sensor to a location in the ductwork about 10-12 feet from the furnace discharge.

Sample Specification

The unit shall have electronic modulation offering at least full modulation to 28% of full fire (capacity) input rate.

Modulating gas control shall be certified by CSA for use in The United States and Canada.

The furnace shall maintain an average thermal efficiency over the range of modulation that is equal to or exceeds the full input rate thermal efficiency.

The furnace shall ignite at any fire rate within its modulation range, not just high fire on start.

AG40 • ELECTRONIC MODULATION BETWEEN 20/28% AND 100% FIRING RATE WITH DDC CONTROL (Model SCE Sizes 125-300 and Models SCE/SSCBL Size 400): Same system as AG39 but includes signal conditioner for use with customer-supplied 4-20MA or 0-10V input signal.

Option AG39 is available on:		Maximum Turndown Percent	Input Range		Gas Supply Pressure Required	
Model	Size		MBH	kW		
SCE	125	20%	25 - 125	7.3 - 36.6	5" w.c.	12.5mbar
SCE	150	27%	40.3 - 150	11.8 - 44	5" w.c.	12.5mbar
SCE	175	23%	40.3 - 175	11.8 - 51.3	5" w.c.	12.5mbar
SCE	200	26%	51.8 - 200	15.2 - 58.6	5" w.c.	12.5mbar
SCE	225	23%	51.8 - 225	15.2 - 65.9	5" w.c.	12.5mbar
SCE	250	28%	69 - 250	20.2 - 73.3	5" w.c.	12.5mbar
SCE	300	23%	69 - 300	20.2 - 87.9	5" w.c.	12.5mbar
SCE/SSCBL	400	25%	100 - 400	29.3 - 117.2	6" w.c.	14.9 mbar

SPECIAL MANIFOLDS

(Apply only to Model Series and sizes indicated —

Model XE requires the addition of optional spark ignition.)

OPTION BM12 • MANIFOLD ARRANGEMENT TO MEET ILLINOIS SCHOOL CODE REQUIREMENTS: In **addition** to the standard gas train, this optional manifold arrangement includes main gas high and low pressure switches, pilot gas high pressure switch, manual main and pilot shutoff valves, and additional main and pilot line safety solenoid valves. A remote console with special alarm bell and push button alarm silencing switch is included. This option applies to all sizes of Model Series XE with Optional Spark Ignition (Option AH2 or AH3), Model Series SCE, Model Series SSCBL and Model PGBL. **Other field-installed components may be required to complete Code requirements.**

OPTION BM13 • MANIFOLD ARRANGEMENT TO MEET IRI REQUIREMENTS: Applies to power vented models with over 1,000,000 BTU's — Models SSCBL 1050 and 1200; and Model PGBL 1200. In **addition** to the standard gas train, this optional manifold arrangement includes two fluid power gas valves, main gas high and low pressure switches, a pilot solenoid gas valve, a vent solenoid valve (requires vent pipe on indoor installation), and a manual shutoff gas valve. **These additional safety components are external to the heater cabinet.** All blower cabinets on units with Option BM13 include an air proving switch.

NOTE: Standard power vent models with spark ignition with less than and including 1,000,000 BTU's meet IRI requirements. (IRI requirements for these sizes are the same as ANSI Standards.)

OPTION BM14 • MANIFOLD ARRANGEMENT TO MEET FM REQUIREMENTS: Applies to Models SSCBL 500, 600, 700, 800, 1050 and 1200 and PGBL 800 and 1200. In **addition** to the standard gas train, this optional manifold arrangement includes a fluid power gas valve, a manual gas shutoff valve, and a pilot solenoid valve. **These additional safety components are external to the heater cabinet.**

NOTE: Standard models with spark ignition meet FM requirements for units with less than and including 400,000 BTU's.

