Honeywell

DIRECT SPARK IGNITION CONTROL MODULE

S87A,B,C,D,J,K

THE S87 IS A LOW VOLTAGE, SOLID STATE, DIRECT SPARK IGNITION CONTROL MODULE FOR GAS-FIRED FURNACES, BOILERS AND HEATING APPLIANCES. MODELS ARE AVAILABLE WITH OR WITHOUT A PREPURGE TIMER. THE S87 CONTROLS THE GAS VALVE, MONITORS THE MAIN BURNER FLAME AND GENERATES A HIGH VOLTAGE FOR SPARK IGNITION.

☐ S87A uses a single electrode for spark ignition and flame sensing. Use only with Honeywell gas controls designed for DSI application: V845, V854, VR845, VR854, VR8450 and VR8540.

☐ S87B uses a single electrode for spark ignition and flame sensing. Use with any gas control designed for DSI application that is rated at 2.0 A or less. Includes optional alarm circuit for use on system safety lockout.

☐ S87C uses separate electrodes for spark ignition and flame sensing. Use only with Honeywell gas controls designed for DSI application: V845, V854, VR845, VR854, VR8450 and VR8540. For direct replacement of S825C. See page 3.

☐ S87D uses separate electrodes for spark ignition and flame sensing. Use with any gas control designed for DSI application that is rated at 2.0 A or less. Includes optional alarm circuit. For direct replacement of S825D. See page 3.

☐ S87J uses a single electrode for spark ignition and flame sensing. Use with any gas control designed for DSI application that is rated at 2.0 A or less. Includes a 30 second (minimum) delay for use with system prepurge.

☐ S87K uses separate electrodes for spark ignition and flame sensing. Use with any gas control designed for DSI application that is rated at 2.0 A or less. Includes a 30 second (minimum) delay for use with system prepurge.

☐ External, replaceable fuse protects system transformer and temperature controller.

☐ Automatic system lockout after trial-for-ignition if malfunction exists or main burner flame fails to ignite. All models available with 4, 6, 11, or 21 second (nominal) lockout time.

☐ Compact, solid state components for accurate, long-lasting performance.

☐ Convenient remote start procedure; after safety shutdown, control module can be reset from the temperature controller.

☐ Low voltage control circuit reduces wiring costs.

☐ Uses flame rectification principle to prove presence of main burner flame; false flame signal resulting from short to ground results in safety shutdown.

J.A.
REV. 11-84●

Form Number 68-0039—1

SPECIFICATIONS

IMPORTANT

THE SPECIFICATIONS GIVEN IN THIS PUBLICATION DO NOT INCLUDE NORMAL MANUFACTURING TOLERANCES. THEREFORE, THIS UNIT MAY NOT MATCH THE LISTED SPECIFICATIONS EXACTLY. ALSO, THIS PRODUCT IS TESTED AND CALIBRATED UNDER CLOSELY CONTROLLED CONDITIONS, AND SOME MINOR DIFFERENCES IN PERFORMANCE CAN BE EXPECTED IF THOSE CONDITIONS ARE CHANGED.

The S87 Direct Spark Ignition Control Module controls a Direct Spark Ignition (DSI) gas heating system. A combination gas control spark igniter, flame sensor, thermostat or temperature controller, temperature limit controller and 25 Vac transformer complete the DSI system.

The S87 performs the following functions when the thermostat calls for heat.

1. The S87J and K models provide a 30 second prepurge (delay on start-up).
2. All models check for a false flame condition (short to ground). Module will lock out if false flame condition is present. Reset is manually done from the thermostat.
3. Generates 30,000 volts (open circuit) at the spark-igniter stud for direct ignition of the main burner.
4. Opens the main gas control valve.
5. Senses the presence of main burner flame and discontinues ignition spark. If the burner fails to ignite within the trial-for-ignition period, the S87 goes into safety lockout. Reset is manually done from the thermostat.
6. On a loss of power, the S87 allows the system to shut down safely. Start-up is initiated when power is restored.
7. On a loss of main burner flame, the timed trial-for-ignition is repeated. Safety lockout occurs if flame is not reestablished within the trial-for-ignition period. Reset is manually done from the thermostat.

MODELS: See Table 1.

ELECTRICAL RATINGS:
Voltage and Frequency—25 Vac, 60 Hz.
Current Rating—0.2 A at 25 Vac.
Valve Contacts (S87B,D,J,K)—2.0 A at 25 Vac.
Alarm Contacts (S87B,D)—0.5 A at 25 Vac.

THERMOSTAT HEAT ANTICIPATOR SETTING: 0.2 A plus valve current draw.

SAFETY LOCKOUT TIMING: 4, 6, 11, 21 sec (nominal). Specify when ordering.

FLAME FAILURE REIGNITION TIME: 0.8 sec maximum.

FLAME CURRENT SIGNAL REQUIRED: 1.5 μA dc minimum. See Table 1 for recommended flame sensors.

ORDERING INFORMATION

WHEN PURCHASING REPLACEMENT AND MODERNIZATION PRODUCTS FROM YOUR TRADELINE WHOLESALER OR YOUR DISTRIBUTOR, REFER TO THE TRADELINE CATALOG OR PRICE SHEETS FOR COMPLETE ORDERING NUMBER, OR SPECIFY—

1. **Order number S87A, B, C, D, J or K.**
2. **Safety lockout timing (4, 6, 11 or 21 seconds).**
3. **DSI system controls, as required.**
   a. **25 V, 60 Hz transformer.**
   b. **Low voltage thermostat or temperature controller.**
   c. **Dual valve combination gas control (for DSI application).**
   d. **Spark igniter and flame sensor or combination spark igniter/flame sensor mounted on single bracket.**
   e. **Ignition cable.**
   f. **High temperature limit controller and auxiliary controls as required.**

IF YOU HAVE ADDITIONAL QUESTIONS, NEED FURTHER INFORMATION, OR WOULD LIKE TO COMMENT ON OUR PRODUCTS OR SERVICES, PLEASE WRITE OR PHONE:

1. **YOUR LOCAL HONEYWELL RESIDENTIAL SALES OFFICE (CHECK WHITE PAGES OF YOUR PHONE DIRECTORY).**
2. **RESIDENTIAL DIVISION CUSTOMER SERVICE**
   HONEYWELL INC., 1885 DOUGLAS DRIVE NORTH
   MINNEAPOLIS, MINNESOTA 55422-4386 (612)542-7500

   IN CANADA—HONEYWELL LIMITED/HONEYWELL LIMITEE, 740 ELLESMERE ROAD, SCARBOROUGH, ONTARIO M1P 2V9. INTERNATIONAL SALES AND SERVICE OFFICES IN ALL PRINCIPAL CITIES OF THE WORLD.

TABLE 1 — S87 MODELS

MODEL NO.	SPARK IGNITER	FLAME SENSOR	VALVE REQUIRED[a]
S87A	Q347B[c]		Honeywell V845, V854, VR845, VR854, VR8450, VR8540
S87B[b,f]	Q347B[c]		Any DSI valve rated up to 2.0 A maximum
S87C[d]	Q347A or Q330	(1) Q354A	Honeywell V845, V854, VR845, VR854, VR8450, VR8540
	Q342[e]		
	Q361[e]		
S87D[b,d,K][f]	Q347A	Q354A	Any DSI valve rated up to 2.0 A maximum
	Q342[e]		
	Q361[e]		

[a]Valve used must be designed for DSI application.

[b]These models have an alarm circuit.

[c]Single electrode for spark ignition and flame sensing.

[d]S87C can be used for direct field replacement of S825A,C. S87D can be used for direct field replacement of S825A-D.

[e]Separate spark igniter and flame sensor mounted on a common bracket.

[f]Includes a 30 second (minimum) prepurge timer.

SPARK GENERATOR VOLTAGE: 30,000 V open circuit. See Table 1 for spark igniter.

IGNITION CABLE:

Type—See Table 2 below. Maximum length, 3 ft. [0.9 m].

Connectors—snap-spring, 1/4 in. [6.4 mm] diameter.

TABLE 2—RECOMMENDED IGNITION CABLE

CABLE TYPE	RMS VOLTAGE RATING	TEMPERATURE RATING F	TEMPERATURE RATING C
UL Style 3217	10,000	302	150
UL Style 3257	10,000	482	250

MOUNTING: Mounts in any position. See Fig. 1.

DIMENSIONS: See Fig. 1.

AMBIENT TEMPERATURE RATING: Minus 40 F to plus 175 F [minus 40 C to plus 79 C].

RELATIVE HUMIDITY RATING: 5 to 95 percent at 90 F [32 C].

PREPURGE TIMING (S87J,K): 30 seconds, minimum; 45 seconds, maximum.

WIRING CONNECTIONS: 1/4 in. [6.4 mm] male, quick-connect terminals for system component connections and 1/4 in. [6.4 mm] diameter stud base for ignition cable.

UNDERWRITERS LABORATORIES INC. LISTED: File No. MH11790.

AMERICAN GAS ASSOCIATION CERTIFIED: No. 20-14B.

CANADIAN GAS ASSOCIATION CERTIFIED: No. 1029-ABI-5037A.

REPLACEMENT PART: 3 A fuse.

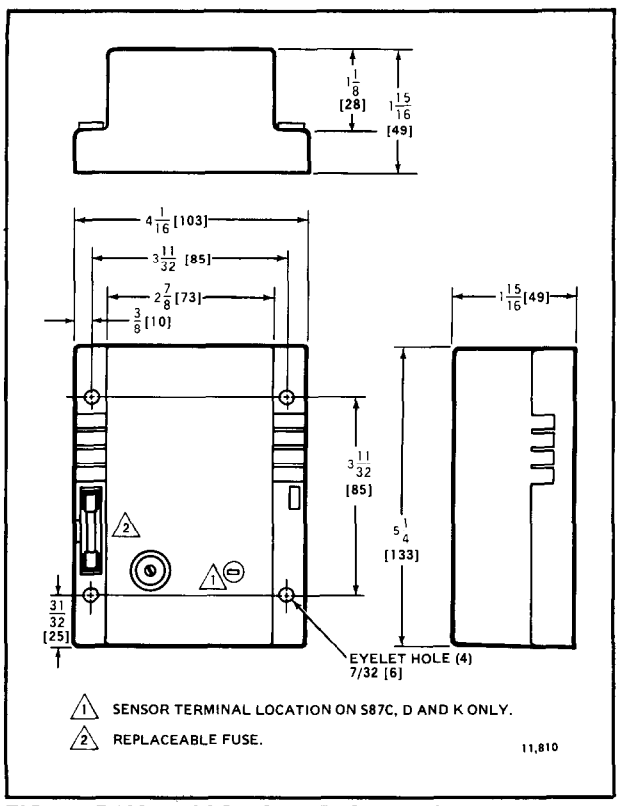

FIG. 1—DIMENSIONS OF S87 IN in. [mm IN BRACKETS].

INSTALLATION

WHEN INSTALLING THIS CONTROL MODULE. . .

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.

2. Check the ratings given in the instructions and on the product to make sure it is suitable for your application.

3. The installer must be a trained, experienced service technician.

4. After installation is complete, check out system operation.