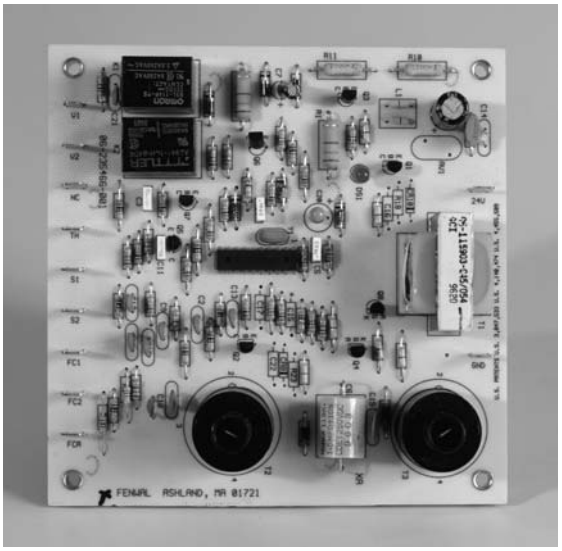
SERIES 35-62

24 VAC Microprocessor Based Dual Point Direct Spark Ignition Control

35.62.03

FEATURES

- *24 VAC microprocessor based DSI control*
- *System diagnostic LED*
- *Multiple tries*
- *Custom prepurge and interpurge timings*
- *Remote flame sensing*
- *Full time flame sensing*
- *Flame sense test pins*
- *Software conforms to UL 1998 requirements*



APPLICATIONS

- *Gas furnaces*
- *Boilers*
- *Water heaters*
- *Commercial cooking*
- *Other similar appliances*

DESCRIPTION

The Series 35-62 is a 24 VAC Microprocessor Based Dual Point Direct Spark Ignition Control continually and safely monitors, analyzes and controls the proper operation of two gas burners. Value added features such as LED diagnostics, automatic one hour reset, and flame current test pins highlight the controls benefits.

Agency Certifications

Design certified to ANSI Z21.20-1993 and CAN/CSA C22.2 No. 199-M89

SPECIFICATIONS

Input Power	Control:20-28 VAC 50/60 Hz (Class 2 Transformer)
Input Current Drain	300 mA @ 24 VAC and gas valve relay energized (control only)
Gas Valve Rating	1.5A @ 24 VAC (Inrush 3,0A maximum)
Operating Temperature	-40°F to +160°F -40°C to +71°C
Flame Sensitivity	>1.0uA minimum
Flame Failure Response Time	0.8 seconds
Types of Gases	Natural, LP, or manufactured
Spark Rate	Line frequency (50/60 sparks/sec)
Enclosure	Gray (Noryl N-190) fire retardant plastic integral standoffs optional
Moisture Resistance	Conformal coated to operate to 95% R.H. Care must be taken to protect module from direct exposure to water
Tries for Ignition	One or three try versions available
Trial for Ignition Periods	4.0,7.0,10.0,15.0 or 21.0 seconds available
Prepurge & Interpurge	None,15, or 30 seconds depending on model.

SEQUENCE OF OPERATION / FLAME RECOVERY / SAFETY LOCKOUT

Power Up/Stand-By

- Upon applying power (24 VAC) to 24V terminal, the control will reset, perform a self check routine, initiate full time flame sensing, flash the diagnostic LED for up to four seconds, and enter the thermostat scan state.

Heat Mode

- When a call for heat is received from the thermostat supplying 24 volts to TH/W, a pre-purge delay begins, then the gas valve is energized and the sparks commence at both burners for the trial for ignition period.
- When flame is detected during the trial for ignition, sparks are shutoff immediately and the gas valve remains energized. The thermostat and burner flame are constantly monitored to assure the system continues to operate properly. When the thermostat is satisfied and the demand for heat ends, the main valve is de-energized immediately.

Failure to Light - Lockout

SINGLE TRIAL MODEL
Should either burner fail to light, or flame is not detected during the trial for ignition period, the control will go into lockout and the valve will be turned of immediately.

MULTI TRIAL MODEL
Should either burner fail to light, or flame is not detected during the first trial for ignition period, the gas valve is de-energized and the control goes through an interpurge delay before another ignition attempt. The control will attempt two additional ignition trials before going into lockout and the valve relay will be de-energized immediately.

Recovery from lockout requires a manual reset by either resetting the thermostat or removing 24 volts for a period of 5 seconds.

FLAME FAILURE- RE-IGNITION

If the established flame signal is lost from either burner while the burners are operating, the control will respond within 0.8 seconds. The HV spark will be energized for a trial for ignition period in an attempt to relight the burners. If either burner does not light the control will de-energize the gas valve. Multi-try models will make two more attempts to relight the burners. If either burner does not relight the control will go into lockout as noted above in “Failure to light”. If flame is re-established, normal operation resumes.

Flame Fault

If at any time the main valve fails to close completely and main tains a flame, the full time flame sense circuit will detect it and flash an error code of 2.

WARNING:
Operation outside specifications could result in failure of the Fenwal product and other equipment with injury to people and product.

MOUNTING AND WIRING

TERMINAL DESIGNATIONS	
TH/W	THERMOSTAT INPUT
GND	SYSTEM GROUND
V1	VALVE POWER
V2	VALVE GROUND
NC	ALARM
S1	REMOTE FLAME SENSOR
S2	REMOTE FLAME SENSOR
FC1	FLAME CURRENT TEST PIN
FC2	FLAME CURRENT TEST PIN
24V	24 VAC INPUT (FULL TIME)

CAUTION:
Label all wires prior to disconnection when servicing controls.
Wiring errors can cause improper and dangerous operation.
A functional checkout of a replacement control is recommended.

WARNING:
The Series 35-62 uses voltages of shock hazard potential. Wiring and initial operation must be done by a qualified service technician.

The Series 35-62 is not position sensitive and can be mounted vertically or horizontally. The control may be mounted on any surface with #6 sheet metal screws.

All wiring must be done in accordance with both local and national electrical code. The control must be secured in a area that will experience a minimum of vibration and remain below the maximum operating temperature of 160°F.

All connections should be made with UL approved 105°C rated 18 gauge, stranded,.054 thick insulated wire. Refer to wiring diagram when connecting the Series 35-62 to other components in the system.

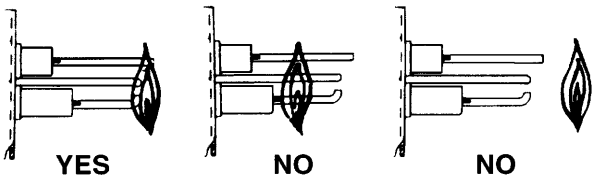
PROPER ELECTRODE LOCATION

Proper location of the electrode assembly is important for optimum system performance. It is recommended that electrode assembly be mounted temporarily using clamps or other suitable means so that the system can be checked before permanently mounting the assembly. The electrode assembly should be located so that the tips are inside the flame envelope and about 1/2 inch (1 cm) above the base of the flame. See Figure 3.

CAUTIONS:
1. Ceramic insulators should nor be in or close to the flame.
2. Electrode assemblies should not be adjusted or disassem bled. Electrodes should have a gap spacing of 0.125± 0.031 in (3.12± 0.81 mm). If this spacing is not correct, the assembly must be replaced. Electrodes are NOT field adjustable.
3. Exceeding the temperature limits can cause nuisance lockouts and premature electrode failure.
4. Electrodes must be placed where they could not be exposed to the appliance user in normal operation.

IGNITOR LOCATION

Figure 3



HIGH VOLTAGE CABLE

Fenwal Part Number 05-129608-624 Suppression Cable (or equivalent) must be used for proper operation of control.

FAULT CONDITIONS

ERROR MODE	LED INDICATION
Internal Control Failure	Steady on
Flame with No Call for Heat	2 flashes
Ignition Lockout	3 flashes

The LED will flash on for 1/4 seconds, then off for 1/4 second during a fault condition, the pause between fault codes is 3 seconds.

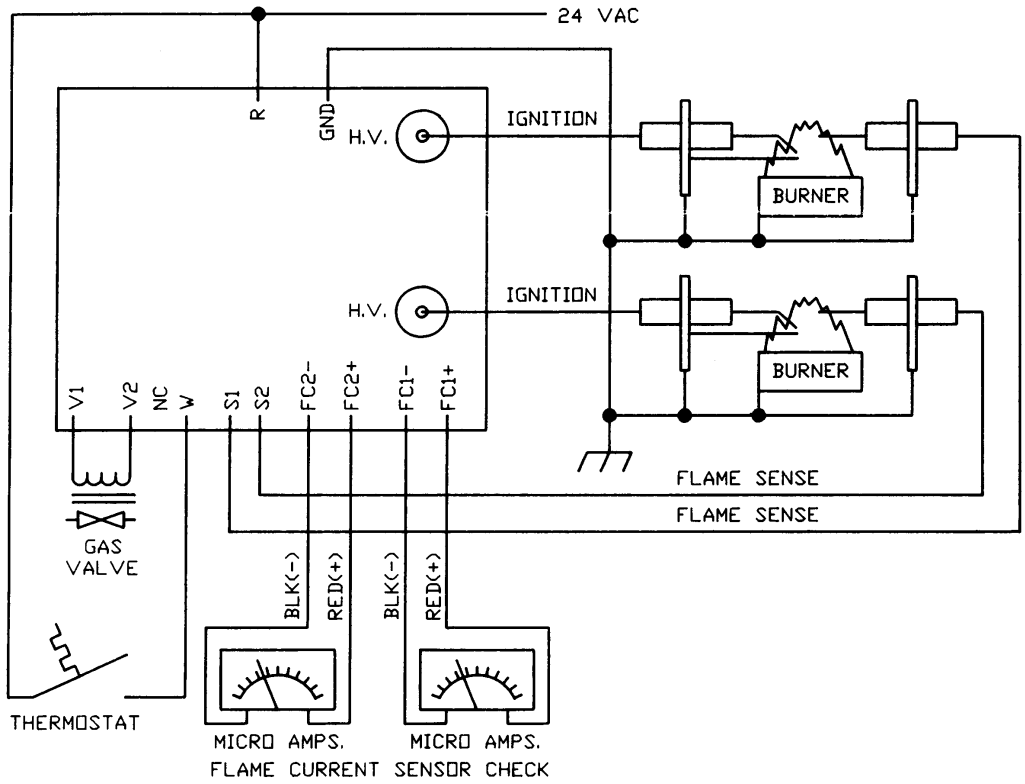
FLAME CURRENT CHECK

Flame current is the current which passes through the flame from the sensor to ground. The minimum flame current necessary to keep the system from lockout is .7 microamps. To measure flame current, connect an analog DC microammeter to the FC - FC+ terminals. Meter should read .7 uA or higher. If the meter reads below "0" on scale, meter leads are reversed. Disconnect power and reconnect meter leads for proper polarity.

TROUBLESHOOTING GUIDE

SYMPTOMS	RECOMMENDED ACTIONS
1.Dead	A. Miswired B. Transformer bad C. Fuse/Circuit breaker bad D. Bad control (check LED for steady on)
2. Thermostat on- no spark	A. Miswired B. Bad t'stat no voltage@ terminal W
3. Valve on, no spark	A. Shorted electrode B. Open HV cable C. Miswired D. Bad control
4. Spark on, no valve	A. Valve coil open B. Open valve wire C. Bad control (check voltage between V1 & V2)
5. Flame okay during TFI, no flame sense (after TFI)	A. Bad electrode B. Bad S1 or HV wire C. Poor ground at burner D. Poor flame (check flame current)
6. Flame with no call for heat	A. Stuck valve (check LED for 2 flashes)

WIRING DIAGRAM



CONTROL CONFIGURATION

SERIES 35-625 X X X - X X X

Description

The Series 35-62 series direct spark ignition controller is a custom manufactured control. Consult factory with operational requirements.

Non-Standard Configurations

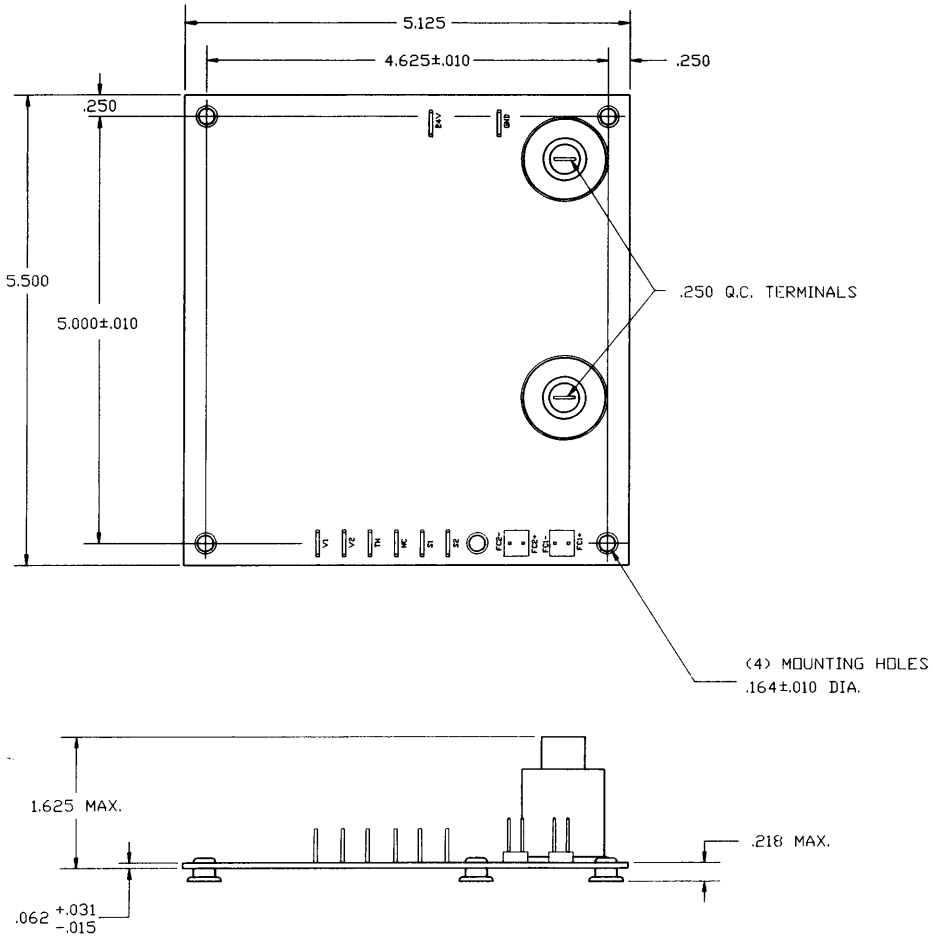
9 = Non Standard Configuration

A 9 in this location of the part number (i.e. 35-62 5 901 -113) identifies this configuration as a non-standard design. The part number does not follow the part numbering system. The 9XX is a sequential part number assigned by Fenwal. Consult factory for operating characteristics of this control.

Variable Options:

- Pre-purge time
- Single or multiple tries for ignition
- Trial for ignition time
- Inter-purge time
- The Series 35-62 is only available with remote flame sensing

DIMENSIONS



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