
**Burner Control System
“ISS” series**

Operations Manual

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Manufactured By : Burners, Inc. - Milford, MI

**Operations Manual for
“ISS” series burner control systems**

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System Overview

This manual is designed to be used for all “ISS” series, burner control systems. These control systems are available in both a 12VDC and a 115VAC version. It is very important to know which system you have in order to insure proper operation.

The “ISS” series control systems are designed to be used on most propane and natural gas burner systems. The “ISS” control system will ignite the gas flow through the main burner and monitor the flame for combustion. The “ISS” control system may also have an on-board, temperature controller. This controller will monitor the product temperature and determine the need to initiate the main burner, or turn it off.

The “ISS” burner control system uses a Fenwal flame controller. This controller will generate a high voltage spark (DSI - Direct Spark Ignition), for flame ignition. The controller also uses a flame rod to prove the flame is present. If no flame is present (the flame rod does not detect fire), the Fenwal flame controller will de-energize the main gas solenoid, thereby minimizing the free flow of unburned gas.

The “ISS” control system may use a temperature controller for product monitoring. Through a remotely mounted capillary sensor (usually mounted inside the product - inside a thermo-well), the temperature controller has the capability to maintain product temperature to a nominal setpoint. The temperature controller will either energize the Fenwal control module to begin the burner ignition / monitoring sequence, or de-energize the Fenwal controller.

Component Installation

IMPORTANT - The “ISS” series burner control systems use solid-state, electrical components. These components are very well built. However, as with any electronic device, they are susceptible to failure if exposed to extreme environmental conditions. Do not allow this systems to be exposed to temperatures lower than 32°F (0°C) or temperatures higher than 130°F (50°C). The exterior of this system is well protected. However, do not expose this system to direct moisture (spraying down with a hose) and in no case should any of the interior components be exposed to moisture (humidity) levels greater than 80%.

Control Enclosure - The control enclosure must be mounted away from any sources of heat and moisture. It is also recommended that the control enclosure not be subject to the build-up of product, dust, or debris. Keep the enclosure within 5 feet of the burner and in a convenient place for proper operator interface. The control enclosure must not be mounted in an area of extreme vibration and/or shock.

Power Cord - The power cord should be routed away from all sources of heat and moisture. Do not allow the power cord to become pinched or trapped between any moving parts. Be sure to route the power cord so as not to allow the operator to trip or fall over it.

Ignition Wire - The ignition wire is orange in color and is made of a highly flexible, heat resistant silicone. The end of the ignition wire has a 1/4” disconnect terminal. It is designed to fit on to the main burner ignitor. Be sure to route the ignition wire away from all sources of heat and moisture. As an added means of protection, it is recommended that it be installed using a high temperature resistant fiberglass sleeving.

Flame Rod (Sensor) Wire - The flame rod wire is black in color and is made of a high strength Teflon material (it is in the same insulator as the solenoid wire). The end of the flame rod wire has a 3/16” disconnect terminal. It is designed to fit on to the main burner flame rod. Be sure to route the flame rod wire away from all sources of heat and moisture. As an added means of protection, it is recommended that it be installed using a high temperature resistant fiberglass sleeving.

Solenoid Valve Wire - The solenoid valve wire has a clear Teflon protective coating (it is in the same insulator as the flame sensor wire). It must be wired to the main burner gas solenoid valve. Be sure to route the wire away from all sources of heat and moisture.

Ignitor & Flame Rod Assembly - The ignitor and flame rod must be mounted directly inside the discharge of the main burner flame. Care must be taken as to not allow either the ignitor or flame rod to become grounded as this will render them useless. Both the ignitor and flame rod use a ceramic insulator which, if exposed to extreme

vibration or shock, will crack and cause them to fail. Do not allow the ignitor to come into contact with the flame rod, or allow the ignitor to arc to the flame rod. This will cause the Fenwal flame module to fail. The ignitor works best with a 1/8" spark gap near the outer perimeter of the flame. The flame rod must come into contact with the flame.

Gas Solenoid - The gas solenoid must be securely mounted to the inlet of the main burner, away from all sources of heat and moisture. Care must be taken to properly align the solenoid in a vertical position. Never tighten across the valve body. This may cause the solenoid body to become distorted. Always verify the solenoid is mounted with the flow in the correct direction. The solenoid body is always marked with either an arrow (to indicate the direction of flow), the word "IN" and/or "OUT", or the letters "P" and "A" (P = inlet and A= outlet). Always use a sealing compound or tape to secure all gas connections. Be careful not to allow any sealing compound or tape to enter the gas piping. This will cause the components to clog or plug.

Sequence of Operation

Perform all pre-operation system checks "*Before you begin ...*".

Turn the toggle switch to the "ON" position. The flame controller will begin a system pause (this is called a pre-purge), it allows for any unburned gas from any previous ignition attempt to dissipate. After the system is enabled, the temperature controller (if equipped) will monitor the temperature of the product and, if needed, the burner will begin its ignition sequence.

When you are finished with this system. Turn **OFF** the supply valve on the propane tank first. Allow the system to fire, until all of the fuel is emptied from the system. The burner will extinguish itself and the control system will go into a lockout mode. Now, turn the toggle switch to the OFF position and unplug the power cord (115 VAC version only).

Before moving the system, be sure to disconnect the propane tank and the hose. Cap or plug all open ports in the gas system. This will help eliminate any contamination from entering the gas system.

Before you begin ...

Before you apply any power or connect any gas supply, read the following section carefully and be sure to understand all of the operating conditions.

First, be certain that your control system will operate correctly with the supply voltage at the jobsite. Also, be certain that you have the correct type of fuel for the burner system.

Perform a visual systems check. Verify the following conditions are met.

The burner(s) are securely fasten.

The burners are aligned with the firing flues or vents.

All gas piping is straight and secure. Verify there are no loose connections.

All wiring is protected and free from bare and/or exposed conductors.

The control panel is securely mounted.

Connect the supplied regulator to the propane tank. Connect the supplied hose to the regulator and to the burner assembly. Be certain all connections are free from debris and tight. Turn the adjustable hand wheel, on the regulator, counter-clockwise until all pressure is removed from the internal spring. Turn on the supply valve on the propane tank, adjust the regulator hand wheel, clockwise, as to allow 5 psi of pressure in the system, then completely turn off the supply valve on the propane tank. Now, check the system for leaks. This is done by using a leak test solution, or soapy water solution on all the components of the gas system. This is to include the entire regulator and all connections, the entire hose assembly, the burner connection and all of the components on the burner assembly. Inspect the entire gas assembly for a build up of small or large bubbles. A build up of bubbles indicates a leak. **This leak must be repaired prior to the use of the system.** If no leaks are found, turn on the

supply valve on the propane tank. Repeat the inspection process. Look for the formation of bubbles. If bubbles are found, this indicates a leak. **This leak must be repaired prior to the use of the system.**

If no leaks are present in the system and a system visual inspection has been performed, it is now safe to connect the electrical supply cord to the electrical outlet. Be certain that the toggle switch on the side of the control panel is in the OFF position. Connect the electrical plug to the electrical outlet.

Troubleshooting

System will not operate

- Verify power is supplied to the control system. *Connect to power supply.*
- Verify the grounding wire (or ground bond) is secure. *Secure ground wire from burners to control panel.*
- Verify the electrical fuse (located inside the control panel) is O.K. *Replace fuse.*
- Verify all electrical connections are secure. *Secure all electrical connections.*
- Verify the fuel tanks are full and all valves are turned ON. *Fill fuel tanks, turn on all valves.*

Electrical system energizes, but no flame is present

- Verify the fuel tanks are full and all valves are turned ON. *Fill fuel tanks, turn on all valves.*
- Verify all electrical connections are secure. *Secure all electrical connections.*
- Verify a spark is present at the burners. *Set spark gap to 1/8".*
- Verify the grounding wire (or ground bond) is secure. *Secure ground wire from burners to control panel.*
- Verify fuel is flow through the burner(s). *See Fuel System Problems*

Electrical system energizes and flame ignites, but goes out immediately after ignition

- Verify all electrical connections are secure. *Secure all electrical connections.*
- **Verify the grounding wire (or ground bond) is secure. *Secure ground wire from burners to control panel.***
- Verify the main burner orifice nozzle is not clogged. *Remove orifice nozzle, clean & replace.*
- Verify the fuel tanks are full and all valves are turned ON. *Fill fuel tanks, turn on all valves.*

Fuel System Problems

Fuel tank must be full - Open supple valves slowly & completely.

Check for contamination in fuel line.

Check for a plugged filter assembly.

Check for a plugged solenoid.

Check for a plugged orifice nozzle in the main burner.