CP-UM-5957E

High Power Igniter

Model S720B

User's Manual

Thank you for purchasing Azbil product.

This manual contains information for ensuring the safe and correct use of the product. Those designing or maintaining the equipment that uses the product should first read and understand this user's manual.

Be sure to keep it nearby for handy reference.

Please read "Terms and Conditions" from the following URL before ordering and use.
https://www.azbil.com/products/factory/order.html

NOTICE

Please make sure that this manual is available to the user of the product.

Unauthorized duplication of this user's manual in part or in whole is forbidden. The information and specifications in this manual are subject to change without notice.

Considerable effort has been made to ensure that this manual is complete and accurate, but if you should find an omission or error, please contact us.

In no event is Azbil Corporation liable to anyone for any indirect, special, or consequential damages as a result of using this product.

SAFETY PRECAUTIONS

Safety precautions are for ensuring safe and correct use of this product, and for preventing injury to the operator and other people or damage to property. You must observe these safety precautions. Also, be sure to read and understand the contents of this user's manual.

● **Key to symbols**

⚠ WARNING
Warnings are indicated when mishandling this product may result in death or serious injury.

⚠ CAUTION
Cautions are indicated when mishandling this product may result in minor injury or property damage.

⚠ WARNING

Electrical Shock Hazard.
Can cause serious injury, death or property damage.

Disconnect power supply before beginning installation to prevent electrical shock and equipment damage.

More than one disconnect may be required.

Never operate this device without having connected the electrode. Otherwise electrical shock may occur.

Connect the ground terminal.

Otherwise in rare cases electrical noise that affects other equipment could be generated, or the operator could receive an electric shock if a ground fault occurs.

OVERVIEW

The S720B High Power Igniter is used to ignite gas burners in commercial and industrial applications.

- Ignites interrupted gas pilots with ignition electrodes spacings between: 0.029 to 0.125 inches (0.7 to 3.2 mm).
- S720B1006 has 14 kV output peak voltage for reliable light-off.
- Recommended for interrupted ignition applications only.
- Mounts in the same space used by conventional ignition transformer.
- Withstands 90% relative humidity at 104 °F (40 °C).
- Weighs 1 pound (0.42 kilogram) versus up to 8-1/2 pounds (3.9 kilograms) for standard transformers.
- Meets UL requirements for radio frequency interference (RFI).

INSTALLATION

⚠ WARNING

Electrical Shock Hazard.
Can cause serious injury, death or property damage.

Disconnect power supply before beginning installation to prevent electrical shock and equipment damage.
More than one disconnect may be required.

⚠ CAUTION

Equipment Damage Hazard.
Improper grounding may burn out device.

Ground S720B chassis at all times, even for bench testing. Otherwise, device may burn out.

(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 the product is suitable for your application.

(3) Installer must be a trained, experienced, flame safeguard control technician.

(4) After installation is complete, check out product operation as provided in these instructions.

Important

- All wiring and installation must comply with applicable local electrical codes, ordinances and regulations.
- Voltage and frequency of the power supply must match the S720B being used.
- Make sure the S720B is properly grounded.

■ Mounting

The S720B can be mounted in any position. ☞ Fig. 3(page 4) for mounting hole locations. Ensure that enough space is available to make the high voltage connections without difficulty.

■ Wiring

⚠WARNING

Electrical Shock Hazard.
Can cause serious injury, death or property damage.

Disconnect power supply before beginning wiring to prevent electrical shock and equipment damage. More than one disconnect may be required.

(1) All wiring must comply with applicable UL regulations.

(2) Voltage and frequency of the power supply:
120 V AC, 60 Hz

(3) Be sure the mounting chassis of the S720B is properly grounded.

NOTE: S720B power input wiring can be the following:
Connect the blue wire to the output terminal of your device and the brown wire to L2.

■ Ignition (Secondary) Wiring

(1) Keep the secondary cable as short as possible to keep radio frequency interference (RFI) to a minimum.

(2) If the high voltage cable is longer than 24 inches (610 mm), modify it with insulating material in such a way that it stays more than 2 inches (51 mm) away from the ground terminal.

(3) Ignition cable connections may be either "Rajah" or screw type. If screw connections are desired, simply loosen the "Rajah" terminal.

(4) Use ignition cable rated for continuous duty at 350 °F (177 °C) and 20,000 volts. ☞ Recommended Ignition Cable in the Specifications section.

Important

- The ignition cable should not exceed 40 inches (1 m) in length.

To ground the S720B to the burner assembly:

(1) Use 16 or 18 AWG wire.

(2) Attach one end of the wire to the S720B igniter end (GND).

(3) If required,wrap the wire around the igniter (high tension) lead as shown in Fig. 1. Four or five wraps are sufficient.

(4) Connect the other end of the wire to the burner assembly (GND).

(5) Make sure the ground connection between the S720B and the burner body is secure.

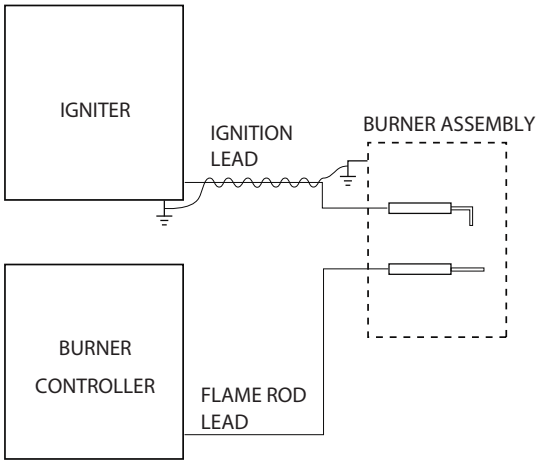

Fig. 1. Grounding the S720B to the burner assembly.

■ Electrode Setting and Positioning

● Gas Burner Systems

Ignition electrode location must be found by trial and error, taking into account the following points:

(1) Ignition electrodes must not interfere with the normal flame pattern.

(2) Ignition electrodes should not be positioned such that they will be overheated by the flame.

(3) The flame detection device must not be adversely affected. In the case of flame rod sensors make sure that the ignition spark does not disturb the flame signal unduly.

For ultraviolet (UV) flame detectors, ensure that the spark does not give a false flame indication.

☞ Ignition Spark Response Test in the Checkout section.

OPERATION

■ Principles of Operation

Referring to Fig. 2, it can be seen that the S720B essentially comprises an RFI filter circuit, a solid state oscillator circuit and a high voltage transformer. The solid state oscillator is comprised of a transistor controlling an LC resonant circuit.

The capacitor in the LC circuit charges and discharges and the voltage developed across the inductor is stepped up by the high voltage transformer.

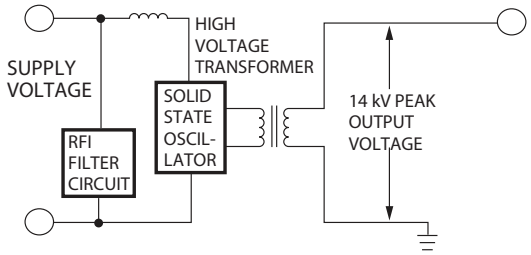

Fig. 2. Internal schematic of S720B Igniter.

CHECKOUT

⚠WARNING

Explosion or Fire Hazard.
Can cause serious injury, death or property damage.

Follow instructions on opening and closing fuel valves carefully to prevent fuel buildup and possible fire or explosion.

After the S720B installation has been completed, make the following checks to ensure that the system is working properly.

■ Ignition Spark Response Test

The flame relay should not respond (pull in) to ignition spark.

To determine flame detector sensitivity to ignition spark, perform the following steps:

(1) Shut off the fuel supply to both pilot and main fuel valve manually.

(2) Start system by raising controller set point or pressing start button.

(3) Energize the S720B Igniter so that ignition spark is produced between electrode and ground.

(4) Check to make sure that ignition has not occurred (there should be no flame). Repeat steps 1 through 3 until there is no flame.

(5) Check the flame relay on the burner controller or the flame LED. If the relay has not pulled in (flame LED is off), the system is operating properly. Restore the fuel supply and continue the checkout with the Pilot Turndown Test.

(6) If the flame relay pulls in (flame LED is on), stop the system as the burner controller is indicating flame regardless of the condition of the pilot or main burner flame.

(7) If a flame rod sensor is being used, ignition interference may be the cause of relay pull in. Ignition interference is most easily detected by measuring the flame current with the ignition off, then on. A difference greater than 1/2 microampere indicates the presence of ignition interference. If ignition interference is detected, take the appropriate following steps:

a. Check for correct spacing of ignition electrode gap.

b. Depending upon the particular situation, rearrange the flame electrode, ignition electrode and ground to provide sufficient physical spacing to prevent electrical interaction (interference) between these components.

c. Add more ground area in the form of a flat plate between the flame rod and ignition electrode.

d. Try wrapping the ground lead around the igniter wire as shown in Fig. 1, if not already done.

e. Repeat steps 1 through 6.

(8) If the flame relay pulls in (flame LED is on), replace the burner controller.

(9) If replacing the burner controller does not eliminate flame relay pull in (flame LED on), contact your local Azbil branch office.

(10) If an ultraviolet (UV) flame detector is being used, the UV detector may be responding to the UV radiation being emitted by the electric spark. To determine whether the UV detector is responding to the ignition spark and to eliminate the response, try the following steps to eliminate the spark pickup:

a. Sight the UV detector far enough out on the pilot flame so the ignition spark is not sensed. If sensed, reverse the S720B power leadwires.

b. Construct a barrier to block the ignition spark from the UV detector view.

c. Reposition the ignition electrode so it is screened by the pilot burner itself.

d. Restrict the UV detector viewing angle by using a slightly longer sighting pipe.

e. Repeat steps 1 through 6.

(11) If the flame relay pulls in (Flame LED on), replace the burner controller.

(12) If replacement of the burner controller does not eliminate the relay pull in, contact your local Azbil branch office.

■ Pilot Turndown Test

Refer to the burner controller instructions for the exact procedure to be used in performing the pilot turndown test.

■ Final Checkout

After other checks have been completed, restore the system to normal operation and observe at least one complete cycle to be sure of satisfactory burner operation.

SPECIFICATIONS

Model	S720B1006 Single high voltage electrode for gas, with "Rajah" and screw connectors
Electrical Ratings	Voltage and Frequency: 120 V AC (+10%, -15%), 60 Hz Output peak voltage at 21 kHz: 14 kV Secondary open circuit voltage: 10 kV equivalent RMS. Power Consumption: 40 Watts nominal
Interrupted Ignition only	Duty cycle: 20%; 45 seconds on/180 seconds off
Spark Characteristics	Spark Gap: 0.029 to 0.125 in. (0.7 to 3.2 mm). Firing Rate: 20,000 sparks per second. Energy Discharge: 1 millijoule per spark. Discharge Time: 50 microseconds per spark. Maximum air velocity in gap is 55 ft. (17 m) per sec.
Ambient Temperature Range	14 °F to 113°F (-10°C to +45°C)
Maximum Ambient Humidity	90% RH at 95° F (40°C) (without condensation)
Service life	10 years
Weight	0.925 lb. (0.42 kg)
Dimensions	☞ Fig.3. S720B dimensions
Approvals	UL File No. MH14381(JHYR2)

Note: 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.

■ Dimension

unit: in. (mm)

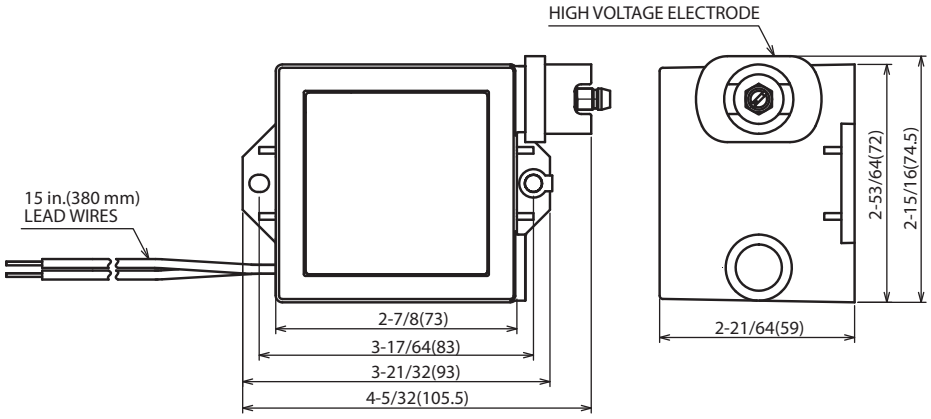

Fig.3. S720B dimensions

■ Recommended Ignition Cable

Temperature Rating: 482°F (250°C)
Voltage Rating: 25 KV DC
UL Recognized: Style 3257 Appliance Wiring Material (AWM wire) under UL 758 standard

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Specifications are subject to change without notice. (11)

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