

# EASY RADIANT WORKS

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## Installation & Operating Instructions

### For EASY RADIANT EZ, EZU, SH & SHU Radiant Tube Heaters.

The prefix "B" added to the model number indicates a "Brooder" model.  
The suffix "LTH" added to the model number indicates a dual input (2-stage) heater  
with the low input being 70% of the high input

(EZ)SH-60-20	(EZ)SH-135-40	(EZU)SHU-60-10	(EZU)SHU-135-20
(EZ)SH-75-20	(EZ)SH-135-50	(EZU)SHU-75-10	(EZU)SHU-135-30
(EZ)SH-80-20	(EZ)SH-150-40	(EZU)SHU-80-10	(EZU)SHU-150-20
(EZ)SH-85-30	(EZ)SH-150-50	(EZU)SHU-85-10	(EZU)SHU-150-30
(EZ)SH-100-30	(EZ)SH-150-60	(EZU)SHU-100-15	(EZU)SHU-165-30
(EZ)SH-100-40	(EZ)SH-165-50	(EZU)SHU-100-20	(EZU)SHU-200-30
(EZ)SH-125-30	(EZ)SH-165-60	(EZU)SHU-125-15	
(EZ)SH-125-40	(EZ)SH-200-60	(EZU)SHU-125-20	
(EZ)SH-125-50	(EZ)SH-200-70	(EZU)SHU-125-30	
	(EZ)SH-200-80		



**WARNING: Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.**

The installation of this appliance must in all cases conform with local and national building codes or in the absence of local codes with the current National Fuel Gas Code ANSI Z223.1/NFPA54, or the Natural Gas and Propane Installation Code, CSA B149.1

#### FOR YOUR SAFETY

DO NOT STORE OR USE GASOLINE OR OTHER VAPOURS AND LIQUIDS  
IN THE VICINITY OF THIS OR ANY OTHER GAS APPLIANCE.

#### FOR YOUR SAFETY IF YOU SMELL GAS

1. OPEN WINDOWS
2. DO NOT TOUCH ELECTRICAL SWITCHES
3. EXTINGUISH ANY OPEN FLAME
4. IMMEDIATELY CALL YOUR GAS SUPPLIER

#### CONSIGNES DE SECURITE

IL EST INTERDIT D'UTILISER DES LIQUIDES INFLAMMABLES OU DEGAGEANT DES  
VAPEURS INFLAMMABLES, A PROXIMITE DE TOUT APPAREIL FONCTIONNANT AU  
GAZ.

#### CONSIGNES DE SECURITE

SI VOUS SENTEZ UNE ODEUR DE GAZ:

1. OUVREZ LES FENETRES
2. NE TOUCHEZ PAS AUX INTERRUPTEURS ELECTRIQUES
3. CONTACTEZ IMMEDIATEMENT VOTRE COMPAGNIE DE GAZ

Technical Data EZ, EZU, SH & SHU straight and U shape radiant tube heaters.  
 Adding the letter **B** to the prefix indicates a brooder model.  
 Adding the suffix **LTH** indicates dual input with the low input being 70% of the high input.  
 Adding the suffix **CW** indicates car wash heater.

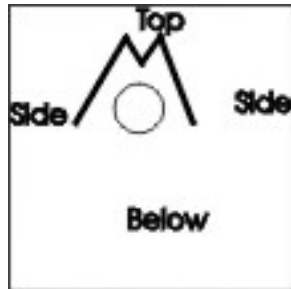
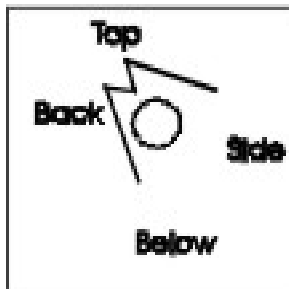
Model	Length (ft.)	Input (BTU)	Hangers	Weight	Clearance to Combustibles (inches)			
					BELOW	SIDES	TOP	BACK(45 DEGREES)
EZ(SH)60-20	22	60,000	4	90	48	25	4	16
EZ(SH)75-20	22	75,000	4	90	48	25	4	16
EZ(SH)80-20	22	80,000	4	90	48	25	4	16
EZ(SH)85-30	32	85,000	6	105	48	25	4	16
EZ(SH)100-30	32	100,000	6	105	48	25	4	16
EZ(SH)100-40	42	100,000	8	130	48	25	4	16
EZ(SH)125-30	32	125,000	6	105	48	25	4	16
EZ(SH)125-40	42	125,000	8	130	48	25	4	16
EZ(SH)125-50	52	125,000	10	150	48	25	4	16
EZ(SH)135-40	42	135,000	8	130	48	25	4	16
EZ(SH)135-50	52	135,000	10	150	48	25	4	16
EZ(SH)150-40	42	150,000	8	130	48	25	4	16
EZ(SH)150-50	52	150,000	10	150	48	25	4	16
EZ(SH)150-60	62	150,000	12	165	48	25	4	16
EZ(SH)165-50	52	165,000	10	150	58	25	4	16
EZ(SH)165-60	62	165,000	12	165	58	25	4	16
EZ(SH)200-60	62	200,000	12	165	74	25	4	16
EZ(SH)200-70	72	200,000	14	180	74	25	4	16
EZ(SH)200-80	82	200,000	16	195	74	25	4	16
Model	Length (ft.)	Input (BTU)	Hangers	Weight	Clearance to Combustibles (inches)			
					BELOW	SIDES	TOP	BACK(45 DEGREES)
EZU(SHU)60-10	12	60,000	2	90	48	25	4	16
EZU(SHU)75-10	12	75,000	2	90	48	25	4	16
EZU(SHU)80-10	12	80,000	2	90	48	25	4	16
EZU(SHU)85-15	17	85,000	4	105	48	25	4	16
EZU(SHU)100-15	17	100,000	4	105	48	25	4	16
EZU(SHU)100-20	22	100,000	4	130	48	25	4	16
EZU(SHU)125-15	17	125,000	4	105	48	25	4	16
EZU(SHU)125-20	22	125,000	4	130	48	25	4	16
EZU(SHU)125-30	32	125,000	6	165	48	25	4	16
EZU(SHU)135-20	22	135,000	4	130	48	25	4	16
EZU(SHU)135-30	32	135,000	6	165	48	25	4	16
EZU(SHU)150-20	22	150,000	4	130	48	25	4	16
EZU(SHU)150-30	32	150,000	6	165	48	25	4	16
EZU(SHU)165-30	32	165,000	6	165	58	25	4	16
EZU(SHU)200-30	32	200,000	6	165	74	32	4	16

N.B. 200,000 BTU input is natural gas only...180,000 BTU for LP

Brooder models must not be installed closer than 60" to the floor.

Clearances "below" on straight models can be reduced by 40%, 15ft. downstream of burner

N.B. 200,000 BTU not available for high altitude.



**Warning:** Heaters should be installed so that the minimum clearances marked on the heater will be maintained from vehicles parked below the heater.

**Heaters must be installed so as to provide adequate accessibility to controls for routine service or maintenance.**

**In locations used for storage of combustible materials, signs must be posted to specify the maximum permissible stacking height to maintain the required clearances from the heaters to combustibles. Signs must either be posted adjacent to the heater thermostats or in the absence of such thermostats in a conspicuous location.**

ELECTRICAL SPECIFICATIONS:

**Electrical**

120 Volt 60Hz.

Starting current 3 Amp. Running current 1 Amp.

**Ignition System:**

120 Volt / Hot surface igniter

**Thermostat control:**

All Easy Radiant heaters are designed for compatibility with either 120 Volt thermostat controllers or 24 Volt thermostat controllers. For use with 120 Volt controllers, the heater must be plugged into a "switched" 120 Volt duplex receptacle, where the receptacle is switched by the thermostat controller. Heating zones may be established where one 120 Volt thermostat, controls more than one heater, provided the total heater electrical load does not exceed the maximum allowable amperage on the circuit.

For 24 volt thermostat control plug the heater into a 120 Volt duplex receptacle. Remove the jumper wire on the control box marked "24 Volt thermostat" and connect the thermostat wire to the terminals. Ensure that if the thermostat has a heat anticipator, that the heat anticipator is set at maximum. When using a 24 Volt thermostat, only one heater may be controlled by one thermostat.

In poultry houses, or other applications where ceiling materials may be of thin poly type material, **additional precautions must be taken to assure safe clearances to combustibles above the heater, to prevent thin poly type materials from weakening and melting.** . A 2' x 2' piece of ½ " insulated material must be placed directly above the blower motor and burner at the burner end of the heater

Heaters must be electrically grounded in accordance with the National Electrical Code, ANSINFPFA 70 or the current Canadian Electrical Code, CSA C22.1. Polarity of Line voltage and neutral wires must be maintained. The total load of all heaters in a circuit must be considered for overload control of that circuit. See electrical specifications above.

<b>Gas Supply (inches W.C.)</b>	<b>Natural</b>	<b>Propane</b>
Manifold pressure	3.5"	10.0"
Minimum inlet pressure	7.0"	14.0"
Maximum inlet pressure	14.0"	14.0"
Gas connection	½" N.P.T.	
Combustion air inlet	4" O.D.	
Vent Connection	4" O.D.	

## GENERAL INSTALLATION PROCEDURES

CAREFULLY READ THIS ENTIRE MANUAL IN IT'S ENTIRETY PRIOR TO BEGINNING ANY INSTALLATION PROCEDURES.

1. In order to ensure valid warranty, a qualified and licensed gas fitter must install this heater.
2. The heater must be hung in such a fashion so as to conform with the clearances to combustibles described on the nameplate of the heater, and any local or applicable codes.
3. The heater may be used in certain areas of **aircraft hangers**. The installation must be in accordance with local and national codes. Heaters in aircraft, storage or service areas must be installed a minimum of 10 ft. above the upper surface of wings or engine enclosures of the highest aircraft that may be housed in the hanger. (This should be measured from the bottom of the heater to the top of the wing, or engine enclosure, whichever is highest from the floor.) In other sections of aircraft hangers, heaters must be installed a minimum of 8 ft above the floor. Heaters installed in aircraft hangers shall be located so as not to be subject to damage by aircraft, cranes or other objects. When installed over hoists, the minimum required safe distances to combustibles must be maintained from the uppermost point of the combustible materials placed on the hoist.
4. The heater may be used in **public garages** provided the installation conforms to all local and national codes for the installation of gas burning appliances. Heaters must be installed a minimum of eight feet above the floor. Minimum safe distances to combustibles must be maintained. When installed over hoists, the minimum required safe distances to combustibles must be maintained from the uppermost point of the combustible material placed on the hoist.
5. It must be located with respect to building construction and equipment so as to provide sufficient clearances and accessibility for servicing.

## HAZARDOUS LOCATIONS

Where there is the possibility of exposure to combustible airborne materials or vapour, consult the local Fire inspector's office, the fire insurance carrier or other applicable authorities for approval of the proposed installation.

DO NOT USE IN AN ATMOSPHERE CONTAINING  
HALOGENATED HYDROCARBONS OR OTHER CORROSIVE  
CHEMICALS. SOME COMPOUNDS IN THE ENVIRONMENT CAN CAUSE AN ACCELERATED  
RATE OF CORROSION TO THE HEAT EXCHANGER.

## GAS SUPPLY

1. Only persons trained and experienced in gas supply piping should be engaged to install the supply piping to the heaters. All gas piping must be in accordance with all national and applicable codes on the installation of gas appliances. Gas supply piping must be sized so as to provide adequate gas supply and pressures as indicated on page 3 of this installation manual.
2. A 1/8" NPT (3.2mm) plugged tapping, accessible for test gauge connection, must be installed immediately upstream of the gas supply connection to the heater.
3. Consideration must be given to the fact that this heater will expand and contract during the heating cycles and care must be taken so as not to cause stress on the gas supply piping system. A suitably approved flexible gas connector must be used to connect the heater to the rigid gas supply piping, and it must be connected so as to provide free movement without causing stress on the flexible gas connector or the rigid piping.

### **Warning**

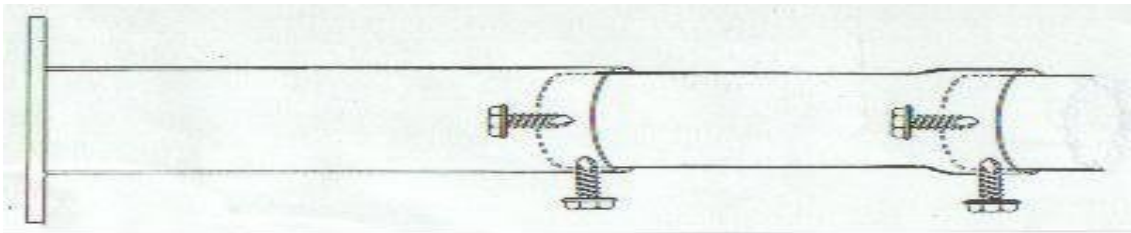
**This heater is equipped with an automatic ignition system. There is no pilot. No person shall attempt to light the heater by hand. Serious injury, property damage or death may occur.**

## COMBUSTION AIR VENTING

When located in a building with a negative air condition or in a dusty or dirty atmosphere such as a woodworking shop, poultry barn or foundry, venting of combustion air to the burner from outside negative or dirty area is mandatory. The combustion air supply must be minimum 4" diameter seamless air duct, connected to the fresh air adapter provided on the blower. All joints must be sealed to prevent leakage. No filters of any type are to be installed on the combustion air supply. The maximum length of combustion air inlet duct shall comply with the "venting of products of combustion" as described in this manual.

### Straight, L-shaped & "U" shaped Heaters

1. Suspend hanging supports with #10 chain, adhering strictly to the hanger locations describe in the diagram following. The first hanger must be no more than 6 inches from the burner flange. Suspend from the top ring on the hanger if the reflectors are to be horizontal and the side ring if the reflectors are to be angled. **IMPROPER HANGER PLACEMENT CAN CAUSE THE RADIANT TUBE TO WARP AND VOID WARRANTY.**
2. With hangers in place, the primary tube, and subsequent secondary tubes can now be placed in the hangers.
3. If the radiant tube has been supplied in 10ft. lengths, see diagram below for joining tubes together. Self tapping screws are provided to be installed into the expanded end of the radiant tube. Slide the tubes together making sure that the first tube is inserted all the way into the expanded end of the secondary tube. Drill the self-tapping screws so as to secure the two tubes together. Make sure to secure the tubes using both screws provided as indicated in the drawing below. Subsequent secondary tubes can now be joined together in the same fashion.



4. If the radiant tube has been supplied in 20 ft. lengths, use the stainless couplers and gear clamps supplied with the heater to couple the lengths of tube together. Make sure the nuts on the gear clamps are securely tightened.
5. Reflectors can now be placed in the hangers. To prevent "walking" of the reflectors, the first and second reflector can be joined together at the overlap with a sheet metal screw. Do not attach more than two reflectors together (i.e. join reflectors 1 & 2 together and reflectors 3 & 4 together etc.)
6. With the radiant tube and reflectors now installed, the burner can be fitted to the flanged end of the primary tube using the nuts provided. The burner does not require it's own hanging support provided the first hanger is no more than 6 inches from the flange. If the first hanger is more than 6 inches from the flange, warping may occur and the warranty will be void.
7. Connect the burner to the gas supply using a suitably approved flexible gas connector.
8. **Heaters incorporating a baffle must have the baffle installed at the extreme opposite end of the heater from the burner. The baffle is not to be installed in the primary tube except for baffles in 20 ft. heaters that have been supplied as one 20 ft. length.**
9. A minimum of 15 ft. must be maintained from the burner before any 90 or 180-degree bend is installed on heaters having inputs of more than 75,000 BTU.

## VENTING OF PRODUCTS OF COMBUSTION

1. The Easy Radiant tube system has been approved for vented and unvented applications. When installed unvented it must be electrically interlocked to an exhaust fan with an air proving switch. The exhaust fan must provide exhaust in the amount of 300 c.f.m. for every 100,000 BTU of input. When installed unvented provision must be made to supply adequate combustion air from outside the space. Combustion air openings must be in the amount of one square inch or more of free area for each 10,000 BTU. When installed vented, installations must comply with all applicable codes. When installed in an adequately ventilated agricultural building used only for brooding purposes, the heater may be installed unvented and discharge the products directly into the space without interlocking provided the maximum input does not exceed 20 BTU per cubic foot, or the input specified by local codes. There must be ventilation during the heating cycle.
2. All vent material shall meet C.G.A. approval standards and be a minimum of 4" diameter.
3. The maximum allowable length of vent pipe is 60 ft. This length includes the combination of inlet air vent for combustion and exhaust venting. The RADIANT TUBE IS NOT INCLUDED IN THIS MEASUREMENT. For every 90-degree bend in the system, 5 ft. must be deducted from the allowable total.
4. When venting through a combustible wall or roof type "B" vent must be used for that portion of the vent that passes through the wall or roof. FOR WALL VENTING THE MANUFACTURER'S APPROVED VENT TERMINAL MUST BE USED. THE USE OF ANY WALL VENT TERMINAL OTHER THAN THAT SUPPLIED BY THE MANUFACTURER WILL VOID WARRANTIES. THE MANUFACTURER ACCEPTS NO RESPONSIBILITY FOR DAMAGES CREATED BY USING OTHER VENT TERMINALS.
5. All vent pipe used with a slip fit connection must be mechanically secured and all vents must be supported every 3 ft.
6. Vent pipe of single wall construction shall not run through unheated spaces unless insulated.
7. All vent pipes longer than 10 ft. must be insulated or have insulated type vent material.
8. Vents for products of combustion shall not terminate less than 3 ft. from a combustion air inlet of any other appliance, less than 3 ft. from a building opening or be directly above a gas utility meter or service regulator. On "U" model heaters the vent terminal shall not be closer than 4 inches from the combustion air inlet.
9. Air intakes or vent terminals shall not be located less than 3 ft. above grade.
10. Horizontal vent systems shall slope downwards not less than ¼ inch per foot from the start of the vent system to the vent terminal.

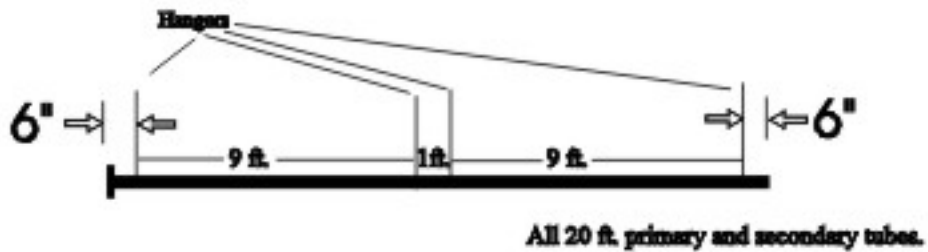
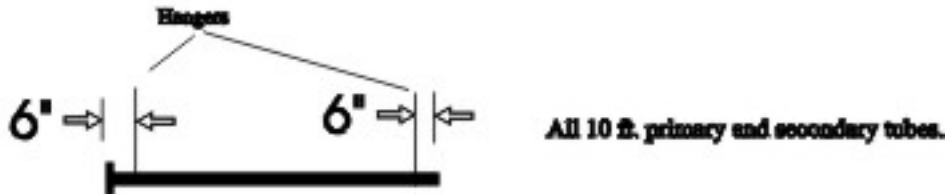
**The gas supply lines, all safety controls of the heater and the venting system must be inspected and tested annually by a qualified and licensed gas technician, experienced with the installation and servicing of this type of appliance.**

**Measurement of hanger locations.**

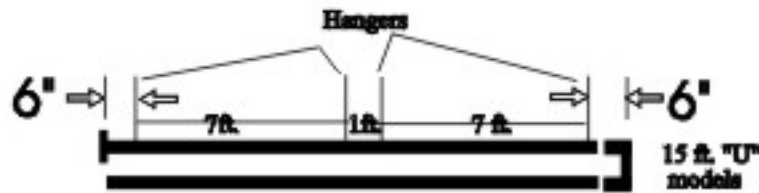
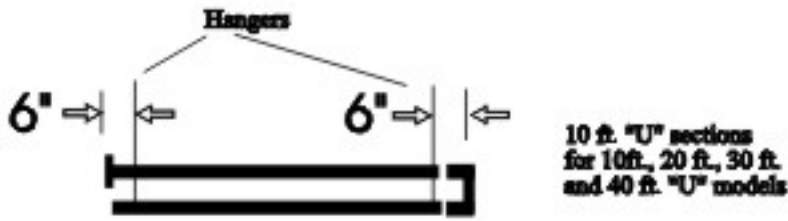
Diagram below shows correct hanger placement for all 10 ft. and 20 ft. primary and secondary tubes.

**IMPROPER PLACEMENT OF HANGERS CAN CAUSE WARPING OF THE RADIANT TUBE AND WILL VOID WARRANTY.**

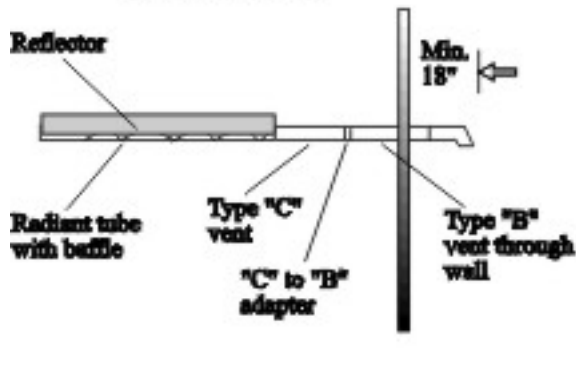
**Straight Models**



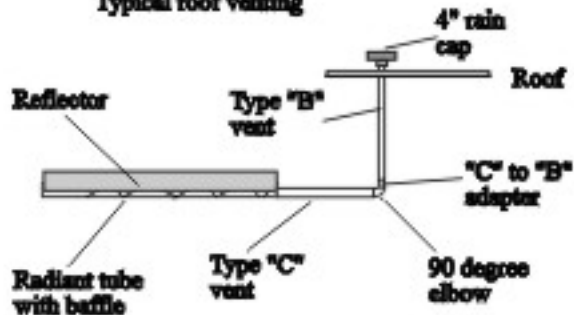
**U-shaped Models**



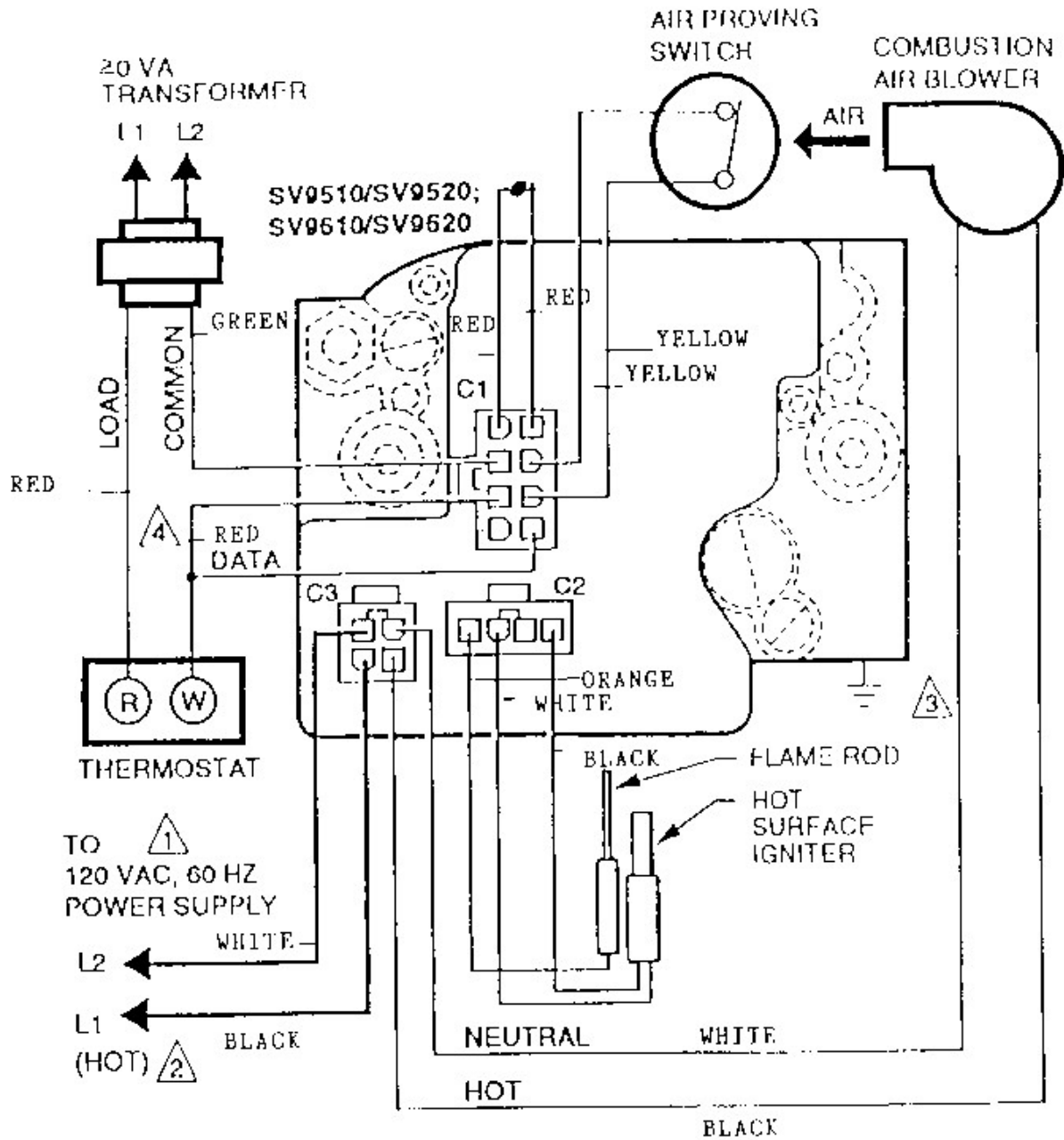
**Typical wall venting**



**Typical roof venting**

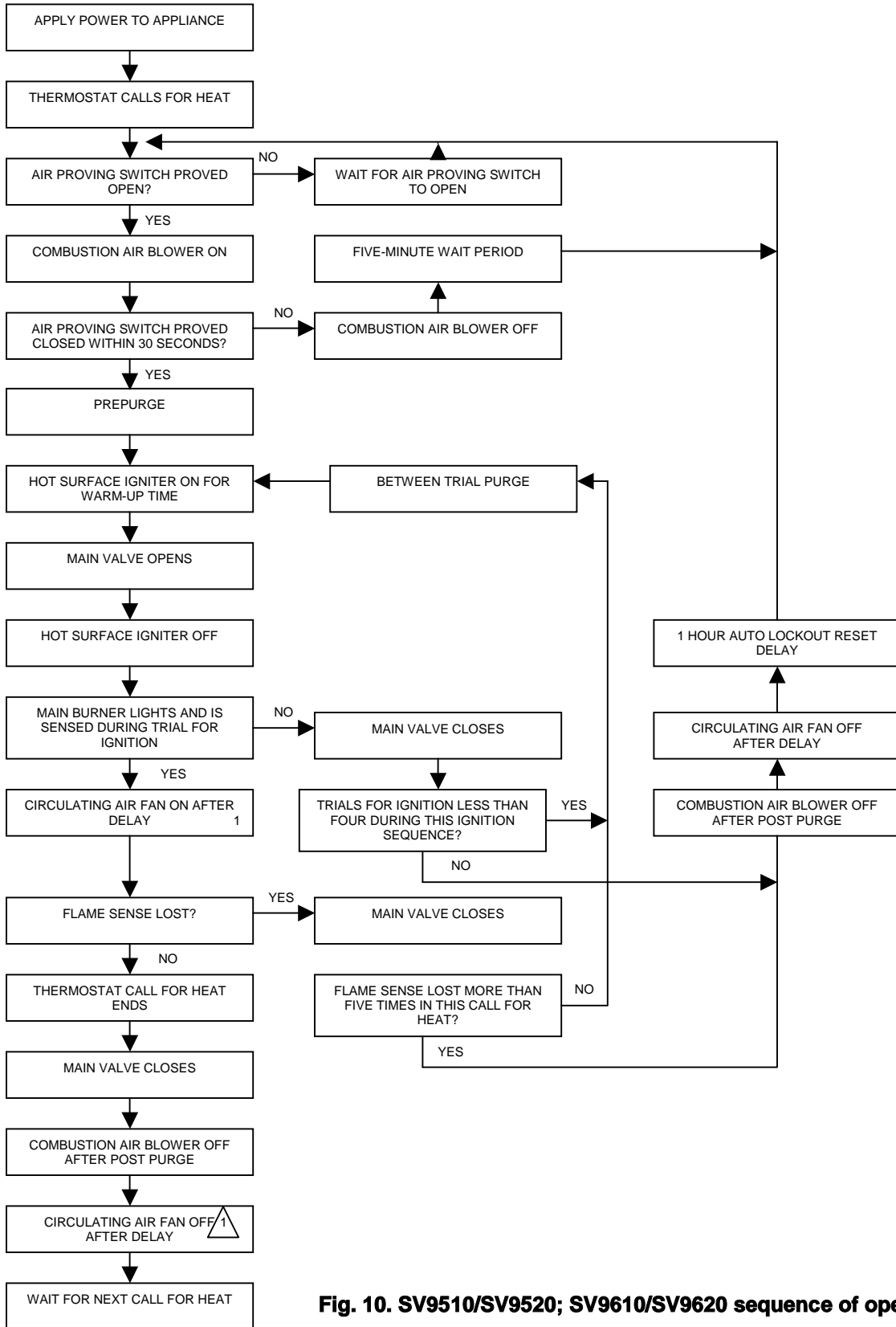


WIRING DIAGRAM FOR HONEYWELL SMART VALVE



- ⚠️ 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- ⚠️ 2 CONNECT 120V (HOT) LEAD AS SHOWN.
- ⚠️ 3 APPLIANCE CHASSIS MUST HAVE RELIABLE CONNECTION TO EARTH GROUND.

**SV9510/SV9520; SV9610/SV9620 DIRECT HOT SURFACE IGNITION SmartValve™  
SYSTEM CONTROL SEQUENCE OF OPERATION WITH ST9160 ELECTRONIC FAN TIMER OR 208907 TERMINAL BOARD**



**Fig. 10. SV9510/SV9520; SV9610/SV9620 sequence of operation.**

## TROUBLESHOOTING

**Troubleshooting with LED Indicator Assistance  
(No cycling of appliance power or thermostat call  
for heat since appliance failure has occurred)**



### WARNING

**Line Voltage Power  
Can cause property  
damage, severe injury or  
death.**

Only a trained, experienced  
service technician should  
perform this troubleshooting.

1. Check the system thermostat to make sure it is in an active call for heat mode. (Do not cycle the thermostat on and off at this time.)
2. Remove the appliance burner compartment door. Do not interrupt the power to the SV9510/SV9520; SV9610/SV9620 by opening any electrically interlocked panels.
3. Observe LED indicator on SV9510/SV9520; SV9610/SV9620; check and repair the system as noted in the following table:

LED Status	Indicates	Check/Repair
OFF	No power to system control	<ol style="list-style-type: none"> <li>1. Line voltage input power at L1 and L2 connectors on Electronic Fan Timer (EFT) or 208907 Terminal Board.</li> <li>2. Low voltage (24V) power at 24VAC and COM terminals on Terminal Board.</li> <li>3. Fuse on EFT; if provided.</li> <li>4. System wiring harness in good condition and securely connected at both ends.</li> </ol>
Bright-Dim	<p>Normal Operation</p> <p>This indication shows whenever the system is powered, unless some abnormal event has occurred.</p>	Not applicable
2 Flashes	<p>Airflow proving switch remains closed longer than 30 seconds after a call for heat begins.</p> <p>Combustion air blower is not energized until airflow proving switch opens</p>	<ol style="list-style-type: none"> <li>1. Airflow proving switch stuck closed.</li> <li>2. Airflow proving switch miswired or jumpered.</li> </ol>
3 Flashes	<p>Airflow proving switch remains open longer than 30 seconds after combustion air blower energized.</p> <p>System goes into 5-minute delay period, with combustion air blower off. At the end of the 5-minute delay, another ignition cycle will begin.</p>	<ol style="list-style-type: none"> <li>1. Ignition system control switch must be in the ON position.</li> <li>2. Airflow proving switch operation, tubing, and wiring.</li> <li>3. Obstructions or restrictions in appliance air intake or exhaust flue system that prevent proper combustion air flow.</li> </ol>
4 Flashes	<p>Limit string open.</p> <p>Combustion air blower is energized. If control system indicates Electronic Fan Timer, the heat speed circulating air fan will be energized until the limit string resets.</p>	<ol style="list-style-type: none"> <li>1. Open manual reset or auto reset burner rollout switch.</li> <li>2. Open high temperature or auxiliary limit switch.</li> <li>3. Limit and rollout switch wiring in good condition and securely connected.</li> </ol>
5 Flashes	<p>Flame signal sensed out of proper sequence.</p> <p>Combustion air blower is energized. If control system indicates Electronic Fan Timer, the head speed circulation air fan will be energized after the selected heat fan on delay.</p>	Flame at main burner
6 Flashes	<p>System Lockout</p> <p>After 1 hour lockout reset delay, control will reset and initiate a new ignition sequence if the call for heat is still present.</p>	<ol style="list-style-type: none"> <li>1. Gas supply off or at too low pressure to operate appliance</li> <li>2. Damaged or broken HSI element</li> <li>3. Line voltage HOT leadwire not connected to L1 terminal on Terminal Board.</li> <li>4. Appliance not properly earth grounded.</li> <li>5. Flame sense rod contaminated or in incorrect location.</li> <li>6. HSI element located in incorrect position.</li> <li>7. Hot surface element or flame sense rod wiring in good condition and properly connected.</li> </ol>

**WARNING****Line Voltage Power****Can cause property damage, severe injury or death.**

Only a trained, experienced service technician

Should perform this troubleshooting.

4. After LED flash code analysis and appliance repair are complete, turn thermostat below room temperature for 10 seconds; turn the thermostat above room temperature to initiate a new call for heat.
5. Observe the ignition sequence; comparing it to the Sequence of Operation shown in fig. 10. Allow the new ignition sequence to proceed until appliance lights or an abnormal or unexpected event is observed. See next section

1. Make sure the appliance power is on and any manually operated gas cock on the appliance is open.
2. Remove the appliance burner compartment door. Confirm that SV9510/SV9520; SV9610/SV9620 LED indicator is flashing in a "bright-dim" sequence.
3. Make sure the ignition system control switch is in the ON position.
4. Disconnect the system thermostat leadwires at the Terminal Board.
5. Using alligator clips on a short jumper wire, jumper the R and W terminals on the EFT or Terminal Board.
6. Observe the appliance operation, comparing it to the Sequence of Operation shown in Fig. 10. Allow the ignition sequence to proceed until the appliance lights or an abnormal or unexpected event is observed.
7. Check the appliance as shown in the following table.

**Troubleshooting Without LED Indicator Assistance (Appliance power or thermostat call for heat has cycled since appliance failure occurred)**

<b>If</b>	<b>And</b>	<b>Check/Repair</b>
Combustion air blower does not energize.	2 Flash code does not come on 30 seconds after call for heat starts.	<ol style="list-style-type: none"> <li>1. Combustion air blower wiring</li> <li>2. Combustion air blower</li> </ol>
Combustion air blower does not energize.	2 Flash code does come on 30 seconds after call for heat starts.	<ol style="list-style-type: none"> <li>1. Airflow proving switch stuck closed</li> <li>2. Airflow proving switch miswired or jumpered</li> </ol>
Combustion air blower energized.	3 Flash code does not come on after 30 seconds.	Wait for the prepurge time to expire
3 Flash code comes on 30 seconds after combustion air blower is energized.	Combustion air blower turns off.	<ol style="list-style-type: none"> <li>1. Ignition system control switch must be in the ON position</li> <li>2. Airflow proving switch stuck in open position</li> <li>3. Airflow proving switch tubing and wiring</li> <li>4. Obstructions or restrictions in appliance air intake or exhaust flue system that prevent proper combustion air flow</li> </ol>
Prepurge time has expired.	HSI element does not glow red within 10-15 seconds.	<ol style="list-style-type: none"> <li>1. Broken or damaged HSI element</li> <li>2. Broken or damaged HSI element leadwires</li> <li>3. Failure to power HSI element</li> </ol>
HSI element is glowing red.	No other visible control system action.	Wait for HSI element warm up time to expire