



# Easy Radiant Works

12288 Side Rd. 22, Wainfleet, Ontario, Canada L0S 1V0  
Phone 905-899-3473 E-mail erw@vaxxine.com Fax 905 899-2262



## Installation / Operating Instructions for **MIDDLEMAN** Model Numbers

EZM-90-40		EZMU-90-20
EZM-90-50		EZMU-90-25
EZM-100-50		EZMU-100-25
EZM-100-60		EZMU-100-30
EZM-120-60		EZMU-120-30

The letter “B” added to the prefix indicates a brooder model.  
The letters “LTH” added as a suffix to the model number indicates 2- stage input.

The installation must comply with local codes and CAN / CGA B – 149 in Canada or the National Fuel Gas codes – ANSI Z 223.1 (latest edition) for gas burning appliances.

<b>FOR YOUR SAFETY</b> IF YOU SMELL GAS	<b>CONSIGNES DE SECURITE</b> SI VOUS SENTEZ UNE ODEUR DE GAZ
1. Open windows	1. Ouvrez les fenetres
2. Do not touch electrical switches	2. Ne touchez pas aux interrupteurs electriques
3. Extinguish any open flame	3. Eteignez toute flamme nue
4. Immediately call your fuel supplier	4. Contactez immediatement compagnie de gaz

### **WARNING:**

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read this manual completely before installing or servicing the equipment.

This appliance has been tested and approved in accordance with CAN. 1-2.16M81 & LR #24, CAN-20-M85, CAN/CGA 2.17-M91, CAN/CSA C22.2 No. 3-M 1988, and ANSI-Z 83.b-1993, WH-GIR001.

## MIDDLEMAN SPECIFICATIONS

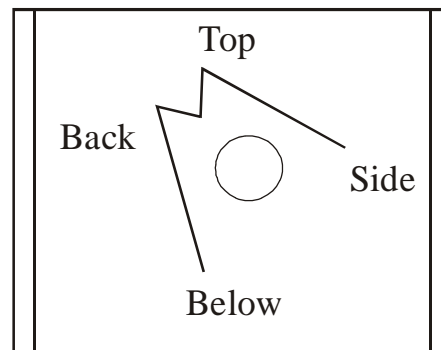
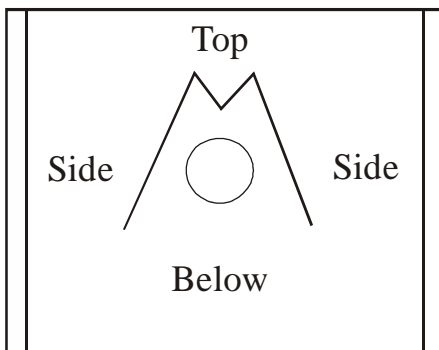
Model No.	Length	Input	Clearances to Combustibles (inches)			
			Top	Side	Back	Below
<b>Straight Series</b>						
EZM-90-40	42' 3"	90,000 (2 x 45,000)				
EZM-90-50	52' 3"	90,000 (2 x 45,000)				
EZM-100-50	52' 3"	100,000 (2 x 50,000)	<b>4</b>	<b>13</b>	<b>15</b>	<b>31</b>
EZM-100-60	62' 3"	100,000 (2 x 50,000)				
EZM-120-60	62' 3"	120,000 (2 x 60,000)				
<b>U – Series</b>						
EZMU-90-20	22' 3"	90,000 (2 x 45,000)				
EZMU-90-25	27' 3"	90,000 (2 x 45,000)				
EZMU-100-25	27' 3"	100,000 (2 x 50,000)	<b>4</b>	<b>13</b>	<b>15</b>	<b>31</b>
EZMU-100-30	32' 3"	100,000 (2 x 50,000)				
EZMU-120-30	32' 3"	120,000 (2 x 60,000)				

- The suffix “LTH” indicates 2-stage input with the low input being 70% of the high input.
- The letter “B” added to the prefix EZM & EZMU indicates brooder model.

Minimum clearances to combustibles are reduced by 1/3, 15ft. from burner.

Gas Supply	Natural Gas	Propane	Electrical	
Manifold Pressure	3.5" W.C.	11.0" W.C.	120 volts 60Hz	
Min. Inlet Pressure	7.0" W.C.	14.0" W.C.	Starting Current	6 amps
Max. Inlet Pressure	7.0" W.C.	14.0" W.C.	Running Current	2 amps
			Thermostat Control	120V (Standard)
Gas Connection	½ in. N.P.T.			24V (optional)
Combustion Air Inlet	4" O.D.		Ignition System 120 volts Hot Surface Ignition	
Vent Connection	4" O.D.		(glow bar)	

Control box and burner housing dimensions: Length 16", Width 30", Height 15"



## GENERAL INSTALLATION PROCEDURE

**WARNING:** THIS HEATER MUST BE INSTALLED AND SERVICED BY A TRAINED GAS SERVICE TECHNICIAN ONLY. READ AND UNDERSTAND THESE INSTRUCTIONS THOROUGHLY BEFORE ATTEMPTING TO INSTALL, OPERATE OR SERVICE THE EASY RADIANT WORKS HEATER. FAILURE TO COMPLY WITH THESE WARNINGS AND INSTRUCTIONS, AND THOSE ON THE HEATER COULD RESULT IN PERSONAL INJURY, DEATH, FIRE, ASPHYXIATION, AND / OR PROPERTY DAMAGE.

### **INSTRUCTIONS MUST REMAIN WITH THE UNIT.**

1. Carefully survey the area to be heated and place the burner and combustion chamber in the coldest area if possible.
2. The heater shall be hung in such a fashion so as to conform with the clearances to combustibles described on the name plate.
3. Clearances to combustibles must be maintained from vehicles parked below.
4. Adequate clearances must be maintained for installation in public garages and airplane hanger.
5. It should be located with respect to building construction and equipment, so as to provide sufficient clearances and accessibility for servicing.
6. The installation must comply with local codes and CAN/CGA B-149 in Canada or the National Fuel Gas codes ANSI Z 223.1 in the United States.

## ELECTRICAL

1. Electrical installation must be grounded in accordance with CSA standard C22.1 part 1 in Canada or The National Electrical code ANSI NFPA 70 (latest edition) in the United States.
2. Polarity of line voltage and neural wires must be maintained.
3. The total load of all heaters in a circuit must be considered not to overload the circuit. See electrical specifications on page 2.

**NOTE:** 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.

**NOTE:** **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.**

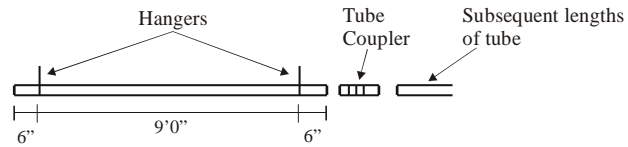
## **INSTALLATION**

1. Suspend hanger supplied with #10 Jack chain with strict adherence to specified placement of hangers, see illustration on page 6. The first hanger must not be more than 6 inches from the burner flange. Hangers have 2 suspension rings. Use top ring if reflectors are to be horizontal, or side ring if reflectors are to be angled.
2. With hangers installed, the primary tube can now be placed in the hangers. Subsequent lengths of tube can now be installed, butting the lengths of tube together and securing joints with stainless steel tube couplers and 3 gear clamps. Be sure to tighten the gear clamps securely and evenly spaced on couplers.
3. Reflector panels can now be placed in hanging supports. Sheet metal screws may be used to secure reflectors together in pairs only.
4. With all radiant tubes and reflector panels now installed, the burner can be fitted to the 2-flanged primary tubes using the bolted flange and nuts (provided). The burner must be installed with the fan on the top. Burner employs a ring to connect a hanging chain to stabilize the unit.
5. Heaters incorporating baffles must have the baffle installed at the immediate vent end of the heater. This baffle is not to be installed in the primary tube.

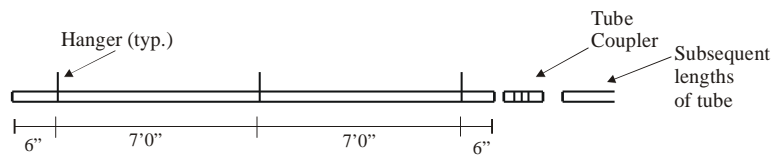
## **U-SHAPED HEATER**

1. U-Shaped heaters consist of radiant tubes, tube couplers and gear clamps, “U” bends, hangers, burner and wide-angle reflectors.
2. Use #10 Jack chain to suspend the hangers from the ceiling, these hangers must be spaced according to hanger location illustration.
3. With hangers now suspended, carefully lay the radiant tube in the holders, flange section first.
4. Use stainless steel tube couplers (supplied) to connect radiant tubes together. Be sure that clamps are securely tightened and evenly spaced.
5. The 180 degree bend can now be fitted to the radiant tube and securely tightened with setscrew provided on 180 degree bend.
6. Reflectors can now be placed in hangers.
7. Fit the burner to the flanged end of the tubes with bolts provided and connects to the gas supply.

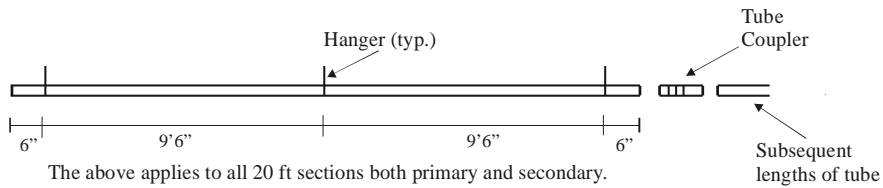
## Measurement of Hanger Locations EZ "Middleman" Center Fired Radiant Tube Heaters



The above applies to all 10 ft sections both primary and secondary.

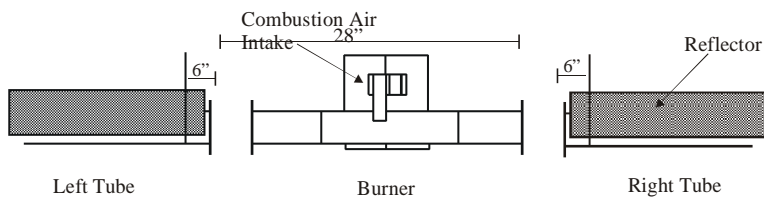


The above applies to all 15 ft sections both primary and secondary.



The above applies to all 20 ft sections both primary and secondary.

Improper placement of hangers can cause warping or sagging of radiant tubes.



## **GAS PIPING**

1. All gas piping and connections shall be made in accordance with local codes and CAN/CGA B-149 or ANSI standard Z223.1.
2. Connect the burner to gas supply with flexible gas connector.
3. Flexible gas connectors are not supplied with nor are they required with “U” shaped models.
4. A drip leg must be installed in the gas line at the heater connection.

**CAUTION:** Correct inlet pressure is vital to efficient operation of heaters. Refer to the rating plate and, if necessary, consult Gas Company.

**WARNING:** Never use a match or other flame to test for gas leaks. Use soap and water solution to check for leaks.

## **VENTING**

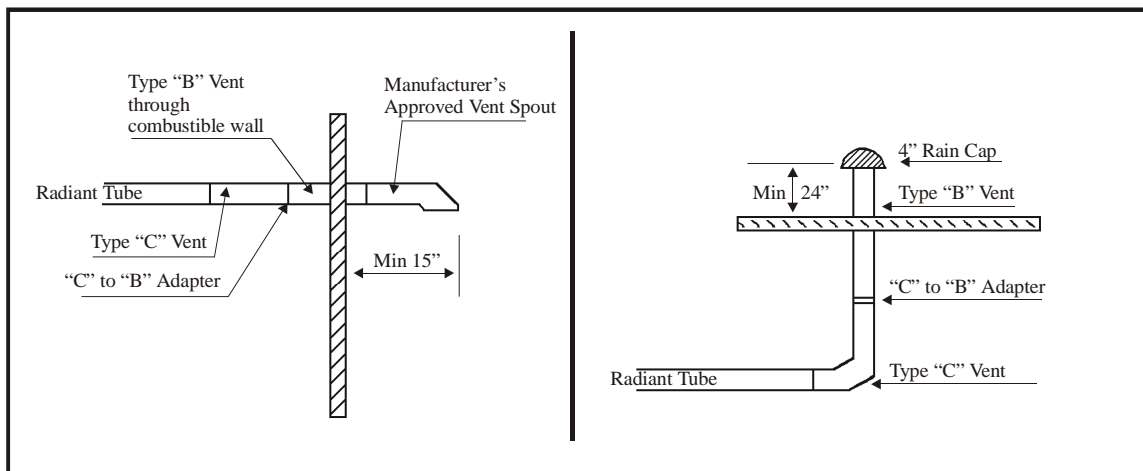
1. The Easy Radiant tube system has been approved for vented and un-vented application. When installed un-vented it must be electrically interlocked to an exhaust fan with an air proving switch. The exhaust fan must provide exhaust in the amount of 300 c.f.m. for every 100,000 BTU input. When installed un-vented provision must be made to supply adequate combustion air from outside the space. Combustion air openings must be in the amount of one (1) square inch or more of free area for each 10,000 BTUH. When installed vented, installations must comply with all governing codes. When installed in an adequately ventilated agricultural building used only for brooding purposes, the heater may be installed un-vented and discharge the products directly into the space without interlocking, providing the maximum input does not exceed 20 BTU per cubic foot, or the input specified by local codes.
2. All venting material, shall be CGA/AGA approved and minimum 4” diameter.
3. The maximum allowable length of vent pipe is 60 feet. This length includes the combination of inlet air vent for combustion and exhaust venting. **THE RADIANT TUBE IS NOT INCLUDED IN THE MEASUREMENT.** For every 90-degree bend in the system, 5 feet must be deducted from the total.
4. When venting through a combustible wall or roof, type “B” vent must be used for that portion of the vent that passed through the wall or roof. For wall venting, the manufacturer’s approved vent spout must be used. **The use of any wall vent terminal other than that supplied by EASY RADIANT will void warranties. EASY RADIANT WORKS accepts no responsibility for damages created by 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 feet.

6. Vent pipe of single wall construction shall not run through unheated spaces unless insulated.
7. All vent pipes longer than 10 feet must be insulated or have insulated type vent materials.
8. Vents for products of combustion shall not terminate less than three (3) feet from a combustion air inlet of any other appliance, or be less than three (3) feet from a building opening or be directly above a gas utility meter or service regulator.
9. The exhaust vent terminal must be installed not less than 7 feet above grade.
10. Air intakes terminals shall not be located less than three (3) feet above grade.

**NOTE:** When located in a building with a negative air condition, or in a dusty or dirty atmosphere such as a wood working shop, poultry barn or foundries, combustion air from outside the negative or dirty area to the burner is mandatory. The combustion air supply should be minimum 4-inch diameter seamless air duct, connected to fresh air adapter provided on combustion air blower. All joints or seams shall be sealed to prevent leaks.

11. Horizontal vent systems shall slope downwards not less than  $\frac{1}{4}$ " per foot from the start of the vent system to the vent terminal.

### Typical Venting Arrangements



## OPERATING SEQUENCE

The Easy Radiant gas burner is a very simple device. The normal sequence of events during ignition and operation of the burner is as follows:

1. The heater is energized by means of a thermostat or switch which powers the left hand module (Module No. #1).
2. The current flows and energizes the glo-bar igniter and reaches ignition temperature (maximum 45 seconds). No gas flows until the valve is energized and opened.
3. The glow bar energizes the relay, which powers the bower and the second transformer.
4. The second transformer energizes the right side module which will power the right side glow bar and allow a current through the pressure switches. **NOTE:** The current flows and energizes the glo-bar igniter and reaches ignition temperature (maximum 45 seconds). NO gas flows until the valve is energized and opened.
5. The relay coil is normally closed but as the relay coil is energized by module No. #1 the relay opens powering the blower by passing the module No. #1.
6. Air pressure generated by the blower will cause the normally open combustion pressure switch to close. The combustion pressure switch is set to allow the normal rate of combustion air to flow into the combustion chamber. Any restriction or blockage will cause the pressure switch to open and shut down the entire system.
7. The current pass through the block flue pressure switch, which is normally closed. Any blockage or restriction will cause the pressure switch to open and shut down the entire system.
8. The valve, in series with the glo-bar, is energized and opened. Gas flows through the burner and is ignited by the glo-bar.
9. The power is removed from the glo-bar. The glo-bar is utilized as a flame probe. As long as a flame is present, the valve is held open. If the flame is lost, the control acts to close the valve within one second and a new trial sequence to start up is initiated.
10. If after step 7 ignition is not achieved, or flame is not sensed by the igniter, then the control closes the gas valve recycles the glo-bar igniter, and attempts ignition a second and if necessary a third time. If ignition is not achieved after the third try, the control goes into lockout and power must be interrupted before trying again. At this point it is suggested that an authorized service person be contacted to inspect and test the controls.
11. The heater should continue to function until power is interrupted either by the thermostat being satisfied or manually disconnected.

## **TROUBLE SHOOTING**

If at the onset of ignition, no ignition occurs, the following should be checked.

Lack of power at the input of the controls caused by:

- Check the line voltage (120 v)
- The thermostat is not calling for heat
- The fan is not running and therefore not closing the air proving switch
- Blocked combustion air inlet or blockage in exhaust venting
- Faulty air flow connection
- The blocked flue air switch in open position
- The combustion air switch should be in the closed position
- Faulty 24 volt transformer
- Low voltage supply to unit

Having established power at the control, and still no ignition occurs then the control itself is suspect and should be changed.

If the igniter operates and still no ignition, then the gas valve is suspect. Be sure that the main gas supply is on, that the gas cock in the drop line is on, and that the shut off cock on the gas valve is open. If all gas cocks are open, then power to the gas valve should be checked. If there is power to the valve and it does not open then the valve should be replaced.

Continued lockout of the control may indicate that the igniter is not providing the signal back to the control (flame sensing circuit). If the igniter is in the proper position and the lockout condition continues, then the grounding connections of the burner, control, and transformer should be checked. Proper polarity must be maintained in the building wiring. Reversed polarity of insufficient supply voltage can cause intermittent ignition failure. If this does not solve the problem, then the control is suspect.

Ignition control modules are solid state; computerized devices that require consistent supply voltage.

## **WARRANTY**

If your heater fails to function within 18 months of the date of its purchase by the original purchaser, due to a defect in materials or workmanship, Easy Radiant Works will furnish a new or rebuilt part F.O.B. factory. Easy Radiant Works is not responsible for delivery, labour or installation costs.