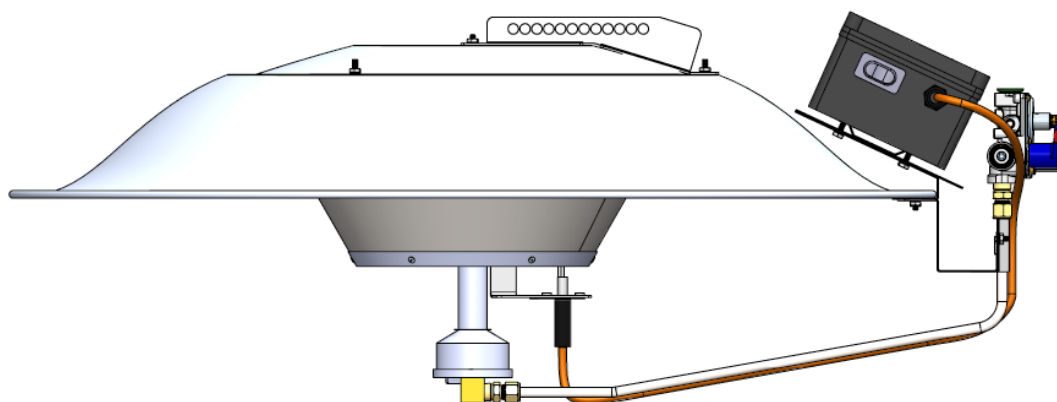


Installation, Operation and Service Instructions

INFRARED BROODER

SERIES BRLS



WARNING

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

FOR YOUR SAFETY

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

If you smell gas:

1. Open windows
2. Don't touch electrical switches
3. Extinguish any open flame
4. Immediately call your gas supplier

OWNER

Retain this Manual & ensure available for service. Improper installation, adjustment, alteration, service or maintenance can cause injury, death or property damage.

Read the installation, operation and service instructions thoroughly before installing or servicing this equipment

INSTALLER

Provide Manual to Owner upon completion of installation!

Read and thoroughly understand these Instructions before attempting any installation

Canada: 563 Barton Street, Stoney Creek, Ontario L8E 5S1

USA: 315 N Madison Street, Fortville, IN 46040

www.superiorradiant.com

WARNING: FIRE OR EXPLOSION HAZARD

Maintain clearance to combustible constructions as further specified in this manual. Failure to do so could result in a serious fire hazard. Heaters should not be located in hazardous atmospheres containing flammable vapors or combustible dusts. Signs should be provided in storage areas specifying maximum safe stacking height.

CAUTION: FIRE OR EXPLOSION HAZARD

This heater is equipped with an automatic ignition device. Do not attempt to light the burner by hand. Failure to comply could result in a serious fire and personal injury hazard.

CAUTION: MECHANICAL HAZARD

Do not use high pressure (above 1/2 psi) to test the gas supply system with the burners connected. Failure to do so could result in damage to the burner and its control components requiring replacement.

CAUTION: SERVICE LIFE RISK

Do not install equipment in atmospheres containing halogenated hydrocarbons or other corrosive chemicals. Failure to do so may lead to premature equipment failure and invalidation of the warranty.

WARNING – California Proposition 65

This appliance, its related accessories and by-product of operation, contain chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.
For more information go to www.P65Warnings.ca.gov.

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INTRODUCTION

Superior Radiant Products is a company in the infrared heating industry founded on the principles of product quality and customer commitment.

Quality commitments are evidenced by superior design, a regard for design detail and an upgrade of materials wherever justifiable.

Customer commitment is apparent through our ready responses to market demands and a never-ending training and service support program for and through our distributor network.

The series BRLS is an infrared brooder for agricultural installations.

IMPORTANT

The manufacturer's instructions, the layout drawing, national and local codes and ordinances, and all applicable standards which apply to gas piping and electrical wiring comprise the basic information needed to complete the installation. These criteria must be thoroughly understood before proceeding.

Only personnel who have been trained and understand all applicable codes should undertake the installation. Manufacturer representatives are Factory Certified in the service and application of this equipment and can be called on for helpful suggestions about installation.

Installation Codes

Installations must comply with local codes, or in their absence, the latest edition of the national regulations and procedures as listed below.

This heater complies with IAS U.S. No. 8-94 (Draft No. 2) and CAN-1-2-20-M85.

General Installation and Gas Codes

Heaters must be installed only for use with the type of gas appearing on the rating plate, and the installation must conform to the National Fuel Gas Code, ANSI Z223.1/NFPA 54 in the US and CSA B149.1 Installation Code in Canada.

Not for use in residential dwellings, refer to Rating plate.

Gas Supply Lines

Gas supply pipe sizing must be in accordance with the National Fuel Gas Code, ANSI Z223.1/NFPA 54 in the US and CSA B149.1 Installation Code in Canada.

A 1/8" NPT plugged tap must be installed in the gas line connection immediately upstream of the burner farthest from the gas supply meter to allow checking of system gas pressure.

Electrical

All heaters must be electrically grounded in accordance with the National Electric Code, ANSI/NFPA 70 in the US, and the Canadian Electric Code, CSA C22.1 in Canada, and must comply with all local requirements.

GENERAL SPECIFICATIONS

Input

36,000 BTU/hr

Gas Supply

Inlet Pressure

Natural Gas:	Minimum	5.0" W.C.	Propane Gas:	Minimum	11.0" W.C.
	Maximum	14.0" W.C.		Maximum	14.0" W.C.

Manifold Pressure

Natural Gas:	4.4" W.C.	Propane Gas:	10" W.C.
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Inlet Connection

Natural Gas or Propane: 3/8" female NPT

Electric Supply

24 VAC, 60 HZ, 0.8 Amp

Ventilation

For indoor installation only and unvented. Minimum ventilation required is 160 CFM per brooder.

Shipping configuration

This heater ships from the factory for use with LP gas. To convert from propane to natural gas, refer to Gas Conversion Instructions within this manual.

High Altitude Ratings

36,000 BTU/hr. For Canada 0-2000 feet above sea level. In the U.S. 0-2000 feet above sea level, anything over 2000 feet is derated by 4% per thousand feet above sea level as per National Fuel Gas Code.

DIMENSIONAL CHARTS

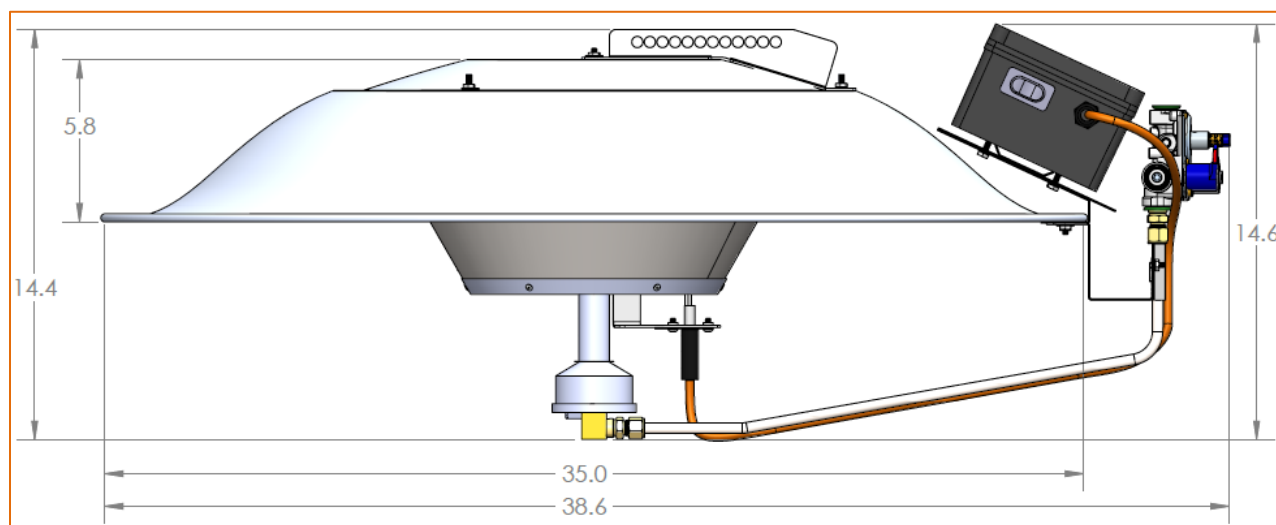


Figure 1: Overall Dimensional Information

BROODER PARTS

Get to know your heater parts (list referencing Figure 2).

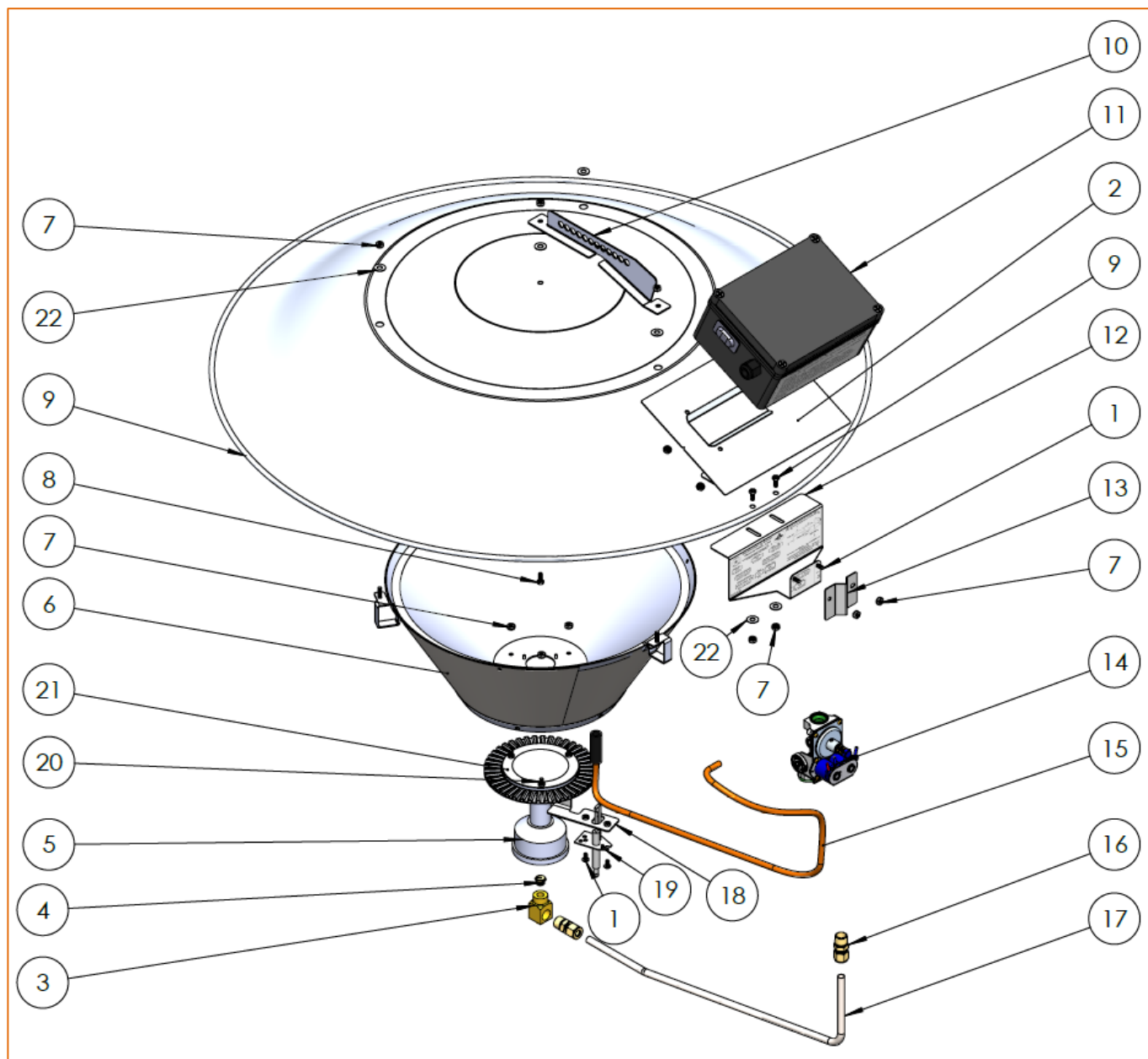


Figure 2: General Overview

General Assembly

Refer to Figure 2 for component identification.

No.	Qty	PN	Description	No.	Qty	PN	Description
1	4	CH118	Screw S/S #8-32x3/8" Pan Phillips	12	1	BS066	Heat Shield, Slim Brooder
2	1	BS091	Module Mounting Bracket Assembly	13	1	BS010	Manifold Mounting Bracket
3	1	BG027	Brass Adapter	14	1	BG003	WR Gas Valve 25M18-716
4	1	UG041	Orifice #50 LPG; #36 NG	15	1	BE004	Ignition Cable 35"
5	1	BG010	Brooder Burner	16	2	BG006	Brass Tube Fitting, 3/8 NPT to 3/8 Pressure Fitting Female
6	1	BS071	Brooder Cone Assembly	17	1	BG007	Gas Tube, 3/8 S/S
7	12	CH190	Keps Nut #10-24	18	1	BS005	Electrode Bracket
8	3	CH051	Hex Head Bolt S/S 1/4"-20	19	1	BE003	Electrode PSE-GF26
9	1	BS013	Reflector	20	3	BS004	Spacer Screw #10-24
10	1	BS069	Brooder Main Hanging Bracket	21	1	BS003	Burner Top Plate
11	1	BE038	Control Box	22	5	CH315	Washer Flat S/S #10 x 0.5" OD

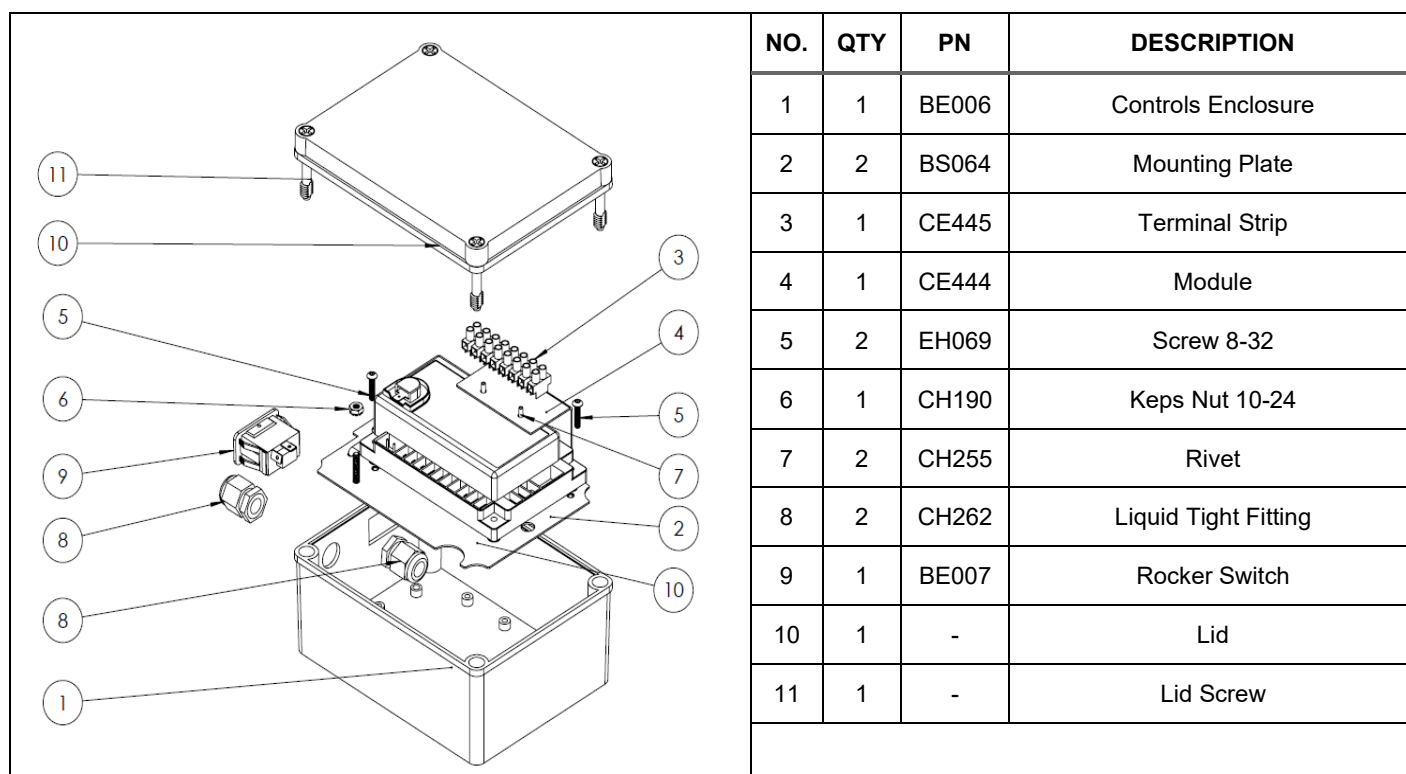


Figure 3: Control Box (BE038) Components

*Not shown in diagram; only used in conjunction with gas valve 25M18-716B1

PACKAGE CONTENTS

The radiant brooder is sold in packages of six or one, depending on the customer's quantity order. Verify that you have received all heater components included with the unit. The unit is packaged as sub-assemblies in kits, listed below. To purchase replacement parts, refer to page 23.

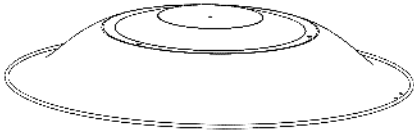
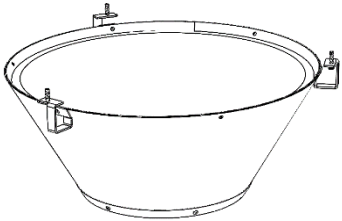
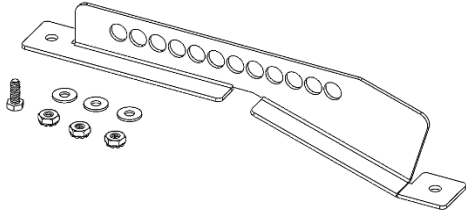
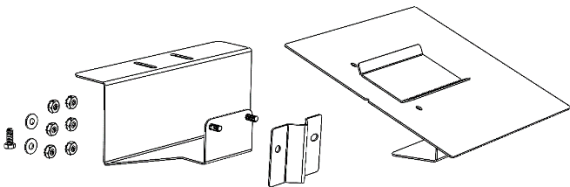
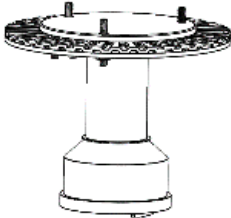
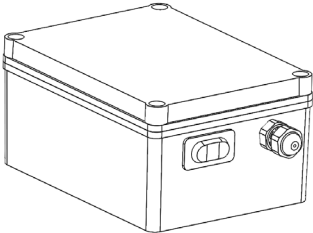
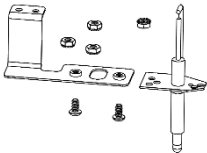
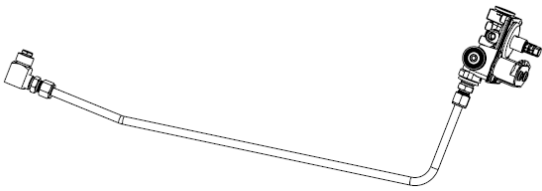

	
BS013 - Reflector	
	
BK071 Emitter Cone Assembly	BK001- Hanger Kit
	
BK018 - Heat Shield Kit	BG010 - Burner
	
BE038 - Control Box Kit	BK004 - Electrode Assembly Kit
	
BK025 - Manifold Assembly	BK023 - Natural Gas Conversion Kit

Figure 4

CLEARANCE TO COMBUSTIBLES

Minimum clearances to combustible materials shall be measured from outer surface of the reflector.

In addition to this, it is very important to observe the minimum clearance to combustibles at all times to avoid any possibility of property damage or personal injury.

Combustible materials are considered to be wood, compressed paper, plant fibres, plastics, Plexiglas or other materials capable of being ignited and burned. Such materials shall be considered combustible even though flame-proofed, fire-retardant treated or plastered.

The stated clearance to combustibles represents a surface temperature of 90°F (50°C) above room temperature. Building materials with low heat tolerance (i.e., **plastics, vinyl siding, canvas, tri-ply, etc.**) may be subject to degradation at lower temperatures.

It is the installer's responsibility to ensure that adjacent materials are protected from deterioration.

A	B	C
66" (1676mm)	36" (915mm)	15" (380mm)

Table1: Minimum clearance to combustible materials

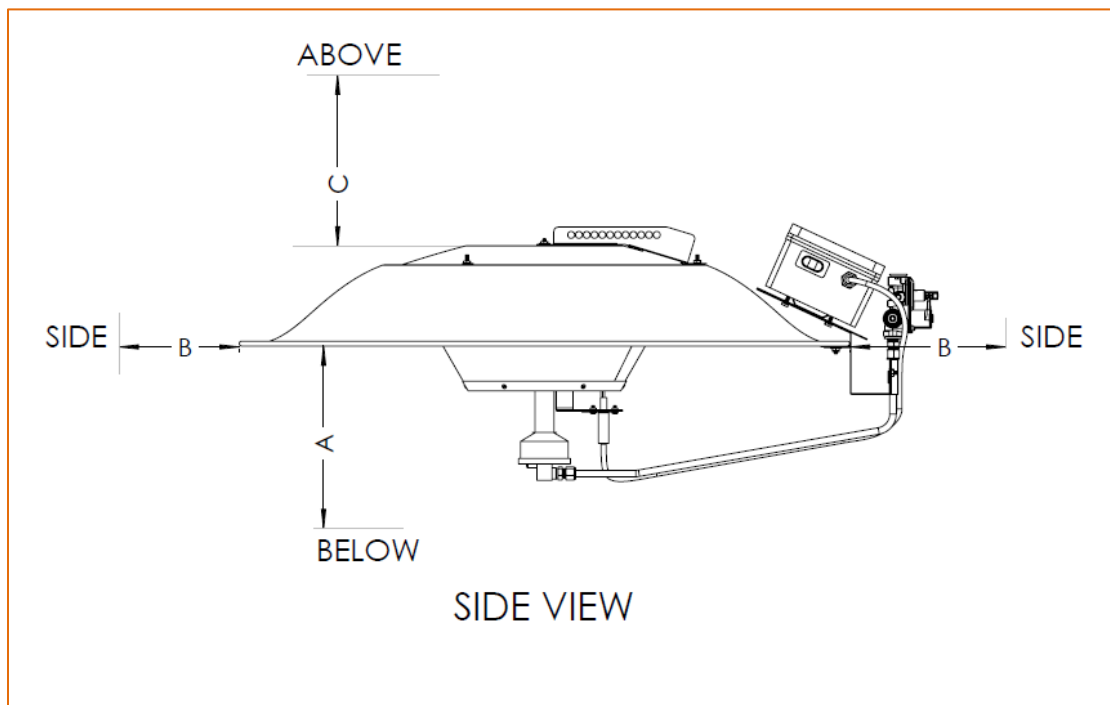


Figure 5: Clearance to Combustible

ASSEMBLY

1. Before assembling, check that all components are included in the package.
2. Fasten the burner assembly to the cone assembly using three (3) #10-24 hex locknuts and attach the igniter bracket to the burner assembly using a #10-24 hex locknut, as shown in Fig. 6.

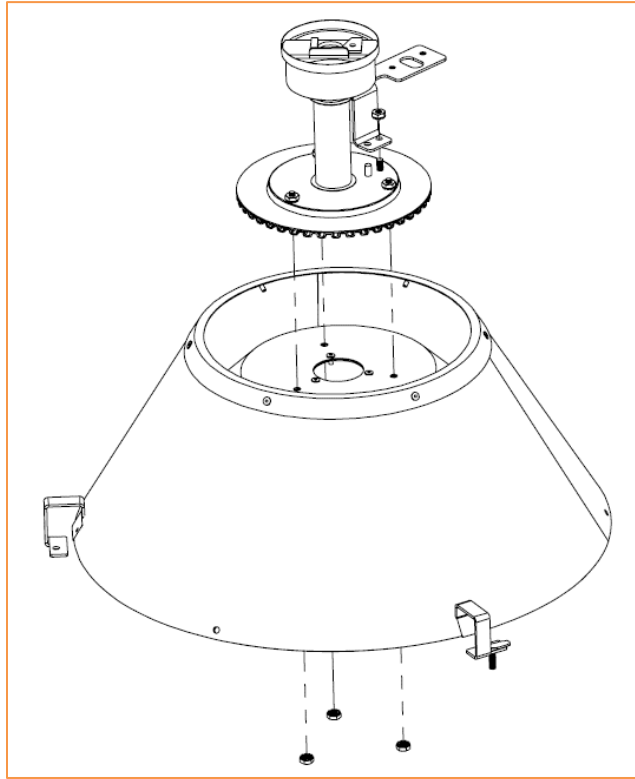


Figure 6

1. Fasten the hanging bracket to the centre hole of the reflector, using a #10-24 S/S bolt and appropriate washer and locknut. Align the other end of the hanging bracket with the alignment holes on the reflector. Attach the cone assembly to the reflector, aligning the igniter bracket with the alignment holes, using #10-24 hex nuts and #10 flat washers.

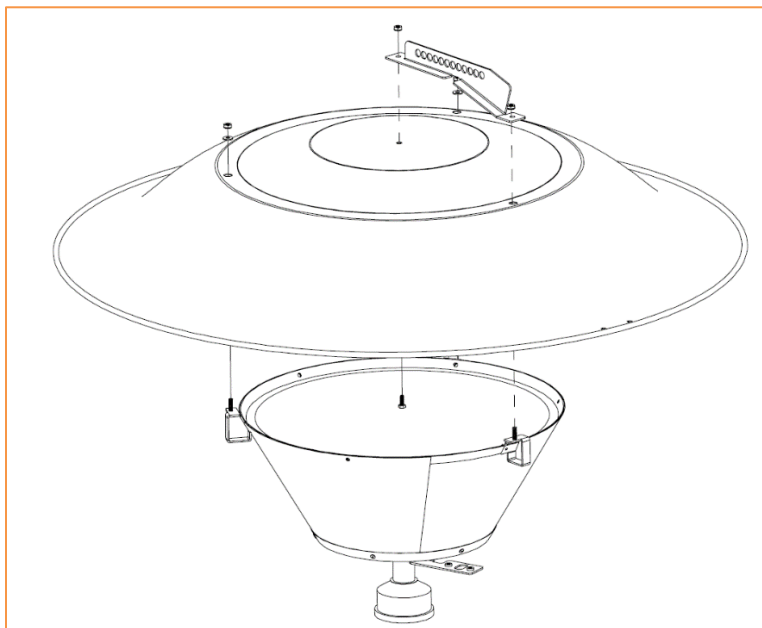


Figure 7

2. Attach the heat shield and control box mounting bracket to the reflector at the alignment holes, using two (2) #10-24 S/S bolts, nuts and washers.
3. Attach the gas manifold assembly by securing the T-clamp over the tube, covering up to the gas fitting. Insert the orifice block into the bottom of the burner and use the swivel clamp to hold it in place.

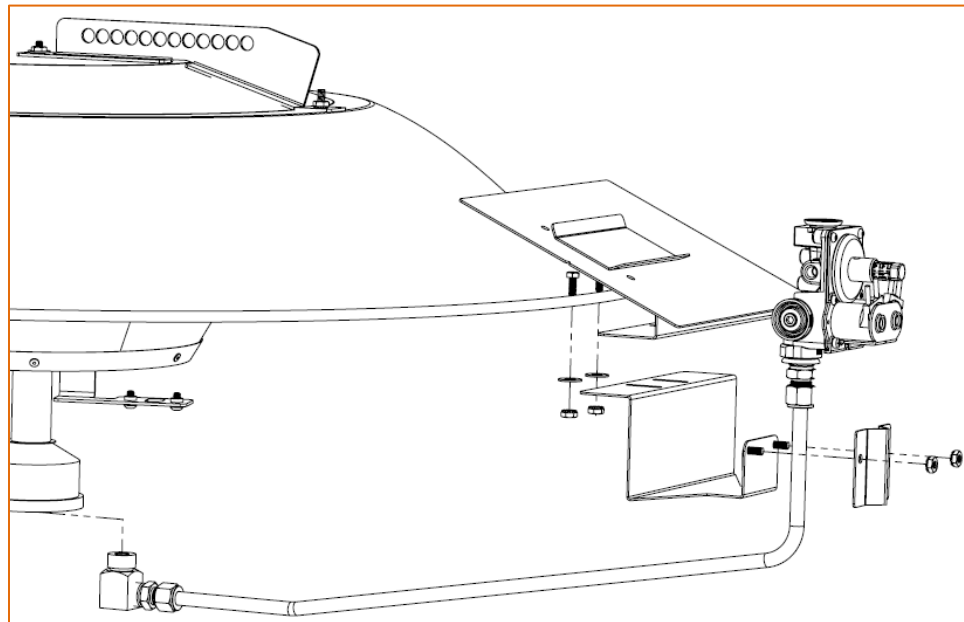


Figure 8

4. Attach the igniter to its bracket with two (2) #8-32 Phillips pan head screws.

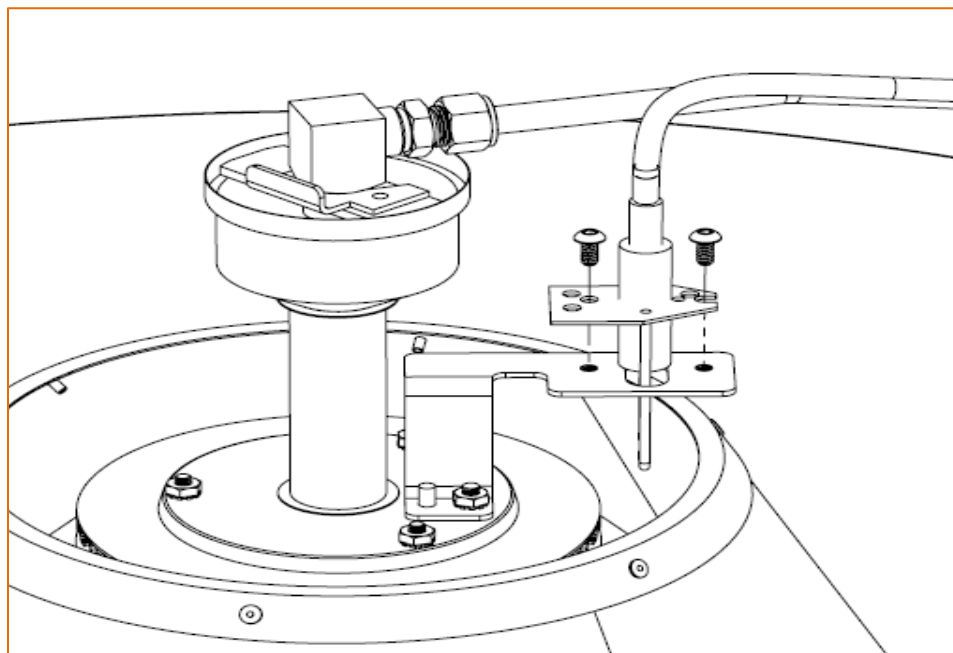


Figure 9

5. Mount the control box with Plate onto the bracket, securing it with two (2) #10-24 locknuts.

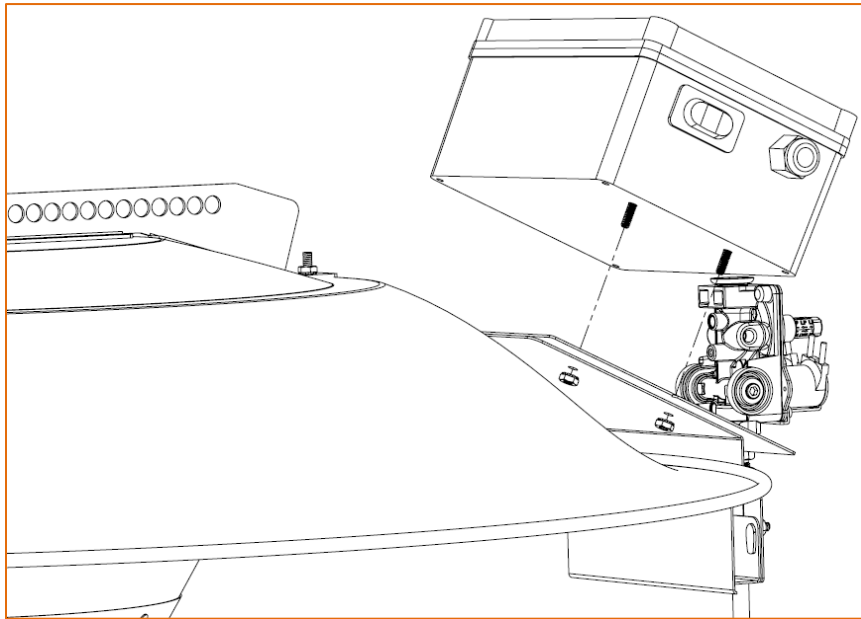


Figure 10

6. Attach the wiring as shown in the wiring diagram (see **ELECTRICAL CONNECTIONS** section below), Plug the ignition cable into the igniter, then secure the boot over the igniter. After attaching the ignition cable to the igniter, secure the cable to the gas tube with zip ties.
7. The gas valve has two (2) blue leads and two (2) red leads. Feed the leads through the liquid tight cable gland inside the box. Connect the valve leads to the terminal block inside the control box. See **ELECTRICAL CONNECTIONS** section below.

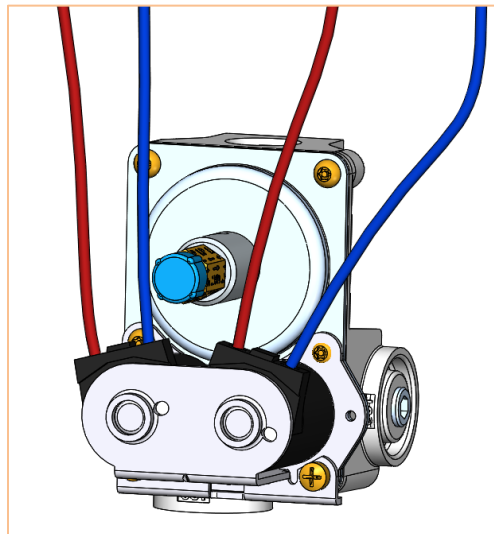


Figure 11 – Gas valve leads

11. The 24VAC and neutral wires connect to the terminal block. See the wiring diagram for proper routing.
12. Close the lid on the control box and tighten the screws with a Phillips or flathead screwdriver.
13. Check the assembly to make sure there are no loose parts before proceeding with the installation.

INSTALLATION

WARNING

NEVER USE THE GAS HOSE AS A SAFETY CHAIN

1. Hang the brooder at the appropriate height above the floor (litter) level, approximately 65"-75" (1650mm-1900mm). When using a winch, use a cable or chain suitable for the weight of each brooder. DO NOT USE ROPE.
2. Connect a safety chain from every brooder to a rigid structure.
3. Connect the gas line and electrical supply to each brooder.
4. Position the brooder so that the control side is approximately 1/2" (13mm) lower from the other side to prevent damaging.

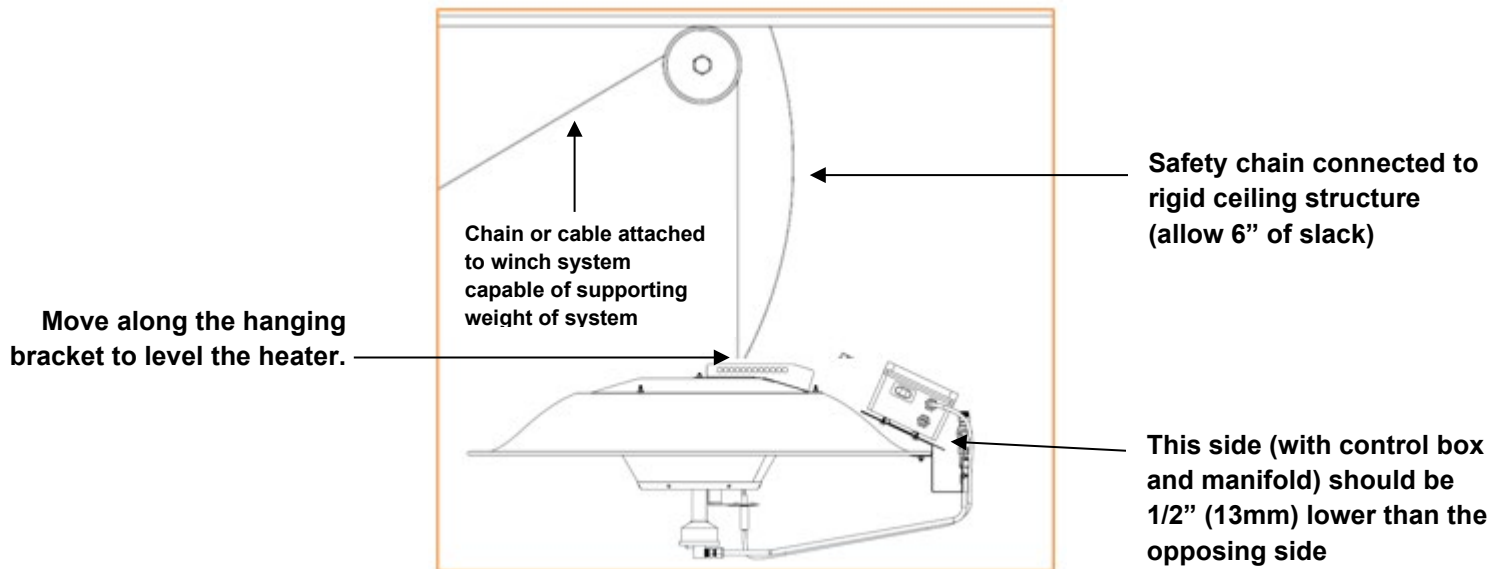


Figure 12: Hanging Diagram

VENTING & COMBUSTION AIR

General Requirements

ATTENTION VENTILATION REQUIREMENTS

- BE SURE THE AIR INLET GRILLS, LOUVERS AND DAMPERS ARE INSPECTED REGULARLY AND THAT THEY ARE CLEAR AND FREE OF DUST, DIRT, SNOW, ICE, FROST AND OTHER FOREIGN MATERIAL SO THAT AIR MAY FREELY ENTER INTO THE BUILDING TO PROVIDE ADEQUATE COMBUSTION AND VENTILATING AIR.
- FOR PROPER AND SAFE OPERATION OF THE BROODER INSTALLATION, THERE SHALL BE PROVIDED A COMBINED INFILTRATION AND NATURAL AND MECHANICAL VENTILATION RATE OF NOT LESS THAN $\frac{1}{4}$ S.C.F.M. (standard cubic foot per minute) PER BIRD.

- Refer to the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) in the US and CSA B149.1 Installation Code in Canada, as well as all local requirements for general venting guidance.
- The National Fuel Gas Code requires a minimum of 4 CFM per 1000 Btu/hr of brooder input for ventilation. This requirement means that a total of 160 CFM is required per brooder.

FOR YOUR SAFETY

- Exhaust fans must be operating on an appropriate cycle when heating the building to avoid high concentration of carbon monoxide and water vapor.

WARNING

- **Carbon Monoxide** is an odorless and poisonous gas. Extended exposure to carbon monoxide may lead to death. Early signs of carbon monoxide poisoning resemble the flu, including headaches, dizziness and/or nausea. If you experience these signs, GET FRESH AIR IMMEDIATELY. Have the brooders serviced as soon as possible and check the ventilation in the house.

GAS PIPING

- The gas meter and service must be sufficiently large to supply gas to the connected building gas load including the heating equipment and any other gas fired equipment. Additionally, the gas distribution piping must be designed according to local and national ordinances. Generally (low pressure) systems designed with a maximum ½" W.C. total pressure drop meet this requirement.
- Gas supply pipe sizing must be in accordance with the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) in the US and CSA B149.1 Installation Code in Canada.
- Before connecting brooders to the gas supply system, verify that high pressure testing of the system has been completed. Failure to do so may expose the brooder components to damaging high pressure, requiring replacement of key components.
- Pipe joint compounds must be resistant to the action of liquefied petroleum (LP) gases

Flexible gas connectors of approved type must be installed as shown in Figure 13, in one plane, and without sharp bends, kinks or twists. Failure to install the gas connection in the approved manner will result in a hazardous and potentially deadly situation due to the movement of the heater in the normal course of operation.

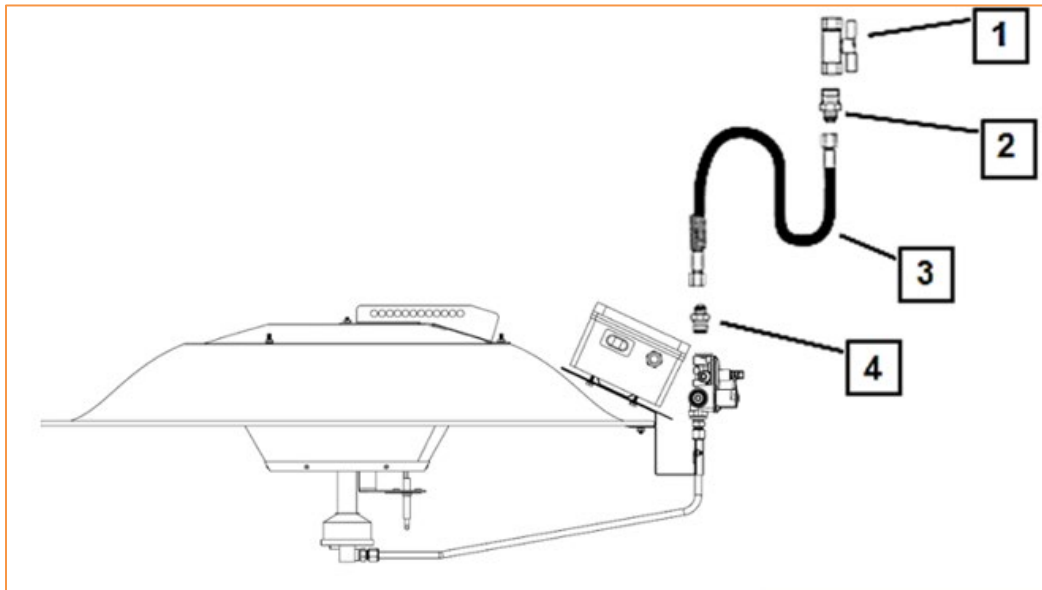
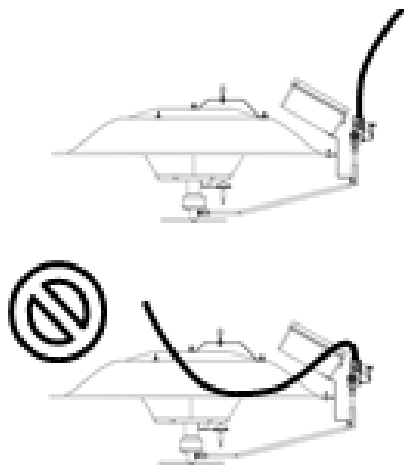


Figure 13: Flexible Gas Connections

The following components not included, may be ordered separately.

NO.	QTY	PART NUMBER	DESCRIPTION
1	1	CG011	VALVE, MANUAL BALL ½"
2	1	BG002	MALE FTG 45FLARE 3/8TUBEx1/2NPT
3	1		HOSE, 3/8IDx6FT with 3/8"F SWIVEL FITTINGS
4	1		MALE FTG 45FLARE 3/8TUBEx3/8NPT

WARNING



FIRE HAZARD

Tighten flexible gas hose and components securely.

Flexible gas hoses must be installed without any twists or kinks in them. **DO NOT** allow the hose to touch any part of the brooder canopy during operation

Failure to do so may result in death, serious injury or property damage

- Install a manual shut-off valve in the gas piping to each brooder. This will allow service of individual brooders without having to shut down the entire gas supply system.
- A sediment trap must be installed in the supply line in the lowest spot prior to connecting to the heater. The trap length should be at least three (3) inches long. Periodically remove the cap from the trap and drain any accumulation of dirt and/or water.

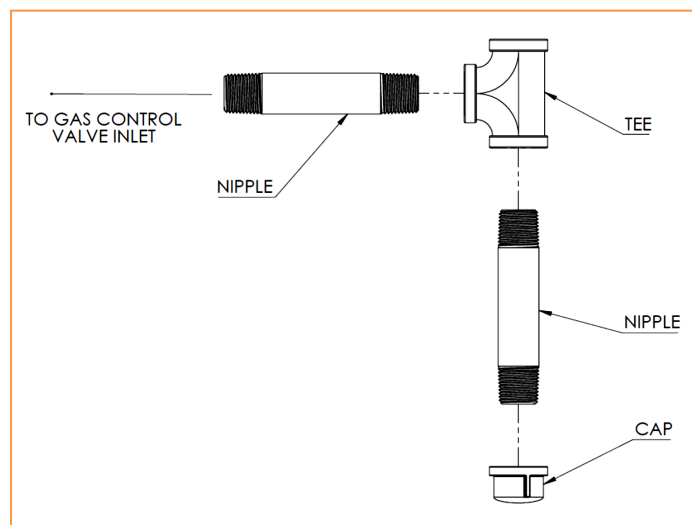


Figure 14: Sediment Trap

- After all gas connections and adjustments are made, check all gas connections for leaks using a heavy soapsuds solution.

WARNING

DO NOT USE AN OPEN FLAME OF ANY SORT TO TEST FOR LEAKS!

ELECTRICAL CONNECTIONS

Wiring diagram

All fields wiring to the brooder must be done in accordance with the National Electric Code, ANSI/NFPA 70 in the USA, and the Canadian Electric Code, CSA C22.1 in Canada, and must comply with all local requirements.

The brooder must be electrically grounded.

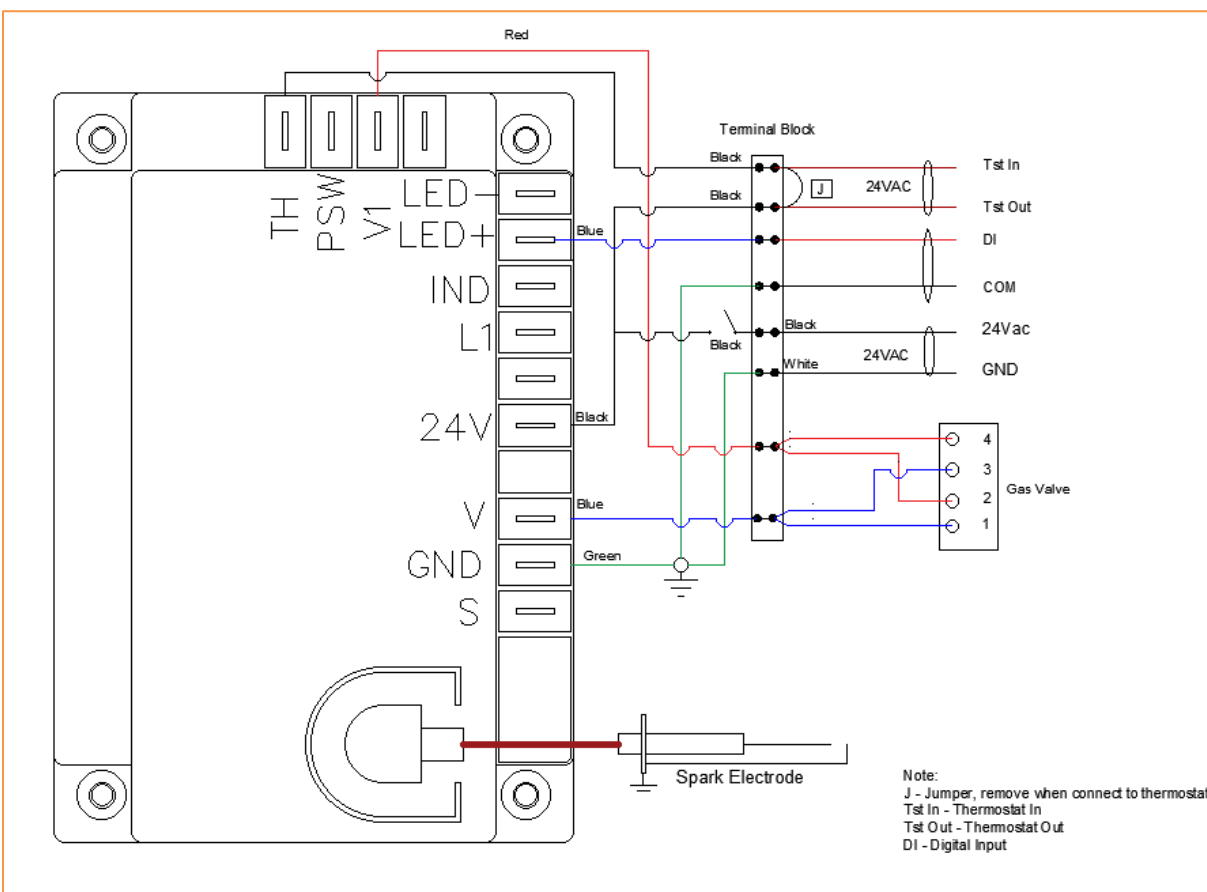


Figure 15: Wiring Diagram

The brooder is designed to operate on an external 24VAC electrical system.

Provide only 24VAC with a **Class 2 transformer** (field supplied) to the control wires.

The transformer size depends on the number of brooders controlled at the same time.

$$\text{Transformer Size} = \text{No. of Brooders} \times 20\text{VA}$$

NO. OF BROODERS	MINIMUM TRANSFORMER VA
6	120
12	240
18	360
24	480

LIGHTING AND SHUTDOWN INSTRUCTIONS

Starting sequence of operation

- Turn on the gas and electrical supply
- Set the thermostat to call for heat.
- Ignition should occur immediately
- If the burner fails to light or flame is not detected during the first trial for ignition (a period of approximately 10 seconds), the gas valve is de-energized and the control goes through an inter-purge delay of approximately 15 seconds before another ignition attempt. The control will attempt two additional ignition trials before going into lockout.
- If the heater does not light, shut off the gas completely for 5 minutes before attempting to relight.
- If the thermostat is still calling for heat after one hour, the control will automatically reset and attempt to ignite the burner again.

NOTE: The heater must be grounded. Poor grounding will give nuisance lockouts, particularly during momentary power interruptions.

- To shut down the heater, turn off the gas and electrical supply.

FUEL CONVERSION KIT

The brooder from the factory is equipped to run on propane but can be modified to run on natural gas with the conversion kit supplied.

The conversion kit, **P/N BK023**, contains the following:

BL035 - BRLS Natural Gas sticker
UG113 - Orifice #36
BL022 - Conversion Label BRLS
LT356 - Conversion Instruction Sheet BRLS

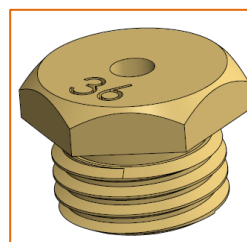


Figure 16

NOTE: If the brooder has been running on propane, first turn off the gas supply at the main shut-off valve and purge the systems of fuel until combustion stops. Disconnect the main power supply or set the thermostat to call for no heat, then disconnect the hose from the gas valve.

1. The gas valve is equipped with a **Flip-Flop convertible regulator screw** which is for conversion from propane to natural gas (and vice versa)
NOTE: the gas valve cannot be field adjusted for outlet (manifold) pressure.
2. Remove the Flip-Flop screw, turn it around, and screw it back in with the 'NAT' markings pointing towards the valve. Refer to the illustration below.
NOTE: do not exceed 15 in-lbs when tightening the regulator screw. Excessive force will damage the valve.

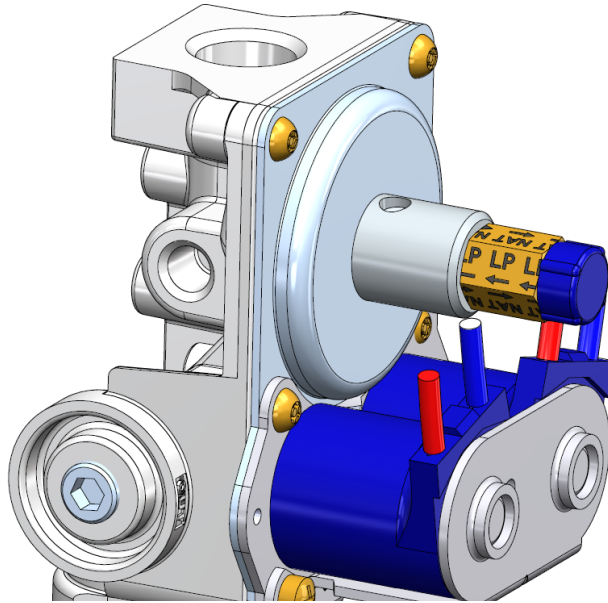


Figure 17

3. Remove the orifice block from the bottom of the burner by turning the locking tab until the orifice block is able to drop down. Be sure to support the weight of the block as it drops down.
4. Remove the orifice with a 1/2" wrench, then clean out the threads of the orifice block with a wire brush

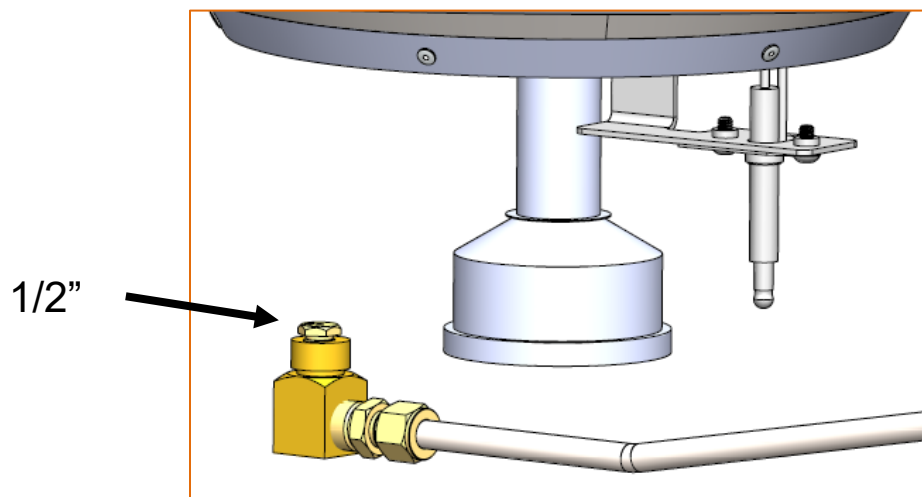


Figure 18

5. Install orifice #36 into the orifice block with a 1/2" wrench.
6. Connect the orifice block to the burner by sliding the orifice into the hole in the bottom of the burner. Turn the locking tab until it slides into the groove between the orifice and the block.
7. Stick the Conversion Label BL022 to the left of the rating plate. Take the BRLS Natural Gas stickers and place them over the indicated section of the rating plate.

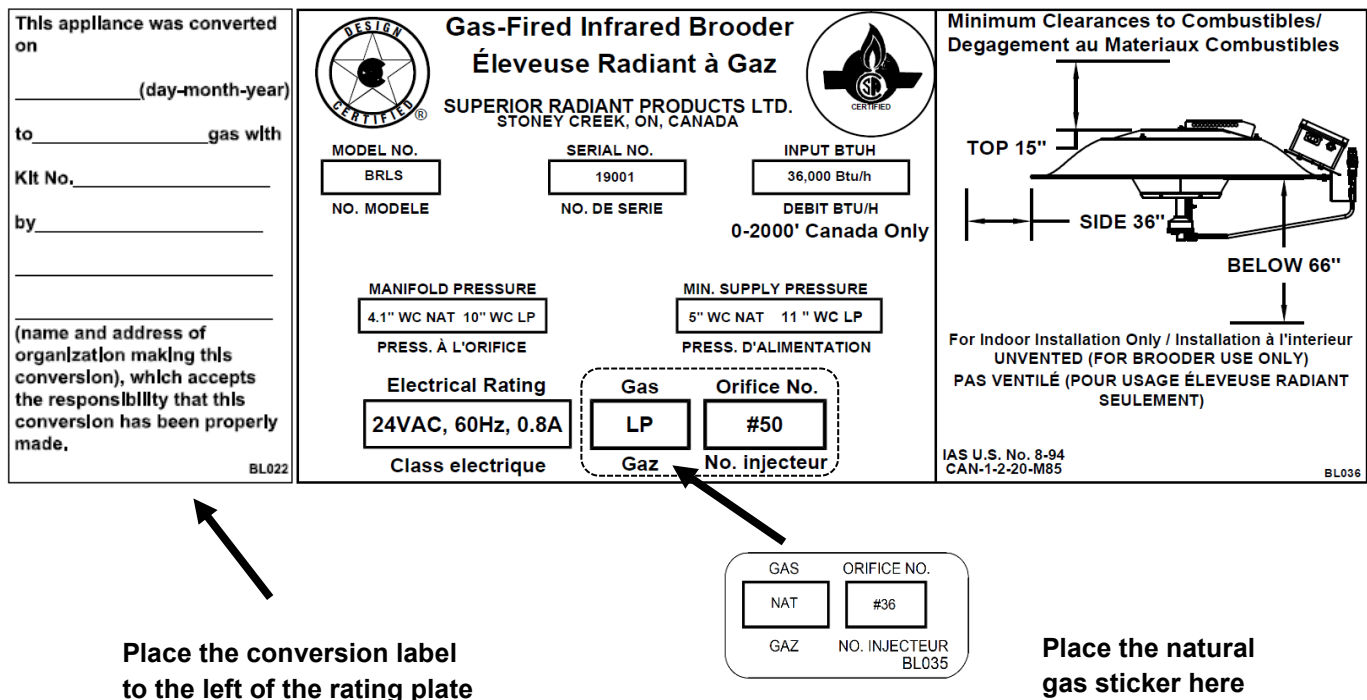


Figure 19: Conversion label placement and natural gas sticker placement

Maintenance

Annually ask your gas supplier to:

- Check all gas piping annually for leaks or restrictions in gas lines. Clean out the sediment trap.
- Check for gas leaks and proper function of regulators.

Note: Before performing any services or maintenance, shut off gas and electrical supply to heater.

- Check all hose assemblies for cracks, cuts, abrasions or ruptures. Replace any hoses that are suspect.

After each crop/flock inspect the brooder.

- Keep the brooder free of dust, dirt or any combustible material. Use pressurized air.
- Inspect the igniter. Replace igniter if there is excessive wear or erosion.
- Inspect brooder orifice. Remove the orifice block from the bottom of the burner by turning the locking tab until the orifice block is able to drop down. Clean the orifice using air.
- Inspect the burner. Clean the burner parts using a small brush. Use pressurized air.
- Clean both the inside and outside surfaces of the perforated emitter assembly with a brush and pressurized air.
- Blow all dirt and dust off the reflector.

TROUBLESHOOTING

1. IGNITION MODULE DIAGNOSTICS

LED Indication	Fault Mode
Steady On	Internal Control Failure
2 Flashes	Flame without call for heat
3 Flashes	Ignition Lockout

2. FLAME CURRENT MEASUREMENT

The flame current passes through the flame from the sensor and to the ground. The flame current necessary to keep the system from lockout should be 1.0 μ A DC or higher.

3. SPARK ELECTRODE INSPECTION

- Inspect the spark electrode for possible cracks in the ceramic insulator. Replace if necessary.
- Check for proper electrode spark gap. Electrodes should have a gap spacing of 1/8".

4. BROODER DOES NOT LIGHT

- Make sure the switch is ON.
- Check the fuel supply valve.
- Check the gas pressure supplied.
- Check the voltage supplied to the brooder.
- Check wiring.

5. BROODER LIGHT BUT DOES NOT STAY LIT

- Check grounding.
- Check the gas pressure supplied.
- Check the electrode.

6. EMITTER NOT GLOWING RED

- Check the supply gas pressure (too low), refer to the rating plate.
- Check the orifice and burner

7. FLAMES BURNING OUTSIDE OF EMITTER SURFACE

- Check gas pressure (too high), refer to the rating plate.
- Check the orifice size.
- Check type of the gas, refer to the rating plate.
- Clean the burner if necessary.

REPLACEMENT PARTS

ITEM	DESCRIPTION	PART NUMBER
1	Ignition control	CE415
2	On/Off switch	BE007
3	Gas valve 25M18-716	BG003
4	Manifold Assembly	BK025
5	Burner orifice – Propane #50	UG041
6	Burner orifice – Natural gas #36	UG113
7	Ignition cable	BE004
8	Electrode	BE003
9	Emitter Assembly	BS071

SERIES BRLS INFRARED HEATERS WARRANTY

The manufacturer warrants to the original owner that the product will be free of defects in material and workmanship as described below.

COMPONENT	WARRANTY PERIOD
Burner & Controls	3 Years
Reflector	7 Years

The Manufacturer's obligation under this warranty is limited to repair or replacement, F.O.B. its facility, of the defective part. In the case of replacement parts, the warranty period shall be the longer of the original warranty or a period of 12 months from the date of purchase. In no event shall the Manufacturer be liable for incidental expense or consequential damages of any kind.

This warranty does not cover any shipping, installation or other costs incurred in the repair or replacement of the product. No materials will be accepted for return without authorization.

This warranty will not apply if in the judgment of the Manufacturer, the equipment has been improperly installed, unreasonably used, damaged or modified.

This warranty will not apply to damage to the product when used in corrosive atmospheres and in particular atmospheres containing halogenated hydrocarbons. No person is authorized to assume for the Manufacturer any other warranty, obligation or liability.

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