ACS Series Manual

Installation, Operation Maintenance and Parts

The ACS Series heater is a gas-fired radiant brooder. This manual provides specific information related to the ACS Series models. All persons involved with the installation, operation and maintenance of the heater system must read and understand the information in this manual.

A 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.

L'installation incorrecte, l'ajustement, le changement, le service ou le maintien peuvent causer des dégâts de propriété, la blessure ou la mort. Lisez l'installation, l'opération et des instructions de maintien à fond avant l'installation ou l'entretien de cet équipement.



This heater **must** be installed and serviced by trained gas installation and service personnel only. Failure to comply could result in personal injury, asphyxiation, death, fire or property damage.

Cet appareil de chauffage doit être installé et entretenu par l'installation à gaz formée et le personnel de service seulement. L'échec de se soumettre pourrait aboutir à la blessure personnelle, l'asphyxie, la mort, le feu ou des dégâts de propriété.



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

Ne stockez pas ou utilisez l'essence ou d'autres vapeurs inflammables et des liquides aux alentours de ceci ou un autre appareil.

Do not use this heater in indoor living or sleeping quarters! Installation of a commercial brooder in residential indoor spaces may result in property damage, serious injury, asphyxiation or death.

N'utilisez pas cet appareil de chauffage dans la vie intérieure ou des chambres à coucher! L'installation d'une couveuse commerciale dans des espaces intérieurs résidentiels peut aboutir aux dégâts de propriété, la blessure grave, l'asphyxie ou la mort.

DANGER

If you smell gas:

- 1. Open windows. Do not touch electrical switches.
- 2. Extinguish any flame.
- 3. If odor continues, keep away from the appliance and immediately call your gas supplier or fire department.

INSTALLER: Present this manual to the end user.

Keep these instructions in a clean and dry place for future reference.

Serial #:

Model#:

(located on rating label)

1. Fenêtres ouvertes. Ne touchez pas d'échanges électriques.

Si vous sentez le gaz:

- 2. Éteignez n'importe quelle flamme.
- 3. Si l'odeur continue, gardez loin de l'appareil et appelez immédiatement votre fournisseur de gaz ou pompiers.

Contents

1.0 Intro	duction
	Overview
	Installation Pre-Checks
	Packaging
	Specifications 4
	Safety Labels and Their Locations 5
2.0 Safet	y 6
	Warning Symbols
	Applications
	Standards, Certifications and Government Regulations
	General Information
	Clearance to Combustibles
3.0 Insta	Ilation
	Brooder Assembly Instructions
	Installation Considerations and Pre-checks 14
	Recommended Mounting Heights
	Heater Suspension
	Gas Supply Installation Instructions
	Leak Testing
	Electrical Requirements and Wiring Diagrams
	Field Wiring Supply Voltage
	Controller/Thermostat Connection
4.0 Oper	ation
	Lighting Instructions
5 0 Main	tenance 20
J.U Main	Routine Maintenance & Inspection 20
	Troubleshooting Guide
	Heater Components and Parts List
	Limited Warranty Terms and Conditions
	NIL OUTILETIES

© 2015 Brant Radiant Heaters Ltd. 24 Scott Ave. • Paris, ON N3L 3T5 Phone: (519) 442-7823 Fax: (519) 442-7321 www.brantradiant.com • sales@brantradiant.com

1.0 Introduction

Overview

The intent of this manual is to provide information regarding safety, design guidelines, installation, operation and maintenance of the ACS Series gas fired radiant brooder. You must read and understand the instructions and all safety warnings before installing the gas fired radiant brooder. This manual is property of the owner, and must stay with the owner or unit after installation is complete. Please note model and serial number in designated box on the front cover of manual.

Installation Pre-Checks

Prior to installation, verify that the heater's gas type and voltage (as listed on the rating plate) match that of your application. Also verify that you have received all heater components included with your unit. Refer to page 36 for a list of the kit contents for your model heater. Materials not included in the heater kit contents (e.g., gas cock, flex connector, transformer, terminals, etc.) are the responsibility of the installer. Notify your product representative or Brant Radiant Heaters of any discrepancy or missing items prior to installing unit.

Packaging



Specifications

The ACS Series heater is a single input brooder. For specific information on each model, see Chart 1.1 below.

Chart 1.1 • Specifications

Model Number	Gas Type	BTU/h Input	Reflector Canopy Diameter (cm)	Brooder Height (cm)	Standard Weight (kg)	Recommended Mounting Height* (m)	Gas Connection	Manifold Pressure Inches W.C. (cm)	Gas Orifice Size	Primary Voltage	Unit Total Amps	Inlet Pressure ** Inches W.C. (cm)
ACS-40P-120V	Propane	40,000	35" (88.9)	18" (45.72)	27 lbs (12.24)	5' to 6' (1.5 to 1.8)	3/8" NPT	10" (25.4)	1.9 mm	120 VAC	0.8	11-14" (28-35.6)
ACS-40N-120V	Natural	40,000	35" (88.9)	18" (45.72)	27 lbs (12.24)	5' to 6' (1.5 to 1.8)	3/8" NPT	3.5" (8.89)	3.1 mm	120 VAC	0.8	5-14" (12.7-35.6)
ACS-40P-24V	Propane	40,000	35" (88.9)	18" (45.72)	27 lbs (12.24)	5' to 6' (1.5 to 1.8)	3/8" NPT	10" (25.4)	1.9 mm	24 VAC	0.5	11-14" (12.7-35.6)
ACS-40N-24V	Natural	40,000	35" (88.9)	18" (45.72)	27 lbs (12.24)	5' to 6' (1.5 to 1.8)	3/8" NPT	3.5" (8.89)	3.1 mm	24 VAC	0.5	5-14" (28-35.6)

* Typical or recommended mounting heights are provided as a guideline. Actual conditions may dictate variations from this data.

** Inlet pressure is measured while unit(s) is/are operating.

Approvals

- Indoor (non-residential) approval.
- Agricultural approval.

Limited Warranty

- 1 year Brooder components.
- 3 years Emitter cone assembly.
- See page 34 for terms and conditions.

Safety Labels and Their Locations



Read and understand all safety information and warnings in this manual before installation, operation and maintenance of the radiant brooder.

Product safety signs or labels should be replaced by the product user when they no longer are legible. Contact either your local distributor or the product manufacturer for obtaining replacement signs or labels.



Warning/Caution Label F/N: LLBCL002c

2.0 Safety

Read and understand all safety information and warnings in this manual prior to installation, operation, and maintenance of this brooder.



Improper installation, adjustment, alteration, service or maintenance can cause property damage, serious injury or death. Read and understand, the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment. Only trained, qualified gas installation and service personnel may install or service this equipment.

Warning Symbols

Safety is the most important consideration during installation, operation and maintenance of the brooder. You will see the following symbols and signal words when there is a hazard related to safety or property damage.

DANGER

A WARNING

which, if not avoided, could result in explosion or death.

Danger indicates a potentially hazardous situation

Warning indicates a potentially hazardous situation which, if not avoided, could result in death or injury.

NOTICE

Caution indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

Notice indicates a potentially hazardous situation which, if not avoided, could result in property damage.

Applications

This is not an explosion proof heater. This heater may not be used in a Class 1 or Class 2 Explosive Environment. Consult your local Fire Marshall, insurance carrier and other authorities for approval if the proposed installation is in question.

Agricultural/Brooder Applications

The ACS Series brooder is designed and certified for use in agricultural buildings, such as poultry houses, dairy parlors, and swine barns. For maximum safety the building must be evaluated for potential problems before installing the heater system. This unit is certified for use as furnished by the manufacturer.

Standards, Certifications and Government Regulations

This brooder is a self-contained infrared radiant brooder for agricultural locations where flammable gases or vapors are not generally present.

The installation of this brooder must be in accordance with all codes found in these instructions and/or the applicable local, state and national codes having jurisdiction. Contact the local building inspector and/ or Fire Marshall for guidance.

In the absence of local codes, brooder installation must conform to the latest edition of:

Canada: Refer to CAN/GCA B149.1 Installation Code.

This heater complies with CAN-1-2-20-M85.

Copies of these standards can viewed or purchased at www.scc.ca.

General Information

Inspect all openings and surfaces regularly and clean as necessary. Litter, dust, feathers and other matter can become airborne clogging openings and dulling surfaces, adversely affecting brooder operation and performance. *Refer to 'Routine Maintenance & Inspection' on page 29.*

Every brooder should be located with respect to building construction and other equipment so as to permit access to brooders. Each installer shall use skillful and reliable installation practices when locating the brooders and must give consideration to service accessibility. *Refer to 'Installation Considerations and Pre-checks' on page 14*.

This brooder is for **INDOOR INSTALLATION ONLY** and operates **UNVENTED**. Provisions must be made to dilute the products of combustion. Ventilation may be provided by either gravity or mechanical means.

Be sure the building's 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 1/4 S.C.F.M. (standard cubic foot per minute) per bird.

Clearance to Combustibles

A WARNING



Placement of explosive objects, flammable objects, liquids and vapors close to the heater may result in explosion, fire, property damage, serious injury or death. Do not store or use explosive objects, liquids, or vapor in the vicinity of the heater.

Clearance to combustibles is defined as the minimum distance that must exist between the specified feature of the heater, and any combustible items. It also pertains to the distance that must be maintained from moving objects around the brooder. A recommended Service clearance is defined as the minimum distance that is needed to properly service the heater. When installing the brooder, clearances to combustible for the model heater must be maintained. Refer to Chart 2.1 to determine the required distances for your model.

Chart 2.1 • Clearance to	Combustibles in Incl	hes (cm) (see Figure 2.1)
--------------------------	----------------------	---------------------------

Heater Feature	Clearance to Combustibles (cm)					
Тор	18" (45.72)					
Sides	36" (91.44)					
Below	48" (121.92)					

Figure 2.1 • Clearance to Combustibles Diagram



SIDE VIEW



Brooder Assembly Instructions

- Before assembling brooder, verify that all components are included. Refer to page 36 for a list of the kit contents for your model heater. The hardware kit contains all nuts, bolts and washer required for brooder assembly. Materials not included in the heater kit contents (e.g., gas cock, flex connector, terminals, etc.) are the responsibility of the installer.
- Open hanger kit.
- Place the hanger onto the center of the reflector canopy using the 1/4"-20 x 5/8" bolt, 1/4" washer, and 1/4"-20 keps nut from the hanger kit and align it with the holes as shown in Figure 3.1.
- 4 Attach eye bolt to the hanger with 1/4"-20 keps nuts and 1/4" washers provided.
- Place emitter cone assembly on a table with the emitter mounting studs facing upward and place reflector canopy over emitter cone assembly so that the three studs on the bracket pass through the three holes on the reflector canopy. Secure the reflector canopy and hanger to the mounting studs using 1/4"-20 keps nuts and washers provided.

Figure 3.1 • Brooder Assembly



- 6 Open heat shield and assembly hardware kit.
- Secure burner assembly to the cast burner cap attached to the emitter cone assembly by flipping the brooder assembly over and using three (3) #10-24 keps nuts from the hardware kit.

NOTE: Make sure the two pins on the burner base are aligned with the two holes on the edge of the reflector canopy (see Figure 3.2).

Figure 3.2 • Brooder Burner Assembly



- Attach heat shield assembly to the edge of the reflector canopy using two (2) 1/4"-20 x 5/8" bolts and two (2) 1/4"-20 keps nuts from the hardware kit but do not fully tighten.
- Attach manifold assembly to the heat shield assembly using the manifold bracket and two (2) #10-32 x 1/4" screws from the hardware kit. Once the manifold bracket is flush against the manifold tube at the bottom of the gas valve, tighten the bracket to the heat shield assembly using the same screws.
- Adjust to manifold bracket so the orifice is aligned with the hole at the bottom of the burner assembly (see Figure 3.3).

Figure 3.3 • Gas Valve & Manifold Assembly



Insert the orifice into the burner base and align the holes in the burner bracket with the holes in the burner. Secure using two (2) thumb screws from the hardware kit (see Figure 3.4).





- While holding the heat shield assembly to the reflector canopy, installed from Step 8, the screws may now be tightened (see Figure 3.5)
- Flip the brooder to its upright position and attach the hanger to the control box assembly by using two (2) #8-32 X 3/8" screws from the hardware kit and attach to the available slots on the hanger and heat shield assembly.

Figure 3.5 • Control Box Assembly



Locate the wires from the control box and connect to the terminals of the gas valve as shown in Figure 3.6. Refer to the internal wiring diagram on pages 23-24.



Attach electrode bracket from the electrode assembly kit to the burner assembly using one (1) keps nut from the hardware kit. Attach the electrode bracket using two (2) 1/4" screws and one (1) #10-24 keps nut from the hardware kit. Secure the high voltage wire to the electrode terminal (see Figure 3.7).

Figure 3.7 • Electrode Assembly



- Attach burner pan to the brass fitting attached to the Manifold Assembly using one (1) screw from the hardware kit. The brooder is now assembled and ready for installation.
- Use the three (3) wire ties to hold the electrode ignition control cable in place on the manifold tube. Space out wire ties evenly along manifold tube.





Installation Considerations and Pre-checks



Improper installation, adjustment, alteration, service or maintenance can cause property damage, serious injury or death. Read and understand, the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment. Only trained, qualified gas installation and service personnel may install or service this equipment.

Placement of the heater is influenced by many factors. Aside from safety factors, considerations for the general space and heating requirements, availability of gas and electrical supply are a few examples of factors that should all be considered.

Inspect and evaluate the location of the heater to ensure that the structural support is adequate to support the unit's weight. The unit must be installed in a horizontally level position to ensure proper operation.

Adequate space around the heater must also be considered in order to maintain the published minimum clearance to combustibles and recommended service clearances.

High humidity or saltwater atmospheres will accelerate heater corrosion and reduce useful life. Do not install the heater in locations where water (in the form of rain, drips, or spray) could fall onto the gas ignition components.



Do not locate any gas fired units in area where chlorinated, halogenated, or acid vapors are present in the atmosphere. These substances can cause premature heat exchanger failure due to corrosion, which can cause property damage, serious injury or death.

Recommended Mounting Heights

The recommended mounting heights of the units are critical to its performance. Refer to Chart 3.1 for specific recommended mounting heights. The mounting height is measured from the finished floor to the bottom of the unit. Units that are mounted higher than the recommended mounting heights may not achieve desired floor temperatures. Clearances to Combustibles must always be maintained.

Chart 3.1 • Recommended Mounting Heights and Coverages

Model No.	Input	Typical or recommended	Approximate Coverage Area
	BTU/h	Mounting Height ft. (m)	(LxW) ft. (m)
All Models	40,000	5' to 6' (1.52 to 1.83)	6' x 6' (1.82 x 1.82)

Figure 3.9 • Application Guidelines



NOTE: Dimensions A & B are based upon heaters hung at the factory recommended mounting height.

Heater Suspension

The suspension of the heater must conform to all applicable codes referenced in the Safety section and these instructions. To ensure proper operation, the heater must be installed in a level horizontal position.



Improper suspension of the brooder may result in collapse and being crushed. Always suspend from a permanent part of the building structure that can evenly support the total force and weight of the unit.

- Locate brooders approximately 25 to 40 ft. (8 to 12m) apart, in a row, as needed for bird comfort and building heat loss. If more than one row is desired, stagger rows for best heat distribution. Attach the Chain Kit (sold separately) to the top of the Brooder Canopy.
- Suspend the brooder at the desired height above the floor (litter) level; normally 60 to 72 inches (152.4 cm to 182.8 cm). For brooders connected to a winch (to allow adjustment of brooder height), connect each Chain Kit (sold separately) using a chain or cable suitable for the weight of each brooder. DO NOT USE ROPE. Size the winch and cable so that it is capable of handling the total weight of all brooders and gas piping involved.

NOTE: Connect a safety chain to each brooder and anchor it to the house structure above each brooder to prevent it from falling onto the litter if the cable/chain breaks or the winch falls. THE GAS HOSE SHOULD NEVER BE USED AS A SAFETY CHAIN.

Connect the gas line and electrical supply (if required) to each brooder as outlined on pages 17 and 26. NOTE: After connection of the gas line, make sure that the brooder is suspended with the control side approximately 1/2" (13mm) below the other side of the brooder to prevent hot products of combustion from damaging the gas control valve.

Figure 3.10 • Safety Chain/Cable Suspension



Chart 3.2 • Heater Mounti	ing Requirements and Weights
---------------------------	------------------------------

Model	Unit Height (cm)	Unit Width (cm)	Suspension Points	Unit Weight (kg)	Chain Set Qty.
All Models	18" (45.72)	35" (88.9)	1	27 lbs (12.24)	1

Gas Supply Installation Instructions



Improperly connected gas lines may result in serious injury and death, explosion, poisonous fumes, toxic gases or asphyxiation. Connect gas lines in accordance to national, state, provincial and local codes.

Gas pressure to the appliance controls must never exceed ½ PSI (14" W.C.).

Damage to the controls may result.

A CAUTION

Gas lines should be purged of air as described in ANSI Z223.1 (NFPA 54) or CSA-B149.1– latest version. Installation of the piping must also confirm with the local building codes, or in the absence of local codes, with the latest edition of the National Fuel Gas Code (NFPA 54).

- Gas piping for the house must be sized to be capable of satisfying the entire demands of the house should all equipment be operating at the same time. Refer to Chart 3.5 (taken from the National Fuel Gas Code) for sizing of piping for the house. Refer to Chart 3.5 (taken from National Fuel Gas Code) for sizing of piping for the house.
- Connect to the supply tank or manifold in accordance with the latest edition of the National Fuel Gas Code (ANSI Z223.1) and/or local codes. Authorities having jurisdiction should be consulted before the installation is made.

Output Pipe joint compound must be resistant to the action of liquefied petroleum (LP), natural gas, and caustic environment.

Gas connections to individual brooders shall be made using flexible gas connectors, or they can utilize rubber hosing suitable for LP gas usage (to allow movement of the brooders for cleaning, etc.). Check with the authorities having jurisdiction and/or local codes prior to choosing an individual gas connection method.

6 Connection to a new installation with accessory hose and fittings is shown in Figure 3.11.

Figure 3.11 • Gas Connection Accessory and Hose Fittings



A 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 area of the brooder reflector canopy during operation.

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



Figure 3.12 • Gas Connection

A NOTICE

The total input to the appliance must fall within +/-5% of the rated input as indicated on the rating plate. Otherwise the emitter cone assembly may prematurely fail.

Chart 3.3 • Natural Gas Consumption

Model	Manifold Pressure Inches W.C.(cm)	Min. Inlet Pressure Inches W.C.(cm)	Max. Inlet Pressure Inches W.C.(cm)	Gas Consumption (CFH)*	Orifice Size	Number of Orifices
ACS-40-N	3.5 (8.89)	5.0 (12.7)	14.0 (35.56)	38.1	3.1 mm	1

*Assumes an average heating value of 1050 BTU/SCF and a Specific Gravity of 0.60.

Chart 3.4 • Propane Gas Consumption

Model	Manifold Pressure Inches W.C.(cm)	Min. Inlet Pressure Inches W.C.(cm)	Max. Inlet Pressure Inches W.C.(cm)	Gas Consumption (CFH)*	Gallons per hour*	Orifice Size	Number of Orifices
ACS-40-P	10.0 (25.4)	11.0 (27.94)	14.0 (35.56)	16.0	0.44	1.9 mm	1

*Assumes an average heating value of 2500 BTU/SCF and a Specific Gravity of 1.53.

Chart 3.5 allows for a 0.3 Inch W.C.(0.762 cm) pressure drop in the supply pressure from the building main to the inlet of the unit. Refer to the chart for the appropriate range of inlet pressures for each gas type. When sizing the inlet gas pipe diameter, make sure that the unit supply pressure can be met after the 0.3 Inch W.C. (0.762 cm) pressure drop has been subtracted from the main pressure. If the 0.3 Inch W.C. (0.762 cm) pressure drop has been subtracted from the main pressure. If the 0.3 Inch W.C. (0.762 cm) pressure drop has been subtracted from the main pressure. If the 0.3 Inch W.C. (0.762 cm) pressure drop is too high, refer to NFPA 54 or the Gas Engineer's Handbook for other gas pipe capacities.

Chart 3.5 • Maximum	capacity for	Schedule 40	Metallic pi	pe, in CFH

Pine Length	1/:	2"	3/	4"	1	"	1-1	/4"	1-1	/2"	2	"
feet (m)	Nat	L.P.	Nat	L.P.	Nat	L.P.	Nat	L.P.	Nat	L.P.	Nat	L.P.
10' (3.04)	132	86	278	182	520	340	1050	686	1600	1046	3050	1993
20' (6.09)	92	60	190	124	350	229	730	477	1100	719	2100	1373
30' (9.14)	73	48	152	99	285	186	590	386	890	582	1650	1078
40' (12.19)	63	41	130	85	245	160	500	327	760	497	1450	948
50' (15.14)	56	37	115	75	215	141	440	288	670	438	1270	830
60' (18.28)	50	33	105	69	195	127	400	261	610	399	1150	752
70' (21.33)	46	30	96	63	180	118	370	242	560	366	1050	686
80' (24.38)	43	28	90	59	170	111	350	229	530	346	990	647
90' (27.43)	40	26	84	55	160	105	320	209	490	320	930	608
100'(30.48)	38	25	79	52	150	98	305	199	460	301	870	569
125' (38.1)	34	22	72	47	130	85	275	180	410	268	780	510
150' (45.72)	31	20	64	42	120	78	250	163	380	248	710	464
175' (53.34)	28	18	59	39	110	72	225	147	350	229	650	425
200' (60.96)	26	17	55	36	100	65	210	137	320	209	610	399

The ACS Series heater is equipped to receive a gas supply line nipple of 3/8" NPT Schedule 40 metallic pipe. All piping must be installed in accordance with the requirements outlined in the National Fuel Gas Code ANSI/Z223.1 (latest edition) or CSA-B149.1. Support all gas supply piping with pipe hangers, metal strapping, or other suitable material. Do not rely on the heater to support the gas pipe.

When connecting piping to the unit, the use of a thread joint compound is required. The thread compound (pipe dope) shall be resistant to the action of liquefied petroleum gas or any other chemical constituents of the gas to be conducted through the piping. Use of Teflon[®] tape is not permitted.



Always use two (2) opposing wrenches to tighten mating pipe connections to prevent excessive torque on the gas valve and manifold pipe. Excessive torque can damage the valve and/or misalign the orifice, resulting in fire, explosion, serious injury or death.

Install a ground joint union with a brass seat and a manual shutoff valve adjacent the unit for emergency shutoff and easy servicing of controls. A 1/8" NPT plugged tap that is accessible for a test gauge connections is also recommended, as illustrated in Figure 3.13.

A sediment trap must be installed in the supply line in the lowest spot prior to connecting to the heater. The trap length shall be at least three inches long. Ideally, the trap would be installed a close as possible to the shut off, as shown in Figure 3.13.

Figure 3.13 • Recommended Hardware • Manual Shut Off and Sediment Trap



Leak Testing

A WARNING



Use a soap solution or equivalent for leak testing. Never test for leak with an open flame. Failure to comply could result in personal injury, property damage or death.

Always leak test final gas assembly for gas leaks according to the procedures outlined in NFPA 54 and all local codes and / or standards.

For leak testing on pressures below 1/2 PSI

Before leak testing, close the field installed manual shut-off valve shown on figure 3.5 on the supply line to isolate the gas valve from the pressure.

NOTE: All factory installed gas connections have passed an approved leak test.

For leak testing on pressures above 1/2 PSI

When leak testing with pressures above ½ PSI (14 inches W.C.), the unit must be isolated from the supply pipe. Close the field installed manual shut-off valve, disconnect the supply line to the unit, and temporarily cap the supply line for testing purposes.



Gas pressures to the appliance controls must never exceed 14 inches W.C. (1/2 PSI). Supply pressures greater than 14" W.C. can damage the controls, resulting in personal injury, property damage, or death.

Electrical Requirements and Wiring Diagrams



Incorrect or improper wiring may result in shock, injury or death. Field wiring to the heater must be connected and grounded in accordance with national, state, provincial, local codes and to the guidelines in this manual. Refer to the most current revisions to the ANSI/NFPA 70 Standard.

All field wiring to the brooder must be done in accordance with the national, state, provincial, local codes

and the guidelines in this manual. In Canada refer to the most current revisions of the Canadian Electrical Code CSA C22.1 Part 1. The unit must be electrically grounded according to these codes.

A NOTICE

The power supply to the heater must be within +/-5% of the voltage rating as indicated on the rating plate of the appliance. If input power does not meet these specifications, contact your utility company.

This brooder system is designed to operate on an external 24VAC electrical system. Provide only 24VAC with a NEC Class 2 transformer to the control wires. Use thermostat type wire that has an adequate capacity and temperature rating for the total load. Consult to the NEC-90 Standard for sizing wire gauge to load.

Internal Wiring Diagrams

Before wiring this appliance, check the existing wiring; replace if necessary. If any of the original wire supplied with the appliance must be replaced, it must be replaced with copper wiring material having a rating of at least 600V, 105°C.

Figure 3.14 • 120V Internal Wiring Diagram







Field Wiring Supply Voltage

Before proceeding with electrical connections, ensure that the supply voltage, frequency, phase and current capacity meet the requirements specified on the rating plate. A dedicated line voltage supply with properly sized wire should run directly from the main electrical panel to the heater. The power to the unit must be protected with a circuit breaker appropriate for the load. The unit must be electrically grounded in accordance with local codes, or in their absence, with the latest edition of the National Electrical Code, ANSI / NFPA 70, latest edition.

A CAUTION

The power supply to the heater must be within +/- 5% of the voltage rating as indicated on the rating plate of the appliance. If input power does not meet these specifications, contact your utility company.

Controller/Thermostat Connection

NOTE: Different controllers/thermostats operate according to their particular features. Refer to the controller/thermostat specifications for details.

Each ACS Series heater requires a single stage thermostat rated for 24VAC or 120VAC to operate. The thermostat terminal designations are as follows:

- R: 24VAC/120VAC Power
- W: Call for Heat
- C: Common for 24VAC/120VAC Power

24VAC is supplied from a NEC Class 2 field supplied external transformer. Use a thermostat type wire that has an adequate capacity and temperature rating for the total load. Follow the field wiring diagram in Figures 3.16 and 3.17 for wiring to a typical single-stage thermostat.

Figure 3.16 • 24V Field Wiring Diagram



Chart 3.6 • Minimum Transformer (Class II)Volt-Ampere for 24 VAC Brooder

Brooder Qty.	14	15	16	17	18	19	20	21	22	23	24
Min. Transformer VA	210	225	240	255	270	285	300	315	330	345	360

Figure 3.17 • 120V Field Wiring Diagram





4.0 Operation



This appliance does not have a pilot ignition. It is equipped with an ignition device which automatically lights the burner. **Do not** attempt to light the system by hand.

Lighting Instructions

Upon satisfactory completion of the electrical supply and purging of the gas supply line to the heater(s), follow the lighting instructions on the heater's rating label to put the heater into operation.

Direct Spark Ignition System

- 1 Turn on the gas and electrical supply.
- 2 Set the controller/thermostat to call for heat.
- **3** 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 interpurge delay of approximately 15 second before another ignition attempt. The control will attempt two (2) additional ignition trials before going into lockout and the valve relay will be de-energized immediately.
- If the heater does not light, shut off the gas completely for five (5) minutes before attempting to relight.
- 6 If the controller/thermostat is still calling for heat after five (5) minutes, the control will automatically reset and attempt to ignite the burner again.
- To shut down the heater, interrupt the gas and electrical supply.

NOTE: The lighting and shutdown instructions are also shown on the permanent nameplate label attached to the heater.

A CAUTION

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



Use only your hand to turn the manual shut off. Never use tools. If the knob will not turn by hand, don't try to repair it; call a qualified technician. Force or attempted repair may result in a fire or explosion.

5.0 Maintenance

Routine Maintenance & Inspection



Personal injury or death may result if maintenance is not performed by properly trained gas installer or service personnel. Contact the installing distributor or place of purchase for service. **Do not operate heating system if repairs are necessary**.



Allow heater to cool prior to servicing. Disconnect power to heater before servicing. Use protective glasses when maintaining the heater.

An inspection should be performed at the beginning of each crop/flock, or on an annual basis, to insure that all heater components are in proper working order and that the brooder operates at peak performance. Particular attention should be paid to the following items.

- **Reflector Canopy:** To maintain effective infrared heating, always keep both sides of the canopy clean. Dirt and dust can be blown with compressed air, vacuumed or wiped with a soap and water solution. Use aluminum polish if the reflectors are severely dirty.
- **Burner:** Check for proper ignition, burner flame and flame sense. Inspect flame characteristics by operating the unit using natural ventilation only. A solid, blue flame with a yellow tip is normal. A lazy yellow flame indicates the burner and orifices need to be disassembled and cleaned (see Figure 5.1).

Figure 5.1 • Burner/Orifice Disassembly and Cleaning



Release the main burner orifice fitting and pan from the burner by removing two (2) thumb screws.

Our Construction of the orifice of the orifice of the orifice of the orifice has a standard of the orifice in acetone cleaner. Dry the orifice using compressed air.

• Apply pipe thread sealant (resistent to propane gas) to the threads of the orifice and replace it into the orifice fitting.

[continued on p30]

A Remove the main burner. Clean both the inside and outside of the perforated emitter assembly, around the burner cap ports, the upper burner surfaces, inside the burner base and venturi with a small wire bristle brush. Blow any remaining dirt and dust off on the ports and in the venturi using compressed air.

6 When reassembling the burner base, avoid overtightening the nuts which can distort the burner. Replace any screws that were sheared during the removal process with stainless steel screws.

NOTE: After all components have been reassembled, check that the gas connections at the burner and gas valve for leaks (see 'Leak Testing' page 19).

- **Gas Connection:** Inspect the integrity of the gas connection to the heater. Check for leaks, damage, fatigue or corrosion. Do not operate if repairs are necessary and turn off gas supply to the heater. Contact service personnel.
- **Clearance to Combustibles:** Inspect the area near the unit to be sure there is no combustible material located within the minimum clearance requirements listed in this manual. Under no circumstances should combustible material be located within the clearances specified in this manual. Failure to provide proper clearance could result in personal injury or equipment damage from fire.
- Wiring: Check electrical connections for tightness and/or corrosion. Check wires for damage.

Contact service personnel if repairs are necessary. Do not operate unit.

Maintenance Log

Date	Maintenance Performed	Replacement Parts Required			
1					

Troubleshooting Guide

Chart 5.1 • Troubleshooting Guide

Symptom	Possible Cause	Corrective Action	
Brooder is not glowing red.	• The supply gas pressure is too low.	 Check the manifold gas pressure and adjust if necessary. 	
	Improper size of gas piping.	 If you are not sure of the performance, use the NFPA 54 gas pipe sizing Chart 3.5 on page 20 	
	The orifice is clogged.	Clean the orifice.	
	Incorrect orifice size	• See the instructions for correct orifice size and replace if necessary.	
Brooder will not attain the desired temperature.	 There is insufficient heat in the building for heat loss (i.e., not enough brooders). The thermistor temperature sensing bulb in incorrectly placed. 	 Conduct heat loss and add brooders or oth source of heat as necessary. Reposition as necessary for proper operati NOTE: The sensing bulb should be shielde from direct radiation to prevent short cyclin of the brooder. 	
	• The thermostat is out of calibration.	Recalibrate (if possible) or replace.	
Flames flaring up outside of emitter	• The gas pressure is too high.	 Check the manifold gas pressure and adjust if necessary. 	
surface.	Incorrect orifice size.	 See instructions for correct orifice size and replace if necessary. 	
	 Incorrect type of gas supplied to the brooder. 	 Check the nameplate to identify the correct type of gas the brooder is equipped to operate using. 	
	Not enough combustion air.	• Clean the inside of the burner with a wire brush and blow out with compressed air.	

ACS Series Parts Listing

Figure 5.2 • Heater Assembly Components



Part No.	Description	Part No.	Description		
BP-110	Orifice Holder	BP-140	24V Natural Gas Valve		
BP-111	Control Box	BP-141	24V Propane Gas Valve		
BP-114	Burner Pan	BP-142	120V Natural Gas Valve		
BP-120	Burner Bracket	BP-143	120V Propane Gas Valve		
BP-122K	Fastener Kit	BP-144	Manifold		
	#8 - 32 X 1/2" Thumb Screw	BP-145	Manifold Bracket		
	#8 X 1/2" Sheet Metal Screw	BP-147N	Gas Orfice - Natural		
	#8 - 32 X 3/8" Hex Head Ground Screw	BP-147P	Gas Orifice - Propane		
	#8 - 32 X 3/8" Round Head Screw	BP-150	Electrode		
	#8 - 32 Keps Nut	BP-151	120V Circuit Board		
	#10 - 32 X 1/4" Hex Head Screw	BP-152	24V Circuit Board		
	#10 - 24 Keps Nut	BP-153	Electrode Bracket		
	1/4" - 20 X 2" Eye Bolt	BP-155	High Voltage Ignition Wire w/ Boot		
	1/4" - 20 X 5/8" Hex Head Bolt	BP-158	Toggle Switch		
	1/4" - 20 Keps Nut	BP-170	Burner Assembly		
	1/4" Flat Washer	BP-179	Hanger		
	3/16" ID X 3/4" OD Flat Washer	BP-188	Reflector Canopy		
	Wire Tie	BP-189	Heat Shield Assembly		
BP-135	120V Wire Harness (not shown)	BP-190	Emitter Cone Assembly		
BP-136	24V Wire Harness (not shown)				

Chart 5.2 • Heater Components List

Limited Warranty Terms and Conditions

One-Year Limited Warranty. The heaters covered in this manual are warranted by Brant Radiant Heaters Limited to the original user against defects in workmanship or materials under normal use for one year after date of purchase. Any part which is determined to be defective in material or workmanship and returned to an authorized service location, as Brant Radiant Heaters Limited designates, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at Brant Radiant Heaters Limited's option. For limited warranty claim procedures, see PROMPT DISPOSITION below. This limited warranty gives purchasers specific legal rights which vary from jurisdiction to jurisdiction.

Additional Limited Warranty. In addition to the above mentioned one-year warranty, Brant Radiant Heaters Limited warrants the original purchaser an additional extension on the heat exchangers and burners. This extension excludes electrical/purchased components.

General Conditions. The Company will not be responsible for labor charges for the analysis of a defective condition of the heater or for the installation of replacement parts. The warranties provided herein will not apply if the input of the heater exceeds the rated input at time of manufacturing or if the heater in the judgment of the Company has been subjected to misuse, excessive dust, improper conversion, negligence, accident, corrosive atmospheres, excessive thermal shock, excessive vibration, physical damage to the heater, alterations by unauthorized service personnel, operation contrary to the Company's instructions or if the serial number has been altered, defaced, or removed. The Company shall not be liable for any default or delay in the performance of these warranties caused by contingency beyond its control, including war, government restriction or restraints, strikes, fire, flood, short or reduced supply of raw materials, or parts.

Limitation of Liability. To the extent allowable under applicable law, Brant Radiant Heaters Limited's liability for consequential and incidental damages is expressly disclaimed. Brant Radiant Heaters Limited's liability in all events is limited to and shall not exceed the purchase price paid.

Warranty Disclaimer. Brant Radiant Heaters Limited has made a diligent effort to provide product information and illustrate the products in this literature accurately; however, such information and illustrations are for the sole purpose of identification, and do not express or imply a warranty that the products are merchantable, or fit for a particular purpose, or that the products will necessarily conform to the illustrations or descriptions. Except as provided below, no warranty or affirmation of fact, expressed or implied, other than as stated in the "LIMITED WARRANTY" above is made or authorized by Brant Radiant Heaters Limted.

Product Suitability. Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Brant Radiant Heates Limited attempts to assure that its products comply with as many codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, review the product applications, and all applicable national and local codes and regulations, and be sure that the product, installation, and use will comply with them. Certain aspects of disclaimers are not applicable to consumer products:

e.g., (a) some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you: (b) also, some jurisdictions do not allow a limitation on how long an implied warranty lasts, consequently the above limitation may not apply to you: and (c) by law, during the period of this limited warranty, any implied warranties of implied merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

Prompt Disposition. Brant Radiant Heaters Limited will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom the product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Brant Radiant Heaters Limited at 34 Scott Ave, P.O Box 395 Paris, Ontario N3L 3T5, listing dealer's name, address, date and number of dealer's invoice, and describe the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.

Notes

ACS Kit Contents Check List

Chart 5.3 • ACS Kit Contents for each ACS Series unit.

BP-179K Hanger Kit		er Kit	BP-190	BP-111K Control Box Kit		BP-150K		
	BP-114		BP-189K	BP-188				
	Burner Par	l	Heat Shield & Assembly Kit	Reflector Canopy				
BP-170 Burner Assembly		bly		BP-144	Manif	fold Assembly	LIOACS A Installation, C Maintenan	CS Series)peration and .ce Manual
Box	Part No.	Desci	ription			<u> </u>		Quantity
ECB	BP-111K	Contro	ol Box Kit			1		1
		1	Control Box			0.41/ 1001/ 0	un it Da and	
	 	Burnou	24V or 120V Wire Harness		I	24V or 120V CI	rcuit Board	1
	DP-114	Dumer		1			1	
IB	BP-144	Manifo	a Assembly					1
ECB	BP-150K	Electro	lectrode Assembly Kit					1
		1	Electrode		2	#8 x 1/2" Sheet	t Metal Screw	
ECB		Burnou			-	#10-24 Keps Nut		
		Lange						1
ECB	BP-1/9K							
		1	1/4"-20 x 2" Evebolt	7 1/4" Elat Washer			ul Sr	
		1	1/4"-20 x 5/8" Hex Head Bolt		,			
MP	BP-188	Reflec	tor Canopy	I		1		1
ECB	BP-189K	Heat Shield & Assembly Hardware Kit					1	
-		1	Heat Shield Assembly		3	#10-24 Keps N	ut	<u> </u>
		1	Manifold Bracket		3	#8-32 x 3/8" Ro	ound Head Scre	W
		2	1/4"-20 x 5/8" Hex Head Bolt		2	#8-32 Keps Nu	t	
		2	1/4"-20 Keps Nut		2	#8-32 x 1/2" Th	umb Screw	
		2	1/4" Flat Washer		1	3/16" ID x 3/4"	OD Flat Washer	•
		2	#10-32 x 1/4" Hex Head Screw		3	Wire Ties		
		1 #8-32 x 3/8" Hex Head Ground Screw						1
ECB	BP-190	Emitter Cone Assembly				1		
MP	LIOACS	ACS Series Installation Manual			1			
Filled	By:							

Box: MP= Main Packaging; TB= Triangular Box; ECB= Emitter Cone Assembly Box (see page 3).