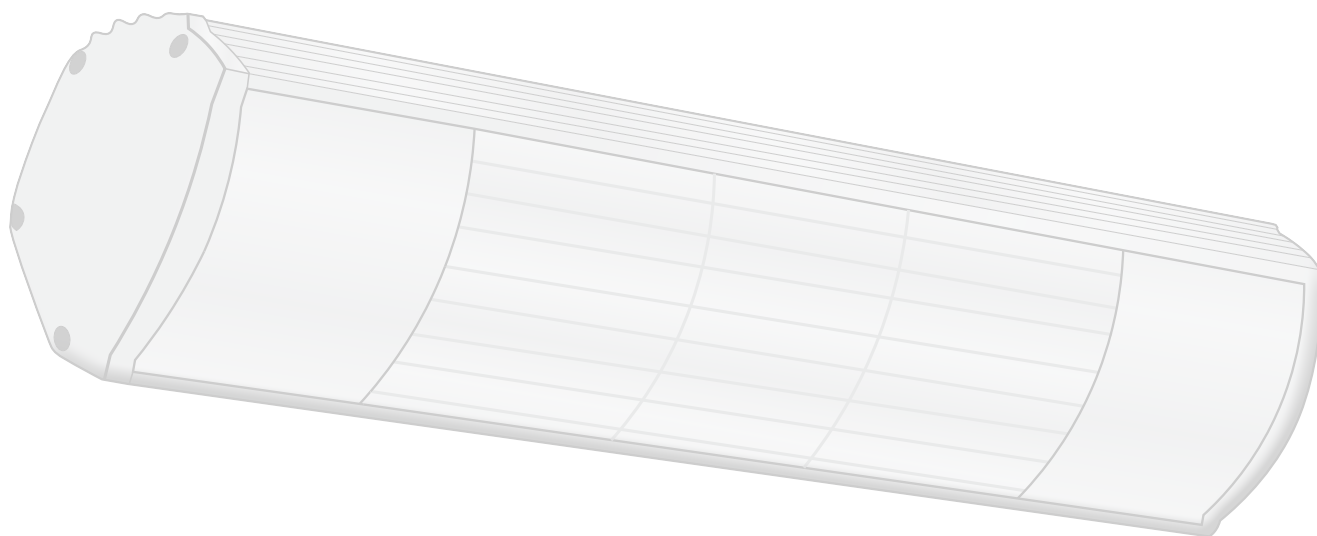


DGS Series Installation Manual



The DGS Series Electric Infrared Heater is a filtered short-wave unit containing one or two gold-filtered red lamps. All persons involved with the installation, operation, and maintenance of the heater system must read and understand the information in this manual.

WARNING



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

INSTALLER: Present this manual to the end user.

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

Model#: _____ **Serial #:** _____
(located on rating label)

LIODGS-Rev. 29515
Print: 5c-01/16_r6-10/18 (CDS)
Replaces: LIODGS-5c-10/15 (CDS)

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1.0 Safety

⚠ WARNING



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

Safety Symbols

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

⚠ WARNING

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

⚠ CAUTION

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

NOTICE

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

Applications

Commercial / Industrial (Indoors and Outdoors)

Infrared heaters are designed and certified for use in industrial and commercial buildings such as warehouses, manufacturing plants, aircraft hangars, and vehicle maintenance facilities. For maximum safety, the building must be evaluated for potential hazards before installing the heater system. A critical safety factor to consider before installation is the clearance to combustibles.

Outdoor Residential Only

This heater is **NOT** approved for use in an indoor residential application. This includes, but is not limited to, attached garages, living quarters, solariums, etc. Consult the local fire marshal and/or insurance provider if unsure of your application.

⚠ WARNING



Not For Residential Use.

Installation of this infrared heater system in residential indoor spaces, RV's, mobile homes, etc. may result in property damage, fire, serious injury, or death.

Model Number Designation Chart

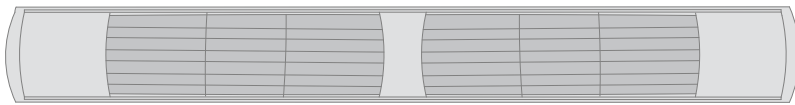
Material Type	Lamp Qty.	Voltage Code	Lamp Wattage Code	Lamp Type (Color)
Bronzed Extruded Aluminum	1	A = 120 VAC	15 = 1,500	Gold-Filtered Red
	2	B = 208 VAC C = 230 VAC	20 = 2,000 30 = 3,000	

Model Configuration Example: DGS-Z1-A15

Available Models and Operational Specifications



Available in 1,500 W or 2,000 W.



Available in 3,000 W comprised of two 1,500 W lamp elements.

Model Number	Volts	Watts	BTU	Amps	Dimensions			Weight
					Length	Width	Height	
DGS-Z1-A15	120	1,500	5,118	12.5	21.06" (536 mm)	4.61" (117 mm)	4.84" (123 mm)	5.7 lbs (2.6 kg)
DGS-Z1-C20	230	2,000	6,824	8.7	21.06" (536 mm)	4.61" (117 mm)	4.84" (123 mm)	5.7 lbs (2.6 kg)
DGS-Z2-C30	230	3,000	10,236	13.0	36.75" (934 mm)	4.61" (117 mm)	4.84" (123 mm)	9.7 lbs (4.4 kg)

Clearances to Combustibles

⚠ 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 vapors in the vicinity of the heater.



Failure to comply with the published clearances to combustibles could result in personal injury, death, and/or property damage.

The outside surfaces of the heater are hot during operation and after operation. If contact is made, permanent skin damage may occur. Do not move, handle, or service the unit during operation or while hot.

⚠ CAUTION



Signs shall be posted specifying the maximum permissible stacking height in order to maintain clearances to combustibles.

Hazards Include:

For maximum safety the building must be evaluated for hazards before installing the heater system. Examples include, but are not limited to:

- Gas and electrical lines
- Combustible and explosive materials
- Chemical storage areas
- Areas of high chemical fume concentrations
- Provisions for accessibility to the heater
- Adequate clearances around air openings
- Vehicle parking areas
- Vehicles with lifts or cranes
- Storage areas with stacked materials
- Lights
- Sprinkler heads
- Overhead doors and tracks
- Dirty, contaminated environment

A critical safety factor to consider before installation is the clearances to combustibles. **Clearance to combustibles** is defined as *the minimum distance you must have between the indicated surface and the combustible item*. Considerations must also be made for moving objects around the infrared heater. The following is a partial list of items to maintain clearances from:

Combustible Items Include:

- Wood
- Paper
- Fabric
- Chemicals
- Wall or roof insulation
- Plastics

Moving Objects Include:

- Overhead doors
- Vehicles on lifts
- Cranes
- Hoists
- Car wash equipment

When installing the infrared heater system, the minimum clearances to combustibles must be maintained. These distances are shown in Chart 1.1 and on the heater. If you are unsure of the potential hazards, consult your local fire marshal, fire insurance carrier, or other qualified authorities on the installation of infrared heaters for approval of the proposed installation.

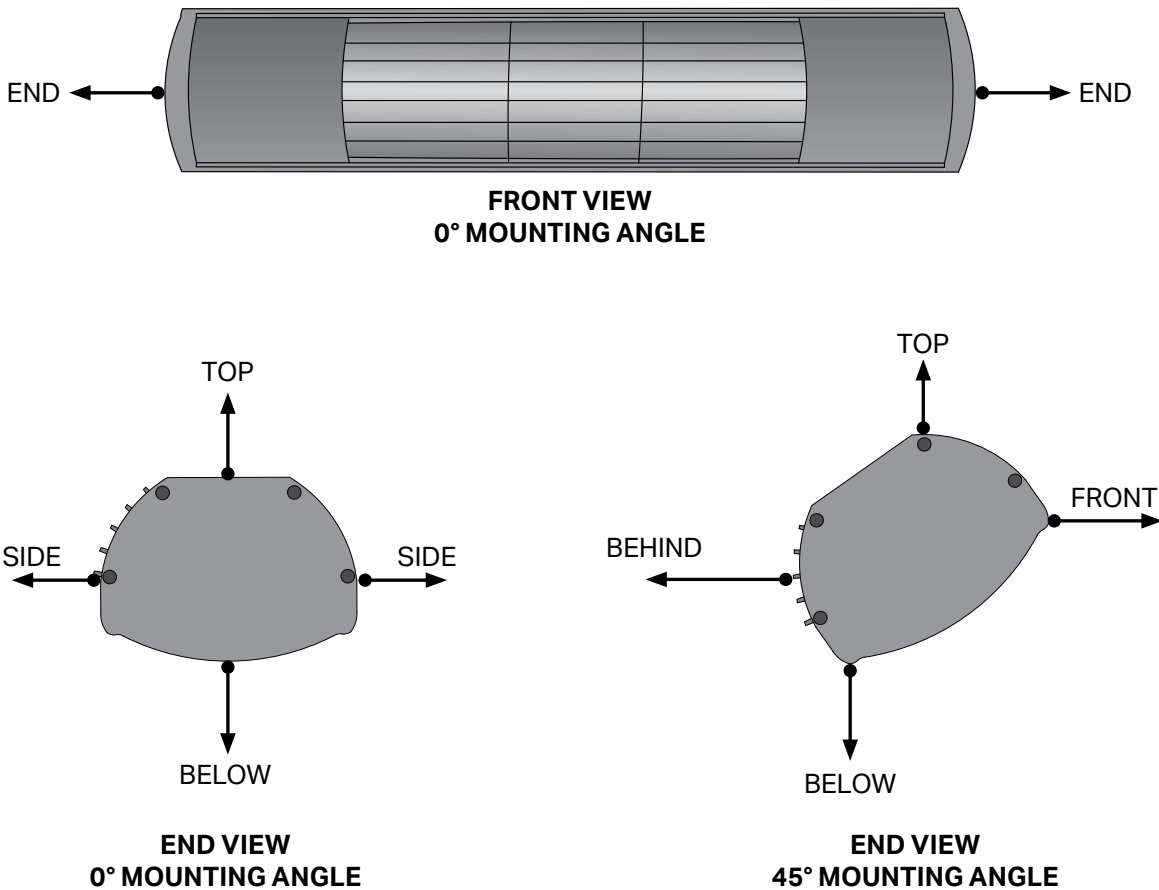
Chart 1.1 • Clearances to Combustibles in Inches (see Figure 1.1)

Model Wattage	Mounting Angle	Side				
		Front	Behind*	End	Top	Below
1,500	0°	10	10	21	3	64
	45°	39	3	21	3.5	40
2,000	0°	10	10	21	3	64
	45°	39	3	21	3.5	40
3,000	0°	13	13	25	3.5	77
	45°	44	3	25	5	51

* A minimum clearance of 36 inches must be maintained from behind another heater. Supplied bracket to be used for 0° mounting on 1,500 W and 2,000 W models only.

NOTE: Ensure that building materials with a low heat tolerance (i.e. awnings, fabrics, plastics, sprinklers, insulation, etc.) are protected against degradation. This may require the heater to be mounted at a distance in excess of the published clearances to combustibles. Contact the material manufacturer for specific details.

Figure 1.1 • Clearances to Combustibles

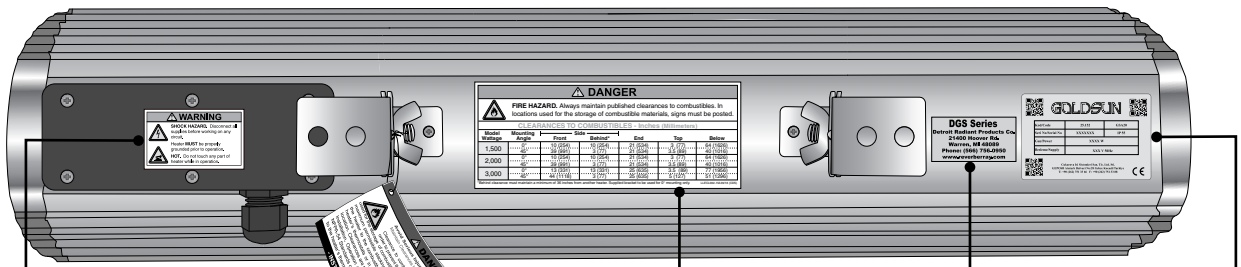


Safety Labels and Their Locations

It is important to provide warnings to alert individuals to potential hazards and safety actions. Signs should state the hazards for the particular application and be legible to the building occupants. Consult the factory or a factory representative for additional information on signage compliance.

Safety warning labels must be maintained on the infrared heater. Illustrations of the safety labels and their locations are pictured below. When labels become illegible, they must be replaced. Contact either your local distributor or the product manufacturer for obtaining replacement signs or labels.

Top View



⚠ DANGER
FIRE HAZARD. Always maintain published clearances to combustibles. In locations used for the storage of combustible materials, signs must be posted.

CLEARANCES TO COMBUSTIBLES - Inches (Millimeters)

Model Wattage	Mounting Angle	Side				
		Front	Behind*	End	Top	Below
1,500	0°	10 (254)	10 (254)	21 (534)	3 (77)	64 (1626)
	45°	39 (991)	3 (77)	21 (534)	3.5 (89)	40 (1016)
2,000	0°	10 (254)	10 (254)	21 (534)	3 (77)	64 (1626)
	45°	39 (991)	3 (77)	21 (534)	3.5 (89)	40 (1016)
3,000	0°	13 (331)	13 (331)	25 (635)	3.5 (89)	77 (1956)
	45°	44 (1118)	3 (77)	25 (635)	5 (127)	51 (1296)

*Behind clearance must maintain a minimum of 36 inches from another heater. Supplied bracket to be used for 0° mounting only. LLECL03-NA-0114-0101

F/N: LLECL002

Clearances to Combustibles Label

WARNING

Avoid Serious Injury, Death, or Property Damage. Maintain Clearances to Combustible to Prevent the Risk of Fire.

Clearances to combustibles must be maintained at all times in order to prevent the ignition of combustible materials. In locations used for the storage of combustible materials, signs must be posted to specify the maximum permissible stacking height to maintain the required clearances from the heater to the combustibles. Signs must either be posted adjacent to the heater's thermostat or, in the absence of such thermostats, in a conspicuous location. Clearances are provided on the heater's safety label and in the heater's Installation, Operation, and Maintenance manual. Product installation and operation must comply with applicable standards, codes, and regulations. Post this tag adjacent to the heater's thermostat or controls before operating the heater.

California Proposition 65

This product can expose you to chemicals including lead and carbon monoxide, which are known to the State of California to cause birth defects or other reproductive harm.

For more information go to www.P65Warnings.ca.gov.

- INSTALLER: READ AND POST THIS NOTICE -

F/N: LL001

Clearance Safety Tag
(Affix adjacent to heater's controller)

DGS Series
Detroit Radiant Products Co.
21400 Hoover Rd.
Warren, MI 48089
Phone: (566) 756-0950
www.reverberray.com

Factory Contact Label

⚠ WARNING

⚡ SHOCK HAZARD. Disconnect all supplies before working on any circuit.
 Heater **MUST** be properly grounded prior to operation.

🔥 HOT. Do not touch any part of heater while in operation.

F/N: LLECL003

Shock Safety Label

GOLDSUN

Kod/Code	25.152	GSA20
Seri No/Serial No	XXXXXXX	IP 55
Guc/Power	XXXX W	
Besleme/Supply	XXX V 50Hz	

Cakurova Isi Sistemleri San. Tic. Ltd. Sti.
 GEPOSB Ataturk Bulvari No:28 Gebze Kocaeli/Turkiye
 T: +90 (262) 751 33 66 F: +90 (262) 751 33 88

Rating Plate

Standards, Certifications, and Government Regulations

Installation of this infrared heater must comply with all applicable local, state, and national specifications, regulations, and building codes. Contact the local building inspector and/or fire marshal for guidance.

The heater must be electrically grounded in accordance with the following codes:

United States: Refer to National Electrical Code®, ANSI/NFPA 70 (latest edition).
Wiring must conform to the latest edition of National Electrical Code®, local ordinances, and any special diagrams from the manufacturer.

Canada: Refer to Canadian Electrical Code CSA C22.1 Part 1 (latest edition).

Detroit Radiant Products Company units comply or are certified by one or more of the following organizations or standards:

- EN 60335-1:2012, EN 60335-1:2012/AC:2012
- EN 60335-1:2012/A1:2014, EN 60335-2-30:2009/AC:2010
- EN 60335-2-30:2009/A11:2012

2.0 Installation

⚠ WARNING



Read and understand the installation, operating, and maintenance instructions thoroughly before installing or servicing this equipment.

Design

To ensure a safe, properly designed heating system, a layout should be developed for the correct placement of the infrared heater(s).

Aside from safety factors such as clearances to combustibles (see Chart 1.1 on page 6), consideration should also be given to factors such as the environment (e.g., cold/drafty, average, protected), heat coverage (sq. ft.) needed, heater centers, and the distance behind a person or work station(s). Also, the effective infrared surface temperature of a person or object may be diminished with wind above 5 mph. Wind barrier(s) may be required. Most importantly, clearances to combustibles **must** always be maintained! Refer to hazards on page 5.

When positioning the heaters, keep in mind the location(s) of combustible materials, lights, sprinkler heads, overhead doors, storage area with stacked materials, gas and electrical lines, parked vehicles, cranes, etc. Refer to page 6 for minimum clearances to verify that a safe installation exists.

This installation manual, along with national, state, provincial, and local codes, addresses these issues. It is critical that you read, understand, and follow all guidelines and instructions. Always inspect and evaluate the mounting conditions, application, and wiring.

When heated, materials high in hydrocarbons (solvents, paint thinner, mineral spirits, formaldehydes, etc.) can evaporate and/or degrade. This may result in odors or fumes being emitted into the environment. To correct this problem, clean the area and/or introduce additional ventilation. Heaters installed and serviced in accordance with the installation manual do not emit foul odors into the environment.

IMPORTANT: Fire sprinkler heads must be located at an appropriate distance from the heater to avoid an inadvertent discharge. This distance may exceed the published clearance to combustibles. Certain applications may require the use of high temperature sprinkler heads or relocation of the heaters.

⚠ CAUTION

Fire sprinkler systems containing propylene glycol, antifreeze, or other potentially flammable substances shall not be used in conjunction with this heater without careful consideration for, and avoidance of, inadvertent discharge hazards. For further information consult NFPA 13. Always observe applicable state and local codes.

Chart 2.1 • DGS Series Basic Heating Application Chart

Series	Lamp Qty.	Recommended Mounting Height (Ft.)* [Dim. A]	Recommended Distance Between Heaters (Ft.) [Dim. B]	Approx. Square Foot Coverage	Approximate Watts per Square Foot
DGS-15	1	7 to 9	3 to 9	100	15
DGS-20	1	7 to 9	4 to 11	100	20
DGS-30	2	8 to 10	5 to 13	150	20

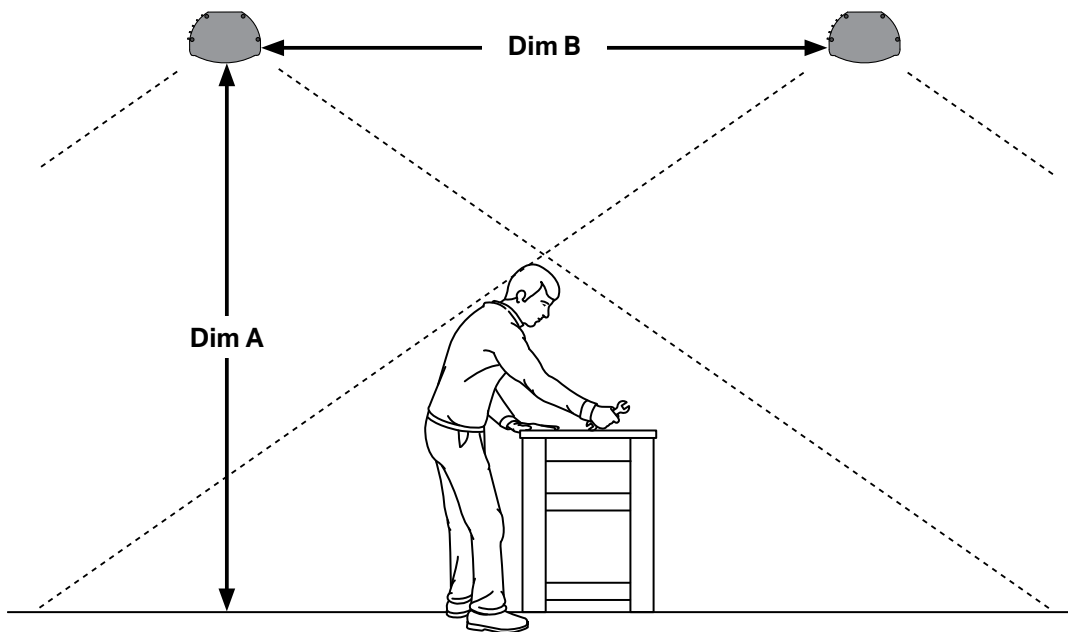
*Clearances to combustibles published in the DGS Series Installation Manual and on safety labels must be maintained at all times. Factory recommended mounting heights are listed as a guideline. If infrared heaters are mounted too low or too high, they may result in discomfort or lack of heat.

Chart 2.2 • Estimating Required Load

Type of Building	Watts Required per Square Foot at Floor Level
Insulated	10
Uninsulated	16
Outdoor Sheltered	25 to 30
Outdoor Unsheltered	30 to 45

When comfort heating people, two heaters should be used to heat both sides of the individual. Heater installation shall comply with all IOPM, NEC, ANSI/NFPA-70, CEC, and local restrictions.

Figure 2.1 • Heating Application



Heater Mounting

⚠ WARNING



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



Failure to maintain minimum clearances to combustibles may result in fire and/or explosion, property damage, serious injury, or death. Always maintain minimum clearances and post signs or provided tags (F/N: LL001) adjacent to heater's controller. Signs should state the hazards for the particular application and be legible to the building occupants. Consult the factory or a factory representative for additional information on signage compliance.

The heater can be suspended with chains or rigid threaded rod. Local codes or conditions that would cause the unit to move (e.g., wind drafts, blowers, crane rails, etc.) may require rigid threaded rod. Consult all applicable codes before installation.

The heater must be level from side to side and may be 0° to 45° on horizontal. Refer to figures 2.2 and 2.3.

Figure 2.2 • Heater Dimensions

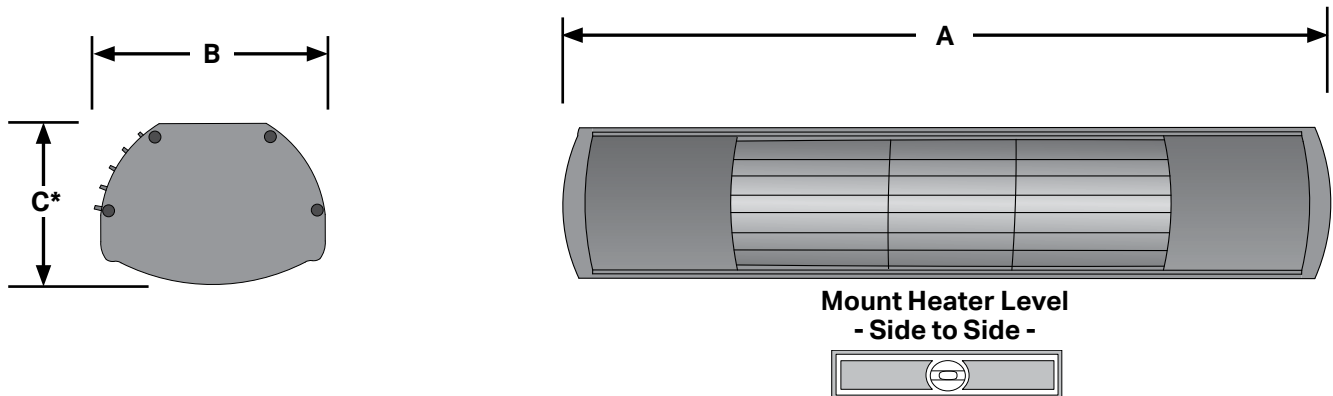


Chart 2.3 • Physical Dimensions (inches)

Model No.	A	B	C*
DGS-Z1-A15	21.06"	4.84"	4.61"
DGS-Z1-C20	21.06"	4.84"	4.61"
DGS-Z2-C30	36.75"	4.84"	4.61"

* This dimension does not include the mounting bracket. The mounting bracket is 3.25" high in its vertical orientation.

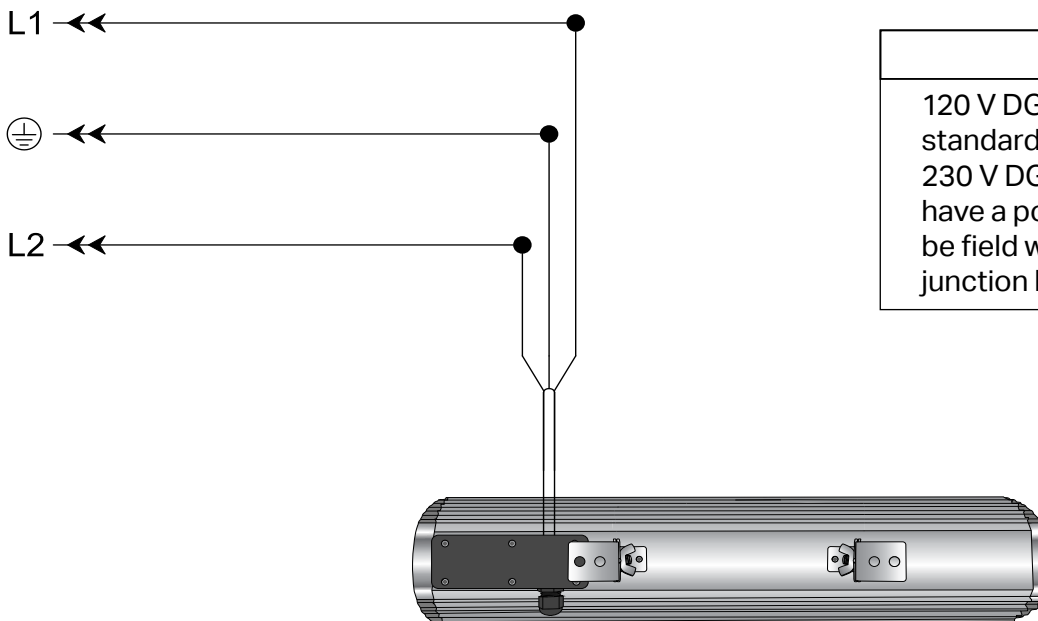
Heater Installation

The mounting bracket, electrical cord (120 V models only), and screws required to install this heater are provided with the unit. To install the unit:

- ❶ Determine the area where the heater is to be mounted. Clearances to combustibles **must** be maintained at all times and should be taken into careful consideration when determining the mounting location of the heater. **Note:** If the mounting surface is a combustible material, additional field-supplied brackets, chains, gripple, etc. may be required to maintain clearances to combustibles.
- ❷ Using a level, determine where the screw holes will need to be drilled and mark the area. Drill the holes then place a plastic anchor into each hole before mounting the hanger using the supplied screws.
- ❸ Verify the hanger is level. At this point, the hanger can be adjusted according to desired mounting angle. Once desired angle is achieved, tighten the screws on the hanger.
- ❹ Wire the electrical connector according to the diagram below. A plug may be added to connect the unit directly to a power supply. Alternately, the unit may be wired into a thermostat and/or dimmer for heater control. Do not install the heater directly underneath a wall plug.

Field Wiring

Figure 3.7 • Single Phase Service



NOTICE

120 V DGS models come standard with a power cord. 230 V DGS models do not have a power cord and must be field wired from the junction box.

⚠ WARNING



Electric Shock

Field wiring to the heater must be connected and grounded in accordance with national, state, provincial, and local codes, and to the guidelines in this manual. In the United States refer to the most current revisions to the ANSI/NFPA 70 Standard and in Canada refer to the most current revisions the CSA C22.1 Part I Standard.

Disconnect power to heater before servicing.

Failure to follow these instructions can result in electrical shock or death.

Heater Usage Tips

⚠ 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 vapors in the vicinity of the heater.



Failure to comply with the published clearances to combustibles could result in personal injury, death and/or property damage.



The outside surfaces of the heater are hot during operation and after operation. If contact is made, permanent skin damage may occur. Do not move, handle, or service the unit during operation or while hot.

It is important to ensure that the heater is installed properly and safely and in accordance with all local, state, municipal, and federal laws. If unsure of the local laws governing electric heaters, contact your local fire marshal, insurance carrier, or licensed and approved electrical contractor to ensure a safe application and installation.

When not in used/plugged in, leave the on/off switch in the “off” position. Disconnect the electrical supply when the heater is not in use.

Fluctuations in electrical voltage can reduce the life of the lamp element. Take all proper precautions and steps to ensure that fluctuations in voltage do not occur.

Ensure heaters are mounted out of reach of children, pets, and anything else that may come into contact with the lamp element(s). Do **not** operate the heater if the protective guard is not installed and do **not** touch the lamp element. The protective guard is in place to prevent larger items from reaching the lamp element but smaller items, such as fingers, may still be able to penetrate the guard, and serious injury and/or burns can occur.

Do not put anything inside of the heater, on top of the heater, or against the heater. When the heater is in operation, stay at least 4 feet away from the unit. Looking directly at the lamp element when the heater is in operation for prolonged periods of time can result in damage to the eyes. Do **not** look directly at the unit when the unit is in operation.

Protect the heater against shock, impact, and vibrations.

If the heater is not working, do not try to fix the heater. Disconnect the electrical supply and contact the nearest licensed electrician or electrical contractor for maintenance.

The reflectors are crafted from highly polished aluminum and do not require frequent cleaning. However, should it become necessary to clean the reflectors, follow the procedure below:

- Disconnect the power supply to the heater and wait until the heater is **completely** cooled down.
- Remove the protective guard.
- Clean the reflector with a dry cloth.
- Do not touch the lamp element with bare hands while cleaning. If the lamp is touched, carefully wipe down with a soft cloth dipped in rubbing alcohol.
- Reinstall the protective guard.
- Reconnect the heater to the power supply.

3.0 Maintenance

It is recommended that the following become a standard yearly procedure to obtain maximum operating efficiency and trouble free operation.

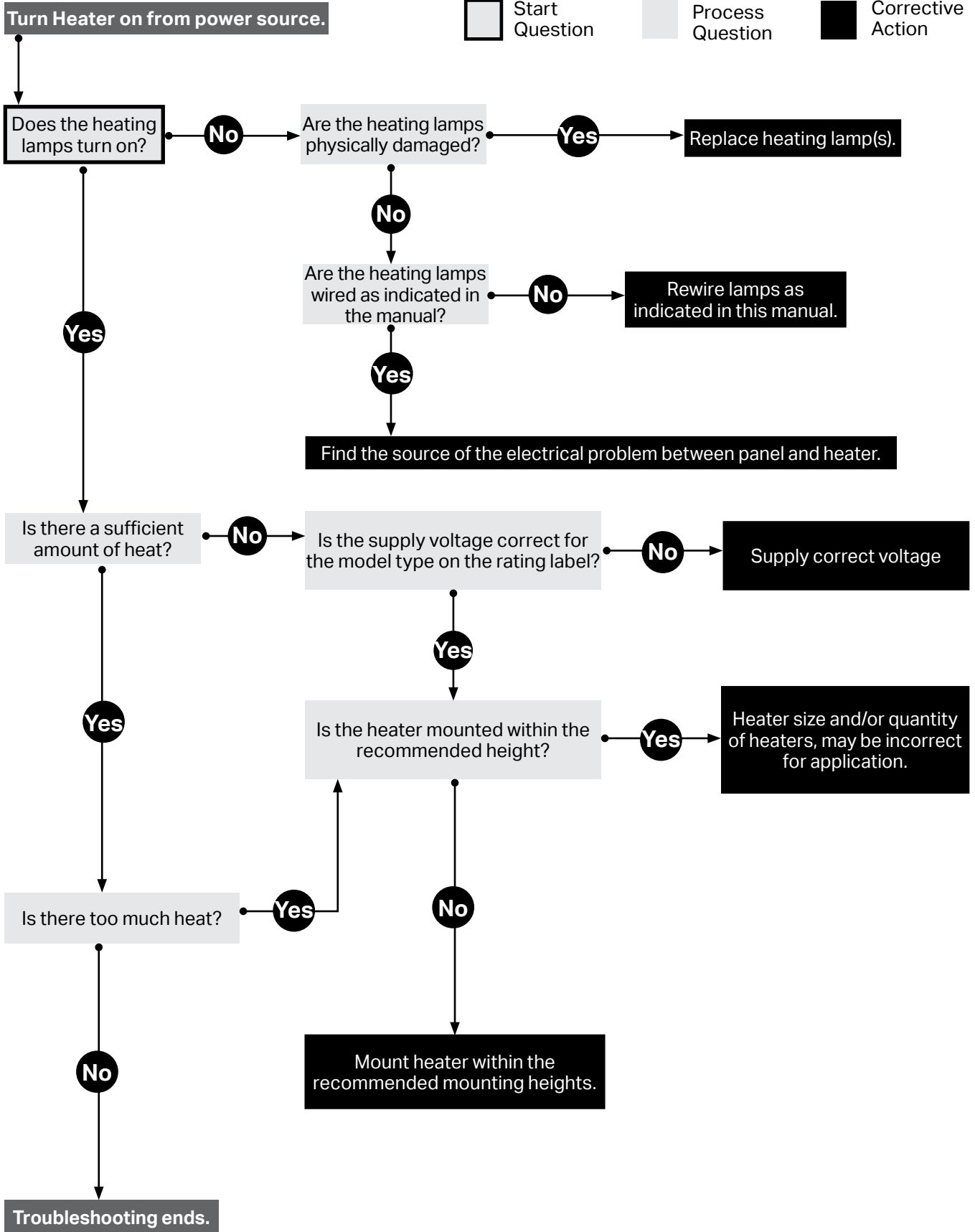
During long periods of non-usage, remove or cover heater with a polyethylene bag and disconnect from power supply. If further service to the heater is desired, contact your representative or the factory.

- ① Clean reflector surface with a damp cloth.
- ② Ensure heater is secure on all hanging points.
- ③ Maintain clearances to combustibles at all times. Immediately remove objects in violations of the published clearances to combustibles.
- ④ Check electrical wires and connections for wear or any kind of damage.

Troubleshooting Guide

Key

- Start Question
- Process Question
- Corrective Action



4.0 Limited Warranty

One-Year Limited Warranty: Detroit Radiant Products Company (hereinafter referred to as the Company) warrants to the original purchaser or original user that all Detroit Radiant Electric Infrared Heaters sold by it and all parts thereof are free from defects in material or workmanship under normal use and service. The Company's sole obligation under this warranty shall be limited to furnishing replacement parts, F.O.B. Warren, Michigan, for 12 months from the date of initial installation of the heater, but not to exceed 18 months from the date of shipment by the Company of the heaters, for any parts which the Company's examination shall disclose to its satisfaction to be defective. Defective parts are to be returned to the Company with transportation charges prepaid.

General Conditions: The warranties set out in this certificate are the exclusive remedy of the original owner or user in lieu of all other warranties written, oral, or implied (including any warranty of merchantability or fitness for the purpose) and all other obligations or liabilities on the part of the Company, and the Company neither assumes nor authorizes an person to assume for it any other obligation or liabilities on the part of the Company, and the Company neither assumes nor authorizes any person to assume for it any other obligation or liability in connection with the sale, installation, or use of the heater or any parts thereof.

The Company will not be responsible for labor charges for the analysis of a defective condition in 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 the time of manufacturing or if the heater, in the judgement 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 cause by contingency beyond its control including war, government restriction or restraints, strikes, fire, flood, short or reduced supply of raw materials, or parts.

The warranties herein shall be null and void if the heater is not installed by a competent heating contractor and/or if the heater is not installed according to Company instructions, normal industry practices, and/or if the heater is not maintained and repaired according to Company's instructions. Normal product degradation and wear (rust, oxidation, etc.) does not constitute a material defect and applicable warranty claim.

Written permission is required for the return of any parts or equipment and any such return must be made on the basis of transportation charges prepaid. Shipment may be refused unless prior written permission is obtained and good returned prepaid.

This warranty applies only within the United States.



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