

LD SERIES TUBE HEATERS

ENGINEERING SUBMITTAL DATA – TWO-STAGE LOW INTENSITY GAS FIRED INFRA-RED TUBE HEATERS & ACCESSORIES

SUBMITTED BY: _____

DATE: _____

JOB TITLE: _____

CONTRACTOR: _____

ADDRESS: _____

PHONE #: _____

CITY: _____

ADDRESS: _____

STATE: _____ ZIP: _____

CITY: _____

STATE: _____ ZIP: _____

ENGINEER: _____

LOCAL REPRESENTATIVE: _____

NOTES: _____

QTY.	MODEL #	GAS TYPE (Circle One)	BTU/H High Fire	BTU/H Low Fire	STRAIGHT LENGTH	U-TUBE LENGTH	STANDARD WEIGHT	RECOMMENDED MOUNTING HEIGHTS ^	FIELD USE ONLY***
									"TYPE" TUBE PKG #1
	LD-10-40	N or LP	40,000	28,000	12' - 3"	N/A	70 lbs.	10' to 14'	10-3 Titanium
	LD-15-40*	N or LP	40,000	28,000	17' - 0"	N/A	85 lbs.	8' to 13'	15-3 Titanium
	LD-15-50	N or LP	50,000	35,000	17' - 0"	N/A	85 lbs.	10' to 15'	15-3 Titanium
	LD-20-40*	N or LP	40,000	28,000	21' - 7"	13' - 0"	100 lbs.	8' to 13'	20-3 Titanium
	LD-20-50	N or LP	50,000	35,000	21' - 7"	13' - 0"	100 lbs.	9' to 15'	20-3 Titanium
	LD-30-50*	N or LP	50,000	35,000	31' - 3"	**17' - 8	120 lbs.	9' to 14'	30-3 Titanium

* CSA Design Certified for installation in residential applications.

** Model requires DB-5EA SUB accessory package when installing in a 'U' configuration.

*** Type packages refer to the tube package that will ship with models (length, diameter, combustion tube type and radiant tubes).

^ Recommended mounting heights are provided as a guideline. Actual conditions may dictate variations from this data.

N/A: Not Available or Not Applicable.

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VISIT OUR WEBSITE FOR:

- Product Specs
- Parts Support
- Dealer Locator
- Applications
- C.A.D. Library
- Design Guidelines
- Theory of Infra-red
- and More!

LD SPECIFICATIONS

APPROVALS

- IAS, CGA, CSA.
- Select models are residentially certified to CSA No. 7-89.

BURNER CONTROL BOX

- Sight glass for burner inspection.
- Totally enclosed components.
- Coated enameled steel.
- Operational & self-diagnostic indicator lights.

GAS CONNECTION

- 7/8" flare-M FPT Connection to 1/2" x 24" (304) SS flex connector provided.
- 1/2" F NPT ball valve & inlet tap included.

COMBUSTION AIR INLET & VENTING

- Preset 4" male air inlet collar.
- Sidewall or roof venting.
- Venting is required for residential applications.

GAS SUPPLY – W.C.P. NAT LP

- Manifold pressure 3.5" 10.0"
- Min. Inlet pressure 5.0" 11.0"
- Max. Inlet pressure 14.0" 14.0"

POWER SUPPLY

- 120 V.A.C., 60 Hz GRD, 1 Ph., 3-wire.
- 24V thermostat connection.
- Ignition current - 4.8 amps.
- Running current - 1.1 amps.

CONTROLS

- Two-stage gas valve (at 100% and 65%).
- Dual safety pressure switches.
- Silicon carbide hot surface igniter.
- Pre-purge controls.
- Flame rod sensing.
- 24V thermostatic control voltage.
- Self-diagnostic – LED "soft lockout".

EMITTER & COMBUSTION TUBES

- 16 ga. 3" O.D. titanium alloy treated steel combustion chamber.
- 16 ga. 3" O.D. aluminized coated steel radiant emitter tubes.
- All tubes coated with high temperature, corrosion resistant black coating, .95 emissivity. Slip-fit swaged connection.
- Stainless steel turbulator baffle.

REFLECTOR

- Highly polished aluminum.
- Two end caps included.
- Reflector tension springs.
- Continuous overlap design.
- One reflector center support per reflector.

LIMITED WARRANTY

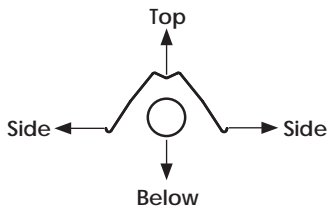
- 1 year - Burner box components.
- 3 years - Combustion and radiant tubes.
- 5 years - Stainless steel burner.

CLEARANCES TO COMBUSTIBLES (IN.)

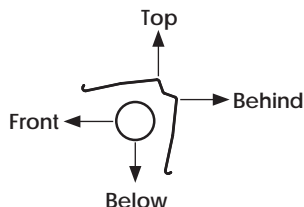
MODEL NO.	MOUNTING ANGLE*	SIDE			
		FRONT	BEHIND	TOP	BELOW
LD (10, 15, 20) - 40 [N,P]	0°	15	15	6	45
	45°	58	8	10	45
W/1 side shield	0°	42	8	6	45
W/2 side shields	0°	20	20	6	45
20 ft. from burner	0°	N/A	N/A	N/A	N/A
LD (15, 20, 30) - 50 [N,P]	0°	11	11	6	48
	45°	39	8	10	48
W/1 side shield	0°	29	8	6	48
W/2 side shields	0°	16	16	6	48
20 ft. from burner	0°	7	7	6	30

* Heaters mounted on an angle between 0° and 45° must maintain clearances posted for 0° or 45°; whichever is greater.

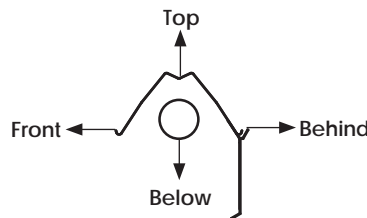
0° Mounting Angle



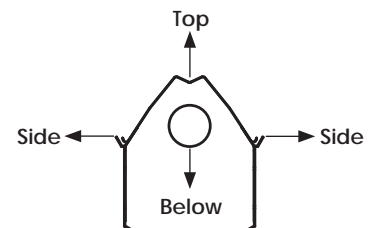
45° Mounting Angle



0° w/ 1 Side Shield



0° W/ 2 Side Shields

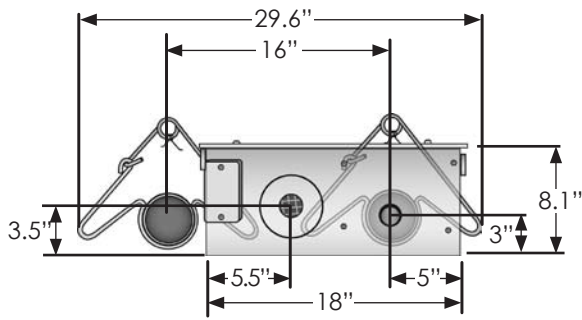


Read and understand the installation, operation and maintenance manual prior to installing or servicing this unit.

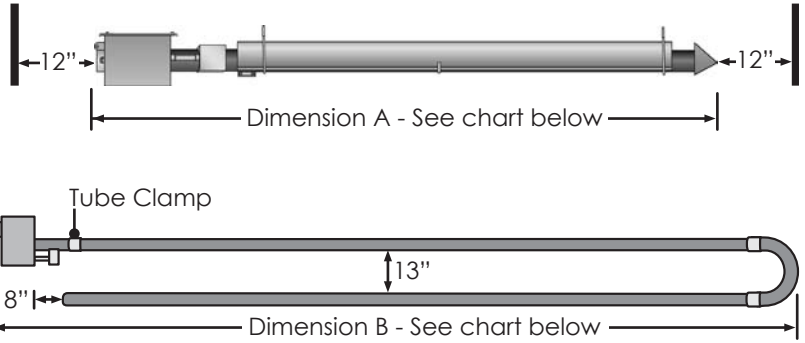
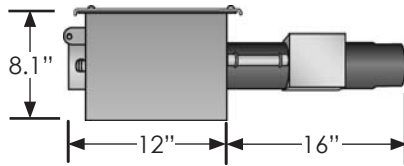
In locations used for the storage of combustible materials, signs must be posted adjacent to the heater's thermostat specifying stacking heights.

FIELD DATA

Burner Control Box with U-Bend • End View



Side View



MODEL NUMBER	DIMENSION A STRAIGHT	DIMENSION B U-TUBE
LD-10	12' - 3"	N/A
LD-15	17' - 0"	N/A
LD-20	21' - 7"	13' - 0"
LD-30	31' - 3"	*17' - 8"

*with DB-5EA SUB

Visit www.reverberray.com/technical for wiring schematics.

OPTIONAL ACCESSORIES

QTY	PART #	DESCRIPTION	NOTES
	DB-10EA	10' X 3" Tube & Reflector Extension	Optional 10' extension package. Max. one per unit.
	DB-DSK	3" Sidewall Vent Kit	Required for all single sidewall vents. No roof venting.
	DB-E6	90 Degree, 3" Radiant Elbow	Used for making an 'L' tube shaped heater. Max. two per unit.
	DB-REP	Reflector & Elbow Package	Reflector and accessories used to configure heater in an 'L' shape.
	DB-RUP	Reflector & 'U' Bend Package	Reflector and accessories used to configure heater in a 'U' shape.
	DB-TF1B	180 Degree, 3" Radiant 'U' Bend	Used for making a 'U' shaped heater. Max. one per unit.
	DB-Y	3" x 4" x 3" Dual Exhaust Assembly (alum)	Used for joining two heaters on one vent. Same thermostat required.
	DB-YSM	3" x 4" x 3" Dual Exhaust Assembly (galv)	Used for joining two heaters on one vent. Same thermostat required.
	4-DSK	4" Sidewall Vent Kit	Required for all dual sidewall vents. No roof venting.
	BK	Angle Mounting Bracket 15-30-45 Deg.	Rotates unit to preset mounting angles.
	PG	Protective Guard	Protects heat exchanger from contact or objects. Each 5' in length.
	PLQ	Warning Plaque	Hung below heater, restates the clearance to combustible warning.
	RTVP-3	3" Rooftop Vent Package	Used to singly vent through the roof.
	RTVP-4	4" Rooftop Vent Package	Used to dual vent vertically through the roof.
	SMB	Single Mount Bracket	Provides units with 'U' bend uniform mounting points. One per 10'.
	SSE	Side Shield Extension	Reflector side guard used to lower side clearances. Each 5' in length.
	TR60	5' x 4" Tube & Reflector Extension	Optional 5' extension package. Max two per unit.
	WIV-4	4" Combustion Air Intake - Sidewall Cap	Used to duct fresh (cold) air 0-30 ft. to a heater. Sidewall only.
	WVE-3	3" Unvented Exhaust Termination Cap	Required when operating unvented. Flapper ensures proper operation.

OPTIONAL UPGRADES

- SILSEAL** Protects internal burner box components against contaminants.
- OD-KIT** For use when applying heaters outdoors.
- HLRB** Relay board, required on heaters sharing a common thermostat or a single vent.
- DB-5EA SUB** Substitute one 10' radiant tube and reflector for two 5' pieces. This is ideal for making "U" heaters from 30', 50' and 70' models. Maximum of one per heater.

STAINLESS STEEL UPGRADES

- SSCBAO** - Control Box
- SSRAO** - Reflectors
- SSFVAO** - Fan Wheel

NOTE: Refer to the Tube Heater Accessory List for detailed specifications and limitations on any of the above options.

WRITTEN SPECIFICATIONS

HEATER PARAMETER/SPECIFICATIONS

- Gas fired two-stage radiant tube heaters shall be furnished and installed in accordance with governing codes and as shown per drawing(s) provided. Two-stage radiant tube heaters shall be **RE-VERBER-RAY LD SERIES** of the model numbers and inputs(s) in BTU/H as manufactured by Detroit Radiant Products Company, Warren, MI 48089.
- Two-stage radiant tube heaters shall be Design Certified by CSA and comply with current Occupational Safety and Health Act (OSHA) Requirements. The supplier shall provide the CSA Certification Number and the heaters shall bear the CSA Seal of Certification. The heaters low fire and high fire modes of operation must be Design Certified by CSA.
- The supplier shall provide a manufacturer's published warranty covering the heater's stainless steel burner for a period of five (5) years, combustion and radiant emitter tube assembly for a period of three (3) years, and all components utilized in the heater control assembly for a period of one (1) year.
- The supplier shall furnish the owner/contractor with _____ copies of the engineering specification forms, showing physical dimensions, installation detail, recommendations, control wiring diagrams, and spare parts list.
- Two-stage radiant tube heaters shall be designed to satisfactorily operate at a minimum inlet pressure of _____ inches W.C. to a maximum inlet pressure of _____ inches W.C.
- Two-stage radiant tube heaters shall be designed to operate without adjustments when burning natural gas having a heat value of _____ BTU per cubic foot with a specific gravity of _____, or when burning propane gas have a heat value of 2500 BTU per cubic foot with a specific gravity of 1.53.
- An Installation, Operation, and Maintenance Manual shall be supplied with each heater.
- The heater's air flow control system shall provide a 45 second pre-purge prior to initiating burner operation and a post purge upon completion, effectively removing all products of combustion from heat exchanger and/or radiant tubes.
- Heater control assembly shall include staging indicator lights that define the units operating input ranges.
- No condensation shall form as a result of combustion in the combustion chamber or radiant tubes while at operating temperatures.
- The thermostats shall be two-stage operating on 24 volts. No external transformer shall be required, except in multiple heater scenarios.
- Total heater shutdown shall occur in the event of circuit control lockout, including burner operation and combustion air blower. An interruption of power (reset thermostat) will restart the firing sequence.
- The heater controls shall provide a 60 second post purge as an integral part of the control assembly.

TWO-STAGE RADIANT TUBE HEATER CONSTRUCTION

TWO-STAGE RADIANT TUBE HEATER BURNER CONTROLS

- The two-stage radiant tube heater's normal sequence of operation shall include a defined input differential. Heater must be CSA Design Certified to operate at an input differential of at least 30% between the low fire and high fire modes.
- Heaters shall be equipped with a direct silicon carbide ignition system with a three (3)-time ignition trial to sensing mode and an infinite trial after sensing mode. Power supplied to each burner shall be 120 VAC, 60 Hz. Flame sensing shall be via an independent sensing rod and circuit.
- The control assembly shall be Design Certified by CSA, shall provide main burner regulation, and shall be of the redundant type.
- Heater controls shall include two safety differential pressure switches: one to monitor exhaust back pressure and one to monitor combustion air flow, so as to provide complete burner shutdown due to insufficient combustion air or flue blockage.
- The heater shall incorporate a self-diagnostic ignition module, include an external LED readout display, and recycle the heater after an inadvertent shutdown.
- The heater's control system shall be designed to shut off the gas flow to the main burner in the event either a gas supply or power supply interruption occurs.
- Heater's control housing shall be totally enclosed with a corrosion resistant enameled steel exterior. The controls shall be easily serviceable by removing one (1) panel.
- The main burner assembly shall be constructed of stainless steel.
- Heater's combustion chamber shall be 3" O.D. 16ga. titanium alloy treated or aluminized steel finished with a high emissivity rated, corrosion resistant, black coating.
- Heater's radiant emitter tube shall be 3" O.D. 16ga. aluminized steel finished with a high emissivity rated, corrosion resistant, black coating.
- The heater's combustion chamber and radiant emitter tube shall incorporate a 3" slip fit connection in which the upstream tube slides into the next tube and is held by a bolted clamp.
- Safety pressure switches shall incorporate atmospheric sensing termination fittings designed to eliminate blockage due to moisture or foreign matter.
- The silicon carbide ignitor shall be readily accessible and serviceable without the use of tools.
- Reflectors shall be .025 polished aluminum with a multi-faceted design which includes reflector end caps. Reflectors shall be rotatable from 0 to 45 degrees when required. The heater's reflector hanging system shall be designed to permit expansion while minimizing noise/rattles. Reflectors shall be assembled to the heater without the use of tools.
- The heaters shall utilize a downstream turbulator baffle for maximum thermal efficiency.
- Heaters shall be equipped with a sight glass allowing a visual inspection of ignitor and burner operation from the floor.
- The two-stage radiant tube heaters shall be designed such that, at the customer's option, outside combustion air may be supplied without the use of additional supply fans. An air intake collar shall be supplied as part of the burner control assembly to accept a 4" O.D. supply duct.