

HLV SERIES TUBE HEATERS

SUBMITTAL DATA – ENGINEERED LOW INTENSITY GAS-FIRED INFRARED TUBE HEATER VACUUM SYSTEM & ACCESSORIES

SUBMITTED BY: _____ DATE: _____

JOB TITLE: _____ CONTRACTOR: _____

ADDRESS: _____ PHONE #: _____

CITY: _____ ADDRESS: _____

STATE: _____ ZIP: _____ CITY: _____

STATE: _____ ZIP: _____

ENGINEER: _____

LOCAL REPRESENTATIVE: _____

NOTES: _____

QTY.	BURNER PACKAGE	TAG	INDICATE GAS TYPE	BTU/h HIGH FIRE	BTU/h LOW FIRE	APPROXIMATE SYSTEM HANGING WEIGHTS			TYP. OR RCMD. MOUNTING HEIGHTS ³
						PER BURNER HEAD	PER 10 FT. RADIANT PIPE & REFLECTOR SECTION	PER 10 FT. TAILPIPE & REFLECTOR SECTION	
	HLV-40 ¹		Nat or Prop	40,000	N/A	35 lbs.	35 lbs.	38 lbs.	9' to 14'
	HLV-50 ^{1,2}		Nat or Prop	50,000	N/A	35 lbs.	35 lbs.	38 lbs.	9' to 14'
	HLV-60 ²		Nat or Prop	60,000	50,000	35 lbs.	35 lbs.	38 lbs.	10' to 15'
	HLV-75		Nat or Prop	75,000	60,000	35 lbs.	35 lbs.	38 lbs.	11' to 18'
	HLV-80		Nat or Prop	80,000	64,000	35 lbs.	35 lbs.	38 lbs.	11' to 18'
	HLV-90		Nat or Prop	90,000	72,000	35 lbs.	35 lbs.	38 lbs.	12' to 20'
	HLV-100		Nat or Prop	100,000	80,000	35 lbs.	35 lbs.	38 lbs.	12' to 20'
	HLV-110		Nat or Prop	110,000	88,000	35 lbs.	35 lbs.	38 lbs.	13' to 23'
	HLV-120		Nat or Prop	120,000	96,000	35 lbs.	35 lbs.	38 lbs.	13' to 23'
	HLV-125		Nat or Prop	125,000	100,000	35 lbs.	35 lbs.	38 lbs.	14' to 27'
	HLV-140		Nat or Prop	140,000	112,000	35 lbs.	35 lbs.	38 lbs.	15' to 30'
	HLV-150		Nat or Prop	150,000	120,000	35 lbs.	35 lbs.	38 lbs.	15' to 30'
	HLV-170		Nat or Prop	170,000	136,000	35 lbs.	35 lbs.	38 lbs.	16' to 40'
	HLV-175		Nat or Prop	175,000	140,000	35 lbs.	35 lbs.	38 lbs.	17' to 42'
	HLV-180		Nat or Prop	180,000	144,000	35 lbs.	35 lbs.	38 lbs.	18' to 47'
	HLV-200		Nat or Prop	200,000	160,000	35 lbs.	35 lbs.	38 lbs.	19' to 50'

¹ The HLV-40 and HLV-50 do not have a reduction for low fire.

² Models approved for use in CNG applications when ordered with the CNG-AO upgrade. Available in natural gas and propane.

³ Typical or recommended mounting heights are provided as a guideline. Actual conditions may dictate variations from this data.

DETROIT RADIANT PRODUCTS CO.

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HLV SPECIFICATIONS

APPROVALS

- CSA Design Certified
- Commercial/Industrial Approval
- Meets NFPA-30A code requirement (50 & 60 MBH only)

BURNER CONTROL BOX

- Sight glass for burner inspection
- Totally enclosed components
- Coated enameled steel
- Operational indicator lights

POWER SUPPLY

- 120 VAC, 60 Hz GRD, 1 Ph., 3-wire
- 60 in. grounded power cord
- 24V thermostat connection
- Ignition current - 0.7 amps per burner
- Running current - 0.2 amps per burner
- Refer to Vacuum Pump Electrical Data chart

GAS CONNECTION

- 7/8" flare-M FPT Connection to 1/2" x 24" (304) SS flex connector provided
- 1/2" threaded gas pipe connection

GAS SUPPLY (Inches W.C.)

- Manifold pressure: Nat 3.5; Prop 10.0
- Min. Inlet pressure: Nat 5.0; Prop 11.0
- Max. Inlet pressure: Nat 14.0; Prop 14.0

CONTROLS

- Two-stage gas valve
- 100% safety shut-off
- Self-diagnostic LED
- Air proving safety switch
- Silicone carbide mini-hot surface igniter
- Flame rod sensing
- Three-try igniter

REFLECTOR

- Highly polished aluminum
- Continuous overlap design
- Reflector tension springs
- One center support per reflector

COMBUSTION AIR INLET & VENTING

- Preset 4" combustion air inlet collar
- Sidewall or roof venting

COMBUSTION & EMITTER TUBES

- Titanium alloy treated steel combustion chamber (TR-C) on all models unless noted otherwise
- 16ga. 4" O.D. coated aluminized steel radiant tubes, with .95 emissive, corrosion resistant black coating
- Alternate 16ga. 4" O.D. uncoated hot-rolled steel emitter tubes
- Slip-fit swaged connection

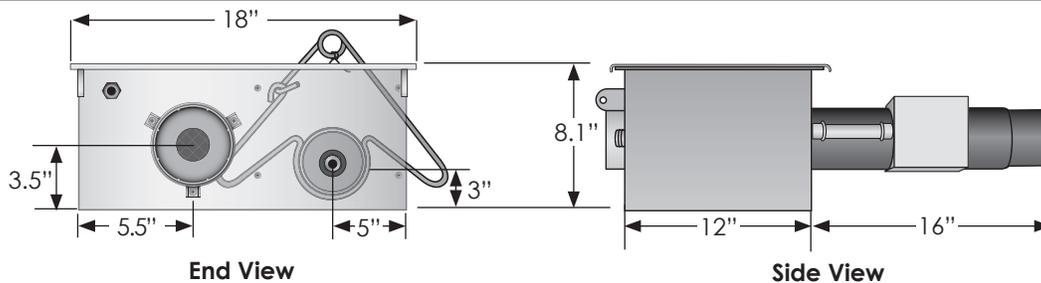
CONDENSING TUBE/TAILOPIPE

- Required when condensing design option is chosen
- 304 Series stainless steel, 16ga. 4" O.D.
- Stainless steel clamps

LIMITED WARRANTY

- 3 year - Burner control box & exhauster pump components
- 1 year - Vacuum pump
- 5 years - Combustion and radiant tubes
- 10 years - Burner

BURNER BOX DIMENSIONAL DATA (Refer to the HLV IOPM or Packing List for Kit Contents)



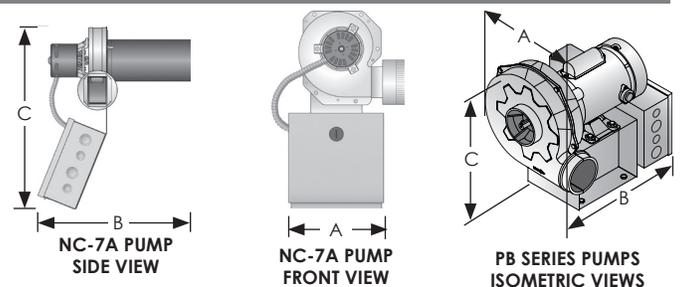
VACUUM PUMP DATA (Refer to the HLV IOPM or Packing List for Kit Contents)

VACUUM PUMP ELECTRICAL DATA

PUMP MODEL	QTY.	SYSTEM MBH	RUNNING CIRCUIT (AMPS)	INPUT VOLTAGE	PH	HP	RPM's
NC-7A ⁴		40-150	1.95	120V	1	1/15	3000
PB8A-1PH		50-275	7.4	120V	1	1/2	3450
PB8B-1PH		50-275	3.9	208V	1	1/2	3450
PB8B-3PH		50-275	2.6	208V	3	1/2	3450
PB8F-3PH		50-275	1	460V	3	1/2	3450
PB9A-1PH		280-545	9.6	120V	1	3/4	3450
PB9B-1PH		280-545	5	208V	1	3/4	3450
PB9B-3PH		280-545	3.1	208V	3	3/4	3450
PB9F-3PH		280-545	1.3	460V	3	3/4	3450
PB10A-1PH		550-750	11.6	120V	1	1	3450
PB10B-1PH		550-750	6.1	208V	1	1	3450
PB10B-3PH		550-750	4.1	208V	3	1	3450
PB10F-3PH		550-750	1.8	460V	3	1	3450

⁴ Can't be used with condensing designs.

NOTE: The average sound level of the PB Series vacuum pump is between 60 and 63 dBA. If the application requires a lower decibel level, relocation of the vacuum pump or a sound-deadening enclosure may be necessary. Contact factory.



VACUUM PUMP DIMENSIONAL DATA

PUMP MODEL	A	B	C	WEIGHT
NC-7A	10.0"	16.0"	18.5"	20 lbs.
PB8	11.0"	19.75"	16.5"	60 lbs.
PB9	14.5"	19.75"	16.5"	67 lbs.
PB10	17.5"	21.0"	20.0"	73 lbs.

VACUUM PUMP SPECIFICATIONS

- Spark resistant cast aluminum housing.
- TEFC motor.
- Heat slinger on motor shaft for cool operation.
- Wheel with keyless bushing.

CLEARANCES TO COMBUSTIBLES (IN INCHES)

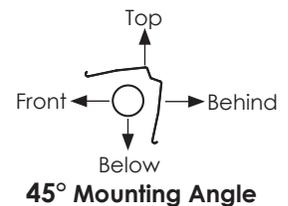
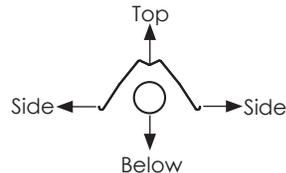
MODEL NO.	MTG. ANGLE ⁵	SIDE			
		FRONT	BEHIND	TOP ⁶	BELOW
HLV 40, 50 [N,P]	0°	9	9	4	47
	45°	39	8	10	47
w/1 side shield	0°	29	8	4	47
w/2 side shields	0°	9	9	4	47
20 ft. from burner	0°	7	7	4	30
HLV 60, 75 [N,P]	0°	9	9	4	48
	45°	39	8	10	48
w/1 side shield	0°	29	8	4	48
w/2 side shields	0°	9	9	4	48
20 ft. from burner	0°	7	7	4	30
HLV 80 [N,P]	0°	11	11	4	48
	45°	39	8	10	48
w/1 side shield	0°	29	8	4	48
w/2 side shields	0°	16	16	4	48
20 ft. from burner	0°	7	7	4	30
HLV 90 [N,P]	0°	12	12	4	54
	45°	39	8	10	54
w/1 side shield	0°	29	8	4	54
w/2 side shields	0°	16	16	4	54
20 ft. from burner	0°	7	7	4	30
HLV 100 [N,P]	0°	14	14	4	66
	45°	39	8	10	66
w/1 side shield	0°	29	8	4	66
w/2 side shields	0°	16	16	4	66
20 ft. from burner	0°	7	7	4	30

⁵ Heaters mounted on an angle between 0° and 45° must maintain clearances posted for 0° or 45°, whichever is greater.

NOTE: Consult manual for side shield clearance diagrams.

MODEL NO.	MTG. ANGLE ⁵	SIDE			
		FRONT	BEHIND	TOP ⁶	BELOW
HLV 110,120,125 [N,P]	0°	18	18	4	72
	45°	58	8	10	72
w/1 side shield	0°	42	8	4	72
w/2 side shields	0°	20	20	4	72
20 ft. from burner	0°	7	7	4	30
HLV 140, 150 [N,P]	0°	24	24	6	81
	45°	58	8	10	81
w/1 side shield	0°	42	8	6	81
w/2 side shields	0°	30	30	6	81
20 ft. from burner	0°	11	11	6	44
HLV 170, 175 [N,P]	0°	34	34	6	92
	45°	63	8	10	92
w/1 side shield	0°	50	8	6	92
w/2 side shields	0°	30	30	6	92
20 ft. from burner	0°	11	11	6	44
HLV 180, 200 [N,P]	0°	41	41	6	94
	45°	63	8	10	94
w/1 side shield	0°	54	8	6	94
w/2 side shields	0°	30	30	6	94
20 ft. from burner	0°	11	11	6	44

⁶ The top clearance of an exposed tube connection to combustibles is 18 inches.



OPTIONAL SYSTEM PACKAGES & ACCESSORIES

TUBE & REFLECTOR PACKAGE ITEM ⁷	QTY.	COATED TITAN. STABILIZED COMBUSTION TUBE	QTY.	COATED ALUMINIZED STEEL TUBE	QTY.	UNCOATED HOT-ROLLED TUBE	QTY.	UNCOATED 304 STAINLESS STEEL TAILPIPE
10-ft. tube & reflector package	_____	TR-C	_____	10EA	_____	10HRE	_____	10STP
20-ft. tube & reflector package	_____	TR-C2	_____	20EA	_____	20HRE	_____	20STP
30-ft. tube & reflector package	_____	TR-C3	_____	30EA	_____	30HRE	_____	30STP
40-ft. tube & reflector package	_____	TR-C4	_____	40EA	_____	40HRE	_____	40STP
	_____	CNG-AO	_____	TR60 (5')	_____	HRE-60 (5')	_____	STP-60 (5')

⁷ Tube & reflector packages contain all applicable tubes, reflectors, tube clamps, hangers and reflector center supports.

QTY	PART #	DESCRIPTION	QTY	PART #	DESCRIPTION
_____	V-D	16ga. aluminized steel 16" damper.	_____	V-SMK	PB Series vacuum pump sidewall mounting kit.
_____	V-DKIT	V-D damper and 18" reflector package.	_____	V-PAI	Powered air inlet for outside combustion air.
_____	E6	90° bend 4" O.D. 16ga. coated aluminized steel elbow.	_____	V-DSKIT	V-D-SS and 18" aluminum reflector package.
_____	REP	E6 90° elbow and reflector package.	_____	E6-SS	304 stainless steel 90° bend, 4" O.D., 16ga. elbow.
_____	TF1B	180°, 4" O.D. coated aluminized steel 'U' bend.	_____	RE	E6 aluminum reflector.
_____	RUP	TF1B 180° U-bend and reflector package.	_____	TF1B-SS	304 stainless steel 180°, 4" O.D. 'U' bend.
_____	V-T	Tee fitting used to join two branches of a system.	_____	RU	TF1B aluminum reflector.
_____	V-TER	V-T tee fitting with V-RTE reflector package.	_____	V-RTE	Aluminum reflector hood used to cover V-T or V-TI
_____	V-TI	In-line tee fitting used to join two branches of a system.	_____	V-T-SS	304 stainless steel tee fitting.
_____	V-TERI	V-TI in-line tee fitting with V-RTE reflector package.	_____	V-TI-SS	304 stainless steel in-line tee fitting.
_____	V-CR	Cross fitting used to join three branches of a system.	_____	V-RCR	Aluminum reflector hood used to cover V-CR.
_____	V-CRP	Vacuum cross (V-CR) and reflector (V-RCR) pkg.	_____	V-CR-SS	304 stainless steel 4" O.D. cross fitting.
_____	V-TTS	Tandem tee set. Emulates in-series burners.	_____	V-CT	Condensate trap and 26ga. venting tee.
_____	V-TB	Turnbuckle for sloping condensing tailpipe.	_____	V-CN	Condensate neutralization kit.

NOTE: Refer to the HLV Vacuum System Accessory List for detailed specifications and limitations on any of the above options.

HLV WRITTEN SPECIFICATIONS

PRODUCTS

1. TUBULAR INFRARED HEATERS (Multiple-Burner Engineered Vacuum System Type)
 - A. Basis-of-design product: Subject to compliance with requirements, provide Detroit Radiant Products Company; **Re-Verber-Ray® HLV Series** Engineered Negative Pressure Multiple Burner Vacuum System.
 - B. Fuel type: Burner shall be designed for [natural] [propane] gas having characteristics same as those of gas available at project site.
 - C. Gas control: Operation shall include a defined input differential. Heater must be CSA Design Certified to operate at an input differential of at least 20% between the low and nominal rated input modes.
 1. 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.
 2. The heater's air flow control system shall provide a 7 second pre-purge prior to initiating burner operation.
 - D. Combustion chamber: Shall be 4 inch O.D. 16ga. Titanium stabilized aluminized steel to allow for the operating temperature to exceed the 1030°F as set forth in the ANSI Z83.20 Standard, finished with a high emissivity rated, corrosion resistant, black coating with an emissivity level documented at .92 or higher. For models with CNG-AO, the operating surface temperature is to not exceed 750°F as set forth by the NFPA-30A code.
 - E. Emitter Tube: Shall be 4 inch O.D. 16ga. aluminized steel finished with a high emissivity rated, corrosion resistant, black coating with an emissivity level documented at .92 or higher.
 - F. Condensate tail pipe: Shall be 4 inch O.D. 16ga. 304 stainless steel. Pipe shall be able to be cut to any length without having raw carbon steel exposed at the edges. Glass lined, porcelain lined, or other material prone to chipping and cracking shall not be permitted.
 - G. Burner type: Units shall operate under a negative pressure with exhaust gases pulled through the exchanger pipe to a common exhaust pump. Each burner shall receive its combustion air independently. Burners that have exhaust gases from upstream burners passing over them shall not be permitted. Burners shall operate at a minimum of 3.5" W.C. manifold pressure to achieve proper air-gas mixing. Burners that require air filters shall not be permitted.
 - H. Burner: Stainless-steel venturi burner. The flame anchoring screen shall have a minimum temperature rating equivalent to 304 grade stainless steel. Non stainless steel burners shall not be permitted.
 - I. Tube connections: The heater's combustion chamber and radiant emitter tube shall incorporate a 4 inch slip-fit, interlocking connection in which the upstream tube slides into the next tube and is held by a bolted clamp. A butted tube connection system shall not be permitted.
 - J. Exhauster Pumps:
 1. Systems designed for condensing shall have a cast aluminum housing for corrosion resistance. Cast iron housings shall not be permitted.
 2. Motors ½ hp and higher shall be TEFC type standard efficiency. Motors shall be equipped with thermal protection and capacitor starters.
 - K. Ignition system: Hot surface silicon carbide composition. Igniter shall be readily accessible and serviceable without having to remove the burner. Spark ignition systems shall not be permitted.
 - L. Reflectors: Shall be .025 polished aluminum with a multi-faceted design which includes reflector end caps. Reflector shall have a polished bright finish with clear visual reflection ability. (A sample will be required at time of submittal). Reflector shall have a minimum of 7 sheet metal bends in its fabrication to optimize downward radiation. 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 and/or rattles.
 - M. Control box: Heater's exterior control chassis shall be constructed of corrosion resistant enameled steel.
 1. Air intake: An air intake collar shall be supplied as part of the burner control assembly to accept a 4 inch O.D. supply duct.
 - N. Heaters shall be equipped with a sight glass allowing a visual inspection of igniter and burner operation from the floor. Sight glass visible only at appliance level shall not be permitted.
 - O. Heater shall be supplied with a stainless steel flexible gas connector.
 - P. System Operation and Safety Controls:
 1. Each burner assembly shall include a safety differential pressure switch to monitor combustion air flow, as to provide complete burner shutdown due to insufficient combustion air or flue blockage. A single differential pressure switch at the exhauster assembly shall not be permitted.
 2. The system exhauster shall have a minimum of a 90-second post purge to aid in the removal of exhaust gases and condensate in the exchanger pipes.
 3. The heater shall incorporate a self-diagnostic ignition module, and recycle the heater after an inadvertent shutdown.
 4. 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.
 5. Heater control assembly shall include three indicator lights that define the units operating input ranges. One indicator shall validate air flow. Two indicator lights shall indicate low and high stages.
 - Q. Thermostat control shall be two-stage operating on 24 volts.
 - R. Venting: Shall be per manufacturer approval and specifications.
 - S. Thermostat: Devices and wiring are specified in Division 23 Section "Instrumentation and Control for HVAC."
 1. Thermostat: 2-stage, digital programmable wall-mounting type with 50 to 90 deg. F (10 to 32 deg. C) operating range.
 2. Control Transformer: Integrally mounted.