



# STAINLESS STEEL SERIES TUBE HEATERS



## ENGINEERING SUBMITTAL DATA – STAINLESS STEEL SINGLE-STAGE GAS-FIRED LOW-INTENSITY INFRA-RED RADIANT TUBE HEATERS

**WARNING!** These heaters must be installed and serviced by trained gas heater installation and service personnel only! Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating, and maintenance instructions thoroughly before installing or servicing this equipment. Observe all safety information. Retain instructions for future reference.

### MOST FREQUENTLY SPECIFIED MODELS

Additional C.S.A. design certified models are available in 5 MBTUH increments from the low MBTUH to high MBTUH listed for each heater length. See the online catalog at [www.solaronicsusa.com](http://www.solaronicsusa.com) for additional models.

Straight Heater Length	5-foot Option ***	MBTUH	Natural Gas				LP / Propane Gas				Typical Mounting Height	Wt.**	U-Tube Heater Length
			Straight Heaters		U*		Straight Heaters		U*				
			Model #	Qty	U*	Qty	Model #	Qty	U*	Qty			
12'-1-1/4"	+5'	40	SSTG 40-10AN		U*+5'		SSTG 40-10AL		U*+5'		9' – 14'	110#	13'-5-1/4"
22'-1-1/4"	na	40	SSTG 40-20AN		U*		SSTG 40-20AL		U*		9' – 14'	190#	13'-5-1/4"
22'-1-1/4"	na	50	SSTG 50-20AN		U*		SSTG 50-20AL		U*		10' – 15'	190#	13'-5-1/4"
22'-1-1/4"	na	60	SSTG 60-20AN		U*		SSTG 60-20AL		U*		10' – 15'	190#	13'-5-1/4"
22'-1-1/4"	+5'	65	SSTG 65-20MBN		U*		SSTG 65-20MBL		U*		11' – 16'	190#	13'-5-1/4"
22'-1-1/4"	+5'	75	SSTG 75-20MBN		U*		SSTG 75-20MBL		U*		11' – 16'	190#	13'-5-1/4"
22'-1-1/4"	+5'	80	SSTG 80-20MBN		U*		SSTG 80-20MBL		U*		11' – 18'	190#	13'-5-1/4"
22'-1-1/4"	+5'	85	SSTG 85-20MBN		U*		SSTG 85-20MBL		U*		11' – 18'	190#	13'-5-1/4"
32'-1-1/4"	+5'	65	SSTG 65-30BN		U*		SSTG 65-30BL		U*		11' – 16'	250#	18'-5-1/4"
32'-1-1/4"	+5'	75	SSTG 75-30BN		U*		SSTG 75-30BL		U*		11' – 16'	250#	18'-5-1/4"
32'-1-1/4"	+5'	100	SSTG 100-30BN		U*		SSTG 100-30BL		U*		12' – 20'	250#	18'-5-1/4"
32'-1-1/4"	+5'	125	SSTG 125-30MCN		U*		na		na		14' – 25'	250#	18'-5-1/4"
32'-1-1/4"	+5'	130	SSTG 130-30MCN		U*		na		na		15' – 27'	250#	18'-5-1/4"
42'-1-1/4"	na	65	SSTG 65-40BN		U*		SSTG 65-40BL		U*		11' – 16'	335#	23'-5-1/4"
42'-1-1/4"	na	75	SSTG 75-40BN		U*		SSTG 75-40BL		U*		11' – 16'	335#	23'-5-1/4"
42'-1-1/4"	+5'	100	SSTG 100-40BN		U*		SSTG 100-40BL		U*		12' – 20'	335#	23'-5-1/4"
42'-1-1/4"	+5'	125	SSTG 125-40BN		U*		SSTG 125-40CL		U*		14' – 25'	335#	23'-5-1/4"
42'-1-1/4"	+5'	130	SSTG 130-40CN		U*		SSTG 130-40CL		U*		15' – 27'	335#	23'-5-1/4"
42'-1-1/4"	+5'	150	SSTG 150-40CN		U*		SSTG 150-40CL		U*		16' – 30'	335#	23'-5-1/4"
52'-1-1/4"	na	100	SSTG 100-50BN		U*		SSTG 100-50BL		U*		12' – 20'	400#	28'-5-1/4"
52'-1-1/4"	na	125	SSTG 125-50BN		U*		SSTG 125-50CL		U*		14' – 25'	400#	28'-5-1/4"
52'-1-1/4"	na	130	SSTG 130-50CN		U*		SSTG 130-50CL		U*		15' – 27'	400#	28'-5-1/4"
52'-1-1/4"	+5'	150	SSTG 150-50CN		U*		SSTG 150-50CL		U*		16' – 30'	400#	28'-5-1/4"
52'-1-1/4"	+5'	175	SSTG 175-50CN		U*		SSTG 175-50CL		U*		17' – 35'	400#	28'-5-1/4"
52'-1-1/4"	+5'	200	SSTG 200-50CN		U*		SSTG 200-50CL		U*		19' – 42'	400#	28'-5-1/4"
62'-1-1/4"	+5'	150	SSTG 150-60CN		U*		SSTG 150-60CL		U*		16' – 30'	480#	33'-5-1/4"
62'-1-1/4"	+5'	175	SSTG 175-60CN		U*		SSTG 175-60CL		U*		17' – 35'	480#	33'-5-1/4"
62'-1-1/4"	+5'	200	SSTG 200-60CN		U*		SSTG 200-60CL		U*		19' – 42'	480#	33'-5-1/4"
72'-1-1/4"	na	150	SSTG 150-70CN		U*		SSTG 150-70CL		U*		16' – 30'	540#	38'-5-1/4"
72'-1-1/4"	na	175	SSTG 175-70CN		U*		SSTG 175-70CL		U*		17' – 35'	540#	38'-5-1/4"
72'-1-1/4"	na	200	SSTG 200-70CN		U*		SSTG 200-70CL		U*		19' – 42'	540#	38'-5-1/4"

Additional Models Specified:

MBTUH = 1000 BTU per hour.

na = not available.

U\* = U (SSTG) replaces G (SSTG) in the model number for U-tube heaters.

Wt.\*\* = Shipping Weight. Add 60# to weight for U-tube heaters. Add 60# to weight for +5' option.

5-foot Option\*\*\* = +5' indicates a 5-foot heater section may be added to the straight heater models only.

Submitted by: \_\_\_\_\_ Date: \_\_\_\_\_

Job Title: \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Contractor: \_\_\_\_\_ Phone #: \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Engineer: \_\_\_\_\_

Local Representative: \_\_\_\_\_

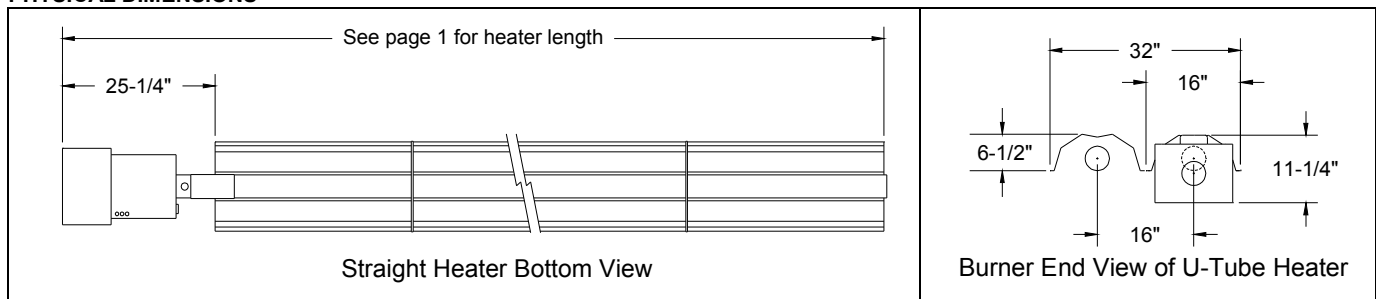
Notes: \_\_\_\_\_

## SPECIFICATIONS AND CLEARANCES

### STAINLESS STEEL SERIES SPECIFICATIONS

<p><b>APPROVALS</b></p> <ul style="list-style-type: none"> <li>• CSA International Design Certified, Report # 163199-1063506. AGA / CGA Approval.</li> <li>• Indoor / Outdoor Approval.</li> <li>• Commercial / Industrial Approval.</li> </ul> <p><b>BURNER AND CONTROLS</b></p> <ul style="list-style-type: none"> <li>• Blower thermally protected and permanently lubricated.</li> <li>• Blower impeller balanced statically and dynamically.</li> <li>• Controls isolated from combustion air.</li> <li>• Safety differential pressure switch.</li> <li>• Redundant gas safety shut-off 100%.</li> <li>• Durable direct spark ignitor.</li> <li>• Independent flame rod sensing.</li> <li>• Sight glass for burner observation.</li> <li>• 3 trials for ignition and automatic recycle after inadvertent shutdown.</li> <li>• 3 validation lights: power on, air pressure normal &amp; operation normal.</li> <li>• Controls easily accessible – 3 sides.</li> </ul>	<p><b>HEAT EXCHANGER TUBES</b></p> <ul style="list-style-type: none"> <li>• 4" O.D., 16 ga., 304L stainless steel for excellent corrosion resistance and durability.</li> <li>• Turbulator baffle factory installed.</li> <li>• 8" long clamps of 2 layers of 18 ga. 304 stainless steel with 4 clamping bolts.</li> </ul> <p><b>COMBUSTION TUBES</b></p> <ul style="list-style-type: none"> <li>• 4" O.D., 16 ga., 304L stainless steel for excellent corrosion resistance.</li> </ul> <p><b>REFLECTORS</b></p> <ul style="list-style-type: none"> <li>• 91.7% reflectional efficiency.</li> <li>• 304 stainless steel.</li> <li>• Rotate sections independently.</li> </ul> <p><b>POWER SUPPLY</b></p> <ul style="list-style-type: none"> <li>• 120 VAC, 60 Hz, 1 phase.</li> <li>• Maximum current draw is 3 amps.</li> </ul> <p><b>GAS CONNECTION</b></p> <ul style="list-style-type: none"> <li>• 1/2" FPT gas inlet.</li> <li>• 36" long flexible gas connector.</li> </ul>	<p><b>GAS SUPPLY (W.C.)</b></p> <table border="1"> <tr> <td>Manifold pressure</td> <td></td> <td></td> </tr> <tr> <td>40 to 100 MBTUH</td> <td>3.5"</td> <td>3.5"</td> </tr> <tr> <td>105 to 200 MBTUH</td> <td>5"</td> <td>5"</td> </tr> <tr> <td>Minimum inlet pressure</td> <td></td> <td></td> </tr> <tr> <td>40 to 125 MBTUH</td> <td>6"</td> <td>11"</td> </tr> <tr> <td>130 to 200 MBTUH</td> <td>7"</td> <td>11"</td> </tr> <tr> <td>Maximum inlet pressure</td> <td>14"</td> <td>14"</td> </tr> </table> <p><b>COMBUSTION AIR / VENTING</b></p> <ul style="list-style-type: none"> <li>• Wall or roof venting – 4" diameter pipe up to 35 linear feet for 40 to 125 MBTUH units and up to 40 linear feet for 130 to 200 MBTUH units. (No more than two 90-degree elbows; one elbow equals 10 lineal feet.)</li> </ul> <p><b>LIMITED WARRANTY</b></p> <ul style="list-style-type: none"> <li>• 10 years on Burner Core.</li> <li>• 5 years on <b>All</b> Heat Exchanger &amp; Combustion Tubes.</li> <li>• 1 years on <b>All</b> Burner Controls.</li> </ul> <p><b>MADE IN THE USA</b></p>	Manifold pressure			40 to 100 MBTUH	3.5"	3.5"	105 to 200 MBTUH	5"	5"	Minimum inlet pressure			40 to 125 MBTUH	6"	11"	130 to 200 MBTUH	7"	11"	Maximum inlet pressure	14"	14"
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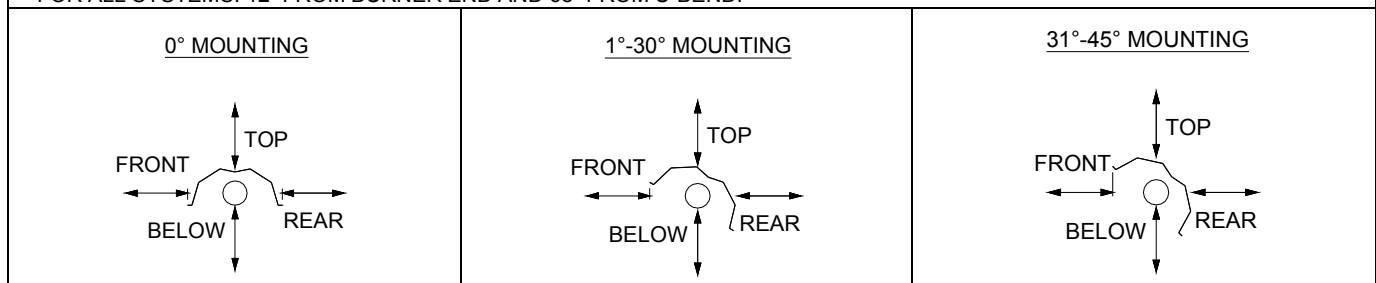
### PHYSICAL DIMENSIONS



### CLEARANCES

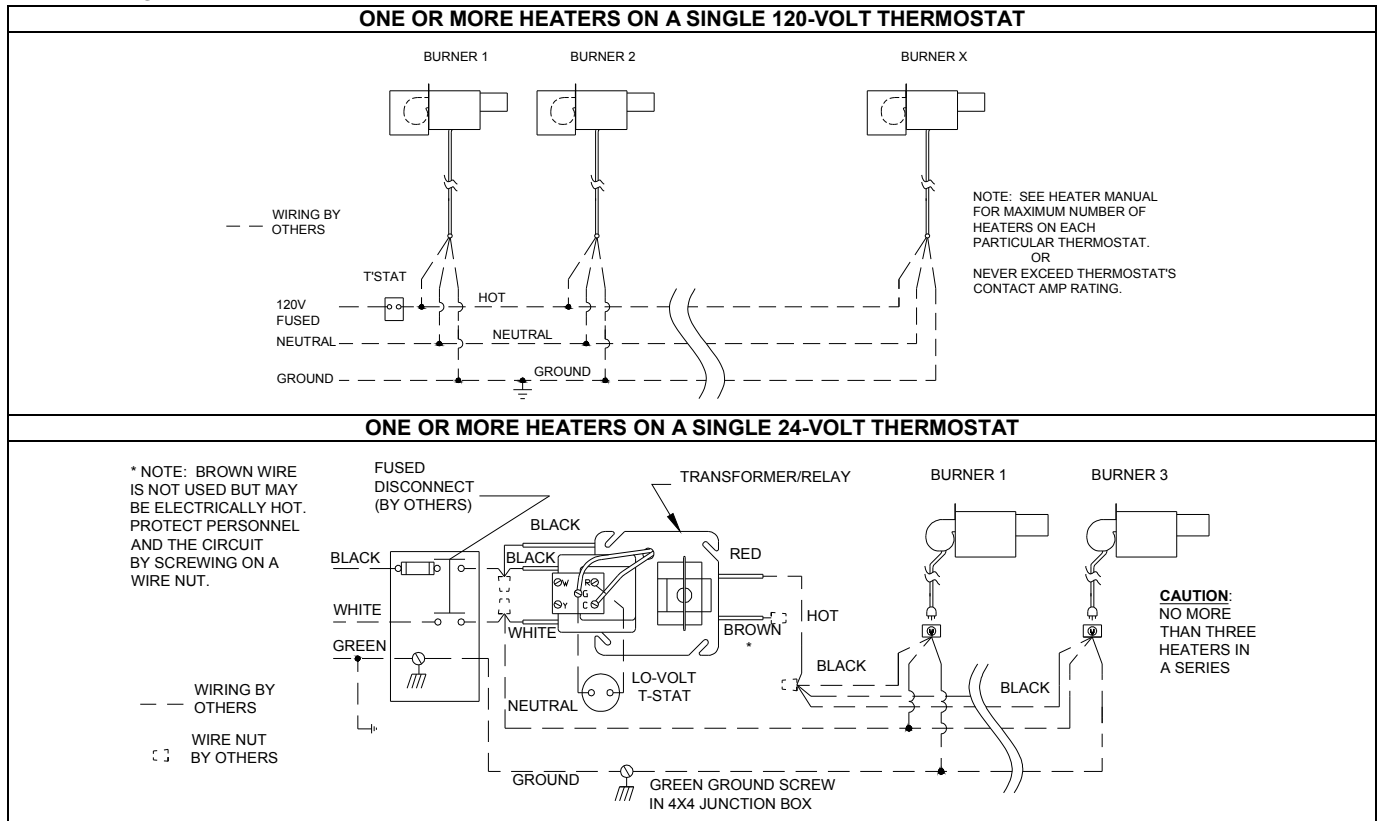
MBTUH (1000 BTU per hour)	CLEARANCES TO COMBUSTIBLES* (INCHES)				
	MOUNTING ANGLE	FRONT	REAR	TOP	BELOW
40, 45 & 50	0°-30°	40	40	12	40
	31°-45°	40	12	12	40
55 & 60	0°-30°	50	50	12	50
	31°-45°	50	12	12	50
65, 70, 75, 80, 85, 90, 95 & 100	0°-30°	24	24	12	60
105, 110, 115, 120 & 125	0°-30°	32	32	12	72
130, 135, 140, 145 & 150	0°-30°	48	48	12	82
	31°-45°	70	12	12	82
155, 160, 165, 170 & 175	0°-30°	58	58	12	92
	31°-45°	80	12	12	92
180, 185, 190, 195 & 200	0°-30°	68	68	12	102
	31°-45°	90	12	12	102

\* FOR ALL SYSTEMS: 12" FROM BURNER END AND 68" FROM U-BEND.



## FIELD WIRING & ACCESSORIES

### FIELD WIRING



### RECOMMENDED ACCESSORIES

QTY	ITEM #	DESCRIPTION	NOTES
	132486	Raintight 120V thermostat	(40-100°F) NEMA-4X, weather resistant, with stainless steel coil. Up to 5 heaters.
	CH-25S	Stainless steel mounting chain set	25 feet of chain plus 14 S-hooks.
	0002-10-133	Gas ball valve	½" full port ball valve with ½" female NPT pipe threads for gas supply.
	131402	4" roof vent cap for single heater	Required for single 4" roof vents.

### OTHER ACCESSORIES

QTY	ITEM #	DESCRIPTION	NOTES
	132619	90° Elbow 4" OD stainless steel	For L-shaped heater. 16 ga. stainless steel 90-degree elbow.
	132616	Stainless tube clamp	304L stainless steel 4" O.D. tube clamp.
	132026-4	Standard thermostat	(40-80°F) 120V or 24V for heaters up to 2640VA total. Up to 7 heaters.
	0002-42-157	Night setback 120V thermostat	(50-90°F) mechanical 120V for heaters up to 1920VA total. Up to 5 heaters.
	0002-42-121	Night setback 24V thermostat	(45-90°F) microelectronic 24V for heaters up to 36VA total. Use with 0002-42-119.
	0002-42-119	120V transformer / relay	(8A94-2) Use with 132026-4, or 0002-42-121 for 24V thermostatic control of 120V heaters.
	0002-42-114/5	Locking thermostat guard	Plastic / or metal guard. Specify material:
	132860	4" wall vent cap for single heater	Standard for single 4" wall vents.
	132336	4" wall air supply kit for single heater	Required for single 4" wall supply. Wall cap, flex duct, sleeve & collar.
	132337	4" roof air supply kit for single heater	Required for single 4" roof supply. Roof cap, flex duct, sleeve & collar.
	132620	4"x4"x5" Y-coupler for dual venting	Joins <b>two</b> heaters to one common 5" vent using <b>one</b> thermostat. 16 ga. stainless steel Y.
	132149	5" roof vent cap for venting 2 heaters	Required for common 5" roof vents.
	132861	5" wall vent cap for venting 2 heaters	Required for common 5" wall vents.
	132746	4"x4"x6" dual vent coupler (Y)	Joins <b>two</b> heaters to one common 6" vent using <b>only one</b> thermostat. Sheet metal.
	131461	Indoor venting kit	Required for all units when operating unvented. Cap & elbow
	S132115	SS U-bend reflector assembly	Stainless reflector used above U-bend of U-tube heater. Includes (2) pipe hangers.
	S131421	SS Corner reflector assembly	Stainless reflector used with 132619 elbow. Includes (2) pipe hangers.
	S132481	SS Reflector side extension assembly	Stainless reflector to focus radiant heat below and in front of heater. 5-foot long with S-hooks.
	S132352	End cap for reflector	Stainless reflector cap for the end of the heater.

**WRITTEN SPECIFICATIONS****SECTION 23 55 23 – FUEL-FIRED RADIANT HEATERS****PART 1 – GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 01 Specification Sections apply to this Section.

**1.2 SUMMARY**

- A. Section includes:
1. Gas-Fired Infra-Red Tube Heaters
- B. Related Sections:
1. Division 23, Section 23 10 00 "Facility Fuel Systems"
  2. Division 23, Section 23 51 00 "Breechings, Chimneys, and Stacks"

**1.3 QUALITY ASSURANCE**

- A. Building Codes and Standards
1. Gas-fired radiant tube heaters shall be Design Certified by CSA (American Gas Association and Canadian Gas Association) and comply with current ANSI, CAN/CSA and Occupational Safety and Health (OSHA) Requirements. The supplier shall provide the CSA Certification Number and the heaters shall bear the CSA Seal of Certification.
  2. Gas-fired radiant tube heaters shall be furnished and installed in accordance with local codes, building drawings and manufacturer's recommendations.

**1.4 SUBMITTALS**

- A. The supplier shall furnish the owner/contractor with \_\_\_\_\_ copies of the engineering specification forms, showing physical dimensions, installation detail, recommendations, and field wiring.

**1.5 WARRANTY**

- A. The supplier shall provide a manufacturer's published warranty covering the heater's burner core for a period of ten (10) years, heat exchanger and combustion chamber tubes for a period of five (5) years, and all components utilized in the heater control assembly and hardware for a period of one (1) year.

**PART 2 – PRODUCTS****2.1 MANUFACTURER**

- A. Gas-fired radiant tube heaters shall be SOLARONICS SUNTUBE IV STAINLESS STEEL SERIES of the model numbers and inputs in MBTUH as manufactured by Solaronics, Inc. Rochester, Michigan 48307.

**2.2 DESCRIPTION**

- A. Gas-fired radiant tube heaters shall be designed to satisfactorily operate at a minimum inlet pressure of: 6 inches W.C. for 40-125 MBTUH units, and 7 inches W.C. for 130-200 MBTUH units, when specified for natural gas; or 11 inches W.C. when specified for LP/propane gas; and at a maximum inlet pressure of 14 inches W.C.
- B. Gas-fired radiant tube heaters shall be designed to operate without adjustments when burning natural gas having a heat value of 1000 BTU per cubic foot with a specific gravity of .65, or when burning LP/propane gas having a heat value of 2500 BTU per cubic foot with a specific gravity of 1.53.

**2.3 CONSTRUCTION**

- A. The heater's controls shall be totally enclosed with a corrosion resistant housing. The controls shall be easily accessible from three sides by removing the cover. The burner core assembly shall be constructed of durable materials specially designed for high efficiency, maximum heat transfer, extremely quiet operation and extended life.
- B. The heater's combustion chamber shall be 4" O.D., 304L stainless steel finished with a high emissivity rated, corrosion resistant, black coating. 304L stainless steel provides excellent mechanical properties and corrosion / oxidation resistance at elevated temperatures.
- C. The heater's heat exchanger tube shall be 4" O.D., 304L stainless steel.
- D. The heaters are CSA Design Certified for alternate construction utilizing radiant tubes of all 304L stainless steel finished with a high emissivity rated, corrosion resistant, black coating.
- E. The 4" O.D. tubes shall be joined by two layers of 18 ga. (.052") wall thickness stainless steel tube clamp assembly and shall be a minimum of 8" in length for maximum support. Clamp shall be of a compression coupling design for uniform draw and pressure, and four (4) 5/8"-11x2" zinc plated carriage bolts and nuts to draw up (tighten to a minimum of 65 foot-pounds of torque).
- F. The direct spark ignitor shall be durable to resist breakage.

- G. Reflectors shall be 304 stainless steel 24 ga. with a geometrically designed configuration not having less than 91.7% reflectional efficiency, shall be supported by 16 ga., 304 stainless steel brackets.
- H. Reflector brackets shall incorporate the geometric ability to rotate the reflector up to 45 degrees, in either direction from horizontal using the center of the combustion chamber or heat exchanger as the axis of rotation.
- I. Each 5 or 10-foot reflector section shall have the ability to be independently rotated from all other 5 or 10-foot sections. The heater's reflector hanging system shall be designed to permit expansion while minimizing noise and/or rattles. Reflectors shall be assembled to the heater without the use of tools.
- J. Heaters shall utilize a downstream turbulator that shall be factory installed in the last 10-foot heat exchanger section, wave formed for optimal turbulence, acceleration and impingement of the products of combustion resulting in appropriate velocity pressure and momentum for maximum thermal efficiency.
- K. Heaters shall be equipped with a sight glass permitting a visual inspection of the spark ignitor and burner operation from the floor.
- L. 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.
- M. Heaters shall be either directly vented outdoors with insulated flue pipe, or indirectly vented by positive air displacement of 4 CFM and one square inch of net free area per 1,000 BTUH input.
- N. Heaters shall come with a 36" long stainless steel flexible gas connector.

**2.4 CONTROLS**

- A. Heater controls shall be isolated from combustion air to prevent corrosion from wet or dirty air.
- B. Heaters shall be equipped with a direct spark ignition system with three (3) trials-for-ignition and upon loss of flame sensing three (3) re-trials-for-ignition. Flame sensing shall be via an independent sensing rod and circuit.
- C. Power supplied to each burner shall be 120 VAC, 60 Hz. (Optional 50 Hz units available.) Maximum heater electrical current draw shall not exceed 3 amps.
- D. Heater controls shall include a safety differential pressure switch, factory set (non-field adjustable), to monitor combustion airflow, so as to provide complete burner shutdown due to insufficient combustion air or flue blockage.
- E. The heater's control system shall be designed to shut off the gas flow to the burner in the event either a gas supply or power supply interruption occurs.
- F. Combination gas control shall have a step open feature for softer ignition. Gas valve shut-off shall be of the redundant type. 100% safety shut-off.
- G. The heater shall automatically recycle itself after an inadvertent shutdown.
- H. The heater shall have three (3) system validation lights easily visible on the bottom of the burner housing. Lights shall validate "Power On," "Air Pressure Normal," and "Operation Normal."
- I. The heater's blower motor shall be thermally protected, permanently lubricated and the blower motor's impeller shall be both statically and dynamically balanced.
- J. The heater's airflow control system shall provide a pre-purge prior to initiating burner operation.
- K. No condensation shall form as a result of combustion in the combustion chamber or heat exchanger tubes while at operating temperatures.
- L. 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.

**PART 3 – EXECUTION****3.1 INSTALLATION**

- A. Installation shall be in accordance with the requirements of the manufacturer.
- B. An Installation, Operation, and Maintenance Manual shall be supplied with each heater.