



SMT SERIES TUBE HEATERS



ENGINEERING SUBMITTAL DATA – STAINLESS STEEL TWO-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.

Straight Heater Length	High Input MBTUH	Low Input MBTUH	Natural Gas Heaters				LP / Propane Gas Heaters				Typical Mounting Height	Wt.**	U* Heater Length
			Straight		U*		Straight		U*				
			Model #	Qty	U*	Qty	Model #	Qty	U*	Qty			
22'-1-1/4"	85	65	SMTS 85/65N20		U*		SMTS 85/65L20		U*		11' – 18'	190#	13'-5-1/4"
27'-1-1/4"	85	65	SMTS 85/65N25		na		SMTS 85/65L25		na		11' – 18'	250#	na
32'-1-1/4"	100	65	SMTS 100/65N30		U*		SMTS 100/65L30		U*		12' – 20'	250#	18'-5-1/4"
	125	95	SMTS 125/95N30		U*		na		na		14' – 25'		
37'-1-1/4"	100	65	SMTS 100/65N35		na		SMTS 100/65L35		na		12' – 20'	320#	na
	125	95	SMTS 125/95N35		na		na		na		14' – 25'		
42'-1-1/4"	100	65	SMTS 100/65N40		U*		SMTS 100/65L40		U*		12' – 20'	335#	23'-5-1/4"
	125	95	SMTS 125/95N40		U*		SMTS 125/95L40		U*		14' – 25'		
	150	100	SMTS 150/100N40		U*		SMTS 150/100L40		U*		16' – 30'		
47'-1-1/4"	125	95	SMTS 125/95N45		na		SMTS 125/95L45		na		14' – 25'	395#	na
	150	100	SMTS 150/100N45		na		SMTS 150/100L45		na		16' – 30'		
52'-1-1/4"	125	95	SMTS 125/95N50		U*		SMTS 125/95L50		U*		14' – 25'	400#	28'-5-1/4"
	150	100	SMTS 150/100N50		U*		SMTS 150/100L50		U*		16' – 30'		
	175	125	SMTS 175/125N50		U*		SMTS 175/125L50		U*		17' – 35'		
	200	145	SMTS 200/145N50		U*		SMTS 200/145L50		U*		19' – 42'		
57'-1-1/4"	150	100	SMTS 150/100N55		na		SMTS 150/100L55		na		16' – 30'	460#	na
	175	125	SMTS 175/125N55		na		SMTS 175/125L55		na		17' – 35'		
	200	145	SMTS 200/145N55		na		SMTS 200/145L55		na		19' – 42'		
62'-1-1/4"	150	100	SMTS 150/100N60		U*		SMTS 150/100L60		U*		16' – 30'	480#	33'-5-1/4"
	175	125	SMTS 175/125N60		U*		SMTS 175/125L60		U*		17' – 35'		
	200	145	SMTS 200/145N60		U*		SMTS 200/145L60		U*		19' – 42'		
67'-1-1/4"	175	125	SMTS 175/125N65		na		SMTS 175/125L65		na		17' – 35'	540#	na
	200	145	SMTS 200/145N65		na		SMTS 200/145L65		na		19' – 42'		
72'-1-1/4"	175	125	SMTS 175/125N70		U*		SMTS 175/125L70		U*		17' – 35'	540#	38'-5-1/4"
	200	145	SMTS 200/145N70		U*		SMTS 200/145L70		U*		19' – 42'		

MBTUH = 1000 BTU per hour heater input rating.
na = not available.
U* = SMTU replaces SMTS in the model number for U-tube heaters.
Wt.** = Shipping Weight. Add 60# to weight for U-tube heaters.

Submitted by: _____ Date: _____

Job Title: _____

Address: _____ City: _____ State: _____ Zip: _____

Contractor: _____ Phone #: _____

Address: _____ City: _____ State: _____ Zip: _____

Engineer: _____

Local Representative: _____

Notes: _____

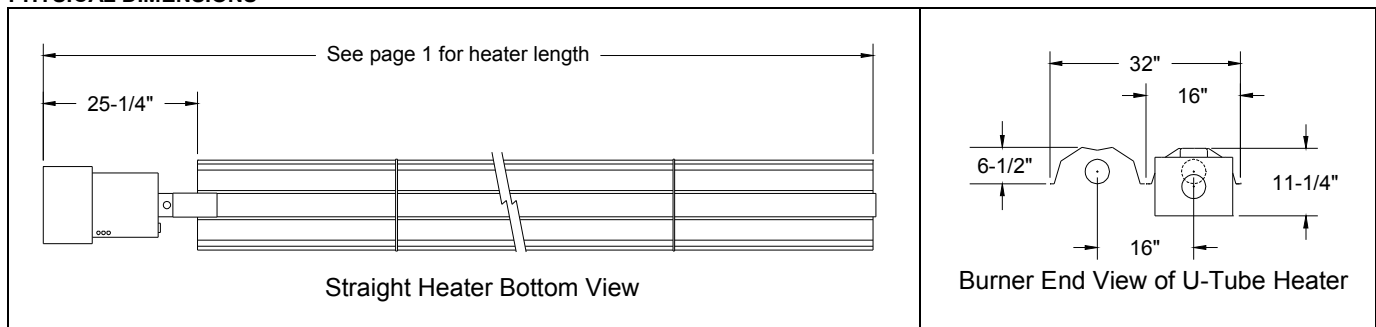
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704 Woodward Ave., Rochester, Michigan MI 48307 U.S.A.
Toll Free: 1-800-223-5335 Phone: 248-651-5333 Fax: 248-651-0357
E-mail: sales@solaronicsusa.com Website: www.solaronicsusa.com

SPECIFICATIONS AND CLEARANCES

SMT SERIES SPECIFICATIONS

<p>APPROVALS</p> <ul style="list-style-type: none"> • CSA International Design Certified, Report # 163199-1063506. • Indoor / Outdoor Approval. • Commercial / Industrial Approval. <p>BURNER AND CONTROLS</p> <ul style="list-style-type: none"> • Two-Stage Control of Both Gas and Air for Precise Air to Gas Ratios and Complete Efficient Combustion at Both High and Low Fire Rates. • Two-stage gas valve - 30% differential. • Two-speed blower thermally protected and permanently lubricated. • Blower impeller balanced statically and dynamically. • Controls isolated from combustion air. • Safety differential pressure switch. • Redundant gas safety shut-off 100%. • Durable direct spark ignitor. • Independent flame rod sensing. • Sight glass for burner observation. • Pre- and post-purge controls. 	<ul style="list-style-type: none"> • 3 trials for ignition and automatic recycle after inadvertent shutdown. • Self-diagnostic LED and soft lockout. • Controls inside a corrosion resistant housing, yet easily accessible from 3 sides by removing the cover. • 24-volt thermostatic control. <p>HEAT EXCHANGER TUBES</p> <ul style="list-style-type: none"> • 4" O.D., 16 ga. 304L stainless steel for excellent corrosion resistance and durability. • Turbulator baffle factory installed. • 8" long clamps of 2 layers of 18 ga. 304 stainless steel with 4 clamping bolts. <p>COMBUSTION TUBES</p> <ul style="list-style-type: none"> • 4" O.D. 16 ga., 304L stainless steel for excellent corrosion resistance. <p>REFLECTORS</p> <ul style="list-style-type: none"> • 91.7% reflectional efficiency. • 304 stainless steel. • Rotate sections independently. 	<p>GAS CONNECTION</p> <ul style="list-style-type: none"> • ½" FPT gas inlet. • 36" long flexible gas connector. <p>GAS SUPPLY (W.C.)</p> <table border="1"> <thead> <tr> <th></th> <th>NAT</th> <th>LP</th> </tr> </thead> <tbody> <tr> <td>• Manifold pressure (High)</td> <td>5"</td> <td>5"</td> </tr> <tr> <td>• Minimum inlet pressure</td> <td>7"</td> <td>11"</td> </tr> <tr> <td>• Maximum inlet pressure</td> <td>14"</td> <td>14"</td> </tr> </tbody> </table> <p>COMBUSTION AIR / VENTING</p> <ul style="list-style-type: none"> • Wall or roof venting – 4" diameter pipe up to 20 linear feet and one 90° elbow. <p>POWER SUPPLY</p> <ul style="list-style-type: none"> • 120 VAC, 60 Hz, 1 phase. • Maximum current draw is 1.3 amps. • Thermostatic 24-volt power supply provided at heater terminal board. <p>LIMITED WARRANTY</p> <ul style="list-style-type: none"> • 10 years on Burner Core. • 5 years on All Heat Exchanger & Combustion Tubes. • 1 years on All Burner Controls. <p>MADE IN THE USA</p>		NAT	LP	• Manifold pressure (High)	5"	5"	• Minimum inlet pressure	7"	11"	• Maximum inlet pressure	14"	14"
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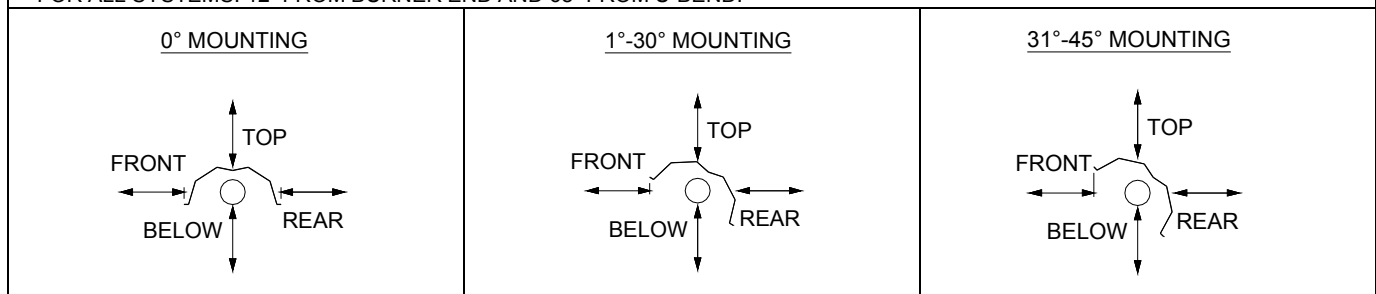
PHYSICAL DIMENSIONS



CLEARANCES

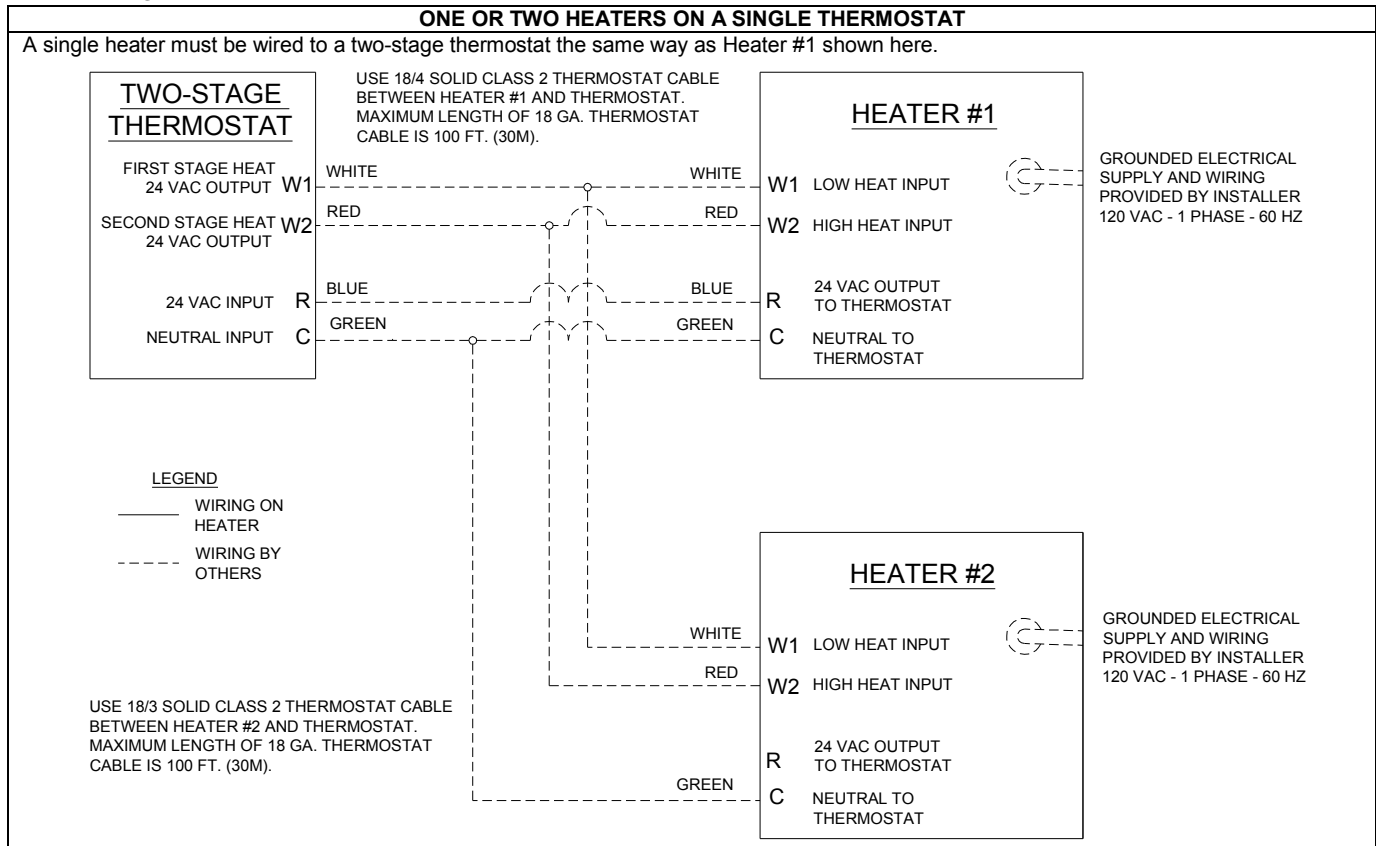
MODELS	CLEARANCES TO COMBUSTIBLES* (INCHES)				
	MOUNTING ANGLE	FRONT	REAR	TOP	BELOW
SMT(S,U)85/65(N,L)(20,25)	0°-30°	24	24	12	60
SMT(S,U)100/65(N,L)(30,35,40)	0°-30°	24	24	12	60
SMT(S,U)125/95N(30,35,40,45,50) SMT(S,U)125/95L(40,45,50)	0°-30°	32	32	12	72
SMT(S,U)150/100(N,L)(40,45,50,55,60)	0°-30°	48	48	12	82
	31°-45°	70	12	12	82
SMT(S,U)175/125(N,L)(50,55,60,65,70)	0°-30°	58	58	12	92
	31°-45°	80	12	12	92
SMT(S,U)200/145(N,L)(50,55,60,65,70)	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
	0002-42-177	2-stage raintight thermostat	Used for 2-stage operation. (40-110°F) NEMA-4X, weather resistant, with stainless steel coil. Operates one or two 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. 304L stainless steel 90-degree heater elbow.
	132616	Stainless tube clamp	304L stainless steel 4" O.D. tube clamp.
	0002-42-156	2-stage standard thermostat	Used for 2-stage operation. (50-90°F) Operates one or two heaters.
	0002-42-176	2-stage programmable thermostat	Used for 2-stage operation. (45-90°F) Operates one or two 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" stainless Y-coupler for dual venting	Joins two heaters to one common 5" vent using one 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 two heaters to one common 6" vent using only one 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. Two stage radiant tube heaters shall be Design Certified by CSA and comply with current Occupational Safety and Health (OSHA) Requirements. The supplier shall provide the CSA Certification Number and the heaters shall bear the CSA Seal of Certification. The heater's low fire and high fire modes of operation must be Design Certified by CSA.
 2. Gas-fired two-stage 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 for a period of one (1) year.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Two-stage radiant tube heaters shall be SOLARONICS SMT SERIES of the model numbers and inputs in MBTUH as manufactured by Solaronics, Inc. Rochester, Michigan 48307.

2.2 DESCRIPTION

- A. The heaters shall provide Two-Stage Control of Both Gas and Air to provide precise air to gas ratios and the most efficient and complete combustion at both high and low fire rates.
- B. Two-stage radiant tube heaters shall be designed to satisfactorily operate at a minimum inlet pressure of 7 inches W.C. 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.
- C. Two-stage 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 stainless steel 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. 16 ga. (.060") wall thickness 304L stainless steel finished with a high emissivity rated, corrosion resistant, black coating.
- C. The heater's heat exchanger tube shall be 4" O.D. 16 ga. (.060") wall thickness 304L stainless steel.
- D. 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, include a sliding hanger for expansion and contraction, and four (4) 5/8"-11x2" carriage bolts and nuts to draw up (tighten to a minimum of 65 foot-pounds of torque).

- E. The direct spark ignitor shall be durable to resist breakage.
- F. Reflectors shall be 20 ga. (.037") thick 304 stainless steel with a geometrically designed configuration not having less than 91.7% reflectional efficiency.
- G. 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. Reflectors shall be supported by 16 ga. (.060") thick 304 stainless steel brackets.
- H. Heaters shall utilize a downstream turbulator that shall be factory installed in the last ten (10) feet of heat exchanger, wave formed for optimal turbulence, acceleration and impingement of the products of combustion resulting in appropriate velocity pressure and momentum for maximum thermal efficiency.
- I. Heaters shall be equipped with a sight glass permitting a visual inspection of the spark ignitor and burner operation from the floor.
- J. 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.
- K. 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.

2.4 CONTROLS

- A. The two-stage radiant tube heater's normal sequence of operation shall include a defined input differential. The heater must be CSA Design Certified to operate at an input differential of at least 30% between the low fire and high fire modes.
- B. Heater controls shall be isolated from combustion air to prevent corrosion from wet or dirty air.
- C. 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.
- D. Power supplied to each burner shall be 120 VAC, 60 Hz. Maximum heater electrical current draw shall not exceed 1.3 amps.
- E. Heater controls shall include a safety differential pressure switch to monitor combustion airflow, so as to provide complete burner shutdown due to insufficient combustion air or flue blockage. Gas valve shut-off shall be of the redundant type.
- F. The heater shall incorporate a self-diagnostic ignition module, include an external LED readout display, and automatically recycle itself after an inadvertent shutdown.
- G. 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.
- H. The heater's blower motor shall be thermally protected, permanently lubricated and the blower motor's impeller shall be both statically and dynamically balanced.
- I. The heater's air flow control system shall provide a 30-second pre-purge prior to initiating burner operation and a 120-second post-purge upon completion, effectively removing all products of combustion from the heat exchanger and/or radiant tubes.
- J. No condensation shall form as a result of combustion in the combustion chamber or heat exchanger tubes while at operating temperatures.
- K. The thermostats shall be two-stage operating on 24 volts.
- L. The heater control shall provide the 24-volt power supply for the thermostat at the heater terminal board. No additional 24-volt power supply is required.
- M. 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.