

## R Series Flat Top MasterSpec

### SECTION 238236 FINNED-TUBE RADIATION 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. This section includes factory packaged, finned-tube heaters, and accessories for closed heating water and steam heating systems.

##### 1.3 SUMMITTALS

- A. Product Data: Include performance data, operating characteristics, furnished specialties, and accessories.
- B. Shop Drawings: For finned-tube covers, elements, and accessories. Include plans, elevations, sections, details, and attachments to other work.

- 1. Design Calculations signed and sealed by a professional engineer

- 2. Piping Diagrams: system piping.

- c. Warranty: 1 year full manufacturer's warranty.

##### 1.4 INFORMATIONAL SUBMITTALS

- A. Operation and Maintenance: To include in operation and maintenance manuals.

- B. Other Informational Submittal:

- 1. Startup report

##### 1.5 CLOSEOUT SUBMITTALS

- A. Operational and Maintenance Data: to include in boiler emergency, operation and maintenance manuals.

##### 1.6 QUALITY ASSURANCE

- A. AHRI Compliance: Output ratings determined by AHRI baseboard or finned tube rating procedure.
- B. Copper tube elements rated for maximum working pressure of 202 P.S.I. at 250<sup>0</sup>F for ¾ inch diameter; 203 P.S.I. at 250<sup>0</sup>F for 1 inch diameter and 265 P.S.I. at 250<sup>0</sup>F for 1 ¼ inch diameter copper size.
- C. Steel tube elements rated for maximum working pressure of 265 P.S.I. at 250<sup>0</sup>F for 1 ¼ and 2 inch Schedule 40 black steel pipe

- D. Dimensions of solder joint ends to comply with ASTM B 88. Dimensions of steel tube joint ends to comply with ASTM A865-A865-97.

#### 1.7 COORDINATION

- A. Coordinate cover and heating element wall mounting and accessory installation.

#### 1.8 WARRANTY

- A. Standard Warranty: Manufacturer's standard warranty in which manufacturer agrees to repair or replace components that fail due to failure in materials or workmanship within specified warranty period.

1. Warranty Period is one year from date of installation.

### PART 2 – PRODUCTS

#### 2.1 FINNED TUBE RADIATION

- A. Basis of Design: Slant/Fin Model (Top Outlet Models - RL-10 or RT-14 or RT-21 or RT-28 SELECT ONE) or (Front Outlet Models RF-14 or RF-21 or RF-28 SELECT ONE) or (Top Outlet with Aluminum Grille - RAG-10 or RAG-14 or RAG-21 or RAG-28 PICK ONE) flat top covers with (one tier or two tiers or three tiers of element(s)). Cover fabricated from 18 (16) gauge galvanized cold rolled steel. Outlet louvers are die cut and bent in portions of grille, louvers are too small to allow pens and pencils to fit into them. (Optional Aluminum Grille replaces sentence starting with "Outlet louvers" – Heavy gauge extruded aluminum grille with die cut air outlet slots on sloped part of cover.)
- B. Optional Rear Panel: Factory fabricated rear panel secured to wall using field supplied screws installed in every vertical wall support stud. Rear panel to be cover length. Rear panel is installed between wall brackets and wall. Optional rear panel is made of 20 gauge galvanized cold rolled steel.
- C. Accessories: Cover accessories shall be 18 gauge galvanized cold rolled steel. Accessories shall be telescopic and color match front and top panel.
- D. Color: Standard color of 18 gauge front cover is NuWhite unless optional color is specified. Optional colors to be selected from manufacturer's color chart with metal color chip to be supplied by finned tube manufacturer upon request. Optional colors are powder coated for durable and long lasting finish. Wet paint is not acceptable.
- E. Brackets: Brackets to be fabricated out of 14 gauge galvanized cold rolled steel. Brackets to be field mounted onto the wall. No fewer than 2 brackets on a 2 to 5 foot cover lengths and 3 brackets on 46 to 8 foot cover lengths.
- F. Slide Cradles: Slide Cradles are made of galvanized steel. They have a cradle that supports the element or bare tube and moves with the expansion and contraction of the copper or steel elements and pipe. Slide cradles bolt to the wall brackets with factory supplied bolts and slide up or down to adjust for slight height differences of elements and bare pipes.
- G. Element used shall be Slant/Fin model (Pick one of following six elements) with (Pick 1 tier of element or 2 tiers of elements) (2 tiers of element for RT-21 (RF & RAG-21) and RT-28)(RF & RAG-

28) (3 tiers of element for RT-28 (RF & RAG-28), specified element and output rating is listed in the finned tube schedule.

C-340 element –  $\frac{3}{4}$  inch copper tube with  $4\frac{1}{4}$  inch by  $4\frac{1}{4}$  inch aluminum fins with aluminum thickness of 0.020 inches. 40 fins per linear foot. On end male sweat and one end female sweat connection.

C-440 element –  $\frac{3}{4}$  inch copper tube with  $4\frac{1}{4}$  inch by  $4\frac{1}{2}$  inch aluminum fins with aluminum fin thickness of 0.020 inches. 40 fins per linear foot of element. One end male sweat and one end female sweat connection.

C-540 element –  $1\frac{1}{4}$  inch copper tube with  $4\frac{1}{4}$  inch by  $4\frac{1}{4}$  inch aluminum fins with aluminum fin thickness of 0.020 inches. 40 fins per foot. One end male sweat and one end female sweat connection.

S-532 element –  $1\frac{1}{4}$  inch schedule 40 steel pipe with  $4\frac{1}{4}$  inch by  $4\frac{1}{4}$  inch aluminum fins with aluminized steel fin thickness of 0.024 inches. 32 fins per linear foot of element. Both ends male pipe thread.

S-540 element –  $1\frac{1}{4}$  inch schedule 40 black pipe with  $4\frac{1}{14}$  inch by  $4\frac{1}{4}$  inch fins with 0.024 inch thick aluminized steel fins. 40 fins per linear foot of element. Both end are male pipe thread.

S-832 element – 2 inch schedule 40 black pipe with  $4\frac{1}{4}$  inch by  $4\frac{1}{4}$  inch fins with 0.024 inch thick aluminized steel fins. 32 fins per linear foot of element. Both ends are male pipe thread.

G. Water Piping: Connecting piping shall be properly sized to deliver adequate and specified flow.

## 2.3 TRIM

### A. Accessories

1. Cover accessories shall be 18 gauge galvanized cold rolled steel. Accessories shall be telescopic, slide over the cover and color match the cover. Accessories to be installed as required. Standard color is NuWhite, optional powder coated colors available.

## 2.4 SOURCE QUALITY CONTROL

A. Factory inspected and packed

B. Final inspection after installation

## PART 3 – EXECUTION

### 3.1 EXAMINATION

A. Before finned tube installation, examine rough-in for hanging, location, and water piping.

B. Examine spaces for suitable conditions where baseboard will be installed.

C. Finned tube element with cover shall be located on outside walls and under windows when possible.

D. Covers to be located where it does not interfere with opening and closing doors and windows.

### 3.2 INSTALLATION

- A. Install finned tube in accordance with manufacturer's instruction
- B. Install finned tube and connecting piping in accordance with Uniform Mechanical Code – Chapter 12 “Hydronics”.
- C. Follow local code requirements.

### 3.3 CONNECTIONS

- A. All piping connections to be in accordance with ASTM standards

### 3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports
  1. Perform installation and startup tests according to Uniform Mechanical Code section 1201.0 Testing. Repair and replace material as required.
  2. Fill system with water (and Glycol if specified) and purge air from system to prevent noise and optimize heat delivery.
  3. Balance to deliver uniform heating delivery.
  4. Operational test – Start heating system to confirm proper heat and balance.
  6. Provide completed field quality documentation to building commissioning agent.

**END OF SECTION 238236**

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RT = Top Outlet Stamped Louvers

RF = Front Outlet Stamped Louvers

RAG = Top Outlet Aluminum Grille