Verify that electrical work installation is in accordance with manufacturer's submittal and installation requirements of Division 26 sections. Do not proceed with equipment start-up until electrical work is acceptable to equipment installer.
Gas Piping: Refer to Division 23 section "Natural Gas Systems".
Connect gas piping to boiler, full size of boiler gas train inlet, provide union with sufficient clearance for burner removal and service.
Breeching: Connect breeching to boiler outlet, full size of outlet. Route as indicated and per manufacturer recommendations.

FIELD QUALITY CONTROL
Start-up heaters, in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Adjust burner for maximum burning efficiency. Replace damaged or malfunctioning controls and equipment.

TRAINING OF OWNER'S PERSONNEL
Owner's Instructions: Provide services of manufacturer's technical representative for one 4-hour day to instruct Owner's personnel in operation and maintenance of heaters.
Schedule training with Owner, provide at least 7-day notice to Contractor and Engineer of training date.

23 74 33.00 - PACKAGED OUTDOOR ROOFTOP UNITS

WARRANTY
Warranty on Compressor and Heat Exchanger: Provide written warranty, signed by manufacturer, agreeing to replace/repair, within warranty period, compressors and heat exchangers with inadequate and defective materials and workmanship, including leakage, breakage, improper assembly, or failure to perform as required, provided manufacturer's instructions for handling, installing, protecting, and maintaining units have been adhered to during warranty period.
Replacement is limited to component replacement only, and does not include labor for removal and reinstallation.
Warranty Period: 5 years from date of owner acceptance.
CONSTANT VOLUME
Unit shall be furnished by Darden Restaurants, Contractor to install unit per plans. Coordinate with Darden Restaurants and Trane National Accounts.

EXAMINATION
Examine areas and conditions under which rooftop units are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

INSTALLATION
General: Install rooftop units in accordance with manufacturer's installation instructions. Install units plumb and level, anchored to curb/stand in locations indicated, and maintain manufacturer's recommended clearances.
Rooftop units shall be installed a minimum of 10'-0" from any roof edge regardless of location indicated on plans unless a screen wall or railing is installed per local building code. See the architectural plans for clarification.
Support units and secure units to roof structure, in accordance with National Roofing Contractors Association (NRCA) installation requirements and sheet drawings. Install and secure rooftop units on curbs and coordinate roof penetrations and flashing.
Condensate Piping: Provide Type L copper condensate piping with trap.
Electrical Connections: Refer to Electrical Specifications - Electrical connections for Equipment for final connections to equipment and installation of loose shipped electrical components.

DEMONSTRATION
Start-Up Services:
Provide the services of a factory-authorized service representative to start-up rooftop units in accordance with manufacturer's written start-up instructions. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

TRAINING OF OWNER'S PERSONNEL
Provide services of manufacturer's service representative to instruct Owner's personnel in operation and maintenance of rooftop units.
Training shall include start-up and shut-down, servicing and preventative maintenance schedule and procedures, and troubleshooting procedures plus procedures for obtaining repair parts and technical assistance.
Review operating and maintenance data contained in the Operating and Maintenance Manuals specified in Division One.
Schedule training with Owner, provide at least 7-day prior notice to the Architect/Engineer.

23 82 36.00 - FINNED-TUBE RADIATION HEATERS

BASEBOARD RADIATION
General: Provide baseboard radiation of lengths and in locations as indicated, and of capacities, style, and having accessories as scheduled.
Cabinets: Minimum 20-ga cold-rolled steel, one-piece back and top panel, front panel with integral damper.
Provide steel brackets inserted in backtop panel, to support element and front panel. Provide baked enamel finish. Color selected by architect.
Elements: Copper tube and aluminum fins, with slide mechanism between element and support brackets to eliminate expansion and contraction noises.
Accessories: Provide the following accessories:
Blank end caps.
End caps with hinged access panel.
Trim strips.
Control valve
Manufacturer: Subject to compliance with requirements, provide baseboard radiation of one of the following:
Hydrotherm, Inc.
Slant/Fin Corp.
Sterling Radiator, Div. of Reed National Corp.
Trane (The) Co.
Weil-McLain, Marley Co.
Rittling
Modine

INSPECTION
Examine areas and conditions under which heaters to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to installer.

INSTALLATION
General: Install baseboard radiation as indicated, and in accordance with manufacturer's installation instructions.
Locate baseboard radiation on outside walls as indicated, run cover continuous wall-to-wall unless otherwise indicated.
Center elements under windows. Where multiple windows occur over units, divide elements into equal segments centered under each window.
Install end caps where units butt against walls. Install access panels centered in front of each shutoff valve, balancing cock, or temperature control valve.

ELECTRICAL WIRING
General: Install electrical devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's wiring diagrams submittal to Electrical Installer.
Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of the electrical specifications. Do not proceed with equipment start up until wiring installation is acceptable to equipment installer.

ADJUSTING AND CLEANING
General: After construction is completed, including painting, clean unit exposed surfaces, vacuum clean terminal coils and inside of cabinets. Retouch any marred or scratched surfaces of factory-finished cabinets, using finish materials furnished by manufacturer.

23 82 39.00 - UNIT HEATERS
General: Provide unit heaters in locations as indicated, and of capacities, style, and having accessories as scheduled. Provide temperature control valves for modulation during a call for heat and closed during cooling.

PROPELLER UNIT HEATERS
General: Except as otherwise indicated, provide manufacturer's standard heating elements of types, sizes, capacities and ratings for duty indicated, consisting of resistance elements in steel sheath with extended fins, or with spirally finned sheath.
Heating Capacity: Size elements for indicated fan speed, CFM, room heating load (BTUH), entering air temperature, and electric inputs (watts, voltage, phase). Provide all required control transformers.
Casings: Provide casings braced and reinforced to provide required stiffness, and with adjustable heating element supports and brackets.
Provide rounded corners. Phosphatize and paint casings inside and out with single coat of baked on enamel and zinc plate hardware. Include fan orifice (venturi) in casing, as well as threaded hanger connections (weld nuts). Fabricate from 18-gage galvanized steel.
Air Deflectors: Provide manufacturer's standard air deflectors of the following types:
2-way horizontal louvers.

Motors: Provide totally enclosed shaded-pole, or permanent-split capacitor motors. Class "B" insulation, resiliently mounted, lap wound with built-in thermal overload protection, and with sleeve type or permanently lubricated ball bearings. Select motors with the voltage as scheduled.
Motor Controls: Provide motor control switch with an "OFF" position.
Internal Electrical Wiring: Provide units with high temperature, heat-resistant electrical wiring enclosed in flexible metal conduit extending from terminal junction box to electrical devices. Provide fusing for motor and control circuit wiring.
Devices: Provide propeller unit heaters with the following devices:
Thermally activated fan switch to keep fan motor operating until residual heat is dissipated.
Disconnect switch.
Automatic reset, high limit cut-out switch located in discharge air stream.
Manual "Summer-OFF-Winter" switch.
Unit-mounted line voltage thermostat.
Control Power Transformer.
Magnetic Contactor (Relay Kit)
Fans: Provide aluminum propeller fans which are balanced statically and dynamically, at indicated capacity. Provide fans suitable for standard or sparkproof application.
Manufacturers: Subject to compliance with requirements, provide propeller unit heaters of one of the following:
Qmark
Markel Nutone Div, Scoville Inc.
Trane Company.
Rayward

INSPECTION
Examine areas and conditions under which heaters to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to installer.

INSTALLATION - UNIT HEATERS
General: Install unit heaters as indicated and in accordance with manufacturer's installation instructions.
Operate units and inspect for correct rotation. Verify that nameplate data corresponds with unit designation.
Hang units from building structure/substrate, not from piping. Mount as high as possible to maximize heat throws possible, unless otherwise indicated.
Support units with rod-type hangers anchored to building substrate.
Install piping as indicated.
Protect units with protective covers during balance of construction.

INSTALLATION
Install electric heating terminal units including components as indicated, in accordance with equipment manufacturer's written instructions, and with recognized industry practices; complying with applicable installation requirements of NEC and NECA's "Standard of Installation".
Coordinate with other electrical work, including wiring/cabling, as necessary to properly interface installation of heating terminal units with other work.
Clean dust and debris from each heating terminal as it is installed to ensure cleanliness.
Comb out damaged fins where bent or crushed before covering elements with enclosures.
Touch-up scratched or marred heating terminal enclosure surfaces to match original finishes.
Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Std 486A.

GROUNDING
Provide equipment grounding connections for electric heating terminals as indicated. Tighten connections to comply with tightening torque values specified in UL Std 486A to assure permanent and effective grounding.

FIELD QUALITY CONTROL
Upon completion of installation of electric heating terminals, and after building circuitry has been energized, test heating terminals to demonstrate capability and compliance with requirements.
Where possible, field correct malfunctioning units, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.
Replace electric heating terminals and accessories which are damaged and remove damaged items from construction site.

ELECTRICAL WIRING

General: Install electrical devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's wiring diagrams submittal to Electrical Installer.
Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of the electrical specifications. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.

ADJUSTING AND CLEANING
General: After construction is completed, including painting, clean unit exposed surfaces, vacuum clean terminal coils and inside of cabinets. Retouch any marred or scratched surfaces of factory-finished cabinets, using finish materials furnished by manufacturer.

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Prototype current thru 12-21-2018
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Drawing
HVAC SPECIFICATIONS

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