



Weights

Table 105. Roof curb weights — air-cooled (AC) and evaporative condensing (EC)

Tonnage AC/EC	Energy Recovery Wheel	Blank Section	One-Piece Unit	Two/Three-Piece Unit
90-105/100-118	No	None	907	1055
90-105/100-118	No	4 ft	988	1136
90-105/100-118	No	8 ft	1069	1217
90-105/100-118	Yes	None	1093	1240
90-105/100-118	Yes	4 ft	1174	1321
90-105/100-118	Yes	8 ft	N/A	1401
120-150/128-162 (All Units Except High Heat Gas models)	No	None	1040	1194
120-150/128-162 (All Units Except High Heat Gas models)	No	4 ft	1122	1275
120-150/128-162 (All Units Except High Heat Gas models)	No	8 ft	N/A	1357
120-150/128-162 (High Heat Gas Models Only)	No	None	1055	1209
120-150/128-162 (All Units Except High Heat Gas models)	Yes	None	N/A	1378
120-150/128-162 (All Units Except High Heat Gas models)	Yes	4 ft	N/A	1459
120-150/128-162 (All Units Except High Heat Gas models)	Yes	8 ft	N/A	1540
120-150/128-162 (High Heat Gas Models Only)	Yes	None	N/A	1393

Note: One-piece available with air-cooled condenser only.

Table 106. Pre-engineered options

Cabinet
4' or 8' blank in Pre DX or Return Position
Economizer
Title 24 Rated Ultra Low Leak Economizer w FDD
Efficiency
Hybrid High and Hybrid Ultra High Efficiency (120T)
Electrical
Dual Power
Energy Recovery
Energy recovery with Horizontal Return
Fans
Beltless Direct Drive Plenum Supply Fan
Propeller Exhaust Fan
Piezometer Rings
Heat
LP Gas heat
Seismic
OSHDP



Mechanical Specifications

General

Units shall be specifically designed for outdoor rooftop installation on a roof curb and be completely factory assembled and tested, piped, internally wired, fully charged with compressor oil and shipped in one, two or three-pieces for field reassembly into a single unit. Single piece units shall be fully charged.

Units shall be available for direct expansion cooling only, or direct expansion cooling with natural gas, electric, hot water or steam heating. Filters, outside air system, exhaust air system, optional non-fused disconnect switches and all operating and safety controls shall be furnished factory installed.

All units shall be cULus approved and factory run tested. Select configurations shall also be compliant with IBC Seismic requirements. In select configurations, cooling capacity shall be tested in accordance with AHRI Standard 360. All units shall have decals and tags to aid in service and indicate caution areas. Electrical diagrams shall be printed on long life water resistant material and shall ship attached to control panel doors.

Casing

Exterior panels shall be zinc coated galvanized steel, phosphatized and painted with a slate grey air-dry finish durable enough to withstand a minimum of 672 hours consecutive salt spray application in accordance with standard ASTM B117. Screws shall be magnigard coated.

Refrigeration components and compressor shall be accessible through removable louvered panels as standard. Unit air handling section shall be laminated double-wall construction with polyurethane foam core injected between sheet metal panels and liners. Insulation value shall be R8. All interior surfaces shall be suitable for cleaning per ASHRAE 62. All access doors and panels shall have neoprene gaskets. Unit base shall be watertight with heavy gauge formed load bearing members and curb overhang. Unit lifting lugs shall accept chains or cables for rigging. Lifting lugs shall also serve as unit tie down points.

Access Doors

Access doors shall be hinged with a single, exterior mounted, height and tension adjustable, handle to provide positive latching at three points. Access doors shall provide a door stop mechanism to latch the door in the open position to prevent unsafe door closure by wind.

Doors of laminated double wall construction with a polyurethane foam core between the exterior sheet metal pane and the interior liner, with an insulating value of R8 shall be provided on the air handlers serviceable compartments such as return/exhaust fan, filters, evaporator coil, and blank sections. Two single wall doors shall be provided for access to the control panel.

Blank Sections

Blank section shall be [four][eight] foot length of laminated double wall construction with a polyurethane foam core between the exterior sheet metal panel and the interior liner, with an insulating value of R8. Hinged access doors of similar construction shall be provided on on either side.

Two- or Three-Piece Construction

[Two][Three] piece construction shall facilitate lifting and rigging of the unit. The condenser section shall contain the associated valving and electrical box for recoupling of refrigeration, power and control systems. Transition panels shall be provided for the integrity on the recoupled unit.

Note: Multi-piece units are shipped with nitrogen and must be field charged with R-410A.



Airflow Path

Unit shall have [downflow][horizontal] discharge conditioned air path. Return airflow path shall be either upflow or horizontal through the side or the end.

Burglar Bars

A grate system shall be installed in supply and return air duct connection areas on non-horizontal airflow path units to minimize unwanted intrusion into duct systems.

Belt Guard

Supply and exhaust fans shall have a universal size belt guard to accommodate any applicable drive configuration. The guard shall completely enclose the drive system and is provided with a two-piece removable front panel for servicing. Return fan guards shall be individually sized with a single piece removable panel for servicing.

Refrigeration System

Compressors

Compressors shall be direct-drive, hermetic, scroll-type compressors with centrifugal-type oil pumps. Each compressor has a crankcase heater to minimize the amount of liquid refrigerant present in the oil sump during off cycles. Discharge line service valves shall be standard on each refrigerant circuit, as well as liquid moisture indicator/sight glass.

eFlex™ Variable Speed Compressors

The Trane eFlex™ variable speed compressor shall be capable of speed modulation from 25 Hz to a maximum of 100 Hz. The minimum unit capacity shall be 15% of full load or less. The compressor motor shall be a permanent magnet type. Each compressor shall have a crankcase heater installed, properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles. Compressors shall be equipped with a bearing oil injection system that optimizes scroll set lubrication, sealing, and controls the oil circulation rate.

Optimal bearing lubrication shall be provided by a gerotor oil pump. Each variable speed compressor shall be matched with a specially designed variable frequency drive which modulates the speed of the compressor motor and provides several compressor protection functions. Control of the variable speed compressor and inverter control shall be integrated with the IntelliPak unit controller to ensure optimal equipment reliability and efficiency.

Supply Fan

[Standard][Low] airflow supply fan shall have a single fan assembly with double width, double inlet, airfoil fan, motor and fixed pitch sheave drive. All fans shall be statically and dynamically balanced for the operating envelop. It shall be tested in the factory. Supply fans shall be test run in unit as part of the unit test. Fan operating envelop rpm shall be below first critical speed. Fan shafts shall be mounted on two grease lubricated ball bearings designed for 200,000 hours average life.

Extended grease lines shall allow greasing of bearings from section base rail. Fan motor and fan assembly shall be mounted on common base to allow consistent belt tension with no relative motion between fan and motor shafts. Entire assemblies shall be completely isolated from unit by two-inch deflection spring isolators.

Evaporator Coil

Internally enhanced copper tubing of ½-inch O.D. shall be mechanically bonded to heavy-duty aluminum fins of configured design. All coils shall be equipped with thermal expansion valves and factory pressure and leak tested. A double sloped [galvanized][stainless steel] drain pan shall be provided to drain condensate to both sides of the unit.

Stainless Steel Drain Pans

Drain pan shall be stainless steel, double sloped, and located under the evaporator coil in order to promote runoff of standing water from condensation inside the unit as well as provide protection in corrosive environments. Two drain pipes shall be installed through the base channel on each side of the unit.

Hot Gas Bypass

The hot gas bypass option shall consist of valves, piping and controls that are all included on circuit 2 to allow operation at low airflow, avoiding coil frosting and damage to compressor. When suction pressure falls below valve adjustable setpoint, the valves shall modulate hot gas to the inlet of the evaporator.

Filter Drier

Removable core filter driers shall be optionally available and installed on each refrigeration circuit. For easy access, the filter driers are conveniently located in the condenser section close to the periphery of the unit.

Suction Service Valves

Each compressor shall be optionally equipped with a suction service valve in order to facilitate compressor servicing.

Air-Cooled Condensing

Air-Cooled Condenser Coil

Condenser coils shall have all-aluminum, Microchannel coils. All coils shall be leak tested at the factory to ensure pressure integrity. The condenser coil shall be pressure tested to 650 psig. Subcooling circuit(s) shall be provided as standard.

Air-Cooled Condenser Fans and Motors

All condenser fans shall be vertical discharge, direct drive fans, statically balanced, with steel blades and zinc plated steel hubs. Condenser fan motors shall be totally enclosed three-phase motors with permanently lubricated ball bearings, built-in current and thermal overload protection and weather tight slingers over motor bearings.

Corrosion Protected Condenser Coil

All aluminum Microchannel condenser coil protection shall consist of a corrosion resistant coating that shall withstand ASTM B117 Salt Spray test for 6,000 hours and ASTM G85 A2 Cyclic Acidified Salt Fog test for 2,400 hours. This coating shall be added after coil construction covering all tubes, headers and fin edges, therefore providing optimum protection in more corrosive environments.

Evaporative Condensing

Evaporative Condensing - Housing

The water basin, corner posts and roof shall be constructed with 304 Stainless Steel. Water basin shall be lined with FRP coating to make it watertight. The side panels and sliding access doors shall be constructed of corrosion and UV resistant, low density fiber glass. Housing shall also have 4 lifting holes, one in each corner to handle the unit with crane.

Evaporative Condensing - Condenser Coils

Evaporative Condenser coils shall be copper 5/16" OD, 0.022 wall thickness with serpentine tubing.



Mechanical Specifications

Evaporative Condensing - Condenser Fan

The fan motors shall have variable speed capability controlled by factory-installed unit controller.

Evaporative Condensing - Pump

Minimal maintenance sump pump shall be fully accessible through the evaporative-condenser access panel. Water shall be pumped at min 80 GPM. The pump shall be powered by 460 V / 3 Phase.

Evaporative Condensing- Sump Float Level Switch

The minimum level float switch shall protect the pump from running dry by turning the fill valve ON and allowing the sump to fill to a predefined minimum level. The maximum level float switch shall prevent the overflowing of the sump and water wastage by turning the fill valve OFF when a predefined maximum level is reached in the sump. Minimum and maximum float switched shall be permanently affixed to the water basin and shall not need any field adjustment.

Water Treatment

To simplify field installation, unit shall have hookups for water treatment devices. Water treatment by a water treatment expert is required for all evaporative condenser units to ensure proper equipment life, product performance and operation. If a Dolphin WaterCare System is used water must be maintained by a water treatment professional throughout the unit life of the Air Handling System.

Dolphin WaterCare System

The Dolphin WaterCare System focuses on minimizing scale build up and managing biological agents with no chemicals. An electronic signal is sent through a PVC pipe at a constant rate, inducing electromagnetic fields. The electromagnetic fields interact with colloidal particles causing precipitation, which does not adhere to the pipe, and is removed through the sump purge. Bacteria and corrosion in the water system is controlled and kept to minimal levels by their incorporation into the precipitate and low frequency radiation generated through the electronic pulsing.

Controls

Unit shall be completely factory wired with necessary control and contactor pressure lugs or terminal block for power wiring. Units shall provide an internal location for a non-fused disconnect with external handle for safety. Unit mounted microprocessor controls shall provide anti-short cycle timing for compressors to provide a high level of machine protection.

Unit Controller

DDC microprocessor controls shall be provided to control all unit functions. The control system shall be suitable to control CV or VAV applications. The controls shall be factory installed and mounted in the main control panel. All factory installed controls shall be fully commissioned (run tested) at the factory. The unit shall have a Human Interface Panel with a 16 key keypad, a 2 line X 40 character clear English display as standard to provide the operator with full adjustment and display of control data functions. The unit controls shall be used as a stand-alone controller, or as part of a building management system involving multiple units.

- The unit shall be equipped with a complete microprocessor control system. This system shall consist of temperature and pressure (thermistor and transducer) sensors, printed circuit boards (modules), and a unit mounted Human Interface Panel. Modules (boards) shall be individually replaceable for ease of service. All microprocessors, boards and sensors shall be factory mounted, wired and tested. The microprocessor boards shall be standalone DDC controls not dependent on communications with an on-site PC or a Building Management Network. The microprocessors shall be equipped with onboard diagnostics, indicating that all hardware, software and interconnected wiring are in proper operating condition. The modules (boards) shall be protected to prevent RFI and voltage transients from affecting the board circuits. All field wiring shall be terminated at separate, clearly marked terminal strip. Direct field wiring to the I/O boards is not acceptable. The microprocessor's memory shall be

non-volatile EEPROM type requiring no battery or capacitive backup, while maintaining all data.

- Zone sensors shall be available in several combinations with selectable features depending on sensor.
- The Human Interface Panel keypad display character format shall be 40 characters x 2 lines. The character font shall be 5 x 7 dot matrix plus cursor. The display shall be Supertwist Liquid Crystal Display (LCD) with blue characters on a gray/green background which provides high visibility and ease of interface. The display format shall be in clear English.
- The keypad shall be equipped with 16 individual touch-sensitive membrane key switches. The switches shall be divided into four separate sections and be password protected from change by unauthorized personnel. The six main menus shall be STATUS, SETPOINTS, DIAGNOSTICS, SETUP, CONFIGURATION and SERVICE MODE.
- Microprocessor control system shall provide Loss of Refrigerant Charge diagnostics to warn of a slightly undercharged situation followed by a warning and a lock out of an undercharged circuit for overall unit performance and compressor protection.
- The Human Interface Panel shall provide refrigerant superheat reading for each circuit to assist the service technician in troubleshooting.

Control Options

Remote Human Interface Panel

Remote Human Interface Panel (RHI) option shall perform all the same functions as unit mounted Human Interface Panel, except for the Service Mode. Single RHI Panel shall be able to monitor and control up to 4 rooftop units. Panel shall use the same enclosure as the Tracker building control panel with 2 line X 40 character English display, a red LED light to indicate an alarm condition (alarm also shown on the two line display), a 16 key keypad used in conjunction with the display to prompt the infrequent user when making desired changes and a hinged door. The RHI shall be mounted inside a building, up to 5,000 feet from the unit. The RHI shall be wired to the IPCB mounted in the rooftop with twisted wire pair communication wiring and 24V control wiring.

Trane LonTalk® Communication Interface Module (LCI-I)

The LCI-I shall provide an interface to a Tracer Summit™ building automation system or other control system that supports LonTalk® and shall be factory installed, allowing for control and monitoring of the unit through a RS485, two-wire communication link.

Trane BACnet® Communication

The BCI-I shall provide an interface to Tracer® SC or a 3rd party control system that supports BACnet® and shall be factory or field installed, allowing for control and monitoring of the unit through a RS485, two-wire communication link.

AirFi™ Wireless Communication Interface Module (WCI-I) (Field Installed)

Trane AirFi™ Wireless Communication interface shall provide wireless communication between the Tracer SC+, Tracer Unit Controllers and BACnet® Communication Interface (BCI) modules.

Low Ambient Unit Operation-Variable Frequency Drives VFDs

The low ambient option shall allow the unit to operate down to 0°F. The VFDs shall be located in an enclosure inside the service side corner post that is adjacent to the main control box. The VFD keypads and displays shall be accessible through a standard door that will allow "touch-safe" access to the VFDs. VFD protection fuses shall be accessible through a second door below the VFD access door.

Low Ambient Unit Operation-575 Volt Units

The low ambient option shall allow the unit to operate down to 0°F. Units configured with a 575V power requirement and low ambient unit operation shall require the use of step-down



Mechanical Specifications

transformers. Additional 3-phase transformers and transformer fuses shall be required to step the voltage down to a 460V operating voltage. The VFDs and the condenser fan motors controlled by the VFDs shall be 460V operating devices

Generic Building Automation System Module (GBAS 0-5 VDC)

Option shall be provided for those cases where non-Tracer building management system is used. The GBAS module option shall provide a binary input for Demand Limiting, four (4) analog inputs for setpoint adjustment and five (5) relay outputs for diagnostic reporting. Inputs shall use a potentiometer or 0-5 VDC signal.

Generic Building Automation System Module (GBAS 0-10 VDC)

Option shall be used to provide broad control capabilities for building automation systems other than Trane's Tracer system. The GBAS module shall provide a binary input for Demand Limiting, four (4) analog inputs for setpoint adjustment and four (4) analog outputs as well as one (1) relay output for diagnostic reporting. Inputs can use a potentiometer or 0-10 VDC signal.

Inter-Processor Communication Bridge (IPCB)

This optional module shall provide an amplified and filtered version of the IPC link for connection to a Remote Human Interface Panel. Each rooftop that is tied into a Remote Human Interface Panel shall have an IPCB installed into it.

Rapid Restart

Option shall provide immediate start up upon power failure. A backup generator shall be required on site before unit start up. Rapid Restart shall begin immediately after recovery from a power loss and work by restarting the compressors and supply fan quickly to provide full cooling within two to three minutes.

System Control Options

Constant Volume

Option shall provide all the necessary controls to operate rooftop from a zone sensor, including CV microprocessor unit control module, a microprocessor compressor controller and a unit mounted Human Interface Panel.

Variable Air Volume Supply Air Temperature control

Option shall provide all the necessary controls to operate a VAV rooftop from the discharge air temperature, including discharge air microprocessor controller and discharge air sensor. The microprocessor controller shall coordinate the economizer control and the stages of cooling with zone or outdoor air reset capabilities and an adjustable control band to fine-tune the control to specific applications.

Variable Air Volume Supply Air Temperature Control with Variable Frequency Drives w/ or w/o Bypass

Option shall provide all necessary controls to operate a VAV rooftop from the discharge air temperature, including discharge air microprocessor controller and discharge air sensor.

The microprocessor controller shall coordinate the economizer control and the stages of cooling with discharge air temperature reset capabilities. Option shall include factory installed and tested VFDs to provide supply fan motor speed modulation.

VFD shall receive 0-10 VDC from the unit microprocessor based upon supply static pressure and causes the drive to accelerate or decelerate as required to maintain the supply static pressure setpoint. Optional bypass control shall provide full nominal airflow in the event of drive failure.

Single Zone Variable Air Volume

Single zone VAV option shall provide all necessary controls to operate a rooftop unit based on maintaining two temperature setpoints; the discharge air and zone. Option shall include factory-

installed variable frequency drive (VFD) to provide supply fan motor speed modulation. During Single Zone VAV cooling, the unit shall maintain zone cooling setpoint by modulating the supply fan speed more or less to meet zone load demand, and the unit shall maintain discharge temperature to the discharge cooling setpoint by modulating economizer if available and staging DX cooling.

Electrical System

Power Supply

Air-cooled rooftops shall be available with 460 or 575 voltage, 3 phase 60 hertz power supply and 380 voltage, 3 phase 50 hertz power supply (Evaporative Condenser models available in 460 voltage, 3 phase, 60 hertz power supply only).

Convenience Outlet

A 15A, 115V Ground Fault Interrupter convenience outlet shall be factory installed and wired and powered from a factory mounted transformer. A unit mounted, non-fused disconnect with internal handle is furnished with the factory powered convenience outlet.

Non-Fused Disconnect Switch

An external handle mounted on the control box door shall be provided to disconnect unit power with the control box door closed for safety.

Compressor Protection

Compressor Protection Modules shall be included in the junction box to protect compressors against reverse rotation.

Unit Interrupt Rating (Short Circuit Current Rating-SCCR)

An optional 65,000 Amp rating (480V) and 25,000 Amp rating (600V) shall be applied to the unit enclosure using a non-fused circuit breaker for disconnect switch purposes. Fan motors, compressors, and electric heat circuits shall be provided with protective devices that will provide an elevated level of fault protection. The unit shall be marked with approved cULus markings and will adhere to cULus regulations.

Marine Lights (Customer Powered)

A 120V master light switch shall be factory installed in the main unit control box for lighting control. The master switch shall be wired into an isolated terminal block with access for customer provided service. Marine light fixtures shall be supplied with 150W incandescent bulbs. Marine light fixtures shall be placed in the Supply Section (2), Outside Air Section (1), Return Section (1), and Extended Casing Section (1) for units without Heat.

Supply/Exhaust/Return Motors

Supply, exhaust/return motors shall be either open drip-proof or totally enclosed fan cooled (TEFC). All 60 Hz motors meet the Energy Independence and Security Act of 2007 (EISA). All 50 Hz supply, exhaust/ return motors shall meet the U.S. Energy Policy Act of 1992 (EPACT). Motors with internal Shaft grounding rings can be selected for use with VFD applications and shall provide a conductive discharge path away from the motor bearings to ground.

Filters

General

Filter options shall mount integral within the unit and be accessible by a hinged access door with a single point latching device.

Pre-evaporator Coil Filter Options

No Filters (Two-inch Nominal Thickness Throwaway Filter Rack Only)

Mechanical Specifications

Shall provide a galvanized steel filter rack (less filter media) with filter channels to handle a complete set of two-inch nominal thickness throwaway filters to accommodate applications which require field supplied filters.

No Filters (Bag or Cartridge Filter Rack with Throwaway Prefilter Rack Only)

Shall provide a galvanized steel filter rack (less filter media) to handle a complete set of two-inch or four-inch (depending on airflow) nominal thickness throwaway prefilters and 7/8" actual header thickness bag or cartridge filters to accommodate applications which require field supplied filters.

MERV 8 Throwaway Filters (Standard)

Shall be provided as standard-U.L. Class 2, two-inch nominal thickness, high efficiency pleated media filters rated MERV 8 per ASHRAE 52.2. Filters shall be provided mounted in a galvanized steel filter rack.

MERV 15, 90-95 Percent Bag Filters Option

Nineteen-inch deep bag filters shall be U.L. Class 2 and have synthetic media mounted to a 7/8" nominal thickness header frame. These bag filters shall have an efficiency rating of MERV 15 per ASHRAE 52.2. To ensure maximum bag filter life two-inch prefilters shall be included with the bag filters. Filters shall be mounted in a galvanized steel filter rack.

MERV 14, 90-95 Percent Cartridge Filters Option

Twelve-inch deep cartridge filters shall be U.L. Class 1 and be mounted with a 7/8" nominal thickness header frame. These cartridge filters shall have an efficiency rating of MERV 14 per ASHRAE 52.2. To ensure maximum cartridge filter life, two-inch (or four-inch, depending on the application) prefilters shall be included with the cartridge filters. Filters shall be mounted in a galvanized steel filter rack.

MERV 14, 90-95 Percent, Low Pressure Drop, Totally Incinerable, Cartridge

Twelve-inch deep cartridge filter shall be U.L. Class 2 and mounted with a rigid 7/8" nominal thickness header frame. These low pressure drop cartridge filters shall have an efficiency rating of MERV 14 per ASHRAE 52.2. To ensure maximum cartridge filter life two-inch or four-inch prefilters (depending on airflow) shall be included with the high-flow, cartridge filters. Filters shall be mounted in a galvanized steel filter rack.

Final Filters Options (Available Only on Units with Blank Section)

Final filter section filter options shall mount integral within the blank section unit casing and be accessible by hinged access doors.

MERV 15, 90-95 Percent, Bag, Final Filter Option

Note: Available on cooling only units with four or eight-foot blank section, as well as steam and hot water units with eight-foot blank section, unit casing only.

Nineteen-inch deep bag filters shall be U.L. Class 2 and have synthetic media mounted to a 7/8" nominal thickness header frame. These bag filters shall have an efficiency rating of MERV 15 per ASHRAE 52.2. To ensure maximum bag final filter life two-inch, MERV 8 prefilters shall be included with the bag filters. Filters shall be mounted in a galvanized steel filter frame bank.

MERV 14, 90-95 Percent, Cartridge, Final Filter Option

Note: Available on cooling only units with four or eight-foot blank section, as well as steam and hot water units with eight-foot blank section, unit casing only.

Twelve-inch deep cartridge filters shall be U.L. Class 1 and be mounted with a 7/8" nominal thickness header frame. These cartridge filters shall have an efficiency rating of MERV 14 per ASHRAE 52.2. To ensure maximum cartridge filter life, two-inch, MERV 8 prefilters shall be included with the cartridge filters. Filters shall be mounted in a galvanized steel filter frame bank.

MERV 14, 90-95 Percent, Low Pressure Drop, Totally Incinerable, Cartridge

Note: Available on cooling only units with four or eight-foot blank section, as well as steam and hot water units with eight-foot blank section, unit casing only.

Twelve-inch deep cartridge filter shall be U.L. Class 2 and mounted with a rigid 7/8" nominal thickness header frame. These cartridge filters shall have an efficiency rating of MERV 14 per ASHRAE 52.2. To ensure maximum cartridge final filter life four-inch, MERV 8 prefilters shall be

included with these cartridge filters. Filters shall be mounted in a galvanized steel filter frame bank.

MERV 14, 90-95 Percent, High Temperature Rated, Cartridge, Final Filter Option

Note: Available on gas and electric heat units with eight-foot blank section casing only.

Twelve-inch deep cartridge filters shall be U.L. Class 1 and be mounted in a galvanized steel casing with a 7/8" nominal thickness header frame. These cartridge filters shall have an efficiency rating of MERV 14 per ASHRAE 52.2. To ensure maximum cartridge final filter life high temperature rated two-inch, MERV 8 prefilters shall be included with the cartridge filters. Filters shall be mounted in a galvanized steel filter frame bank.

MERV 17, 99.97 Percent, Standard Temperature Rated, HEPA, Final Filter Option

Note: Available on cooling only units with four or eight-foot blank section, as well as steam and hot water units with eight-foot blank section, unit casing only.

Twelve-inch deep HEPA filters shall be U.L. Class 1 and be mounted in a galvanized steel casing. These filters have an efficiency rating of MERV 17 per ASHRAE 52.2 and an efficiency of 99.97% on a 0.3 micron DOP particle size. To ensure maximum HEPA final filter life two-inch, MERV 8 prefilters shall be included with the HEPA final filters. Filters shall be mounted in a galvanized steel filter frame bank.

MERV 17, 99.97 Percent, High Temperature Rated, HEPA, Final Filter Option

Note: Available on gas and electric heat units with eight-foot blank section casing only.

Twelve-inch deep HEPA filters shall be U.L. Class 1 and be mounted in a galvanized steel casing. These filters have an efficiency rating of MERV 17 per ASHRAE 52.2 and an efficiency of 99.97% on a 0.3 micron DOP particle size. To ensure maximum HEPA final filter life high temperature rated two-inch, MERV 8 prefilters shall be included with the HEPA final filters. Filters shall be mounted in a galvanized steel filter frame bank.

Exhaust Air

General

Exhaust air options shall include no relief, 100 percent modulating exhaust fan and 100 percent modulating exhaust fan with direct space building pressurization control. Exhaust fans shall be either standard or low airflow

No Relief (Standard)

Relief air opening shall be sealed with panel and made watertight.

100 Percent Modulating Exhaust Fan Option

Fan design shall be double width, double inlet forward-curved type. Fan shall be mounted on a shaft with fixed sheave drive. All fans shall be dynamically balanced and tested in factory before being installed in unit. It shall be test run in unit as part of unit test.

Fan operating envelop rpm shall be below first critical speed. Fan shaft shall be mounted on two grease lubricated ball or roller bearings as applicable designed for 200,000-hour average life. Extended grease lines shall be provided to allow greasing of bearings from section base rail. Fan motor and assembly shall be mounted on common base to allow consistent belt tension with no relative motion between fan and motor shafts. The entire assembly shall be completely isolated from unit with 2-inch spring isolation. Discharge dampers at unit outlet shall modulate exhaust airflow in response to OA damper position.

The fan shall operate when economizer damper is open greater than minimum position. Discharge dampers at fan outlet shall modulate in response to economizer damper position on Constant Volume (CV) rooftops.

100 Percent Modulating Exhaust Fan with Statitrac Control Option

Fan design shall be double width, double inlet forward-curved type. Fan shall be mounted on a shaft with fixed sheave drive. All fans shall be dynamically balanced and tested in factory before being installed in unit. Exhaust fan shall be test run as part of unit final run test.

Fan operating envelop rpm shall be below first critical speed. Fan shaft shall be mounted on two grease lubricated ball or roller bearings designed for 200,000-hour average life. Extended grease lines shall be provided to allow greasing of bearings from section base rail.

Fan motor and assembly shall be mounted on common base to allow consistent belt tension with no relative motion between fan and motor shafts. The entire assembly shall be completely isolated from unit with 2-inch spring isolators. For both CV and VAV rooftops, the 100 percent modulating exhaust discharge damper (or VFD) shall be modulated in response to building pressure. A differential pressure control system, (Statitrac), shall use a differential pressure transducer to compare indoor building pressure to outdoor ambient atmospheric pressure. The FC exhaust fan shall be turned on when required to lower building static pressure setpoint.

The (Statitrac) control system shall then modulate the discharge dampers (or VFD) to control the building pressure to within the adjustable, specified deadband that shall be adjustable at the Human Interface Panel. Optional bypass can be factory installed to provide full nominal airflow in the event of a drive failure.

Return Air

General

Return air options shall include 100 percent modulating return fan and 100 percent modulating return with direct space building pressurization control. Return fans shall be either standard or low airflow.

100 Percent Modulating Return Fan

A single width plenum fan with airfoil blade shall be mounted on a shaft with fixed sheave drive. The fan shall be dynamically balanced for the operating envelop and tested in factory before being installed in unit. The plenum fan shall be test run in unit as part of unit test. Fan operating envelop rpm shall be below first critical speed. Fan shaft shall be mounted on two grease lubricated ball or roller bearings designed for 200,000-hour average life. Extended grease lines shall be provided to allow greasing of bearings from section base rail.

Fan motor and assembly shall be mounted on common base to allow consistent belt tension with no relative motion between fan and motor shafts. The entire assembly shall be completely isolated from unit with 2-inch spring isolators. Discharge dampers at unit outlet shall modulate relief airflow in response to OA / return air damper position. The return fan VFD shall operate in conjunction with the supply fan.

100 Percent Modulating Return Fan with Statitrac Control Option

A single width plenum fan with airfoil blade shall be mounted on a shaft with fixed sheave drive. The fan shall be dynamically balanced for the operating envelop and tested in factory before being installed in unit. The plenum fan shall be test run as part of unit final run test. Fan operating envelop rpm shall be below first critical speed. Fan shaft shall be mounted on two grease lubricated ball or roller bearings designed for 200,000-hour average life. Extended grease lines shall be provided to allow greasing of bearings from section base rail.

Fan motor and assembly shall be mounted on common base to allow consistent belt tension with no relative motion between fan and motor shafts. The entire assembly shall be completely isolated from unit with 2-inch spring isolators. The 100 percent modulating relief damper shall be modulated in response to building pressure. A differential pressure control system, (Statitrac), shall use a differential pressure transducer to compare indoor building pressure to outdoor ambient atmospheric pressure.

The Statitrac control system shall modulate the discharge dampers to control the building pressure to within the adjustable, specified deadband that shall be adjustable at the Human Interface Panel. The return fan VFD shall modulate in response to return duct static pressure. Optional bypass can be factory installed to provide full nominal airflow in the event of a drive failure.

Outside Air

General

Three outside air options: 0 to 25 percent motorized controlled outside air, 0-100 percent fully modulating economizer, and 0-100 percent fully modulating economizer with outside air measurement.

0-25 Percent Motorized Outside Air Damper Option

0-25 percent motorized outside air damper option shall include an outside air opening with moisture eliminator and motorized position damper for drawing up to 25 percent outside air. The damper position will be adjustable at the Human Interface Panel.

0-100 Percent Modulating Economizer Option

Economizer shall be operated through the primary temperature controls to automatically utilize OA for "free" cooling. Automatically modulated return and OA dampers shall maintain proper temperature in the conditioned space. Economizer shall be equipped with an automatic lockout when the outdoor high ambient temperature is too high for proper cooling. Minimum position control shall be standard and adjustable at the Human Interface Panel or with a remote potentiometer or through the building management system. A spring return motor shall ensure closure of OA dampers during unit shutdown or power interruption. Mechanical cooling shall be available to aid the economizer mode at any ambient. Standard economizer dampers shall have a leakage rate of 20 CFM/ft² at 1.0 in W.C. pressure difference.

Low Leak Dampers

Low leak dampers shall be provided with chlorinated polyvinyl chloride gasketing added to the damper blades and rolled stainless steel jamb seals to the sides of the damper assembly. The low leak dampers shall have a leakage rate of 10 CFM/ft² (AMCA Class 2) at 1.0 in W.C. pressure difference.

Ultra Low Leak Dampers AMCA Class 1

Standard ultra low leak damper will have added sealing under the jamb seals and in the frame. The ultra low leak dampers shall have a leakage rate of 4 CFM/ft² (AMCA Class 1) at 1.0 in W.C. pressure difference.

Note: Based on testing completed in accordance with AMCA Standard 500D.

Ultra Low Leak, AMCA 1A Economizer

The AMCA 1A rated Ultra Low Leak Economizer option shall be provided with parallel operating, horizontal airfoil blades and spring-return actuators (to the fresh air closed, return air open position). The economizer, including linkages and actuators, shall have a 5 year limited warranty and functional life of 60,000 opening and closed cycles. Dampers shall be AMCA 511 Class 1A certified with a maximum leakage rate of 3 CFM/sq-ft at 1.0 in WC pressure differential.

Economizer frame and 6" wide blades shall be galvanized steel. Blade edge seals shall be Ruskiprene (-72°F to + 275°F) and jamb seals shall be compressible, flexible metal.

The economizer fresh air damper shall include an adjustable linkage to allow for field damper balance of pressure drop between 100% fresh and 100% return airflow paths. The adjustable linkage is used to limit the fresh air damper maximum wide open stroke.

Fault Detection and Diagnostic

Fault Detection and Diagnostic (FDD) control shall also be provided with Ultra Low Leak Economizers. FDD control shall monitor the commanded position of the economizer compared to the feedback position of the damper. If the damper position is outside +/- 10% of the commanded position, a diagnostic shall be generated.

Intellipak units ordered with Ultra Low Leak Economizers shall be listed on the California Energy Commission Registry for factory compliance with Title 24 Economizer and FDD requirements. A



Mechanical Specifications

label shall be applied to the unit identifying construction with the Ultra Low Leak Economizer and FDD controls.

Economizer Control with Comparative Enthalpy

Option shall include two enthalpy sensors to compare total heat content of the indoor air and outdoor air to determine the most efficient air source when economizing.

Economizer Control with Reference Enthalpy

Option shall include an outdoor enthalpy sensor to compare the total heat content of outdoor air to a locally adjustable setpoint. The setpoint shall be programmed at the human interface, or remote human interface, to determine if the outdoor enthalpy condition is suitable for economizer operation.

Economizer Control with Dry Bulb

Option shall include an outdoor temperature sensor for comparing the outdoor dry bulb temperature to a locally adjustable temperature setpoint. The setpoint shall be programmed at the human interface, or remote human interface, to determine if outdoor air temperature is suitable for economizer operation.

Outside Air Measurement (Traq)

A factory mounted airflow measurement station (Traq) shall be provided in the outside air opening to measure airflow. The airflow measurement station shall be AMCA certified (+/- 5.0%) from 300fpm to 2500fpm. The airflow measurement station shall adjust for temperature variations

Demand Control Ventilation

When equipped with a CO₂ sensor and the (VCM) module, the outside air damper position shall modulate in response to a CO₂ sensor in the conditioned space, in order to minimize the unit energy consumption, yet simultaneously meet the ventilation requirements of ASHRAE Std 62.1. The Traq airflow monitoring solution augments the system, allowing for measurement and control of outside airflow.

Note: CO₂ sensor used with Demand Control Ventilation must be powered from an external power source or separate 24 VAC transformer.

Ventilation Override Module

With the optional Ventilation Override Module (VOM) installed, the unit shall be programmed to transition to up to 5 different programmed sequences for Smoke Purge, Evacuation, Pressurization, Purge, Purge with duct control sequence and Unit off. The transition shall occur when a binary input on the VOM is closed (shorted); typically a hard-wired relay output from a smoke detector or fire control panel.

Heating System

Electric Heating Option

All electric heat models shall be completely assembled and have wired electric heating system integral within the rooftop unit. Heavy duty nickel chromium elements internally wired with a maximum density of 40 watts per square inch shall be provided. Heater circuits shall be 48 amps or less, each individually fused. Automatic reset high limit control shall operate through heater backup contactors. The 460 and 575 volt electric units shall have optional factory mounted non-fused disconnect switch located in the main control panel to serve the entire unit.

Gas Fired Heating Option

All gas fired units shall be completely assembled and have a wired gas fired heating system integral within unit. Units shall be cULus approved specifically for outdoor applications downstream from refrigerant cooling coils. All gas piping shall be threaded connection with a pipe cap provided. Gas supply connection shall be provided through the side on horizontal discharge units, and through the bottom and side for downflow discharge units. All units shall be fire tested prior to shipment.

- Heat Exchanger shall be tubular two pass design with stainless steel primary and secondary surfaces. Free floating design shall eliminate expansion and contraction stresses and noises. Gasketed cleanout plate shall be provided for cleaning of tubes/ turbulators. Heat exchanger shall be factory pressure and leak tested.
- Burner shall be a stainless steel industrial type with an air proving switch to prevent burner operation if the burner is open for maintenance or inspection. Ceramic cone shall be provided to shape the flame to prevent impingement on sides of heat exchanger drum. Burner assembly shall house ignition and monitoring electrode.
- Combustion Blower shall be centrifugal type fan to provide air required for combustion. Fan motor shall have built-in thermal overload protection.
- Gas Safety Controls shall include electronic flame safety controls to require proving of combustion air prior to ignition sequence which shall include a 60 second pre-purge cycle. Pilot ignition shall be provided on 850, 1100, 1800 and 2500 MBh heat exchanger units. Sixty second delay shall be provided between first and second stage gas valve operation on two-stage heaters. Continuous electronic flame supervision shall be provided as standard.
- Full Modulation Gas Heaters shall be made from grades of stainless steel suitable for condensing conditions. The heater shall have a turn down ratio of at least 10 to 1 on the 850 and 20 to 1 on the 1100, 1800 and 2500 MBh

Steam Heating Option

Steam coils shall be Type NS with non-freeze steam distribution circuits. Distributor tubes shall be located concentrically within condensing tubes to assure even steam distribution. Coils shall be pitched to provide complete drainage. Steam modulating valve with actuator shall be provided.

Hot Water Heating Option

Hot water coils shall be Type 5W and factory mounted in the rooftop unit to provide complete drainage of coil. Hot water modulating valve with actuator shall be provided.

Energy Saving Options

Energy Recovery Wheel

The energy recovery option shall incorporate a rotary wheel in an insulated cassette frame complete with seals, drive motor, and drive belt. Two wheel size options shall be available for each unit. The standard size option shall be capable of treating 50% of maximum unit outside airflow, while the low CFM shall be able to treat only 30%. An exhaust fan shall be required in conjunction with the energy recovery option. A return fan option is incompatible with the energy recovery wheel option.

Mechanical Specifications

A total energy recovery wheel shall be required to recover both sensible and latent energy. The factory installed wheel shall be coated with a silica gel desiccant. The desiccant shall be permanently bonded without the use of binders or adhesives or other means which may degrade desiccant performance. The substrate shall be lightweight polymer and shall not degrade nor require additional coatings for application in marine or coastal environments.

Desiccant shall not dissolve or deliquesce in the presence of water or high humidity. The coated wheel segments shall be washable with non-acid coil cleaner or alkaline detergent and warm water. Wheel segments shall be removable without specialized tools or compartment modifications to facilitate maintenance and cleaning.

Hot Gas Reheat Option

Hot Gas Reheat option shall consist of hot gas reheat coil, located on the leaving air side of the evaporator coil, and pre-piped to circuit 1 along with a modulating reheat valve.

Evaporative Condensing Option

The evaporative condenser module shall be located in the outdoor section of the unit. The module shall consist of two serpentine copper coils enclosed in a fiber glass and stainless steel cabinet, a sump to hold the water, and water and air movement devices. The water movement devices shall consist of a sump pump for water distribution on the coils, float switches to maintain the water level in the sump, fill and drain valves to fill and drain the sump as required. The air movement devices are condenser fans that are modulated to control air flow through the coils.

Accessories

Roof Mounting Curb

Roof mounting curb shall be heavy gauge zinc coated steel with nominal two-inch by four-inch nailer setup. Supply/return air opening gasketing shall be provided. Curb shall ship knocked down for easy assembly. Channel shall be provided to allow for adjustment of return air opening location. Curb shall be manufactured to National Roofing Contractors Association guidelines.

Electronic Zone Sensors

- Zone Sensor shall provide two temperature setpoint levers, Heat, Auto, Off, or Cool system switch, Fan Auto or Fan On switch. Optional status indication LED lights, System On, Heat, Cool, and Service shall be available. This sensor shall be used with CV & SZVAV units.
- Programmable Night Setback Sensor shall be electronic programmable with auto or manual changeover with 7 day programming. Keyboard shall provide selection of Heat, Cool, Fan Auto or On. All programmable sensors shall have System On, Heat, Cool, Service LED/ indicators as standard. Night setback sensors shall have (1) Occupied, (1) Unoccupied and (1) Override program per day. Sensors shall be available for CV zone temperature control and VAV Supply Air temperature control.
- VAV Zone Sensor shall be provided with supply air single temperature setpoint and AUTO/OFF system switch. Status indication LED lights shall include: System On, Heat, Cool and Service. Sensor shall be provided for zone temperature control with VAV units. VAV units are not compatible with SZVAV units.
- Remote Sensor shall be available to be used for remote zone temperature sensing capabilities when zone sensors are used as Remote panels.
- Fast Warm-Up Sensor shall be used as Morning warm-up sensor with VAV units.
- Integrated Comfort System sensors shall be available with sensor only, sensor with timed override, and sensor with local temperature setpoint adjustment with timed override.
- Remote Minimum Position Potentiometer shall be available to remotely adjust the minimum position setting of the unit economizer.
- AirFi™ Wireless Zone Sensor shall be available with a RF wireless zone temperature, setpoint and timed override transmitter and a RF receiver that connects directly to the IntelliPak 2 controller and uses spread spectrum technology. Option includes sensor, receiver wiring

harness and (2) AA lithium batteries. Sensor battery life shall provide at least 5 years life under normal operating conditions and shall provide a readily visual indication of battery condition.

CO₂ (Carbon Dioxide) Sensing

The CO₂ sensor shall have the ability to monitor space occupancy levels within the building by measuring the parts per million of CO₂ in the air. As the CO₂ levels increase, the outside air damper modulates to meet the CO₂ space ventilation requirements.

Humidity Sensor

A wall or duct-mounted humidity sensor shall be used to control activation of the hot gas reheat dehumidification option. The humidity sensor shall be set for humidity levels between 40% and 60% relative humidity

High Duct Temperature Thermostats

Two manual reset thermostats shall be provided with one located in the discharge section of the unit set at 240°F and the other in the return section set at 135°F. The rooftop shall shut down if the thermostats are tripped.

Trane Startup

A Trane technician shall provide unit startup after the unit is properly installed. The installation shall include:

- Unit and all ship-with items installed
- All utilities and drain pipes connected
- All refrigerant piping reconnected and all refrigerant charge adequately distributed throughout the system
- All ductwork attached to the unit

Prior to Trane Unit Startup

Prior to Trane startup, the following work should be inspected and verified:

Evaporative Condenser

Review the Multi-piece units section for refrigeration hookup. Review the water system to ensure that the fill valve is properly set and the drain timing is set properly for the given application. Verify the condenser fan shipping supports have been removed.

Unit inspection - Cabinet

Review the overall unit for exterior damage (dents, bends, missing panels, doors working properly, etc). Verify the unit interior is free from debris/obstructions, the panels and doors are secured properly, the unit clearances are adequate to avoid air recirculation, and that the unit drain lines and traps are properly installed.

Wiring

Review the unit main power to ensure that the unit is properly grounded, the main power feed wire gauge is adequately sized, the correct voltage is supplied to the unit and electric heaters (if applicable), and the incoming voltage is phase balanced. Verify that all wiring connections are tight, all field installed control wiring is landed on correct terminals, and that all automation and remote controls, along with control wiring for CV and VAV controls, are correctly installed/wired.

Refrigeration system

Review the refrigeration system to ensure the coil fins are straightened, shipping hardware and plastic covers for compressors have been removed, compressors contain the correct oil level, service valves are in the correct position, and the crankcase heaters have been operational for at least 12 hours prior to Trane startup.

Fans

Mechanical Specifications

Check the unit fans to ensure the condenser fan blade set-screws to the motor shaft are tight, hold down bolts and channels from fan sections have been removed, proper adjustment of fan section spring isolators, proper fan belts tension, adequate fan bearings greased, alignment of fan sheaves, adequate tightness of supply and exhaust fan pulley bolts, proper fan rotation, and proper fan motor amperage.

Multi-piece units

Check to ensure both piping to the condenser and air handler side of the system have been completed and interconnecting refrigerant tubing has been evacuated. Verify base rail connection points. Inspect and verify wiring connection points related to multi-piece units.

Economizer

Check all damper linkages for proper adjustment. Verify proper damper operation and outside air pressure sensors.

Electric Heat

On units equipped with electric heaters, check to ensure the heating system matches the unit nameplate and verify that the correct voltage is supplied to the heaters.

Hot Water/Steam

On units equipped with hot water heat, check and verify the following: hot water pipes are properly routed, sized and leak free; the presence of swing joints or flexible connectors next to the hot water coil; proper gate valve installation in the supply and return branch line; proper three way modulating valve installation, and proper coil venting. On units equipped with steam heat, check and verify the following: hot water pipes are properly routed, sized and leak free; proper swing check vacuum breaker installation; proper 2-way modulating valve installation; and proper steam trap installation.

Gas Heat

On units equipped with gas heaters, check to ensure that the flue assembly is secure and properly installed, sufficient gas pressure exists at the unit, no leaks exist in gas supply line, the gas heat piping includes a drip leg, and condensate line is run if required.

Trane Unit Startup

After the unit installation has been fully completed, a Trane technician shall do the following:

- Verify and log supply fan operation, proper compressor operation, and condenser fan operation, as well as correct levels of superheat and subcooling.
- Verify operation of all VAV modes per job requirements, which include: Supply Air Cooling and Heating, Daytime Warmup, Morning Warmup, and Supply Air Tempering.

Evaporative Condenser — Verify the sump fill level, set blow-down interval and duration per customer requirement.

Return Fan — Establish the return fan maximum setpoint based on the required building pressure setpoint.

Space pressure control — Verify that unit is sensing field installed building pressure input.

GBAS 0-5 & 0-10 VDC — Verify that inputs are set up and functional per customer requirement.

Ventilation override — Verify that sequences are set up and functional per customer requirement.

Economizer — Adjust outside air travel and verify all sensor inputs.

Dehumidification — Verify that dehumidification mode operates correctly and is set up per job requirements.

Outside Air Measurement — Verify that there is correct Traq damper linkage and actuator operation, as well as matched left and right air flow. Verify that Demand Flow Ventilation function is correct.

Gas Heat — Startup gas heat per the unit Installation, Operation, Maintenance Manual (IOM) and record CO₂ and O₂ levels.

Energy Recovery — Check to ensure proper rotation and operation of the wheel. Use the service test guide in the unit Installation, Operation, Maintenance Manual (IOM) to operate unit components.

All units — Verify Human Interface programming, including setpoints and sensor sources per customer requirements. Leave the unit in a running state or off per customer requirement. Once the IntelliPak® unit startup is complete, provide a startup activities communication and the associated operating log.

Certified AHRI Performance

Packaged Rooftop units cooling, heating capacities and efficiencies shall be rated within the scope of the Air-Conditioning, Heating & Refrigeration Institute (AHRI) Certification Program and display the AHRI Certified® mark as a visual confirmation of conformance to the certification sections of AHRI Standard 340-360 (I-P) and ANSI Z21.47 and 10 CFR Part 431 pertaining to Commercial Warm Air Furnaces. The applications in this catalog specifically excluded from the AHRI certification program are:

- Ventilation modes
- Heat Recovery



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TRANE®

Electric Unit Heaters



Model UHWA



Model UHAA



Model UHRA



Model UHXA



Model UHEC



Model UHCA









Model UHEC

Introduction

Introduction

Electric unit heaters have been a traditional means of heating hard-to-warm spaces for many years. Their uncomplicated approach in auxiliary heating make them easy to install and maintain. Their versatile characteristics allow Trane's electric unit heaters to fill nearly every heating application gap, while their structural integrity makes them a reliable heat source to blend into today's building décor.

Trane's electric unit heaters are available in 6 variations. The following chart presents a brief overview of the different electric unit heater models Trane offers.

<i>Model</i>	<i>Description</i>	<i>Application</i>
UHEC 3 to 50 kW 	Horizontal and Vertical Spot Heating Electric Unit Heater	Applied as an auxiliary heat source in walkways, stairways, vestibules, and entrances. The horizontal and vertical spot heater may be used in commercial, industrial and institutional applications.
UHRA 3 to 48 kW 	Hose-Down, Corrosion-Resistant Electric Unit Heater	Used in industrial applications where dirt or dust may be extensive. The totally enclosed, watertight casing is corrosion-resistant for non-hazardous locations.
UHXA 3 to 25 kW 	Explosion-Proof Electric Unit Heater	Designed for hazardous locations, the UHXA model may be applied where flammable gases, vapors, powdered metals or dust may be present.
UHCA 2 to 5 kW 	Commercial, Ceiling-Mounted Electric Unit Heater	The surface- or recessed mounted model may be applied in restricted areas or where wall space is limited. This may included vestibules, lobbies, rest rooms, small-offices or guard buildings.
UHWA 2 to 5 kW 	Heavy Duty, Wall Mounted Electric Unit Heater Series 20 and 50	Suited for public buildings such as schools, stores, offices, dormitories, hospitals and transportation terminals.
UHAA 1.5 to 4.8 kW 	Architectural Wall Mounted Electric Unit Heater	The rugged construction and attractive design of the UHAA model make them appropriate for offices, lobbies, and reception areas for schools and dormitories.

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Features and Benefits

Model UHEC

Electric Unit Heaters

- Thirty-seven models to choose from ranging from 3.3 to 50 kW. Available for 208, 240/208, 277 or 480-volt operation.
- One unit can be used for either horizontal or vertical discharge.
- Specially designed inlet louvers, venturi and outlet diffuser provide uniform air temperature and throw characteristics.
- Single-phase units, easily converted to three-phase power, are available in 3.3 to 10 kW for 208 and 240-volt operation.
- Two-speed fan operation standard on 25 kW units and above.
- Meets all requirements of UL listing standard 1278 when installed as directed.

UHEC electric unit heaters are ideal for applications ranging from new construction to auxiliary heat to renovation. They are available in 37 models ranging from 3.3 kW to 50 kW. In addition to a wide capacity range, each compact, attractive unit can be mounted in either a horizontal or vertical discharge arrangement.

Flexibility

The Trane electric unit heater shows its flexibility in installation and operation. Intended for industrial, commercial or institutional use, the Trane electric unit heater is available for 208 to 480-volt, single or three-phase operation. Units from 3.3 to 10 kW for 208 and 240-volt operation may be converted easily from single to three-phase operation in the field. Two-speed fan operation on 25 kW units and above provides greater airflow flexibility.

Uniform Air Distribution

The Trane unit heater uniformly directs the air to exactly where it's needed. A specially designed deep-drawn venturi assures uniform air distribution. The outward-drawn venturi channels the air forward for maximum, uniform air throw. Outlet diffusers are provided to properly direct the heated discharge air.

In order to minimize the potential for hot spots on the heating coil, inlet louvers evenly distribute intake air over the entire heating element.

Trane electric unit heaters are designed with totally enclosed, permanently lubricated industrial motors. The air-over-motor design reduces operating temperatures, promoting long motor life. Thermal overloads provide additional protection for major circuits, in case normal operating temperatures are exceeded.

Quick and Easy Low-Cost Installation

Installation time and costs are minimized. Compact and completely factory wired, the Trane electric unit heater requires only a single-source power supply connection. The units are available with factory installed 24-volt control transformers and contactors.

Outlet Louvers — Individually adjustable from 30° up to 45° down.

Motor and Fan — Totally enclosed, permanently lubricated, sealed bearing, all-angle motor and fan combination through 20 kW and two-speed permanent capacitor-type motor on 25 through 50 kW units.

Contactors — All units 25 kW and larger are equipped with two contactors and two element banks for either single or two-stage heating operation.

Fusing — Element, motor and transformer primary fusing are factory installed and wired where required to NEC. Branch circuit fusing installed where required on 48 amps and up.

Casing — Die-formed heavy-gauge steel with baked enamel finish.

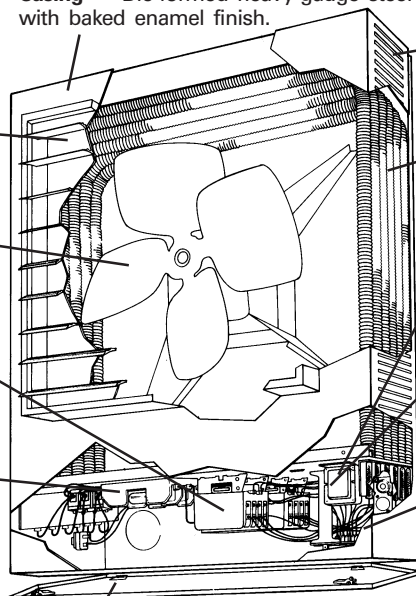
Intake Louvers — Designed to provide uniform air distribution across entire heating element.

Element — High mass, all steel finned, tubular heating element.

Transformer — 24-volt control circuit for closer temperature control and added safety. Standard on most models, optional on 3.0 and 5 kW 208, 240/208, 277-volt models.

Thermal Overloads — Automatic reset thermal cutouts disconnect motor and element in the event normal operating temperatures are exceeded.

Terminal Panel — Single-point terminal board wiring for easy control accessories installation.



Access Panel — Full width access panel secured by quarter-turn fasteners.



Features and Benefits

Model UHEC

Mounting the unit is easily accomplished with the use of hanger rods connected to weld nuts on the unit casing. An accessory mounting bracket is available for single-point mounting. Field installed accessories such as built-in thermostats, disconnect switches and summer fan switches are provided with spade terminals for easy installation to a single-point terminal board.

Reliable Operation

Trane electric UHEC unit heaters operate reliably when installed and operated as directed. In addition to meeting all requirements of UL listing standard 1025, the heating element is backed with a five-year warranty.

Easy Access

In the event that service is required, easy access to the control components is provided with a full-length access panel secured by quarter-turn fasteners. For added convenience, unit wiring diagrams are located inside the access panel for easy reference during installation and servicing.



Horizontal Discharge



Vertical Discharge

Features and Benefits

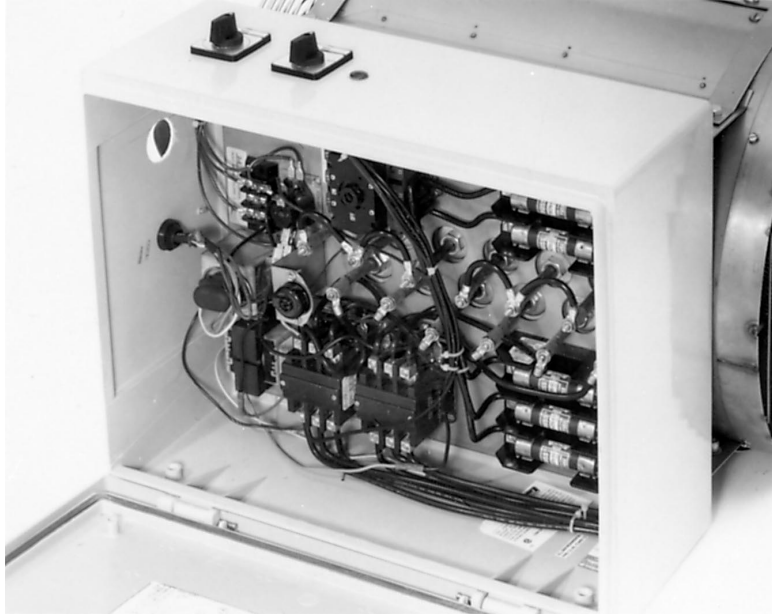
Model UHRA

Hose-Down Electric Unit Heaters

Trane UHRA hose-down electric unit heaters are constructed for use in areas that require washing or hosing of equipment due to a dirty or dusty industrial environment in non-hazardous locations. The totally enclosed, watertight casing made with corrosion-resistant material, makes the unit ideal for industrial heating applications. All controls are built-in and the safety temperature controls are wired in a nonmetallic NEMA 4x control panel with single-point power connections.

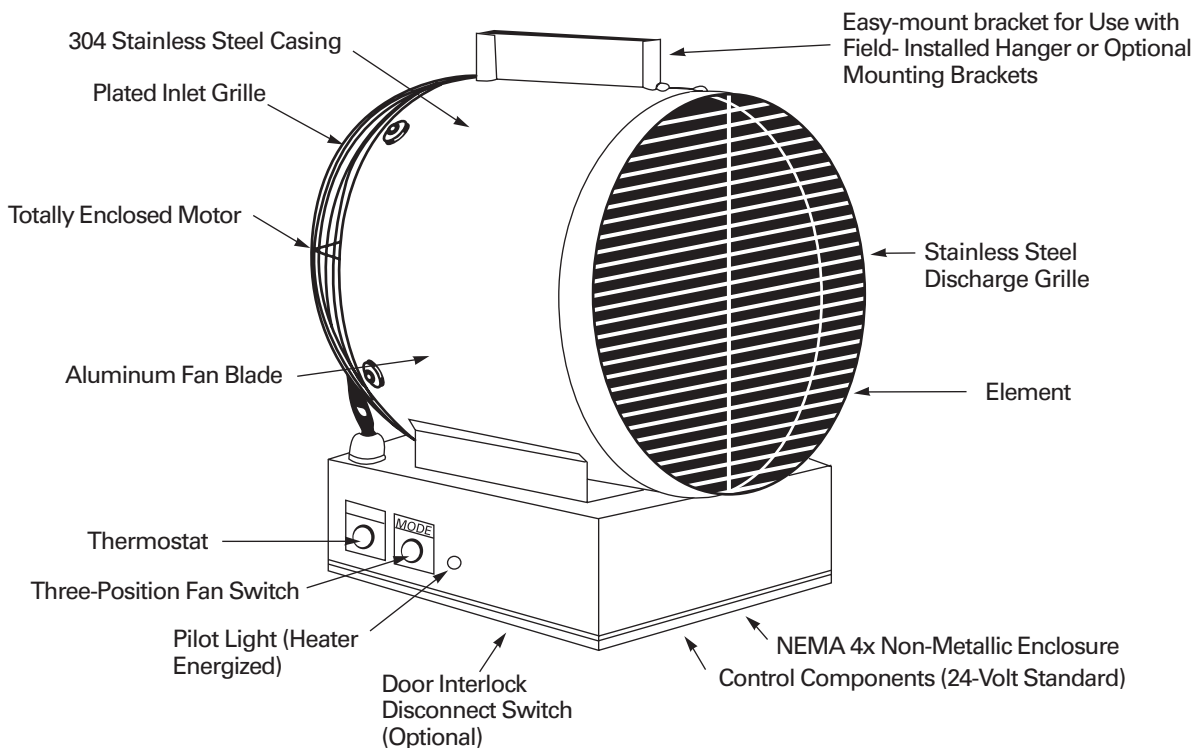
Standard Features

- Heavy-duty 304 stainless steel casing
- NEMA 4x nonmetallic control panel
- 24-volt transformer and control circuit
- Three-position switch (off - heat - fan)
- Disconnect switch with enclosure interlock
- Capillary thermostat with stainless steel sensor
- Automatic reset thermal cutout
- Totally enclosed UL listed motor
- Pilot light (power on indicator)
- Chrome-plated finned tubular element
- Control panel on bottom of unit for ease of installation and service



Control Enclosure

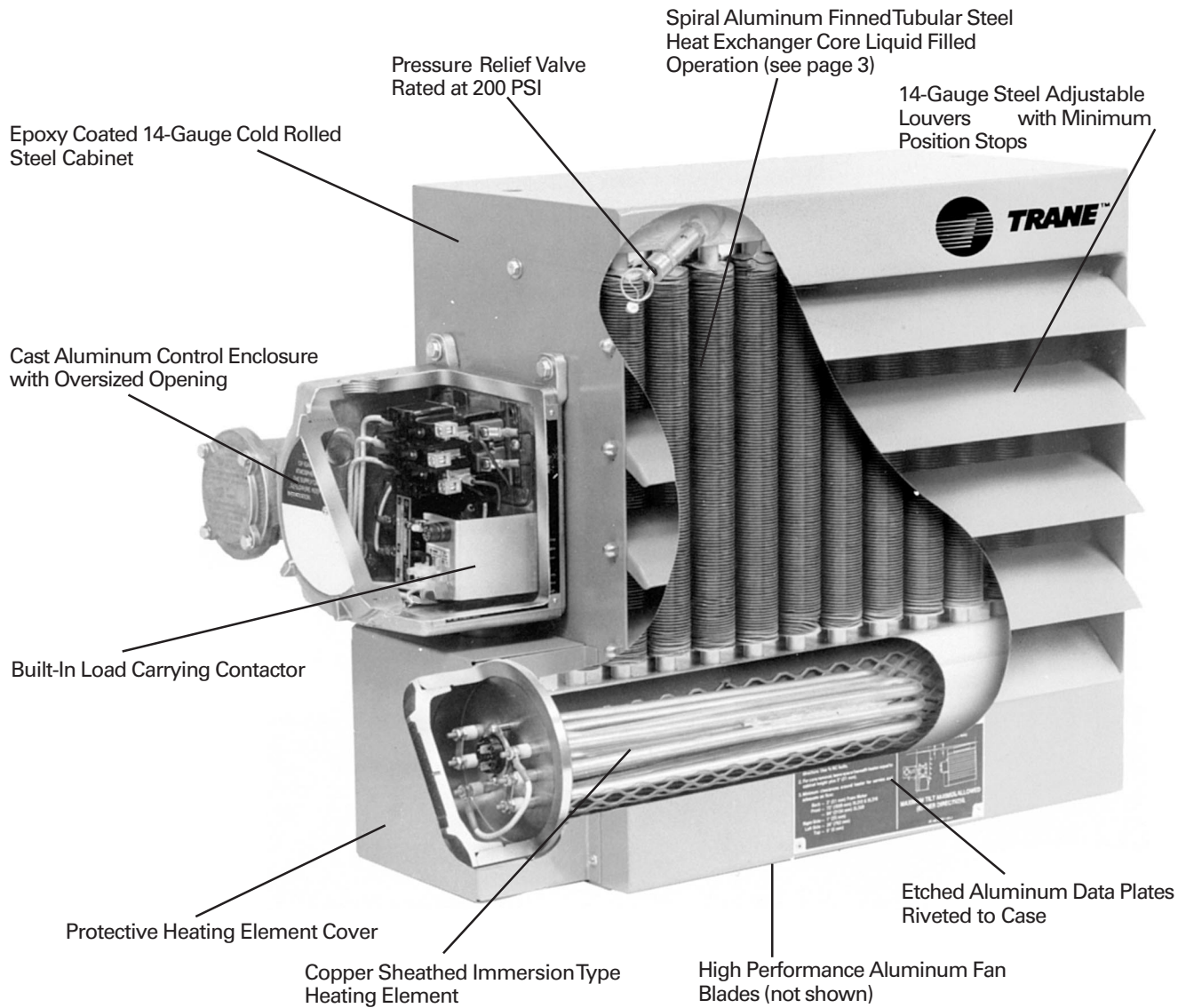
- Single-point power connection
- Meets all UL, NEC and OSHA requirements (when installed as directed)
- Corrosion-resistant in high humidity and water-saturated areas (for areas where corrosion-resistance is needed in non-hazardous areas).



Features and Benefits

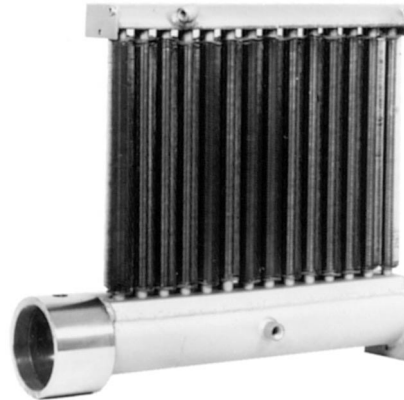
Model UHXA

Trane Explosion-Proof Electric Unit Heaters

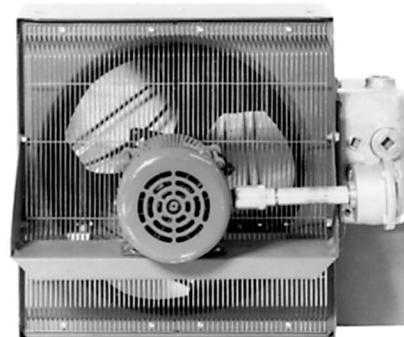


Features and Benefits

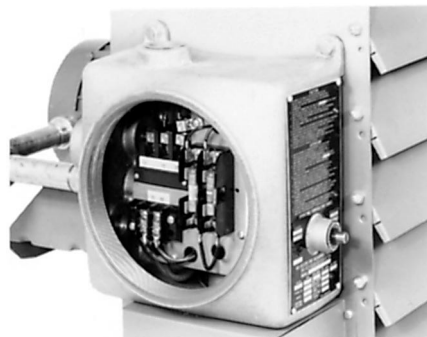
Model UHXA



Liquid to air heat exchanger with low watt density heating elements in ethylene glycol solution that provides freeze protection to -45°C.



Ball bearing permanently lubricated explosion-proof motor. Chrome plated guard meets OSHA requirements.



Heavy-duty control contactor with 24-volt control circuit provided on all models.

Designed for rugged industrial applications in hazardous locations where the possibility of explosion or fire exists due to the presence of certain flammable gases, vapors, powdered metals or dusts.

- Permanently sealed, liquid to air, finned tube heat exchanger core.
- Ethylene glycol water mixture used as heat transfer fluid in the heater core, providing -45°C, (-49°F) freeze damage protection.
- High-performance electric motor driven fan blows air across finned tubes to effect uniform heat transfer and area heat distribution.
- Automatic reset capillary type high limit provides high temperature regulation and is rated for 100,000 cycles of service.
- Stainless steel and aluminum pressure relief valve handles any over-pressure.
- 14-gauge steel cabinet contains heater core, motor and fan assembly.
- Narrow gap safety fan guard shields all moving parts.
- Adjustable louvers allow directional control of air.
- Copper conductor wires enclosed in rigid metal conduits carry all electrical power.
- Box lugs are furnished for field connections within an approved enclosure.

Features and Benefits

Model UHWA Series 20 and 50

Heavy-Duty Wall Heaters

Trane heavy-duty wall mounted electric forced-air unit heaters are architecturally styled in a vandal-resistant design for all commercial, institutional and many industrial applications. They are particularly suited for schools, office buildings, dormitories, stores, hospitals and other public buildings.

The high capacity and wide range of voltage/phase and control systems provides application versatility to meet most installation requirements. A wide selection of built-in factory installed and wired, pre-engineered control systems minimizes system design and installation time.

All units are equipped with zero voltage reset thermal cut-outs for overheat protection and a totally enclosed, permanently lubricated motor. Optional circuit breaker, control transformer and a selection of integral or wall-mounted thermostat controls are part of the unit package.

Solid Construction and Dependable Components

Sleeve

Sleeve for surface or semi-recessed installation. 16 gauge (1.5 mm thickness) zinc coated steel.

Element

Totally enclosed, corrosion-resistant. Maximum finning for lower operating temperature and longer life. Will not become dust clogged. (No filter required.)

Thermal Cut-Out

Exclusive "zero voltage reset" type for high degree of effectiveness if normal operating temperatures are exceeded.

Transformer

Optional factory assembled and wired in 50 Series. Choice of 24 or 120 volt secondary.

Entrance Terminals

Line side termination enclosed for safe servicing of heaters when supplied with circuit breakers.

Circuit Breakers

Reduces installation cost by allowing one or more heaters to be wired from feeder and feeder tap. Separate control circuit switch supplied when required. All power can be turned off before front cover is removed.



Louvered Grille

Heavy-duty welded steel for maximum impact resistance. Closely spaced (pencil proof), tamperproof.

Motor Shield

Protects motor by separating return air from heated air.

Motor

Heavy-duty unit bearing, permanently lubricated, totally enclosed, impedance protected.

Blade

Highly efficient, space saving blade-over-motor design, individually balanced.

Contactors

Optional, definite purpose, heavy-duty type with flame path separators and dust covers. Choice of heater voltage, 120 volt or 24 volt holding coil.

Thermostat

Optional heavy-duty hydraulic snap action type with sensing bulb in return airstream. Disconnects all ungrounded conductors in OFF position.



Series 50 with exposed thermostat knob and covered circuit breaker and control switch only



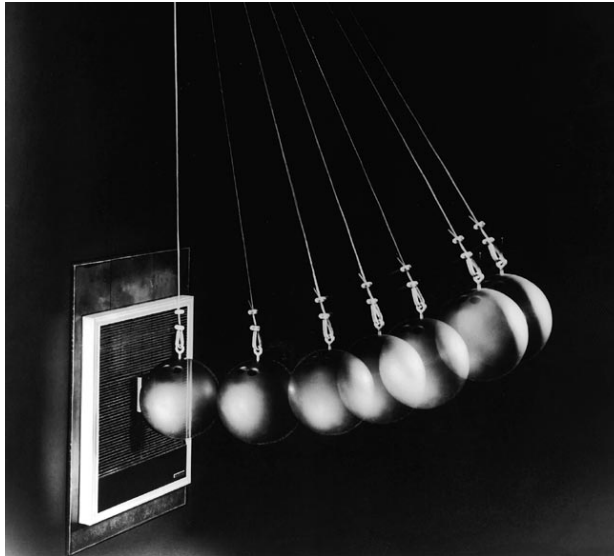
Series 20 and 50 with tamper-resistant thermostat cover plate which is included with each heater.



Series 50 with tamper-resistant cover removed.

Features and Benefits

Model UHWA Series 20 and 50



- Architecturally styled and vandal-resistant for schools, churches, stores, office buildings, transportation terminals, dormitories, hospitals.
- Use in vestibules, entrance ways, lobbies, corridors, stairways, reception rooms, rest rooms, offices.
- Simple application design — Wide selection of built-in, factory installed and wired, pre-engineered control systems. Saves design and on-the-job time.
- Versatile application — Higher capacity and wider range of voltage/phase and control systems than any similar heaters previously available.
- Heater front withstands with less than $\frac{1}{16}$ " (1.6 mm) permanent distortion, 10.8 ft lbs (324 poundals) impact and 400 lbs (181.4 kg) static force applied to an 8 sq. in. (5160 sq. mm) area at center grille location.

Features and Benefits

Model UHCA Series 70 and 80



Series 80 Recess mounted for 2' (609.6 mm) x 2' (609.6 mm) "T" bar or plaster ceilings

Mounting Bracket — features swing up installation on surface mounted 70 Series. Bracket center notched to accept screws of ceiling outlet box (installed by others). Recessed heater 80 Series has junction box attached to heater can.

Motor — heavy-duty unit bearing, permanently lubricated, totally enclosed, impedance protected.

Blade — highly efficient, space-saving blade over motor design, individually balanced.

Thermal Cut-Out — exclusive "zero voltage reset" type for highest degree of effectiveness in event normal operating temperatures are exceeded. Heater must be manually shut off for five minutes to reset. (See page 8.)

Element — totally enclosed and corrosion resistant. Maximum finning for lower operating temperatures and long life. Will not become dust clogged. (No filter required.)

Discharge Venturi — bull's-eye design permitting heated air to leave in uniform pattern.

Plaster Trim — optional plaster trim for recessed mounted heaters (series 80) only. Provides finished ceiling appearance.

Commercial and Industrial Ceiling - Mounted Fan Forced Heaters

Series 70 and 80 Features

- Crisp, unique styling to blend into any architectural design — unit designed for long life and warranted for five years.
- Higher velocity ceiling-mounted heater gets air down to warm those hard to heat areas where public accessibility is not desired or where wall area is restricted.
- Single or multiple installations at a fraction of the cost of cabinet unit heaters.
- Five-year warranty.
- 2,000 to 5,000 watts.
- 208, 204 V single and three-phase. 277 V single-phase.
- UL listed and conform to Underwriters' Standard 1025.

Commercial and Institutional Applications

- Use in vestibules, entrance ways, lobbies, restrooms and small office and guard building applications.
- A unique design offers surface and recessed applications with higher wattage capacity and wider range of voltage and phase capabilities than other heaters of this type.
- Control: Line voltage and low voltage control capabilities using accessory thermostat (see page 8).
- Unit mounted controls for Series 80 only with fan purge.





Features and Benefits

Model UHAA Series 3320



Architectural Quality

- Built - in tamper resistant thermostat
- Built - in tamper resistant disconnect switch
- Richly styled, rugged grille
- Whisper-quiet sound level
- Fan delay
- Decorator designed for functional beauty and versatility.
- Five-year element, limited warranty
- UL listed

Optional Accessories

3320EX33	Surface Mounting Adapter
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Factory-Installed Accessories

Suffix R	Day/Night Relay
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Rugged Grille — Grille made of 18 gauge (1.2 mm thickness) steel painted with a dark brown baked enamel finish.

Richly Styled Grille — Grille is highlighted by a snap-on, 14-gauge (1.9 mm thickness) aluminum frame, secured to the heater with an inconspicuous fastener.

Element — Steel sheath with plate heat exchanger.

Fan Delay Switch — To allow the fan to continue to run for a short period after the thermostat is satisfied, to expel warm air from inside the heater. Also delays fan on start up to insure delivery of heated air. This switch also prolongs element life.

“Unique” Vane Axial Fan Wheel — Draws in large volumes of air then quietly and gently discharges 175 cfm (82.6 l/s) of heated air downward into the room.

Application Considerations

Model UHXA

Abbreviated descriptions of UL classes, groups and divisions. Before selecting any heater for a particular application, refer to Article 500 as well as other standards referenced in the National Electric Code.

- **Class I:** Equipment does not have surface operating temperature in excess of the ignition temperature of the specific gas or vapor.
- **Class II:** Equipment does not have surface temperature greater than the ignition temperature of the specified dust.
- **Group D:** Atmospheres such as but not limited to acetone, alcohol, gasoline, lacquer solvent vapors, natural gas, propane or other gases or vapors of equivalent hazard.
- **Group E:** Atmospheres containing combustible metal dust regardless of resistivity, or other combustible dust of similar hazard characteristics having resistivity of less than 10^5 ohm-centimeter.
- **Group F:** Atmospheres containing carbon black, charcoal, coal or coke dust.
- **Group G:** Atmospheres containing combustible dust having resistivity of 10^5 ohm-centimeter or greater.
- **Division I:** A location in which ignitable concentrations of flammable material exist under normal operating conditions.
- **Division II:** Locations in which flammable materials will normally be confined within closed containers and escape only in the case of accidental rupture, breakdown or during maintenance operations. Any equipment approved for Division I is automatically also approved for Division II.

Selection and application of electric unit heaters should consider the location, classification and properties of flammable vapors, liquids, gases, dusts and fibers which may be present. Each room, section or area should be considered individually.

For further information consult National Electric Code and National Fire Prevention Association (ANSI) standards. All models conform to OSHA requirements when mounted at any height.

Installation Conditions

- 1**
Refer to owner's manual.

- 2**
The Trane explosion-proof electric unit heaters have been listed by the Underwriters Laboratories for maximum surface temperatures. Use only in atmospheres having an ignition temperature higher than 165°C (T3B) for Class I and Class II operation.

- 3**
Altitude restrictions — see specification table.

- 4**
Heater must be installed in permanently mounted upright position and connected to fixed power supply.

- 5**
Do not operate in atmospheres corrosive to steel and aluminum.



Selection Procedure

Model UHEC, UHRA, UHXA, UHWA, UHCA, UHAA

Calculate the heating loads using the NEMA, ASHRAE, or other accepted heating load calculation method. Determine the quantity and size of unit heaters to be used. To maintain uniform temperature and recommended air circulation, it is suggested that cfm should be adequate to accomplish three air changes per hour.

For maximum comfort, the use of smaller units with lower airflows is suggested to provide more uniform temperature and even airflow. In warehouses and storage areas where uniform heat distribution and temperature control is of lesser importance, it is desirable to use fewer units with greater capacity.

Unit heaters mounted in the horizontal discharge position are most effective when heat is directed along the perimeter of the building wall with the airflow of each unit supporting the airflow of the other units to create a constant flow of warm air.

Model UHEC and Model UHRA

Unit heaters in the vertical position are ideal for use in high ceiling areas and areas where low mounting heights would interfere with personnel or equipment activity. Units mounted in the vertical discharge position should not be mounted higher than the unit's published maximum mounting height ratings. When unit heaters are used to temper areas such as loading dock doors, one or more units should be arranged to blanket the exposed opening.



Model Number Description

Model UHEC, UHRA, UHXA

Model UHEC

Digits 1-3 — Electric Unit Heater

Digit 4 — Development Sequence

Digits 5-6 — Unit Capacity

03 — 3.3 kW
05 — 5 kW
07 — 7.5 kW
10 — 10 kW
15 — 15 kW
20 — 20 kW
25 — 25 kW
30 — 30 kW
40 — 40 kW
50 — 50 kW

Digit 7 — Element Phase

1 — Single-phase
2 — Single-phase/three-phase (field convertible)
3 — Three-phase

Digit 8 — Element and Motor Voltage

A — 208 V
B — 240/208 V
C — 277 V — Single-phase only
D — 480 V — Three-phase only

Digit 9 — 24-Volt Control Transformer

0 — None - wired for direct line voltage
A — Transformer - for 24-volt control circuits

Digit 10 — Design Sequence

Digit 11 — Contactors

0 — None - wired for direct line voltage
A — Contactor - for 24-volt control circuits

Model UHRA

Digits 1-3 — Electric Hose-Down Corrosion Resistant Unit Heater

Digit 4 — Development Sequence

Digits 5-6 — Unit Capacity

03 — 3.3 kW
05 — 5 kW
07 — 7.5 kW
10 — 10 kW
15 — 15 kW
20 — 20 kW
25 — 25 kW
30 — 30 kW
40 — 40 kW
48 — 48 kW

Digit 7 — Element Phase

1 — Single-phase
3 — Three-phase

Digit 8 — Element Voltage

A — 208 V
G — 240 V
C — 277 V
D — 480 V
F — 600 V

Digit 9 — 24-Volt Control Transformer/Relay

A — Transformer/Relay — Standard

Digit 10 — Design Sequence

Digit 11 — Thermostat/off/on/fan switch — Factory installed and wired

T — Thermostat/off/on/fan switch — Standard

Model UHXA

Digits 1-3 — Electric Explosion-Proof Unit Heater

Digit 4 — Development Sequence

Digits 5-6 — Unit Capacity

03 — 3 kW
05 — 5 kW
07 — 7.5 kW
10 — 10 kW
15 — 15 kW
20 — 20 kW
25 — 25 kW

Digit 7 — Element Phase

1 — Single Phase
3 — Three Phase

Digit 8 — Voltage

A — 208 Volts
B — 240 Volts
D — 480 Volts
F — 600 Volts

Digit 9 — Control Voltage

1 — 24 Volts (STD)
2 — 120 Volts (For 208, 240 & 480 Volts only)
3 — 208 Volts (For 208 Volts only)
4 — 240 Volts (For 240 Volts only)

Digit 10 — Design Sequence

Notes:

1. Available in 3 phase only.
2. Available in 480 volts or 600 volts, 3 phase only.
3. Available for 3 kW, 5 kW and 7.5 kW in 208 and 240 volts and 10 kW in 240 volts only.



Model Number Description

Model UHWA

Model UHWA

Digits 1-3: Unit Type

UHW = Electric Wall Mounted Unit Heater

Digit 4: Development Sequence**Digits 5 - 6: Unit Capacity**

02 = 2 kW

03 = 3 kW

04 = 4 kW

05 = 5 kW

Digit 7: Element Phase

1 = 1 Phase/60 Cycle

3 = 3 Phase/60 Cycle

Digit 8: Element and Motor Voltage

A = 208 Volt

B = 240 Volt

C = 277 Volt

Digit 9: Unit Series

2 = Unit Series 20

5 = Unit Series 50

Digit 10: Current Design Sequence**Digit 11: Built-in Thermostat**

0 = None

T = Unit Mounted Tamper Proof
Thermostat

Digit 12: Wall Box

2 = Series 20 Wall Box

5 = Series 50 Wall Box

Digit 13: Extension Sleeves

0 = No Extension Sleeves

A = 4" (102 mm) Ext Surface Mounted
(20 Series)

B = 2" (51 mm) Ext Semi-Recessed
(20 Series)

C = 1" (25 mm) Ext Semi-Recessed
(20 Series)

D = 4" (102mm) Ext Surface Mounted
(50 Series)

E = 2" (51 mm) Ext Semi-Recessed
(50 Series)

F = 1" (25 mm) Ext Semi-Recessed
(50 Series)

Digit 14: Wall Mounted Line Voltage Thermostat

1 = DPST 1-Phase Line Voltage

2 = DPST 1-Phase Tamper Resistant

3 = DPST 3-Phase Line Voltage

4 = SPST Pilot Duty Line Voltage

5 = SPST Pilot Duty Tamper Resistant

Digit 15: Contactors

H = Line Voltage

J = 24V

K = 120V

Digit 18: Circuit Breaker

L = Unit Mounted

Digit 19: Transformer 24 Volt

M = 24V Transformer

Digit 20: Transformer 120 Volt

P = 120V Transformer



Model Number Description

Model UHCA

Model UHCA

Digit 1-3: Unit Type

UHC = Electric Ceiling Mounted Commercial Heater

Digit 4: Development Sequence

Digits 5-6: Unit Capacity

02 = 2 kW
03 = 3 kW
04 = 4 kW
05 = 5 kW

Digit 7: Element Phase

1 = 1 Phase/60 Cycle
3 = 3 Phase/60 Cycle

Digit 8: Element and Motor Voltage

A = 208 Volt
B = 240 Volt
C = 277 Volt

Digit 9: Unit Series

2 = Surface Mounted, Unit Series 70
5 = Recess Mounted, Unit Series 80

Digit 10: Current Design Sequence

Digit 12-13: Unit Mounted Thermostat

T1 = Single Pole Thermostat
T2 = Double Pole Thermostat

Digit 14: Unit Mounted Disconnect

S = Unit Mounted Disconnect Switch

Digit 15-16: Unit Mounted Relay

R1 = Unit Mounted 24 Volt Transformer/Relay
R = Unit Mounted Line Voltage Relay
R2 = Unit Mounted 120 Volt Relay

Digit 17: Plaster Trim

A = Plaster Trim

Digit 18: Wall Mounted Line Voltage Thermostat

1 = DPST 1-Phase Line Voltage Thermostat
2 = DPST 1-Phase Tamper Resistant Thermostat
3 = DPST 3-Phase Line Voltage Thermostat
4 = SPST Pilot Duty Line Voltage Thermostat
5 = SPST Pilot Duty Tamper Resistant Thermostat

Digit 19: Control Panels

A = 24V Control Panel for 208V, 1-Contactor
B = 24V Control Panel for 240V, 1-Contactor
C = 24V Control Panel for 277V, 1-Contactor
D = 24V Control Panel for 208V, 2-Contactor
E = 24V Control Panel for 240V, 2-Contactor
F = 24V Control Panel for 277V, 2-Contactor
G = 24V Control Panel for 208V, 3-Contactor
H = 24V Control Panel for 240V, 3-Contactor
J = 24V Control Panel for 277V, 3-Contactor
1 = 120V Control Panel for 208V, 1-Contactor
2 = 120V Control Panel for 240V, 1-Contactor
3 = 120V Control Panel for 277V, 1-Contactor
4 = 120V Control Panel for 208V, 2-Contactor
5 = 120V Control Panel for 240V, 2-Contactor
6 = 120V Control Panel for 277V, 2-Contactor
7 = 120V Control Panel for 208V, 3-Contactor
8 = 120V Control Panel for 240V, 3-Contactor
9 = 120V Control Panel for 277V, 3-Contactor

Digit 20: Low Voltage Thermostat Option

0 = No Low Voltage T-Stat
7 = Low Voltage T-Stat

Digit 21: Thermal Relay with Transformer

0 = No Thermal Relay
A = SPST Relay w/Transformer

Digit 22: Tamper Proof Kit

8 = Tamper Proof Kit



Model Number Description

Model UHAA

Model UHAA

Digit 1 - 3: Unit Type

UHA = Electric Architectural Wall Heater

Digit 4: Development Sequence**Digits 5-6: Unit Capacity**

15 = 1.5 kW

02 = 2 kW

03 = 3 kW

04 = 4 kW

48 = 4.8 kW

Digit 7: Element Phase

1 = 1 Phase/60 Cycle

Digit 8: Element and Motor Voltage

A = 208 Volt

B = 240 Volt

C = 277 Volt

E = 120 Volt

Digit 9: Built-in Thermostat

T = Unit Mounted Tamperproof Thermostat

Digit 10: Current Design Sequence**Digit 11: Unit Mounted Disconnect**

D = Unit Mounted Disconnect Switch

Digit 12: Day/Night Relay

0 = None

R = Unit Mounted Day/Night Relay

Digit 13: Surface Mounting Adapter Option

0 = None

A = 3320EX33 Surface Mounting Adapter



General Data

Model UHEC

Table GD-2 – Model UHEC – Metric

Unit Heater Capacity kW Rating	Motor Data		Airflow at Outlet (L/S)	Approx. Air Rise @ Outlet (C)	Horiz. Air Throw (M)	Rec. Max Mounting Height (M)	
	Watts	R.P.S.				Horizontal	Vertical
3.3	6	25.8	189	14.4	3.7	2.7	2.7
5.0	6	25.8	189	22.2	3.7	2.7	2.7
7.5	14	25.8	330	18.9	6.7	3.0	3.7
10	14	25.8	330	25.0	6.7	3.0	4.3
15	37	25.8	519	23.9	9.8	3.4	6.1
20	37	25.8	519	31.7	9.8	3.7	5.5
25	62	25.8	944/	22.2/	13.7	3.7	6.7
			849	24.4	13.7	3.7	6.7
25 480/3 Mtr	50	25.8	944/	22.2/	13.7	3.7	6.7
			849	24.4	13.7	3.7	6.7
30	62	25.8	944/	26.1/	12.2	3.7	6.1
			849	29.4	12.2	3.7	6.1
30 480/3 Mtr	50	25.8	944/	26.1/	12.2	3.7	6.1
			849	29.4	12.2	3.7	6.1
40	186	25.8	1463/	22.2/	16.8	4.6	7.3
			1321	25.0	16.8	4.6	7.3
40 480/3 Mtr	149	25.8	1463/	22.2/	16.8	4.6	7.3
			1321	25.0	16.8	4.6	7.3
50	186	25.8	1463/	28.3/	15.2	4.6	6.7
			1321	31.1	15.2	4.6	6.7
50 480/3 Mtr	149	25.8	1463/	28.3/	15.2	4.6	6.7
			1321	31.1	15.2	4.6	6.7

Note 1. 25 through 50 kW models are equipped with two-speed motors for Hi-Lo fan operation with addition of fan switch option.



General Data

Model UHRA

Table GD-3 — Model UHRA

Unit Model Number	kW Rating	Btu/Hr	Motor & Heater Volts/Phase	Control Volts	Max Amp Rating	Motor HP	Motor RPM			
031AAAT	3.3	11,200	208/1	24	15.9	35 mhp	1550 (26 rps)			
033AAAT			208/3		9.2					
031GAAT			240/1		13.8					
033GAAT			240/3		8.0					
031CAAT			277/1		12.0					
033DAAT	480/3	4.0								
033FAAT	600/3	3.2								
051AAAT	5.0	17,100	208/1	24	24.1	35 mhp	1550 (26 rps)			
053AAAT			208/3		13.9					
051GAAT			240/1		20.9					
053GAAT			240/3		12.1					
051CAAT			277/1		18.1					
053DAAT	480/3	6.1								
053FAAT	600/3	4.9								
071AAAT	7.5	25,600	208/1	24	36.1	35 mhp	1550 (26 rps)			
073AAAT			208/3		20.9					
071GAAT			240/1		31.3					
073GAAT			240/3		18.1					
071CAAT			277/1		27.1					
073DAAT	480/3	9.1								
073FAAT	600/3	7.3								
101AAAT	10	34,130	208/1	24	48.1	35 mhp	1550 (26 rps)			
103AAAT			208/3		27.8					
101GAAT			240/1		41.7					
103GAAT			240/3		24.1					
101CAAT			277/1		36.2					
103DAAT	480/3	12.1								
103FAAT	600/3	9.7								
151AAAT	15	51,200	208/1	24	72.2	35 mhp	1550 (26 rps)			
153AAAT			208/3		41.7					
151GAAT			240/1		62.5					
153GAAT			240/3		36.2					
153DAAT			480/3		18.1					
153FAAT	600/3	14.5								
203AAAT	20	68,260	208/3	24	55.6	1/3 (249 w)	1625 (27 rps)			
203GAAT			240/3		48.2					
203DAAT			480/3		24.1					
203FAAT			600/3		19.3					
253AAAT			208/3		69.5					
253GAAT	25	85,325	240/3	24	60.3	1/3 (249 w)	1625 (27 rps)			
253DAAT			480/3		30.2					
253FAAT			600/3		24.1					
303AAAT			208/3		83.4					
303GAAT	30	102,390	240/3	24	72.3	1/3 (249 w)	1625 (27 rps)			
303DAAT			480/3		36.2					
303FAAT			600/3		29.0					
403DAAT			40		136,520			480/3	24	48.2
403FAAT	600/3	38.6								
483DAAT	48	163,824	480/3	24	57.9	1/3 (249 w)	1625 (27 rps)			
483FAAT			600/3		46.3					

Table GD-4 — Air Delivery Data

Unit Model Number UHRA	kW	Cfm Outlet	FFM Outlet	F Deg. Temp. Rise Outlet	Air Throw Feet	Rec. Mtg. Height						
031AAAT	3.3	400 (189 L/S)	500 (2540 MM/S)	26°F (-3.3°C)	20 Ft. (6.1 M)	6 Ft. (1.8 M)						
033AAAT												
031GAAT												
033GAAT												
031CAAT												
033DAAT												
033FAAT												
051AAAT	5.0	400 (189 L/S)	500 (2540 MM/S)	40°F (4.4°C)	20 Ft. (6.1 M)	6 Ft. (1.8 M)						
053AAAT												
051GAAT												
053GAAT												
051CAAT												
053DAAT												
053FAAT												
071AAAT	7.5	400 (189 L/S)	500 (2540 MM/S)	60°F (16°C)	20 Ft. (6.1 M)	6 Ft. (1.8 M)						
073AAAT												
071GAAT												
073GAAT												
071CAAT												
073DAAT												
073FAAT												
101AAAT	10	700 (330 L/S)	660 (3353 MM/S)	45°F (7.2°C)	28 Ft. (8.5 M)	6 Ft. (1.8 M)						
103AAAT												
101GAAT												
103GAAT												
101CAAT												
103DAAT												
103FAAT												
151AAAT	15	700 (330 L/S)	660 (3353 MM/S)	68°F (20°C)	28 Ft. (8.5 M)	6 Ft. (1.8 M)						
153AAAT												
151GAAT												
153GAAT												
153DAAT												
153FAAT												
203AAAT	20	1400 (661 L/S)	1000 (5080 MM/S)	45°F (7.2°C)	35 Ft. (10.7 M)	6 Ft. (1.8 M)						
203GAAT												
203DAAT												
203FAAT												
253AAAT							25	1400 (661 L/S)	1000 (5080 MM/S)	56°F (13.3°C)	35 Ft. (10.7 M)	6 Ft. (1.8 M)
253GAAT												
253DAAT												
253FAAT												
303AAAT	30	1400 (661 L/S)	1000 (5080 MM/S)	68°F (20°C)	35 Ft. (10.7 M)	6 Ft. (1.8 M)						
303GAAT												
303DAAT												
303FAAT												
403DAAT							40	1800 (849 L/S)	1000 (5080 MM/S)	70°F (21°C)	42 Ft. (12.8 M)	6 Ft. (1.8 M)
403FAAT												
483DAAT												
483FAAT	48	1800 (849 L/S)	1000 (5080 MM/S)	84°F (29°C)	42 Ft. (12.8 M)	6 Ft. (1.8 M)						



General Data

Model UHRA

Table GD-5 – Air Delivery Characteristics

Heater Capacity (kW Rating)	Velocity of Air Movement (FPM)			Throw Distance	Weight
	Distance from Heater				
	6 Ft. (1.8 M)	12 Ft. (3.7 M)	24 Ft. (7.3 M)		
3.3, 5.0	210	80	25	36 Ft.	45 lbs.
7.5	(12.8 M/S)	(4.9 M/S)	(1.5 M/S)	(11 M)	(20.4 Kg)
10, 15	270	95	45	46 Ft.	55 lbs.
	(16.5 M/S)	(5.8 M/S)	(2.7 M/S)	(14 M)	(24.9 Kg)

Table GD-6 – Air Delivery Characteristics

Heater Capacity (kW Rating)	Velocity of Air Movement (FPM)			Throw Distance	Weight
	Distance from Heater				
	10 Ft. (3.0 M)	20 Ft. (6.1 M)	30 Ft. (9.1 M)		
20, 25,	750	450	300	55 Ft.	85 lbs.
30	(45.7 M/S)	(27.4 M/S)	(18.3 M/S)	(16.8 M)	(39 Kg)
40, 48	900	500	350	65 Ft.	130 lbs.
	(54.9 M/S)	(30.5 M/S)	(21.3 M/S)	(19.8 M)	(59 Kg)

Table GD-7 – Unit Electrical Data

Model Number	Watts	BTU/Hr. Output
UHRA-03	3,300	11,261
UHRA-05	5,000	17,062
UHRA-07	7,500	25,594
UHRA-10	10,000	34,125
UHRA-15	15,000	51,188
UHRA-20	20,000	68,250
UHRA-25	25,000	85,313
UHRA-30	30,000	102,375
UHRA-40	40,000	136,500
UHRA-48	48,000	163,800



General Data

Model UHXA

Table GD-8 – Model UHXA

Unit Size	Model No. UHXA	Volts/Phase	Motor HP	Heater Amps	Line Amps	BTU/Hr.	Air Temp. Rise Deg. F	Air Temp. Rise Deg. C	Min. Cir. Ampacity	Max Fuse Amps	Min* Wire AWG
3 kW	031A1B	208/1		14.4	16.3				20.4	25	10
	033A1B	208/3		8.3	9.8				12.3	15	14
	033B1B	240/1	1/4	12.5	14.8	10239	16.6	9.2	18.5	20	12
	033B1B	240/3	(186W)	7.2	8.6				10.8	15	14
	033D1B	480/3		3.6	4.3				5.4	15	14
	033F1B	600/3		2.9	3.5				4.4	15	14
5 kW	051A1B	208/1		24.0	26.0				32.4	35	8
	053A1B	208/3		13.9	15.4				19.2	20	12
	051B1B	240/1	1/4	20.8	23.1	17065	27.6	15.3	28.9	30	10
	053B1B	240/3	(186 W)	12.0	13.4				16.8	20	12
	053D1B	480/3		6.0	6.7				8.4	15	14
	053F1B	600/3		4.8	5.4				6.8	15	14
7.5 kW	071A1B	208/1		36.1	38.0				47.5	50	8
	073A1B	208/3		20.8	22.3				27.9	30	10
	071B1B	240/1	1/4	31.3	33.6	25598	41.4	23.0	42.0	45	8
	073B1B	240/3	(186 W)	18.0	19.4				24.3	25	10
	073D1B	480/3		9.0	9.7				12.2	15	14
	073F1B	600/3		7.2	7.8				9.8	15	14
10 kW	103A1B	208/3		27.8	29.3				36.6	40	8
	101B1B	240/1		41.7	44.0				55.0	60	6
	103B1B	240/3	1/4	24.1	25.5	34130	21.7	12.1	31.8	35	8
	103D1B	480/3	(186 W)	12.0	12.7				15.9	20	12
	103F1B	600/3		9.6	10.2				12.8	15	14
	15 kW	153A1B	208/3		41.6	43.5				54.4	60
153B1B		240/3	1/2	36.1	38.1	51195	19.2	10.7	47.6	50	8
153D1B		480/3	(186 W)	18.0	19.0				23.8	25	10
153F1B		600/3		14.4	15.2				19.0	20	12
203D1B		480/3	1/2	24.1	25.1				31.3	35	8
203F1B		600/3	(373 W)	19.2	20.0	68260	26.2	14.6	25.1	30	10
20 kW	253D1B	480/3	1/2	30.1	31.1				38.8	40	8
	253F1B	600/3	(373 W)	24.1	24.9	85325	32.8	18.2	31.1	35	8

*Supply conductors must be suitable for 90°C

1. 1 watt equals 3.413 Btu.

2. 1 kW equals 3,413 Btu.

3. 24 volt control voltage is standard and includes built-in contactor and 24 volt control transfer.



General Data

Model UHXA

Table GD-9 – Model UHXA with 120 Volt Control Voltage

Unit Size	Model No. UHXA	Volts/Phase	Motor HP	Heater Amps	Line Amps	BTU/Hr.	Air Temp. Rise Deg. F	Air Temp. Rise Deg. C	Min. Cir. Ampacity	Max Fuse Amps	Min* Wire AWG
3 kW	031A2B	208/1		14.4	16.3				20.4	25	10
	033A2B	208/3		8.3	9.8				12.3	15	14
	033B2B	240/1	1/4	12.5	14.8	10239	16.6	9.2	18.5	20	12
	033B2B	240/3	(186W)	7.2	8.6				10.8	15	14
	033D2B	480/3		3.6	4.3				5.4	15	14
5 kW	051A2B	208/1		24.0	26.0				32.4	35	8
	053A2B	208/3		13.9	15.4				19.2	20	12
	051B2B	240/1	1/4	20.8	23.1	17065	27.6	15.3	28.9	30	10
	053B2B	240/3	(186 W)	12.0	13.4				16.8	20	12
	053D2B	480/3		6.0	6.7				8.4	15	14
7.5 kW	071A2B	208/1		36.1	38.0				47.5	50	8
	073A2B	208/3		20.8	22.3				27.9	30	10
	071B2B	240/1	1/4	31.3	33.6	25598	41.4	23.0	42.0	45	8
	073B2B	240/3	(186 W)	18.0	19.4				24.3	25	10
	073D2B	480/3		9.0	9.7				12.2	15	14
10 kW	103A2B	208/3		27.8	29.3				36.6	40	8
	101B2B	240/1		41.7	44.0				55.0	60	6
	103B2B	240/3	1/4	24.1	25.5	34130	21.7	12.1	31.8	35	8
	103D2B	480/3	(186 W)	12.0	12.7				15.9	20	12
15 kW	153A2B	208/3		41.6	43.5				54.4	60	6
	153B2B	240/3	1/2	36.1	38.1	51195	19.2	10.7	47.6	50	8
	153D2B	480/3	(186 W)	18.0	19.0				23.8	25	10
20 kW	203D2B	480/3	1/2 (373 W)	24.1	25.1	68260	26.2	14.6	31.3	35	8
25 kW	253D2B	480/3	1/2 (373 W)	30.1	31.1	85325	32.8	18.2	38.8	40	8

*Supply conductors must be suitable for 90°C.

- 120 volt control voltage is standard and includes built-in contactor and 120 volt control transformer.
- Not available for 600 volt heaters.

Table GD-10 – Model UHXA with 208 or 240 Volt Control Voltage

Unit Size	Model No. UHXA	Volts/Phase	Motor HP	Heater Amps	Line Amps	BTU/Hr.	Air Temp. Rise Deg. F	Air Temp. Rise Deg. C	Min. Cir. Ampacity	Max Fuse Amps	Min* Wire AWG	Control Voltage
3 kW	031A3B	208/1		14.4	16.3				20.4	25	10	208
	033A3B	208/3		8.3	9.8				12.3	15	14	208
	033B4B	240/1	1/4	12.5	14.8	10239	16.6	9.2	18.5	20	12	240
	033B4B	240/3	(186 W)	7.2	8.6				10.8	15	14	240
5 kW	051A3B	208/1		24.0	26.0				32.4	35	8	208
	053A3B	208/3		13.9	15.4				19.2	20	12	208
	051B4B	240/1	1/4	20.8	23.1	17065	27.6	15.3	28.9	30	10	240
	053B4B	240/3	(186 W)	12.0	13.4				16.8	20	12	240
7.5 kW	071A3B	208/1		36.1	38.0				47.5	50	8	208
	073A3B	208/3		20.8	22.3				27.9	30	10	208
	071B4B	240/1	1/4	31.3	33.6	25598	41.4	23.0	42.0	45	8	240
	073B4B	240/3	(186 W)	18.0	19.4				24.3	25	10	240
10 kW	103A3B	208/3		27.8	29.3				36.6	40	8	208
	101B4B	240/1		41.7	44.0	34130	21.7	12.1	55.0	60	6	240
	103B4B	240/3	1/4	24.1	25.5				31.8	35	8	240
15 kW	153A3B	208/3	1/2	41.6	43.5				54.4	60	6	208
	153B4B	240/3	(186 W)	36.1	38.1	51195	19.2	10.7	47.6	50	8	240

*Supply conductors must be suitable for 90°C.

- Not available for 480 and 600 volt heaters.



General Data

Model UHXA

Table GD-11 – Model UHXA

Unit Size	3 kW, 5 kW & 7.5 kW	10 kW	15 kW, 20 kW & 25 kW
Capacities Available	3 kW 10,236 Btu 5 kW 17,060 Btu 7.5 kW 25,590 Btu	10 kW 34,120 Btu	15 kW 51,180 Btu 20 kW 68,240 Btu 25 kW 85,300 Btu
UL Listing	Class I, Group D, Divisions 1 & 2 Class II, Groups E, F & G, Divisions 1 & 2		
UL Temperature Code	Class I: T3B 165°C (329°F) Class II: T3B 165°C (329°F)		
CFM @ 70°F (21°C)	580	1500	2450
L/S @ 21°C (70°F)	274	708	1156
FPM	1000	1600	2000
MMS	5080	8128	10160
Air Temperature Rise	3 kW 16.3°F 9.1°C 5 kW 27.2°F 15.1°C 7.5 kW 40.8°F 22.7°C	10 kW 21.0°F 11.7°C	15 kW 19.0°F 10.6°C 20 kW 25.5°F 14.2°C 25 kW 32.3°F 17.9°C
Horizontal Throw	24 ft. 7.3 M	40 ft. 12.2 M	43 ft. 13.1 M
Max. Mtg. Height from floor	8 ft. 2.4 M	10 ft. 3.1 M	13 ft. 4.0 M
Max. Operational Altitude	3 kW, 5 kW, 10 kW & 15 kW - 8000 ft. (2438 M) 20 kW - 7000 ft. (2134 M) 7.5 kW & 25 kW - 5500 ft. (1676 M)		
Ambient Temperature Limits	Min. -45°C, (-49°F) Max. 40°C, (104°F)		
RPM/RPS	1725/29	1725/29	1725/29
Propeller Fan — 3 wing, Aluminum	12" Dia. (305 mm)	16" Dia. (406 mm)	20" Dia. (508 mm)
Motor	Motor Voltage/Phase same as element. PSC, Explosion-Proof, Permanently Lubricated, Ball Bearing 1/4 HP (186 W) 1/4 HP (186 W) 1/2 HP (373 W)		
Heat Exchanger	Heavy wall, liquid filled with immersion elements.		
Core Material	Steel with aluminum fins.		
Heat Transfer Fluid	Ethylene-glycol solution, protected to -45°C (-49°F).		
Heating Elements	Three, low watt density, immersion type copper sheathed.		
Thermal Cut-Out	Snap action capillary type rated 100,000 cycles pilot duty.		
Relief Valve	Stainless steel and aluminum construction, opens @ 200 PSI (1379 kPa).		
Cabinet	14-gauge cold rolled steel, epoxy coated, individually adjustable louvers.		
Fan Guard	Wire, less than 1/4" (6.4 mm) spacing, plated, split design for easy removal.		
Fasteners	Zinc plated.		
Conduit Material	3/4 (19.1 mm) rigid metal.		
Control Box	Cast aluminum with oversized opening. (2) 1" (25.4 mm) NPS with conduits stops for field wiring.		
Hanger Connections	5/8" (15.9 mm) NC tap, 2 holes.		
Contactors	Heavy-duty, break all ungrounded conductors rated 100,000 cycles @ full load. Built-in and prewired.		
Control Transformer	Built-in and prewired - 24 volt secondary (standard) and 120 volt (optional).		
Control Circuits	24 volt standard on all models. 120 volt optional on 208, 240 and 480 volt models. Line voltage on 208 and 240 volt models only.		
Remote wall mounted Thermostats Models TW161 & TW162	Explosion-proof 40-90°F operating range 22A, 125-277 VAC - 3/4 HP @ 125 VAC; 1 1/2 HP @ 250-277 VAC.		
Built-in "T" Option	125 VA pilot duty Sensing Bulb and Capillary made from 300 Series Stainless Steel ASW Tube.		
Heater Net Weight	3, 5 & 7.5 kW 132 lbs (60 Kg)	10 kW 158 lbs (72 Kg)	15, 20 & 25 kW 190 lbs (86 Kg)
Shipping Weight	3, 5 & 7.5 kW 167 lbs (76 Kg)	10 kW 193 lbs (88 Kg)	15, 20 & 25 kW 225 lbs (102 Kg)



Model UHWA Series 20 and 50

General Data

Table GD-12 — Electric Wall-Mounted Unit Heaters — Series 20

Watts	Model No. UHWA	Order No. 233	Element + Motor Voltage	Element Phase	Ship Wt. Lbs	Ship Wt. Kg	BTU	Degree F Air Rise	Degree C Air Rise
2000 Watts	021A2AT	-400	208	1	41	18.6	6,826	27	15
	021B2AT	-402	240	1					
	021C2AT	-404	277	1					
3000 Watts	031A2AT	-406	208	1	41	18.6	10,239	41	23
	031B2AT	-408	240	1					
	031C2AT	-410	277	1					
4000 Watts	041A2AT	-412	208	1	41	18.6	13,652	57	32
	041B2AT	-414	240	1					
	041C2AT	-416	277	1					
	043A2AT	-418	208	3					
	043B2AT	-420	240	3					
5000 Watts	051A2AT	-422	208	1	41	18.6	17,065	73	41
	051B2AT	-424	240	1					
	051C2AT	-426	277	1					
	053A2AT	-428	208	3					
	053B2AT	-430	240	3					

Note: ONLY thermostat and/or contactor may be built-in on Series 20 wall heaters.

Table GD-13 — Electric Wall-Mounted Unit Heaters — Series 50

Watts	Model No. UHWA	Order No. 233	Element + Motor Voltage	Element Phase	Ship Wt. Lbs	Ship Wt. Kg	BTU	Degree F Air Rise	Degree C Air Rise
2000 Watts	021A5AT	-431	208	1	54	24.5	6,826	27	15
	021B5AT	-433	240	1					
	021C5AT	-435	277	1					
3000 Watts	031A5AT	-437	208	1	55	24.9	10,239	41	23
	031B5AT	-439	240	1					
	031C5AT	-441	277	1					
4000 Watts	041A5AT	-443	208	1	55	24.9	13,652	57	32
	041B5AT	-445	240	1					
	041C5AT	-447	277	1					
	043A5AT	-449	208	3					
	043B5AT	-451	240	3					
5000 Watts	051A5AT	-453	208	1	55	24.9	17,065	73	41
	051B5AT	-455	240	1					
	051C5AT	-457	277	1					
	053A5AT	-459	208	3					
	053B5AT	-461	240	3					

Note: If circuit breaker and/or transformers are required, the Series 50 wall heater must be ordered. 1 Watt Equals 3.413 Btu.



General Data

Model UHCA Series 70 and 80

Table GD-14 — Series 70 Electric Ceiling Surface Heaters

Watts	Model No. UHCA	Order No. 233	Element + Motor Voltage	Element Phase	Mounting Application	Amp Rating	BTU	*Degree F Air Rise	*Degree C Air Rise
2000	021A7A	-300	208	1	Surface	9.6	6,826	15	13.9
	021B7A	-302	240	1	Surface	8.3			
	021C7A	-304	277	1	Surface	7.2			
3000	031A7A	-306	208	1	Surface	14.4	10,239	32	17.8
	031B7A	-308	240	1	Surface	12.5			
	031C7A	-310	277	1	Surface	10.8			
4000	041A7A	-312	208	1	Surface	19.2	13,652	40	22.2
	041B7A	-314	240	1	Surface	16.7			
	041C7A	-316	277	1	Surface	14.4			
	043A7A	-318	208	3	Surface	11.1			
	043B7A	-320	240	3	Surface	9.6			
5000	051A7A	-322	208	1	Surface	24.1	17,065	44	24.4
	051B7A	-324	240	1	Surface	20.8			
	051C7A	-326	277	1	Surface	18.1			
	053A7A	-328	208	3	Surface	13.9			
	053B7A	-330	240	3	Surface	12.1			

Surface Mounted Ceiling Heaters — Series 70 designed to be mounted to standard 4 inch (101.6 mm) ceiling box furnished and installed by others. Approximate weight 32 lbs (14.5 kg) packed and shipped as complete unit.

Table GD-15 — Series 80 Electric Ceiling Recessed Heaters

Watts	Model No. UHCA	Order No. 233	Element + Motor Voltage	Element Phase	Mounting Application	Amp Rating	BTU	*Degree F Air Rise	*Degree C Air Rise
2000	021A8A	-331	208	1	Recessed	9.6	6,826	15	13.9
	021B8A	-333	240	1	Recessed	8.3			
	021C8A	-335	277	1	Recessed	7.2			
3000	031A8A	-337	208	1	Recessed	14.4	10,239	32	17.8
	031B8A	-339	240	1	Recessed	12.5			
	031C8A	-341	277	1	Recessed	10.8			
4000	041A8A	-343	208	1	Recessed	19.2	13,652	40	22.2
	041B8A	-345	240	1	Recessed	16.7			
	041C8A	-347	277	1	Recessed	14.4			
	043A8A	-349	208	3	Recessed	11.1			
	043B8A	-351	240	3	Recessed	9.6			
5000	051A8A	-353	208	1	Recessed	24.1	17,065	44	24.4
	051B8A	-355	240	1	Recessed	20.8			
	051C8A	-357	277	1	Recessed	18.1			
	053A8A	-359	208	3	Recessed	13.9			
	053B8A	-361	240	3	Recessed	12.1			

Recessed Mounted Ceiling Heaters — Series 80 packed as a complete unit. Contains junction box, heater box and grille. For finished ceiling application, use plaster trim (PT3480) which is an optional accessory. Approximate weight 35 lbs (15.9 kg) for use with 2' (609.6 mm) x 2' (609.6 mm) T-bar or hard surface.

* Use PT3480 plaster trim for Series 80 when recessed in a hard finished ceiling. Option Accessory.

Performance Data —

*Degree F (c) air rise measured at 710 fpm (3606.8 mm/s) and 425 cfm (201 l/s) in both 70 and 80 Series.

Throw designed for 8 foot (2438.4 mm) to 12 foot (3657.6 mm) ceilings.

DB RE 10-12WATT = 63.9



General Data

Model UHAA Series 3320

Table GD-16 – Electrical Specifications and Ordering Information

Unit No.	Volts	kW	Watts	Btu/Hr Output	Wgt Lbs	Wgt Kg
UHAA151ETAD	120					
UHAA151BTAD	240	1.5	1500	5119	22	10
UHAA151ATAD	208					
UHAA151CTAD	277					
UHAA021BTAD	240					
UHAA021ATAD	208	2.0	2000	6825	22	10
UHAA021CTAD	277					
UHAA031BTAD	240					
UHAA031ATAD	208	3.0	3000	10240	22	10
UHAA031CTAD	277					
UHAA041BTAD	240					
UHAA041ATAD	208	4.0	4000	13650	22	10
UHAA041CTAD	277					
UHAA481BTAD	240					
UHAA481ATAD	208	4.8	4800	16380	22	10
UHAA481CTAD	277					

Notes: 1 watt equals 3.413 btu.
1000 Watts Equals 1 kW.

Control Wiring Model UHXA

The Trane heaters have been designed for explosion-proof service with single and 3-phase inputs of 208, 240, 480 and

600 volts. They meet stringent UL requirements. However, it is essential that correct installation procedures be

followed to eliminate all potential hazards arising from faulty installation.

<p>Single Phase Heater with 24 Volt Control</p> <p>WD1</p>	<p>24 Volt Control</p> <p>WD1 – Single Phase 208, 240 Volt</p> <p>WD2 – Three Phase 208, 240, 480 Volt</p>	<p>Three Phase Heater with 24 Volt Control</p> <p>WD2</p>
<p>Single Phase Heater with 120 Volt Control</p> <p>WD3</p>	<p>120 Volt Control</p> <p>WD3 – Single Phase 208, 240 Volt</p> <p>WD4 – Three Phase 208, 240, 480 Volt</p>	<p>Three Phase Heater with 120 Volt Control</p> <p>WD4</p>
<p>Single Phase Heater Line Voltage Control 208V or 240V Models Only</p> <p>WD5</p>	<p>Line Voltage Control</p> <p>WD5 – Single Phase 208, 240 Volt</p> <p>WD6 – Three Phase 208, 240 Volt</p>	<p>Three Phase Heater Line Voltage Control 208V or 240V Models Only</p> <p>WD6</p>
<p>600 Volt Three Phase Heater with 24 Volt Control</p> <p>WD7</p>	<p>600 Volt</p> <p>WD7 – Three Phase 24 Volt Only</p> <p>WD8 – Three Phase 120 Volt Only</p>	<p>600 Volt Three Phase Heater with 120 Volt Control</p> <p>WD8</p>



Model UHWA Series 20 and 50

Controls

Control Systems

Type of Control	WD	Heater Type
Built-in thermostat control	1	20 & 50 (1)
Wall mounted thermostat, heater voltage, line duty. For single phase heaters use SP or DP (DP if used as a disconnect) of sufficient capacity. For three-phase heaters use TW1512 which cycles two poles simultaneously.	2	20 & 50 (1)
Wall mounted, heater voltage, pilot duty, one or more heaters. Heater has built-in contactor with heater voltage coil.	3	20 & 50 (1)
Wall mounted, 120V, pilot duty, one or more heaters. Heater has built-in contactor with 120V coil.	4	20 & 50
Wall mounted, 24V, pilot duty, one or more heaters. Heater has built-in contactor with 24V coil.	4	20 & 50
Wall mounted, 24V. Heater has built-in contactor with 24V coil and heater voltage/24V transformer.	5	50 Only
Wall mounted, pilot duty, 120V. Heater has built-in contactor with 120V coil and heater voltage/120V transformer.	5	50 Only

(1) If built-in circuit breaker and/or built-in transformer are desired, 50 Series must be ordered.

Transformer with 24V secondary (A1) available on all models.

Transformer with 120V secondary (A2) available on following models only:

All three-phase models

277 V one-phase up to 4000 watts

208 and 240 V one-phase up to 3000 watts

Accessories

For accessory built-in controls:

- T Built-in thermostat breaks all ungrounded conductors in OFF position.
- C Circuit breaker (Series 50 only) arranged to be disconnected before removal of front with line side terminals covered for safe maintenance. Additional control circuit switch installed if required.
- R Built-in contactor holding coil same as heater voltage.
- R1 Built-in contactor 24V holding coil.
- R2 Built-in contactor 120V holding coil.
- A1 Built-in control transformer, (Series 50 only) 24V secondary.
- A2 Built-In control transformer, (Series 50 only) 120V secondary available on all three-phase heaters, up to 3000 watts on 208 and 240V, one - phase and up to 4000 watts on 277V, 1-phase.

For semi-recessed and surface mounting:

20 Series

- 20 EX 34 Extension sleeve for full surface mounting.
- 20 EX 16 Extension sleeve for extending front additional 2" (50.8 mm) from finished wall.
Heater recesses 2 1/4" (57.2 mm).
- 20 EX 8 Extension sleeve for extending front additional 1" (25.4 mm) from finished wall.
Heater recesses 3 1/4" (82.6 mm).
- 20 Box Must be used on all heater installations.

50 Series

- 50 EX 34 Extension sleeve for full surface mounting.
- 50 EX 16 Extension sleeve for extending front additional 2" (50.8 mm) from finished wall.
Heater recesses 2 1/4" (57.2 mm).
- 50 EX 8 Extension sleeve for extending front additional 1" (25.4 mm) from finished wall.
Heater recesses 3 1/4" (82.6 mm).
- 50 Box Must be used on all heater installations.

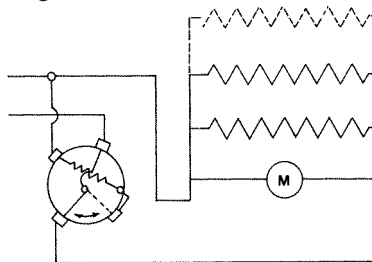
Control Wiring

Model UHCA Series 70 and 80

Optional Control Systems

- Heaters operated from wall mounted, line voltage, heavy-duty thermostats.
- **Direct Line Voltage.** More than one heater may be controlled from one thermostat providing total amperage of heaters does not exceed thermostat rating.
- **Single-Phase Heaters.** Use any good quality single pole thermostat of sufficient ampacity. Use double pole thermostat if positive off is desired. Knob operated and tamper resistant type available.
- **Three-Phase Heaters.** Use TW1512. Makes and breaks two poles simultaneously.
- **Control Panels.** For control of one or more single or three-phase ceiling heaters from one 24V or 120V thermostat. Panels are in NEMA 1 enclosures and have one or more 30 amp, three-pole, 600 VAC contactor(s), operating voltage to control voltage transformer and transformer fusing. (User must provide separate circuit for each contactor.)

Single Phase

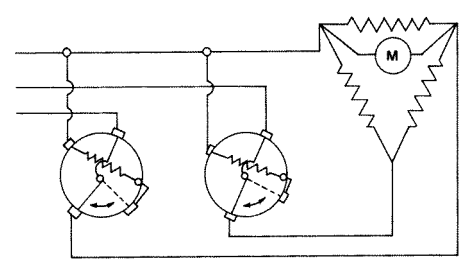


Typical heater element, motor, zero voltage reset thermal cut-out

Optional

- Unit Mounted Controls for Series 80 Recessed Ceiling Heater only shall be factory installed and wired on the Heater.
- T2 = Tamper Proof Built-in Thermostat Double Pole.
- S = Disconnect Switch.
- R1 = Transformer with 24 volt Secondary and Relay for low voltage control.
- R = Relay — Coil operates on heater supply voltage.
- R2 = Relay — Provided with 120 volt control coil.
- Three-phase heaters shall be used with a control panel when controlled by a low voltage (24V or 120V) thermostat.
- **Low Voltage Thermostat (Wall Mounted).** Heaters operated from wall mounted, low voltage thermostats.
- **Thermal Relay With Built-In Line Voltage/24 Volt Transformer.** Relay with built-in line volt/24 V transformer are provided for use with wall mounted low voltage thermostat. For remote mounting only.

Three Phase



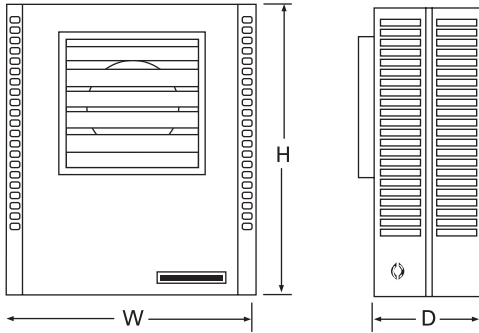
Fan purge (off delay to dissipate residual heat on shut off) supplied as a standard control on heaters with factory installed options.



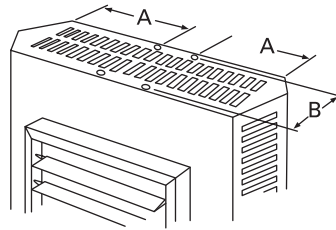
Dimensional Data

Model UHEC

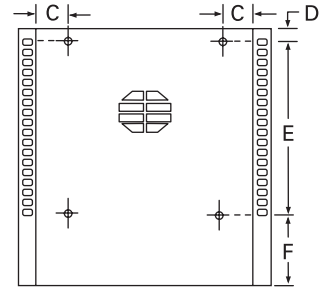
Unit Casing



Horizontal Air Discharge



Vertical Air Discharge



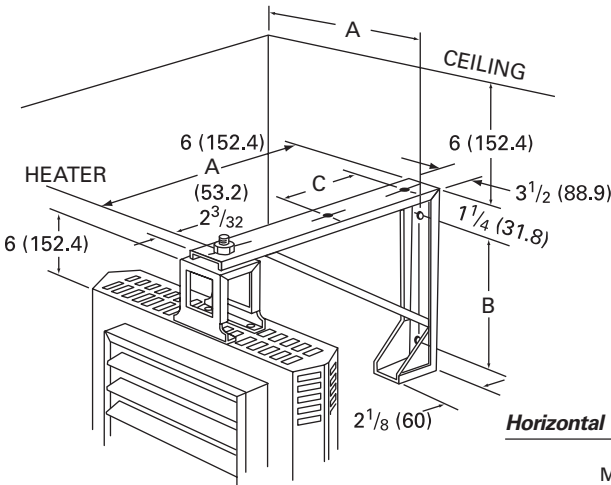
Unit Casing (Inches)

Unit Size	H	W	D
3.3-5	17 3/4 (451)	14 15/32 (368)	6 1/2 (165)
7.5-10	24 5/16 (618)	21 1/2 (546)	6 1/2 (165)
15-20	28 11/16 (729)	21 1/2 (546)	6 1/2 (165)
25-50	34 (864)	29 1/4 (743)	10 1/16 (256)

Weld-Nut Location Dimensions, Inches (mm)

Unit Size	Horizontal			Vertical		
	A	B	C	D	E	F
3.3-5	3 1/32 (77)	5 1/4 (133)	2 7/16 (62)	1 5/32 (29)	11 5/32 (283)	5 7/16 (138)
7.5-10	7 17/32 (191)	5 1/4 (133)	3 1/2 (89)	1 7/8 (48)	16 1/16 (408)	6 3/8 (162)
15-20	7 17/32 (191)	5 1/4 (133)	3 1/2 (89)	1 7/8 (48)	20 7/16 (519)	6 3/8 (162)
25-50	10 27/32 (275)	8 13/16 (224)	6 13/16 (173)	1 7/8 (48)	26 1/2 (673)	5 5/8 (143)

Horizontal Air Discharge



Horizontal Wall/Ceiling Swivel Bracket Clearance Requirements (Inches)

Unit Size	Model Mounting Bracket	Minimum Distance			Mounting Bracket Wt. lbs. (Kg)	Dimensions		
		Ceiling To Unit	Adjacent Surface To Unit	Floor To Unit*		A	B	C
3.3-5	A5105	12 (305)	12 (305)	84 (2134)	6 (2.7)	19 15/64 (487)	10 1/2 (267)	9 1/4 (235)
7.5-20	A5120	18 (457)	12 (305)	84 (2134)	9 (4.1)	23 (584)	12 (305)	19 1/8 (486)
25-50	A5150	18 (457)	12 (305)	84 (2134)	11 (5.0)	26 21/32 (677)	13 1/2 (343)	19 7/8 (505)

*Do not exceed unit's maximum mounting height.

All dimensions approximate.
Certified prints available on request.

Vertical Mounting Bracket Clearance Requirements (Inches)

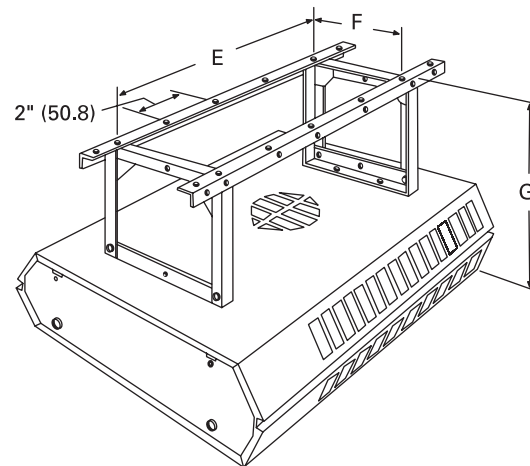
Unit Size	Model Mounting Bracket	Minimum Distance			Mounting Bracket Wt. lbs. (Kg)	Dimensions		
		Ceiling To Unit	Adjacent Surface To Unit	Floor To Unit*		E	F	G
3.3-5	V5105	12 (305)	12 (305)	84 (2134)	9 (4.1)	26 (660)	9 1/8 (232)	18 3/4 (476)
7.5-20	V5120	18 (457)	24 (610)	84 (2134)	13 (5.9)	36 9/16 (929)	13 7/8 (352)	24 1/2 (622)
25-50	V5150	18 (457)	24 (610)	84 (2134)	13 (5.9)	42 (1067)	13 7/8 (352)	28 1/16 (713)

*Do not exceed unit's maximum mounting height.

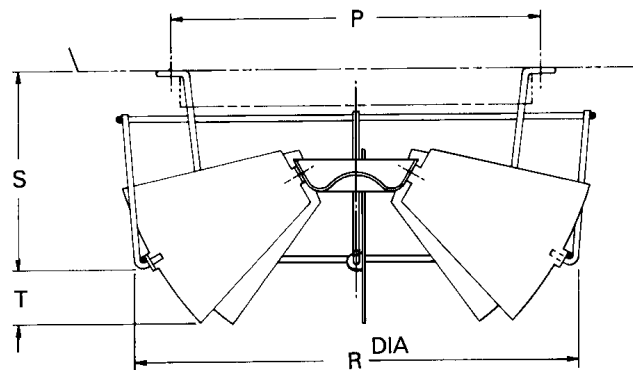
Dimensional Data

Model UHEC

Vertical Air Discharge



Louver Cone Diffuser



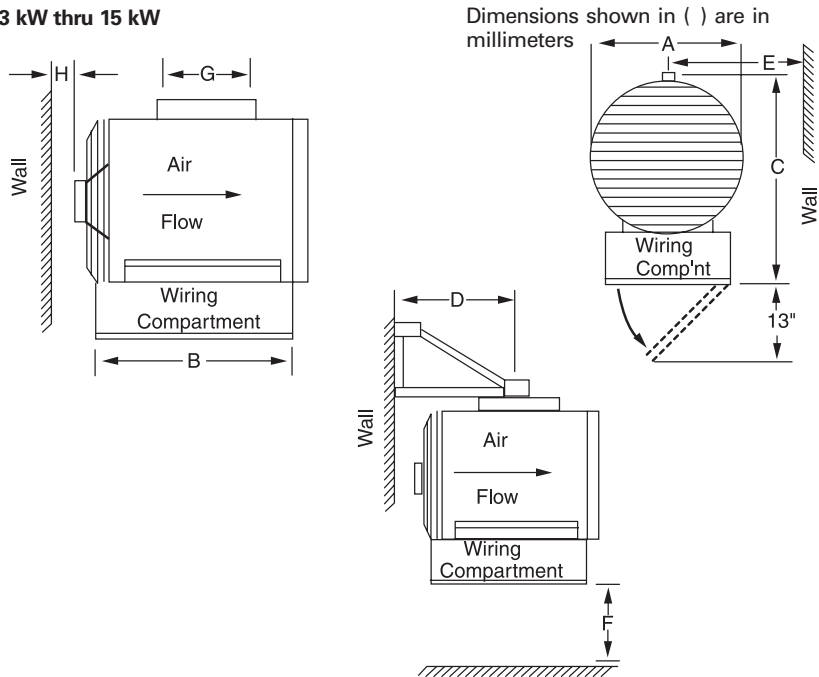
Louver Cone Diffuser Dimensions, in. (mm)

Unit Size	P	R	S	T
03 & 05	N/A	N/A	N/A	N/A
07 & 10	11 ⁵ / ₈ (295.3)	14 ¹ / ₄ (362.0)	6 ¹ / ₂ (165.1)	1 ³ / ₄ (44.5)
15 & 20	11 ⁵ / ₈ (295.3)	14 ¹ / ₄ (362.0)	6 ¹ / ₂ (165.1)	1 ³ / ₄ (44.5)
25-50	17 ¹ / ₈ (435.0)	21 (533.4)	9 ³ / ₄ (247.7)	2 ³ / ₄ (69.9)

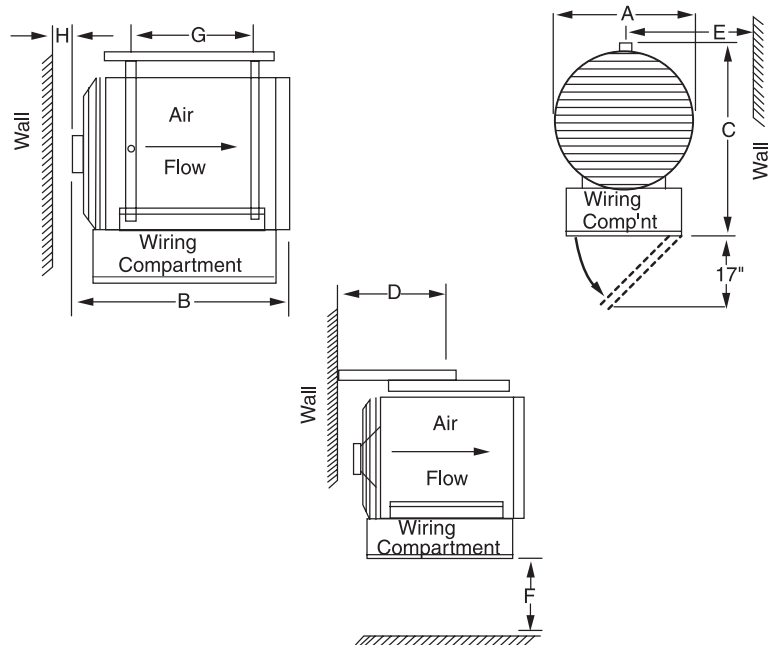
Dimensional Data

Model UHRA

3 kW thru 15 kW



20 kW thru 48 kW



Unit Size	Dimensions, in. (mm)							
	A	B	C	D	E	F	G	H
03,05,07	12" (305)	18" (457)	19 3/4" (502)	15 1/4" (387)	16 1/2" (419)	6 Ft. (1.8 M)	8" (203)	6" (152)
10,15	14" (356)	19" (483)	21 3/4" (552)	15 1/4" (387)	18" (457)	6 Ft. (1.8 M)	8" (203)	6" (152)
20,25,30	16" (406)	27" (686)	28 3/4" (730)	19 1/2" (495)	17 1/2" (445)	6 Ft. (1.8 M)	15 1/2" (394)	4 1/2" (114)
40,48	18" (457)	31" (787)	30 3/4" (781)	19 1/2" (495)	19 1/2" (495)	6 Ft. (1.8 M)	21 3/4" (552)	2 3/4" (70)

Dimensional Data

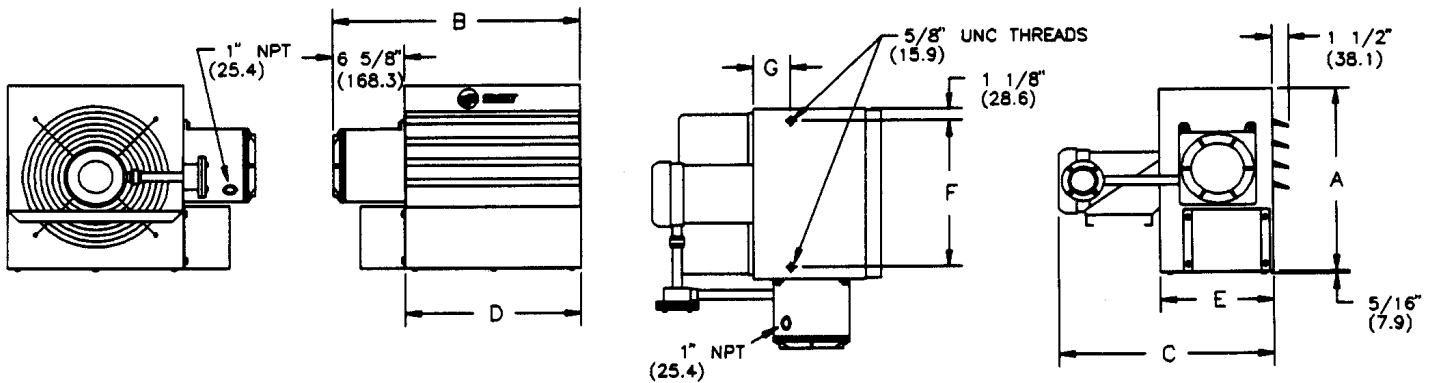
Model UHXA

Physical Dimensions, in. (mm)

Unit Size	A	B	C		D	E	F	G
			3 PH.	1 PH.				
3-5 7.5 kW	17 3/4"	22 3/8"	19 3/4"	20 5/8"	16 1/4"	10 1/2"	14"	3"
10 kW	20 3/4"	26 3/8"	20 3/4"	21 5/8"	20 1/4"	11 1/2"	18"	4"
15-20 25 kW	24 3/4"	30 3/8"	22 1/2"	—	24 1/4"	12 1/2"	22"	4 1/2"

Unit Size	A	B	C		D	E	F	G
			3 PH.	1 PH.				
3-5 7.5 kW	(450.9)	(568.3)	(501.7)	(523.9)	(412.8)	(266.7)	(355.6)	(76.2)
10 kW	(527.1)	(669.9)	(527.1)	(549.3)	(514.4)	(292.1)	(457.2)	(101.6)
15-20 25 kW	(628.7)	(771.5)	(571.5)	—	(616.0)	(317.5)	(558.8)	(114.3)

Dimensions shown in () are in millimeters



Mounting Bracket Kit

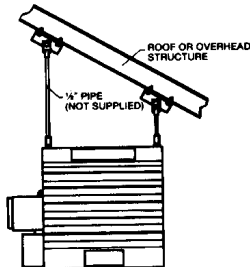
In examples HLPM and HLWM, heater may be rotated horizontally at attachment point as required.

HLPM Floor Mounting Bracket

Particularly useful in buildings with insufficient strength to use other types of mounts. Requires 3 1/2" (89 mm) pipe [4" (102 mm) O.D. — not supplied].

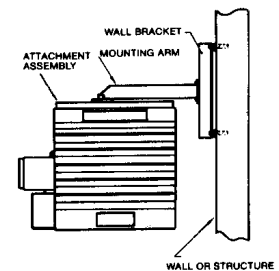
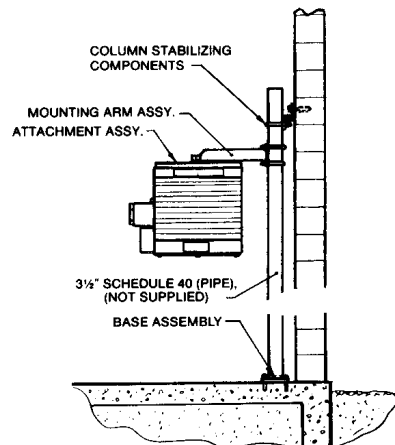
HLWM Wall Mounting Bracket

Ideal for use in buildings that have substantial walls. Arm only can also be bolted directly to structural steel.



HLHM Ceiling Mounting Bracket

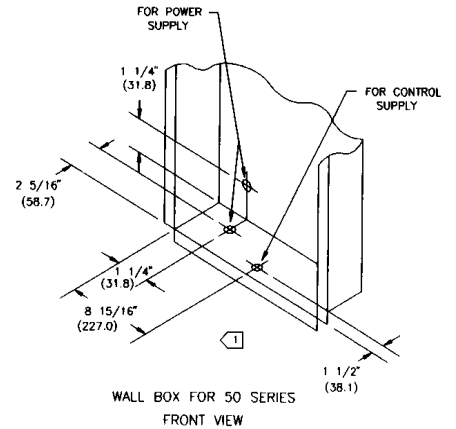
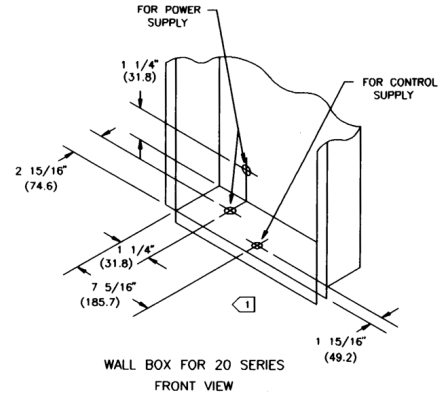
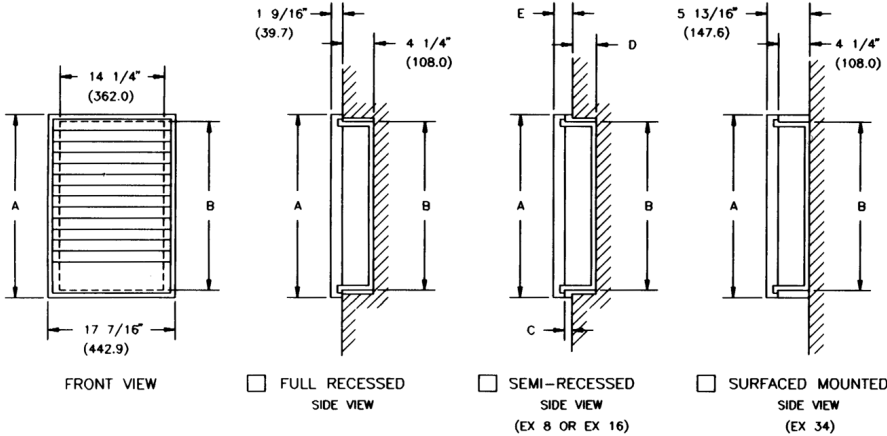
Simple and economical if adequate overhead structure exists. Requires 1/2" (13 mm) pipe, cut and threaded (not supplied).



Dimensional Data

Model UHWA Series 20 and 50

Dimensions shown in are inches (mm)

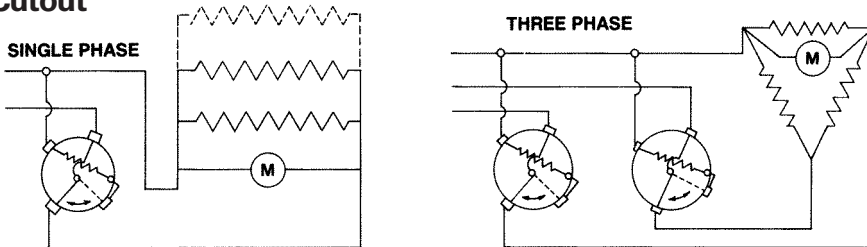


20/50 DIMENSIONS

UNIT	EXTENDERS									
	EX 8			EX 16			EX 34			
A	B	C	D	E	C	D	E	C	D	E
20 SERIES	21 15/32\" (545.3)	19 3/8\" (492.1)	1\" (25.4)	3 1/4\" (82.6)	2 9/16\" (65.1)	2\" (50.8)	2 1/4\" (57.2)	3 9/16\" (90.5)	2 1/4\" (57.2)	3 9/16\" (90.5)
50 SERIES	25 1/32\" (635.8)	23 1/16\" (585.8)	1\" (25.4)	3 1/4\" (82.6)	2 9/16\" (65.1)	2\" (50.8)	2 1/4\" (57.2)	3 9/16\" (90.5)	2 1/4\" (57.2)	3 9/16\" (90.5)

- 1 FOR SEMI-RECESSED AND SURFACE MOUNTING, USE THE FOLLOWING EXTENSION SLEEVES.
 EX 34 EXTENSION SLEEVE FOR FULL SURFACE MOUNTING.
 EX 16 EXTENSION SLEEVE FOR EXTENDING FRONT ADDITIONAL 2\" (50.8) FROM FINISHED WALL. HEATER RECESSES 2 1/4\" (57.15).
 EX 8 EXTENSION SLEEVE FOR EXTENDING FRONT RECESSES 3 1/4\" (82.55).
- 2 ONLY THERMOSTAT AND/OR CONTACTOR MAY BE BUILT-IN THE SERIES 20 HEATERS.
- 3 IF CIRCUIT BREAKER AND/OR TRANSFORMER ARE REQUIRED SERIES 50 ONLY MUST BE ORDERED.

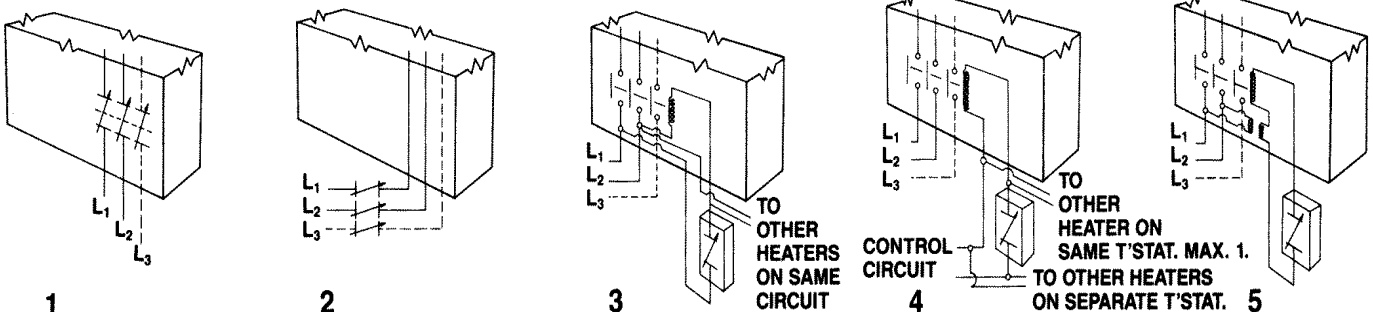
Typical Heater Element, Motor, "Zero Voltage Reset" Thermal Cutout



Control System Wiring Diagrams

ONLY CONTROL CIRCUITS SHOWN
SEE HEATER DIAGRAMS BELOW

1 POWER SUPPLY KO'S 1/2\"-3/4\"-1\" (12.7-19.05-25.4). CONTROL SUPPLY KO'S 1/2\" (12.7). DO NOT MOUNT HEATER CLOSER THAN 12\" (304.8) TO ADJACENT WALL OR TO FLOOR.

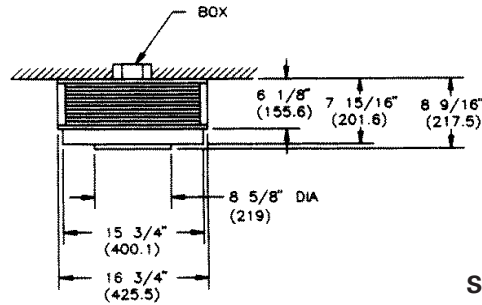


Dimensional Data

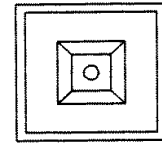
Model UHCA Series 70 and 80

Series 70 — Surface Mounted

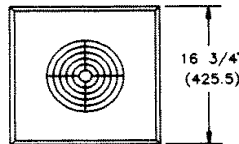
Note: Dimensions shown in inches (mm)



SIDE VIEW
(ALL SIDES IDENTICAL)

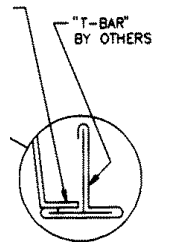


TOP VIEW



BOTTOM VIEW

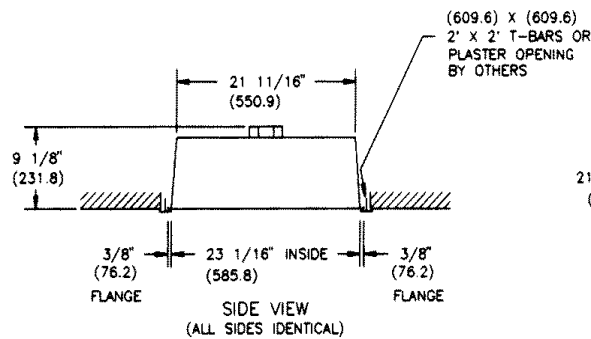
Series 70 — Surfaced Details



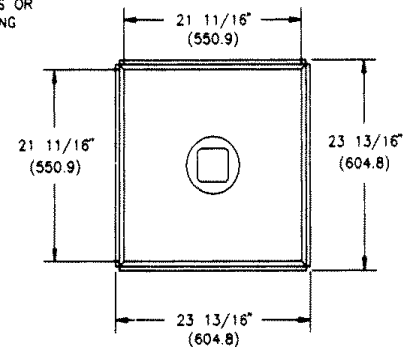
RECESSED T-BAR
INSTALLATION

INSTALLATION

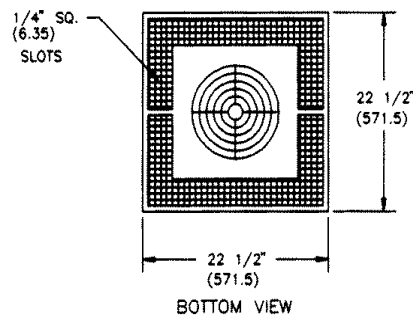
Series 80 — Recessed Mounted



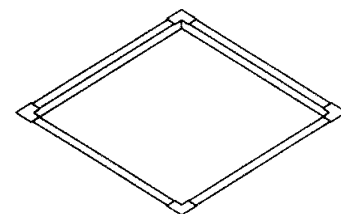
SIDE VIEW
(ALL SIDES IDENTICAL)



TOP VIEW



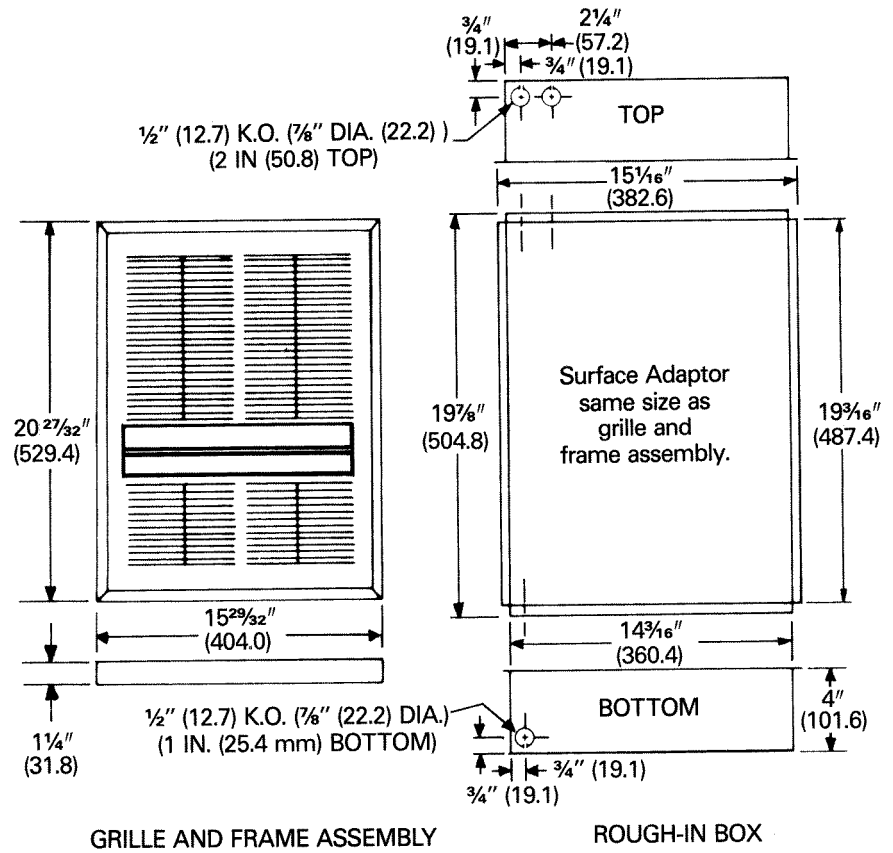
BOTTOM VIEW



Dimensional Data

Model UHAA Series 3320

Dimensions are shown in inches (mm)

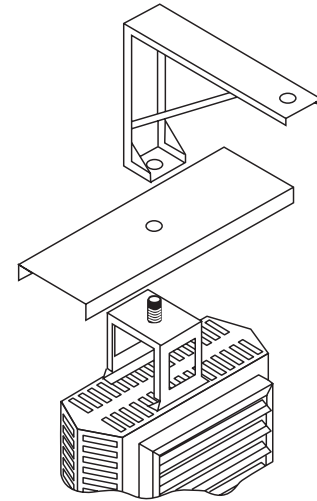


Options

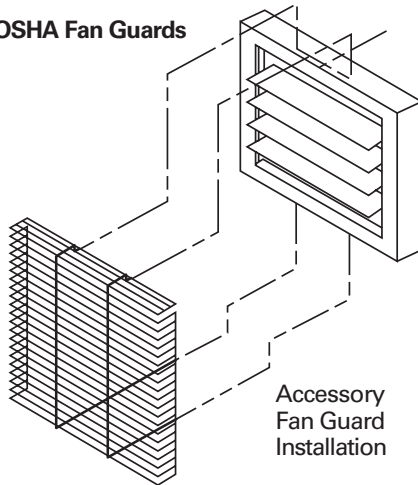
Model UHEC

Dust Shield

Used On	Horizontal	
	Heater and Wall Brackets	Dust Shield
3.3 kW	A5105	DS5105
7.5 kW to 20.0 kW	A5120	DS5120
25.0 kW to 50.0 kW	A5150	DS5150



OSHA Fan Guards



Stratification Control Option

Electric UHEC unit heaters are an efficient way to provide quick, efficient heat when and where it's required. A wall thermostat with an optional stratification thermostat makes the Trane unit heater even more energy efficient. The stratification thermostat recovers trapped ceiling heat, saving electrical energy. When ceiling temperatures are high, the stratification thermostat allows the fan to operate without energizing the heating element. Recovering this otherwise wasted heat assures substantial energy savings.

Diffuser Options

Optional diffusers lend added air pattern versatility to individual vertical down blown installations as shown in illustrations.

Description	Used On	Model No.	Max. Mtg. Ht.	Dim. A	Dim. B	Diffuser Pattern	
1. Louver Diffuser (Standard) Louvers can be individually adjusted for rectangular coverage over doorways as an air curtain or to meet rectangular floor pattern heating requirements.	3.3 & 5.0 kW	STD	9' (2.7 M)	20' (6.1 M)	10' (3.0 M)		
	7.5 & 10.0 kW	STD	12' (3.7 M)	40' (12.2 M)	22' (6.7 M)		
	15.0 & 20.0 kW	STD	18' (5.5 M)	52' (15.8 M)	30' (9.1 M)		
	25.0 & 30.0 kW	STD	22' (6.7 M)	75' (22.9 M)	42' (12.8 M)		
	40.0 & 50.0 kW	STD	24' (7.3 M)	84' (25.6 M)	47' (14.3 M)		
2. General Distribution (No Diffuser) Trane's Airchute Venturi permits general downflow air pattern distribution as required at a higher mounting height.	3.3 & 5.0 kW	NR	9' (2.7 M)	15' (4.6 M)			
	7.5 & 10.0 kW	NR	12' (3.7 M)	30' (9.1 M)			
	15.0 & 20.0 kW	NR	18' (5.5 M)	40' (12.2 M)			
	25.0 & 30.0 kW	NR	22' (6.7 M)	55' (16.8 M)			
	40.0 & 50.0 kW	NR	24' (7.3 M)	64' (19.5 M)			
3. Anemostat Diffuser (Optional) For application where draft restriction is required at lower unit mounting heights.	3.3 & 5.0 kW	NA	—	—			
	7.5 & 10.0 kW	AD5120	10' (3.0 M)	30' (9.1 M)			
	15.0 & 20.0 kW	AD5120	15' (4.6 M)	38' (11.6 M)			
	25.0 & 30.0 kW	AD5150	17' (5.2 M)	50' (15.2 M)			
	40.0 & 50.0 kW	AD5150	20' (6.1 M)	60' (18.3 M)			
4. Louver Cone Diffuser (Optional) Individually adjustable blades permit increased floor coverage at 45° open. Additional throw is accomplished when blades are 90° vertical. Allow higher mounting height.	3.3 & 5.0 kW	NA	45° 90°	45° 90°			
	7.5 & 10.0 kW	RD5120	—	—			
	15.0 & 20.0 kW	RD5120	10' 3.0 M 14' 4.3 M	36' 11.0 M 30' 9.1 M			
	25.0 & 30.0 kW	RD5150	14' 4.3 M 21' 6.4 M	42' 12.8 M 35' 10.7 M			
	40.0 & 50.0 kW	RD5150	20' 6.1 M 30' 9.1 M 18' 5.5 M 28' 8.5 M	62' 18.9 M 44' 13.4 M 68' 20.7 M 54' 16.5 M			

STD=Standard NR=None Required NA=Not Applicable

Options

Model UHEC

Unit-Mounted Room and Stratification Thermostats

Unit-mounted thermostats for field installation are available in low voltage (24V) for either single or two-stage operation, and line voltage (up to 277V) for single-stage operation. All room thermostats have an adjustable temperature setting range of 45°F (7.2°C) to 90°F (32.2°C); and the stratification thermostat has a range of 70°F (21.1°C) to 130°F (54.4°C).

Low voltage thermostats should only be used with units provided with contactors and a low voltage control transformer. Line voltage thermostats can be used with all units provided the thermostat's maximum amp and voltage ratings are not exceeded. Line voltage thermostats have a maximum amp rating of 25 amps, and maximum voltage rating of 277V. Two-stage thermostats can be used on unit sizes 25 kW and above to provide automatic two-stage heating operation.

Unit and Wall Mounted Summer-Fan Switches

Unit mounted and wall mounted summer-fan switches are available for line voltage (up to 277V) and low voltage (24V). Summer fan switches allow fan only operation without energizing the unit's heating element. During the nonheating season, the summer fan switch will allow the unit's fan to provide air circulation without providing heat.

Model UHRA

- Remote 24-volt thermostat
- Stainless steel wall/ceiling mounting bracket (3.3-15 kW)
- Cast iron painted mounting bracket available on all units for wall/ceiling or pipe mounting
- Hanging bracket for use with threaded rod

Wall-Mounted Room Thermostat

Wall-mounted thermostats are available in low voltage (24V) for either single or two-stage operation, and line voltage (up to 277V) for single-stage operation. All Line voltage thermostats have an adjustable temperature setting range of 40°F (4.4°C) to 90°F (32.2°C). Single stage low voltage thermostats have a range of 50°F (10°C) to 80°F (26.7°C), and two-stage low voltage thermostats have a range of 45°F (7.2°C) to 85°F (29.4°C).

The same guidelines for the application of unit-mounted thermostats are also applicable to wall-mounted thermostats.

Unit and Wall Mounted Power Disconnect Switches

Unit and wall mounted power disconnect switches are available to provide a positive disconnect of the unit from the power supply. Two-pole and three-pole power disconnect switches are available with voltage ratings from 25 to 63 amps.



Options

Model UHXA

Mounting Bracket Kits

Trane makes three mounting kits available — the HLPM Pipe Mounting Bracket, the HLHM Ceiling Mounting Bracket, and the HLWM Wall Mounting Bracket. Each of these is illustrated and described on page 20 of this brochure. To order, specify the type of bracket with the heater model desired.

Explosion-Proof Thermostat

Specifications

- TW161 Single Pole
- 22 Amps 125-277 VAC
- 3/4 Hp 125 VAC
- 1½ Hp 250-277 VAC
- 5½" H x 5½" W x 4¾" D
- Can be used for heating or cooling applications



Built-In Hydraulic Thermostat

Optional On All Models

- Stainless steel bulb and capillary
- 125 VA pilot duty
- Used on 24 volt, 120 volt or 208-240 volt line voltage control
- 60°F to 90°F temperature range
- Adjustable from front of unit with screwdriver.





Mechanical Specifications

Model UHEC

Heaters shall be installed and wired in accordance with the manufacturer's recommendations and applicable national and local codes.

Casing

Casings fabricated of die-formed, heavy gauge steel and finished in high gloss, baked enamel. Supply air shall be drawn through a stamped louver periphery evenly across the heating element, and discharged through an outward drawn venturi. Adjustable discharge louvers shall be provided to control the direction of airflow. A large, hinged access door shall extend the width of the heater and locked in position by quarter-turn fasteners. Heater and supply wiring diagram shall be permanently attached to the inside of the access door.

Elements

Elements shall be high mass, all steel tubular finned type, copper brazed. Centrally located and installed in fixed element banks.

Motors

Motors shall be totally enclosed, all angle industrial rated. All units 3.3 through 20 kW will utilize sealed bearings to assure permanent lubrication. 25 through 50 kW units are provided with a two-speed, permanent capacitor-type.

Fan Blades

Fan blades shall be of the axial flow type designed for quiet efficient operation. Fan speed does not exceed 1,600 rpm (26.7 R.P.S.).

Wiring

Heaters designed for a single circuit, with elements, motor and control circuits subdivided with factory wired fuses to conform to the National Electric Code and Underwriter's Laboratory, Inc., Standard 1278. All three-phase heaters shall have balanced phases.

Thermal Overload Protection

All heaters shall be equipped with automatic reset thermal overloads which shut down the element and motor if safe operating temperatures are exceeded.

Fusing

Element, motor and transformer primary fusing are factory installed and wired where required by NEC. Branch circuit fusing is installed where required (48 amps and up).

Control

Contactors and control circuit transformers where required are factory installed and wired. Only direct line supply and thermostat connections in the field are required. Two-stage operation is standard on all units 25 kW and larger with use of two-stage thermostats. Built-in fan override is provided to purge unit casing of excess heat after unit shutdown. The units are listed under the Reexamination Service of Underwriter's Laboratories, Inc. Units are warranted to be free from defective material and workmanship for a period of one year with the exception of the heating elements which are warranted for five years.

Control Options

- Integral power disconnects (where applicable) — supplied to disconnect all ungrounded connectors in the "Off" position. Disconnect is isolated from unit wiring by use of a metal plate and fish paper.

- Thermostats (unit-mounted); (wall-mounted) — heavy-duty hydraulic actuating-type. Thermostat range 45°F (7.2°C) to 90°F (32.2°C). Unit-mounted thermostat can be rendered tamperproof by removing the temperature adjustment knob.
- Independent fan operation for summer air circulation — provided from a line or low voltage (unit-mounted) (wall-mounted) fan switch.
- Combination low voltage wall thermostat and fan switch — provided to give wall mounted control of element and fan.
- Stratification thermostat with a range of 70°F (21.1°C) to 130°F (54.4°C) — provided for units mounted in the vertical discharge position to provide an energy saver cycle recovering warm stratified air.

Optional Dust Shield

- For use on horizontal units with wall brackets only, to protect from dust and other particles falling inside the unit heater.

Optional Diffusers

- Louver Cone Diffuser — shall have individually adjustable blades to permit increased floor coverage at 45 degrees open. Additional throw is accomplished when blades are 90 degrees vertical, allowing higher mounting height.
- Anemostat Diffuser — for applications where draft restriction is required at a lower unit mounting height.

Quiet Operation

The heater's air chute is specifically designed with an outward deep-drawn venturi to provide the maximum throw of warm air forward in either the horizontal or vertical mounting position.

Sound Ratings of Free Field

Unit Size	dba Rating
3.3-5.0 kW	56
7.5-10 kW	57
15-20 kW	71
25-30 kW	70 High/70 Low Speed
40-50 kW	79 High/73 Low Speed

OSHA Fan Guards - Optional

Model No.	Unit Size	Number of Holes	Dim. From Edge	Center to Center Dimension
OFG-5101	2-5 kW	4	1/4" (6.4 mm)	3 3/4" (95 mm)
OFG-5102	7-20 kW	4	1/4" (6.4 mm)	4 3/4" (121 mm)
OFG-5103	25-50 kW	4	1/4" (6.4 mm)	4 3/4" (121 mm)

1. For units with existing holes in louver frame, the fan guard snaps into place.
2. To retrofit the fan guard, holes must be drilled 1/8" (3.2 mm) diameter.
3. OSHA approved.

Mechanical Specifications

Model UHRA

Heaters shall be installed and wired in accordance with the manufacturers recommendations and applicable national and local codes.

Casing

The casing that houses the heating elements shall be fabricated from 16-gauge 304 stainless steel with a 304 stainless steel outlet protective grille and angled outlet louvers to insure uniform air flow and delivery temperature across the entire face of the heater. The inlet grille shall be chrome plated. The control enclosure compartment factory installed to the bottom of the heater shall be NEMA 4x nonmetallic provided with a hinged and latched access door that opens from the bottom to simplify wiring installation and maintenance. A single point line voltage connection is provided for 208, 240, 277, 480 and 600 volt service.

Elements

Heavy duty heating elements shall be manufactured from rugged finned tubular steel and chrome-plated for corrosion resistance. Factory wired and sealed for washdown applications.

Motors

Motors shall be totally enclosed permanently lubricated manufactured with corrosion resistant windings to resist moisture and corrosion, factory wired to NEMA 4x enclosure and UL Listed. Both the motor and fan blade shall be factory installed within the heaters casing on rubber isolators to minimize vibration and noise.

Fan Blades

Fan Blades shall be manufactured from anodized aluminum and finished with an epoxy coating.

Thermal Overload Protection

All heaters equipped with corrosion resistant auto reset thermal overloads shall be sealed to prevent moisture to enclosure. Shuts down the element and motor if safe operating temperatures are exceeded.

Controls

All heaters shall be provided as standard with 24-volt transformer and control circuit, fusing (NEC required), pilot light

(power-on indicator), thermostat with stainless steel capillary sensor and three-position switch (heat- off-fan) factory installed and wired in the control enclosure compartment to the terminal block for ease of wiring.

- Fan delay relay shall be provided as standard factory installed and wired in the control enclosure to maintain fan operation for approximately 2½ minutes (150 S) after the heating cycle has ended.
- Disconnect switch with control enclosure compartment door interlock shall be furnished as standard factory installed and wired.

Installation

All heaters shall be used in (non-hazardous) locations with corrosive atmospheres where humidity, incidental water, water-saturated or direct spray of water is the normal condition.

Supply Connections

Supply connections shall meet all local and NEC requirements and shall be suitable for use in WET or CORROSIVE atmospheres and locations.

Wiring Instructions

The heaters wiring diagram for field connections shall be located inside the control enclosure and all field wiring connections shall terminate in coded terminal blocks. Terminal blocks shall be suitable for either copper or aluminum field wiring. A single power supply circuit shall be provided for all voltages thru 48 kW size heaters.

UL, NEC and OSHA

Heaters shall meet all UL, NEC and OSHA requirements when installed as directed per Installation Operation Maintenance Manual (UHRA-IOM-1) dated March 1994.

Mounting Bracket Kits

Wall Mounting Bracket Kits — Model A5520 shall be manufactured from stainless steel and epoxy coated. Models W5520, W5550, H5550, P5520 and P5550 shall be manufactured from epoxy coated steel.



Mechanical Specifications

Model UHXA

Heaters shall be installed and wired in accordance with the manufacturer's recommendations and applicable national and local codes for use in hazardous classified locations and shall be UL listed.

UL Classes

For Class I, Group D, Divisions 1 and 2 and Class II, Groups E, F and G, Divisions 1 and 2.

Abbreviated descriptions of UL classes, groups and divisions.

Before selecting any heater for a particular application, refer to Article 500 as well as other standards referenced in the National Electric Code.

- **Class I:** Equipment does not have surface operating temperature in excess of the ignition temperature of the specific gas or vapor.
- **Class II:** Equipment does not have surface temperature greater than the ignition temperature of the specified dust.
- **Group D:** Atmospheres such as but not limited to acetone, alcohol, gasoline, lacquer solvent vapors, natural gas, propane or other gases or vapors of equivalent hazard.
- **Group E:** Atmospheres containing combustible metal dust regardless of resistivity, or other combustible dust of similar hazard characteristics having resistivity of less than 10^5 ohm-centimeter.
- **Group F:** Atmospheres containing carbon black, charcoal, coal or coke dust.
- **Group G:** Atmospheres containing combustible dust having resistivity of 10^5 ohm-centimeter or greater.
- **Division I:** A location in which ignitable concentrations of flammable material exist under normal operating conditions.
- **Division II:** Locations in which flammable materials will normally be confined within closed containers and escape only in the case of accidental rupture, breakdown or during maintenance operations. Any equipment approved for Division I is automatically also approved for Division II.

UL Temperature Codes

The UL temperature code is T3B 165°C (329°F) for Class 1 and Class 2, indicating maximum operating surface temperatures.

Cabinet

Cabinet fabricated of 14-gauge (1.9 mm thickness) cold rolled steel, with individually adjustable louvers, epoxy coated. A wire fan guard chrome-plated with less than $\frac{1}{4}$ " (6.4 mm) spacing conforms to NEMA requirements and shields all moving parts to meet OSHA requirements. Zinc plated fasteners, conduit made of cadmium-plated seamless steel tubing, cast aluminum control box with opening and $2\frac{5}{8}$ " (16 mm) NC top hanger connections.

Heat Exchanger

Heat exchanger double walled, liquid filled with three low watt density immersion type copper sheathed elements hermetically sealed into the core made of steel with aluminum fins. Heat transfer fluid of ethylene-glycol solution protected to -45°C (-49°F).

Motors

Motors PSC, explosion-proof, permanently lubricated, ball bearing type, 1725 rpm (29 rps). Motor voltage/phase same as element.

Fan Blade

Fan blades are made of aluminum designed for quiet efficient operation.

Controls Factory Installed

Contactors shall be built-in and pre-wired into an explosion-proof enclosure. Contactors shall be heavy duty and break all ungrounded conductors and be rated for 100,000 cycles at all full load. Control transformers where required shall be built-in and pre-wired. Control circuits shall be 24 volts on 208, 240, 480 and 600 volt heaters or 120 volts on 208, 240 and 480 volt heaters or 208 volts on 208 volt heaters or 240 volts on 240 volt heaters.

Thermal Overload Protection

All heaters equipped with automatic reset thermal overload switch capillary type rated for 100,000 cycles of reliable service for temperature regulation.

Relief Valve

Over-pressure arising from excessive external temperature is relieved by a pressure relief valve factory installed in the top header tank. Made of stainless steel opens @ 200 psi (1379 kPa).

Control Options:

- Explosion-proof thermostat (wall-mounted) - SPST 40°F (4.4°C) - 90°F (32.2°C) 22 amps, 125-277 VAC, $\frac{3}{4}$ HP (559 W) @ 125 VAC, $1\frac{1}{2}$ hp (1119 W) @ 250-277 VAC.
- Explosion-proof thermostat (wall-mounted) - DPST 40°F (4.4°C) - 90°F (32.2°C) 22 amps, 125-277 VAC, $\frac{3}{4}$ hp (559 W) @ 125 VAC, $1\frac{1}{2}$ hp (1119 W) @ 250-277 VAC.
- Explosion-proof hydraulic thermostat (built-in) — 45°F (7.2°C) -90°F (32.2°C) 125 VA pilot duty.

Mounting Bracket Kits:

- Wall mounting bracket, ideal for use in buildings that have substantial walls. Note the arm only can be bolted directly to structural steel.
- Ceiling mounting bracket, must have adequate overhead structure to mount to. Note $\frac{1}{2}$ " (12.7 mm) pipe, cut and threaded and supplied by others is required.
- Floor mounting bracket should be used in buildings with insufficient strength to use other types of mounting brackets. To be used with $3\frac{1}{2}$ " (88.9 mm) schedule 40 pipe 4" (101.6 mm) OD supplied by others.



Mechanical Specifications

Model UHWA Series 20 and 50

Contractor shall supply and install heavy-duty, wall-mounted forced-air electric unit heaters of the wattage, voltage and phase as indicated on the plans. The heater is designed to provide an even distribution of heated air to the space by drawing return air in the periphery of the heater across the element, which shall then be discharged from the center section of the heater by means of an electric motor and axial flow fan blade.

Heaters are recessed to extend no more than 1 1/2" (38.1 mm) from the finished wall, surface mounted to extend no more than 5 3/4" (146.1 mm) from the finished wall or semi-recessed to extend no more than 2 1/2" (63.5 mm) from the finished wall.

Enclosure

Heater front can withstand, with less than 1/16" (1.6 mm) permanent distortion, 10.8 ft. lbs (324 poundals) impact and 400 lbs. (181.4 kg) static force applied to an 8 sq. in. (516 sq mm) area at center grille location.

The combination return and supply grille assembly are constructed of 1/16" (1.6 mm) x 3/8" (9.5 mm) rounded edge horizontal steel. Louvers are spaced for maximum opening of 1/4" (6.4 mm). Louvers are welded at every intersection to three evenly spaced 1/16" (1.6 mm) diameter vertical members and completely framed in a heavy - gauge natural anodized aluminum extrusion. Front assembly are be attached to the chassis by hidden tamper-resistant (Allen-head) machine screws. All other parts are 16-gauge (1.5 mm thickness) steel zinc coated both sides painted in a high gloss bronze colored baked enamel finish.

Motor

Motors are permanently lubricated unit bearing, totally enclosed, shaded pole type with impedance protection. Motors will operate at no more than 1400 rpm (23.3 rps) and are the same voltage as the heater. A protective shield shall surround the motor to separate return air from heated air.

Performance

Heaters have a rating of 245 cfm (115.6 l/s) at 660 fpm (3352.8 mm/s) with a maximum temperature rise of 73 F (40.6 C).

Elements

Element assemblies consist of two or three corrosion-resistant steel sheathed type elements mechanically bonded to common corrosion-resistant steel fins. Each sheathed element consist of helically coiled nickel chromium alloy- resistant wire completely embedded in and surrounded by magnesium oxide, enclosed and wedged into corrosion- resistant steel sheaths. Elements have 2" (50.8 mm) cold conductor pins extending into the sheath and have a density of no more than 60 watts per inch (25.4 mm).

Thermal Overload

Heaters are equipped with a "zero voltage reset" thermal overload which disconnects elements and motor in the event normal operating temperatures are exceeded. For safety, if opened due to abnormal temperatures, thermal overload will remain open until manually reset by turning heater off for five minutes. Automatic reset thermal overloads which allow the element to continue to cycle under abnormal conditions will not be accepted.

Warranty

Heaters are warranted for 5 years.

Approval

Heaters are Underwriters' Laboratories listed. Heaters are conform to Underwriters' Laboratories, Inc. Standard 1025, Paragraphs 31.20, 31.21, 31.22 and 31.23. Heaters not conforming to these paragraphs will not be acceptable.

Optional Control Systems

Heaters are operated from wall - mounted, line voltage, heavy-duty (tamper-resistant) thermostats.

Heaters with built-in, pre-wired contactors are operated from wall - mounted, line voltage, pilot duty (tamper-resistant) thermostats.

Heaters with built-in, pre-wired contactors (and control transformers) will be operated from wall-mounted, pilot duty (24 V) or (120 V) wall-mounted tamper-resistant thermostats.

Heaters are controlled by integrally mounted thermostats. Thermostats are heavy-duty, hydraulic type with a range of 40 F (4.4 C) to 80 F (26.7 C) and with remote sensing bulb placed in the return air. Thermostats shall be electrically rated at least 125 percent of heater rating. Thermostats also act as a disconnect by breaking all ungrounded conductors in the OFF position. (Thermostat control knob is covered by a 16-gauge (1.5 mm thickness) tamper- resistant access plate to prevent adjustment by unauthorized personnel.)

Contactors

Where required, heaters are equipped with heavy-duty, definite purpose contactors with flame path separators and dust covers. Contactors will cycle all ungrounded conductors. Contactors have holding coils (of the same voltage as the heater), or 120 volts or 24 volts.

Contactors are be rated at least 125 percent of heater rating and are UL approved for 250,000 cycles.

Control Transformers

Heater are equipped with a Class 2 control transformer, sealed rating of 20 VA, to supply control circuits of 24 volts or 120 volts. (120 volt secondaries not available in single phase heaters over 3 kW.)

Circuit Breakers

Heaters equipped with built-in circuit breakers in order to allow the heaters to be supplied from feeder taps. A separate switch providing a positive off for control circuits are included where required. Circuit breakers and control switches are arranged so that all line side conductors will be separately enclosed when heater front is removed for servicing so that no current-carrying parts are accessible without the use of additional tools.



Mechanical Specifications

Model UHCA Series 70 and 80

Contractor shall supply and install heavy duty ceiling-mounted forced-air electric heater(s) of the wattage, voltage and phase as indicated on the plans. The heater is designed to provide an even distribution of heated air to the space to be heated by drawing return air in the periphery of the heater, across and through the element and be discharged from the center section of the heater by means of an electric motor and axial flow fan blade.

Heaters that are recessed type and mounted flush with the finished ceiling or surfaced mounted to extend no more than 8 9/16" (217.5 mm) from the finished ceiling.

Enclosure — Recessed

The return grille assembly is constructed of a one piece heavy gauge steel with 1/4" (6.4 mm) sq. slots for return air and concentric rings for uniform air discharge. Grille assembly is attached to the chassis by tamper-resistant (Allen head) machine screws. All parts of enclosure are heavy gauge steel, zinc coated both sides and finished in neutral, off-white colored, baked enamel.

Surface Mounted

Enclosure are constructed of 1/16" (1.6 mm) x 3/8" (9.5 mm) rounded edge horizontal steel louvers which are spaced for maximum opening of 5/16" (7.9 mm). Louvers are welded at every intersection to evenly spaced 1/8" (3.2 mm) diameter vertical members. Discharge grille to have concentric rings for uniform air discharge. Grille assembly are attached to chassis by tamper-resistant (Allen head) machine screws. All parts of enclosure are heavy gauge steel, zinc coated both sides and finished in neutral, off-white colored, baked enamel.

Motor

Motors are permanently lubricated, unit bearing, totally enclosed shaded pole type with impedance protection. Motors operate at no more than 1,300 rpm (21.7 RPS) and are the same voltage as the heater.

Performance

Heaters have a rating of 425 cfm (200.6 l/s) at 710 fpm (3606.8 mm/s) with a maximum temperature rise of 44 F (24.4 C) and 63.9 DB RE 10-12 watt.

Elements

Element assemblies consist of two or three corrosion-resistant, steel-sheathed type elements mechanically bonded to common corrosion-resistant steel fins. Each sheathed element consist of helically coiled nickel chromium alloy resistant wire completely embedded in and surrounded by magnesium oxide, enclosed and wedged into corrosion resistant steel sheaths. Elements have 2" (50.8 mm) cold conductor pins extending into sheath and have a density of no more than 60 watts per inch (25.4 mm).

Thermal Overload

Heaters are be equipped with a "zero voltage reset" thermal overload which disconnects elements and motor in the event normal operating temperatures are exceeded. For safety, if opened due to abnormal temperatures, thermal overload will remain open until manually reset by turning heater off for five minutes. Automatic reset thermal overloads which allow the element to continue to cycle under abnormal conditions will not be accepted.

Approval

Heaters are Underwriters' Laboratories listed. Heaters conform to Underwriters' Standard 1025.



Mechanical Specifications

Model UHAA Series 3320

Furnish and install heavy-duty forced air wall heaters, Series 3320 where specified. Heaters are architectural styled, constructed of a 18-gauge (1.2 mm thickness) steel housing with a 14-gauge (1.9 mm thickness) extruded aluminum frame. The rugged steel grille and heater box are painted with a rust resistant dark brown baked enamel color finish. Rough-in dimensions of 19 ³/₁₆" (487.4 mm) high x 14 ³/₁₆" (360.4 mm) wide x 4" (101.6 mm) deep. Power wiring is connected through two ¹/₂" (12.7 mm) knockouts in the top of the heater and one ¹/₂" (12.7 mm) knockout on the bottom of the heater. Units are available in ratings from 1500 to 4800 watts at 240, 208 and 277 volts and 1500 watts at 120 volts. The heaters have a low-speed 600 rpm (10 rps), four-pole motor which drives a vane axial blower to deliver a quiet 175 cfm (82.6 l/s) of down flow air.

The heating element are of the sealed tubular type with large, parallel steel fins for quick heat transfer.

Unit's have as standard, thermal overload cut-off for added safety, fan delay switch, manual tamper resistant disconnect switch and a tamper resistant thermostat which are calibrated to provide a range of 55 F (12.8 C) to 85 F (29.4 C). All items factory installed and wired.

Optional accessories include a surface mounting adapter and day-night relays. All heaters are listed by Underwriter's Laboratories, Inc. The heating element are supplied with a manufacturer's five - year limited warranty.



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