

KVP Series Engineering Specification & Configuration

GENERAL

Furnish and install Krueger KVP series of vertical hi-rise, direct drive fan coil units where indicated on the plans and in the specifications. Units shall be completely factory assembled, tested and shipped as one piece. All units shall be capable of meeting or exceeding the scheduled capacities for cooling, heating and air delivery. All unit dimensions for each model and size shall be considered maximums. Units shall be ETL listed in compliance with UL/ANSI Standard 1995, and be certified as complying with the latest edition of AHRI Standard 440.

CONSTRUCTION

All unit chassis shall be fabricated of heavy gauge galvanized steel panels able to meet 125 hour salt spray test per ASTM B-117. All exterior panels shall be insulated with 1/2" thick insulation with a maximum k value of .24 (BTU • in) / (hr • ft² • °F) and rated for a maximum air velocity of 5000 f.p.m. Insulation must meet all requirements of ASTM C1071 (including C665), UL 181 for erosion, and carry a 25/50 rating for flame spread/smoke developed per ASTM E-84, UL 723 and NFPA 90A.

Option: For units with multiple outlets, include an insulated sheet metal baffle inside the discharge plenum to break the sight lines between the two discharge outlets and to attenuate room noise that could be transmitted through the openings.

All unit panels shall have knockouts for supply air openings and riser slots to facilitate the field conversion of riser location and supply air grille location.

Option: Supply air opening knockouts shall be factory sealed and left in place during shipping and staging at the job site.

All units shall have decorator front panels fabricated of not less than 18 gauge galvanized steel. The front panel shall include a stamped louver return air grille and be attached with quarter turn quick open fasteners to allow for easy removal and access for service.

All concealed units shall have a duct collar on the discharge.

All exposed units shall have exterior panels fabricated of not less than 18 gauge galvanized steel. The front panel shall be attached with quarter turn quick open fasteners to allow for easy removal and access for service.

Option: Provide an architectural grade double deflection aluminum discharge grille.

Option: Provide foil faced insulation in lieu of standard. Foil insulation shall meet or exceed the requirements stated above, and in addition meet ASTM Standards C-665 and C-1136 for biological growth in insulation. Insulation shall be lined with aluminum foil, fiberglass scrim reinforcement, and 30 pound kraft paper laminated together with a flame resistant adhesive. All exposed edges shall be sealed to prevent any fibers from reaching the air stream.

Option: Provide Elastomeric Closed Cell Foam Insulation in lieu of standard. Insulation shall conform to UL 181 for erosion and NFPA 90A for fire, smoke and melting, and comply with a 25/50

Flame Spread and Smoke Developed Index per ASTM E-84 or UL 723. Additionally, insulation shall comply with Antimicrobial Performance Rating of 0, no observed growth, per ASTM G-21. Polyethylene insulation is not acceptable.

Option: Tandem Primary and Tandem Secondary units. Primary and Secondary units shall be supplied joined together by a nominal 6" wall that contains the supply, return and condensate risers. The cabinets of both units in the pair will be the same height and width regardless of capacity and will be the standard dimension of the unit with the greater capacity.

The Secondary unit will have a 5/8" layer of type-X gypsum board mechanically fastened to the unit wall adjacent to the risers.

Where a one hour rating of the partition between the units is required, a second layer of type-X gypsum board shall be mechanically fastened to the Primary unit wall adjacent to the risers. An 18 gauge steel blower shield shall be provided for both the Primary and Secondary units. Piping penetrations in the partition walls shall be provided with fire blocking material. The unit shall be cETL listed in compliance with ANSI/UL-1479 Standard Test Method for Fire Tests of Through Penetration Fire Stops. A copy of the Authorization to Mark certifying compliance by a nationally recognized testing laboratory shall be provided with the unit submittal.

PAINTED FINISH

All painted cabinet exterior panels shall be finished with a heat cured anodic acrylic powder paint of the standard factory color.

SOUND

Units shall have published sound power level data tested in accordance with AHRI Standard 350-2000.

FAN ASSEMBLY

Unit fan shall be dynamically balanced, forward curved, DWDI centrifugal type constructed of 18 gauge galvanized steel for corrosion resistance. Motors shall be high efficiency, permanently lubricated sleeve bearing, permanent split-capacitor type with UL and CSA listed automatic reset thermal overload protection and three separate horsepower taps. Single speed motors are not acceptable.

Option: Provide a blower shield to cover the entire fan assembly. The blower shield shall be tight fitting to prevent air bypass and prohibit accidental contact with the fan assembly. Units that allow accidental contact with the fan assembly with the front panel removed are not acceptable.

The fan assembly shall be removed and serviced through the front and safety panels. The entire assembly shall be able to come out of the unit easily by removing two lock nuts and unplugging the motor.

Option: Provide an electronic fan speed controller (SCR) wired to high motor tap for aid in balancing the fan capacity. The speed controller shall have a turn down stop to prevent the possibility of harming the motor bearings, and incorporate electrical noise suppression to minimize noise on the incoming power lines.

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Option: Devices used to energize and de-energize (switch) fan speeds must be totally silent. Magnetic, mercury, and/or quiet relays and/or contactors are not acceptable.

COILS

All cooling and heating coils shall optimize rows and fins per inch to meet the specified capacity. Coils shall have seamless copper tubes and shall be mechanically expanded to provide an efficient, permanent bond between the tube and fin. Fins shall have high efficiency aluminum surface optimized for heat transfer, air pressure drop and carryover.

All coils shall be hydrostatically tested at 450 PSIG air pressure under water, and rated for a maximum 300 PSIG working pressure at 200°F.

Heating coils shall be furnished in the reheat position as standard.

All water coils shall be provided with a manual air vent fitting to allow for coil venting.

Option: Provide automatic air vents in lieu of manual air vents.

Option: Provide a motorized two-position coil bypass damper. Damper shall be sized such that when it is opened, 30% of the fan airflow capacity will be drawn through the damper opening, bypassing the cooling coil.

Option: Coil casing shall be fabricated from stainless steel.

DRAIN PANS

Primary condensate drain pans shall be single wall, heavy gauge galvanized steel for corrosion resistance, and extend under the entire coil section. Drain pans shall be of one piece construction and be positively sloped for condensate removal. A P-Trap shall be furnished, factory piped to the condensate drain riser.

The drain pan shall be externally insulated with a fire retardant, closed cell foam insulation. The insulation shall carry no more than a 25/50 Flame Spread and Smoke Developed Rating per ASTM E-84 and UL 723 and an Antimicrobial Performance Rating of 0, no observed growth, per ASTM G-21.

The P-Trap shall be easily removed and serviced through the front panel.

Option: Provide a removable primary drain pan to allow for inspection and cleaning. The drain pan shall be easily removed through the front panel without disturbing the coils. Drain pan access that requires removal of coils is not acceptable.

Option: Provide a primary drain pan constructed entirely of heavy gauge type stainless steel for superior corrosion resistance. Stainless steel drain pans shall be externally insulated and meet or exceed the requirements stated above.

FILTERS

All units shall be furnished with a minimum 1" nominal glass fiber throwaway filter. Filters shall be tight fitting to prevent air bypass. Filters shall be easily removable from the return air opening with the front panel removed, without the need for tools.

Option: Provide unit with 1" pleated filter (MERV 8).

Option: Provide unit with 1" self-gasketing filter consisting entirely of synthetic media and frames. Filter shall be tight fitting to prevent air bypass. Filter shall be easily removable from the return air opening with the front panel removed. Filter efficiency shall be 40% at 1.5 microns.

ELECTRICAL

Units shall be furnished with single point power connection. Provide an electrical junction box with terminal strip for motor and other electrical terminations. The factory mounted terminal wiring strip consists of a multiple position screw terminal block to facilitate wiring terminations for the electric control valves and thermostats.

ELECTRIC HEAT

Furnish an electric resistance heating assembly as an integral part of the fan coil unit, with the heating capacity, voltage and kilowatts scheduled. The heater assembly shall be rated for installation on the fan coil unit and be located so as not to expose the fan assembly to excessive leaving air temperatures that could affect motor performance.

The heater and unit assembly shall be listed for zero clearance and meet all NEC requirements, and be ETL listed with the unit as an assembly in compliance with UL/ANSI Standard 1995.

All heating elements shall be open coil type Ni-Chrome wire mounted in ceramic insulators and located in an insulated heavy gauge galvanized steel housing. All elements shall terminate in a machine staked stainless steel terminal secured with stainless steel hardware for corrosion resistance. The element support brackets shall be spaced no greater than 3-1/2" on center. All internal wiring shall be rated for 105°C minimum.

All heaters shall include over-temperature protection consisting of an automatic reset primary thermal limit and back-up secondary thermal limit. All heaters shall be single stage.

Option: Provide a manual reset secondary thermal limit.

All units with electric heat shall be provided with an incoming line power distribution block, designated to accept single point power wiring capable of carrying 125% of the calculated load current.

Option: Devices used to energize and de-energize (switch) electric heat must be totally silent. Magnetic, mercury, and/or quiet relays and/or contactors are not acceptable.

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PIPING PACKAGES

Provide a standard factory assembled valve piping package to consist of a 2 or 3-way, on/off, motorized electric control valve and two ball isolation valves. Control valves shall be piped normally closed to the coil. Maximum entering water temperature on the control valve shall be 200°F, and maximum close-off pressure 25 PSIG. Maximum operating pressure shall be 300 PSIG.

Piping packages shall include stainless steel braided hoses to allow for thermal expansion within the unit cabinet. The hose shall be EPDM inner lined and Kevlar® reinforced, with stainless steel FNPT swivels and/or fittings. The hoses shall be rated for a maximum 450 PSIG working pressure at 250°F, and shall conform to NFPA 90A and carry no more than a 25/50 Flame Spread and Smoke Developed Rating, per ASTM E-84 and UL 723.

Option: Provide 3-wire floating point modulating control valve (fail-in-place) in lieu of standard 2-position control valve with factory assembled valve piping package.

Option: Provide high pressure close-off actuators for 2-way on/off control valves. Maximum close-off pressure is 50 PSIG (1/2").

Option: Provide either a fixed or adjustable flow control device for each piping package.

Option: Provide pressure-temperature ports for each piping package.

Piping packages shall be completely factory assembled, including interconnecting pipe, and mounted inside the unit in a serviceable location over the coil and primary drain pan.

RISERS

Furnish chilled and hot water supply and return risers mounted to the unit. Risers shall be Type-M seamless copper tube and include swaged connections at the top for connection to the unit above. Slip couplings are not acceptable.

Option: Provide Type-L copper risers that meet or exceed the requirements stated above.

Risers shall be insulated with 1/2" closed cell foam insulation covering the entire riser. Insulation shall conform to NFPA 90A and carry no more than a 25/50 Flame Spread and Smoke Developed Rating, per ASTM E-84 and UL 723.

Option: Provide 3/4" closed cell foam insulation that meets or exceeds the requirements stated above.

Condensate drain risers shall be Type-M seamless copper tube and meet the requirements stated above.

Option: Risers shall be factory fabricated, bundled, and tagged separate from the fan coil units, allowing for shipment and installation of risers prior to the fan coil units. The riser tag must show the corresponding FCU tag, floor number, room number, riser number, CW, HW, and condensate pipe diameters. Refer to submittal drawing on Ship in Advance risers.

OUTSIDE AIR DAMPER

Option: Provide a manual outside air damper with locking mechanism integral to the unit.

Option: Provide a motorized outside air damper integral to the unit and interlocked with the fan motor. The damper actuator shall be spring return closed.

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| <p>1. SERIES: (XXX)
 KVPH - Vertical Stack Fan Coil, Stand Alone
 KVPP - Vertical Stack Fan Coil, Primary
 KVPS - Vertical Stack Fan Coil, Secondary
 KVIP - Vertical Stack Fan Coil, Primary Twin Pack
 KVIS - Vertical Stack Fan Coil, Secondary Twin Pack
 KVPE - Vertical Stack Fan Coil, Exposed</p> <p>2. SIZE: (XX)
 03, 04, 06, 08, 10, 12</p> <p>3. MOTOR: (X)
 <i>(See Krueger's selection software.)</i></p> <p>4. MOTOR CONTROL: (X)
 0 - None
 C - 3 Speed Fixed</p> <p>5. UNIT CAPACITY: (X)
 0 - Standard Capacity
 H - High Capacity</p> <p>6. ARRANGEMENT: (X)
 <i>(See Krueger's selection software.)</i></p> <p>7. COIL 1: (X)
 B - 3 Row Cold Water
 C - 4 Row Cold Water
 R - 3 Row with Changeover
 S - 4 Row with Changeover</p> <p>8. COIL 1 DIAMETER: (X)
 38 - 3/8" Tube Diameter</p> <p>9. COIL 1 TUBE WALL: (X)
 3 - 0.012" Tube Wall Thickness</p> <p>10. COIL 1 AIR VENT: (X)
 1 - Manual Air Vent
 2 - Auto Air Vent</p> <p>11. COIL 1 PIPING SIZE: (X)
 H - 1/2"</p> <p>12. COIL 1 PIPING PACKAGE: (XX)
 0 - None
 A - 2-Way Control Valve
 B - 3-Way Control Valve
 C - 3-Way with Balance ByPass Valve</p> <p>13. COIL 1 FLOW CONTROL: (XX)
 <i>(See Krueger's selection software.)</i></p> <p>14. COIL 1 FIXED GPM: (X)
 <i>(See Krueger's selection software.)</i></p> <p>15. COIL 1 Y-STRAINER CLEANOUT: (XX)
 0 - None
 1 - Y-Strainer Cleanout</p> | <p>16. COIL 1 P/T PORTS: (X)
 0 - None
 P - P/T Port</p> <p>17. COIL 1 AQUASTAT BLEED LINE: (X)
 0 - None
 A - Aquastat Bleed Line</p> <p>18. COIL 1 ACTUATOR TYPE: (X)
 0 - Field Provided by Others 2-Position Close-Off
 1 - Factory Provided 2-Position Close-Off, NC
 2 - MV, 2 Way, Floating Point, Fail-In-Place, 24V
 3 - MV, 3 Way, Floating Point, Fail-In-Place, 24V
 4 - HP Close-Off Actuator, 2-Way Valve-24/115/208V
 5 - HP Close-Off Actuator, 2-Way Valve-230/277V
 <i>Note: MV = Modulating Valves, HP = High Pressure</i></p> <p>19. COIL 2 SELECTIONS
 <i>(See Coil 1 options. Differences may apply.)</i></p> <p>20. ELECTRIC HEAT VOLTAGE: (X)
 0 - None
 A - 115 Volt, 1 Phase, 1 Stage
 D - 208 Volt, 1 Phase, 1 Stage
 G - 230 Volt, 1 Phase, 1 Stage
 K - 277 Volt, 1 Phase, 1 Stage</p> <p>21. kW: (XX)
 <i>(See Krueger's selection software.)</i></p> <p>22. SILENT RELAY: (X)
 0 - None
 S - Silent Relay</p> <p>23. MANUAL RESET: (X)
 0 - None
 M - Manual Reset</p> <p>24. COIL CASING: (X)
 1 - Galvanized Coil Casing
 2 - Stainless Steel Coil Casing</p> <p>25. FILTER: (X)
 0 - 1" Throwaway Filter
 P - 1" Pleated Filter MERV 8
 S - 1" Synthetic Media Filter MERV 8</p> <p>26. SPARE FILTER: (X)
 <i>(See Krueger's selection software.)</i></p> <p>27. INSULATION: (X)
 0 - Standard 1/2" thick Fiberglass
 F - Foil Faced Insulation
 C - Elastomeric Closed Cell Foam Insulation</p> <p>28. BLOWER SHIELD: (X)
 B - Blower Shield</p> |
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- 29. UPSIZE CABINET: (X) (KVIP/KVIS Only)**
 0 - None
 1 - Upsize Cabinet - 03/04 to 06/08
 2 - Upsize Cabinet - 06/08 to 10/12
 3 - Upsize Cabinet - 03/04 to 10/12
- 30. UNIT DRAIN PAN: (X)**
 0 - Galvanized Drain Pan
 S - Stainless Steel Unit Drain Pan
- 31. REMOVABLE DRAIN PAN: (X)**
 0 - None
 R - Removable Drain Pan
- 32. BASIC CONTROL PACKAGE: (X)**
 0 - Line Voltage with Electric Heat (EH)
 1 - Line Voltage
 2 - 24V, Unit S/S Relay, Fan Op. Relay, Trans.
 3 - 24V, Unit S/S Relay, Fan Op. Relay, Trans. with EH
- 33. THERMOSTAT LOCATION: (X)**
 R - Remote Mounted Thermostat
 U - Unit Mounted Thermostat
 F - ADA Front Panel Mounted Thermostat
 S - ADA Side Mounted Thermostat
- 34. THERMOSTAT: (XXXX)**
(See Krueger's selection software.)
- 35. AQUASTAT: (X)**
 0 - None
 A - Aquastat
- 36. DISCONNECT SWITCH: (X)**
 0 - None
 L - Door Interlocking non-Fused Disconnect
 T - Toggle Disconnect Switch
- 37. MAIN FUSING: (X)**
 0 - None
 M - Main Fusing
- 38. FLOAT SWITCH: (X)**
 0 - None
 D - Drain Pan Float Switch
- 39. SPEED SWITCH: (X)**
 0 - None
 U - Unit Mount 3-Speed Switch with Off Position
 R - Remote Mount 3-Speed Switch with Off Position
- 40. SOLID STATE RELAY: (X)**
 0 - None
 1 - SSR (1) in Lieu of Start/Stop Relay
 2 - SSRs (2) for (High, Low) Fan Control
 3 - SSRs (3) for (High, Medium, Low) Fan Control
- 41. UL FIRE RATED: (X) (KVIP Only)**
 0 - None
 1 - UL Fire Rated, 1 Hour
- 42. RETURN AIR: (X)**
 0 - Stamped Louver Front Panel
 1 - Stamped Louver Front Panel with TPF
 2 - Stamped Louver Front Panel - ADA
 3 - Stamped Louver Front Panel with TPF - ADA
 4 - No Front Panel
- 43. QUANTITY OF SUPPLY GRILLES: (X)**
 0 - None
 1 - Quantity (1) Supply Grille
 2 - Quantity (2) Supply Grilles
- 44. SUPPLY AIR: (X)**
 0 - None (Not available for KVPE)
 1 - Aluminum Double Deflection Grille
 2 - Aluminum Double Deflection Grille with OBD
- 45. OUTSIDE AIR: (X)**
 0 - None
 1 - Manual Sliding Outside Air Damper
 2 - Motorized Outside Air Damper
 3 - Outside Air Opening Only - No Damper
- 46. PAINT: (X)**
 0 - Pearl White Satin
 1 - British White
- 47. UNIT DISCHARGE: (X)**
 0 - None
 B - Sight and Sound Baffle
- 48. RISER COVER: (X) (KVPE/KVPH/KVPP Only)**
 0 - None
 1 - 22 Gauge Riser Cover
- 49. FM DDC MANUFACTURER: (X)**
 0 - None
 6 - Johnson Controls
- 50. FM DDC MODEL: (XX)**
 00 - None
 01 - FEC 1610