

KLPP Engineering Specification & Configuration**KLPP UNIT**

Fan powered terminal unit shall be a low profile type of 11" height and 35 3/4" in length, complete factory assembled and wired with motor, blower, mixing plenum and primary air damper contained in a single unit housing. Unit shall be Krueger model KLPP.

Primary airflow controller shall compensate for central system pressure fluctuations. When room temperature requires maximum heating, the (direct digital) (analog) (pneumatic) pressure independent velocity controller maintains the minimum primary airflow setting by modulating the damper. The induction fan shall run and the electric heating coil or hot water coil, if supplied, is energized (activated). As room temperature begins to rise, the heating coil is de-energized (deactivated). As room temperature calls for maximum cooling, the velocity controller shall maintain primary airflow setting.

Terminals shall be tested by use of the AHRI Standard 880. The terminal unit shall be ETL listed as a complete assembly. All electrical components shall be UL listed and installed in accordance with the National Electric Code. All electrical components shall be mounted in sheet metal control enclosures. Electrical connection shall be single point.

Unit casing shall be constructed of not less than 20 gage galvanized steel. Unit discharge shall be rectangular, suitable for flanged duct connections.

Unit labels shall be adhered to each unit including model size, airflow (CFM), balancing chart, and tagged data.

KLPP unit shall be equipped with a factory installed airflow sensing device. Provide a K4 LineaCross, four quadrant, multi-point center averaging sensor with an amplified signal.

- **(Optional)** Provide a linear, multi-point, velocity averaging sensor with an amplified signal.

Provide balancing taps to allow for easy airflow verification.

Terminal unit shall be provided with a heavy gage galvanized steel backdraft damper.

Fan motor and all interior components must be accessible through a removable bottom access panel.

Fan shall be of the forward curve, centrifugal type. The fan motor shall be [120, 208/240, 277 volt, single-phase, 60 cycle, single-speed], energy efficient design, permanently lubricated, using permanent split capacitor for starting and be specifically designed for use with an SCR fan speed controller. Motor must have thermal overload protection. The fan motor shaft shall be connected directly to the fan and the entire fan assembly shall be isolated from the unit casing to prevent transmission of vibration.

- **(Optional)** ECM Fan Motor: The fan motor shall be [120, 208/240, or 277 volt, single-phase] ECM (electronically commutated motor) fan motors including either a manual or remote adjustable speed controller. The manual adjustable speed controller is field set and adjustable with a digital display, alternating between RPM and percentage full airflow. The remote adjustable speed controller provides a means to remotely set and/or adjust the fan speed.

The radiated and discharge attenuation factors for the specified NC levels shall be based on attenuation factors from AHRI Standard 885-08 Appendix E, which includes room absorption, environmental adjustment factor, duct insertion, end reflection and duct branching.

CASING LINERS

Unit casing shall be lined with dual density, 1/2" thick, 1 1/2" lb. dual density fiberglass insulation that meets UL 181 and NFPA 90A. Insulation shall be attached to the unit casing by adhesive and weld pins.

- **(Optional)** Cellular Insulation: Unit casing shall be lined with 1/2" thick, 1 1/2" lb. density, smooth surface, polyolefin, closed-cell, foam insulation for fiber free application. Cellular insulation meets UL 181 and NFPA 90A and does not support mold or bacteria growth. Insulation shall be attached to the unit casing by adhesive and weld pins.
- **(Optional)** Foil Encapsulated Insulation: Unit casing shall be lined with nylon reinforced, foil-wrapped exposed edges, 1/2" thick, 1 1/2" lb. density fiberglass insulation that meets UL 181 and NFPA 90A. Insulation shall be attached to the unit casing by adhesive and weld pins.
- **(Optional)** Sterilwall Insulation: Unit casing shall be lined with 1/2", 1 1/2 lb. dual density fiberglass insulation that meets UL 181 and NFPA 90A, enclosed between the unit casing and a non-perforated internal sheet metal cover extending over the fiberglass insulation, as well as covering the liner cut edges.
- **(Optional)** Perforated Doublewall Insulation: Unit casing shall be lined with 1/2", 1 1/2 lb. dual density fiberglass insulation that meets UL 181 and NFPA 90A, enclosed between the unit casing and a perforated internal sheet metal cover extending over the fiberglass insulation, as well as covering the liner cut edges.

Electric coils shall be supplied by the terminal unit manufacturer and shall be ETL listed in accordance with UL standards. Construct coil casing with minimum of 20 gage galvanized steel. Elements shall be nickel chrome and supported by ceramic insulators. The integral control panel shall be housed in a NEMA 2 enclosure for access to all controls and safety devices.

ELECTRIC HEATING COILS

Electric coils shall contain a primary automatic reset thermal cutout and differential pressure airflow switch for proof of airflow.

- **(Optional)** Electric coils shall include fused or non-fused door interlocking disconnect switch, AC Solid State Relay, fuse-block, manual reset cutout, and/or dust tight enclosure construction.
- **(Optional)** LineaHeat solid state electronic proportional control of electric heat shall meet the requirements of ASHRAE Standard 62, Addenda N.
- **(Optional)** LineaHeat solid state electronic controlled heater with control of the leaving air temperature limiting the unit discharge temperature to a set value.

HOT WATER COILS

Hot water coil casing shall be constructed with minimum 20 gage galvanized steel with flanged discharge for attachment to downstream ductwork. The hot water coil may also be factory

KLPP Engineering Specification & Configuration

attached to the upstream side of the induced air inlet. Coils shall be factory installed on the terminal unit. Fins shall be rippled and corrugated heavy gage aluminum, mechanically bonded to tubes. Tubes shall be copper with minimum wall thickness of 0.016" and with male solder header connections.

Coils shall be leak tested to 400 psi. Number of coil rows and circuits shall be selected to provide performance as required by the plans. Coil performance data shall be based on tests run in accordance with AHRI Standard 410.

1. SERIES: (XXXX)

KLPP - Low Profile, Fan Powered Terminal Unit

2. SENSOR TYPE: (X)

- 1 - Linear Averaging
- 3 - K4 LineaCross (Four Quadrant, Standard)

3. LINER TYPE: (X)

- 0 - 1/2" Liner
- 4 - Sterilwall with 1/2" Dual Density
- 6 - 1/2" Foil Encapsulated
- A - Perforated Doublewall with 1/2" Dual Density
- F - 1/2" Cellular

4. UNIT CASING CONTROLS: (XX)

- 1L - Left-hand Side, 20 Gage
- 1R - Right-hand Side, 20 Gage

5. UNIT SIZE: (X)

- 2 - Available Inlet Size: 6", 8", 10"
- 4 - Available Inlet Sizes: 10", 8" x 14"

6. INLET CODE: (XX)

- 06 - 6" Round
- 08 - 8" Round
- 10 - 10" Round
- 12 - 8" x 14" Rectangle **

7. MOTOR VOLTAGE: (X)

- 1 - 120V, 1-Phase
- 2 - 208/240V, 1-Phase
- 3 - 277V, 1-Phase
- 4 - ECM Motor, 120V, 1-Phase **
- 5 - ECM Motor, 208/240V, 1-Phase **
- 6 - ECM Motor, 277V, 1-Phase **

8. CONTROL TYPE: (XXXX)

- (2XXX) - Analog
- (7XXX) - Digital, BACnet Compatible
- (6XXX) - Digital, Standalone
- (XXXX) - Factory Mounted, Provided by Others
- (1XXX) - Pneumatic

9. UNIT ACCESSORIES: (X) (X) (X) (X)

- 0 - None
- A - Motor Toggle Disconnect *
- F - Fan Motor Fuse
- R - Induction Inlet Filter
- S - Hanger Brackets

10. WATER HEAT:
(ROWS/CONNECTION HAND) (XXX)

- 000 - N/A / None
- W61 - 1 Row/Right/Induced Air Inlet *
- W62 - 2 Row/Right/Induced Air Inlet *
- W71 - 1 Row/Left/Induced Air Inlet *
- W72 - 2 Row/Left/Induced Air Inlet *

11. ELECTRIC HEAT: (XX)

- 00 - None
- E1 - 120v/1-Phase
- E2 - 208v/1-Phase
- E3 - 240v/1-Phase
- E4 - 277v/1-Phase
- E6 - 208v/3-Phase/3-Wire
- E9 - 480v/3-Phase/4-Wire

LINEAHEAT: (XX)

- L1 - 120v/1-Phase
- L2 - 208v/1-Phase
- L3 - 240v/1-Phase
- L4 - 277v/1-Phase
- L6 - 208v/3-Phase/3-Wire
- L9 - 480v/3-Phase/4-Wire

12. ELECTRIC HEAT STEPS: (X)

- 0 - None
- 1 - 1-Stage
- 2 - 2-Stage
- 3 - 3-Stage

13. HEAT COIL ACCESSORIES: (X) (X) (X) (X) (X)

- 0 - None
- C - Fuse Block
- F - Manual Reset Cutout
- G - Dust-tight Construction
- H - Staged Solid State Relays
- K - Door-interlocking Fused Disconnect
- L - Door-interlocking Non-fused Disconnect

* Motor Toggle Disconnect not available with electric heat.

** Manual or remote adjustable speed controller for ECM motor option is required.

* Water coil connection must be opposite of control enclosure.

** KLPP size 4 only.