KSL, KSB Engineering Specification & Configuration

GENERAL
Furnish and install Krueger Model KSL/KSB belt drive blower coil units where indicated on the plans and specifications. Units shall be completely factory assembled and tested and shipped as one piece except where noted.

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.

All units shall be designed with coils, fans, motor/drive and drain pan completely contained within the unit cabinet. Electric heat to be in the blow-thru configuration.

Hot water and steam coils to be in a blow thru configuration when installed in a discharge plenum.

Units shall be ETL listed in compliance with UL/ANSI Standard 1995.

All unit coils shall meet or exceed the scheduled cooling and heating capacity, selected and rated in accordance with AHRI 410.

CONSTRUCTION
All units shall be fabricated of minimum 18 gage galvanized steel, able to withstand a 125 hour salt spray test per ASTM B-117. Panels shall be die-formed “multibend” construction for optimum strength and rigidity. All exterior panels shall be single wall. Insulation shall be 1 inch thick, 1.6 pound per cubic foot scrim reinforced foil faced insulation, glued and pinned with mechanical fasteners, and seams are foil taped for maximum positive adhesion. Insulation must comply with UL 181, ASTMC-1071, NFPA 90A & 90B and meets bacteriological standard ASTMC-665 and C-1136 for mold, mildew and humidity resistance. Maximum thermal conductivity shall be 0.24. All units shall have minimum 1” duct collars on discharge and return.

The access panel shall be fully insulated and attached with standard lift and turn fasteners on at least two opposite sides. No coil or drain piping or electrical connections shall pass through any access panel.

Each unit shall be furnished with a one-piece heavy gage (Galvanized steel) (stainless steel) drain pan with welded corner construction.

(Rubber-in-shear) (Spring) type unit mounting vibration isolators shall be provided by the unit manufacturer.

FAN ASSEMBLY
All units shall be furnished with DWDI forward curved centrifugal blowers statically and dynamically balanced for smooth operation. All blower wheels shall have two setscrews and shall be mounted on solid steel shafting rotating in ball bearings with a minimum design average life (L50)of 100,000 hours. All blower assemblies shall have resilient mounted cartridge type permanently lubricated ball bearings.

FAN MOTOR & DRIVE ASSEMBLY
All fan motors shall be standard NEMA design motors of the horsepower listed in the equipment schedule. All motors shall be 1750 RPM, 60-hertz (ODP) (ODP E+) single speed motors rated for continuous duty. All motors shall be reversible rotation type. Three phase motors shall be “across-the-line” start type in 56 Frame size up through two horsepower. Three horsepower shall be standard “T” frame with rigid mount.

All motors shall be mounted on an adjustable base. All motor wiring is to be terminated in a junction box, external to the unit casing.

All fan drive assemblies shall include an adjustable pitch motor pulley, a fixed pitch blower pulley and a standard cross section “V-belt”. All fan drives shall be selected at a minimum service factor of 1.2.

COILS
All unit coils shall be rated in accordance with AHRI 410.

All coils shall be 1/2” O.D. seamless copper tubes with collared and corrugated aluminum fins. All tubes shall be mechanically expanded to provide an efficient bond between tube and fin. All water coils shall be provided with a manual air vent fitting to allow for coil venting. Valve core type vent fittings shall not be accepted.

All chilled water, hot water, and direct expansion (DX) coils shall have 0.0055” thick aluminum fins and 0.016” tube wall thickness. All steam coils shall have 0.0055” thick aluminum fins and 0.025” tube wall thickness.

All steam coils shall be suitable for temperatures above 35°F and 15-psig maximum operating pressure.

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

DX coils shall be tested to 450 pressure and factory sealed and charged with a minimum of 5-psig nitrogen or refrigerated dry air. DX coils shall be provided with a fixed orifice refrigerant distributor. A field furnished and installed thermal expansion valve (TXV) can be mounted directly to the refrigerant distributor.

COIL OPTIONS
Coil casing shall be fabricated from stainless steel.

Provide automatic air vents, in lieu of manual air vents.

Tube wall thickness shall be 0.025” on chilled water, hot water, and direct expansion coils.

FILTER RACK ASSEMBLY
All units shall be furnished with a flat filter rack designed to accept 2” nominal, standard sized, throwaway filters. One complete set of spare throwaway filters shall be provided for each unit.

KSL, KSB Engineering Specification & Configuration

FILTER OPTIONS
Unit shall be furnished with a flat filter rack designed to accept 2" nominal, standard sized, pleated filters. One complete set of spare pleated filters shall be provided for each unit.

INLET DAMPER SECTION – MODEL KSB ONLY
Where shown on the plans, the unit manufacturer shall furnish a fully insulated mixing box section (factory assembled and installed inlet damper section) to be mounted next to the unit on base rail (unit and mixing box).

The mixing box section shall include heavy gage formed steel blade dampers in a heavy gage steel frame with extruded vinyl blade seals and flexible metal jamb seals. Damper drive linkage shall be factory furnished and installed by the unit manufacturer. A field furnished and installed damper actuator can be mounted directly to the damper shaft.

RETURN PLENUM SECTION – MODEL KSL ONLY
Where shown on the plans, the unit manufacturer shall furnish a fully insulated return air plenum section to be mounted under the unit in the field. Return plenum will have a solid bottom & back panel with right, left, and front openings all with the same dimensions. The return plenum right and left openings will be covered with a sheet metal panel that can be removed and used to cover the front opening (for field modification) or discarded when more than one opening is required. The return air can be from the (front and/or sides) (rear and/or sides).

DISCHARGE PLENUM SECTION
Where shown on the plans, the unit manufacturer shall furnish and mount a fully insulated discharge plenum section complete with a double deflection discharge grille (cannot be used with discharge heating coil plenum options).

ELECTRICAL CONTROL
The unit fan motor shall be completely factory wired to an external electrical enclosure. Each unit shall include fan control package with 24-volt control voltage. Each unit shall include motor circuit fusing, control circuit transformer and terminal strip for connection of field wiring.

A main incoming power (non-fused) (fused) disconnect switch shall be factory furnished and wired by the unit manufacturer for single point power connection.

ELECTRIC HEAT SECTION
Where shown on the plans, the unit manufacturer shall furnish an electric resistance heating assembly with the heating capacity, voltage and stages as shown in the schedule. The heater assembly shall be designed and rated for installation to the blower coil unit in the blowthru configuration without the use of duct extensions or transitions between the unit and the heater assembly. The heater assembly shall be factory assembled to the blower coil unit and completely factory wired for single point power connection to the unit. The heater/unit assembly shall be listed for zero clearance meeting all N.E.C. requirements and be ETL listed in compliance with UL/ANSI Std. 1995.

All heating elements shall be of open coil design using Ni-Chrome wire mounted in ceramic insulators and housed in an insulated heavy gage galvanized steel housing. All elements shall terminate in a machine staked stainless steel terminal secured with stainless steel hardware. 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. All heaters shall include a non-adjustable airflow switch.

An incoming line power distribution block shall be provided. The power distribution block shall be designed to accept incoming power wiring capable of carrying 125% of the calculated load current.

In addition to the above, electric heaters shall include the following options:

- Door interlocking disconnect switch (non-fused) (with main fusing).
- Fusing (main) (per stage).
- Magnetic contactors wired for disconnecting operation.
- Fan control package with heater interlock contacts (required for single point power connection).

KSL, KSB Engineering Specification & Configuration

1. **SERIES: (XXX)**
   KSL - Vertical Small Footrprint Blower Coil, Bottom Return
   KSB- Vertical Small Footrprint Blower Coil, Rear Return

2. **ARRANGEMENT: (X)**
   1 - Fan Arr. 1 (Upblast Rear)
   2 - Fan Arr. 2 (Upblast Front)
   7 - Fan Arr. 7 (Horizontal Top Rear)

3. **INLET: (X)**
   0 - None
   2 - Mixing Box with Linkage **KSB Only*
   3 - Return Plenum **KSL Only*

4. **OUTLET: (X)**
   0 - None
   1 - Supply Plenum with Grille

5. **SIZE: (XX)**
   08 - Size 8
   12 - Size 12
   16 - Size 16
   20 - Size 20
   25 - Size 25
   30 - Size 30

6. **MOTOR: (XX)**
   (*See Krueger's selection software.*)

7. **MOTOR HAND: (X)**
   L - Left-hand Motor
   R - Right-hand Motor

8. **CONDUIT: (X)**
   0 - None
   C - Conduit

9. **DISCONNECT SWITCH: (X)**
   0 - None
   D - Disconnect Switch

10. **FAN CONTROL PACKAGE: (X)**
    0 - None
    F - Fan Control Package

11. **AUTO SWITCH: (X)**
    0 - None
    H - Hand-Off Auto Switch

12. **SPARE BELTS: (X)**
    0 - None
    1 - 1 Spare Belt
    2 - 2 Spare Belts
    3 - 3 Spare Belts

13. **COIL 1: (X)**
    B - 4 Row Cold Water
    C - 6 Row Cold Water
    E - 4 Row DX, Single Circuit
    F - 6 Row DX, Single Circuit
    G - 1 Row Hot Water
    H - 2 Row Hot Water
    L - 4 Row with Changeover
    M - 6 Row with Changeover

14. **COIL 1 FPI: (XX)**
    10 - 10 FPI
    12 - 12 FPI

15. **COIL 1 HAND: (XX)**
    LR - Coil 1 Left Hand, Coil 2 Right Hand
    RL - Coil 1 Right Hand, Coil 2 Left Hand

16. **COIL 1 AUTO AIR VENT: (X)**
    0 - None
    1 - Auto Air Vent

17. **COIL 1 CASING: (X)**
    0 - Galvanized Casing
    1 - Stainless Steel Casing

18. **COIL 1 TUBE WALL: (X)**
    0 - 0.016"
    1 - 0.025"

19. **COIL 2: (X)**
    0 - None
    B - 4 Row Cold Water
    C - 6 Row Cold Water
    G - 1 Row Hot Water
    H - 2 Row Hot Water

20. **COIL 2 FPI: (XX)**
    00 - None
    10 - 10 FPI
    12 - 12 FPI

21. **COIL 2 AUTO AIR VENT: (X)**
    0 - None
    1 - Auto Air Vent

22. **COIL 2 TUBE WALL: (X)**
    0 - 0.016"
    1 - 0.025"

23. **COIL 3: (X)**
    0 - None
    G - 1 Row Hot Water
    H - 2 Row Hot Water
    I - 1 Row Steam
    J - 2 Row Steam

Continued on next page...

KSL, KSB Engineering Specification & Configuration

24. COIL 3 FPI: (XX)
- 00 - None
- 10 - 10 FPI
- 12 - 12 FPI

25. COIL 3 TUBE WALL: (X)
- 0 - 0.016”
- 1 - 0.025”

26. ELECTRIC HEAT CASING: (X)
- 0 - None
- U - Blow Thru Uninsulated
- W - Blow Thru Double Wall

27. ELECTRIC HEAT VOLTAGE: (X)
(*See Krueger’s selection software.*)

28. ELECTRIC HEAT KW: (XX)
(*See Krueger’s selection software.*)

29. ELECTRIC HEAT HAND: (X)
- 0 - None
- L - Left-hand
- R - Right-hand

30. MAGNETIC CONTACTOR: (X)
- 0 - None
- M - Magnetic Contactor

31. FUSING PER STEP: (X)
- 0 - None
- F - Fusing per Step

32. DOOR DISCONNECT: (X)
- 0 - None
- K - Door Interlocking Fused Disconnect
- L - Door Interlocking Non-Fused Disconnect

33. MAIN FUSING: (X)
- 0 - None
- M - Main Fusing

34. DRAIN PAN: (X)
- 1 - IAQ Galvanized Drain Pan
- 3 - IAQ Stainless Steel Drain Pan

35. FILTER: (X)
- 1 - 2” Throwaway
- 2 - 2” MERV 8

36. FILTER RACK: (X)
- 0 - None
- 1 - 2 in. Side Access Filter Rack - **KSB Only*

37. SPARE FILTER: (X)
- 0 - None
- A - (1) 2” Throwaway Spare
- B - (1) 2” Pleated Spare
- F - (2) 2” Throwaway Spares
- G - (2) 2” Pleated Spares
- L - (3) 2” Throwaway Spares
- M - (3) 2” Pleated Spares

38. BASE RAILS: (X)
- 0 - None
- B - Base Rails

39. HINGE DOORS: (X)
- 0 - None
- S - Hinged Doors with Lift and Turn Fasteners
- D - DW Hinged Doors with Lift and Turn Fasteners

40. VIBRATION: (X)
- 0 - None
- R - Rubber in Shear
- S - Spring

41. FLOAT: (X)
- 0 - None
- C - Condensate Float Switch