

## Introduction: KSL, KSB

Krueger's model KSL/KSB belt drive blower coils offer a wide range of application flexibility, while maintaining a simple, easy to install unit design. These units are intended to provide comfort cooling and heating within a small footprint. They may be applied in many types of building structures including schools, office buildings, hospitals, condominiums, assisted living facilities, apartments or stores. Applications can be constant or variable volume. There are many applications the KSL/KSB product can be utilized. Some examples are listed below.

### Constant Volume Applications:

- Two-pipe hydronic system for cooling and/or heating.
- Two-pipe hydronic cooling system with electric heat.
- Four-pipe system with dedicated heating and cooling coils.
- Direct Expansion (DX) split systems with hydronic heat.
- Direct Expansion (DX) split systems with electric heat.

### Variable Volume Applications:

- Two-pipe hydronic system for cooling and/or heating.
- Two-pipe hydronic cooling system with electric heat.
- Four-pipe system with dedicated heating and cooling coils.

### MODEL

KSL - Vertical Small Footprint Blower Coil, Bottom Return

KSB - Vertical Small Footprint Blower Coil, Rear Return



KSL

BLOWER COILS



KSB

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## KSL, KSB Product Description

### ACOUSTICS

Control of noise within both occupied and unoccupied spaces has become increasingly important to designers and building owners/occupants. Proper consideration must be given to placement of indoor air conditioning units, particularly in the occupied space. Inherent flexibility of the fan and coil combination in the vertical configuration allows application in sound-sensitive areas. In such instances, a fan running at a low speed with a high capacity coil normally yields satisfactory results. It also may be desirable to select a larger nominal capacity unit and operate it at a less than nominal airflow for further acoustic benefit.

Three phase motors are recommended for sound-sensitive applications to avoid potential single phase motor hum. Unit operation in the stall region of the fan curve is not recommended since it may cause unsatisfactory noise levels and excessive unit vibration.

### INSTALLATION

These floor mounted units can be installed with external vibration isolation on a base rail (KSB) or on a return plenum (KSL) at the corner points. This requires flex connections at the corner brackets, ductwork, electrical connections and piping connections. One of the most important and basic IAQ issues is condensate management. The first step to ensure trouble-free operation is proper installation. It is very important that the unit

be mounted high enough so that the condensate drain from the unit may be properly trapped. Please refer to the KSL/KSB IOM Manual for specifics on this issue. As with all HVAC systems, these units should be installed according to all applicable ASHRAE standards, SMACNA and local code requirements.

### OPERATING LIMITATIONS

Units must not be operated above maximum fan speed or unit airflow as listed in the Fan Performance section of this catalog. Unit operation at greater than maximum fan speed could drastically reduce bearing life and may result in a catastrophic wheel failure. Operating at greater than the maximum allowable airflow in the cooling mode may result in unsatisfactory operation due to moisture carry over from the coil. In addition, it is often not economical to operate a unit at its maximum fan speed due to the greater motor power requirements.

Units with electric heat should not be operated with leaving air temperature greater than 104°F (40°C), to prevent excessive leaving air temperatures and electric heat limit trips. A hydronic (or steam) coil and electric heat should not be operated simultaneously to prevent excessive leaving air temperatures and limit trips. Electric heat units are equipped with a high limit lockout switch that disables the electric heater if the temperature of the hydronic (or steam) coil is greater than 104°F (40°C).

Water coils must not be operated above a fluid velocity of 8 ft./sec. to reduce the possibility of velocity induced erosion and flow noise. Water coils must not be operated below a fluid velocity of 1 ft./sec. to prevent degraded coil performance caused by laminar flow. These high or low fluid flow rates may not be included in the AHRI coil certification.

### DESIGNED FOR MAXIMUM FLEXIBILITY

The Krueger KSL/KSB belt drive blower coils give maximum flexibility for selection and installation where extreme space restrictions exist. The units are designed with a slant coil and all front access to minimize the space used for installation.

The units are designed to exceed the stringent quality standards of the institutional market, while remaining cost competitive in the light commercial segment of the market.

Krueger belt drive blower coils set the new standards for quality, flexibility, and competitive pricing.

### COMPONENT OPTIONS

The extensive variety of standard options available on the KSL/KSB units are where you find the versatility to fit any HVAC system designer's needs.

Options include: Mixing boxes with standard low-leak dampers, blow thru electric heat with or without single point power connection. All electric heat units are listed with ETL as an assembly and carry the cETL label.

High efficiency motors, starters, disconnects and fusing mean easier coordination between mechanical and electrical trades. Coil options allow for 4 or 6 row cooling coils.

### QUALITY PRODUCT

KSL/KSB model blower coils are constructed from 18 gage galvanized steel. This metal surpasses the ASTM 125 hour salt spray test for corrosion and rust. Insulation is 1 inch thick, 1.6 pound per cubic foot scrim reinforced foil faced insulation, which is glued, pinned and taped for maximum positive adhesion. Insulation complies with UL 181, ASTM-C1071, NFPA90A and 90B and meets bacteriological standard ASTM-C665 and C1136 for mold, mildew and humidity resistance.

All units, with or without Electric Heat, are cETL listed and labeled. All wiring is in compliance with NEC, assuring safety and quality for the owner.

### LOWER INSTALLED COST

All KSL/KSB model blower coils are shipped completely assembled, reducing field installation time and labor. All units are thoroughly inspected and tested prior to shipment, eliminating potential problems at startup. Motor wiring is brought to a junction box and terminated. The junction box is located on the outside of the unit casing, reducing electrical hook-up time.

A wide variety of fan discharge configurations allow for increased flexibility and easier installation on the jobsite, resulting in cost reductions by eliminating expensive elbows, etc.

## KSL, KSB Product Description

### STANDARD FEATURES

#### Construction

- Galvanized steel cabinet construction, minimum 18 gage.
- 1" thick 1.6 lb/ft<sup>3</sup> scrim reinforced foil faced insulation, glued, taped and pinned in place.
- 1" supply duct collars.
- Gasketed, removable access panel sized for easy handling.
- Galvanized steel drain pan with 1 1/8" ODM copper pipe outlet.
- Left and right hand arrangement.

#### Fan Assembly

- Forward curved (double width, double inlet) fans.
- Statically and dynamically balanced.
- Solid steel shafting.
- Ball bearings with a minimum design average life (L50) of 100,000 hours.

#### Fan Motor and Drive

- NEMA design ODP motors.
- 1750 RPM single speed, 60 Hertz.
- Single phase motors with inherent thermal protection.
- Three phase motors.
- Rigid mount adjustable motor base.
- Standard cross section "V-belt" drive with 1.2 service factor.
- Adjustable pitch motor pulley and fixed pitch blower pulley.

#### Coils

- AHRI 410 certified and labeled.
- 1/2" O.D. seamless copper tubes.
- Collared and corrugated aluminum fins.
- Manual air vent plug on all water coils.
- 300 PSIG working pressure at 200°F.
- Steam coils rated at 15 PSIG maximum.
- Copper ODM sweat connections.
- 0.016" tube wall on water and evaporator coils.
- 0.025" tube wall on steam coils.
- High efficiency aluminum fin surface for optimizing heat transfer, pressure drop and carryover.

#### Filters and Filter Rack

- Top access flat filter rack (KSB only).
- Front access filter rack (KSL only).
- Standard size 2" nominal throwaway filters.

#### Electrical

- Fan motor wired and terminated to J-box.
- All units ETL listed in compliance with UL/ANSI Standard 1995.

### OPTIONAL FEATURES

#### Construction

- Stainless steel drain pan with 1" MPT galvanized pipe outlet.
- External rubber-in-shear or spring type vibration isolators, floor mount.
- Fan discharge arrangements.
- Discharge plenum with double deflection discharge grille.
- Access panel with lift and turn fasteners.
- Double wall access panel w/lift and turn fasteners.
- Return plenum with removable panels (KSL only).
- Base rails with rigging slots factory assembled and installed.

#### Fan Motor and Drive

- TEFC motors.
- High efficiency motors.

#### Coils

- 4 and 6 row chilled water or R22 DX coils.
- 1 and 2 row hot water coils.
- 1 and 2 row hot water or standard steam coils in discharge coil section only.
- Hot water coil in preheat or reheat position.
- Stainless steel coil casings.
- 0.025" tube wall on water and evaporator coils.
- Auto air vents on water coils.

#### Filters and Filter Rack

- Side access filter rack (KSB only).
- 2" pleated filter.
- Spare throwaway or pleated filters.

#### Inlet Damper Section

- Factory assembled and installed.
- Heavy gage galvanized steel formed blade dampers.
- Low-leak dampers with extruded vinyl blade seals and flexible metal jamb seals.
- Parallel blade operation.
- Interconnecting damper linkage.

#### Electrical

- Motor wiring in conduit.
- Motor starter (contactor with overload for three phase; contactor for single phase), factory installed (mounted and wired).
- Door interlocking disconnect switch (non-fused) (with main fusing).
- Hand off auto switch (HOA).
- Main fusing.

#### Electric Heat Section

- Factory mounted electric heater with single point power connection, ETL listed as an assembly (see page 37).