

KBM SUGGESTED SPECIFICATION & CONFIGURATION

GENERAL

HVAC Guide Specifications:
Size Range: 600 – 10,000 CFM
Model: KBM Blower Coil Unit

PART 1 — GENERAL

1. System Description

- A. Indoor mounted blower coil unit designed to provide air to a conditioned space as required to meet specified performance requirements for ventilation, heating, cooling, filtration and air distribution. Unit shall be assembled for draw thru application and shall be arranged to discharge conditioned air horizontally or vertically as shown on the contract drawings.
- B. Unit with a direct-expansion cooling coil shall have the capability to be used in a refrigerant circuit in conjunction with a field supplied and matched air-cooled condensing unit.

2. Quality Assurance

- A. Coils shall be tested in accordance with AHRI 410 "Standard for Forced-Circulation Air-Cooling and Air-Heating Coils".
- B. Direct expansion coils shall be designed and tested in accordance with ANSI/ASHRAE 15 "Safety Code for Refrigeration Systems".
- C. Insulation and insulation adhesive shall comply with NFPA 90A and 90B requirements for flame spread and smoke generation.
- D. Unit shall be constructed in accordance with UL 1995 standards, comply with NEMA standards and shall carry the cETL label, display certification symbol on units of certified models. Installation of ancillary electrical components shall comply with NEC.

3. Delivery, Storage and Handling

Unit shall be stored and handled in accordance with the unit manufacturer's instructions.

PART 2 — PRODUCTS

1. Equipment

A. General

Factory assembled blower coil unit that is modular in design and construction. Unit may consist of a fan and coil section with factory-installed chilled water or direct expansion coil, preheat or reheat coil, heating coil section, filter section, combination filter/mixing box (flat or V-bank arrangement), economizer, or access section(s) as indicated on the equipment schedules.

B. Unit Cabinet

1. Unit panels shall be constructed of G60 galvanized steel and shall be capable of withstanding 125-hour salt spray test per ASTM Standard 117. All casing panels shall be removable for easy access to the unit. All panels shall be gasketed to ensure a tight seal.
2. Double wall unit panels (includes corner posts, mullions and access doors) shall be 1" nominal thickness using 1.5-lbs/ft³ fiberglass insulation between galvanized steel panels.
3. Single wall unit panels shall be 1" nominal thickness using matte-faced fiberglass insulation with a nominal density of not less than 1.5-lbs/ft³.
4. Insulation shall be secured to casing with water based adhesive and weld pins where necessary, corresponding to 25/50-flame spread/smoke developed.
5. Condensate drain pans shall be sloped to prevent standing water and shall be constructed of 18 gage G60 galvanized steel or stainless steel; they shall have a galvanized steel or stainless steel male pipe threaded drain connection.

C. Fan Section

1. Fan sections shall be constructed of G60 steel and shall have a formed channel base for integral mounting of fan, motor, and casing panels. Fan housing, wheel, shaft, and bearings shall be rigidly secured to the base unit.
2. Fan decks shall be internally spring isolated (one-inch deflection) with the fan outlet connection to be made using canvas duct.
3. Each unit shall have one fan wheel and housing only.
4. Fan wheels shall be designed for continuous operation at the maximum rated fan speed and motor horsepower. Fan wheels and shafts shall be selected to operate at least 25% below the first critical speed, and shall be statically and dynamically balanced as an assembly.
5. Fan shafts shall be solid steel, turned, ground and polished.
6. Fan bearings shall be a self-aligning, non-regreasable ball bearing type selected for an average life (L50) of 100,000 hours at design operation conditions, per ANSI Code B3.15.
7. Fan motor shall be mounted within the fan section casing. Motor shall be NEMA Design B with sizes and electrical characteristics as shown on the equipment schedule.
8. Fan drive shall be designed for a minimum of 1.15 service factor and shall be factory mounted and aligned. Belt drive package shall be variable-pitch type (constant volume) or fixed-pitch type (variable volume).

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D. Coil Sections

1. All coils shall have aluminum plate fins mechanically bonded to 1/2" OD seamless copper tubes by mechanical expansion. Coils shall be factory leak tested at 350-psig air pressure under water. Copper tubes shall be either 0.016" or 0.025" copper tube wall thickness. Coils shall have G60 galvanized steel or stainless steel casings with copper headers and sweat connections.
2. Chilled water coils shall have a working pressure of 300 psig at 200°F. No turbulence-promoting devices will be permitted inside the tubes. Headers shall have vent connections.
3. Direct-expansion coils shall be provided with pressure-type brass distributors with solder-type connections. Coils shall be designed and tested in accordance with ANSI/ASHRAE 15.
4. Hot water coils shall have a working pressure of 300 psig at 200°F. No turbulence-promoting devices will be permitted inside the tubes. Headers shall have vent connections.
5. Steam distributing coils (standard single tube type) shall have a maximum working pressure of 15 psig at ambient temperatures above 35°F. Tube wall thickness shall be 0.025" as standard.
6. Electric heat coils for use in blower coil units shall be open coil type, ni-chrome wire resistance elements, insulated by floating ceramic bushings. Thermal cutouts for primary and secondary over-temperature protection shall be provided to meet UL and NEC requirements. Maximum element watt density shall be 55-watts/sq inch. The manufacturer shall furnish an integral control box. It shall contain primary and secondary control thermal cutouts, relays, airflow switch, and fused control transformer.

E. Filter Sections

1. Each filter section shall be designed and constructed to house the specific type of filter specified on the equipment schedule.
2. Flat filter sections shall accept 2", 30% (MERV-6) pleated filters of standard sizes. Sections shall include side access slide rails. Flat filter section shall be arranged with minimum depth in direction of airflow.
3. Angle filter section shall accept 2", 30% (MERV-6) pleated filters of standard sizes arranged in horizontal V formation. Sections shall include side access slide rails.

F. Damper Sections

1. Mixing boxes, filter mixing boxes and economizers shall have parallel blade, interconnecting dampers. Damper blades shall have parallel bends for stiffness and shall be mechanically fastened to steel rods rotating in brass bushings and mounted in rigid galvanized steel frames.

Dampers shall be sectionalized to limit blade width, minimize blade deflection, and ensure tight closure.

2. All dampers for mixing boxes and filter mixing boxes shall be rated with a leakage rate not to exceed 5% of air quantity calculated at 2000 fpm velocity through damper and 4.0-in.wg. pressure difference. Damper blades shall be gasketed and stainless steel perimeter-sealing strips shall be provided. Damper linkage shall be provided and installed with all mixing boxes.

G. Access Sections

1. Access sections shall be installed where indicated on the drawings and shall be as specified on the equipment schedule.
2. Access sections shall have removable access panels.

H. Special Features

The following unit options shall be available.

1. Fan Section:
 - a. Variable frequency drives (VFD).
 - b. Motor starters – contactor with overload for three phase and contactor for single phase.
 - c. High-efficiency motors (inverter-duty).
 - d. Totally enclosed fan cooled (TEFC) motors (inverter-duty).
 - e. Two-speed motors.
 - f. Class II forward curved fans with regreasable pillow block bearings.
 - g. Exhaust or return fans for use with economizer sections.
2. Coil Section
 - a. Chilled water coil with copper plate fins and / or stainless steel casing.
 - b. Direct-expansion coil with copper plate fins and /or stainless steel casing.
 - c. Hot water coil with copper plate fins and /or stainless steel casing.
 - d. Steam distributing coil with copper plate fins and /or stainless steel casing.
3. Filtration
 - a. 4" pleated filter type (standard size), 60-65% efficiency (MERV-11)
 - b. 4" pleated filter type (standard size), 80-85% efficiency (MERV-13)
 - c. 4" pleated filter type (standard size), 90-95% efficiency (MERV-14)
4. Access Doors: Hinged (lift-off type) doors with quick-action latches (handles) on both sides of the section for access to both the fan and filter from either side of the unit.
5. Base Rail: Unit mounted base rail shall be a minimum of 4" in height and constructed of galvanized steel, structurally capable of supporting unit on floor or by ceiling suspension.

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I. End Devices

The following guide specifications should be used as a basis for design when using optional factory/field mounted direct digital controls. These specifications should be reviewed to match the specific system control requirements and available control packages.

1. The electrical components shall be recognized by UL. The unit shall be in compliance with the UL 1995 standards. Fan motors are wired and terminated in the control enclosure.
2. All application software performing the required control functions shall be field-supplied with the DDC controller factory or field mounted and wired (tested and configured).

3. Available End Devices and Controls

- a. Variable Frequency Drives
 - Factory supplied and mounted.
 - Field supplied and factory mounted.
- b. Motor Starters
 - Factory supplied and mounted.
 - Field supplied and factory mounted.
- c. End Devices (factory supplied and mounted)
 - Disconnect switch (fused or non-fused).
 - Damper actuator (modulating from 100% OA to 100% RA).
 - Fuses, relays, transformers, etc.
 - Electric heat interlock relay.
 - Hand off auto switch.

1. SERIES: (XXX)

KBM - Modular Blower Coil

2. UNIT TYPE: (XXX)

H - Horizontal
V - Vertical

3. CFM:

(See Krueger's selection software.)

4. SIZE: (XX)

02, 03, 04, 06, 08, 10, 12, 14, 17

5. MOTOR: (XX)

(See Krueger's selection software.)

6. MOTOR HAND: (X)

L - Left-hand Motor
R - Right-hand Motor

7. INLET: (X)

0 - None
P - Inlet Plenum
B - Mixing Box

8. INLET ARRANGEMENT: (X)

0 - None
1 - Top
2 - Bottom
3 - Rear

9. MIXING BOX DAMPER LOCATION: (X)

0 - None
1 - Top and Rear
2 - Bottom and Rear
3 - Top and Bottom

10. INLET DAMPER: (X)

0 - Not Available
A - No Damper
B - (1) Damper Top
C - (1) Damper Bottom

D - (1) Damper Rear

E - (2) Dampers

11. INLET ACCESS: (X)

0 - None
1 - Standard Access
2 - Hinged Access

12. INLET ACTUATOR: (X)

0 - None
1 - Inlet Actuator

13. FAN TYPE: (X)

1 - Forward Curved Fan

14. FILTER: (X)

0 - None
A - 2" MERV 8
B - 4" MERV 11
C - 4" MERV 14
D - 4" MERV 15
E - 2" MERV 8, 4" MERV 11
F - 2" MERV 8, 4" MERV 14
G - 2" MERV 8, 4" MERV 15
H - 2" MERV 8 V-bank, 4" MERV 11
J - 2" MERV 8 V-bank, 4" MERV 14
K - 2" MERV 8 V-bank, 4" MERV 15

15. SPARE 2" FILTER: (X)

0 - None
A - (1) 2" Spare MERV 8
B - (2) 2" Spare MERV 8
C - (3) 2" Spare MERV 8
D - (1) 2" Spare MERV 8, V-bank
E - (2) 2" Spare MERV 8, V-bank
F - (3) 2" Spare MERV 8, V-bank

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16. SPARE 4" FILTER: (X)

- 0 - None
- A - (1) 4" Spare MERV 11
- B - (2) 4" Spare MERV 11
- C - (3) 4" Spare MERV 11
- D - (1) 4" Spare MERV 14
- E - (2) 4" Spare MERV 14
- F - (3) 4" Spare MERV 14
- G - (1) 4" Spare MERV 15
- H - (2) 4" Spare MERV 15
- J - (3) 4" Spare MERV 15

17. FILTER ACCESS SIZE: (X)

- 0 - None
- 1 - 15" Access Segment
- 3 - 30" Access Segment

18. FILTER ACCESS: (X)

- 0 - None
- 1 - Standard Access
- 2 - Hinged Access

19. FILTER ACCESS DRAIN PAN: (X)

- 0 - None
- 1 - IAQ Galvanized Drain Pan
- 3 - IAQ Stainless Steel Drain Pan

20. SEGMENT (1 - 10): (XX)

(See Krueger's selection software.)

21. CASING (1 - 10): (XX)

- 0 - Single Wall
- 1 - Double Wall
- 2 - Foil Face

22. BASE RAILS (1 - 10): (X)

- 0 - None
- B - Base Rails

23. AIRFLOW MEASUREMENT STATION: (X)

- 0 - None
- 1 - Airflow Measurement Station

24. FAN CLASS: (X)

- 1 - Class 1
- 2 - Class 2

25. FAN ARRANGEMENT: (XX)

- 1 - Fan Arrangement 1 (Horizontal Top Front)
- 2 - Fan Arrangement 2 (Upblast Front)
- 3 - Fan Arrangement 3 (Downblast Front)

26. FAN ACCESS: (X)

- 1 - Standard Access
- 2 - Hinged Access

27. FAN ISOLATION: (X)

- R - Rubber in Shear
- S - Spring

28. COIL (1 & 2): (X)

- 0 - None
- A - 4 Row Cold Water
- B - 6 Row Cold Water
- C - 8 Row Cold Water
- D - 1 Row Hot Water
- E - 2 Row Hot Water
- F - 3 Row Hot Water
- G - 4 Row Hot Water
- H - 1 Row Steam
- J - 2 Row Steam
- K - 3 Row DX, Single Circuit
- L - 4 Row DX, Single Circuit
- M - 6 Row DX, Single Circuit
- N - 8 Row DX, Single Circuit

29. COIL (1 & 2) FPI: (XX)

- 00 - None
- 08 - 08 FPI
- 10 - 10 FPI
- 12 - 12 FPI
- 14 - 14 FPI

30. COIL (1 & 2) TUBE WALL: (X)

- 0 - None
- 1 - 0.016"
- 2 - 0.025"

31. COIL (1 & 2) CASING: (X)

- 0 - Galvanized Casing
- 1 - Stainless Steel Casing

32. COIL (1 & 2) DRAIN PAN: (X)

- 0 - Galvanized Drain Pan
- 3 - IAQ Stainless Steel Drain Pan

33. COIL (1 & 2) HAND: (XX)

- 0 - None
- L - Left-hand
- R - Right-hand

34. COIL (1 & 2) ACCESS SIZE: (XX)

- 0 - None
- 1 - 15" Access Segment
- 3 - 30" Access Segment

35. COIL (1 & 2) ACCESS: (XX)

- 0 - None
- 1 - Standard Access
- 2 - Hinged Access

36. COIL (1 & 2) ACCESS DRAIN PAN: (XX)

- 0 - None
- 1 - IAQ Galvanized Drain Pan
- 3 - IAQ Stainless Steel Drain Pan

37. ELECTRIC HEAT VOLTAGE: (X)

(See Krueger's selection software.)

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38. ELECTRIC HEAT KW: (XX)

(See Krueger's selection software.)

39. ELECTRIC HEAT HAND: (X)

- 0 - None
- L - Left-hand
- R - Right-hand

40. MAGNETIC CONTACTOR: (X)

- 0 - None
- M - Magnetic Contactor

41. FUSING PER STEP: (X)

- 0 - None
- F - Fusing per Step

42. DISCONNECT SWITCH: (X)

- 0 - None, High Voltage Line Block
- K - Door Interlocking Fused Disconnect
- L - Door Interlocking Non-Fused Disconnect

43. AUTO SWITCH: (X)

- 0 - None
- 1 - Hand-Off Auto Switch

44. FAN CONTROL PACKAGE: (X)

- 0 - Junction Box
- 1 - Starter Motor Control - 24v
- 2 - VFD Motor Control

45. SPARE BELTS: (XX)

- 0 - None
- 1 - (1) Spare Belt
- 2 - (2) Spare Belts
- 3 - (3) Spare Belts

46. Motor Sheave Driver-Driven: (X)

(See Krueger's selection software.)