Daikin North America LLC

HVAC Guide Specifications
Direct Expansion (DX), Variable Capacity, Split System

Section 15700 – Mechanical HVAC

Size Range:
0.6 to 16 Tons Nominal

Daikin Model Number:
EKEQFCBAV3-US – AHU INTEGRATION KIT (W-CONTROL BOX)
EKEQMCBAV3-US – AHU INTEGRATION KIT (Z-CONTROL BOX)
EKEXV50-US – AHU INTEGRATION KIT EXPANSION VALVE 18 MBH
EKEXV63-US – AHU INTEGRATION KIT EXPANSION VALVE 24 MBH
EKEXV80-US – AHU INTEGRATION KIT EXPANSION VALVE 30 MBH
EKEXV100-US – AHU INTEGRATION KIT EXPANSION VALVE 36 MBH
EKEXV125-US – AHU INTEGRATION KIT EXPANSION VALVE 48 MBH
EKEXV140-US – AHU INTEGRATION KIT EXPANSION VALVE 60 MBH
EKEXV200-US – AHU INTEGRATION KIT EXPANSION VALVE 72 MBH
EKEXV250-US – AHU INTEGRATION KIT EXPANSION VALVE 96 MBH
EKEXV400-US – AHU INTEGRATION KIT EXPANSION VALVE 144 MBH
EKEXV500-US – AHU INTEGRATION KIT EXPANSION VALVE 192 MBH

Part 1 – GENERAL

VARIABLE REFRIGERANT VOLUME (VRV) AIR CONDITIONING SPECIFICATION – Heat Recovery / Heat Pump Air Handling Unit Integration Kit

1.01 QUALITY ASSURANCE
- A. The units shall be tested by a Nationally Recognized Testing Laboratory (NRTL), in accordance with ANSI/UL 1995/CAN/CSA-C22.2 No. 236-05 (R2009) – Heating and Cooling Equipment, and shall bear the Listed Mark.
- B. All wiring shall be in accordance with the National Electric Code (NEC)/Canadian Electrical Code (CEC).
- C. The system will be produced in an ISO 9001 and ISO 14001 facility, which are standards set by the International Standard Organization (ISO). The system shall be factory tested for safety and function.

1.02 DELIVERY, STORAGE AND HANDLING
- A. Unit shall be stored and handled according to the manufacturer's recommendations.

Part 2 – WARRANTY

2.01 STANDARD LIMITED WARRANTY

Daikin North America LLC warrants original owner of the non-residential building, multifamily residence or residence in which the Daikin products are installed that under normal use and maintenance for comfort cooling and conditioning applications such products (the "Products") will be free from defects in material workmanship. This warranty applies to compressor and all parts and is limited in duration to ten (10) years starting from the "installation date" which is one of the two dates below:

1. The installation date is the date that the unit is original commissioned, but no later than 18 months after the manufacture date noted on the unit's rating plate.
2. If the date the unit is originally commissioned cannot be verified, the installation date is three months after the manufacture date.

Complete warranty details are available from your local Daikin representative or at www.daikincomfort.com.

Part 3 – PERFORMANCE

3.01 DESIGN BASIS

The HVAC equipment basis of design is Daikin. All bidders shall furnish the minimum system standards as defined by the base bid model numbers, model families or as otherwise specified herein (see Key General Specifications Alternate Supplier Checklist). In any event the contractor shall be responsible for all specified items and intents of this document without further compensation.

Part 4 – PRODUCTS

4.01 EKEQFCBAV3-US

A. General:
   1. Daikin model EKEQFCBAV3-US control box shall be used to control the flow of R-410a refrigerant to a non-*VRV* air handling unit connected to a *VRV* condensing unit by means of an appropriate Daikin EKEXV***-US expansion valve kit. Each EKEQFCBAV3-US control shall be paired with no more than one EKEXV***-US expansion valve kit. The EKEQFCBAV3-US shall control the refrigerant flow as determined by a 0-10VDC input provided by a field-supplied DDC controller
   2. The unit shall be furnished with 2 thermistors required for control of the expansion valve. These thermistors shall be field-installed in the air handling unit as required.
   3. The unit shall be furnished with 9 capacity setting adaptors, each corresponding to an appropriate EKEXV***-US capacity selection.
   4. The unit shall be furnished with a conduit mounting plate and sealing gasket.

B. Unit Enclosure:
   1. The unit enclosure shall be constructed of a polymer resin suitable for indoor or outdoor installation in accordance with UL1995.
   2. The units shall be constructed such that the when the cover is opened for electrical connections, the cover shall remain attached to the body of the control box.

C. Electrical:
   1. A separate power supply will be required of 208/230 volts, 1 phase, 60 hertz. The acceptable voltage range shall be 187 to 253 volts.
   2. Transmission (control) wiring between the EKEQFCBAV3-US and the *VRV* outdoor unit shall be a maximum of 3,280 feet (total 6,560 feet).
   3. The length of transmission (control) wiring between the EKEQFCBAV3-US and the field-supplied DDC controller shall be determined by the DDC manufacturer.

4. The length of transmission (power and control) wiring between the EKEQFCBAV3-US and the EKEXV***-US shall be a maximum of 65 feet (20m).
5. All wiring shall be in accordance with National Electric Code (NEC)/Canadian Electrical Code (CEC) and any applicable local or regional codes.

D. Control:
1. The EKEQFCBAV3-US shall receive a 0-10V DC input from a field-supplied DDC controller.
2. The *VRV* outdoor unit shall adjust the system target evaporating temperature (in cooling mode) and target condensing temperature (in heating mode) in response to the 0-10V DC input.
3. The unit shall receive a 16V DC analog input from the included liquid pipe thermistor attached to the field supplied air handling unit. The thermistor shall be field-installed as necessary with the included 8.5 feet of wiring.
4. The unit shall receive a 16V DC analog input from the included gas pipe thermistor attached to the field supplied air handling unit. The thermistor shall be field-installed as necessary.
5. The unit shall be compatible with the Daikin BRC1E72, BRC1E73, and BRC2A71 indoor unit controllers for purposes of field-setting and troubleshooting purposes only. These controllers shall not be used for controlling refrigerant flow to the expansion valve.
6. The unit shall be capable of receiving a contact input On/Off signal.
7. The unit shall provide a 16V DC output to the EKEXV_-US expansion valve. This output shall provide both power and communication/control to the expansion valve.
8. The unit shall provide a voltage-free contact signal output for use with the air handling unit fan operation. Additional fan speed control shall be via the DDC controller or other Building Management System control.
9. The unit shall provide a voltage-free contact signal output indicating compressor on/off operation.
10. The unit shall provide a voltage-free contact error signal output.
11. The unit shall provide a voltage-free contact signal output indicating the *VRV* outdoor unit is in a defrost cycle.
12. The VRT function for the *VRV* outdoor unit shall be automatically disabled upon connection of the EKEQFCBAV3-US.
13. The unit shall be capable of wiring to the Daikin *VRV* D-III Net communication using the F1,F2 terminal block.

E. Optional Accessories:
1. The unit shall be compatible with the BRC1E72, the BRC1E73, and the BRC2A71 for field setting and troubleshooting purposes only.
2. The unit shall be compatible with the I-Touch Manager (DCM601A71).
3. The unit shall be compatible with the following expansion valve kits: EKEXV63-US, EKEXV80-US, EKEXV100-US, EKEXV125-US, EKEXV140-US, EKEXV200-US, EKEXV250-US, EKEXV400-US, EKEXV500-US.
4. The unit shall be compatible with DACA-KRCS-PW40 and DACA-KRCS-PW80 thermistor cables

4.02 EKEQMCBAV3-US

A. General:
   1. Daikin model EKEQMCBAV3-US control box shall be used to control the flow of R-410a refrigerant to a non-*VRV* air handling unit connected to a *VRV* condensing unit by means of an appropriate Daikin EKEXV_-US expansion valve kit. Each EKEQMCBAV3-US control shall be paired with no more than one EKEXV_-US expansion valve kit. The EKEQMCBAV3-US shall control the refrigerant flow similar to a standard *VRV* indoor unit by measuring the return air temperature or room temperature of the space and comparing the measured value to the desired set point value.
   2. The unit shall be furnished with 2 thermistors required for control of the expansion valve. These thermistors shall be field-installed in the air handling unit as required.
   3. The unit shall be furnished with 1 additional thermistor for measuring the return air temperature or room temperature. This thermistor shall be field-installed in the air handling unit or in the conditioned space as required.
   4. The unit shall be furnished with 10 capacity setting adaptors, each corresponding to an appropriate EKEXV-US capacity selection.
   5. The unit shall be furnished with a conduit mounting plate and sealing gasket.

B. Unit Enclosure:
   1. The unit enclosure shall be constructed of a polymer resin suitable for indoor or outdoor installation in accordance with UL1995.
   2. The unit enclosure shall be constructed such that when opened for electrical connections, the cover shall remain attached to the main body of the control box

C. Electrical:
   1. A separate power supply will be required of 208/230 volts, 1 phase, 60 hertz. The acceptable voltage range shall be 187 to 253 volts.
   2. Transmission (control) wiring between the EKEQMCBAV3-US and the *VRV* outdoor unit shall be a maximum of 3,280 feet (total 6,560 feet).
   3. The length of transmission (power and control) wiring between the EKEQMCBAV3-US and the EKEXV-US shall be a maximum of 65 feet (20m).
   4. All wiring shall be in accordance with National Electric Code (NEC)/Canadian Electrical Code (CEC) and any applicable local or regional codes.

D. Control:
   1. The EKEQMCBAV3-US shall control the expansion valve
   2. The unit shall receive a 16V DC analog input from the thermistor used to control space temperature. This thermistor may be placed in the return air stream or in the conditioned space, as appropriate.
   3. The unit shall receive a 16V DC analog input from the included liquid pipe thermistor attached to the field supplied air handling unit. The thermistor shall be field-installed as necessary.
   4. The unit shall receive a 16V DC analog input from the included gas pipe thermistor attached to the field supplied air handling unit. The thermistor shall be field-installed as necessary.
   5. The unit shall be compatible with the Daikin BRC1E72, BRC1E73, and BRC2A71 indoor unit controllers.
   6. The unit shall be capable of receiving a contact input On/Off signal.

7. The unit shall provide a 16V DC output to the EKEXV_-US expansion valve. This output shall provide both power and communication/control to the expansion valve.
8. The unit shall provide a voltage-free contact signal output for use with the air handling unit fan operation. Additional fan speed control shall be via the DDC controller or other Building Management System control.
9. The unit shall provide a voltage-free contact signal output indicating compressor on/off operation.
10. The unit shall provide a voltage-free contact error signal output.
11. The unit shall provide a voltage-free contact signal output indicating the *VRV* outdoor unit is in a defrost cycle.
12. The VRT function for the *VRV* outdoor unit shall be automatically disabled upon connection of the EKEQMCBAV3-US.
13. The unit shall be capable of wiring to the Daikin *VRV* D-III Net communication using the F1,F2 terminal block.

E. Optional Accessories:
1. The unit shall be compatible with the BRC1E72, the BRC1E73, and the BRC2A71 for control, field setting and troubleshooting purposes.
2. The unit shall be compatible with the I-Touch Manager (DCM601A71).
3. The unit shall be compatible with the following expansion valve kits: EKEXV50-US, EKEXV63-US, EKEXV80-US, EKEXV100-US, EKEXV125-US, EKEXV140-US, EKEXV200-US, EKEXV250-US, EKEXV400-US, EKEXV500-US.

4.03 EKEXV***-US

A. General:
1. Daikin model EKEXV***-US expansion valve kit shall be used to control the flow of R-410a refrigerant to a non-*VRV* air handling unit connected to a *VRV* condensing unit. Each EKEXV***-US shall be paired with one EKEQ*CBAV3-US control box. The EKEXV***-US shall be compatible with R-410a refrigerant, and shall be capable of an expansion valve control resolution of 2000 pulses. It shall be available in nominal capacities from 18,000 Btu/h to 192,000 Btu/h.

B. Performance:
1. The unit's performance shall be determined by the selected operating conditions, and shall fall within the following range:

Model Number	Nominal Capacity	Cooling Capacity (Btu/h)		Heating Capacity (Btu/h)	
		Min.	Max.	Min.	Max.
EKEXV50-US	18 MBh	17,500	21,000	19,000	24,000
EKEXV60-US	24 MBh	21,500	26,500	24,200	30,000
EKEXV80-US	30 MBh	27,000	34,500	30,500	38,000
EKEXV100-US	36 MBh	34,000	42,000	38,500	47,000
EKEXV125-US	48 MBh	42,500	52,500	47,500	59,000
EKEXV140-US	60 MBh	53,000	60,000	59,500	67,500
EKEXV200-US	72 MBh	60,500	84,000	68,000	94,500
EKEXV250-US	96 MBh	84,500	105,000	95,000	118,500

EKEXV400-US	144 MBh	120,000	169,000	136,000	187,500
EKEXV500-US	192 MBh	170,000	210,000	188,000	236,500

C. Unit Enclosure:
   1. The unit enclosure shall be constructed of a heavy gauge sheet metal with a powder coat finish, and shall be suitable for both indoor and outdoor installation.

D. Piping:
   1. All piping within the unit shall be copper.
   2. The unit shall be furnished with refrigerant filter/driers on both the inlet and outlet piping to the expansion valve.
   3. External refrigerant connections to the unit shall be brazed connections.
   4. Both refrigerant lines shall be fully insulated from the outdoor unit.

E. Electrical:
   1. The unit shall not require a dedicated power connection. Power to the expansion valve shall be provided via 12V DC input connection from the paired EKEQ*CBAV3-US control box.
   2. The power wiring connection shall be made using the factory included 18 AWG wiring harness. The connection shall be capable of up to 65 ft (20m) of wiring length.

F. Control:
   1. The control signal to the EKEXV***-US shall be received via the factory included 18 AWG wiring harness. The connection shall be capable of up to 65 ft. (20m) of wiring length.

G. Optional Accessories:
   1. The control signal to the EKEXV***-US shall be received via the factory included 18 AWG wiring harness. The connection shall be capable of up to 65 ft. (20m) of wiring length.