



VRV

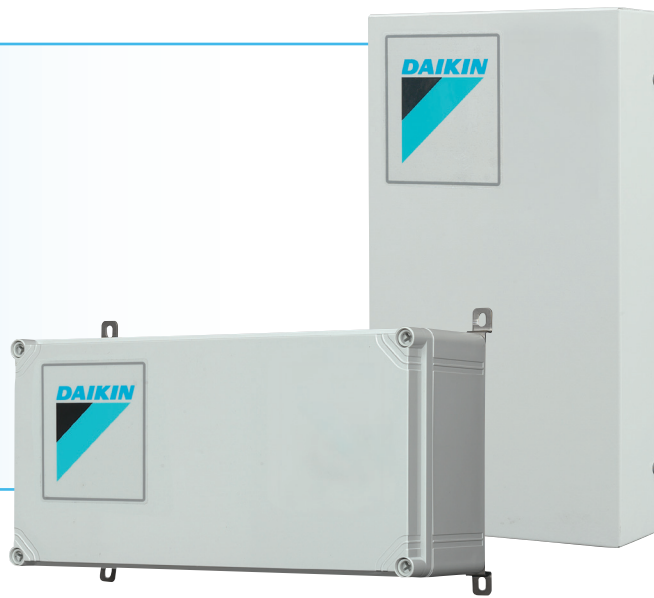
AIR HANDLING UNIT
INTEGRATION KIT
APPLICATION AND
SELECTION GUIDE



A GLOBAL LEADER IN HVAC INVESTED IN NORTH AMERICA

About Daikin:

Daikin Industries, Ltd. (DIL) is a global Fortune 1000 company which celebrated its 95th anniversary in May 2019. The company is recognized as one of the largest HVAC (Heating, Ventilation, Air Conditioning) manufacturers in the world. DIL is primarily engaged in developing indoor comfort products and refrigeration systems for residential, commercial and industrial applications. Its consistent success is derived, in part, from a focus on innovative, energy-efficient and premium quality indoor climate and comfort management solutions.



Contents

1	Definitions	4
2	Introduction	5
3	Control Box Types	7
	3.1. EKEQMCBAV3-US (Z-Control)	9
	3.1.1. Control Options	9
	3.1.2. VRV System Compatibility	9
	3.1.3. Connection Ratio	9
	3.1.4. Standard Operating Conditions	9
	3.1.5. Piping Limitations	10
	3.1.6. EKEQMCBAV3-US Terminal Block I/Os	10
	3.1.7. EKEQMCBAV3-US Layout Examples	11
	3.2. EKEQFCBAV3-US - (W-Control)	15
	3.2.1. Control Options	15
	3.2.2. VRV System Compatibility	15
	3.2.3. Standard Operating Conditions	15
	3.2.4. Extended Operating Conditions	16
	3.2.5. Piping Limitations	17
	3.2.6. EKEQFCBAV3-US Terminal Block I/Os	17
	3.2.7. EKEQFCBAV3-US Layout Example	18
	3.2.8. EKEQFCBAV3-US Applications to Avoid	19
4	AHU Coil and EEV Selection	21
5	VRV System Connection Ratio	25
6	VRV System Layout	27
7	Controls Integration and Field Settings	31
8	Quick Reference Summary	47

For the purposes of this document, the following definitions are made:

Air Handling Unit (AHU) – A mechanical equipment used to condition air by moving the air across a heat exchanger coil. For purposes of describing the EKEQ and EKEXV AHU integration kit, this refers to units that are non-VRV indoor units.

Capacity Index – A number used to define the nominal capacity of an IDU or AHU. Capacity Index is used for purposes of calculating the system connection ratio.

Capacity Correction Factor – A factor used to calculate an adjusted Capacity Index when utilizing the AHU integration. The Correction Factor is necessary due to the range of potential AHU coils paired with each expansion valve.

Coil – The AHU coil can be a single circuit or multiple interlaced circuits. An interlaced coil shall have balanced fluid distribution by means of interlaced circuits. Each circuit should perceive the same on-coil air conditions, and each circuit must start and end with the same refrigerant conditions and must have the same pipe diameter.

Discharge Air – The off-coil or leaving-air-temperature from the AHU coil.

Indoor Unit (IDU) – A standard Daikin VRV indoor unit.

On-Coil Temperature – The temperature of air as it enters the heat exchanger coil of the AHU.

Outdoor Unit (ODU) – A VRV outdoor condensing unit. Can be a single module, dual module, or triple module outdoor unit.

Pair Application – An application where the outdoor unit is connected to a single coil (with single or multiple circuits) using up to 3 **EKEQMCAV3-US** control boxes. Combinations with VRV indoor units are not allowed in Pair applications.

W-Control – Control scheme utilized by the **EKEQMCAV3-US** control kit; controls the VRV system capacity relative to the 0-10V DC input from a field provided DDC controller.

Z-Control – Control scheme utilized by the **EKEQMCAV3-US** control kit; controls the expansion valve using a built-in PID loop according to the current return air temperature measured by the R1T thermistor and target temperature set-point. This is the same method of control utilized by standard VRV indoor units.

Electronic Expansion Valve (EEV) – An electronic expansion device used in a VRV system for regulating refrigerant flow.

Variable Refrigerant Temperature (VRT) – A method of resetting refrigerant temperature to optimize efficiency and comfort.

Variable Refrigerant Volume (VRV) – A system that varies the amount of refrigerant based on the required load. Also known as the industry term Variable Refrigerant Flow (VRF). VRV is a registered trademark of Daikin.



2. Introduction



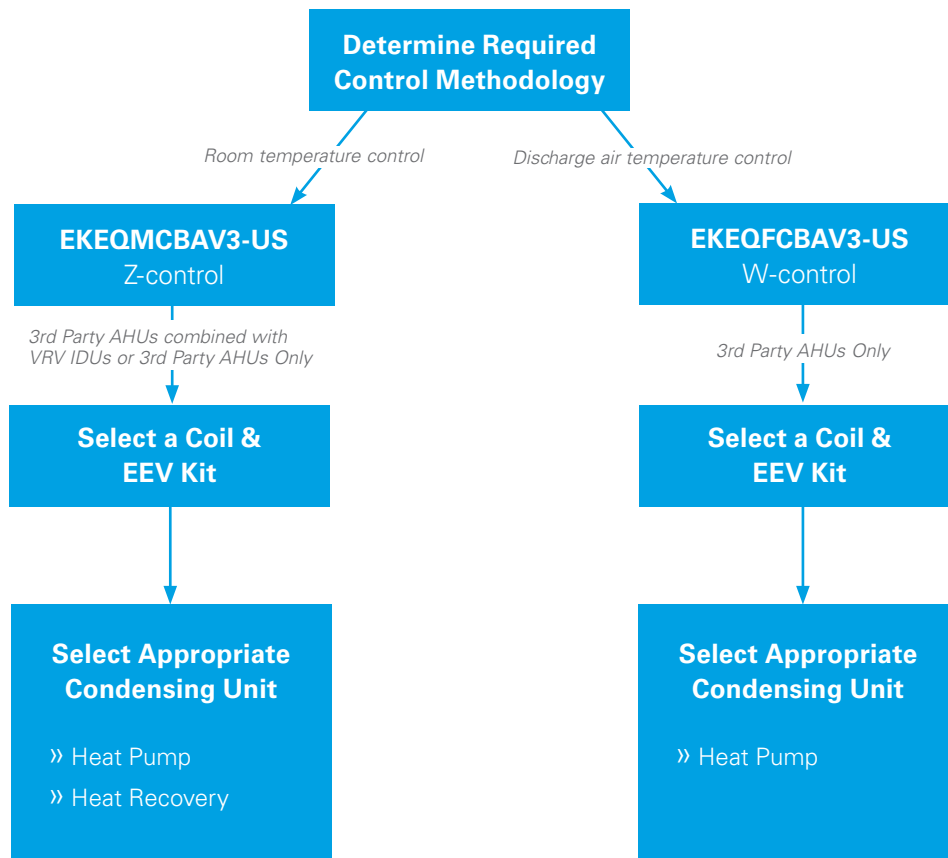
2. Introduction

This guide provides an overview of the factors and conditions to be considered while incorporating the Air Handler Unit (AHU) Integration Kit into the system design. This guide should be used as a supplement only; engineering manuals and installation manuals for VRV systems, indoor units, controls, AHUs and AHU integration kits should be carefully reviewed prior to making the selections. Daikin North America cannot assume responsibility for systems designed outside the scope presented in this document and the accompanying engineering and installation manuals.

Each AHU Integration Kit solution is comprised of two key components:

- » One EKEQ control box
- » One EKEXV expansion valve kit

The EKEQ control box provides the control and communication interface between the expansion valve, the VRV condensing unit, and the 3rd party AHU. The desired EKEQ control methodology will dictate various application requirements and restrictions, so determining the desired control scheme is an ideal starting point.





3. Control Boxes



3. Control Box Types

Two types of control boxes, namely EKEQMCBAV3-US and EKEQFCBAV3-US, are available. Each control box can control one EKEXV, so an air handler requiring multiple circuits and multiple EKEXVs will also require multiple control boxes. Each control box type has specific application requirements designed to match the internal VRV refrigerant control mechanisms employed by the EKEQ control type.

Figure 3.1

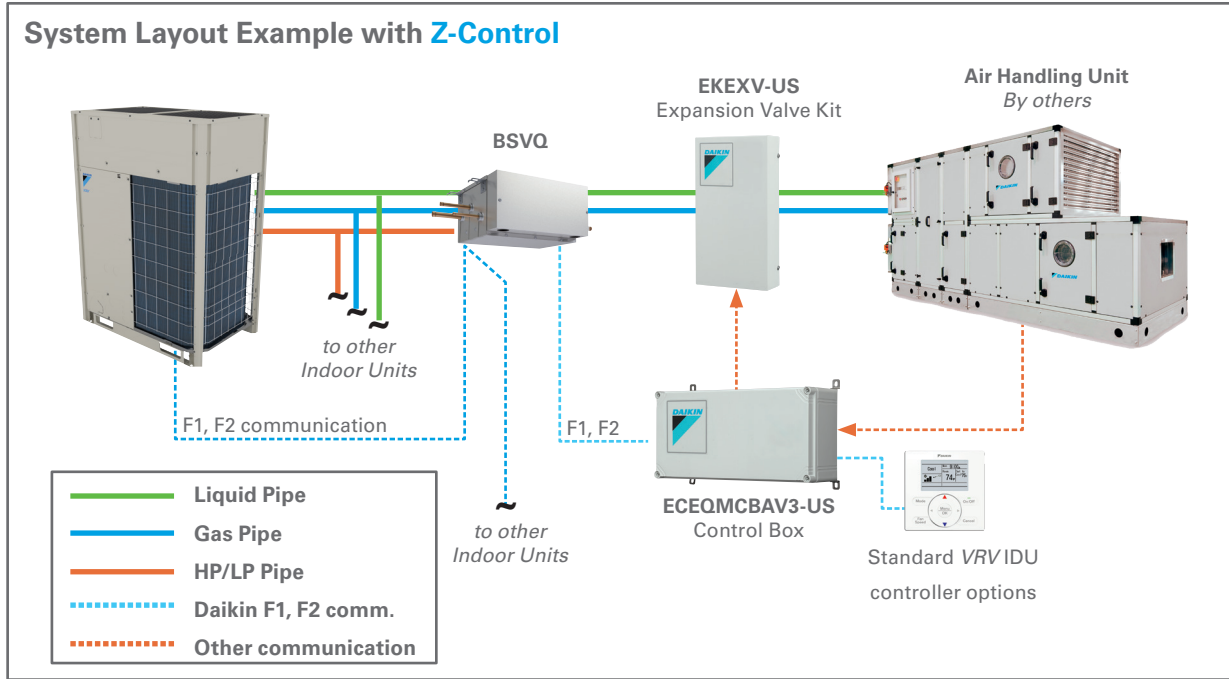
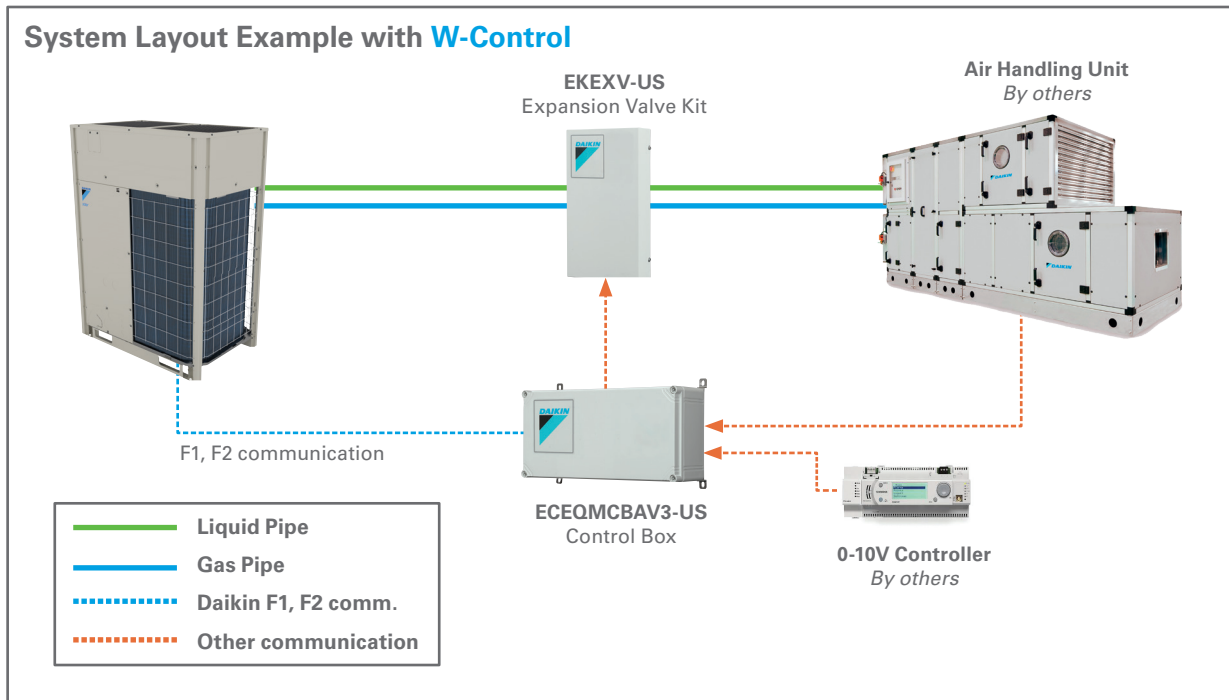


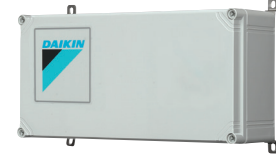
Figure 3.2



3. Control Box Types

3.1 EKEQMCAV3-US (Z-Control)

The EKEQMCAV3-US box controls the EEV using an internal PID algorithm that adjusts the EEV's target superheat based on the measured room/return air temperature and the AHU set-point.



3.1.1. Control Options:

Standard VRV indoor unit controller choices are available. The BRC1E73 is recommended.

3.1.2. VRV System Compatibility

- » Can be applied to Heat Pump or Heat Recovery Systems
- » Other VRV indoor units can be connected to the outdoor system
- » Provides fan ON/OFF dry contact output for the AHU
- » Requires the use of controllers that can communicate via P1/P2 protocol
- » VRT function not available when using this type of control box

3.1.3. Connection Ratio

Table 3.1

EKEQMCAV3-US (Z-Control) Connection Ratio					
ODU Type	IDU Types	AHU Nominal Heating Capacity	AHU Connection Ratio	VRV IDU Connection Ratio	Total Connection Ratio
Heat Pump or Heat Recovery	AHU Kit + VRV IDU	≥Standard*	0 - 110%	0 - 110%	50 - 110%
		<Standard*	0 - 60%	50 - 110%	50 - 110%
	AHU Kit Only	≥Standard*	50 - 110%	0%	50 - 110%
		<Standard*	90 - 110%	0%	90 - 110%

*Standard nominal heating capacity values can be found in table 4.1 of section 4 for each EKEXV valve

3.1.4. Standard Operating Conditions

The standard allowable mixed air on coil temperature range for the AHU are shown in figure 3.3 to the right.

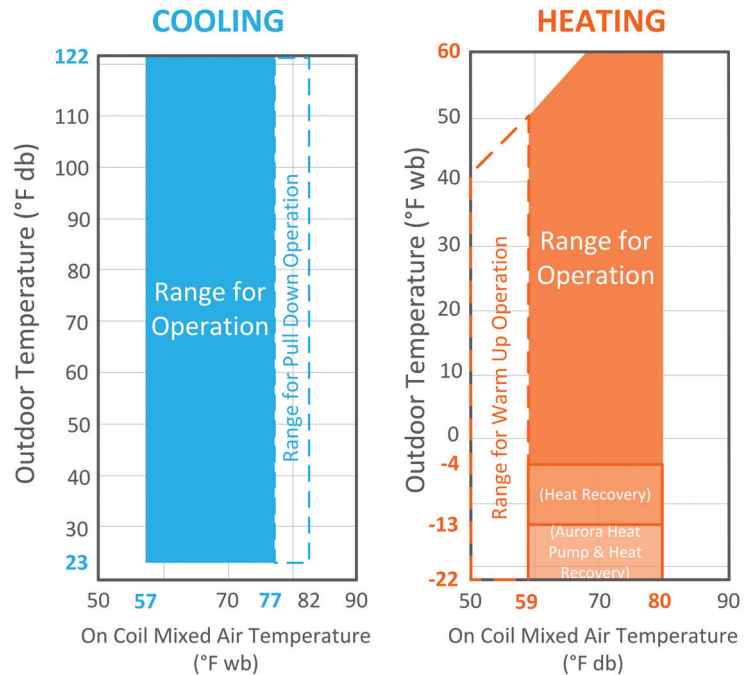


Figure 3.3

3. Control Box Types

3.1.5. Piping Limitations

» Refer to Table 6.2 for piping length limitations for EKEQMCBAV3-US.

3.1.6. EKEQMCBAV3-US Terminal Block I/Os

Figure 3.4

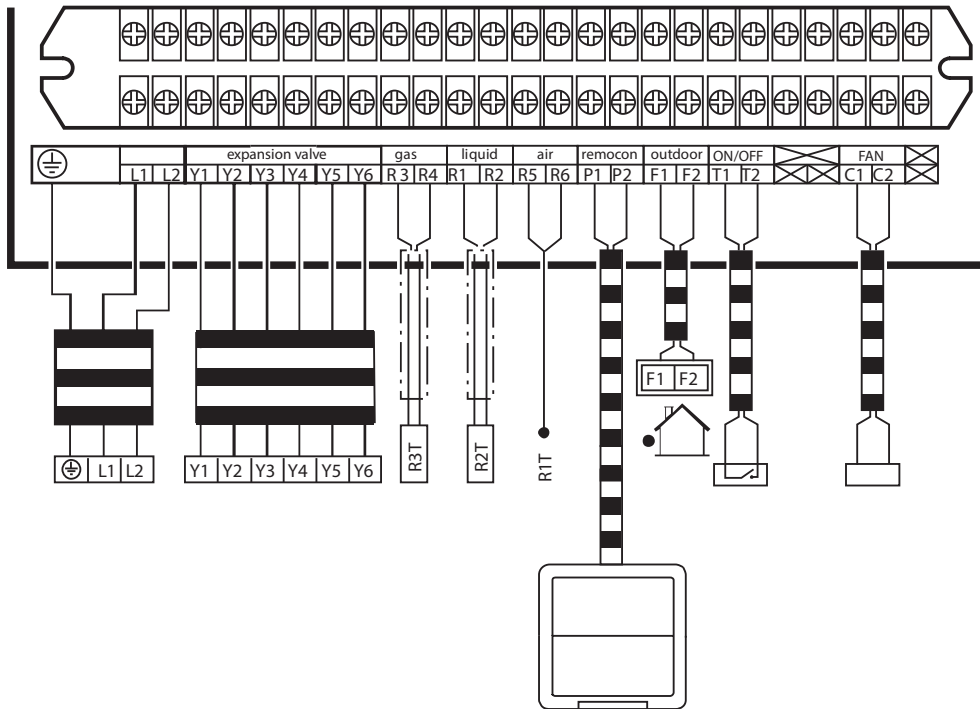


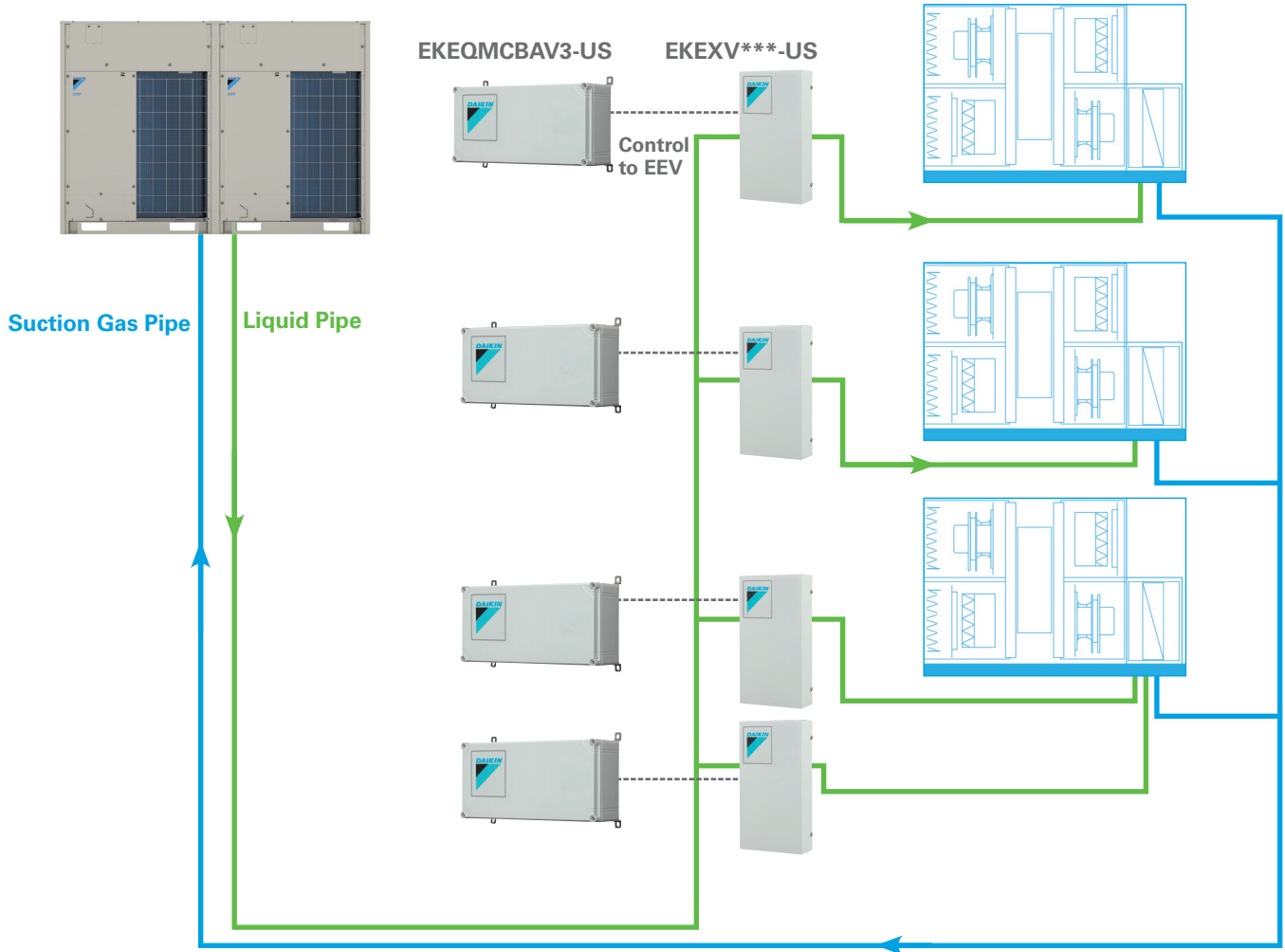
Table 3.2: Cable Connections

Description	Connect to	AWG/Cross section*	Maximum length feet (m)	Specifications	
L1, L2	Power supply	Power supply	AWG 12 0.01"	–	Power supply 230 V 1-60Hz
Y1 ~ Y6 (†)	Expansion valve connection	Expansion valve kit	AWG 18 0.03"	65 (20)	Digital output 12 V DC
R1, R2	Thermistor R2T (liquid pipe)	–		Standard: 8 (2.5) Max.: 65 (20)	Analog input 16 V DC
R3, R4	Thermistor R3T (gas pipe)			328 (100)	Communication line 16 V DC
R5, R6	Thermistor R1T (air)				–
P1, P2	Remote controller			Outdoor unit	–
F1, F2	Communication to outdoor unit	Outdoor unit	–	–	–
T1, T2	ON/OFF	Control field supplied	Optional connection: when the function of the switch box needs to be extended: see KRP4A71 for details of settings and instructions		
–	–				
–	–				
C1, C2	Fan signal	Air handler unit fan field supplied	AWG 12 0.01"	–	Digital output: voltage free. Maximum 230 V, maximum 2A

(*) Recommended size (all wiring must comply with local codes).

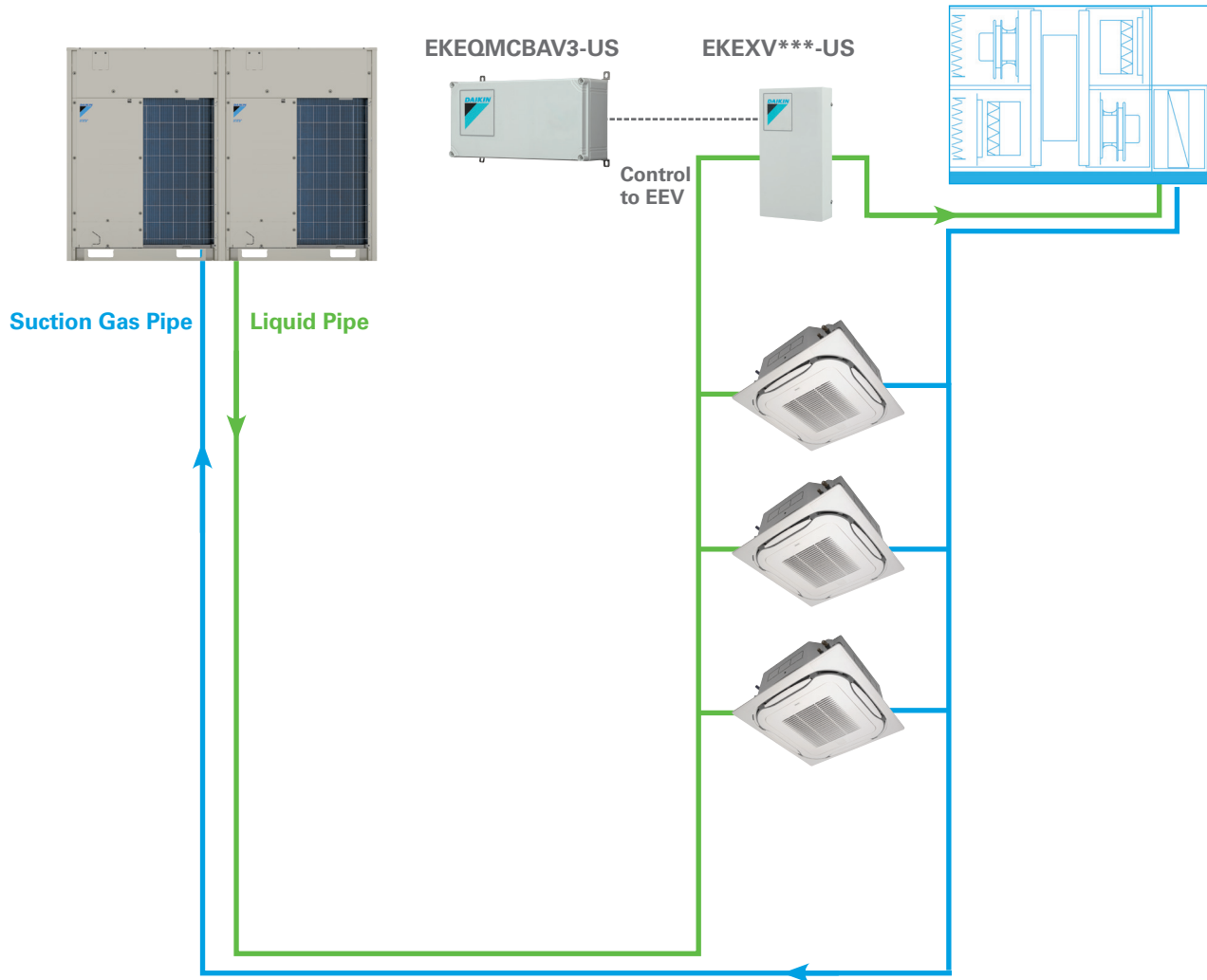
3.1.7. EKEQMCBAV3-US Z-Control Examples

Scenario Z1: HP system with **ONLY** EKEQMCBAV3-US/EKEXV***-US



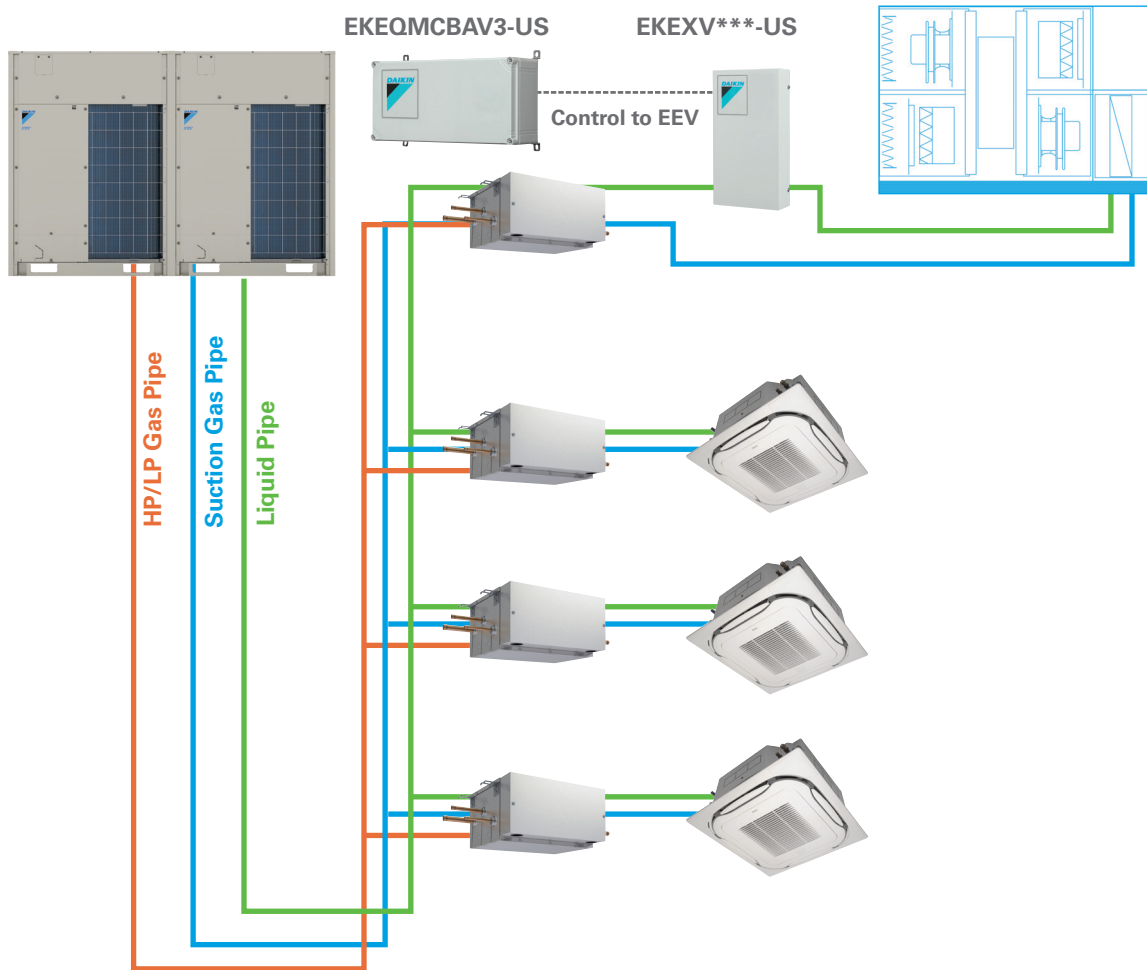
3. Control Box Types

Scenario Z2: HP system with EKEQMCBAV3-US/EKEXV***-US and VRV IDU's



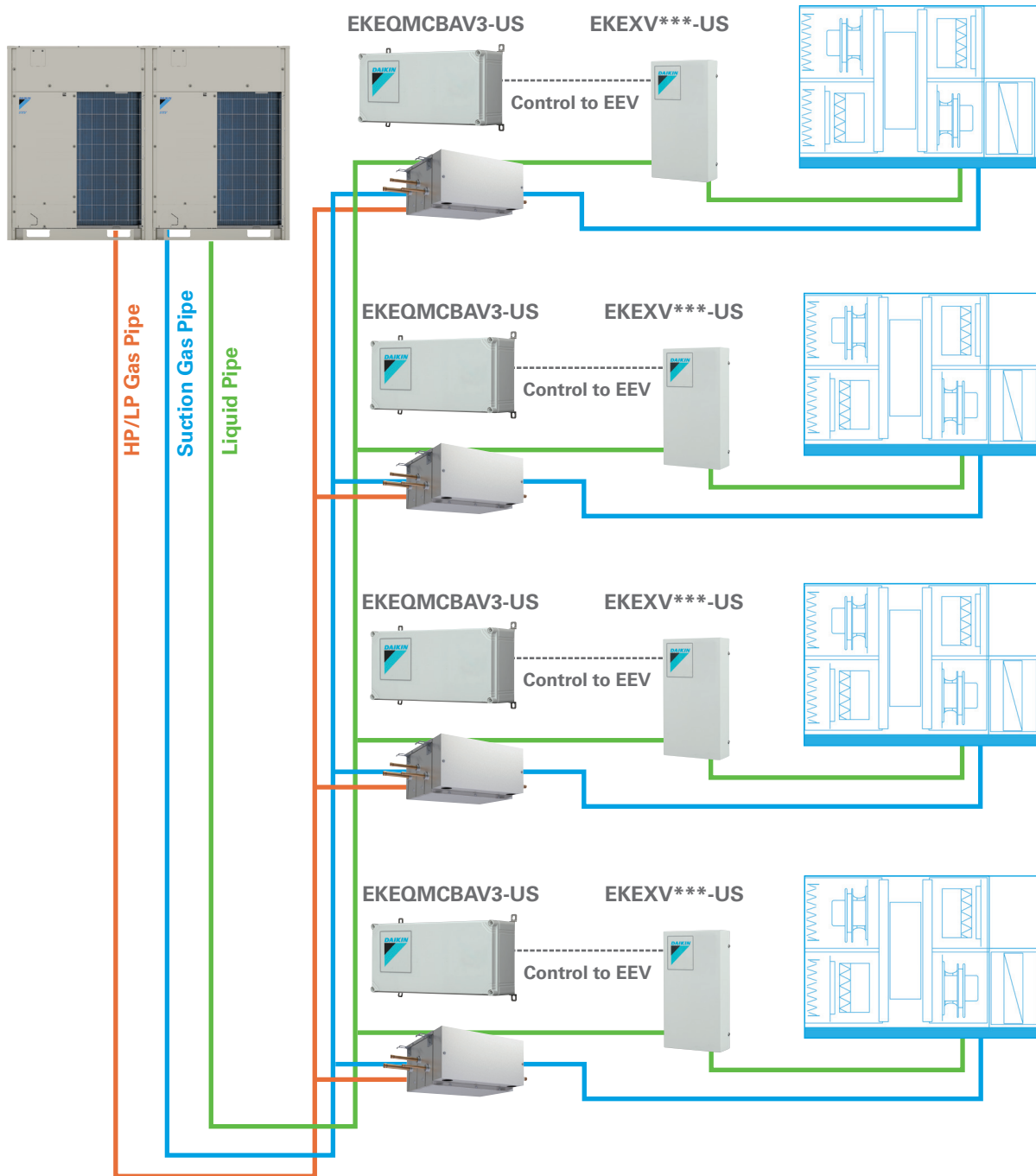
3. Control Box Types

Scenario Z3: HR system with EKEQMCBAV3-US/EKEXV***-US and VRV IDU's



3. Control Box Types

Scenario Z4: HR system with ONLY EKEQM CBAV3-US/EKEXV***-US



3. Control Box Types

3.2. EKEQFCBAV3-US (W-Control)

System level control of the AHU and VRV system is performed using a 0-10V input from a DDC controller to the EKEQFCBAV3-US control box.

3.2.1. Control Options

A 0-10V field-supplied DDC. A Daikin local controller like the BRC1E73 is required to perform field settings.

3.2.2. VRV System Compatibility

- » Can be applied to Heat Pump systems only
- » 90-110% Connection Ratio
- » Only 1-to-1 pairing with outdoor unit is permitted (other VRV indoor units cannot be connected to the outdoor unit)
- » A maximum of 3 AHU integration kits can be connected per system to create a multi-circuit AHU coil. These circuits must be interlaced as indicated in Section 4 of this document.
- » 5 voltage based programmable levels to control refrigerant flow
- » Dry contact Fan On/Off output
- » AHU fan control is handled by DDC
- » VRT function not available when using this type of control box

3.2.3. Standard Operating Conditions

The standard allowable mixed air on coil temperature range for the AHU are shown in figure 3.5 to the right. An extended on coil temperature range is allowed with the EKEQFCBAV3-US control and is outlined in the following section.

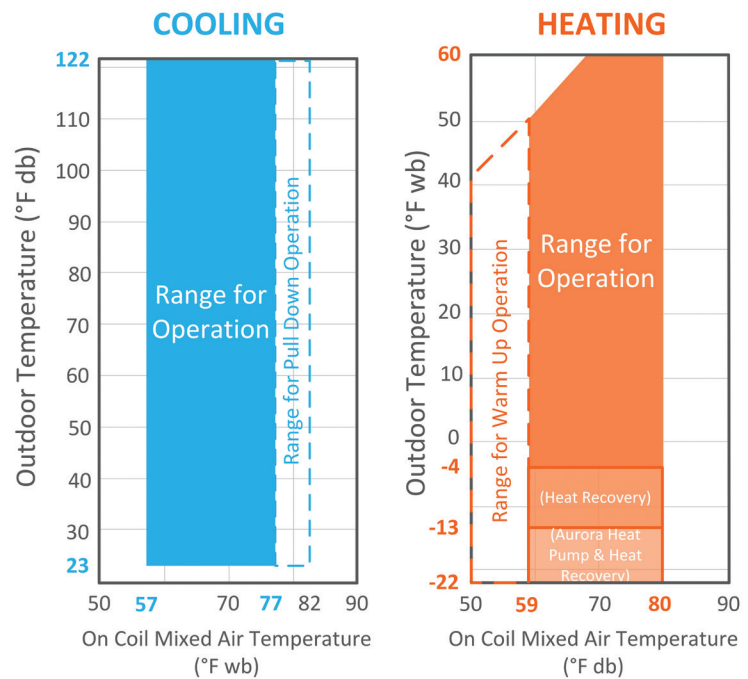
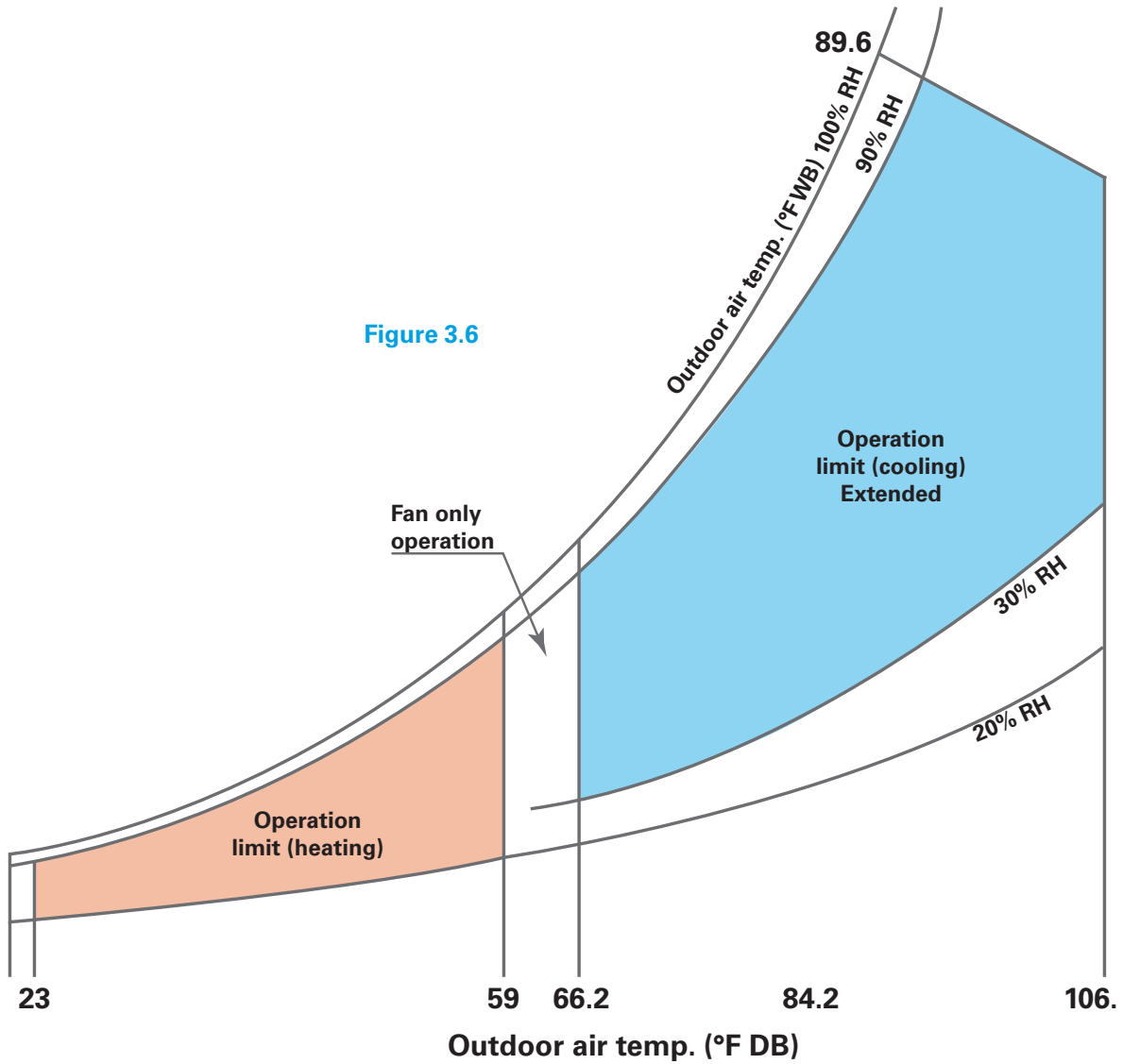


Figure 3.5

3.2.4. Extended Operating Conditions

When designing air handler solutions with the EKEQFCBAV3-US, it is possible to utilize a modified selection process in order to allow for an extended range of on-coil air temperatures. Refer to section 4. Coil Design and Selection for the nominal on-coil selection conditions to be used for selecting a coil for Extended Operation.



3. Control Box Types

3.2.5. Piping Limitations

Refer to **Table 6.3** for piping length limitations for EKEQFCBAV3-US.

3.2.6. EKEQFCBAV3-US Terminal Block I/Os

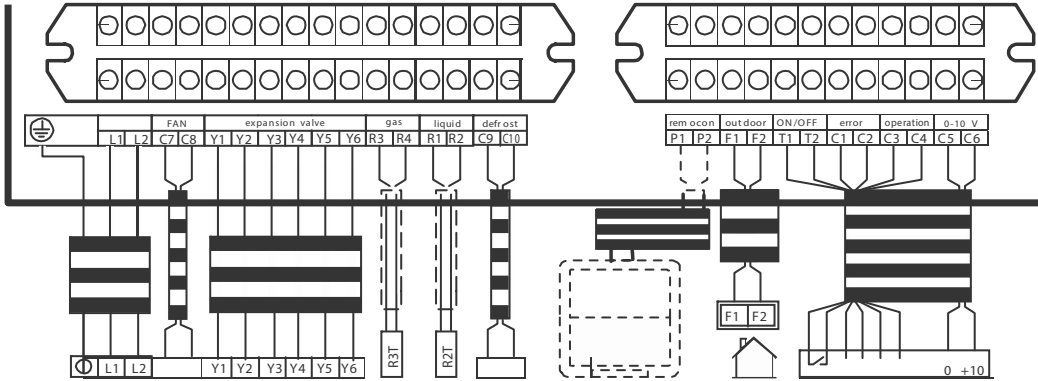


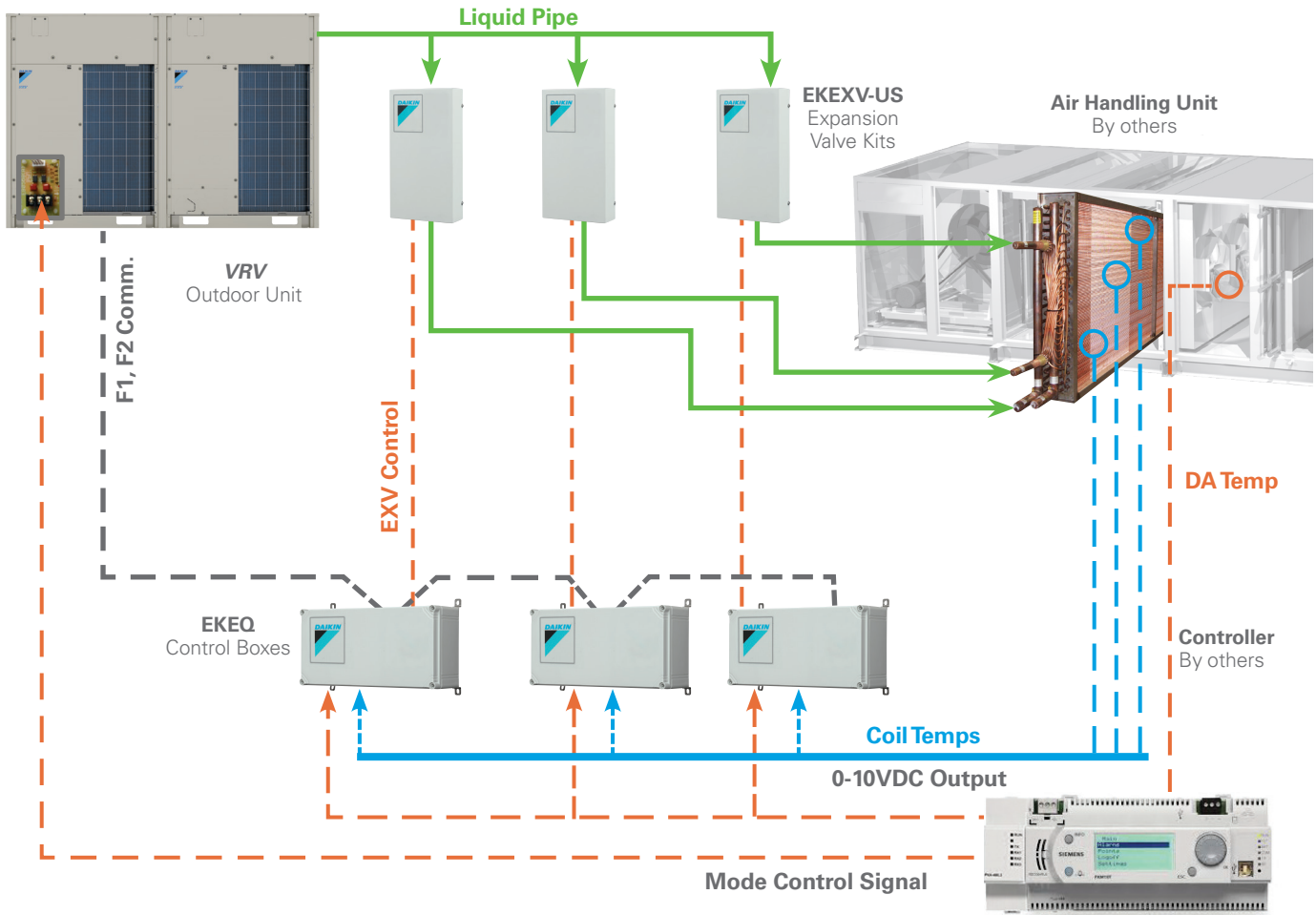
Figure 3.7

Table 3.3: Cable Connections

	Description	Connect to	AWG/Cross section*	Maximum length feet (m)	Specifications
L1, L2	Power supply	Power supply	AWG 12 0.01"	–	Power supply 230 V 1-60Hz
Y1 ~ Y6 (†)	Expansion valve connection	Expansion valve kit	AWG 18 0.03"	65 (20)	Digital output 12 V DC
R1, R2	Thermistor R2T (liquid pipe)	–		Standard: 8 (2.5) Max.: 65 (20)	Analog input 16 V DC
R3, R4	Thermistor R3T (gas pipe)				
P1, P2	Remote controller (optional)	Outdoor unit		328 (100)	Communication line 16 V DC
F1, F2	Communication to outdoor unit	Controller field supply		(‡)	Digital input 16 V DC
T1, T2	ON/OFF				Digital output: voltage free. Maximum 230 V, maximum 0.5A
C1, C2	Error signal				Analog input 0-10V
C3, C4	Operation signal (#)	Air handler unit fan field supply	AWG 12 0.01"	–	Digital output: voltage free. Maximum 230 V, maximum 2 A
C5, C6	Capacity step (\$)				
C7, C8	Fan signal	Controller field supply	AWG 18 0.03"	(‡)	Digital output: voltage free. Maximum 230 V, maximum 2A
C9, C10	Defrost signal				

3. Control Box Types

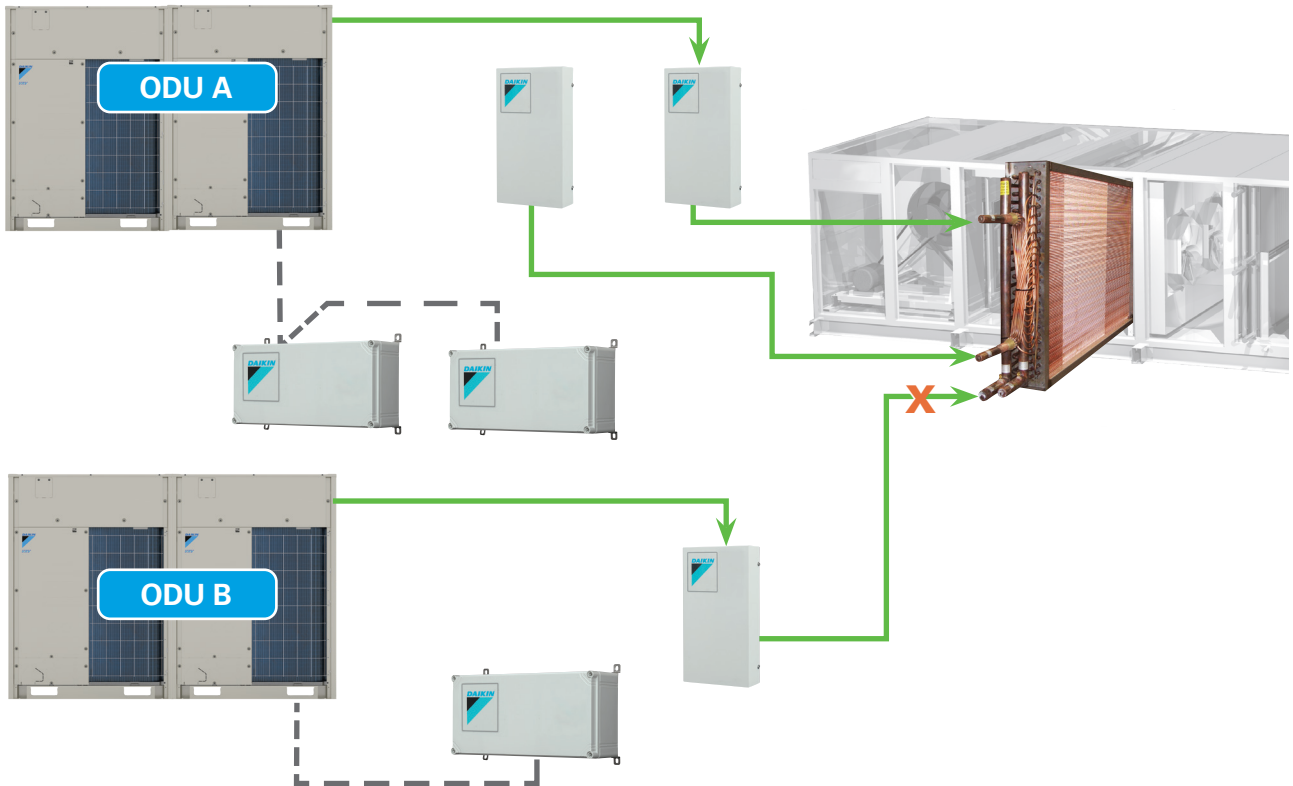
3.2.7. EKEQFCBAV3-US Layout Example



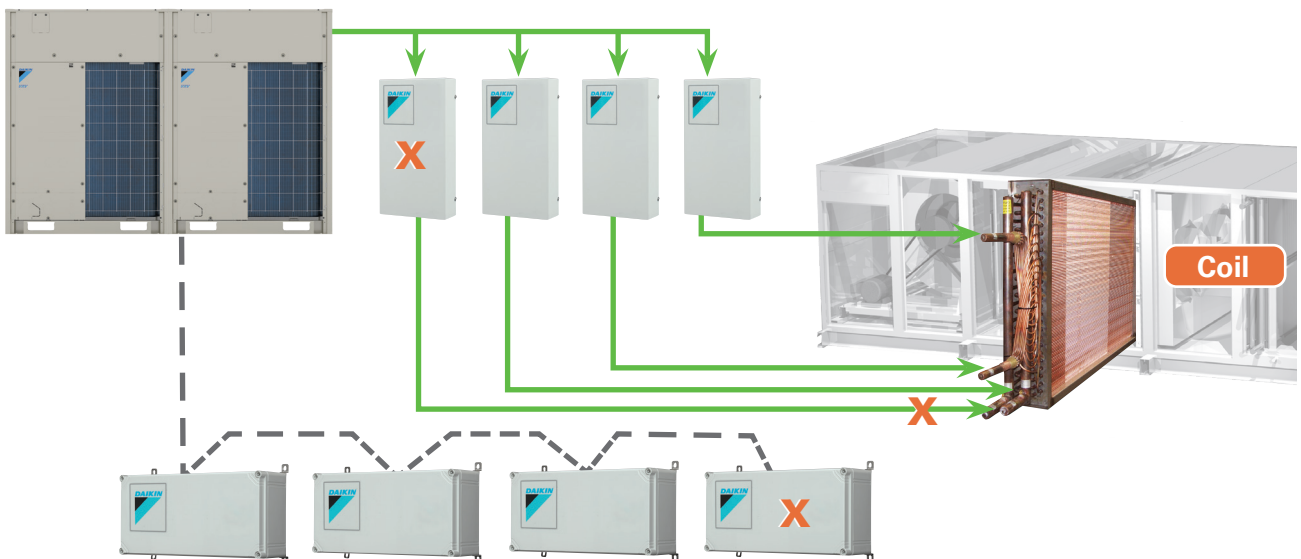
3. Control Box Types

3.2.8. EKEQFCBAV3-US - Applications to Avoid ❌

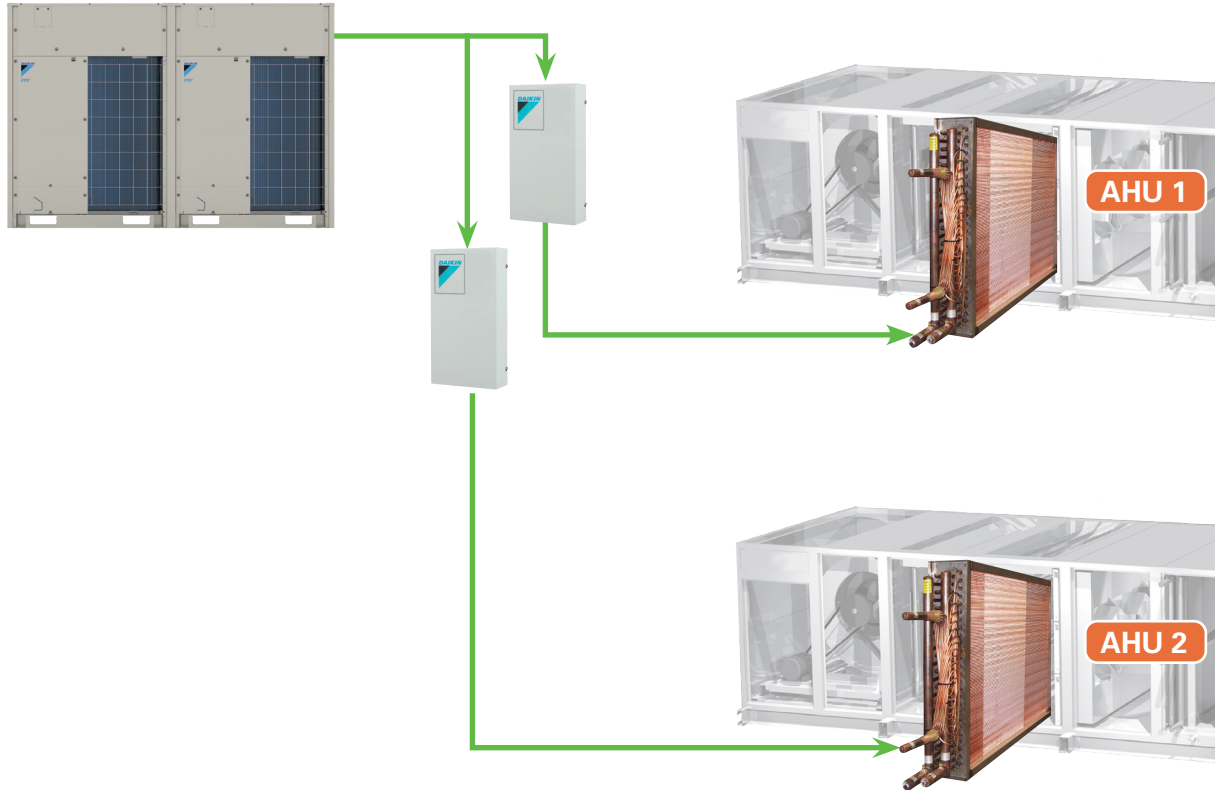
❌ ODU A connected to circuit 1 and 2 of coil A. ODU B connected to circuit 3 of coil A.



❌ More than 3 control boxes connected to same coil



Single ODU connected to multiple AHUs



4. AHU Coil and EEV Selection



4. AHU Coil and EEV Selection

The selection process for the coil and electronic expansion valve kit is outlined in figure 4.1.

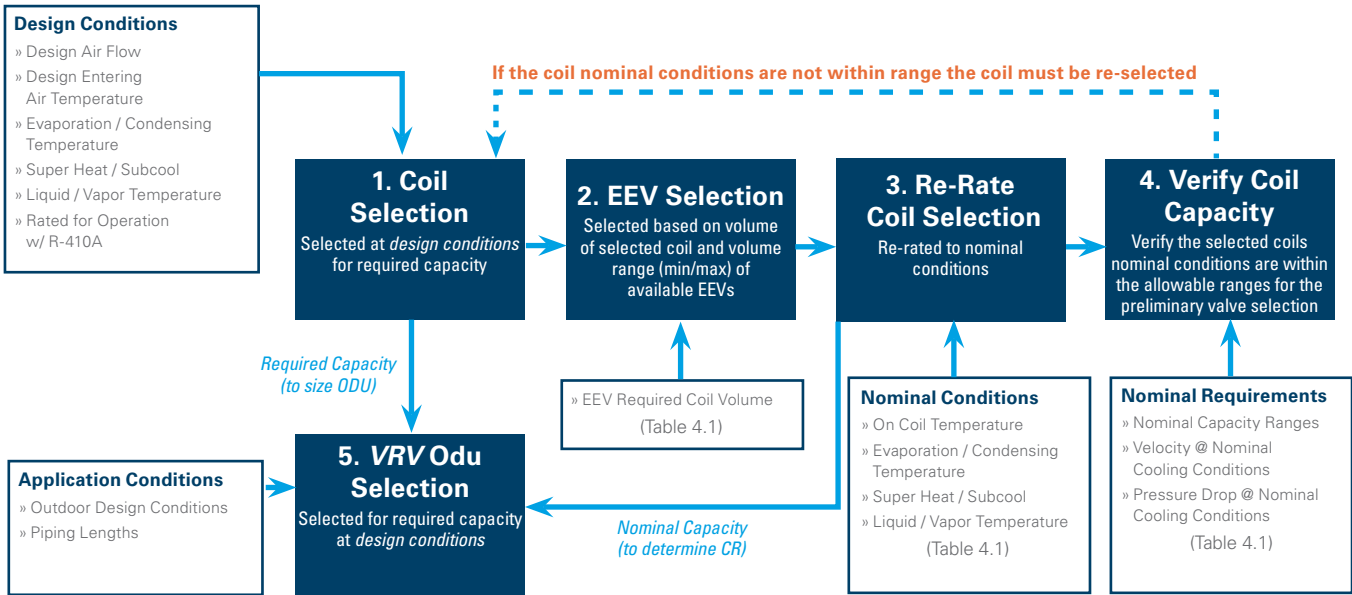


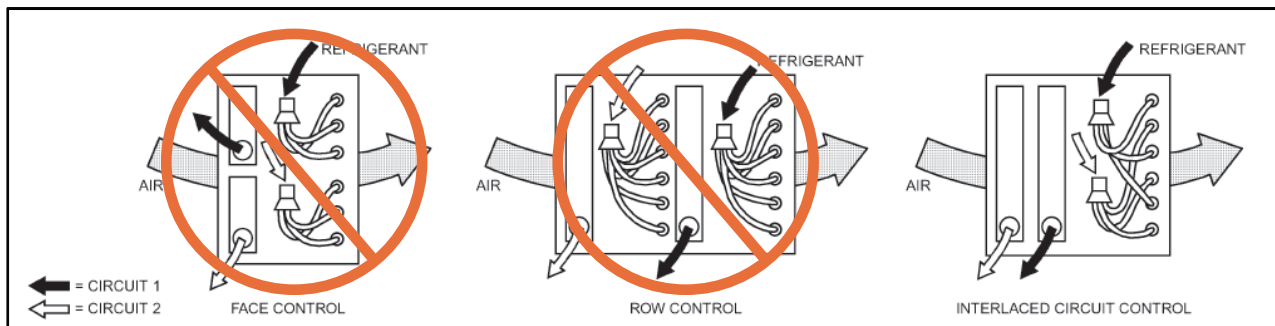
Figure 4.1 (Coil and EEV Selection Flow)

The selection processes can be broken down into the following steps:

Step 1: Coil Selection

Apply the application design conditions to size the coil to deliver the required design capacity. Ensure that the coil is selected in accordance with the coil properties and refrigerant conditions outlined in table 4.1. Sizing can be done based on cooling or heating requirements, whichever is larger.

Coils larger than 16 ton should be designed such that the coils are interlaced, and each coil is controlled by a separate AHU integration kit. Each circuit should perceive the same on-coil air conditions, and each circuit must start and end with the same refrigerant conditions and must have the same pipe diameter.



4. AHU Coil and EEV Selection

Step 2: EEV Selection

Apply the coil volume of the coil selected in step 1 to the coil volume ranges in table 4.1 to select the appropriate size valve.

Step 3: Re-Rate Coil Selection to Nominal Conditions

Re-rate the coil selected in step 1 back to the nominal on coil air temperatures and refrigerant temperatures found in table 4.1. Daikin does not define a specific requirement for the airflow rate over the coil at the nominal design conditions. Meaning when re-rating the coil the airflow will remain unchanged from the design airflow used in step 1.

If the on-coil temperature falls outside of the standard on coil temperature range, listed in section 3.2.3., the extended range nominal on coil temperatures must be used for re-rating the coil.

Step 4: Verify Nominal Conditions

Verify the capacity, refrigerant velocity, and refrigerant pressure drop, at the re-rated nominal conditions, are within the nominal ranges listed in table 4.1. If not, return to step 1 and re-select the coil.

Table 4.1

Coil Selection Parameters													
Valve Model			EKEXV50-US	EKEXV63-US	EKEXV80-US	EKEXV100-US	EKEXV125-US	EKEXV140-US	EKEXV200-US	EKEXV250-US	EKEXV400-US	EKEXV500-US	
Nominal Capacity (MBh)			18	24	30	36	48	60	72	96	144	192	
Allowed Nominal Capacity Range (Btu/hr)	Cooling	Min	17000	21,500	27,000	34,000	42,500	53,000	60,500	84,500	105,000	170,000	
		Standard	19200	24,300	30,800	38,300	47,800	54,600	76,500	95,600	153,600	191,300	
		Max	21000	26,500	34,500	42,000	52,500	60,000	84,000	105,000	169,000	210,000	
	Heating	Min	19000	24,200	30,500	38,500	47,500	59,500	68,000	95,000	118,500	188,000	
		Standard*	21500	27,300	34,200	42,700	54,600	61,500	85,300	107,500	170,800	215,200	
		Max	24000	30,000	38,000	47,000	59,000	67,500	94,500	118,500	187,500	236,500	
Required Coil Properties	Volume Range (in3)**		Min	46	102	128	162	202	253	283	404	566	808
			Max	101	127	127	201	251	282	403	503	806	1006
	Tube Size		3/8" or smaller										
	Refrigerant		R-410A										
Rated Operating Pressure		478 psi (3.3 MPa)											
Nominal Cooling Selection Conditions [95°F (35°C) Ambient]	On Coil Temperature, db/wb		81°F / 66°F (27°C / 19°C)										
	Extended On Coil Temperature, db/wb		91°F / 82°F (32.7°C / 27.7°C)										
	Minimum Coil Refrigerant Velocity		1000 feet per minute										
	Maximum Pressure Drop (Coil / Distributor)		10 psi / 31 psi										
	Evaporation Temperature***		43°F (6°C)										
	Evaporation Superheat		9°F (5°C)										
	Liquid Temperature		77°F (25°C)										
	On Coil Temperature, db		68°F (20°C)										
Nominal Heating Selection Conditions [47°F (8°C) Ambient]	Extended On Coil Temperature, db		32°F (0°C)										
	Condensing Temperature***		115°F (46°C)										
	Condenser Subcool		5.4°F (3°C)										
	Vapor Temperature		140°F (60°C)										
	Airflow Range from Nominal		70% - 100% (80% - 110% for extended range W-Control)										

**Applications with <50% VRV IDUs CR require a coil nominal heating capacity ≥ Standard Nominal Heating Capacity of the valve or a minimum 90% total CR.

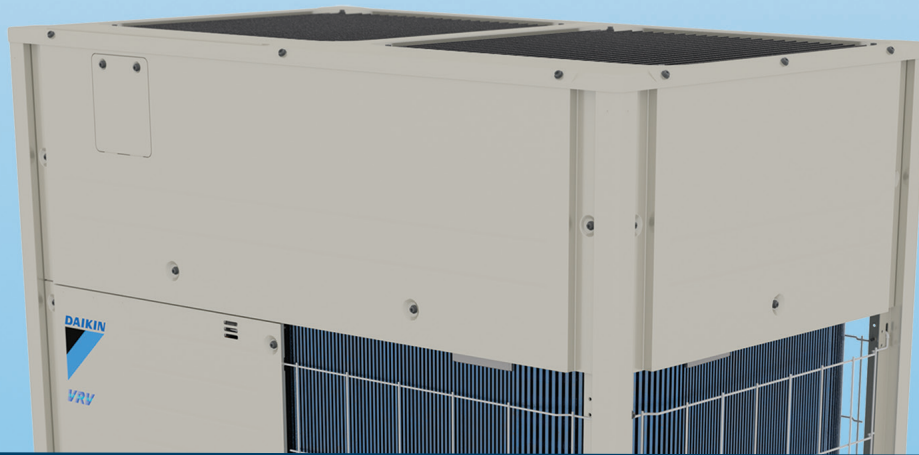
** Coil volume ranges do not include the volume of the distributor and header

***Te and Tc will vary for W-control application with >165 ODU to IDU equivalent length. See system layout for complete details.

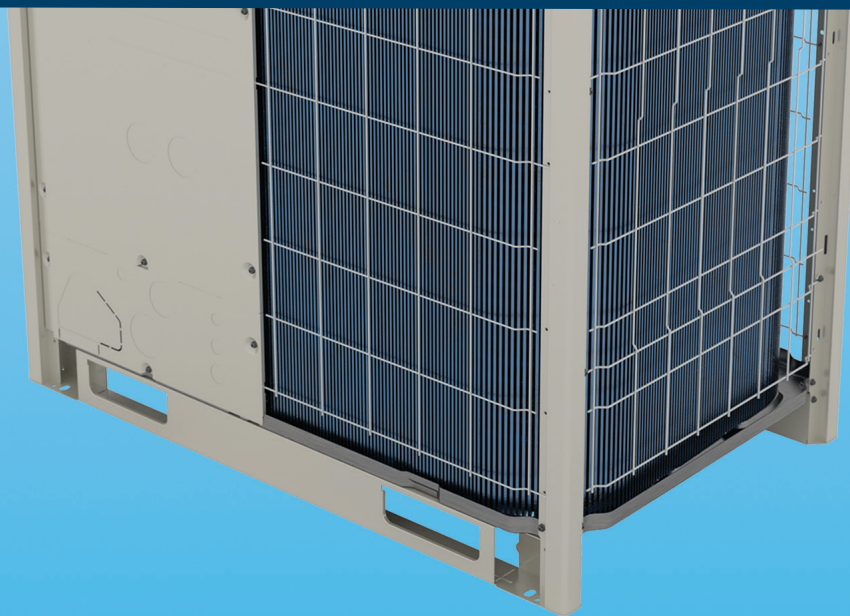
Step 5: VRV ODU Selection

Select the "AHU" in WebXpress and attach this AHU to the associated ODU. Both the required capacity and the nominal rating of the valve are needed for selection of the VRV ODU. The required capacity at design conditions is used to size the ODU while the nominal rating is used to validate connection ratio constraints.





5. VRV System Connection Ratio



5. VRV System Connection Ratio

The AHU operates in conjunction with the outdoor unit and may operate alongside other VRV indoor units (when using the EKEQMCBAV3-US). It is necessary to determine the capacity index of the AHU coil in order to determine the overall VRV system connection ratio. Therefore, determine the capacity of the AHU at nominal cooling or heating conditions.

Note: The capacity correction factor and connection index are automatically calculated in WebXpress.

Capacity Correction Factor:

$$\text{Capacity Correction Factor} = \frac{\text{Capacity of AHU at Nominal Selection Conditions}}{\text{Standard Capacity of EKEXV}}$$

Capacity Index:

$$\text{Capacity Index} = \text{EEV Capacity Index} \times \text{Capacity Correction Factor}$$

The derived capacity index should be used to determine the overall system connection ratio. Refer to section 8. Selection Quick Reference Summary for the allowable VRV system connection ratio for various EKEQ application types.

Example Calculations

An AHU coil selection is made, resulting in a cooling capacity of 100,000 Btu/h at the nominal cooling selection conditions. The internal volume of the selected coil is 500 in³.

✓ 100,000 Btu/h falls within the cooling capacity range for EKEXV250-US

✓ 500 in³ falls within the allowable heat exchanger volume for EKEXV250-US

The capacity correction factor can be calculated using the formula provided above:

The standard cooling capacity for EKEXV250-US is 95,600 Btu/h

$$\text{Capacity Correction Factor} = \frac{\text{Actual Capacity of AHU}}{\text{Standard Capacity of EKEXV}} = \frac{100,000}{95,600} = 1.04$$

$$\text{Resulting capacity index} = 96 \times 1.04 = \mathbf{99.8}$$

This capacity index should be used to calculate the total connected capacity index and connection ratio of the VRV system.

6. VRF System Layout



6. VRV System Layout

Combine the EKEQMCBAV3-US and EKEQFCBAV3-US with the appropriate VRV system as indicated in the following table.

Table 6.1 - VRV System Compatibility

VRV System			AHU Integration Kit Type	
VRV System Type	Type	Series	EKEQMCBAV3-US Z-Control	EKEQFCBAV3-US W-Control
Air-Cooled all voltages (3-Phase)	Heat Pump	RXYQ_PB		
		RXYQ_T*	√	√
		RXLQ_T*	√	√
		RXYQ_X*	√	√
	Heat Recovery	REYQ_PB		
		REYQ_PC	√	
		REYQ_T*	√	
		RELO_T*	√	
Air-Cooled all voltages (1-Phase)	Heat Pump	RXYMQ_P		
		RXTQ_T*	√	√
Water-Cooled all voltages (3-Phase)	Heat Pump	RWEYQ_P		
		RWEYQ_PC	√	√
		RWEQT*	√	√
	Heat Recovery	RWEYQ_P	√	
		RWEYQ_PC	√	
		RWEQT*	√	

6. VRV System Layout

VRV System Piping Limits When Applying EKEQMCAV3-US

When applying EKEQMCAV3-US to a VRV system, the EKEQMCAV3-US is treated as a typical VRV indoor unit with respect to VRV system piping lengths.

Figure 6.1 - EKEQMCAV3-US on Heat Pump Systems

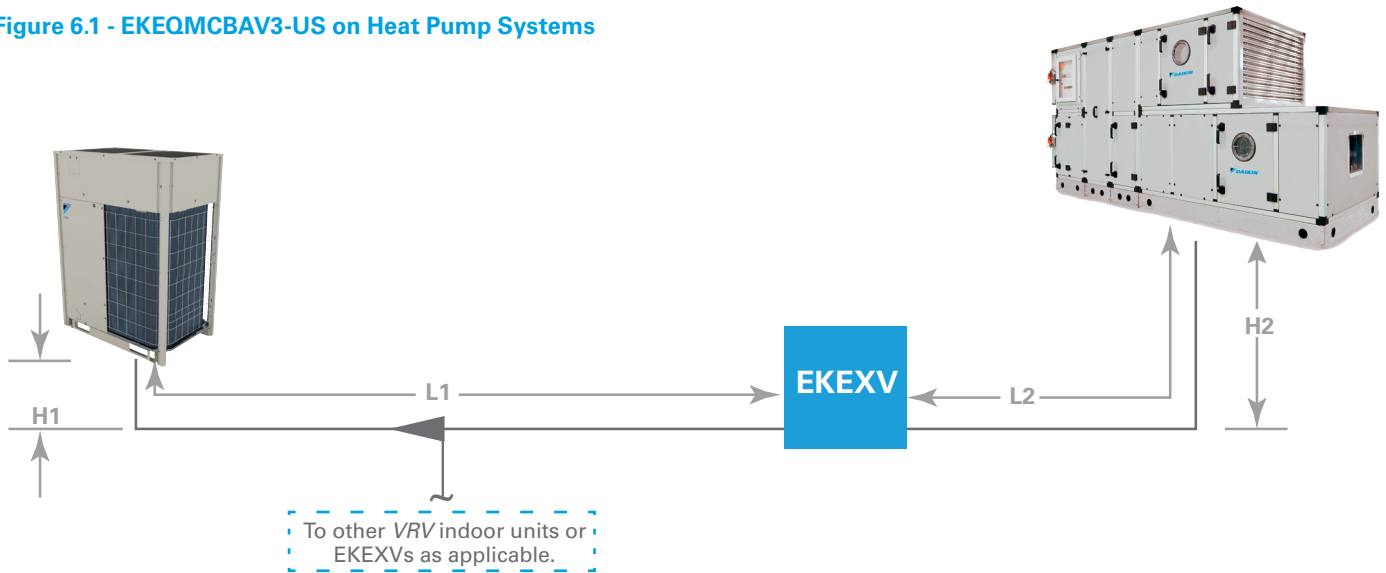


Figure 6.2 - EKEQMCAV3-US on Heat Recovery Systems

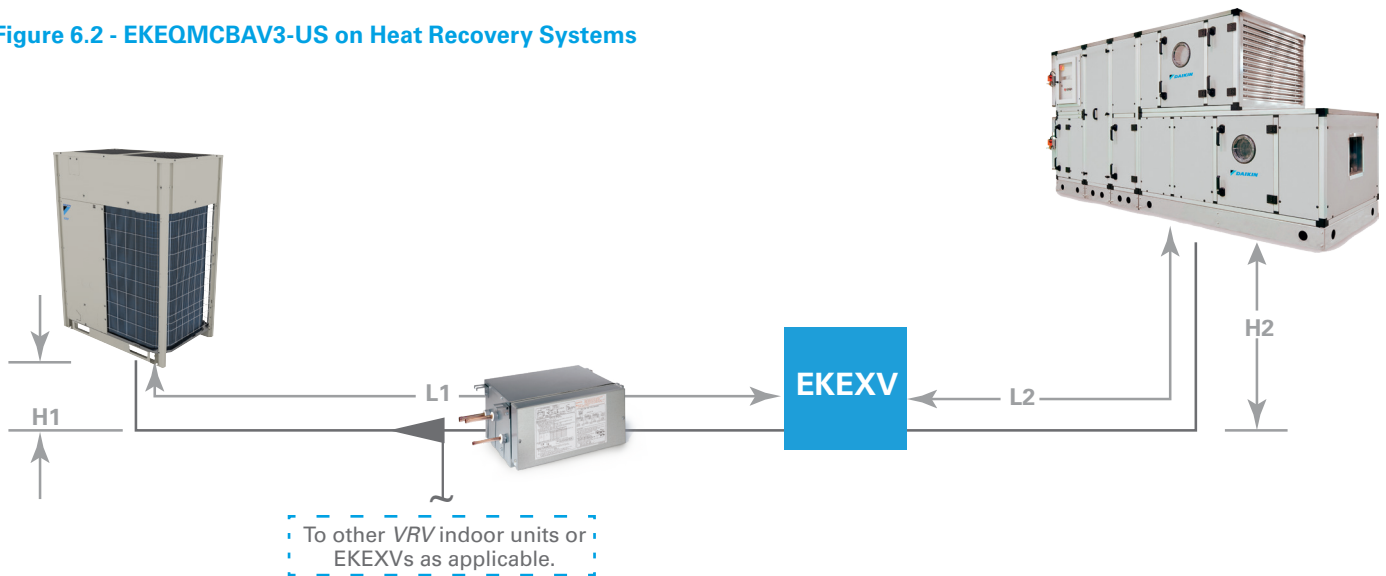


Table 6.2 - Piping Lengths for Z-Control

Item	Description	Piping Length Limit
L1	Maximum equivalent length from ODU to EEV	Refer to the VRV installation manual for the piping limitations of the applicable VRV system.
L2	Maximum equivalent length from EEV to AHU	16 ft. (5m)
H1	Maximum vertical separation from ODU to EEV	Refer to the VRV installation manual for the piping limitations of the applicable VRV system.
H2	Maximum vertical separation from EEV to AHU	+/- 16 ft. (5m)

6. VRV System Layout

VRV System Piping Limits When Applying EKEQFCBAV3-US

When applying EKEQFCBAV3-US to a VRV system, longer piping length runs can affect the actual refrigerant temperature at the coil and may impact the delivered coil capacity if not accounted for. Refer to Table 6.4 for additional details.

Figure 6.3 - EKEQFCBAV3-US on Heat Pump Systems

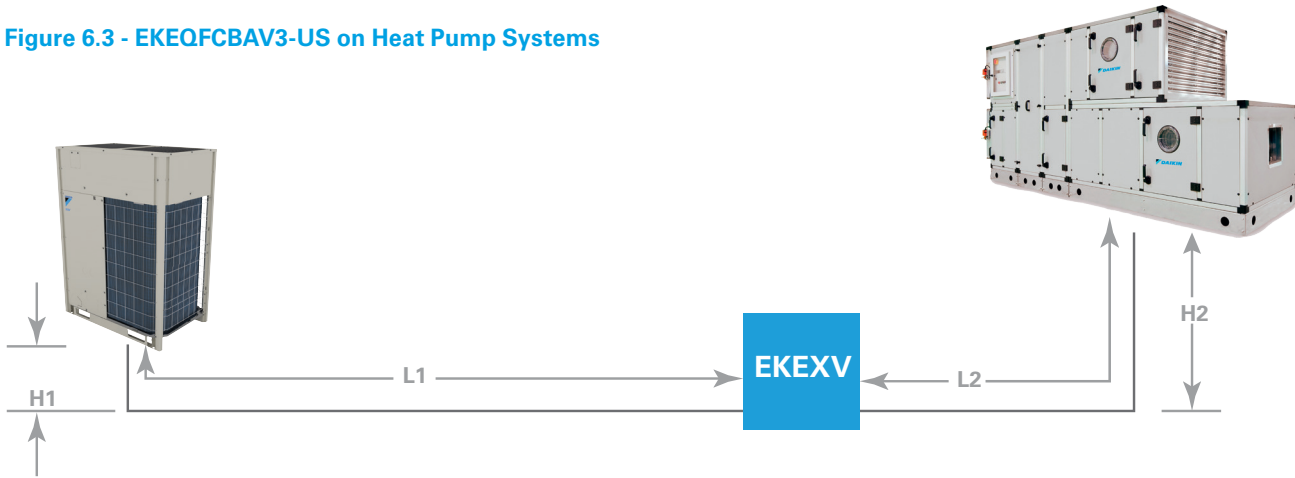


Table 6.3 - Piping Lengths for W-Control

Item	Description	Piping Length Limit
L1	Maximum equivalent length from ODU to EEV	360 ft. (110m)
L2	Maximum equivalent length from EEV to AHU	16 ft. (5m)
H1	Maximum vertical separation from ODU to EEV	295 ft. (90m)
H2	Maximum vertical separation from EEV to AHU	+/- 16 ft. (5m)

Table 6.4 - Capacity Correction for W-Control

W-Control Heat Exchanger Te/Tc for Extended Piping Lengths						
ODU to IDU Equivalent Length (ft)		0	165	230	295	360
Cooling: Heat Exchanger Te (°F)	Factory Default [21-1-01]	43	43	46	49	53
	W/ Field Setting [21-1-03]	39.4	39.4	42.4	45.4	49.4
Heating: Heat Exchanger Tc (°F)	Factory Default [21-2-01]	115	115	113	111	110
	W/ Field Setting [21-2-03]	118.6	118.6	116.6	114.6	113.6

Piping lengths greater than 165' will result in additional pressure drop that the ODU is not able to compensate for on W-control systems. This results in a higher Te at the coil in cooling and a lower Tc at the coil in heating. To avoid a capacity de-rate, this will need to be considered in the selection of the AHU coil. For these systems with ODU to IDU equivalent lengths exceeding 165' the coil will need to be selected at the modified refrigerant temperature to deliver the design capacity required.

As shown in table 6.4 a field setting can be applied to compensate for the effects of this additional pressure drop by offsetting the target Te/Tc that the ODU provides.

VRV System Additional Refrigerant Charge Calculation

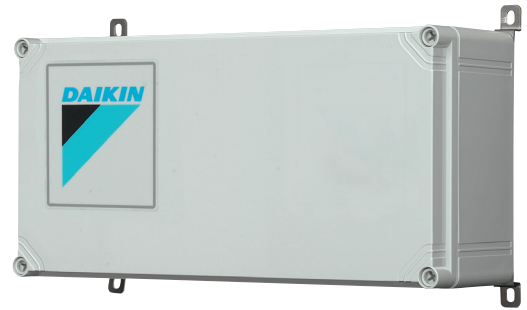
When applying either the EKEQMCAV3-US or EKEQFCBAV3-US Integration Kits to a VRV system, the standard additional charge calculation for the applicable VRV system should be followed. Because the coil selection criteria follows VRV coil design requirements, there is no need to account for additional charge for the AHU coil. Refer to the applicable VRV system installation manual for the additional charge calculation procedure.

7. Controls Integration and Field Settings

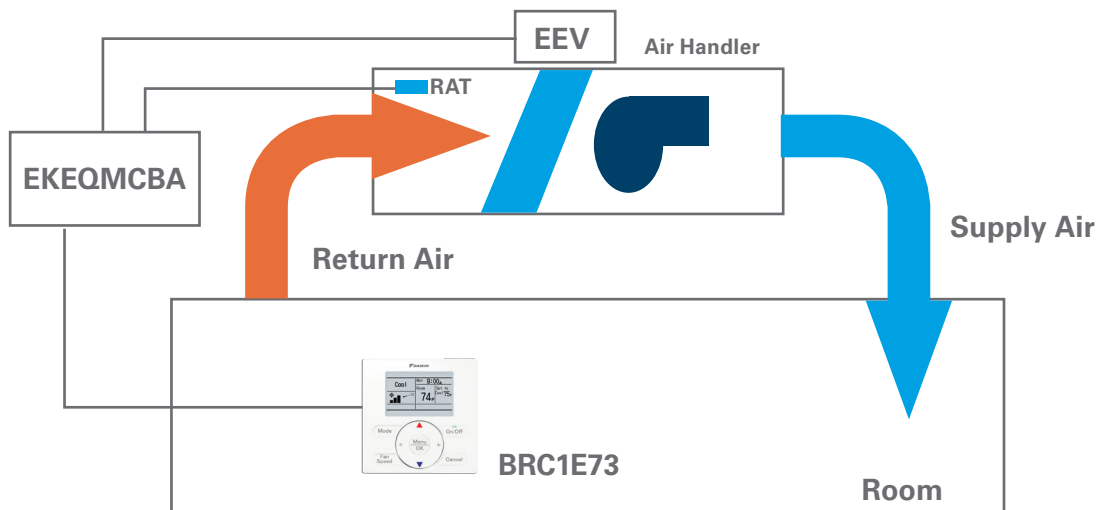


EKEQMCAV3-US (Z-Control) Controls

An Air Handler Unit (AHU) with EKEXV (EEV) kit and controlled by the EKEQMCAV3-US control box (Z-control), functions just like a VRF indoor unit. The set-point can be adjusted by the occupant using standard Daikin remote controllers (BRC1E73 or BRC2A71). There is no need for an external DDC controller, however the AHU can be controlled and monitored by a Building Management System (BMS). The required cooling capacity or the heating capacity is determined from the return air temperature and set-point on the Daikin controller.



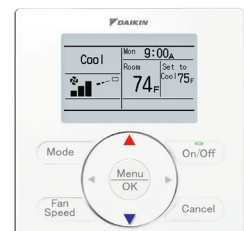
EKEQMCAV3-US Control box



RAT = Return Air Temperature sensor factory provided.

1. Navigation Controller (BRC1E73):

The *Navigation (NAV)* Controller (BRC1E73) is a local zone level controller for the AHU connected to the EKEQMCAV3-US control box. The *Navigation* Controller provides a simple user interface for the occupant to control the AHU. The local controller is connected to control box using the 2-wire P1-P2 communication network. The functions available using the *Navigation* Controller are mentioned below.



7. Controls Integration and Field Settings

Functions that are possible from the <i>Navigation Controller</i>	Functions that are NOT possible from the <i>Navigation Controller</i>
<ul style="list-style-type: none"> » Turn the unit ON or OFF » Adjust Set-points (Single and Dual) » View Room Temperature » Mode Change (Cool, Heat and Fan) » Auto Changeover » Set-point Range Limitation » Schedule » Setback » Off Timer » Field Settings » Button Lockouts » Configurable Display (Simple, Detailed, Standard) 	<ul style="list-style-type: none"> » Adjust Fan Speed. » Adjust Vane Position » Command Dry Mode » Command indoor unit's native Auto changeover logic.

2. *iTouch Manager (DCM601A71)*

The *iTouch Manager (iTM)* is a centralized controller for the Daikin VRV system. The *iTouch Manager* can monitor and control the AHU connected to an EKEQMCAV3-US control box by using the DIII-Net communication network. The functions that are available using the *iTM* are mentioned below.



Functions that are possible from the <i>iTouch Manager</i>	Functions that are NOT possible from the <i>iTouch Manager</i>
<ul style="list-style-type: none"> » Turn the unit ON or OFF » Adjust Set-points (Single and Dual) » View Room Temperature » Mode change (Cool, Heat and Fan) » Auto changeover (Individual, Fixed, Average, Vote) » Set-point Range Limitation » Schedule » Setback » Remote Control Prohibition » Interlock Programming 	<ul style="list-style-type: none"> » Adjust Fan Speed » Adjust Vane Position » Command Dry Mode » Command indoor unit's native Auto changeover Logic.

3. BACnet™ Interface (DMS502B71)

The Daikin *BACnet* Interface for use in *BACnet* networks, operates as a *BACnet* interpreter using the services defined by *BACnet* to return the status of the VRV indoor units and the AHU controller. When the EKEQMCAV3-US control box is used with the AHU, it can receive configuration commands via the control box, in response to requests from a *BACnet* Building Management System. The list of points available to control and monitor the EKEQMCAV3-US control box using the Daikin *BACnet* interface are mentioned below.



Indoor unit objects list								
Member Number	Command point name	Object name (XXX represents the indoor unit number calculated based on group address.)	Type	Unit				
				Inactive	Active	Text-3	Text-4	Text-5
				Text-1	Text-2			
1	On/Off (setting)	StartStopCommand_XXX	BO	On	Off			
2	On/Off (status)	StartStopStatus_XXX	BI	On	Off			
3	Alarm	Alarm_XXX	BI	Normal	Malfunction			
4	Malfunction code	MalfunctionCode_XXX	MI	Normal	Daikin specified			
5	Operation mode (setting)	AirConModeCommand_XXX	MO	Cool	Heat	Fan	Auto ¹	Dry ¹
6	Operation mode (status)	AirConModeStatus_XXX	MI	Cool	Heat	Fan	not used ¹	Dry ¹
7	Fan Speed (setting) ²	AirFlowRateCommand_XXX	MO	This point is not applicable to the current application				
8	Fan Speed (status) ²	AirFlowRateStatus_XXX	MI	This point is not applicable to the current application				
9	Measured room temperature	RoomTemp_XXX	AI	°C/°F				
10	Set-point ³	TempAdjust_XXX	AV	°C/°F				
11	Filter sign signal ⁴	FilterSign_XXX	BI	This point is not applicable to the current application				
12	Filter sign signal reset ⁴	FilterSignReset_XXX	BV	This point is not applicable to the current application				
13	Remote controller Permit/Prohibit (Or/Off)	RemoteControlStart_XXX	BV	Permit	Prohibit			
14	Remote controller Permit/Prohibit (Operation mode)	RemoteControlAirConModeSet_XXX	BV	Permit	Prohibit			
16	Remote controller Permit/Prohibit (Set-point)	RemoteControlTempAdjust_XXX	BV	Permit	Prohibit			
20	Communication status	CommunicationStatus_XXX	BI	Normal	Communication error			
22	Vane direction (setting)	AirDirectionCommand_XXX	AV	This point is not applicable to the current application				
23	Vane direction (status)	AirDirectionStatus_XXX	AI	This point is not applicable to the current application				
24	Forced Thermo-off(setting)	ForcedThermoOFFCommand_XXX	BO	Inactive	Active			
25	Forced Thermo-off (status)	ForcedThermoOFFStatus_XXX	BI	Inactive	Active			
26	Energy saving (setting)	EnergyEfficiencyCommand_XXX	BO	Inactive	Active			
27	Energy saving (status)	EnergyEfficiencyStatus_XXX	BI	Inactive	Active			
28	Thermo-on status	ThermoStatus_XXX	BI	Off	On			
29	Compressor status	CompressorStatus_XXX	BI	Off	On			
30	Indoor fan status	IndoorFanStatus_XXX	BI	Off	On			
31	Heater status	HeaterStatus_XXX	BI	Off	On			

Notes:

1. Auto mode and Dry mode selections are not available.
2. Fan speed setting command and Fan speed status are not valid for the Z-Control. All commands sent to these points will be ignored.
3. Set-point range is fixed to 60°F - 90°F. Commands sent out of this range will be corrected to the closest value.
4. Filter Sign and Filter Sign Reset command function have not been evaluated.

7. Controls Integration and Field Settings

4. iTouch Manager Server Gateway (DCM014A51)

The *intelligent Touch Manager* is now capable of serving as a BACnet™ interface for Building Management System (BMS) integration. The *iTM BACnet Server Gateway Option (DCM014A51)* provides a BMS with the ability to monitor and control the *VRV* indoor units via the *BACnet/IP* protocol. The list of points available to control and monitor the *EKFQMCBA* control box using the *iTouch Manager Server Gateway* are mentioned below.

Indoor unit objects list							
Instance No	Object Name	Type	Unit				
			Inactive	Active			
			Text-1	Text-2	Text-3	Text-4	Text-5
1	Occupancy Mode	MO	Unocc	Occ	Standby		
2	Unit On_Off Status	BI	Off	On			
3	Alarm Status	BI	Normal	Alarm			
4	Operation Mode	MV	Cool	Heat	Fan	Dry ¹	
5	Room Temperature	AI	°C/°F				
6	Occ Cooling Set-point	AV	°C/°F				
7	Occ Heating Set-point	AV	°C/°F				
8	Unocc Cooling Set-point	AV	°C/°F				
9	Unocc Heating Set-point	AV	°C/°F				
10	Max Cooling Set-point	AV	°C/°F				
11	Min Cooling Set-point	AV	°C/°F				
12	Max Heating Set-point	AV	°C/°F				
13	Min Heating Set-point	AV	°C/°F	Prohibit			
14	Min Set-point Differential (Cooling & Heating)	AV	°C/°F	Prohibit			
15	Cooling & Heating Set-point Tracking Mode	BV	Disable	Enable			
16	Fan Speed ²	MV	This point is not applicable to this application; Commands send to this point are ignored and autocorrect to position ¹				
17	Airflow Direction ³	MV	This point is not applicable to this application; Commands send to this point are ignored and autocorrect to position ¹				
18	Timed Override Operation	MV	BV	Disable	Enable		
19	Current Unit Operation	MV	MI	Off	Normal	Override	Setback
20	Remote Controller Prohibit (On_Off)	MV	Permit	Prohibit	Stop Only		
21	Remote Controller Prohibit (Set-point)	BV	Permit	Prohibit			
22	Remote Controller Prohibit (Set-point)	BV	Permit	Prohibit			
23	Filter Sign Status ⁴	BI	This point is not applicable to this application;				
24	Filter Sign Reset ⁴	BV	This point is not applicable to this application;				
25	Indoor Fan Status	BI	Off	On			
26	Communication Status	BI	Normal	Alarm			
27	Thermo-on Status	BI	Off	On			
28	Compressor Status	MI	Off	On	Defrost/ HotStart ⁵		
29	Aux Heater Status	BI	Off	On			
30	Forced Thermo-off	BV	Disable	Enable			
31	Changeover Option	BI	Not Available	Available			

Notes:

1. Dry mode function is not available; the command will be ignored.
2. Fan Speed setting is not available
3. Air Flow Direction is not available
4. Filter Sign and Filter Sign Reset command function have not been evaluated.
5. Defrost/Hot start status does not display for this unit.

5. Indoor unit Field Settings Table

Mode No.1	First Code No.	Description	Second Code No. (bold cells are factory default settings)			
			1	2	3	4
10(20)	2	Priority of thermistor sensors for space temperature control ²	The return air thermistor is primary, and the remote controller thermistor is secondary	Only the return air thermistor will be utilized	Only the remote controller thermistor will be utilized	–
	5	Room temperature value reported to multizone controllers	Return air thermistor	Thermistor designated by 10-2 above ²	–	–
	6	The remote controller thermistor is used in Remote Controller Group	No	Yes	–	–
	8	System Operation Mode	Heat – Pump	Cooling Only	Heating Only	
12(22)	0	Indoor unit Thermo-On/Off status	Thermo On/Off	Indoor unit Operation On/Off status	Indoor unit Alarm status	
	1	Indoor unit T1-T2 input	Forced Off Closed Contact-Indoor unit is forced off and Central Control icon is displayed. Unit cannot be turned on manually. Operation can be overridden by central control. Open Contact-Indoor unit can resume normal operation. Unit must be turned on manually or by central control.	On/Off Closed Contact-Indoor unit is turned on. Open Contact-Indoor unit is turned off. Unit responds to last command, i.e., unit can be turned on manually or by central control after circuit has opened. Operation is prohibited when remote controller On/Off control is restricted by a multi-zone controller.	External Protection Device Closed contact-Unit shall resume normal operation. Open contact-Unit shall shut down and generate an A0 error.	
	2	Thermo-On/Off deadband	2°F (1°C)	1°F (0.5°C)	–	–
	3	Fan Speed in Heating Thermo-Off	On	On	Off (Delayed Off)	–
	5	T1-T2 setting in case of power failure	T1-T2 must be open at power restore	After power failure, the status of T1/T2 must remain identical to the initial T1/T2 status prior to the power failure.		
	6	Fan Speed in Cooling Thermo-Off	On	On	Off (Immediate Off)	–
13(23)	8	Fan Speed heating defrost & oil return	Off	On	On	–
1b (NAV controller setting)	7	STANDBY icon ³	Not Displayed	Not Displayed		

Notes:

- Field settings are normally applied to the entire remote-control group, however, if individual indoor units in the remote-control group require specific settings or for confirmation that settings have been established, utilize the mode number in parenthesis.
- When mode 10-2-01 is selected, only the return air temperature value is reported to the multi-zone controller.
- This field setting has no effect.

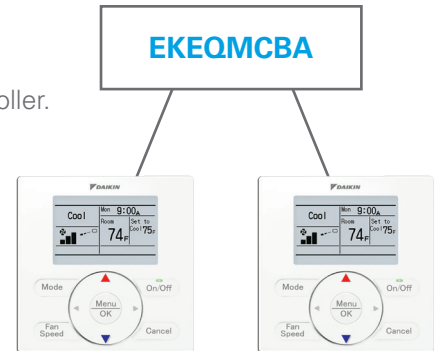
7. Controls Integration and Field Settings

6. Two Remote Controllers Connected to One Unit

Two remote controllers can be in control of a single Z-control indoor unit; the following menu functions are only available on the main remote controller.

- » Schedule
- » Off Timer
- » Setback

The on/off, set-point, and operation mode functions can be controlled by either the main or sub controller.



7. Remote Controller Group

Type	Description
	Remote controller grouping between two EEV kits is allowed.
	Remote controller between an EEV kit and a VRV indoor unit is not allowed because of conflicting field settings
	Remote controller group between an EEV kit and VAM (ERV) unit is allowed.

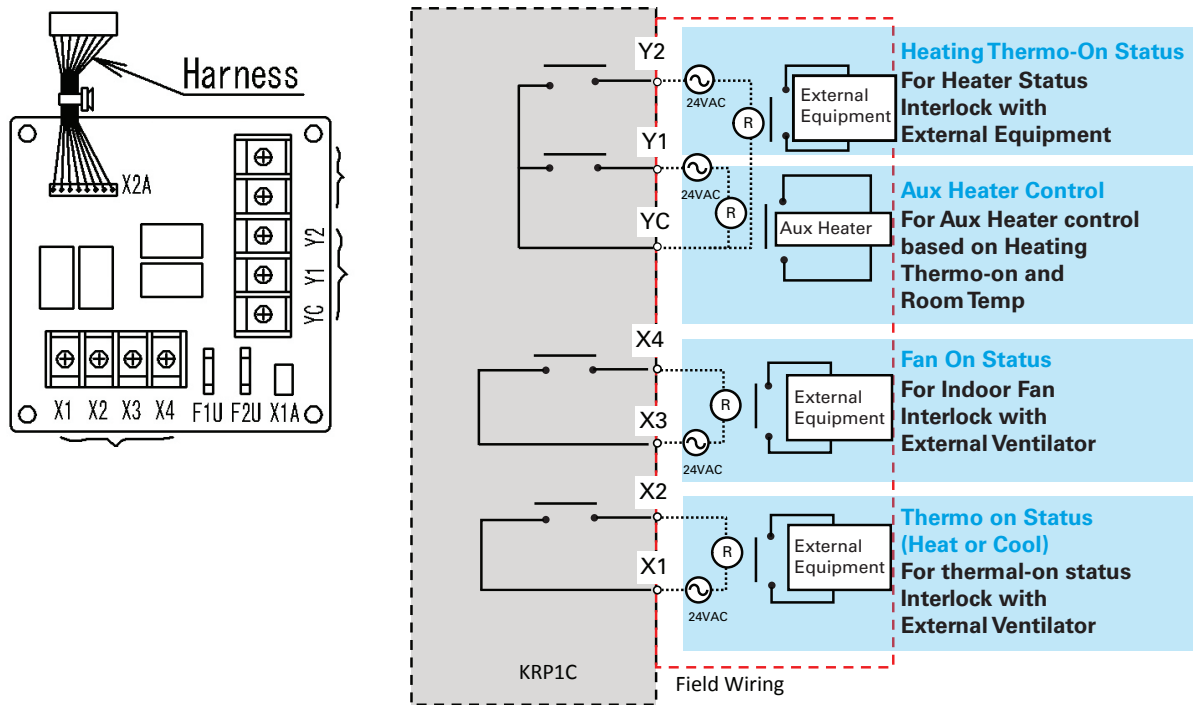
7. Controls Integration and Field Settings

8. Accessories

8.1 KRP1C74 Wiring Adapter

The KRP1C74 auxiliary contact board is wired to an EEV kit control box for control of external appliances such as an auxiliary heater or humidifier. The Adapter can be installed inside the EEV kit box by using suitable spacers. The KRP1C74 wiring adapter is used to interlock external equipment with an indoor unit. It can be applied to interlock external equipment with indoor unit's thermo-on status, fan on status, heating thermo-on status, or auxiliary heat output. Based on indoor unit's operation status, it provides dry contact closures through the following terminals:

Terminals	Output	Possible Application
X1-X2	Indoor unit thermo-on status (for both heating and cooling), indoor unit operation status, or indoor unit alarm status. Depending on indoor unit field setting 12(22) - 0, the X1-X2 output can be varied.	Interlock with External Ventilator, Error Detection
X3-X4	Indoor unit fan on Status	Interlock with External Ventilator
Y2-YC	Indoor unit heating thermo-on status (when the room calls for heating)	Interlock with Emergency Heat Source or Humidifier
Y1-YC	Auxiliary heater control based on heating thermo-on status, room temperature and set-point	Auxiliary Heater Control

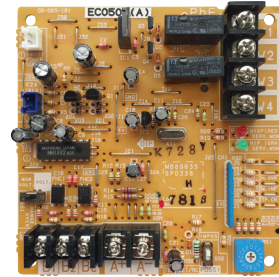


The EEV kit provides fixed Ton (Temperature On) and Toff (Temperature Off) setting for the control of an auxiliary heater (field provided refer type A logic). For more information about the KRP1C74 wiring adapter's operation refer to the installation manual. The adapter wires to the X16A connector on the control box's PCB.

7. Controls Integration and Field Settings

8.2 KRP4A71 Group Control Adapter

This adaptor is applied to individual VRV indoor unit remote control groups to facilitate start/stop control and set-point adjustment for remote controller groups from a BMS. The BMS can also monitor contact closure outputs for operation and malfunction status. The KRP4A71 is a low-cost alternative to traditional energy management integration for small projects with simple control requirements.



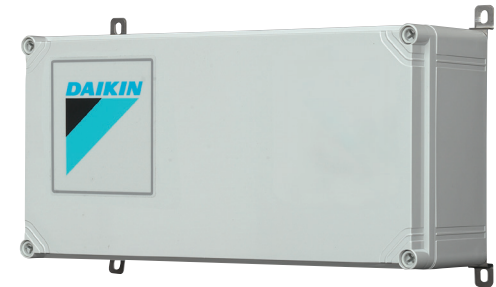
8.3 KRCS01-1B/4B Optional Remote Temperature Sensor

If the application requires remote sensing of the room temperature away from the air handler, this low-cost wall mountable remote sensor can be used to sense temperature in the space. Both KRCS01-1B/4B can be used with the EEV kit. To wire the sensor, cut the connector on the sensor and wire it to the R5-R6 terminal.

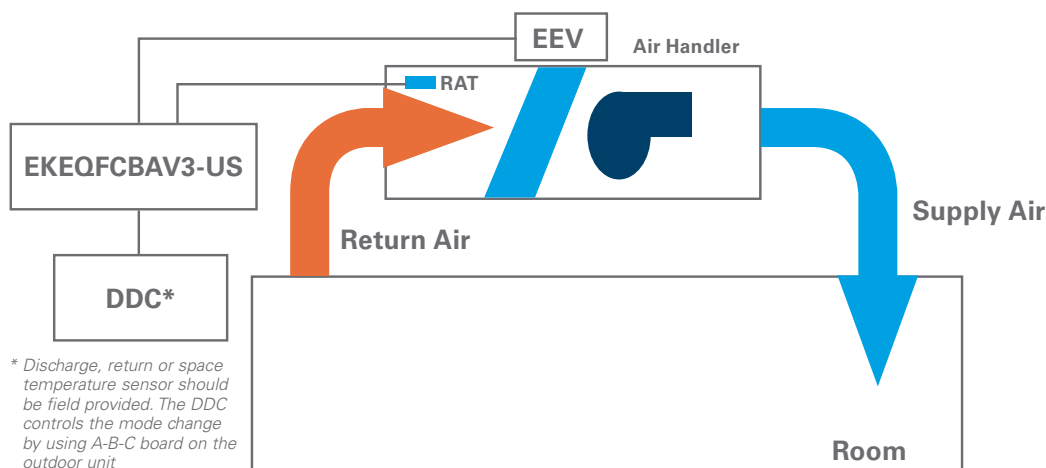


EKEQFCBAV3-US (W-Control) Controls

An Air Handler Unit (AHU) with EKEQ (EEV) kit controlled by the EKEQFCBAV3-US control box (W-control), allows the unit to be controlled by a DDC (Direct Digital Controller). The DDC will control a unit by sending a 0-10VDC signal that is proportional to the difference between the set-point and return/discharge temperature. The 0-10VDC signal is used to reset Te (Target evaporator temperature)/Tc (Target condensing temperatures) (See installation manual for voltage ranges and target values).

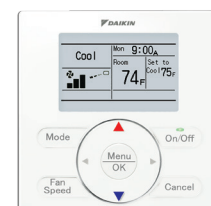


EKEQFCBAV3-US Control Box



Navigation Controller (BRC1E73):

The *Navigation* Controller (BRC1E73) is a local zone level controller for the AHU connected to the EKEQFCBAV3-US control box. The local controller is connected to the control box using the 2-wire P1-P2 communication network. The *Navigation* controller offers limited functionality and should not be used as the main point of control. The main function of this controller in this application is to display error codes and perform field settings. The functions available using the *Navigation* Controller are mentioned in the tables on page 34.



7. Controls Integration and Field Settings

Functions that are possible from the <i>Navigation Controller</i>	Functions that are NOT possible from the <i>Navigation Controller</i>
<ul style="list-style-type: none"> » Turn the unit ON or OFF » View Room Temperature measured by the remote controller. (not used for control) » Mode Change (Cool, Heat and Fan) » Schedule¹ » Field settings » View Error Code 	<ul style="list-style-type: none"> » Adjust Fan Speed » Adjust Vane Position » Command Dry Mode » Command indoor unit's native Auto changeover logic. » Adjust Set-points (Single and Dual) » Set-point Range Limitation » Setback » Auto changeover

Notes:

1. Although schedule and off timer function are available from the *NAV* controller, do not use the function to avoid conflict with the DDC.

iTouch Manager (DCM601A71)

The *iTouch Manager (iTM)* is a centralized controller for the Daikin *VRV* system. The *iTouch Manager* can provide basic monitoring and control the AHU connected to EKEQFCBAV3-US control box by using the DIII-Net communication network. The *iTouch Manager* offers limited functionality and should not be used as the main point of control. The functions that are available using the *iTM* are mentioned below.



Functions that are possible from the <i>iTouch Manager</i>	Functions that are NOT possible from the <i>iTouch Manager</i>
<ul style="list-style-type: none"> » Turn the unit ON or OFF » Mode change (Cool, Heat and Fan) » Schedule¹ » RC Prohibition » Interlock Programming » View Error Code 	<ul style="list-style-type: none"> » Adjust Fan Speed » Adjust Vane Position » Command Dry Mode » Command indoor unit's native Auto changeover Logic. » Adjust Set-points (Single and Dual) » Set-point Range Limitation » Setback » View Room Temperature » Auto Changeover

Notes:

1. Although schedule and off timer function are available from the *iTM*, do not use the function to avoid conflict with the DDC.

BACnet™ Interface (DMS502B71)

The Daikin *BACnet* Interface for use in *BACnet* networks, operates as a *BACnet* interpreter using the services defined by *BACnet* to return the status of the *VRV* indoor units and the AHU controller. When the EKEQMFCBAV3-US control box is used with the AHU, it can receive configuration commands via the control box, in response to requests from a *BACnet* Building Management System. The list of points available to control and monitor the EKEQFCBAV3-US control box using the Daikin *BACnet* interface are mentioned below.



7. Controls Integration and Field Settings

Indoor unit objects list								
Member Number	Command point name	Object Name (XXX represents the indoor unit number.)	Object type	Unit				
				Inactive	Active			
				Text-1	Text-2	Text-3	Text-4	Text-5
1	On/Off (setting)	StartStopCommand_XXX	BO	On	Off	Standby		
2	On/Off (status)	StartStopStatus_XXX	BI	On	Off			
3	Alarm	Alarm_XXX	BI	Normal	Malfunction			
4	Malfunction code	MalfunctionCode_XXX	MI	Normal	Daikin specified			
5	Operation mode (setting)	AirConModeCommand_XXX	MO	Cool	Heat	Fan	Auto ¹	Dry ¹
6	Operation mode (status)	AirConModeStatus_XXX	MI	Cool	Heat	Fan	not used ¹	Dry ¹
7	Fan Speed (setting) ^{2,3}	AirFlowRateCommand_XXX	MO	This point is not applicable to the current application				
8	Fan Speed (status) ^{2,3}	AirFlowRateStatus_XXX	MI	This point is not applicable to the current application				
9	Measured room temperature ³	RoomTemp_XXX	AI	This point is not applicable to this application; Do not use.				
10	Set-point ³	TempAdjust_XXX	AV	This point is not applicable to this application; Do not use.				
11	Filter sign signal ^{3,4}	FilterSign_XXX	BI	This point is not applicable to the current application				
12	Filter sign signal reset ^{3,4}	FilterSignReset_XXX	BV	This point is not applicable to the current application				
13	Remote controller Permit/Prohibit (ON/Off)	RemoteControlStart_XXX	BV	This point is not applicable to this application; However, if the NAV controller is connected, the point can be used to prevent remote on/off command from the NAV controller.				
14	Remote controller Permit/Prohibit (Operation mode)	RemoteControlAirConModeSet_XXX	BV	This point is not applicable to this application; However, if the NAV controller is connected, the point can be used to prevent remote mode changes from the NAV controller.				
16	Remote controller Permit/Prohibit (Set-point)	RemoteControlTempAdjust_XXX	BV	This point is not applicable to this application; the set-point cannot be adjusted using the Navigation controller.				
20	Communication status	CommunicationStatus_XXX	BI	Normal	Communication error			
22	Vane direction (setting) ³	AirDirectionCommand_XXX	AV	This point is not applicable to the current application				
23	Vane direction (status) ³	AirDirectionStatus_XXX	AI	This point is not applicable to the current application				
24	Forced Thermo-off (setting)	ForcedThermoOFFCommand_XXX	BO	Inactive	Active	Normal	Override	Setback
25	Forced Thermo-off (status)	ForcedThermoOFFStatus_XXX	BI	Inactive	Active	Stop Only		
26	Energy saving (setting) ³	EnergyEfficiencyCommand_XXX	BO	This point is not applicable to this application; Do not use.				
27	Energy saving (status) ³	EnergyEfficiencyStatus_XXX	BI	This point is not applicable to this application; Do not use.				
28	Thermo-on status	ThermoStatus_XXX	BI	Off	On			
29	Compressor status	CompressorStatus_XXX	BI	Off	On			
30	Indoor fan status	IndoorFanStatus_XXX	BI	Off	On			
31	Heater status ³	HeaterStatus_XXX	BI	This point is not applicable to the current application				

Notes:

- Auto mode and Dry mode are not available.
- Fan speed setting command and Fan speed status are not valid for the W-Control, commands sent to this point will be ignored.
- These points do not offer any function for the W-control, do not use them during integration.
- Filter Sign and Filter sign reset command function have not been evaluated.
- The following 12 points from the BACnet™ gateway can be used with the W-Control:
 - StartStopCommand_XXX
 - StartStopStatus_XXX
 - Alarm_XXX
 - MalfunctionCode_XXX
 - AirConModeCommand_XXX
 - AirConModeStatus_XXX
 - CommunicationStatus_XXX
 - ForcedThermoOFFCommand_XXX
 - ForcedThermoOFFStatus_XXX
 - ThermoStatus_XXX
 - CompressorStatus_XXX
 - IndoorFanStatus_XXX

7. Controls Integration and Field Settings

iTouch Manager BACnet™ Server Gateway (DCM014A51)

The *intelligent Touch Manager* is now capable of serving as a *BACnet* interface for Building Management System (BMS) integration. The *iTM BACnet* Server Gateway Option (DCM014A51) provides the BMS with the ability to monitor and control the *VRV* indoor units via the *BACnet/IP* protocol. The list of points available to control and monitor the EKEQMFCBAV3-US control box using the *iTouch Manager BACnet* Server Gateway are mentioned below.

Indoor unit objects list						
Instance No.	Object Name	Type	Unit			
			Inactive	Active		
			Text-1	Text-2	Text-3	Text-4
1	Occupancy Mode	MO	Unocc	Occ	Standby (Do not Use) ⁷	
2	Unit On_Off Status	BI	Off	On		
3	Alarm Status	BI	Normal	Alarm		
4	Operation Mode	MV	Cool	Heat	Fan	Dry (Do not Use) ¹
5	Room Temperature ³	AI	This point is not applicable to this application; Do not use. This point's status flag will be set to 0100 and the reliability is set to "No sensor".			
6	Occ Cooling Set-point ³	AV	This point is not applicable to this application; Do not use.			
7	Occ Heating Set-point ³	AV	This point is not applicable to this application; Do not use.			
8	Unocc Cooling Set-point ³	AV	This point is not applicable to this application; Do not use.			
9	Unocc Heating Set-point ³	AV	This point is not applicable to this application; Do not use.			
10	Max Cooling Set-point ³	AV	This point is not applicable to this application; Do not use.			
11	Min Cooling Set-point ³	AV	This point is not applicable to this application; Do not use.			
12	Max Heating Set-point ³	AV	This point is not applicable to this application; Do not use.			
13	Min Heating Set-point ³	AV	This point is not applicable to this application; Do not use.			
14	Min Set-point Differential (Cooling & Heating) ³	AV	This point is not applicable to this application; Do not use.			
15	Cooling & Heating Set-point Tracking Mode ³	BV	This point is not applicable to this application; Do not use.			
16	Remote controller Permit/Prohibit (Set-point)	BV	This point is not applicable to this application; the set-point cannot be adjusted using the <i>Navigation</i> controller.			
17	Airflow Direction ³	MV	This point is not applicable to this application; Commands send to this point are ignored and autocorrect to position ¹			
18	Timed Override Operation ⁶	BV	Disable	Enable (Do not use) ⁷		
19	Current Unit Operation	MI	Off	Normal	Override	Setback (Not used) ⁵

7. Controls Integration and Field Settings

Indoor unit objects list						
Instance No.	Object Name	Type	Unit			
			Inactive	Active		
			Text-1	Text-2	Text-3	Text-4
20	Remote Controller Prohibit (On_Off)	MV	This point is not applicable to this application; However, if the NAV controller is connected, the point can be used to prevent remote on/off command from the NAV controller.			
21	Remote Controller Prohibit (Operation Mode)	BV	This point is not applicable to this application; However, if the NAV controller is connected, the point can be used to prevent remote mode changes from the NAV controller.			
22	Remote Controller Prohibit (Set-point) ³	BV	This point is not applicable to this application; The set-point cannot be adjusted from the NAV controller.			
23	Filter Sign Status ⁵	BI	This point is not applicable to this application;			
24	Filter Sign Status ⁵	BV	This point is not applicable to this application;			
25	Indoor Fan Status	BI	Off	On	Stop Only	
26	Communication Status	BI	Normal	Alarm		
27	Thermo-on Status	BI	Off	On		
28	Compressor Status	MI	Off	On	Defrost/Hot start	
29	Aux Heater Status ³	BI	This point is not applicable to this application;			
30	Forced Thermo-off	BV	Disable	Enable		
31	Changeover Option	BI	Not Available	Available		

Notes:

1. Dry mode is not available. The command is ignored.
2. Fan speed setting command and Fan speed status are not valid for the W-Control, commands sent to this point will be ignored.
3. These points do not offer any function for the W-control, do not use them during integration. Do not expose these points to BACnet™.
4. Setback operation must be programmed by a DDC for the AHU, the *ITM* does not provide setback function.
5. Filter Sign and Filter sign reset command function have not been evaluated.
6. The Timed Override Operation point has to set to be 'False' (i.e. Present Value =0) for AHU to operate based on DDC commands. Do not expose this point to the BMS to avoid confusion.
7. Standby mode is not supported for the W-control.
8. The following 12 points from the *ITM BACnet Server Gateway* can be used with the W-Control:
 - i. StartStopCommand_XXX
 - ii. StartStopStatus_XXX
 - iii. Alarm_XXX
 - iv. MalfunctionCode_XXX
 - v. AirConModeCommand_XXX
 - vi. AirConModeStatus_XXX
 - vii. CommunicationStatus_XXX
 - viii. ForcedThermoOFFCommand_XXX
 - ix. ForcedThermoOFFStatus_XXX
 - x. ThermoStatus_XXX
 - xi. CompressorStatus_XXX
 - xii. IndoorFanStatus_XXX

7. Controls Integration and Field Settings

Indoor unit Field Settings Table

Mode No. (Note 1)	First Code No.	Description	Second Code No. (bold cells are factory default settings)			
			1	2	3	4
10(20)	8	System Operation Mode	Heat – Pump	Cooling Only	Heating Only	
12(22)	1	Indoor unit T1-T2 input	Forced Off Closed Contact-Indoor unit is forced off and Central Control icon is displayed. Unit cannot be turned on manually. Operation can be overridden by central control. Open Contact-Indoor unit can resume normal operation. Unit must be turned on manually or by central control.	On/Off Closed Contact-Indoor unit is turned on. Open Contact-Indoor unit is turned off. Unit responds to last command, i.e., unit can be turned on manually or by central control after circuit has opened. Operation is prohibited when remote controller On/Off control is restricted by a multi-zone controller.	External Protection Device Closed contact-Unit shall resume normal operation. Open contact-Unit shall shut down and generate an A0 error.	
	3	Fan Speed in Heating Thermo-Off	On	On	Off (Delayed Off)	–
	5	T1-T2 setting in case of power failure	T1-T2 must be open at power restore	After power failure, the status of T1/T2 must remain identical to the initial T1/T2 status prior to the power failure.		
13(23)	0	Box Control Type1	X (Do not Use)	Y (Not Available)	W (Always set to W)	–
	6	Max delay in Hot Start in minutes.	0	1	3	5
	7	Min Tc Hot Start Heating (°C/°F)	34°C/93.2°F	37°C/98.6°	40°C/104°F	43°C/109.4°F
	8	Fan Speed heating defrost & oil return	Off	On	On	–
EKEQFCBC3			Settings			
Description		Code-Mode	01	02	03	04
Sampling Time (min)		21-0	1	3	5	
Target TC Correction		21-1	0	-1.8	-3.6	+1.8
Target TC Correction		21-2	0	+1.8	+3.6	-1.8

Notes:

1. Box control type has to be W-control while the unit is commissioned.

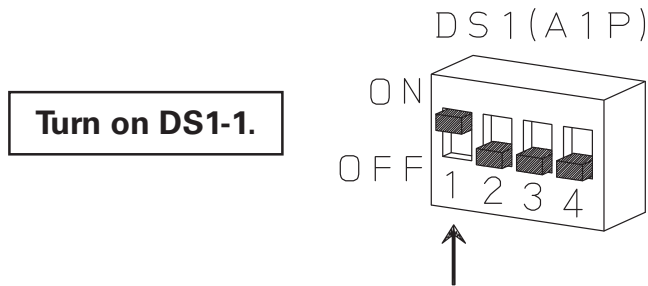
Important Notes

- Two remote controllers cannot be connected to one unit
- The EKEQFCBAV3-US boxes cannot be part of a remote controller group
- Although the KRP1C7x can be connected to the unit, it does not offer normal function. The external contact requirement should be handled by the DDC.
- During the cooling mode or the fan continues to operate regardless of thermo-on or thermo-off state
- To prevent coil freeze, provide safety mechanism such as flow switch with the help of DDC controller to prevent the unit from operating when the fan is not running.
- The 0-10VDC terminal is polarity sensitive, supplying wrong polarity will cause the unit to malfunction.

7. Controls Integration and Field Settings

Controlling Mode changes using A-B-C board.

The A-B-C terminals are standard on most VRV ODUs (optional on RWEQ_TA and RXTQ48-60TA) and can be used by a DDC controller to change the operation mode between heat, cool and fan. The A-B-C terminals are enabled by using the DS1-1 dip switch on the A1P board of the outdoor unit.



Notes

1. This setting is read by the outdoor unit PCB when the outdoor unit power is turned ON after the setting has been made. Be sure to make the setting before the power is turned ON.
2. This setting will not go into effect if there are any active errors in the system.

Operation Mode	Wiring
<p>Cooling Mode: If the A, B and C remain in a free-state (unconnected), the outdoor unit operation will be in cooling.</p>	
<p>Heating Mode: Shorting A and C contacts will set the outdoor unit operation mode to heating.</p>	
<p>Fan Mode: Shorting A, B & C will set the outdoor unit operation to Fan only mode. In this mode the outdoor unit will not provide cooling or heating function.</p>	

The maximum current flowing through the A-B-C terminals is 16VDC and 1A, the A-B-C terminals are not dry contacts. Do not supply external voltage to these contacts.

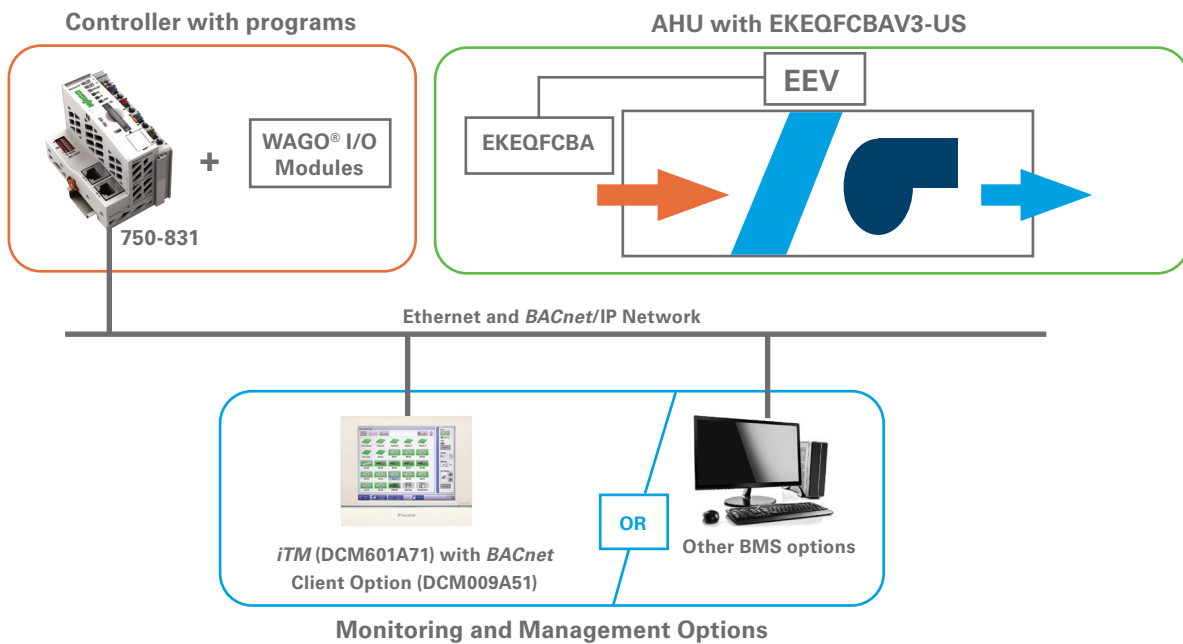
7. Controls Integration and Field Settings

Accessories

WAGO® 750-831 BACnet™/IP Controller

The WAGO BACnet/IP controller (Part number:750-831) is a programmable controller that can be used to control an AHU connected to an EKEFCBAV3-US. The controller is programmed by Daikin's VRV controls department as per the AHU configuration and the requested sequence of operation. For the application, the WAGO BACnet/IP controller is ordered with I/O modules, programming and 24VDC power supply.

Since the WAGO BACnet/IP Controller is BACnet/IP compatible, the AHU operation can be monitored by a BACnet compatible BMS or the iTM with BACnet Client Option.



In order to use the 750-831 controller for an application with EKEQFCBAV3-US, please contact the Daikin VRV controls department with your request.

8. Quick Reference Summary

8. Quick Reference Summary

EKEQ Model	EKEQMCBAV3-US			EKEQFCBAV3-US
Control Type	Z-Control			W-Control
	Return Air, Room Temperature			Discharge Air, Return Air
Control Input	BRC controller			0-10V from DDC
System Type	Heat Pump or Heat Recovery without VRF/IDU's	Heat Pump or Heat Recovery with VRF/IDU's		Heat Pump without VRF/IDU's
System Connection Ratio	90% ⁵ - 110%	50% - 110%		90% - 110%
Minimum VRF/IDU Connection Ratio	–	50% ⁴		–
Maximum EEV Kit Connection Ratio	110%	60% ⁴		110%
Standard Cooling On-Coil Air Temp Range	57°F WB - 77°F WB (14°C WB - 25°C WB)			Max. 95°F DB / 77°F WB (35°C / 25°C)
Standard Heating On-Coil Air Temp Range	(50°F DB) ³ 59°F DB - 80°F DB ((10°C DB) ³ 14°C DB - 25°C DB)			Min 50°F DB (10°C DB)
Extended Cooling On-Coil Air Temp Range	Extended on-coil air temperature ranges are intended only for EKEQFCBAV3-US			66°F DB - 106°F DB (18.8°C DB - 41.1°C DB)
Extended Heating On-Coil Air Temp Range	Extended on-coil air temperature ranges are intended only for EKEQFCBAV3-US			23°F DB - 59°F DB (-5°C DB - 15°C DB)
Maximum EKEQ/EKEXV Qty	See Note 1	See Note 1	See Note 1	(See Note 2)

Notes:

1. EKEQFCBAV3-US may only be used in Pair applications.
2. When mixing EKEQMCBAV3-US control boxes with other indoor units, the maximum number of control boxes is dictated by the standard indoor unit limitation of the selected outdoor unit. Each control box should be considered a single indoor unit.
3. 50°F for warm up operation
4. 50% VRF/IDU minimum requirement can be eliminated when the nominal heating capacity of all AHUs is greater than or equal to the standard nominal valve capacity
5. The minimum system CR can be brought down to 50% if all AHUs have a nominal heating capacity greater than or equal to the standard nominal heating capacity of the valve.

8. Quick Reference Summary

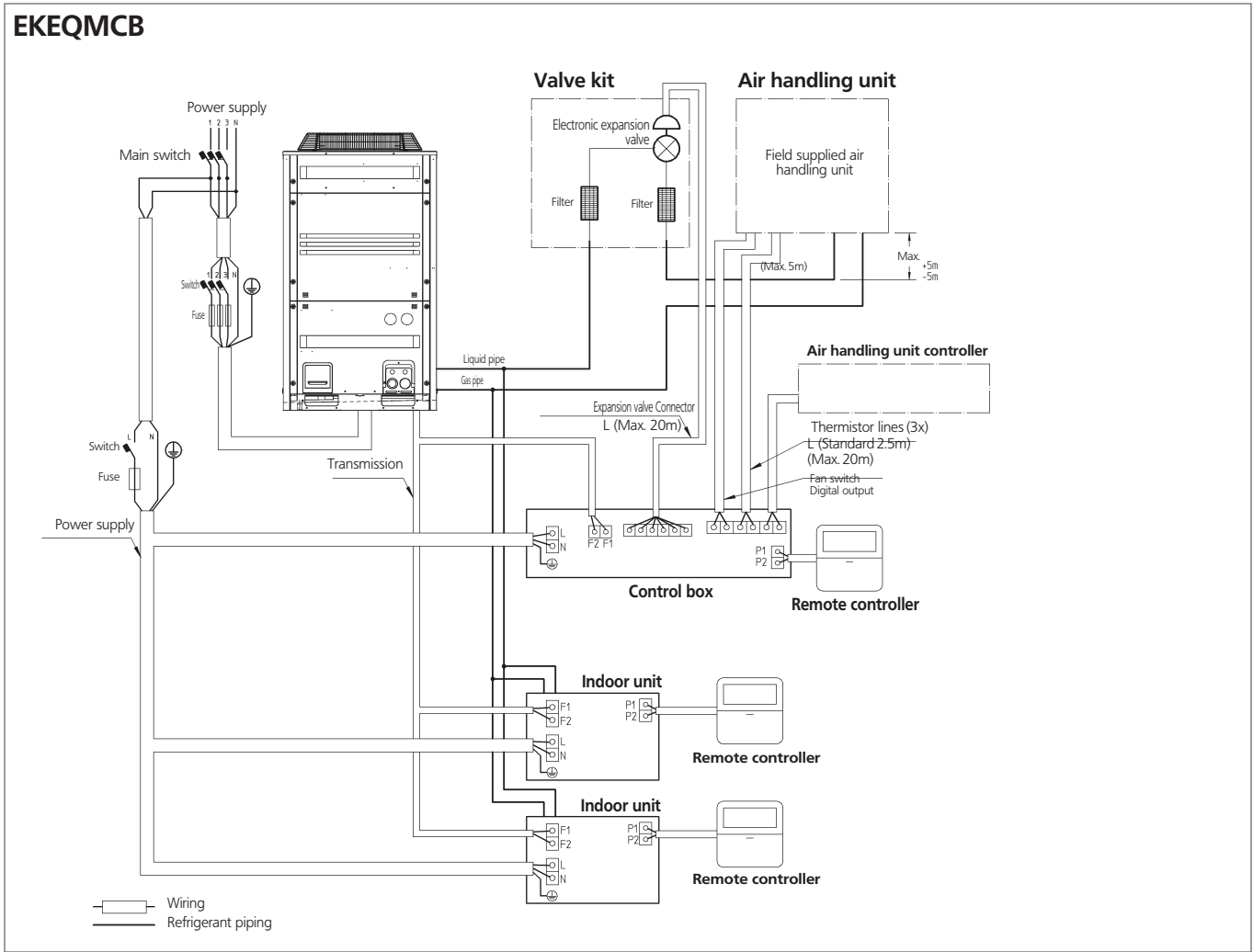


Figure 2: System Layout Using EKEQMCAV3-US

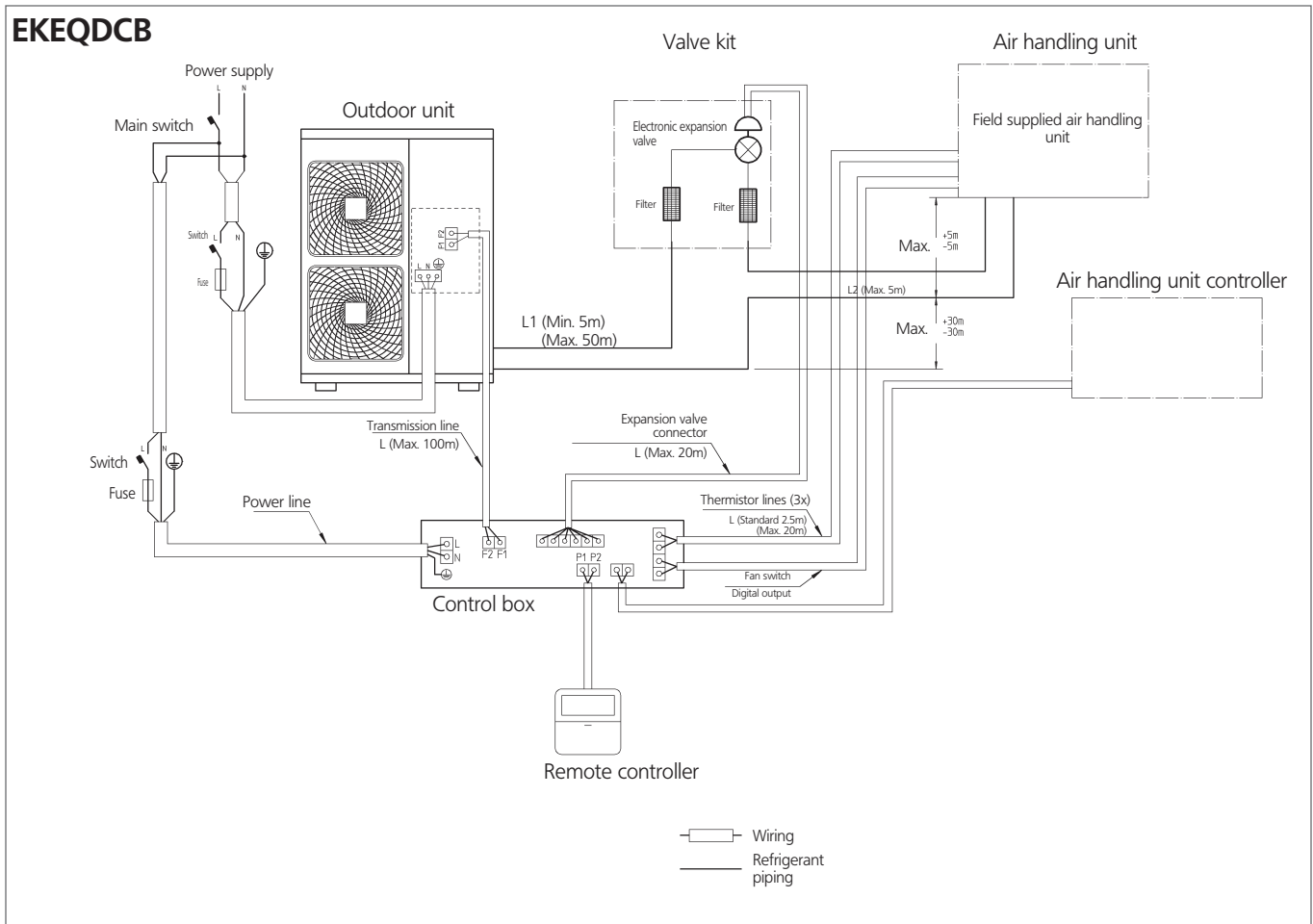
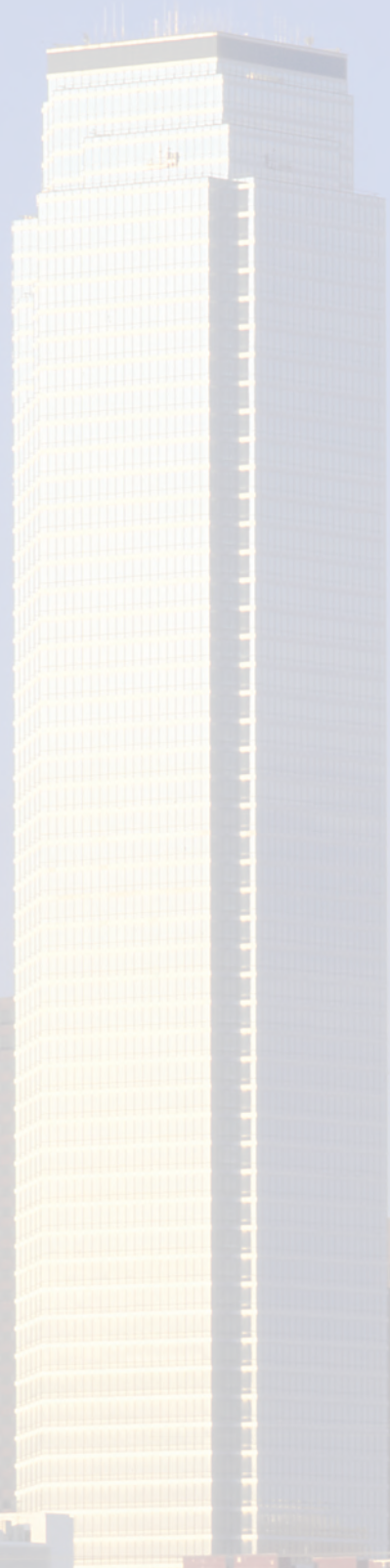


Figure 3: System Layout Using EKEQFCBAV3-US



5048
5049
5050
5051
5052
5053
5054
5055
5056
5057
5058
5059
5060
5061
5062
5063
5064
5065
5066
5067
5068
5069
5070
5071
5072
5073
5074
5075
5076
5077
5078
5079
5080
5081
5082
5083
5084
5085
5086
5087
5088
5089
5090
5091
5092
5093
5094
5095
5096
5097
5098
5099
5100

Daikin provides innovative, premium quality indoor climate management solutions to meet the changing needs of residential, commercial and industrial customers.



ADDITIONAL INFORMATION

Before purchasing this appliance, read important information about its estimated annual energy consumption, yearly operating cost, or energy efficiency rating that is available from your retailer.



Our continuing commitment to quality products may mean a change in specifications without notice.
© 2020 **DAIKIN NORTH AMERICA LLC** · Houston, Texas · USA · www.daikincomfort.com or www.daikinac.com

AHU_SELECTION 07-20