DAIKIN UNIVERSITY

Daikin SkyAir
RZR/RZQ
Key Points of Installation

Participant Guide

SkyAir Key Points

RZQ & RZR DIII-Net Systems with one-to-one and Unitary Ducted Application

DAIKIN

Residential Ductless Mini-split Systems

Key Points of the Installation Process

Daikin eQuip App

The Daikin eQuip App includes:

- Technical Specifications
- System Compatibility List
- Error Code Descriptions
- System Configuration Details (Field Settings, Emergency Settings, etc.)
- Thermistor Information
- Technical Documents (Installation and Operation Manuals, Submittal Data Sheets)

NOTE: Access to modules requires registration through the Daikin eQuip app (Wi-Fi or Cellular service required). Users will be designated a user type based on registration criteria and will have access to select modules and functions. Daikin University module is available to all users.

Daikin eQuip App Cont.

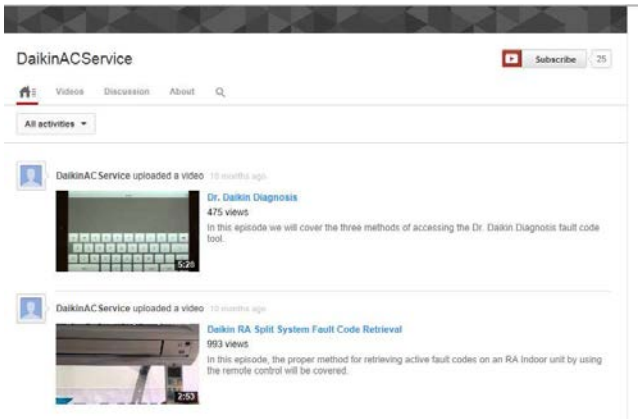
- Spare Parts Database
- Additional Refrigerant Calculations
- Marketing Materials (Product Brochures and Flyers)
- Daikin University Course Listings
- Unit of Measurement Converter
- General Information (News Updates, FAQ's, Dealer Directory, Daikin Key Department Contact Directory)

NOTE: Access to modules requires registration through the Daikin eQuip app (Wi-Fi or Cellular service required). Users will be designated a user type based on registration criteria and will have access to select modules and functions. Daikin University module is available to all users.

Troubleshooting Videos

"How to" troubleshooting videos are available on the Daikin AC YouTube Service channel

http://www.youtube.com/user/DaikinACService?feature=mhee



Dr. Daikin

Dr. Daikin

Diagnostic Tool

Fault Code Identification

Three ways to help with ERROR CODES:

WEB: www.drdaikin.com

MOBILE WEB: http://mobile.drdaikin.com

SMS TEXT: **Error** plus (**code**)

- send to 32075 -

Example: Error U4

Daikin AC Website

Daikin University Training

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Daikin University Facilities:

- Carrollton, TX
- Irvine, CA
- Long Island City, NY

Daikin Approved Training Facilities:

- Miami/Davie, FL* (Daikin-McQuay)
- Atlanta/Marietta, GA* (Daikin-McQuay)
- New Haven, CT
- Boise, ID
- Boston/Woburn, MA
- Detroit/New Hudson, MI
- Newark/W. Caldwell, NJ
- Greensboro, NC
- Columbia/Cayce, SC
- Houston, TX

Daikin University Training

Daikin University offers the following classroom training for our Residential/Light Commercial Ductless product line

- Residential Ductless Install & Start Up – 8hr
- Residential Ductless Install & Commissioning – 16hr
- Residential Ductless Service & Troubleshooting
- Residential Ductless Product & Applications
- Residential Ductless Single & Multi Split Systems: Key Points of Installation
- Key Sales Points for Dealers: Residential Ductless Mini-Split Systems
- Daikin 8-Zone Multi-Split System: Key Points of Installation
- Dealer Day

Please refer to www.daikinuniversity.com for the most current course listing.

Topics

- DIII-Net SkyAir Products, Controls Options, & Applications
- SkyAir Nomenclature
- Technology
- Installation Best Practices
- Optional Accessories
- DIII-Net SkyAir Installation & Commissioning
- Troubleshooting

SkyAir DIII-Net

One-to-One & Unitary Ducted Systems

SkyAir DIII-Net Wall Mounted

Wall Mounted Fan Coil

- 208/230V Dedicated power circuit
- SEER up to 18.6 & HSPF 9.1
- Wide angle louvers
- Auto Swing function
- Operates as low as 37 dB(A)
- Gravity Drain
- Optional condensate pump

FAQ 18/24 PVJU

RZR & RZQ Heat Pump & Cool Only
18 & 24 MBtu

R-410A INVERTER

- **RZR 18/24 PVJU Cooling Only** – Range 23°F* -115°F
- **RZQ 18/24 PVJU9 Heat Pump** – Heating Range 0°F to 77°F
- 208/230V Dedicated power circuit
- Line Set 3/8" & 5/8" - flared connections
- Line Set length 164 feet maximum
- Vertical Separation 98 feet maximum

*Optional outdoor unit wind baffle is required and sold separately to cool down to 0 °F outdoor ambient

SkyAir DIII-Net Ducted Concealed

Ducted Concealed Fan Coil

- FBQ 18/24/30/36/42 PVJU
- 208/230V Dedicated power circuit
- ESP up to .8" W.G.
- 3 User selected fan speeds + Auto Logic
- Operates as low as 37 dB(A)
- Optional MERV (8 & 13) Rated Filters
- Built in condensate lift pump – 28"

RZR & RZQ Heat Pump & Cool Only

FBQ 18/24/30/36 PVJU

FBQ 18 – use 3/8" & 5/8" line set and reduce at the indoor connections

R-410A INVERTER

- **RZR 18/24/30 PVJU Cooling Only** – Range 23°F* -115°F
- **RZQ 18/24/30 PVJU9 Heat Pump** – Range 0°F to 77°F
- 208/230V Dedicated power circuit
- Line Set 3/8" & 5/8" - flared connections
- Line Set length 164 feet maximum
- Vertical Separation 98 feet maximum

- **RZR 36/42 PVJU Cooling Only** – Range 23°F* -115°F
- **RZQ 36/42 PVJU9 Heat Pump** – Range 0°F to 77°F
- 208/230V Dedicated power circuit
- Line Set 3/8" & 5/8" - flared connections
- Line Set length 230 feet maximum
- Vertical Separation 164 feet maximum

*Optional outdoor unit wind baffle is required and sold separately to cool down to 0 °F outdoor ambient

SkyAir DIII-Net Round Flow Cassette

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Round Flow Cassette Fan Coil

- FCQ 18/24/30/36/42 PVJU
- 208/230V Dedicated power circuit
- 360° Air flow
- 23 Configurable air flow patterns
- Operates as low as 22 dB(A)
- Outside air options available
- Built in condensate lift pump – 33”

RZR & RZQ Heat Pump & Cool Only

FCQ 18/24/30/36/42 PVJU

FCQ 18 – use 3/8” & 5/8” line set and reduce at the indoor connections

R-410A INVERTER

- **RZR 18/24/30 PVJU Cooling Only** – Range 23°F* -115°F
- **RZQ 18/24/30 PVJU9 Heat Pump** – Range 0°F to 77°F
- 208/230V Dedicated power circuit
- Line Set 3/8” & 5/8” - flared connections
- Line Set length 164 feet maximum
- Vertical Separation 98 feet maximum

- **RZR 36/42 PVJU Cooling Only** – Range 23°F* -115°F
- **RZQ 36/42 PVJU9 Heat Pump** – Range 0°F to 77°F
- 208/230V Dedicated power circuit
- Line Set 3/8” & 5/8” - flared connections
- Line Set length 230 feet maximum
- Vertical Separation 164 feet maximum

*Optional outdoor unit wind baffle is required and sold separately to cool down to 0 °F outdoor ambient

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SkyAir DIII-Net Ceiling Suspended

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Ceiling Suspended Fan Coil

- FHQ 18/24/30 PVJU (36/42 MVJU)
- 208/230V Dedicated power circuit
- Auto-swing - 100° airflow pattern
- Front discharge – fits in tight spaces
- Operates as low as 45 dB(A)
- Gravity Drain

RZR & RZQ Heat Pump & Cool Only

FHQ 18/24/30 PVJU
FHQ 36/42 MVJU

R-410A INVERTER

- **RZR 18/24/30 PVJU Cooling Only** – Range 23°F* -115°F
- **RZQ 18/24/30 PVJU9 Heat Pump** – Range 0°F to 77°F
- 208/230V Dedicated power circuit
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- **RZR 36/42 PVJU Cooling Only** – Range 23°F* -115°F
- **RZQ 36/42 PVJU9 Heat Pump** – Range 0°F to 77°F
- 208/230V Dedicated power circuit
- Line Set 3/8” & 5/8” - flared connections
- Line Set length 230 feet maximum
- Vertical Separation 164 feet maximum

*Optional outdoor unit wind baffle is required and sold separately to cool down to 0 °F outdoor ambient

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SkyAir DIII-Net Inverter Ducted

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Inverter Ducted Fan Coil

- FTQ 18/24/30/36/42 PBVJU
- 208/230V Dedicated power circuit
- Brazed 3/8" & 5/8" pipe connections
- Upflow or Horizontal Right
- 2 speed fan – user selectable with Auto Logic
- Gravity Drain

RZQ Heat Pump

FTQ 18/24/30/ 36/42 PBVJU

R-410A INVERTER

- **RZR 18/24/30 PVJU Cooling Only** – Range 23°F* -115°F
- **RZQ 18/24/30 PVJU9 Heat Pump** – Range 0°F to 77°F
- 208/230V Dedicated power circuit
- Line Set 3/8" & 5/8" - flared connections
- Line Set length 98 feet maximum
- Vertical Separation 98 feet maximum

- **RZR 36/42 PVJU Cooling Only** – Range 23°F* -115°F
- **RZQ 36/42 PVJU9 Heat Pump** – Range 0°F to 77°F
- 208/230V Dedicated power circuit
- Line Set 3/8" & 5/8" - flared connections
- Line Set length 230 feet maximum
- Vertical Separation 164 feet maximum

*Optional outdoor unit wind baffle is required and sold separately to cool down to 0 °F outdoor ambient

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SkyAir DIII-Net Control Systems

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Individual Remote Controllers

- BRC1E72 Navigation Remote Control
  - Seven Day Programmable
- BRC2A71 Simplified Control
  - Basic system control
- BRC7C/7E/4C Wireless Remote control
  - Receiver specific to fan coil

BRC1E72

Navigation Remote

BRC2A71

Simplified

BRC7C/7E/4C

Wireless

R-410A INVERTER

Multi-Zone Control Systems

- Intelligent Touch Manager
- Intelligent Touch Control
- Centralized Zone Control
- Unified ON/Off Control
- Schedule Timer
- BACnet Gateway
- LON Works Gateway

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RZQ/RZR SkyAir DIII-Net Options

Fan Coil Options

- 3K to 15K Electric Heater Kit (FTQ Only)
- Condensate Pump
- Condensate Control Switch
- FBQ Economizer Option
- FBQ MERV8/13 Rated Filter Kit
- FCQ MERV13 Rated Filter Kit
- Remote Sensor

Electric Heater Kit
HKR-03 thru 15C

DACA-CP3-1
Condensate Pump

R-410A
INVERTER

Outdoor Unit Options

- Optional Wind Baffle
- Line-set Duct
- Outdoor Unit Wall Mount Bracket

Nomenclature

RZQ/RZR SkyAir Nomenclature

RZQ/RZR SkyAir Nomenclature

R	Z	Q	18	P	VJ	U

- U: Standard compatibility symbol
  U: Meets UL standards for North America
- VJ: Power supply symbol
  VJ: 1 phase, 208/230V, 60 Hz
- P: Indicates major design category
- 18: Capacity indication in cooling
  18: 18,000 Btu/h 24: 24,000 Btu/h 30: 30,000 Btu/h
  36: 36,000 Btu/h 42: 42,000 Btu/h
- Q: System type
  Q: R-410A, Heat pump R: R-410A, Cooling only
- Z: System type
  Z: Inverter
- R: Unit category
  R: Air cooled single split outdoor unit

RZQ/RZR SkyAir Nomenclature

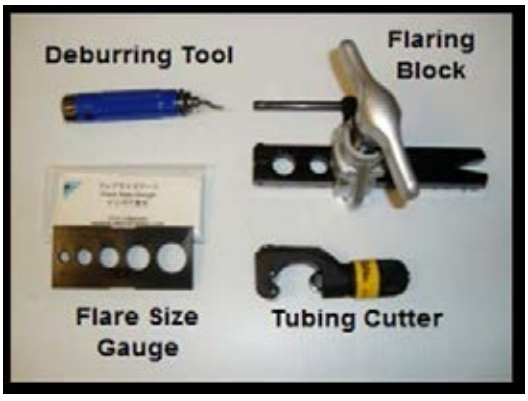
RZQ/RZR Indoor Unit SkyAir Nomenclature

F	A	Q	18	P	VJ	U

- U: Standard compatibility symbol
  U: Meets UL standards for North America
- VJ: Power supply symbol
  VJ: 1 phase, 208/230V, 60 Hz
- P: Indicates major design category
- 18: Capacity indication in cooling
  18: 18,000 Btu/h 24: 24,000 Btu/h 30: 30,000 Btu/h
  36: 36,000 Btu/h 42: 42,000 Btu/h
- Q: System Type
  Q: R-410A, Heat pump or cooling only (FA, FB, FC, FH)
  Q: R-410A, Heat pump (FTQ only)
- A: Indoor unit type
  A: Wall mounted B: DC Duct
  C: Roundflow Cassette H: Ceiling suspended
  T: Inverter Ducted Unitary
- F: Unit Category
  F: Single split indoor unit

Piping & R-410A

Daikin Tool Kit



Proper deburring is critical to a successful flare

Additional Tools for Install

- Metric tools (hex key set and socket set) are required when installing or servicing Daikin VRVIII-S systems
- Nitrogen regulator capable of measuring up to 700 plus PSI is necessary for pressurizing systems to 550 PSIG
- Daikin offers a full selection of torque wrenches that are adjustable to the required torque and sized for the Daikin system flare nuts

Torque Wrench Set
Part # TLTWSM

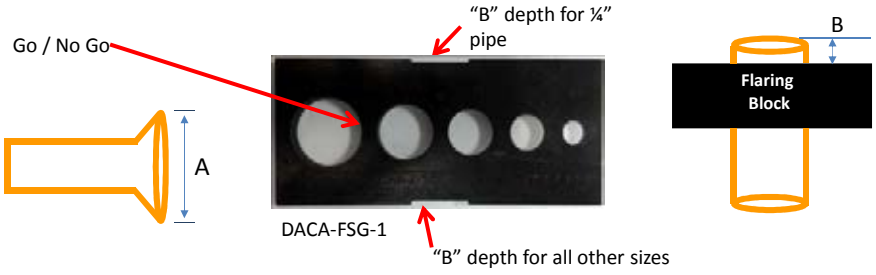
5/16 Valve Core Removal Tool

700 PSI Min

Metric Socket Set

Metric Hex Key Set

Piping Flaring



Dimension "A" requirement	
Pipe Size	**Dimension**
1/4"	**9.1mm**
3/8"	**13.2mm**
1/2"	**16.6mm**
5/8"	**19.7mm**
3/4"	**24.0mm**

Dimension "B" Requirement	
Pipe Size	**Dimension**
1/4"	**1 mm**
3/8"	**2 mm**
1/2"	**2 mm**
5/8"	**2 mm**
3/4"	**2 mm**

Flare Torque

Must use back up wrench when tightening or loosening flare nuts

Tightening Torque

Flare nut size	Standard tightening torque	
	Ft/lb.	N/m
1/4	10.5 – 12.7	14.2 –17.2
3/8	24.2 – 29.4	32.7 – 39.9
1/2	36.5 – 44.5	49.5 – 60.3
5/8	45.6 – 55.6	61.8 – 75.4

Use only Daikin supplied flare nuts
(shown on left side above)

INAPPROPRIATE TIGHTENING TORQUE

Too tight

- **Reduced flare nut wall thickness - leakage**
- **Flare nut damage**

Too loose

- **Gas leak**

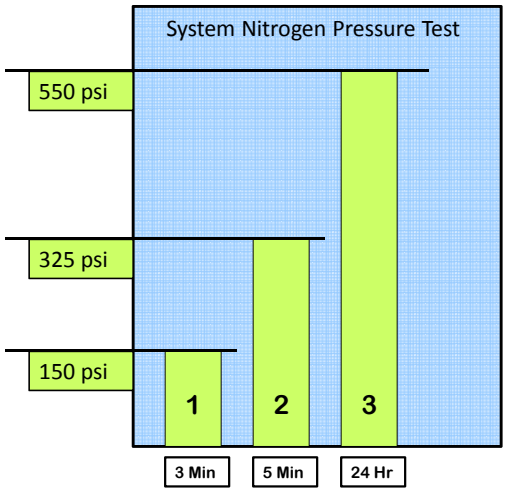
Brazing

Dry Nitrogen *MUST* be used during all brazing (Pressure regulated to 1.5 to 3 PSIG) to prevent oxidation formation

- Tape in Schrader Fitting
- Set Nitrogen regulator to 1.5 – 3 PSIG
- Leave other end of pipe open

3 Step System Pressure Test

Verify all Stop Valves are securely closed before pressure test



Nitrogen Pressure Testing Considerations

Nitrogen pressure is subject to fluctuation above 300 psi, based on ambient temperature changes. Use this formula to compensate for temperature changes from one day to the next when performing the 24 hour pressure test. The following formula will determine system pressure drop caused by low ambient temperature.

Note the **T**emperature when the system is **p**ressurized (**Tp**) Subtract the **T**emperature when the pressure is **c**hecked (**Tc**) Multiply by a factor of 0.80 to get the **P**ressure **D**rop (**PD**)

(**Tp – Tc**) x 0.80 = **P**ressure **D**rop

Triple Evacuation

Daikin Recommends Triple Evacuation

- Evacuate the system to 4000 microns, hold for 15 minutes
- Break vacuum with dry nitrogen to pressure of 2-3 PSIG
- Evacuate to 1500 microns & maintain for 20 minutes
- Break vacuum with dry nitrogen to pressure of 2-3 PSIG
- Evacuate to below 500 microns and hold for 60 minutes

Line Components

Only install driers, oil traps, shut off valves or any other line components in your piping work if instructed to do so in the IOM documents – if no instruction, it's because it is NOT necessary (for Daikin).

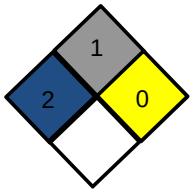
The only acceptable piping is **ACR** (copper) type tubing which is dehydrated and sealed at both ends.

R-410A Safety

- Asphyxia
- Heavier than air
- Products of Decomposition
- Skin Irritant
- Frostbite
- Storage below 125 F
- **Do not leak test with air**

ASHRAE

HMIS®



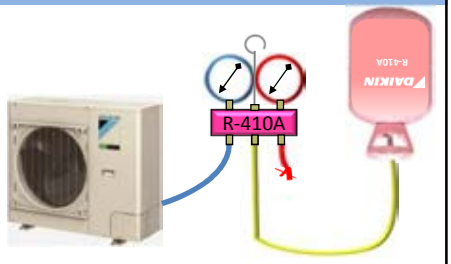
NFPA 704

PolyVinylEther Oil (PVE)

- PVE oil is optimal for systems that do not use line set driers
- Compatible with all HFC Refrigerants
- Excellent anti-wear properties
- Better solubility with process fluids
- Superior Resistance to Cap tube blockage
- Better lubricity
- Optimal for non-drier systems
- Very Hygroscopic but with no hydrolysis
- Moisture easily removed

Additional Refrigerant Charge

- The best time to add refrigerant charge is immediately after evacuation is complete
- Close vacuum pump valve first, then close manifold gauges
- R-410A must be charged as a liquid and weighed in



RZQ/RZR	Factory Charge	Not charged for any line length
18/24/30/36/42	Varies by capacity – Data Plate	…036 lbs per foot

An additional charge of 1.54 lb is required for the FTQ ducted air handler.

RZQ/RZR SkyAir

Installation Overview

Piping & Charging

RZQ/RZR Piping Specifications

Model #	Maximum Separation (ft)		
	Total Length	Vertical (CDU above FCU)	Vertical (CDU below FCU)
RZQ18,24,30PVJU	164	98	98
RZQ36,42MVJU	230	164	130
Minimum	5	0	0

RZQ/RZR Piping Specifications

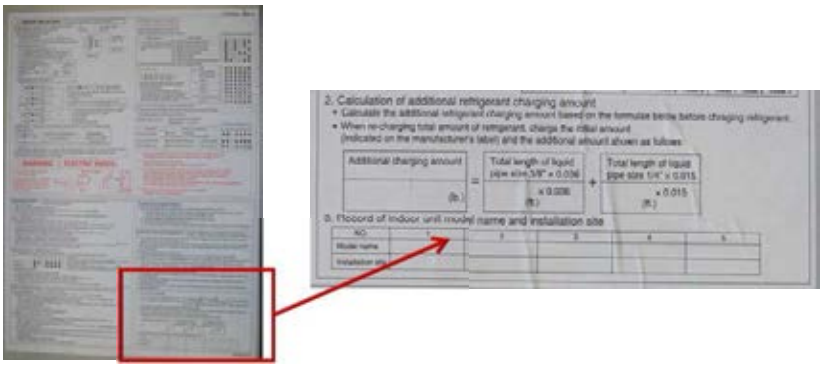
- **All Condensers and Fan Coils use Flare connections (excl. FTQ)**
- **RZQ/RZQ Condensers: 3/8" Liq. & 5/8" Gas – Flare Connections**
  - Fan Coils: 1/4" 3/8" Liq. - 1/2" 5/8" Gas (based on capacity model)
  - Liquid and Gas lines must be individually insulated with recommended ¾" wall insulation
- **SkyAir systems are single refrigerant circuits; condenser to single fan coil**
  - Piping Rules Apply
    - From condenser to farthest fan coil: 18K & 24K Max. 164', 30K thru 42K Max 230'
    - Vertical Separation 18K, 24K, & 30K Max 98', 36K & 42K Maximum 164
    - Measure the actual lengths of all liquid lines for system "Additional Refrigerant Charge" calculation
    - Note special charging requirements for the SkyAir FTQ Air Handler

RZQ/RZR System Charging

- Providing the proper refrigerant charge is critical to optimum system performance
- Daikin equipment cannot be charged by means of superheat or sub-cooling charging methods
- Daikin requires the measuring of the linear footage of all liquid line piping and then use the appropriate pipe size multiplier for refrigerant charge
- Additional refrigerant charge should be added to the liquid line stop valve or the charging port only prior to opening the stop valves
- R-410A MUST be charged as a liquid
- After all refrigerant has been added, open the stop valves
- If all refrigerant cannot be added at the end of the evacuation, follow the instructions for Additional Refrigerant Charge Mode

RZQ/RZR System Charging

- Refrigerant charging and commissioning instructions are listed on the inside cover of the outdoor unit service cover
- Fill out the lengths of the liquid lines installed; this information is crucial for future service work



RZQ/RZR System Charging

Use the following calculations:

Total length (ft) of 3/8" liquid line X .036 lbs/ft

+

If indoor unit is: FTQ_PA add 1.54 lbs. (Inverter Ducted only)

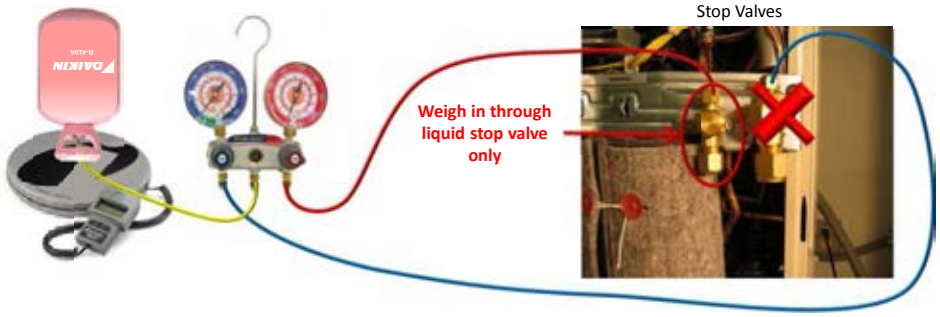
FTQ_PB add .35 lbs. (Inverter Ducted only)

Note: .1 lbs. = 1.6 Oz.

_____

= Total additional refrigerant charge (lbs)

RZQ/RZR Adding Refrigerant Charge after Evacuation

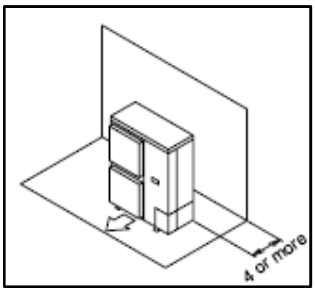


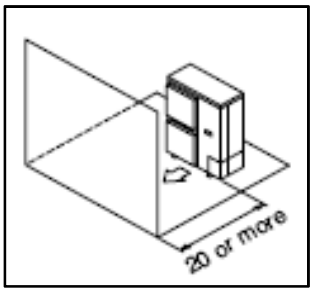
- Connect high side of refrigeration gauges to liquid stop valve
- Weigh in 100% of calculated additional refrigerant charge using digital scale, breaking the vacuum
- If vacuum will not take all of the calculated charge, add remainder using Additional Refrigerant Charge Mode
- Do not add refrigerant into to gas stop valve
- RZQ/RZR 36/42 – use charge port in Additional Charge mode

Outdoor Units

RZQ/RZR Outdoor Unit Location

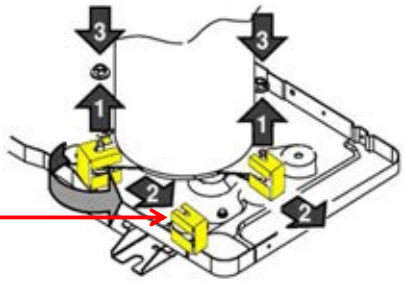
- Condenser should be installed on a level base
  - The air inlet side requires a min. of 4” clearance to a wall
  - The air outlet should have a min. of 20” clearance
  - Refer to the Installation Manual for all clearance applications
  - Condenser should be installed above the snow line





RZQ/RZR Compressor Shipping Brackets

- Compressor shipping brackets must be removed before start up.
- There are two brackets on the compressor underneath the compressor blanket. One in front and one on the right side.
- They are yellow in color and once removed retighten down compressor bolts.
- Failure to remove brackets can result in excessive noise during operation.

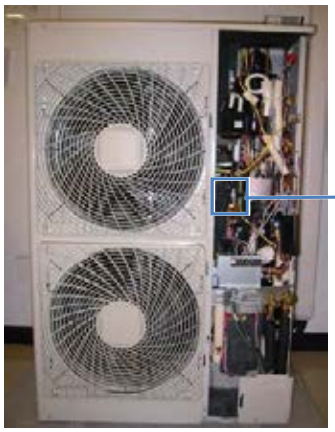


RZQ/RZR LED & Button Layout

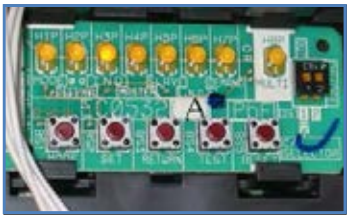
RZQ/RZR SkyAir 18, 24, & 30 MBtu

H1P to H8P LEDs
MODE-SET-RETURN-TEST & RESET buttons

RZQ/RZR LED & Button



RZQ/RZR SkyAir 36 & 42 MBtu



H1P to H8P LEDs
MODE-SET-RETURN-TEST & RESET buttons

Indoor Unit Installation Considerations

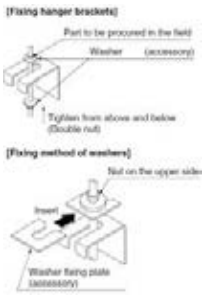
FBQ_PVJU Ducted Concealed

Models from 18 MBtu to 42 MBtu

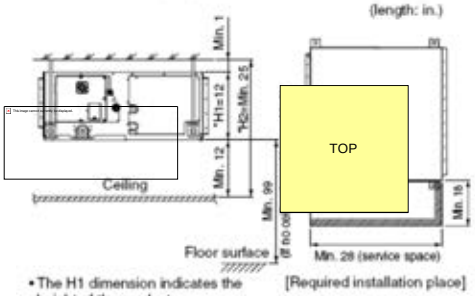
- Improved efficiency with our new DC (ECM) fan motor
- Medium ESP capabilities of up to .8" W.G
- "Auto" adjust or select SP range from Remote Controller
- 3 user select fan speeds available + Fan "Auto" Logic
- Low profile design – less than 12" high
- Built in Condensate Lift pump for 28" rise
- Optional filter box
- Optional Filters (MERV 8 & 13)
- Mechanical service from below
- Weight: 80 lb. 18,24,30 102 lb. 36&48

FBQ_PVJU Installation

- Install FBQ with threaded –style bolts
- Install nut and washer above and below each angle bracket
- Min. 1” open clearance from top of Fan Coil to bottom of structure
- Min. 28” X 18” service access on side



(2) Use hanging bolts to install the indoor unit. Check that the place of installation withstands the weight of the indoor unit. Secure the hanging bolts with proper beams if necessary.



- The H1 dimension indicates the height of the product.
- Determine the H2 dimension by maintaining a downward slope of at least 1/100 as specified in “7. DRAIN PIPING WORK”.

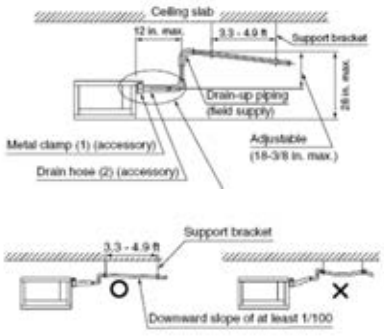
[Required installation place]
The dimensions indicate the minimum required space of installation.

Fig. 2-1

FBQ_PVJU Condensate Removal Lift Pump (Standard)

- Max. drain riser height: 28”
- Flexible, insulated drain coupling is included
- Max. riser pipe diameter from coil outlet: ¾” ID
  - Larger diameter pipe may generate an “AF” code
- Never connect drain piping to sewer vent
- Properly support the horizontal piping to eliminate piping deflection

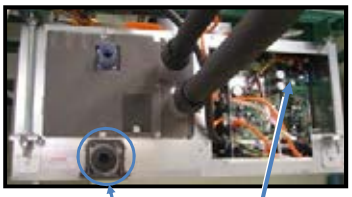
Fan Coil Installation Kit



Lift Pump Piping

FBQ_PVJU Condensate Removal - Gravity

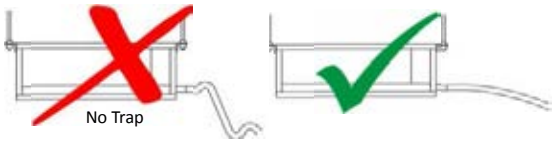
- **Gravity Condensate Conversion**
  - Unplug Lift Pump connector at PCB (A1P) X25A
  - Remove coil drain plug and connect to drain piping
- **Field supplied condensate drain pipe**
  - Use flexible drain connector (Accessory)
  - Must not contain any traps or kinks in the line
  - Must maintain an even slope of 1/100 or greater



Drain Plug

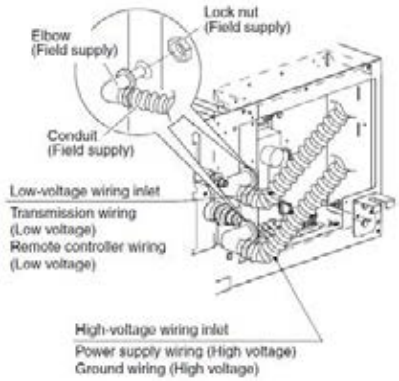
X25A

PCB "A1P"

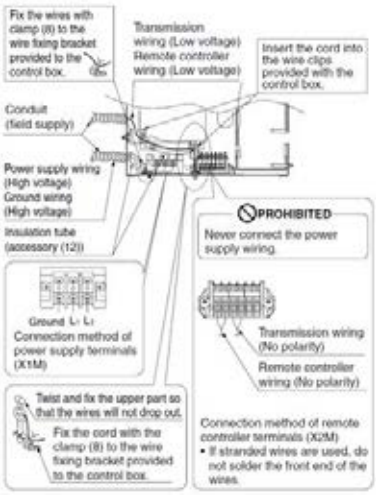


FBQ_PVJU Line Voltage and Control Voltage

- Lay the wires in the control box through the wire inlet on the side of the control box

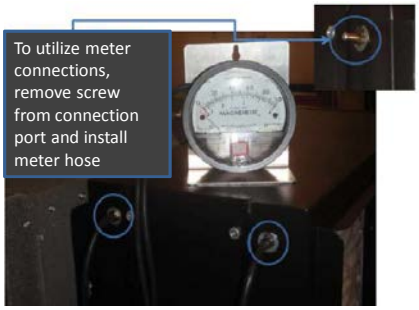


- Follow the instructions below and lay the wires in the control box



FBQ_PVJU MERV 13 Filter Kits

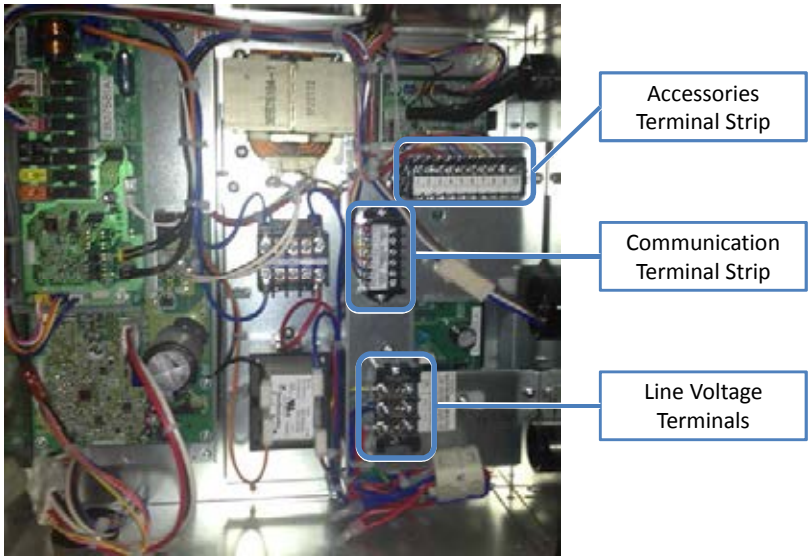
- Filter boxes are installed with “Keyhole” style attachment holes
- Filter access from RH or LH
- Static pressure ports are installed for manometer readings across filter media



FTQ_PBVJU Vertical Air Handler

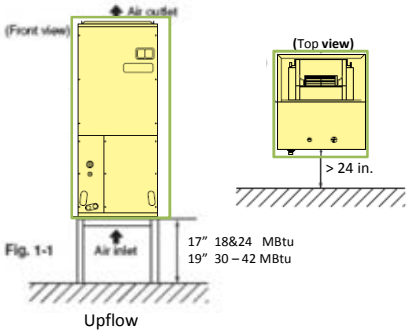
- Offered in 5 model sizes from 18 MBtu to 42 MBtu
- Integrated EEV, PCB & Other Components
- Upflow and Horizontal Right configuration
- 208-230V/1/60Hz Power Supply
- Brazed Pipe Connections (1/4”x1/2” and 3/8”x5/8”)
- Hi & Low Fan Speeds + Fan “AUTO” Logic
- ECM Blower Motor
- ESP automatically set based on installed ductwork (Max. 0.5” WG)
- Slide-in Electric Heater Options - 3kW to 15 kW
- Heating as low as 0° Outside Ambient

FTQ_PBVJU Terminal Strips

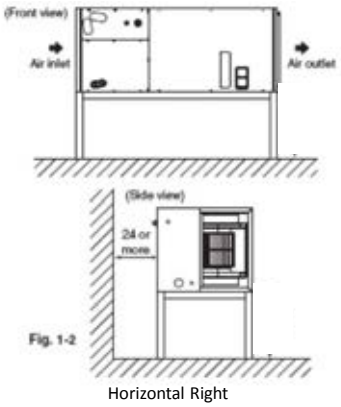


FTQ_PBVJU Unit Installation

- The Fan Coil cabinet must be firmly supported on the bottom for upflow and the full underside when in the horizontal right position
- Ensure that the cabinet is perfectly level



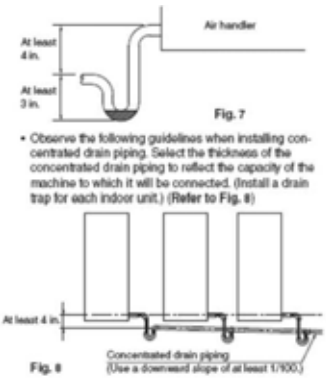
Upflow

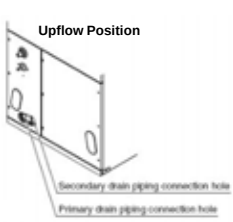


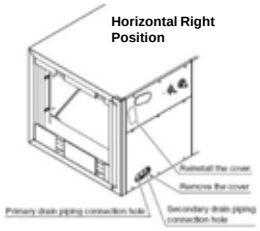
Horizontal Right

FTQ_PBVJU Condensate Installation

- Air handler requires a “P Trap” for the condensate drain
- Copper type DWV, or sched’l 40 PVC tubing may be used for the condensate drain
- Provision should be made to clean the trap

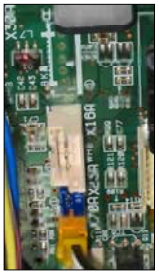






FTQ_PBVJU Remote Sensor Installation

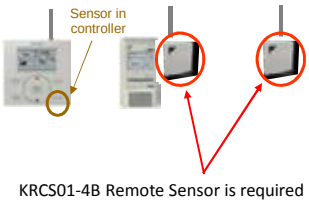
FTQ Air Handler is not equipped with a return air sensor. Some method of sensing room temperature is needed.



X16A Remote Sensor Cable Connection

	Mode No.	FIRST CODE NO.	SECOND CODE NO.
To use both the remote controller thermistor and the remote sensor	10 (20)	2	01
To use only the remote sensor			02
To use only the remote controller thermistor			03*

* factory set



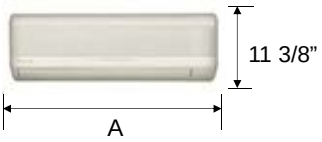
KRCS01-4B Remote Sensor is required **or** the Nav Remote sensor

FAQ18/24PVJU Wall Mounted

- 18,000 to 24,000 Btu/h
- Very low sound levels
- Auto-swing feature ensures efficient air distribution
- Louvers automatically close when unit is turned off
- Wide air discharge outlet distributes a comfortable airflow through the entire space
- Flexible routing of refrigerant and condensate lines

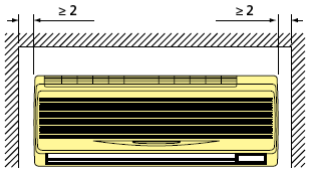
  Options Include:
  - Condensate Pump
  - Controls

FAQ Wall Mounted Clearances



Capacity Model MBtu	18/24
A	41 3/8”

[Space required for Installaion (in.)]



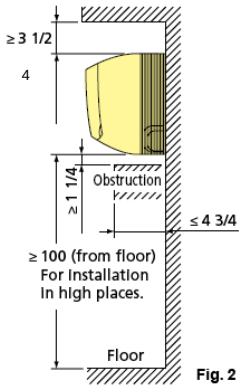


Fig. 2

FAQ Installation Considerations

- Select a location for the unit where the airflow will not be blocked
- Avoid locations exposed to direct sunlight
- Install the mounting panel securely to the wall with a minimum of 6 screws
- Refrigerant and Condensate piping may exit unit in one of 5 directions
- For surface exposed lines, use cutout for refrigerant and condensate lines

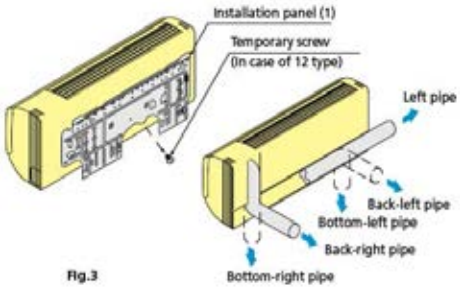


Fig.3

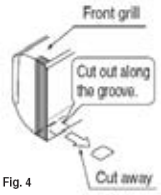


Fig. 4

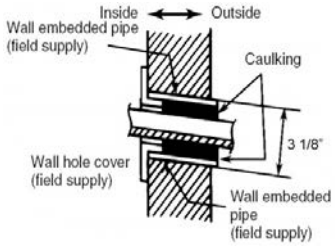
FAQ Wall Mounting Plate

Wall Mounting Plate

FAQ Wall Penetration

FAQ Installing Pipe Through Exterior Wall

- For walls containing metal frame or siding, use field supplied conduit or grommet to prevent heat transfer, electrical shock or fire
- Fill all gaps around the piping with caulk or putty to prevent water leaks
- Drill or cut a 3 1/8” diameter hole
- Ensure that the hole has a slight down angle from the inside to the outside

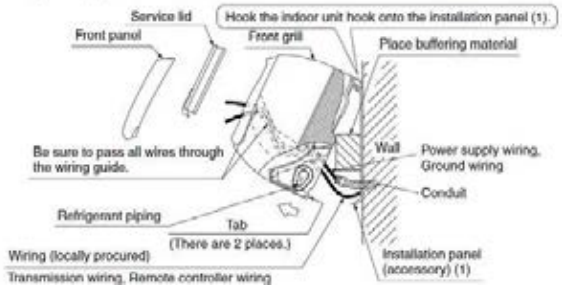


FAQ Indoor Unit Installation

Rear of Wall Mount Unit - Right hand exit

FAQ Indoor Unit Installation

Hook the indoor unit onto the installation panel. (Refer to Fig. 9)
• Placing buffering material between the wall and the indoor unit at this time will make work easier.



Secure the indoor unit to the installation panel with the securing screws.

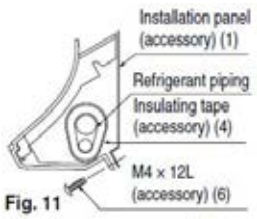


Fig. 11

When making the penetration on the left side of the unit tuck the line set in the back of unit and wrap with felt tape.

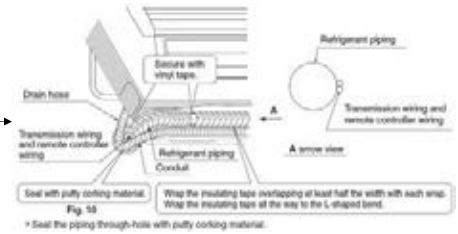
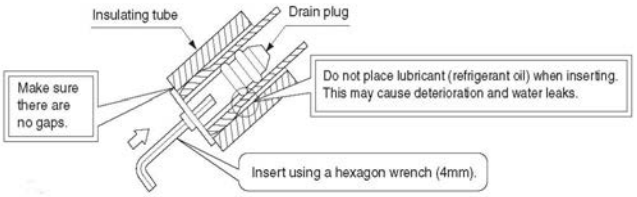


Fig. 10
• Seal the piping through-hole with putty corking material.

FAQ Drain Plug

1. Remove the drain plug from left hand side, plug can be twisted out carefully without tools. Use Allen wrench method if plug seems tight.
2. Grasp drain hose on unit very close to where it connects and gently twist out.
3. Swap Insulation tube.
4. Install drain plug in right hand side where drain hose was connected.



Drain Plug

Drain from unit must be swapped to the left hand side (factory shipped right hand).

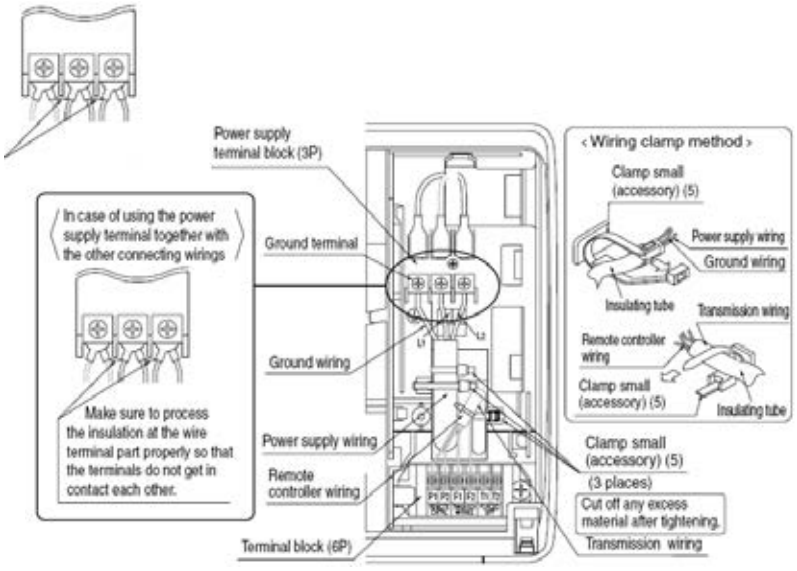
FAQ Condensate Pump Installation

Sample Condensate Pump Example Shown from Below

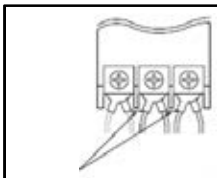
FAQ Condensate Pump Priming

After drain system is installed, perform a drain check by opening the front panel, removing the air filter, (or removing the unit cover) and pouring water into the drain pan.

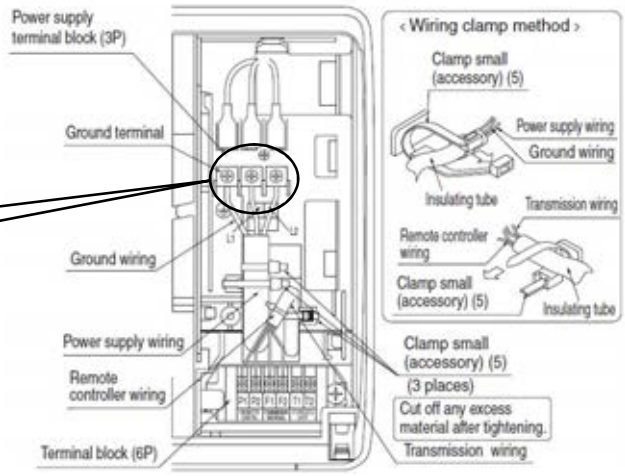
FAQ Wiring Connections



FAQ Wiring Connections



When using the power supply terminal together with the other connecting wirings, make sure to process the insulation at the wire terminal part properly so that the terminals to do not get in contact with each other.

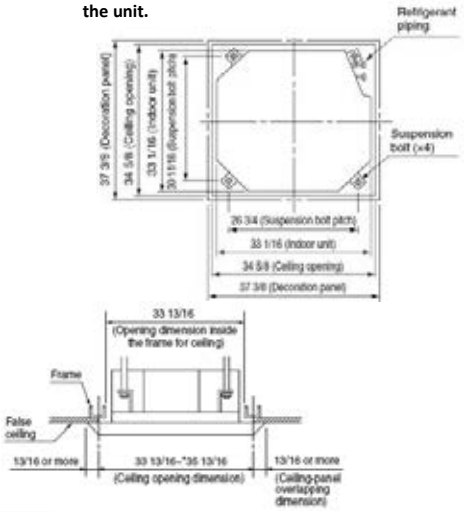


FCQ_PAVJU Round Flow Ceiling Cassette

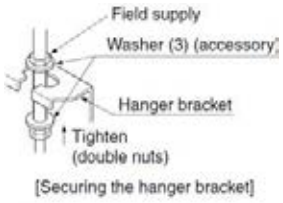
- 18/24/30/36/42 MBtu/h
- 3'x3' (33"x33")
- 360° airflow for enhanced air distribution
- Space-saving above ceiling height of unit less than 12"
- Unit weight: 43lb. to 55lb.
- Service access through RA grille – washable filter
- Condensate lift pump max. 33"
- 3 selectable fan speeds
- 23 field configured air discharge patterns
- Fresh-Air inlet provision
- Outside Air option

FCQ_PAVJU Round Flow Installation

- **Use suspension bolts for installation. Check whether the ceiling is strong enough to support the weight of the unit or not. If there is a risk, reinforce the ceiling before installing the unit.**



- **Attach the hanger bracket to the suspension bolt. Be sure to fix is securely by using a nut and washer from the upper and lower sides of the hanger bracket. The washer fixing plate will prevent the washer from falling.**

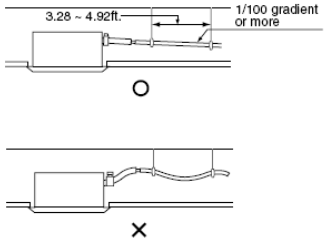


[Securing the hanger bracket]

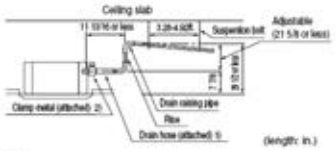
[Securing the washer]

FCQ_PAVJU Condensate Piping

- The diameter of the drain pipe should be greater than or equal to the diameter of the connecting pipe (vinyl tube; pipe size: 1"; outer dimension: 1 1/4"). (This does not apply to rises.)
- Keep the drain pipe short and sloping downwards at a gradient of at least 1/100 to prevent air pockets from forming.
- If the drain hose cannot be sufficiently set on a slope, execute the drain raising piping.
- To keep the drain hose from sagging, space hanging wires every 3.28 ~ 4.92ft .

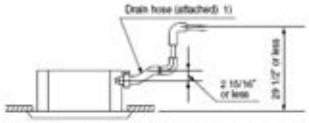


- Install the drain raising pipes at a height of less than 21 5/8".
- Install the drain raising pipes at a right angle to the indoor unit and no more than 11 13/16" from the unit.

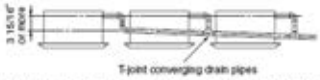


NOTE

- The incline of attached drain hose 1) should be 2 15/16" or less so that the drain socket does not have to stand additional force.



- If converging multiple drain pipes, install according to the procedure shown below.

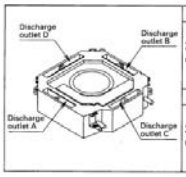


Select converging drain pipes whose gauge is suitable for the operating capacity of the unit.

FCQ_PAVJU Local Settings

Caution

Never select the direction of air discharge other than the following pattern. (You may have a condensation problem.)



3-way discharge	Setting position No.	02	02	02	02
2-way discharge	Setting position No.	03	03	03	

It is required to make a local setting on the remote controller according to the installation of indoor unit.
The direction of air discharge should also be set by the remote controller.

- The 3 different kind of setting such as "Mode number", "The setting switch number" and "The setting position number" should be made by the remote controller.
- Refer to the item of "Local setting" on the operation manual of the remote controller for the setting procedure.

(1) Set according to the table of "The direction of air discharge and the installation of the sealing material". Check the setting position number corresponding to the direction of air discharge.
(2) Refer to the item of "Local setting" of the operation manual for the remote controller and change the setting according to the position determined by (1) as shown in the table below.

	Mode number	Setting switch number
Setting of the direction of air discharge	13 (23)	1

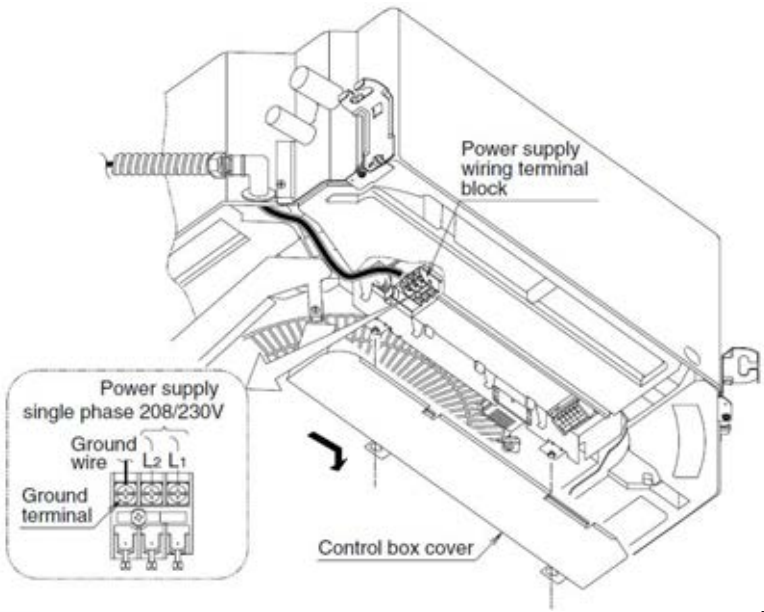
(Ceiling Height is reference value)

Ceiling height	~71 type			80~125 type			Ceiling height setting position number
	4-way air outlet	3-way air outlet	2-way air outlet	4-way air outlet	3-way air outlet	2-way air outlet	
Standard	~2.7	~3	~3.5	~3.2	~3.6	~4.2	01
Semi-high	2.7~3	3~3.3	3.5~3.8	3.2~3.6	3.6~4	~4.2	02
High	3~3.5	3.3~3.5	——	3.6~4.2	4~4.2	——	03

Caution

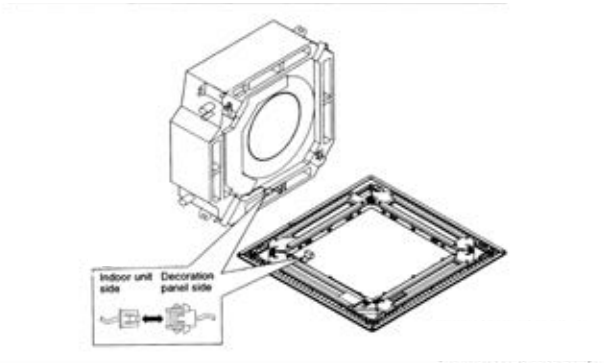
Refer to the table for the height of the ceiling for each direction of air outlet. (The setting of the ceiling height is also required.)

FCQ_PAVJU Wiring Terminals



FCQ_PAVJU Decorative Panel Installation

Make sure that the swing flap motor lead wire is not caught between the indoor unit and the decoration panel.



NOTE: If power swing flap connectors from the decoration panel to the fan coil are not connected, an “A7” fault code is generated

FCQ_PAVJU Decorative Panel Installation

Mounting loop

Mounting tab

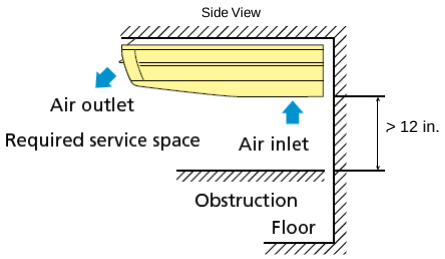
Adjustment Screw

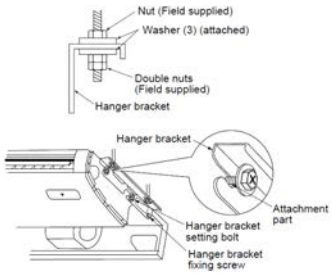
FHQ_PVJU Ceiling Suspended

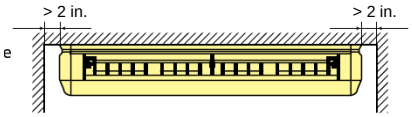
- 18/24/30/36/42 MBtu/h
- Slim design – less than 8” high
- Wide air discharge outlet distributes a comfortable airflow throughout the entire space
- Gravity condensate drain
- Standard equipped with a washable, long-life, mildew-proof filter
- Long Air Throw 15-20 ft
- Options Include:
  - Condensate Pump
  - Controls

FHQ_PVJU Installation Considerations

- Max. ceiling height: 10.6 ft
- Fasten unit with 4 suspension bolts
- Ensure building structure will support unit
- Hanger bolts and hardware field supplied
- Ensure unit is installed level for proper condensate draining

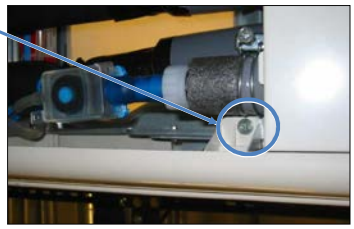






FHQ_PVJU Wiring Terminals

- Easy side panel removal with a single screw
- Optional Condensate Pump
- PCB with Line and Control Voltage Terminals



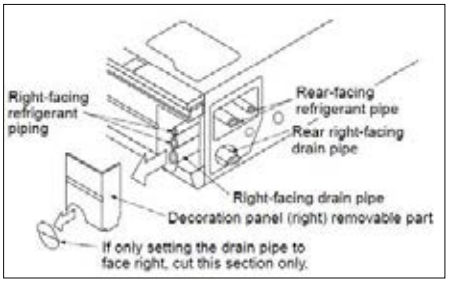
Unit Bottom View

Control and Line voltage connections

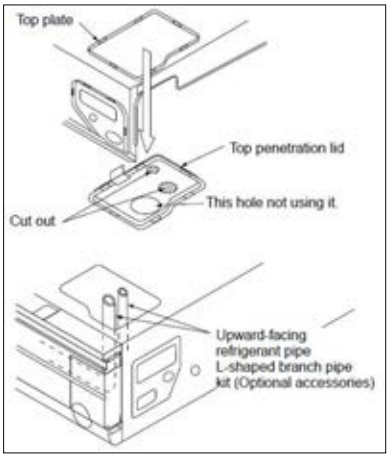
Unit Side View

FHQ_PVJU Refrigerant & Drain Lines

- Refrigerant lines may be run through the top access
- Refrigerant and condensate lines may be run through right rear or side of unit.



Refrigerant Lines & Drain through RH rear or side



Refrigerant Lines through top RH

Condensate Accessory Installation

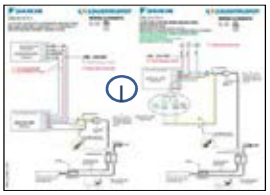
Condensate Pump (Option)

Before You Start Installing Condensate Pump

- Installing a condensate pump behind a wall mount unit requires special consideration due to the limited amount of space left over after running the line set and line voltage behind the unit.
- If line set has to go out the left hand side of unit, follow the same instructions listed within for the right hand exit. Drain tubing lengths may very depending on materials used for line set, high voltage and drain. Cut lengths of tubing as you assemble drain and line set.
- When exiting on left side use one piece of ½" insulation to cover both the liquid and suction lines behind unit. This will give you more room for the pump and float assembly. After you exit unit increase insulation back to ¾" wall and insulate the liquid and suction lines separately.
- After install, prime pump before starting unit.

Condensate Pump Kit Contents

A. Pump Assembly
B. ¼" ID. Discharge tube w/check valve & male barb fitting (40")
C. Power/Safety Switch cable (60")
D. Rubber pump mounting pads R&L
E. 1/4" x 3/8" Self-sealing Drain Fitting
F. Drain outlet to float assembly inlet fitting
G. Float assembly w/cable & vent tube
H. Float assembly mount with double sided adhesive tape
I. Instruction sheet



NOTE: Inline fuse (2amp), ¼" ID. Discharge tubing & barbed couplings are field supplied - Refer to pump Installation Instructions

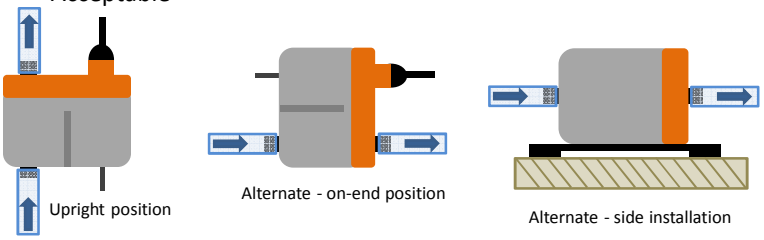
Slide 87

Pump Installation Tips

- **Pump Motor Installation**
  - R&L rubber mounting pads provided
    - Wall or surface mount
    - Suspended
    - Attached to refrigerant line

Upright wall | Suspended | Attached to refrigerant

- **Pump Motor Positions**
  - Acceptable



Upright position | Alternate - on-end position | Alternate - side installation

NOTE: Wallmount fan coil installations require the refrigerant lines to only be run on right side of unit for pump to be installed within the cabinet.

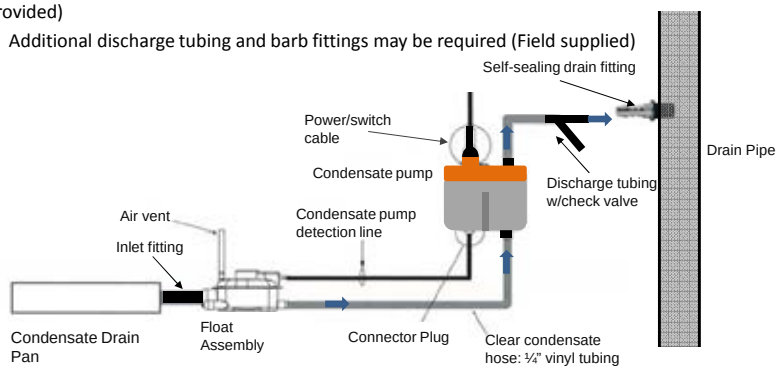
Slide 88

Pump Installation Tips

- **Float Assembly Installation**
  - Float assembly has a 1/4” front and rear outlets
  - Front outlet is capped from the factory
  - The float assembly must be supported
  - Recommended float assembly position: flat and level
  - Install the float assembly where it can be accessed for maintenance
- **Alternate float assembly positions**

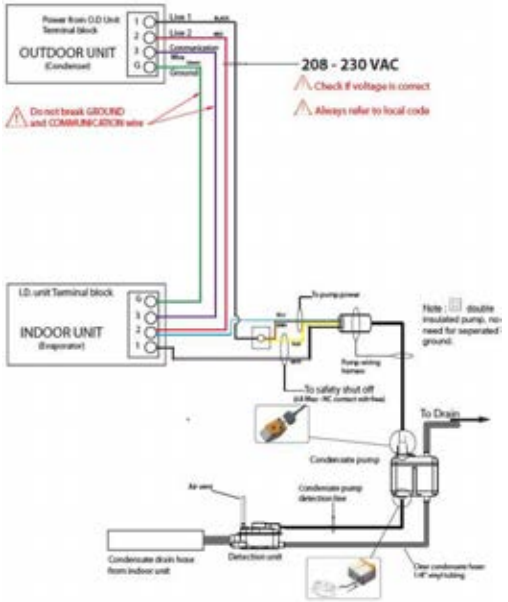
Pump Installation Tips

- **Trim to fit the black rubber inlet fitting from drain pan outlet to inlet of float assembly** (Provided)
  - Drain outlet adapters may be required (Field supplied)
- **Install air vent on float assembly** (Provided)
  - Air vent tube must terminate above drain pan level
- **Install ¼” clear tubing from float outlet to pump inlet** (Field supplied)
- **Install ¼” clear tubing from pump outlet to self-sealing drain fitting including check valve** (Provided)
  - Additional discharge tubing and barb fittings may be required (Field supplied)



Pump Installation Tips

- **Condensate pump is powered from the Indoor fan coil unit on terminals 1 & 2**
  - The pump motor requires no ground conductor
  - Float switch safety controls line voltage power to fan coil unit by switching terminal 1 (Yellow & White)
- **Always follow local codes for proper wiring**
- **Refer to the pump Installation Instructions for additional information.**



Pump Installation Tips

- **After the condensate pump system has been installed it should be checked and tested to verify proper operation**
  - Verify all line voltage connections and power supply voltage
  - Verify the correct positioning of the pump motor and float assembly
  - Verify float assembly detection cable is connected to the pump
  - Verify that all tubing is in place with tight connections
  - Self-sealing drain fitting is properly installed in drain pipe where applicable
  - Cycle the pump by priming the condensate drain pan with water when possible
  - Check for excessive vibration and noise from the pump
  - Verify leak-free operation

Condensate Overflow Protection Sensor DACA-CFS1

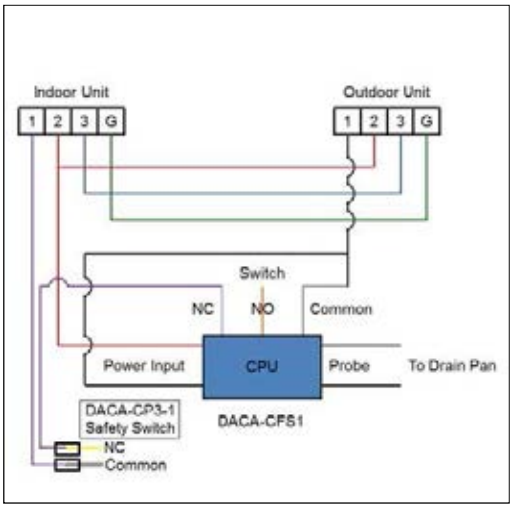
- **Condensate overflow protection for all Daikin wall mounted indoor units**
  - Microelectronic control
  - No moving parts
- **Simple two component installation**
  - Drain Pan Water Sensor
  - Electronic Control Switch

DACA- CFS1


Drain Pan Water Sensor


Electronic Control Switch
Line Voltage Powered

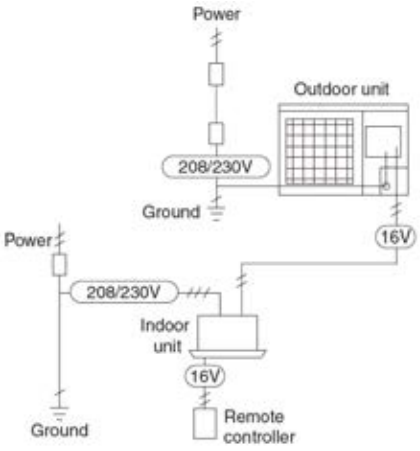
FTXS & DACA-CFS1 Wiring



DACA-CFS1 Condensate Overflow Safety Switch

Line Voltage & Control Wiring

RZQ/RZR SkyAir 208/230 Wiring



Model	Phase and frequency	Voltage	Max. Overcurrent Protective Device	Min. Circuit Amps.
RZQ18PVJU RZR18PVJU	~ 60Hz	208/230V	20A	16.5A
RZQ24PVJU RZR24PVJU				
RZQ30PVJU RZR30PVJU				

Model	Phase and frequency	Voltage	Max. Overcurrent Protective device	Min. Circuit Amps.
RZQ30PVJU9	~ 60Hz	208/230V	30A	27A
RZQ36PVJU9 RZR36PVJU				
RZQ42PVJU9 RZR42PVJU				

RZQ/RZR SkyAir Wiring Terminals

- **Fan Coil Control Terminal Circuits**
  - **P1 P2** – FC to Remote Controller
    - Remote Controller power supply and data transfer
  - **F1 F2** – Condenser to Fan Coil Communications
  - **T1 T2** – Forced Off (Default N.O.) External Contacts
    - Optional Condensate Float Switch
    - Security Switch contacts
      - Fire Safety
      - System On-Off
- **Condenser Control Terminal Circuits**
  - **F1 F2 In** - Condenser to Fan Coil(s)
  - **F1 F2 Out** – Centralized Controller
    - I-Touch BMS
    - Gateway – Lon Works or BACnet
  - **A B C** – Cool/Heat Selector Switch

All Fan Coils

SkyAir Outdoor Unit

NOTE: 16-18 AWG stranded, non-shielded communication wire transmits 16VDC communication DIII-Net will integrate directly with iTouch, iTouch Manager, & Daikin BACnet & LON Works

Controls

RZQ/RZR SkyAir Remote Control

Navigation Remote Controller
BRC1E72

Simplified
BRC2A71

Wireless
BRC7C/7E/4C

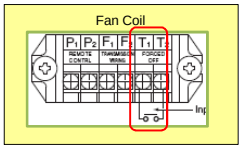
KRCS01-1B (4B) Remote Sensor

- **RZQ/RZR SkyAir Fan Coil Units incorporate a built-in return air thermistor temperature sensor as standard (excl. FTQ)**
  - KRCS01-1B (4B) Remote Sensor is offered to replace the return air thermistor when:
    - Outside fresh air is brought in to the fan coil return air
    - Ceiling height of fan coil return is 13ft or more
    - Above ceiling plenum return is used
  - Standard 39ft cable - Plenum Rated 40ft and 80ft cable optional (DACA-KRCS-PW40 & DACA-KRCS-PW80)

NOTE: KRCS01-4B Remote Sensor Kit for FBQ_P and FTQ_PB Fan Coil Units

RZQ/RZR SkyAir Fan Coil T1 T2 Forced Off

- **RZQ/RZR SkyAir Fan Coil control includes selectable Forced Off operation from an outside safety device (dry contact) using the T1 T2 terminals**
  - Optional Condensate Pump Float Switch
  - Motion Sensor or Door Switch
  - Card Key Remote Start/Stop
  - Fire Safety System
- **Factory Default - Forced Off (N.O.) Manual Restart**
  - Field Setting – 12 (22) 1-01
  - Input N.O. – Normal Operation
  - Input Closed – Unit Stop – Manual Restart Required – AO Fault
- **Reprogram Setting – Forced Off (N.C.) Auto restart on contact close (Condensate Float Switch)**
  - Reprogram Field Setting – 12 (22) 1-03
  - Input N.C. – Normal Operation
  - Input Open – Unit /Condenser Stop – AO Fault Code on connected RC, other RCs indicate U9 Fault Code
  - Auto reset on contact close



External Input	Mode No.	1st Code No.	2nd Code No.
Forced Off	12(22)	1	01 - Default
ON/OFF Op	12(22)	1	02
Ext Protection Device	12(22)	1	03

RZQ/RZR SkyAir Commissioning

RZQ/RZR SkyAir & Inverter Ducted Commissioning Guide

Preface

This handbook is intended for use as an aid to Field Service Technicians with general technical knowledge and training on Daikin equipment. If the Field Service Technician does not have any (or limited) technical knowledge and training on Daikin equipment, it is not advisable to attempt to install, commission or service any Daikin product with this handbook. Please check with Daikin University for our detailed install & commissioning class availability.

Daikinuniversity.com

This reference handbook is available for Field Service Technicians as reference guide for commissioning. It is not intended to be a substitute for the Daikin Installation and Service Manuals or for training offered by Daikin University.

We assume the Field Service Technicians using this handbook are fully qualified to work on the Daikin equipment.

Contact Information

If at any time during the commissioning procedure you require assistance, contact your local Daikin Service Champion at your local Rep or Distributor.

RZQ/RZR SkyAir Outdoor Unit Models

Heat Pump	Cooling Only	Heat Pump	Cooling Only
RZQ18PVJU9	RZR18PVJU	RZQ36PVJU9	RZR36PVJU
RZQ24PVJU9	RZR24PVJU	RZQ42PVJU9	RZR42PVJU
RZQ30PVJU	RZR30PVJU		

RZQ/RZR SkyAir Indoor Unit Models

FHQ18PVJU
FHQ24PVJU
FHQ30PVJU
FHQ36MVJU
FHQ42MVJU

FAQ18PVJU
FAQ24PVJU

FCQ18PVJU
FCQ24PVJU
FCQ30PVJU
FCQ36MVJU
FCQ42MVJU

RZQ/RZR Inverter Ducted Unit Models

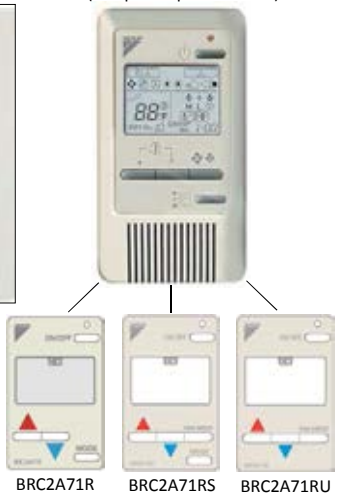
FBQ18PVJU
FBQ24PVJU
FBQ30PVJU
FBQ36PVJU
FBQ42PVJU

FTQ18PBVJU
FTQ24PBVJU
FTQ30PBVJU
FTQ36PBVJU
FTQ42PBVJU
(convertible horizontal right)

RZQ/RZR SkyAir Remote Control Models

BRC1E72

BRC2A71
(faceplate options below)



BRC2A71R BRC2A71RS BRC2A71RU

Wireless

BRC4C82
BRC7E818
BRC7E83
BRC7F812

RZQ/RZR SkyAir Components

RZQ18-24PVJU9
RZQ30PVJU
RZR18-30PVJU

PCB LED & Buttons

High Voltage Connections

Low Voltage Connections

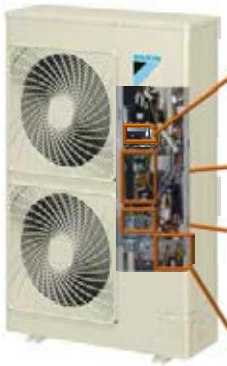
Stop Valves

RZQ/RZR SkyAir Components

PCB LED & Buttons

A,B,C Terminals

Low Voltage Connections



RZQ36-42PVJU9
RZR36-42PVU

Stop Valves

Line Voltage Connections

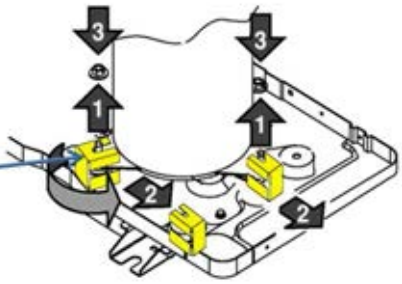
Pre-Commissioning Steps

1) Verify compressor shipping brackets were removed
2) Stop valves tightened down & field piping pressure tested to 550 PSIG for 24 hours
3) Triple evacuated to below 500 microns
4) Liquid line length measured, charge calculated, 100% of calculated charge weighed into liquid line using refrigerant scale, breaking vacuum
5) Stop valves opened
6) All control wiring and remote control(s) installed & wired
7) All drain pipes, ductwork and air filters installed
8) All refrigerant and condensate lines (as required) insulated
9) Voltage checked and verified within listed range
10) Indoor unit powered up first and power ON to condenser for 6 hours
11) Initialization sequence complete and indoor unit counted
12) Remote Controller Setup and Field Settings programmed if applicable
13) Run Additional Refrigerant Charge Mode if 100% of the calculated charge could not be added at end of evacuation
14) Perform Check Operation Mode
15) After Check Operation is complete run system normally

Remove Shipping Brackets

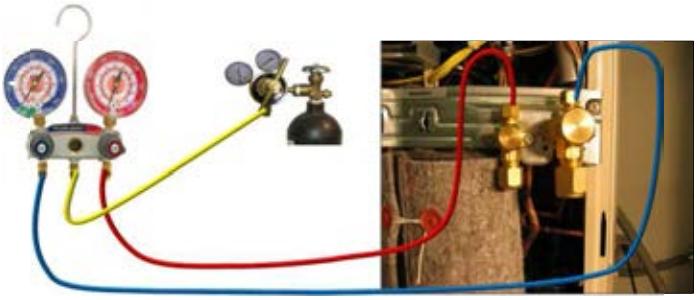
- Compressor shipping brackets must be removed before start up
- There are two brackets on the compressor underneath the compressor blanket One in front and one on the right side
- They are yellow in color and once removed retighten down compressor bolts
- Failure to remove brackets can result in excessive noise during operation

NOTE: Shipping brackets are not on all models



Pressure Test Connections

1. Connect gauges
2. Connect nitrogen cylinder
3. Do not energize indoor or outdoor units. If units are energized the EEVs will close. If this happens, proceed to pages for Recovery/Evacuation Mode before pressure test
4. Follow pressure test procedures



Stop Valves

Verify Supply Voltage

- Using a Volt meter, check the line power supply voltage to the indoor and outdoor unit. Compare reading to units nameplate
- After all voltage is verified, power up all indoor unit(s) then power up outdoor unit
- Ensure that power has been applied for a minimum of 6 hours to the condenser to enable crank case heater to drive liquid refrigerant out of the compressor
- Voltage range for all 1PH 208 – 230 VAC units is 187 - 253 VAC

Refrigerant Recovery Evacuation Mode Procedure

- Used to ensure that all indoor and outdoor expansion valves are driven to the open position
- Power must be on to Indoor & Outdoor Units and the system must be communicating for this procedure
- Ensure that all indoor units are turned off at their respective remote controllers. Follow the setting procedure on the next page
- Perform the required refrigerant recovery and/or evacuation using proper collection procedures

NOTE: If at any time you miscount when pressing buttons and are not sure where you are, start over by pressing **"MODE"** button until you get back to H3P on solid and then start procedure over

Refrigerant Recovery
Evacuation Mode Procedure Continued

Light positions before you start →

Press and hold down the **MODE** button (BS1) for 5 seconds →

Press **SET** button 21 times
H1P(0) + H3P(16) + H5P(4) + H7P(1) = 21 →

Press the **RETURN** button once →

Press the **SET** button once to turn on →

Press the **RETURN** button once to lock on →

Press the **RETURN** button once to activate the setting →

Recover Refrigerant or Evacuate NOW. After you finish, proceed to next step

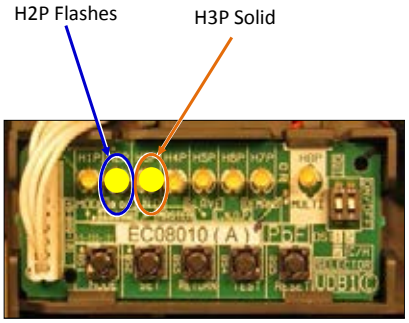
On completion press **MODE"** button once to return normal mode →

System Communication

RZQ24 LED & Button Layout

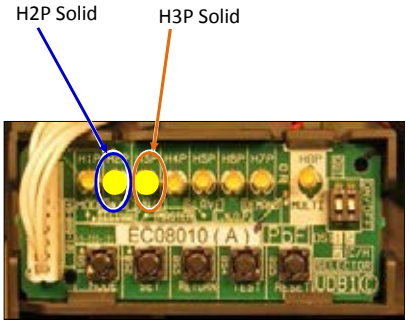
Initialization Period

- After indoor unit) has been powered up, turn on disconnect to outdoor unit
- Upon power up of the system, the system will perform a 12 to 20 minute initialization period where it assigns an address to the outdoor unit and the indoor unit
- It is important to make sure the indoor unit remains OFF at the remote controller, failure to have all remote controllers OFF may result in an incomplete initialization
- This mode is identified by H2P flashing and H3P on solid
- Do not attempt to put the unit into Check Operation Mode until the initialization period is complete



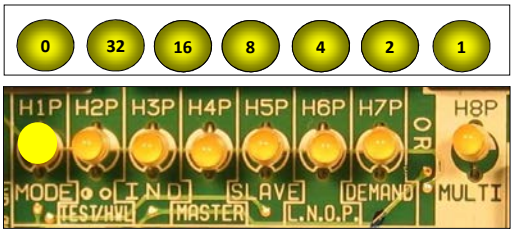
Initialization Period Cont.

- Near completion of the initialization period, both the H2P and the H3P lights will be solid (this is normal during this step).
- When the H2P light goes out and only H3P remains on solid, this will indicate the end of the initialization period.
- If H2P does not go out after 30 minutes or more, check remote controller for an error code.



Binary Code Key for Indoor Unit Count

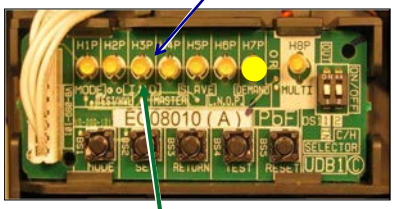
LED Numerical Value



NOTE: H1P light always has value of "0" when counting SkyAir & Inverter Ducted has one indoor unit connected

Counting Indoor Units

- Once the initialization procedure is completed, the indoor unit needs to be counted to confirm communication
- During this, a Binary Code is pre-assigned to the LEDs for identification



1. Press **MODE 1 time**
2. Press **SET 5 times**
3. Press **RETURN 1 time** & count up lights
4. Press **MODE** once to return to normal operation (H3P light on only).

Forced Fan ON

- An additional procedure to help troubleshoot missing indoor unit is to force the fan to the indoor unit ON. By forcing the fan ON, you will determine if the indoor and outdoor units are communicating. In jobs where you have multiple systems, using the "Forced Fan ON" procedure, will quickly indicate what units are connected by which indoor fans operate
- Forced Fan ON is a Mode 2 field setting, performed from the outdoor PCB. It is a procedure you will use often during Commission and Servicing of Daikin equipment. It is important to follow the steps closely and be aware of the binary code to insure proper programming.
- The following page will show you how to initialize Forced Fan ON

Mode 2 – Forced Fan ON

Light positions before you start →

Press and hold down the **MODE** button (BS1) for 5 seconds →

Press **SET** button 5 times
H1P(0) + H5P(4) + H7P(1) = 5
Refer to page 30 for Binary Code →

Press the **RETURN** button once →

Press the **SET** button once to turn on →

Press the **RETURN** button once to lock on →

Press the **RETURN** button once to activate the setting →

STOP & check fans on indoor unit to see if it is on

On completion, press **MODE** button once to return to normal mode →

Control Commissioning & Programming

- After the initialization sequence is complete, the next step is to program field settings from the system controls
- The next section will cover how to program basic field settings for the BRC1E, BRC2A and wireless models
- For advanced control setup, the installation and engineering guide for the system and control being commissioned should be consulted

Programming Field Settings for Indoor Units

- Field Settings are settings that will help the installer configure the system to the application it was designed for
- Not all Field Settings are available for every system, consult the Installation and Engineering Manuals for the system being installed to insure compatibility and proper operation after the setting is applied
- Once a new setting is chosen for the indoor unit, it must be programmed by using the Remote Control
- On the next page is a list of available field settings. Not all settings are available for each unit. If the setting does not show up or the display says “Not Available”, the setting selected cannot be used
- Below is a sample from the Field Settings table, the first numbers shown are Group and Individual, Group is the first number & Individual is in the parenthesis

12 (22)	0	Optional accessories output selection (Field selection of output for adaptor for wiring)	Indoor Unit turned ON by thermostat	—	Operation output	Error output
	1	ON/OFF Input from outside (Set when ON/OFF is to be controlled from outside.)	Forced Off	ON/OFF control	External protection device input	—
	2	Thermostat differential changeover (Set when remote sensor is to be used.)	2 °F	1 °F ▪7	—	—
	3	Set fan speed when thermostat OFF	LL	Set fan speed	—	—
	5	Power failure automatic reset (Auto restart)	No equipped	Equipped	—	—

Field Settings Table

: Factory setting

Mode No.	First Code No.	Description of Setting	Second Code No. 01	02	03	04
10 (20)	0	Filter cleaning sign time	Light	Heavy	—	—
	0 *5	Filter dirt	Light	Heavy	—	—
	1	Filter type	Long life filter	Ultra long life filter	—	—
	1 *5	Filter cleaning sign time (Light/Heavy)	2,500/1,250	10,000/5,000	—	—
	2	Remote controller thermistor	Use	Not use	—	—
	2 *5	Remote sensor and remote controller thermistor	Both	Remote thermistor	Remote controller thermistor	—
	3	Filter sign display	ON	OFF	—	—
	7	4-step thermostat processing	Symbol *6: 01 / 02 / 03 / 04 / 05 / 06 Ttson: -7.2°F / -6.3°F / -5.4°F / -4.5°F / -3.6°F / -2.7°F Ttsoff: -3.6°F / -2.7°F / -1.8°F / -0.9°F / 0°F / -0.9°F			
11 (21)	3 *5	Electric heater setting	Heat Pump lockout mode	—	Auxiliary electric heater + Heat Pump lockout mode	—
	5 *5	Electric heater step setting	With heater	—	Without heater	—
12 (22)	0	Optional accessories output selection (Field selection of output for adaptor for wiring)	Indoor Unit turned ON by thermostat	—	Operation output	Error output
	1	ON/OFF Input from outside (Set when ON/OFF is to be controlled from outside.)	Forced Off	ON/OFF control	External protection device input	—
	2	Thermostat differential changeover (Set when remote sensor is to be used.)	2 °F	1 °F *7	—	—
	3	Set fan speed when thermostat OFF	LL	Set fan speed	—	—
	5	Power failure automatic reset (Auto restart)	No equipped	Equipped	—	—
13 (23)	0	Airflow adjustment ceiling height	N	H	S	—
	1	Airflow direction	F (4 directions)	T (3 directions)	W (2 directions)	—
	4	Field setting airflow position setting	Draft prevention	Standard	Ceiling soiling prevention	—
	5	Setting of static pressure selection	Standard	High static pressure	—	—

See Page 74 Of SkyAir Service Manual SiUS281117

Applicable Field Settings

Mode No.	First Code No.	Description of Setting	FCQ	FHQ	FAQ	FBQ	FTQ
10 (20)	0	Filter cleaning sign time	○	○	○	○	—
	0	Filter dirt	—	—	—	—	○
	1	Filter type	○	—	—	—	—
	1	Filter cleaning sign time	—	—	—	—	○
	2	Remote controller thermistor	○	○	○	○	—
	2	Remote sensor and remote controller thermistor	—	—	—	—	○
	3	Filter sign display	○	○	○	○	○
	7	4-step thermostat processing	—	—	—	—	○
11 (21)	3	Electric heater setting	—	—	—	—	○
	5	Electric heater step setting	—	—	—	—	○
12 (22)	0	Optional accessories output selection	○	○	○	○	○
	1	ON/OFF Input from outside	○	○	○	○	○
	2	Thermostat differential changeover	○	—	—	○	—

See Page 75 Of SkyAir Service Manual SiUS281117

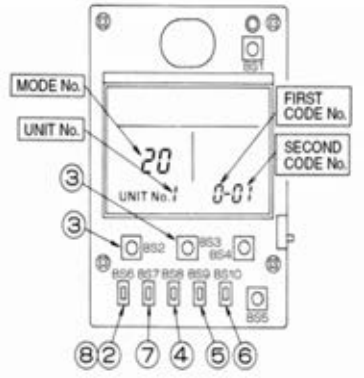
Programming Field Settings for Indoor Units

1. Press any button to continue
2. Press the **Cancel** button for 5 seconds until the Service Settings screen is displayed
3. Press the **Down** arrow until **Field Settings** is highlighted
4. Press the **Menu/OK** button
5. Press the **Up or Down** arrow until **12** is shown under **Mode**
6. Press the **Right or Left** arrows until **1-*** is highlighted
7. Press the **Up or Down** arrow until **03** is shown
8. Press the **Menu/OK** button
9. With the Yes highlighted, press the **Menu/OK** button again
10. Press the **Cancel** button
11. Press the **Cancel** button
12. Once connection is checked display will return to normal, back light will go out

BRC1E72

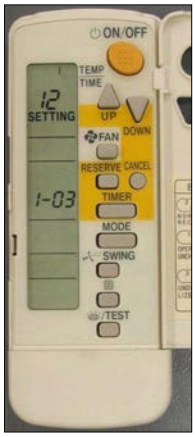
Field Settings for Simplified Controller

- Remove cover from the controller
- Press BS6 Button to enter Field Settings
- Press BS2 and BS3 to select the Mode No.
- Press BS9 to select the First Code No.
- Press BS10 for the Second Code No.
- Press BS7 to Set the field Setting code
- Press BS6 to confirm (88) and return to Normal Display



Field Settings for Wireless Controller

- To enter the Field Setting Mode press the **TEST** button for 5 sec. The display will change to **"00"**
- Press the **MODE** button until the desired first **Code Number** appears
- Press the **UP** button to set the first number
- Press the **DOWN** button to set the second number
- Press **RESERVE** button to lock in the field setting
- Listen for the **"Beep Beep"**
- Press **TEST** button twice



Setting Fan Static on FBQ

To use Auto Airflow Adjustment follow these steps

1. Turn remote control ON and select Fan Mode
2. Select desired fan speed;
3. Turn remote control OFF
4. Enter Field Setting 11(21) 7-03 (11 or 21 will depend on Group or Individual setup)
5. Exit Field Settings and turn remote control ON. Operation light will turn ON and unit will go into Auto Airflow Adjustment Mode. This will run for 1 to 8 minutes. Once complete the unit will shut OFF automatically.
6. After unit shuts down check to see that Field Setting 21 7-03 has changed to 21 7-02, this indicates successful completion of Auto Airflow Adjustment
7. If code did not change repeat process
8. If Auto Airflow Adjustment will not complete, check for closed/blocked vents and or improper ductwork size.
9. If you choose to manually set static instead, set 11(21) to 7-01 (OFF)

MODE NO.	FIRST CODE NO.	Setting contents
11 (21)	7	Airflow adjustment
SECOND CODE NO.		
01	02	03
OFF	Completion of airflow adjustment	Start of airflow adjustment

Manually Set Static on FTQ & FFQ-P Unit

- To change the static setting a field setting must be programmed at the remote controller
- From Remote Controller go to Field Setting 13(23) 6 - **
- Select Mode 13, First Code 6, and then the required static for the application

NOTE:

FBQ18/24/30/36/42PVJU cannot be set to 0.12 inWG.

FTQ is factory set @ .40 ESP

External Static Pressure	MODE NO.	FIRST CODE NO.	SECOND CODE NO.
0.12 inWG (*1)	13 (23)	06	01
0.20 inWG			02
0.24 inWG			03
0.28 inWG			04
0.32 inWG			05
0.36 inWG			06
0.40 inWG			07
0.44 inWG (*2)			08
0.48 inWG (*2)			09
0.52 inWG (*2)			10
0.56 inWG (*2)			11
0.60 inWG (*2)			12
0.64 inWG (*2)			13
0.72 inWG (*2)			14
0.80 inWG (*2)			15

Setting Ceiling Height on FCQ-P Unit

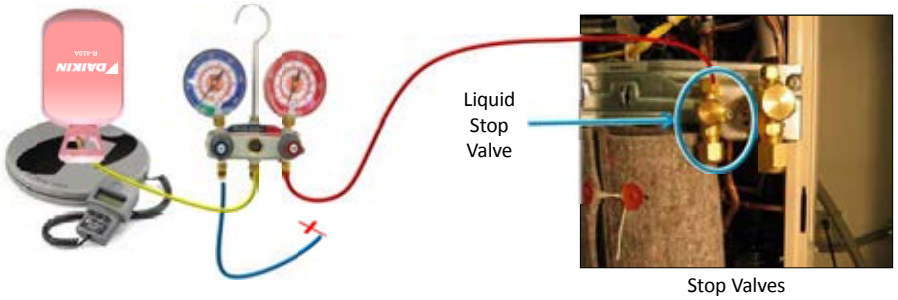
- To change setting from **Standard**, **High 1** or **High 2**, a field setting must be programmed at the remote controller
- From Remote Controller go to Field Setting 13(23) 0 - **
- ** = 01 - Standard, 02 - High 1, 03 - High 2
- Follow Control Field Setting Programming instructions

		FXFQ - PVJU		Mode No. Note) 1	FIRST CODE NO.	SECOND CODE NO.
		09 · 12 · 18 · 24 · 30 type	36 · 48 type			
Ceiling height (ft.)	Standard - All round outlet	≤ 8-3/4	≤ 10-1/2	13 (23)	0	01
	High ceiling 1	8-3/4 - 10	10-1/2 - 12			02
	High ceiling 2	10 - 11-1/2	12 - 13-3/4			03

Additional Refrigerant Charge – Charging Connections

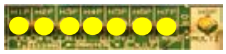
If all refrigerant can not be added at end of evacuation procedure of unit, follow these steps to add the balance of additional charge.

- Leave refrigeration gauges connected liquid stop valve
- Low pressure gauge does not need to be connected for charging



Stop Valves

Additional Refrigerant Charge – Steps

Light positions before you start	
Press and hold down the **MODE** button for 5 seconds	
Press **SET** button 20 times H1P(0) + H3P(16) + H5P(4) = 20 Refer to page 30 for Binary Code	
Press the **RETURN** button once	
Press the **SET** button once to turn on	
Press the **RETURN** button once to lock on	
Press the **RETURN** button once to activate the setting	

Add Refrigerant NOW. Refer to previous page for details.
During this mode lights will change pattern, this is normal

On completion press **MODE** button once to return normal mode	

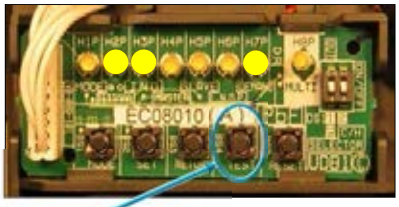
Check Operation Mode

Be sure that indoor remote control is in the OFF position prior to entering the Check Operation Mode. Failure to do so will result in an error code

- After the initialization period has elapsed, and all indoor unit(s) have been counted the unit can be placed in Check Operation Mode
- Check Operation Mode checks for the following:
- Check for wrong wiring
- Stop valve closed
- Check refrigerant for over charge
- Pipe length automatic judgment
- To enter Check Operation Mode, press and hold the "TEST" button (BS4) down for 5 seconds or until lights change pattern and BRC1E71 and BRC2A71 have the following displays

BRC1E72

BRC2A71



If H2P & H3P come on solid after "TEST" button is held for 5 seconds check remote for error code

Check Operation Mode Cont.

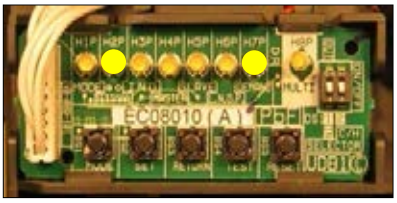
- Check Operation Mode can take approx. 15 to 30 minutes. The LEDs will follow the lighting patterns shown on the next page

NOTE: The system always runs in Cooling Mode during Check Operation Mode

- Check Operation will may not function if the outdoor ambient temperature is 23°F or below

BRC1E72

BRC2A71



Check Operation Mode Sequence

Start	**Normal State**	Hold test button for 5 seconds	
Step 1	**Pressure Equalization**	10 sec to 10 minutes	
Step 2	**Cooling Start Control**	20 sec to 2 minutes	
Step 3	**Stop Valve Close Check**		
Steps 4-8	**Judgment Function**	▪ Wrong wiring check ▪ Correct refrigerant charge check ▪ Piping length check	
Step 9	**Pump Down Residual Operation**	5 minutes	
Step 10	**Stand by for Restarting**	5 minutes	
Finish	**Completion**		

Check Operation Mode

- **Status of indoor remote control during check operation**
  - ON/OFF light is ON
  - Centrally Controlled icon is displayed
  - **Test Operation** is shown in the lower left corner (BRC1E71 Only)
  - BRC1E72 display will change from **Fan to Cool Mode** automatically during Check Operation Mode
  - Cooling Mode is displayed
  - Wireless Controller's display does not change during Check Operation Mode

BRC1E72

BRC2A71

Check Operation Mode Complete

When Check Operation Mode is complete:

- H3P is solid on Condenser Main PCB
- Controller will return to normal display and ON/OFF light will be OFF

BRC1E72

BRC2A71

Check Operation Mode Error

If an error occurs during check operation:

- H2P & H3P are ON solid on outdoor PCB
- ON/OFF light flashes on BRC1E/BRC2A
- When error occurs on BRC1E72, user must push **Menu/OK** button for more details of error
- Error code shows in the lower left corner of the display (BRC2A)
- The condition that caused the error must be corrected so the Check Operation Mode can be restarted and completed

BRC1E72

BRC2A71

Check Operation Mode Error Code Chart

This chart lists several error codes that may occur during the Check Operation Mode

Error Code	Installation Error	Remedial Action
E3, E4, F3, F6, UF	The stop valve of an outside unit is left closed.	Open stop valve.
U1, U4, LC	No power is supplied to an outdoor , BS or indoor unit (including phase interruption).	Check if the power wiring for the outside, inside units are connected correctly.
UF	There is a conflict on the connection of transmission wiring in the system.	Check if the refrigerant piping line and the unit transmission wiring are consistent with each other.
E3, F6, UF	Refrigerant overcharge.	Recalculate the required amount of refrigerant from piping length and correct the refrigerant charge level by refrigerant recovery machine.
E4, F3	Insufficient refrigerant.	Check to see if additional refrigerant charge has been finished correctly. Recalculate the required amount of refrigerant from piping length and then add the adequate amount of refrigerant.
U3	The check operation has not been preformed.	Perform the check operation.

Use Monitor Mode 14 to Find Error in Outdoor Unit

Monitor Mode 14 can tell you the error in the outdoor unit. Follow the below procedure and refer to the Service Manual for more detailed information

Light positions before you start →

Press the **MODE** button once →

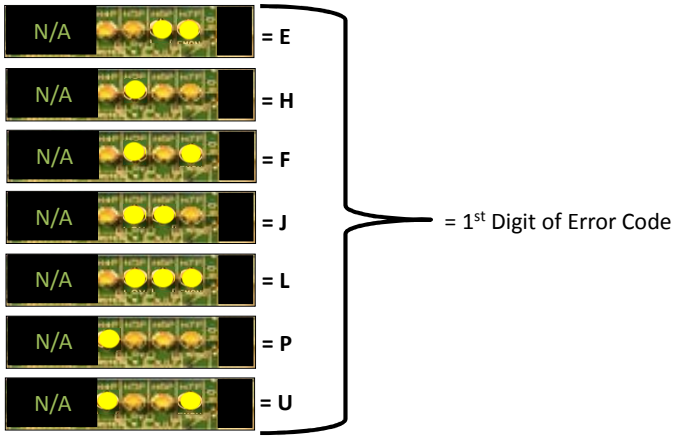
Press **SET** button 14 times
H1P(0) + H4P (8) + H5P(4) + H6P(2)= 14
Refer to page 30 for Binary Code →

Confirmation 1. Press the **RETURN** button once to display "First digit" of malfunction code → See Next Page for First Digit of Error Code

Confirmation 2. Press the **SET** button once to display "Second digit" of malfunction code → See Page After for Second Digit of Error Code

Confirmation 3. Press the **SET** button once to display "malfunction location" This may not apply to Error, refer to unit's Service Manual for more information →

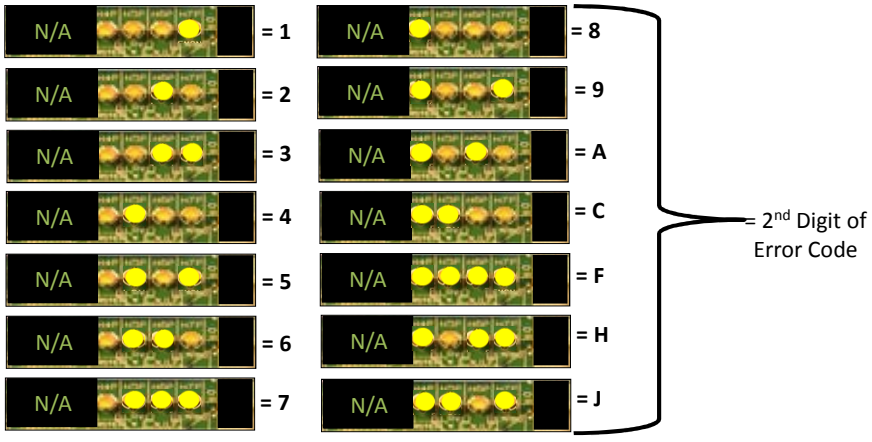
Use Monitor Mode 14 to Find Error in Outdoor Unit Cont.



Continued on next page

Use Monitor Mode 14 to Find Error in Outdoor Unit Cont.

Put 1st & 2nd digit together for error code and then refer to Service Manual for unit for further troubleshooting



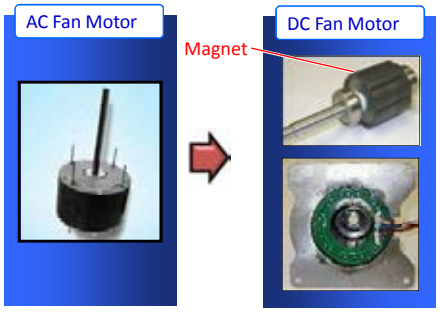
Technology

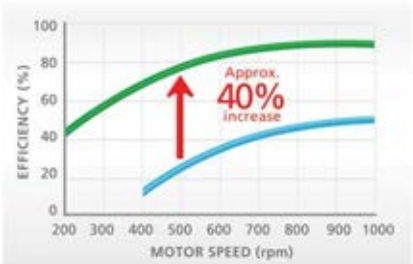
DAIKIN

DC Fan Motor Efficiency

DAIKIN

Increased efficiency compared to conventional AC induction motors, especially at medium to low speeds





DC Motor AC Motor

Silent Operation

Smooth Air Inlet Bell Mouth
Smooth inlet bell mouth added guides to the bell mouth intake to reduce turbulence in the fan blades.

31 to 70 Watt Fan Motor

Aero Spiral Fan
The bent fan blade edges control air eddies of blade edge, and drastically reduce operation sound.

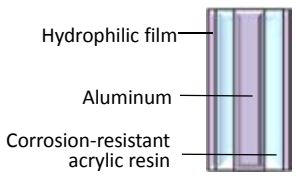
Smooth Inflow

PE Acrylic Resin Fin Coat

	Corrosion Resistance Rating	
	Non-treated	Anticorrosion treated
Salt corrosion	1	5 to 6
Acid rain	1	5 to 6

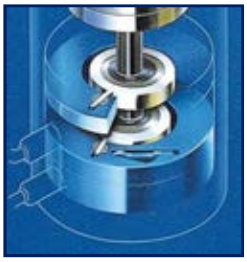
5 to 6 times the corrosion resistance compared to standard non-coated fins

Galbarium metal base pan for maximum rust and corrosion protection



Daikin Swing Compressor

"Piston" with an integrated roller and blade
➔ Reduced refrigerant leakage & Increased efficiency



Adopted cylinder structure is less susceptible to heat-transfer and deformation.

Rotary

Swing

Single swing for size 9,000-12,000 Btu/hr
Double swing for size 15,000-32,000 Btu/hr

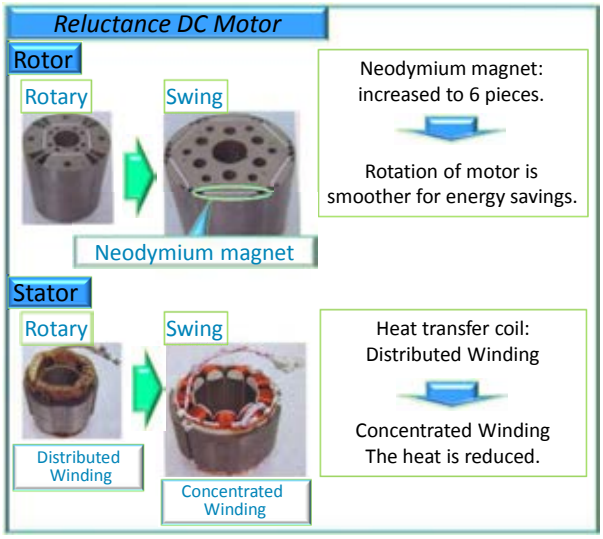
FEATURES	*BENEFITS*
Smooth rotation, little friction Smooth piston motion Few parts rubbing each other	High operation efficiency, energy savings Low vibration, low noise High performance, High reliability

Daikin Swing Compressor

- Large energy savings
- Smooth rotation with little friction and refrigerant gas compression with low loss, allowing high operation efficiency
- Low vibrations and low noise
- High durability
- Fewer moving parts during operation, achieving high performance and reliability

Single or Double Swing

Reluctance DC Motor

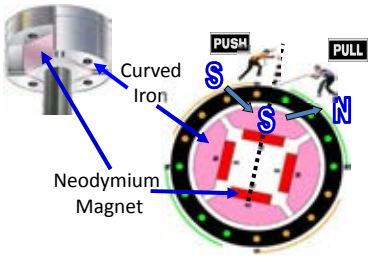


Digitally Commutated Compressor

- Digitally Commutated (DC) Motor
- Neodymium magnet in the rotor – Up to 10 times stronger than ferrite magnets
- Increased power & decreased energy usage

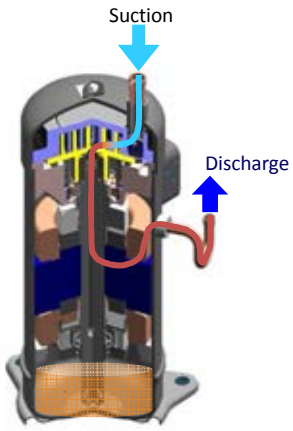
Reluctance DC Motor

- Rotating stator field
  - Electrical field is in the stator not the rotor; no need for brushes
- Based on the principles of a direct current motor
- Uses neodymium magnets
- Benefits from an additional reluctance torque when loaded
- Extreme high performance in low and medium RPM
- At start max. torque for min. current

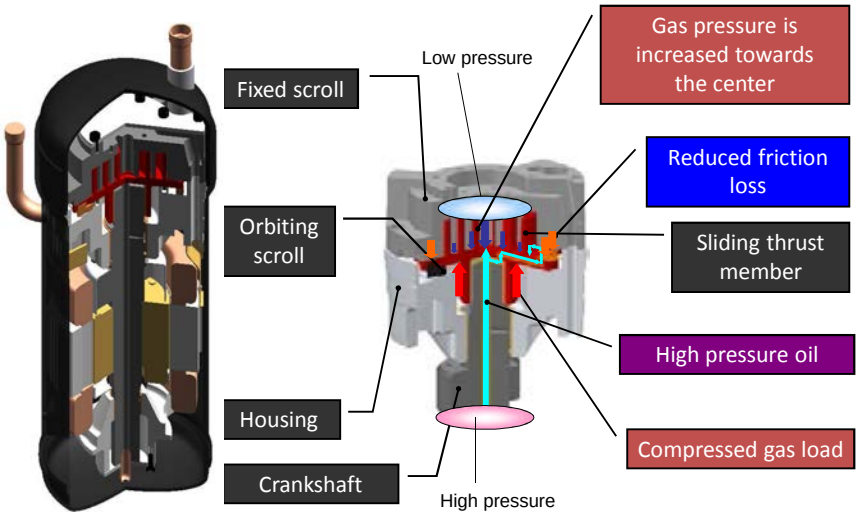


Daikin Scroll Compressor

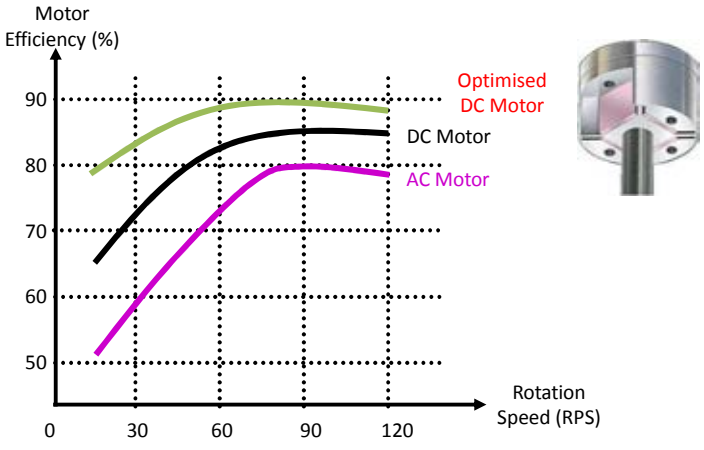
- Reluctance DC (Digitally Commutated) motor
- Optimized scroll (R-410A)
- High pressure shell
- Stronger shell material
- Improved sealing
- Stable oil temperature
- Improved efficiency
- Improved reliability



Daikin Scroll Compressor



Reluctance Digitally Commutated Motor



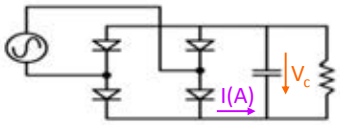
Inverter Technology

An Inverter is:

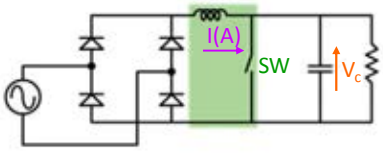
- A variable frequency drive that changes the electrical frequency applied to an electric motor [VFD]
- Inverter drive technology is used to vary the HVAC system's operating capacity to match the Heating or Cooling load.
- The inverter drive controls compressor speed like a throttle controls an automobile's engine speed.
- The Inverter varies the applied frequency based on a number of system temperature sensors and the temperature set point.

Pulse Amplitude Modulation

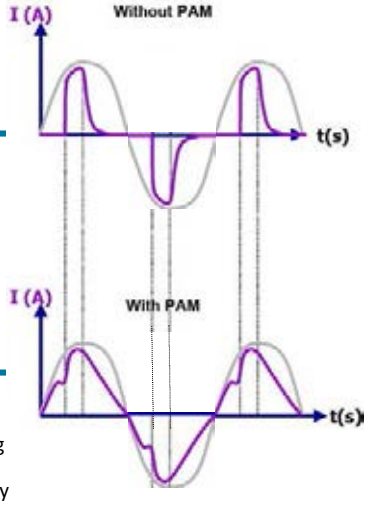
Pulse **A**mplitude **M**odulation



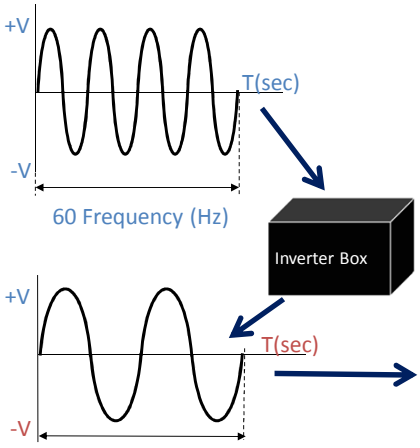
Standard rectifier circuit (without PAM) provides a smooth, steady voltage. However, under peak load conditions, efficiency is lost due to modulation of the current wave.



Daikin rectifier circuit (with PAM) adds a coil and switching contact that cycles at 20 kHz. This creates an improved current wave resulting in 10% higher compressor efficiency than standard inverter systems.

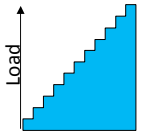


Inverter Drive



- The Daikin inverter control converts the incoming AC voltage to DC voltage
- The inverter then smoothes the sine wave to smooth motor rotation
- Reconverts the DC voltage to 3 phase AC voltage to the compressor
- Frequency applied to the compressor motor to modulate the rotational speed which increases or decreases system capacity

Multi-Step Principle



Multiple capacity steps
Applied frequency

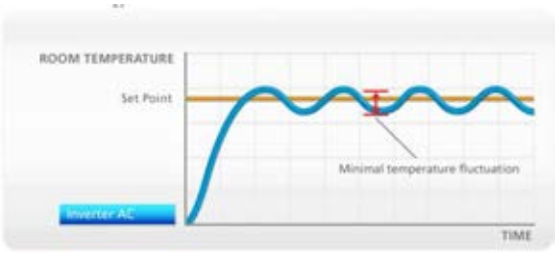
Inverter Benefits

- High Efficiency in Part-Load conditions
- Very low startup amperage
- No locked rotor amps
- No stress on windings or compressor frame
- No “light flicker”
- Lubrication of bearings increases before speed increase
- System pressures increase gradually reducing noise and stress on piping
- Quiet compressor startup
- Better Dehumidification
- Fewer start/stop cycles
- As room temperature nears set point capacity is automatically reduced

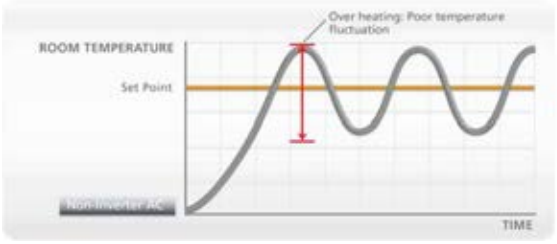
Additional Inverter Benefits

- Electronic control of the compressor
  - High outdoor ambient temperature
    - Temperature sensors identify high temperature condition
      - Compressor speed is electronically reduced to limit high side pressure and energy usage
  - Reduces energy usage during peak conditions
- Higher heating performance
  - Compressor increases speed during cold outdoor ambient conditions
    - Generates higher head pressure, discharge gas temperatures and discharge air temperatures
  - Achieves competitive heat output as systems with electric heat strips without using the extra energy

Inverter Benefits



Inverter Technology



Non-Inverter Technology

RZQ/RZR SkyAir Compressor Capacity Control

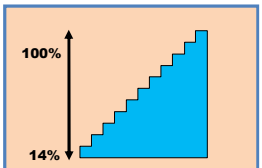
Control System

- Sets Target low & high pressure values at the Condenser
- Sets the Target evap. & cond. Temps in the indoor Fan Coil
- Local Remote Controller initiates a system Thermo-ON with a 1° deviation from set point
- Local Remote Controller initiates a system Thermo-OFF when all set points are reached

Condenser Control

- **COOL** Operation
  - Detects the system operating suction pressure at the out door unit once every 20 seconds & Target Evap temp
- **HEAT** Operation
  - Detects the system operating high pressure at the out door unit once every 20 seconds & Target Cond temp

Inverter Control
Adjusts compressor speed (capacity) up or down to correct deviation from the target pressure values (system load)

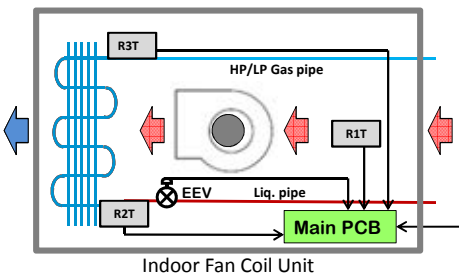


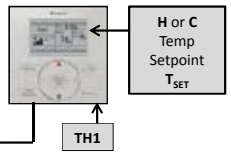
RZQ/RZR SkyAir Electronic Expansion Valve Control

RZQ/RZR SkyAir fan coils have 3 thermistor sensors

- The sensor signals are used to regulate refrigerant volume through the fan coil using Proportional, Integral & Derivative (PID) control, to correct deviation from target temperature values by adjusting the Electronic Expansion Valve in pulsed signal to modulate the position

SENSOR LEGEND
R1T: Return Air
R2T: Saturated Liquid Pipe
R3T: Gas Pipe
TH1: Remote Controller Sensor
T_{SET}: Remote Controller Set Point





RZQ/RZR SkyAir Basic Fan Coil Control

- **Blower cycling**
  - Constant Fan – User selectable speeds: L – H – (HH)
    - COOL mode – User selectable (Thermo-ON & Thermo-OFF)
    - HEAT mode – Thermo-ON - User selectable / Thermo OFF – LL
  - Fan Auto Setting ("P" series fan coils only)
    - Blower cycling may be reprogrammed in the field
- **Electronic Expansion Valve**
  - Modulates from 0 to 2000 pulses (PID control)
    - COOL mode
      - Thermo-ON - Modulates to maintain target superheat temperatures
      - Thermo-OFF – Closes (0 pulse)
    - HEAT mode
      - Thermo-ON – Modulates to maintain target subcooled temperatures
      - Thermo-OFF – Minimum Open (200 pulses approx)
- **Condensate Lift Pump**
  - COOL Thermo-ON – Constant operation
  - COOL Thermo-OFF- 5 minute residual operation then OFF
- **Control PCB (A1P)**
  - Field Settings programmed from RC reside in permanent memory
  - Contains unit control address and Group Address

Topics

- DIII-Net SkyAir Products, Controls Options, & Applications
- SkyAir Nomenclature
- Technology
- Installation Best Practices
- Optional Accessories
- DIII-Net SkyAir Installation & Commissioning
- Troubleshooting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