



Daikin VRV
Installation & Commissioning

Participant Guide

***Daikin VRV* Installation & Commissioning**

Agenda
Training Modules
Training Materials
Simulator Exercises



- ☐ **Class Introduction**
 - ☐ Training Agenda & Handout Review
 - ☐ **VRV Prod. & Tech Review** presentation
 - ☐ **Basic VRV Installation** presentation
 - ☐ VRV^{III} Component Control Wiring Exercises
 - ☐ **Basic VRV RC Installation & Configuration** presentation
 - ☐ Remote Controller Simulator Exercises
 - ☐ **VRV^{III} Commissioning Guide** presentation
 - ☐ VRV^{III} Commissioning Exercises – PCB Simulator
 - ☐ **Class wrap-up**
 - ☐ Training Surveys
 - ☐ **Training End**
-



Slide Presentation Modules

VRV Prod & Tech Intro Review

VRV Basic Installation

Basic VRV Remote Controller Installation & Configuration

VRV^{III} Commissioning Guide

Materials

Simulators

Remote Controller CD or DACA Controls Simulator Box

VRV^{III} Control PCB CD

Printed Handouts

VRV^{III} / VRV^{III}-S Service Manuals

VRV-^{WIII} Service Manual (optional)

VRV RC Install & Config. Booklet

Basic VRV Installation

^{DIII}-Net Wiring Quiz & Component Wiring Exercises

VRV Field Settings

VRV^{III} Commissioning Guide booklet

VRV-^{WIII} Commissioning Guide booklet

Misc. Materials

Colored Pens or Pencils (Black – Blue – Red)

Extra ^{DIII}-Net Wiring Quiz & Component Wiring Exercises

DIII-Net Control Wiring Exercises



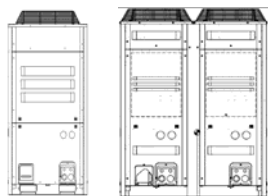
Exercise #1

Write in your answers

1. VRV DIII-Net Control Wire Specification:

Indicate the *DIII-Net* Control Wire Specification

2. Control Terminal Designations on VRVIII HP & HR Condensers:



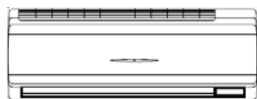
Indicate the Control Terminal Designations

3. Control Terminal Designations on BSVQ Single Branch Selector Boxes:



Indicate the Control Terminal Designations

4. Control Terminal Designations on VRV Fan Coils:



Indicate the Control Terminal Designations

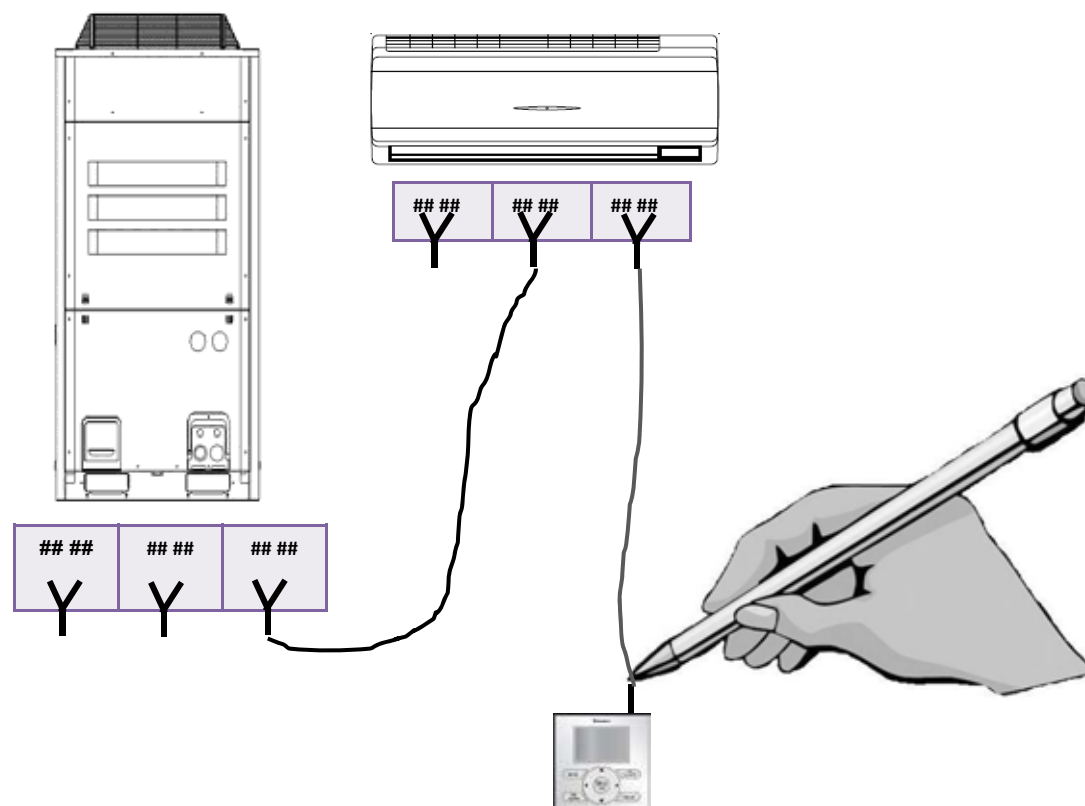
5. Control Terminal Designations on BRC1E71 and BRC2A71 Remote Controllers:



Indicate the Control Terminal Designations

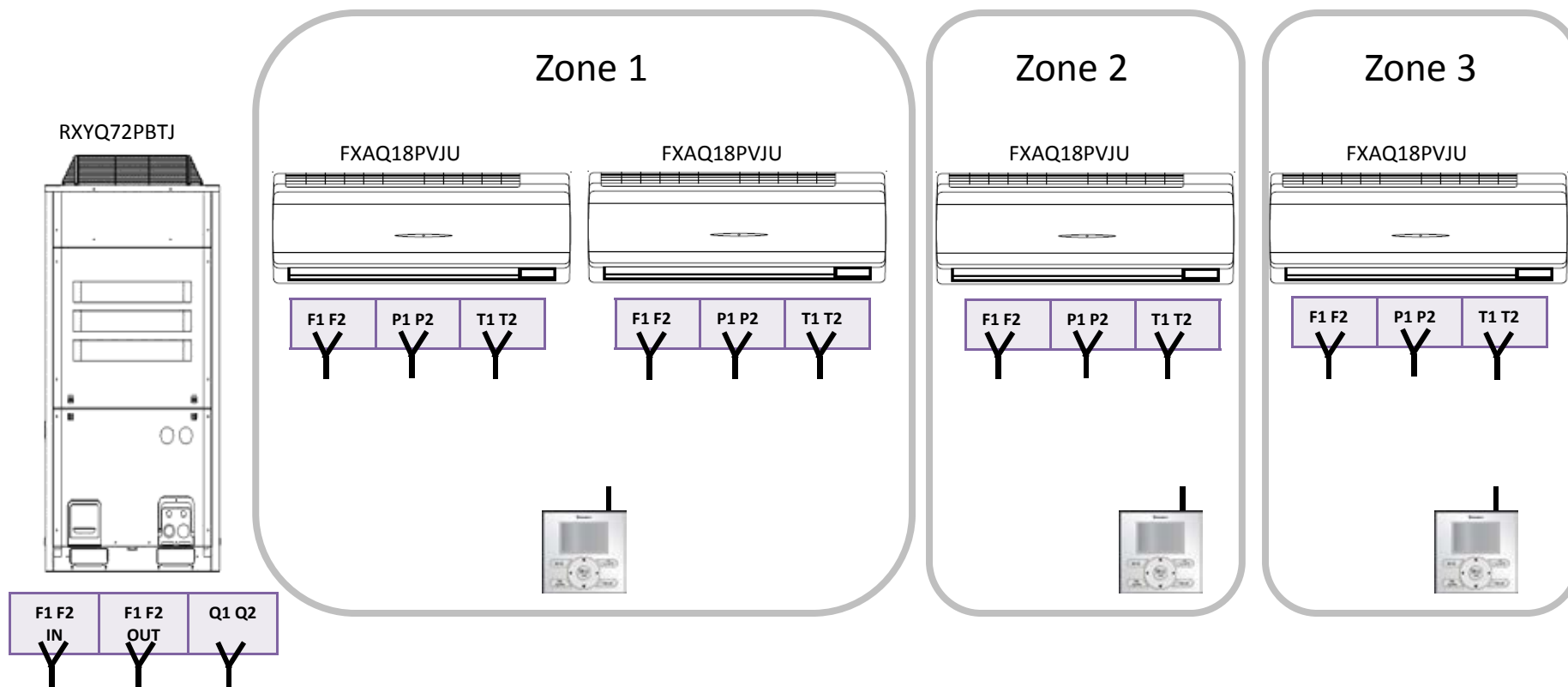
DIII-Net Wiring Exercise Example

Draw in each circuit using a different color pencil or pen from component terminal to component terminal to indicate each control circuit – Indicate the “Daisy-chain” wiring where required.



Exercise #2

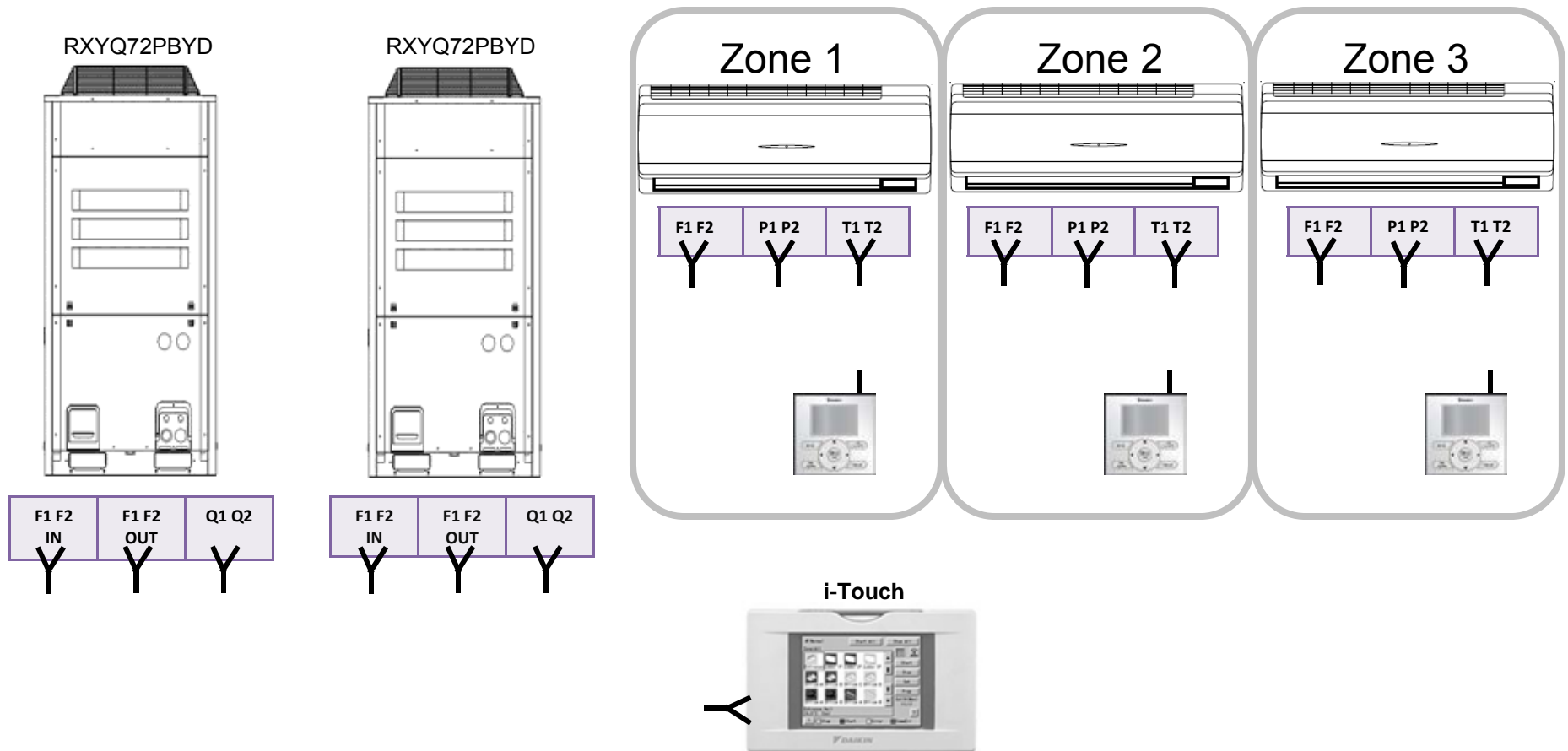
6 Ton Heat Pump with 3 zones



Exercise #3

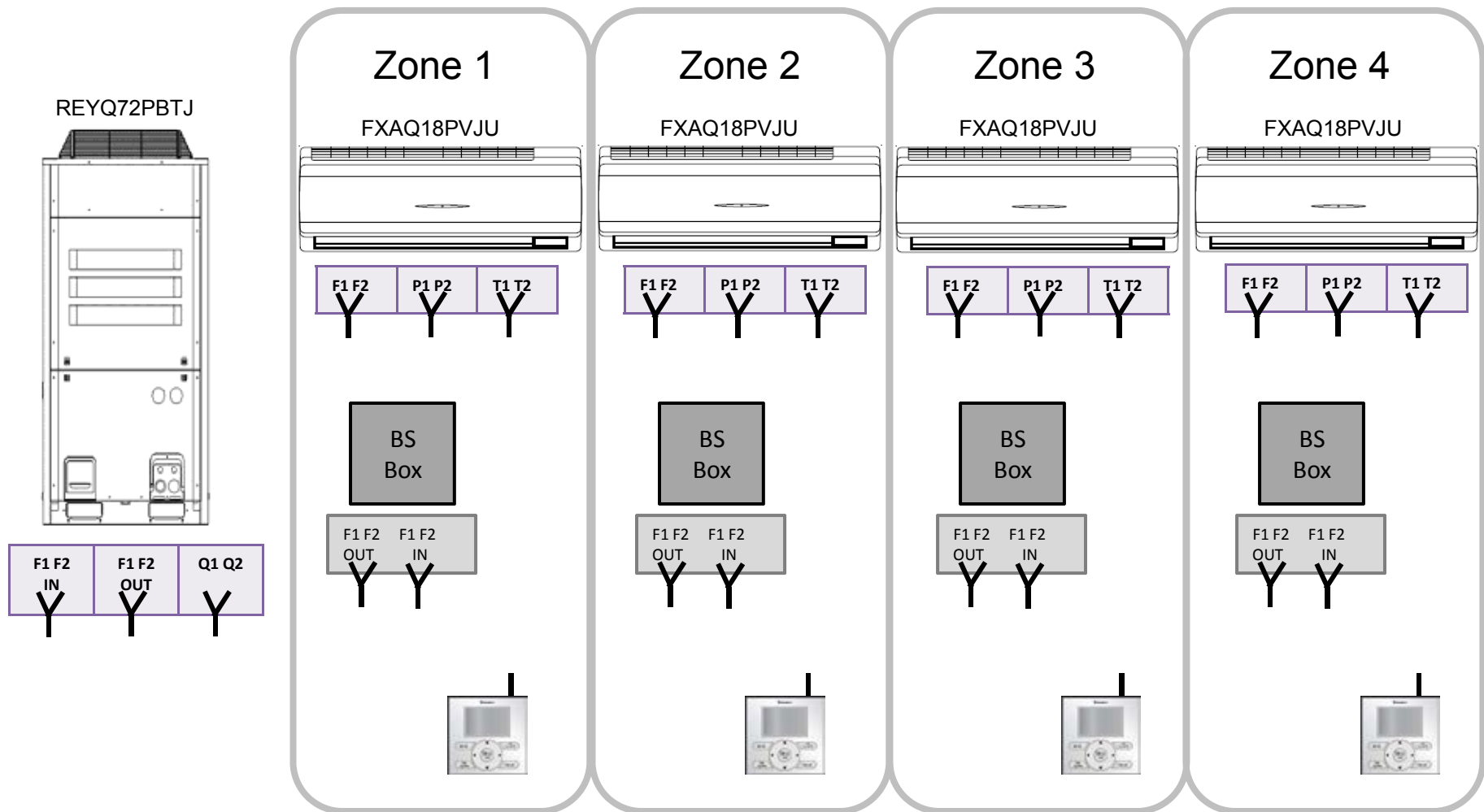


12 Ton Manifolded Heat Pump with 3 zones and i-Touch Multi-Zone Controller



Exercise #4

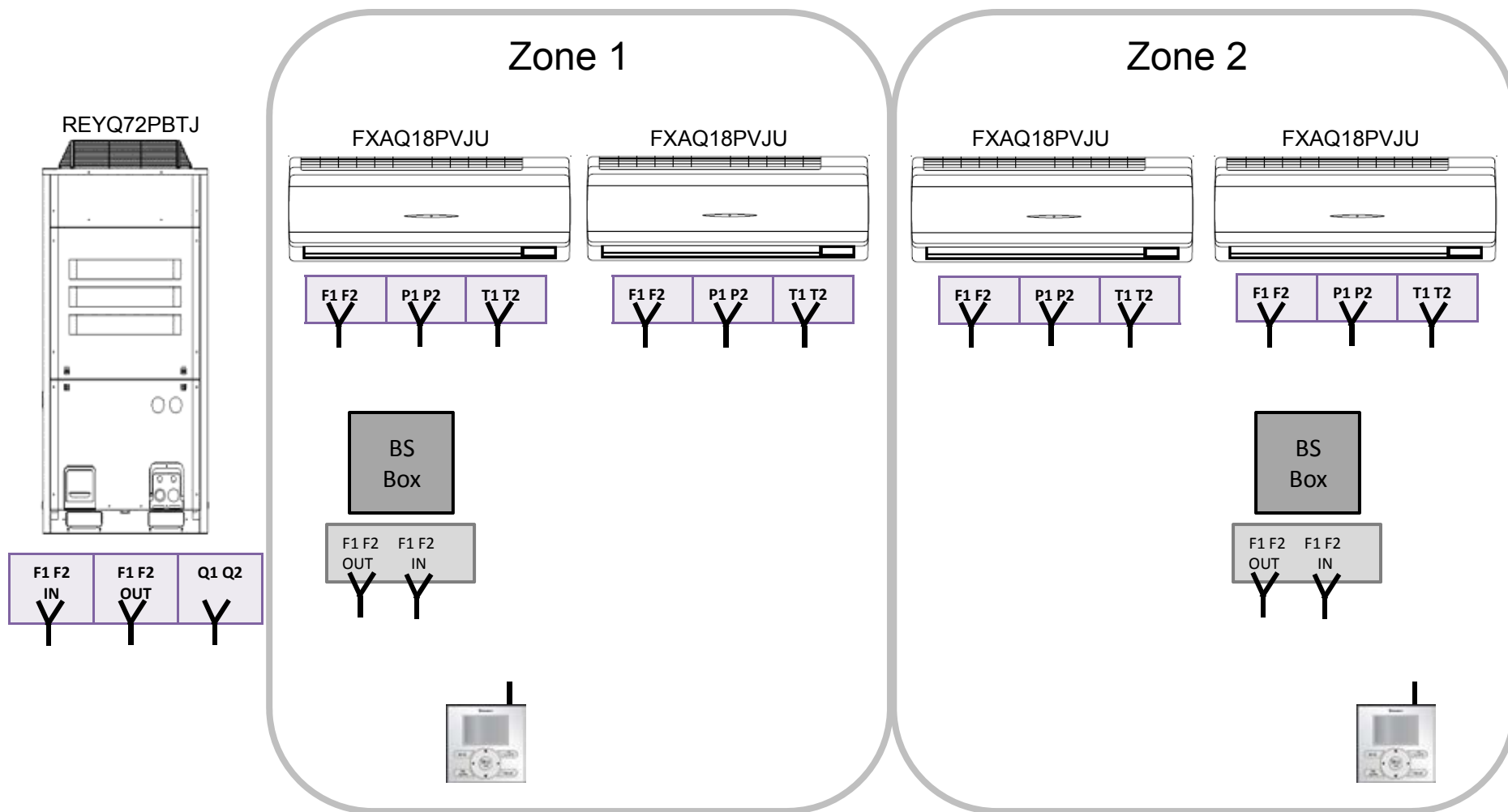
6 Ton Heat Recovery with 4 zones



Exercise #5



6 Ton Heat Recovery with 2 Zones



BRC1E71 Remote Controller Simulator Exercises



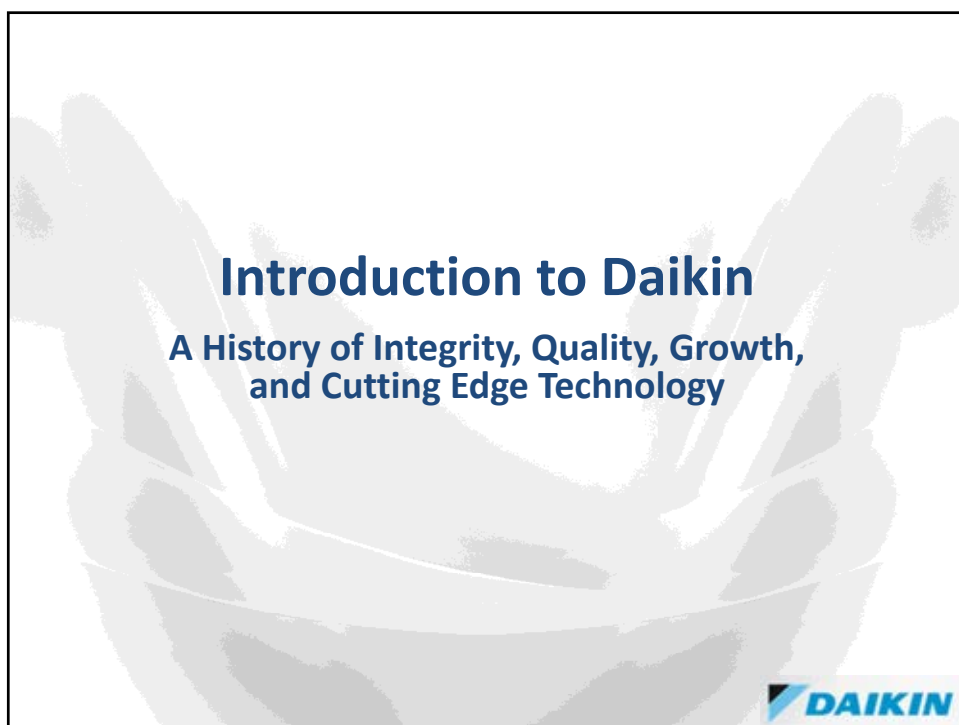
- ☐ Turn Controller Simulator ON or load Controller Simulator CD
 - ☐ Verify the power-up sequence on the NAV Remote Controller
 - ☐ Change the Main Display from “STANDARD” to “DETAILED”
 - ☐ Room Temp
 - ☐ Date & Time
 - ☐ Day of week
-
- ☐ Use the “Field Settings Table” handout sheet for the following exercises
 - ☐ Change the Field Setting for “Priority of thermistor sensors for space temperature control” **TO:**
“Only the Return Air Thermistor will be used”
 - ☐ Change the “T1 T2” Field Setting **TO:** “ON/OFF” Operation
 - ☐ Verify Field Setting Changes
-



***VRV* VIII PCB “CD” Simulator Commissioning**

***VRV* VIII Commissioning Guide**

- Pg. 44 Verify “Initialization” Operation**
 - Pg. 56 Counting Indoor Fan Coil Units**
 - Pg. 58 “Forced Fan On” Mode**
 - Pg. 60 Counting Branch Selector Boxes**
 - Pg. 75 “Additional Refrigerant Charge” Mode**
 - Pg. 106 “Refrigerant Recovery/Evacuation” Mode**
 - Pg. 91 Initiate “Check Operation” Mode**
-



Learning Objectives



- Basic understanding of Daikin's history
- Understand Daikin's position in the global marketplace
- Understand Daikin's commitment to the environment and the industry
- Know what other resources are available to you and how to use them to your advantage
- Understand where to go for sales and technical support

© 2014 Daikin North America, LLC

Slide 3

About Daikin

Introduction



About Daikin

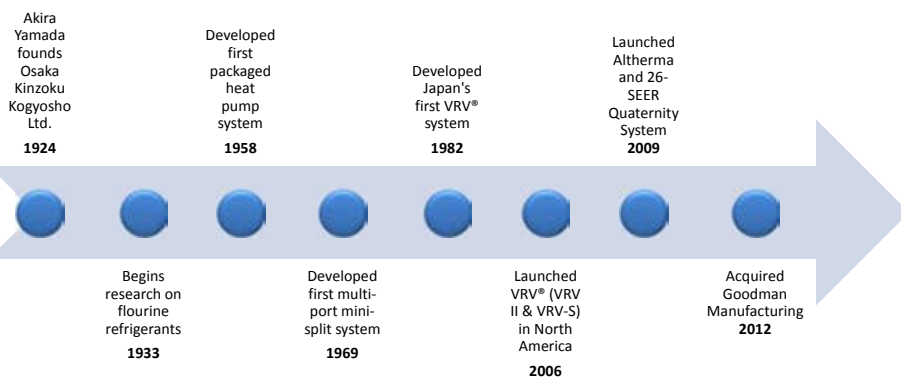


Daikin is a comprehensive global HVAC manufacturer offering extensive products, including ducted and ductless air-conditioning and heat pump systems for residential and commercial applications as well as large-sized HVAC systems for buildings and factories.

© 2014 Daikin North America, LLC

Slide 5

History (1924 - Present)



© 2014 Daikin North America, LLC

Slide 6

2014 - Unveiling of VRV IV




2014 Daikin Releases VRV IV

© 2014 Daikin North America, LLC

Slide 7

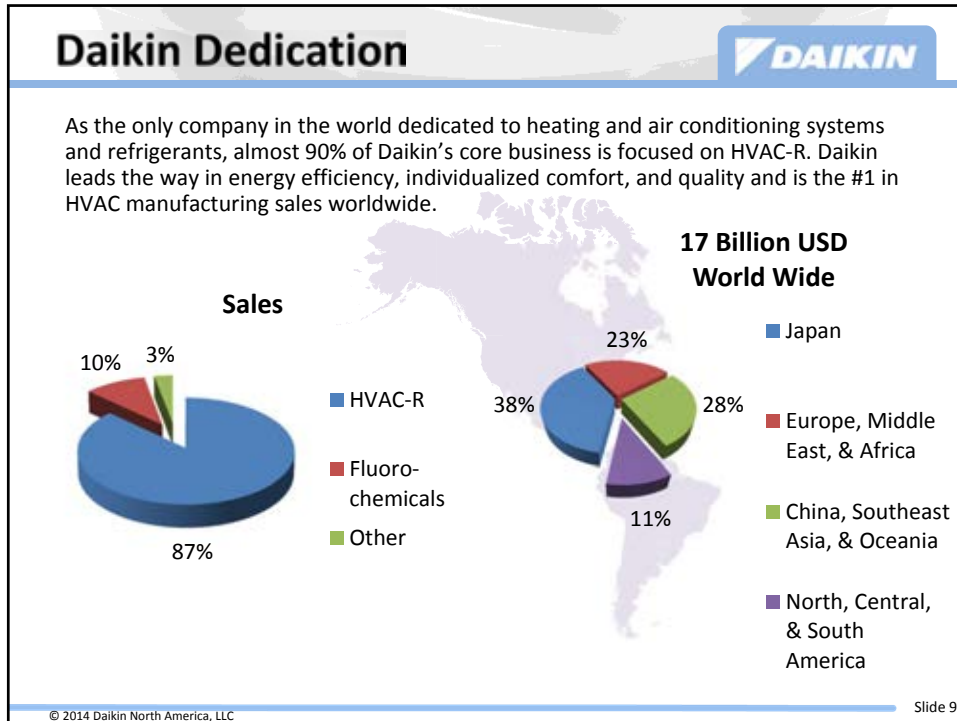
Daikin Quality



- Daikin is committed to providing homes, businesses and industry with the most efficient HVAC solutions to meet your cooling and heating needs, today and in the future.
- We are keenly aware of our responsibility to protect the environment in everything we do, and all our policies, practices and processes are developed and implemented with environmental sustainability at their heart. We conduct our business in accordance with green principles because it makes sound economical, as well as ecological sense.

© 2014 Daikin North America, LLC

Slide 8



Daikin's Investments



Who has made the largest investment in the North American HVAC industry over the last 8 years? *Daikin.*













© 2014 Daikin North America, LLC Slide 10

Trust & World-Class Support



Heating and Cooling Comfort
A Solution to All Your Residential Needs

INNOVATIVE PRODUCTS FROM THE #1 HVAC COMPANY IN THE WORLD
Unprecedented flexibility with your HVAC configurations — almost any application is covered

SUCCESS STORIES
Daikin helps buildings and businesses improve

Dr. Daikin Diagnosis
Enter Code: A3

A3 Error Details
Indoor Unit
Malfunction
Malfunction of drain-reversal control system
Causes
Drain pipe clogging, improper drain piping work
Defect of drain pump
Defect of float switch

Applis
Sketch
3D
BIM

Document Library
Specs Part Information
Daikin University
List Courseware
General Information

© 2014 Daikin North America, LLC

Slide 11

Daikin's Social Responsibility



- Recover – Recycle – Reclaim – Reuse
- Partnerships with AHRI, ASHRAE and others





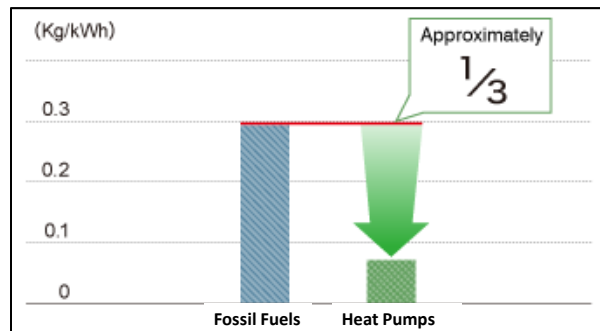

© 2014 Daikin North America, LLC

Slide 12

Environment



Reduce CO₂ with Heat Pump Systems



© 2014 Daikin North America, LLC

Slide 13

Daikin North America Introduction



Daikin North America – Our Vision



Our vision is to be the premier provider of the highest quality air conditioning products, systems, services, and solutions in North America by focusing on outstanding, long-term customer service.

To accomplish this, we will continue to hire the best people, always conduct our business easily and fairly, and operate with the highest degree of integrity in all business practices.

In order to attract and retain the best people, we are committed to providing the best training and creating an atmosphere of teamwork where we help each other grow.

© 2014 Daikin North America, LLC

Slide 15

Daikin Locations



Daikin North America
Technical Service & Training Center
Carrollton, TX

© 2014 Daikin North America, LLC

Slide 16

Daikin Sales/Service Locations



Daikin North America
Western Regional Sales & Training Center
Irvine, CA

© 2014 Daikin North America, LLC

Slide 17

Daikin Sales/Service Locations



Daikin North America
Eastern Regional Sales & Training Center
Long Island City in Queens, NY

© 2014 Daikin North America, LLC

Slide 18

Daikin University Website





[Create New Account](#)
[Contact Administrator](#)

Daikin University: More than Just ELearning!

Recent Announcements

Important Tips/Info

Dealers - Be sure to list your dealer number in your profile! Go to My Profile, Professional Tab to update.

Have questions?
Send an email to: training@daikinac.com

Login ID

[Forgot Login ID?](#)

Password

[Forgot Password?](#)

Log In

© 2014 Daikin North America, LLC

Slide 19

Daikin North America Sales Regions




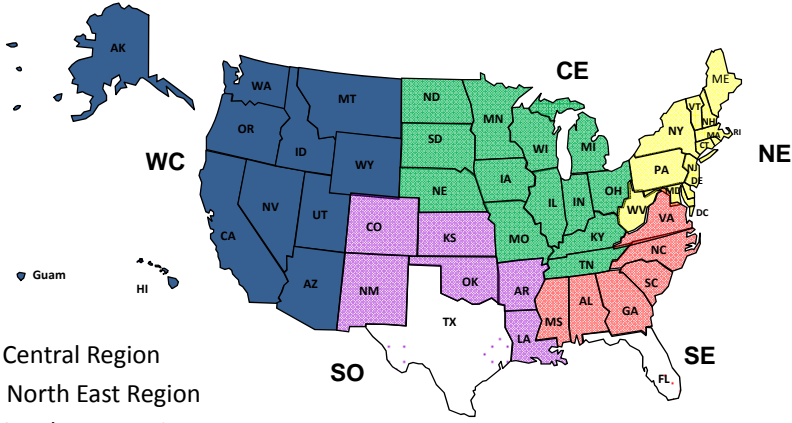


© 2014 Daikin North America, LLC

Slide 20

Daikin North America Service Regions






CE: Central Region
NE: North East Region
SE: South East Region
SO: Southern Region
WC: West Coast


© 2014 Daikin North America, LLC

Slide 21

Daikin Support




- **Literature**
 - Brochures
 - Leaflets
 - Submittals
 - Manuals
 - Engineering
 - Service
 - Installation
- **Website**
 - www.Daikinac.com
- **Daikin Representatives and Sales Support Network**




© 2014 Daikin North America, LLC

Slide 22

Daikin Support




- **Software Tools**
 - VRV Xpress
 - Energy Calc
 - TRL Technical Reference Library
 - Spare Parts Bank
 - Dr. Daikin
 - Daikin eQuip App
- **Training**
 - Product & Applications by Product Line
 - Installation & Commissioning
 - Service & Troubleshooting
 - Sales Training
 - General Courses
- **Technical Support**
 - Email: techsupport@daikinac.com or servicerequest@daikinac.com




© 2014 Daikin North America, LLC
Slide 23

Daikin eQuip App



- Daikin eQuip is designed for both smart phones and tablets. It places information in your hands quickly and easily for all of your on-the-go needs. Whether you're a Daikin partner, dealer, engineer, or just interested in the Daikin product, you can:
 - **SEARCH** product information to quickly access and download your most referenced documents.
 - **SEND** key information via email or text message (SMS) for immediate sharing.
 - **RETRIEVE** instant updates for the most up-to-date news and information on Daikin AC.



Search for Daikin eQuip in the APP store or Android Market!

© 2014 Daikin North America, LLC
Slide 24

Learning Objectives



- Basic understanding of Daikin's history
- Understand Daikin's position in the global marketplace
- Understand Daikin's commitment to the environment and the industry
- Know what other resources are available to you and how to use them to your advantage
- Understand where to go for sales and technical support

© 2014 Daikin North America, LLC

Slide 25

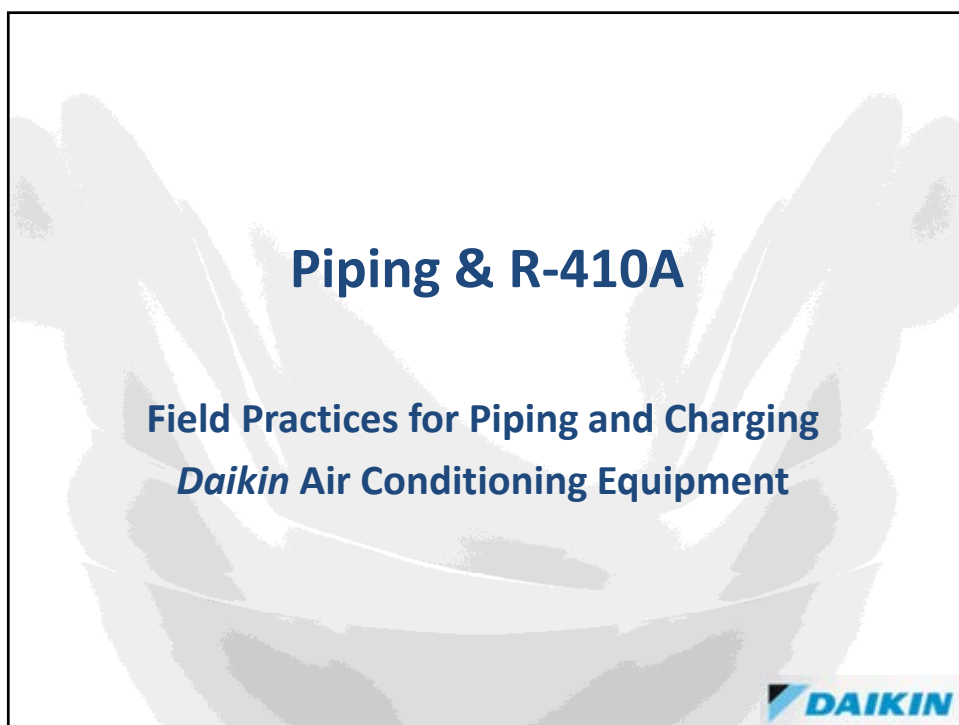


DAIKIN

COMFORT FOR LIFE

Thank You

PT-INF-1211-PP0-01C



Objectives



- Refrigerant recovery and the atmosphere
- Properties of R-410A
- PVE oil
- Identify line set components
- Daikin dedicated tools
- Flared connections

© 2013 Daikin North America, LLC

Slide 3

Objectives



- Brazing
- Standing pressure test and leak testing
- Triple evacuation process
- Pipe insulation
- Importance of liquid charging

© 2013 Daikin North America, LLC

Slide 4



Daikin Environmental Initiatives

Recover – Recycle – Reclaim - Reuse
Daikin cares for our environment



© 2013 Daikin North America, LLC Slide 5

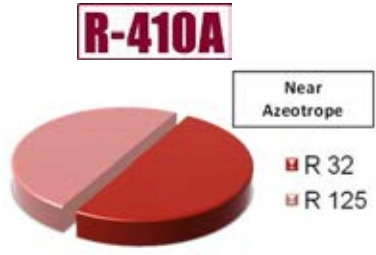
R-410A



R-410A

DAIKIN

- Developed since 1991
- Ozone friendly - No Chlorine
- Lower Significant ODP than R22
- Near Azeotrope
- 50/50 Mixture
- Temperature Glide .02° F
- Not compatible with mineral oils**
- Generally non toxic, non flammable



R-410A

Near Azeotrope



R 32
R 125

© 2013 Daikin North America, LLC Slide 7

R-410A

DAIKIN

- Recovery cylinder must be rated for R-410A
- 400 PSIG Service Pressure Rated
- 800 PSIG Test Pressure Rated
- DOT BA400, DOT BW400


R-410A

DAIKIN


Store refrigerants in a clean, dry area out of direct sunlight. Never heat cylinders above 125°F(52°C).

© 2013 Daikin North America, LLC Slide 8


R-410A Safety



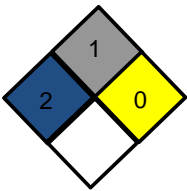
- Asphyxia
- Heavier than air
- Products of Decomposition
- Skin Irritant
- Frostbite
- Storage below 125 F
- **Do not leak test with air**




ASHRAE




HMIS®



NFPA 704



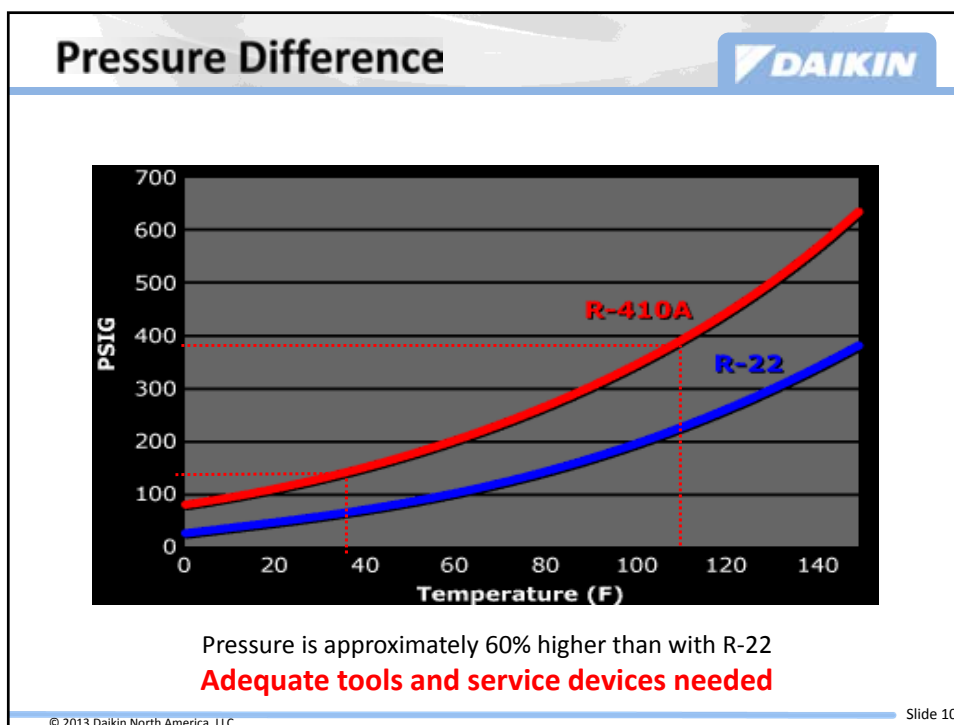
Safety Glasses



Gloves

© 2013 Daikin North America, LLC

Slide 9



Working with PVE Oil



Miscibility



R-410A & Mineral Oil



R-410A & PVE Oil

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



© 2013 Daikin North America, LLC

Slide 13

Refrigerant Lines



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.



© 2013 Daikin North America, LLC

Slide 15

Isolation Valves



We do not recommend Isolation Valves be installed in Daikin systems; however, there are times when the specifications require them:

- Compatibility with R-410A and PVE (*Polyvinylether*) oil
- Temperature operation range of -40°F to 300°F
- Working pressure of 550 PSIG, capable of handling up to 700 PSIG
- Full flow valve with 0 pressure drop
- Bi-directional flow
- Brazed connections
- Service port in valve body



© 2013 Daikin North America, LLC

Slide 16

Pipe Expansion DAIKIN

$100^{\circ} F \times 100 \text{ ft} \times 12 \text{ in./ft.} \times 0.0000094 \text{ in./in./}^{\circ}F = 1.128 \text{ in.}$

Expected Expansion, inches		Radius "R", inches, for Nominal or Standard Tube Sizes Shown Length "L", inches, for Nominal or Standard Tube Sizes Shown														
		1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5		
1/2	R	6	7	8	9	11	12	13	15	16	18	19	20	23		
	L	38	44	50	59	67	74	80	91	102	111	120	128	142		
1	R	9	10	11	13	15	17	18	21	23	25	27	29	32		
	L	54	63	70	83	94	104	113	129	144	157	169	180	201		
1 1/2	R	11	12	14	16	18	20	22	25	28	30	33	35	39		
	L	66	77	86	101	115	127	138	158	176	191	206	220	245		
2	R	12	14	16	19	21	23	25	29	32	35	38	41	45		
	L	77	89	99	117	133	147	160	183	203	222	239	255	284		

(a) U-Bend

(b) Coiled Loop

(c) Offset and Return

Reference: The Copper Tube Handbook published by Copper.org - the #1 resource for technical and professional information regarding copper and copper alloys.

© 2013 Daikin North America, LLC Slide 17

Pipe Expansion DAIKIN

No Movement

Alternative → Movement

© 2013 Daikin North America, LLC Slide 18

Pipe Expansion



© 2013 Daikin North America, LLC

Slide 19

Pipe Expansion



50° F



186° F

© 2013 Daikin North America, LLC

Slide 20

Refrigerant Line Insulation



Good Piping Practices



- Refrigerant piping must be maintained clean
- During the course of installation, the refrigerant lines should be occasionally blown out with dry nitrogen to drive out any particulate debris
- When the piping is not connected to the indoor and outdoor units, the ends must be properly sealed

Insulating Pipe



ALL pipe work must be insulated along its full run using 3/4" Wall Insulation minimum.

Take extra care to cover the flare nuts on the fan coils using the insulation provided or condensation will occur causing water leaks.



The liquid line must be insulated



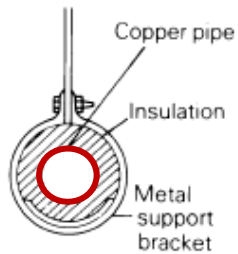
Could cause excessive subcooling.

Always follow local codes

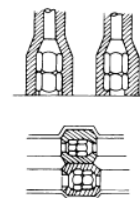
© 2013 Daikin North America, LLC

Slide 23

Insulating Hanging Pipe



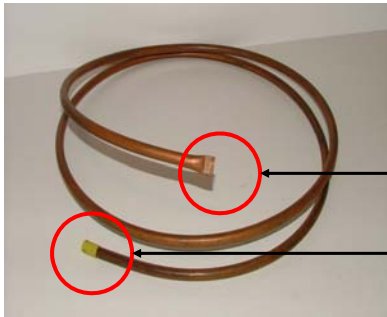
Insulation of support brackets



© 2013 Daikin North America, LLC

Slide 24

Good Piping Practices



Keep copper ends sealed to prevent debris from settling in the piping.

Pinched & brazed


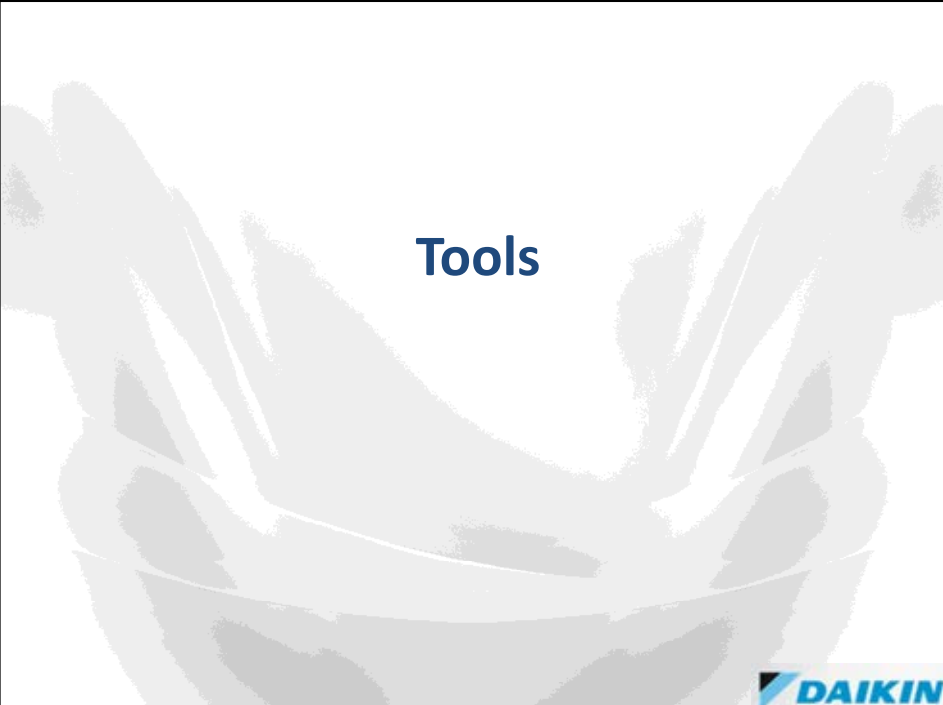
Capped or taped

When the refrigerant lines are not connected and dormant during construction there are two recommended methods of sealing the ends

- < 30 days cap or tape the ends
- > 30 days pinch and braze the ends

© 2013 Daikin North America, LLC Slide 25

Tools



R-410A Gauges



- All of our service connections are 5/16"
- Dedicated manifold
- R-410A Rated up to 550 and 800 PSIG
- 5/16" hose connections

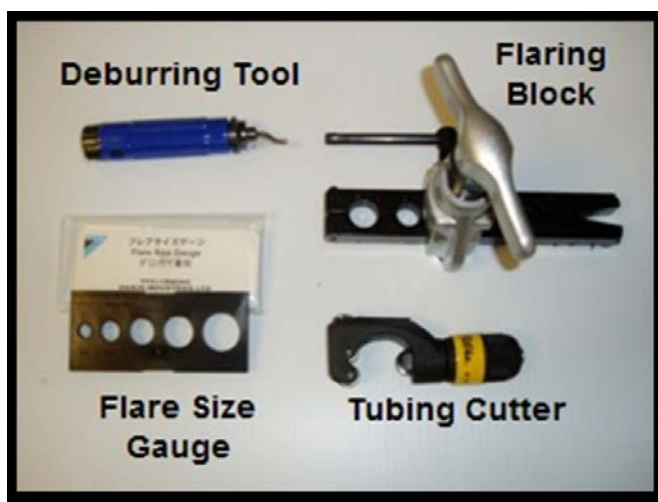


Hose Pressure 800 PSIG Rated

© 2013 Daikin North America, LLC

Slide 27

Daikin Tools



Deburring Tool

Flaring Block


Flare Size Gauge

Tubing Cutter


© 2013 Daikin North America, LLC

Slide 28

Daikin Tools




Torque Wrench Kit



Part No. TLTWSM


Service Tool Kit




DACA-99S TK-1

© 2013 Daikin North America, LLC Slide 29

Vacuum Pump



- Pump capacity should be a minimum of 6 cfm
- Vacuum pump should have a check valve
- Pump must be kept properly maintained
- Change pump oil frequently



© 2013 Daikin North America, LLC Slide 30

Digital Micron Gauge



- As driers are not used in VRV refrigerant lines it is imperative to properly evacuate the system to remove all moisture to insure a dry system
- All Daikin systems must be triple evacuated down to 500 microns or less
 - The moisture level can only be determined with an accurate micron gauge
 - Never evacuate a refrigeration system using atmospheric pressure alone



© 2013 Daikin North America, LLC

Slide 31

Digital Scale




- Daikin systems are charged with R-410A refrigerant by weight based on the length of the liquid lines
 - All liquid lines should be measured as accurately as possible to insure optimum system performance
 - Each liquid line diameter is multiplied by a factor per measured foot of piping length
 - The refrigerant charge is designated as the "Additional Refrigerant Charge"
- A good digital scale must be used to properly weigh in the liquid R-410A refrigerant




© 2013 Daikin North America, LLC


Slide 32

Other Installation Tools







5/16" Valve
Core Removal
Tool w/side
port




Nitrogen Regulator
Rated 750-1000 PSIG



3/8"



Metric Hex Keys




1/4"

© 2013 Daikin North America, LLC

Slide 33

Flaring



Pipe Flaring

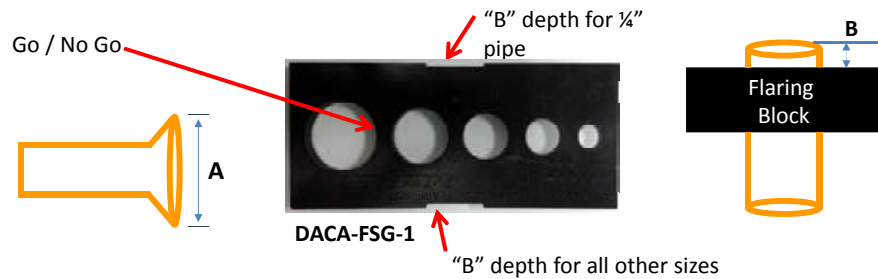


Proper deburring is critical to a successful flare

© 2013 Daikin North America, LLC

Slide 35

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

© 2013 Daikin North America, LLC

Slide 36

Brazing



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



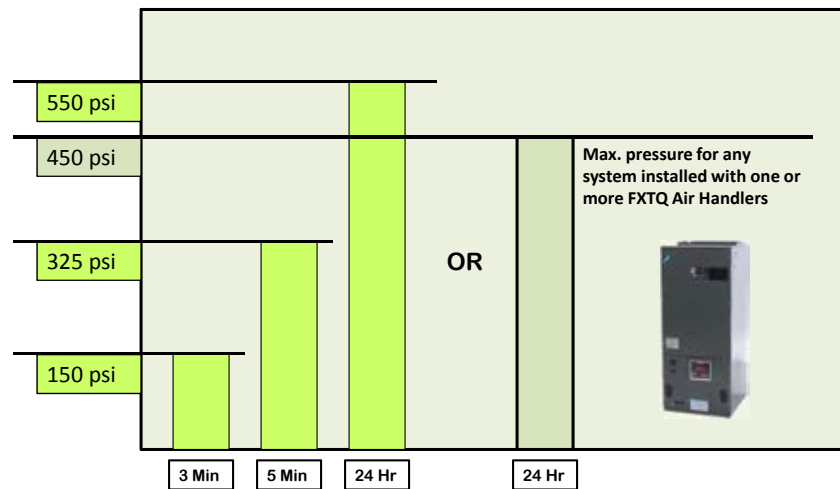
Pressure Test & Evacuation



System Nitrogen Pressure Test



Verify all stop valves are securely closed before pressure test



Pressure Test



Use commercial liquid leak detector



© 2013 Daikin North America, LLC

Slide 41

Evacuation



What is a micron as a unit of measurement for a vacuum?



© 2013 Daikin North America, LLC

Slide 42

Triple Evacuation



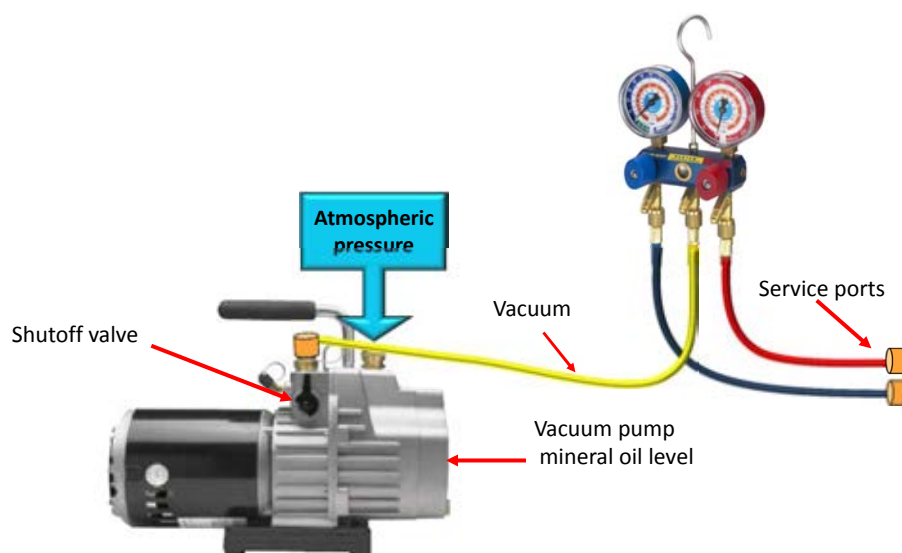
Daikin Recommends Triple Evacuation

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

© 2013 Daikin North America, LLC

Slide 43

Evacuation



© 2013 Daikin North America, LLC

Slide 44

System Refrigerant Charging



Additional Refrigerant



Weigh in additional refrigerant with digital scales

- Calculate charge based on total line length x lb/ft of diameter.
- Check with each model for correct multiplier.



Wrap-up



- The ozone is only part of the equation in refrigerant containment and recycling.
- R-410A is a very efficient blended refrigerant but it requires knowledge and skills to be used correctly and safely.
- Daikin chose PVE as for its properties and easier system dehydration.
- Daikin does not require dryers, sight glasses, or oil traps on system installations.
- Expansion must be taken into consideration to prevent fractures or cracks in the gas lines due to temperature increases.
- Daikin recommends a dedicated tool set including gauges for working on Daikin equipment.

© 2013 Daikin North America, LLC

Slide 47

Wrap-up



- R-410A systems require a different flaring block for making flared connections.
- Dry nitrogen purge while brazing prevents oxidation inside of the lines.
- Pressure test and evacuation must be completed according to best practices in the industry.
- All lines must be insulated including the liquid and the condensate lines.
- Daikin requires R-410A to be charged as a liquid and a complete recovery and recharge in the event of a leak.

© 2013 Daikin North America, LLC

Slide 48



DAIKIN VRV

Product & Technology Introduction Review








RESIDENTIAL | LIGHT COMMERCIAL | COMMERCIAL

Training Department
September 2012

© 2012 Daikin AC

Daikin VRV Concept




What is VRV® ?

Variable - *System capacity varies with load*

Refrigerant - *R-410A Direct Expansion System*

Volume - *Refrigerant flow regulated by EEV's and a variable speed compressor*

- ☐ VRV- Daikin Registered trademark
- ☐ Introduced in 1982 – Worlds first VRF system
- ☐ Over 1 million installations worldwide
- ☐ Over 25,000 systems in the US and Canada
- ☐ Multiple Indoor units connected to one condenser system
- ☐ Air Cooled and Water Cooled systems
- ☐ Ultra high comfort control and efficiency



Slide 2 © 2012 Daikin AC

Daikin VRV concept



Multiple Fan Coil Control + Inverter = *Daikin VRV*

- ☐ Daikin *VRV* incorporates multiple technologies to provide ultra high energy savings, comfort control and reliability
 - ☐ Multiple indoor fan coils connected to a single refrigerant network
 - ☐ Inverter control system to modulate system capacity as loads change
 - ☐ Heat Pump & Heat Recovery systems



1

Slide 3 © 2012 Daikin AC

DAIKIN VRV Product & Technology Introduction



VRV System Models
VRV^{III}-S® VRV^{III}® VRV-W^{III}®
Condensers & Indoor Units

© 2012 Daikin AC

VRV Systems



208/230 vac Single Phase Heat Pump
3 Ton & 4 Ton Models
Up to 14.9 SEER / HSPF 9.1

Slide 5 © 2012 Daikin AC

VRV Nomenclature



VRV III-S Heat Pump

RXY M Q 36/48 P

TJ U


UL listed for US market

voltage
208 - 230V 1ph 60Hz
Revision

Cooling Capacity
Refrigerant R410A
Trunk-shaped VRV system
RXY: Heat Pump

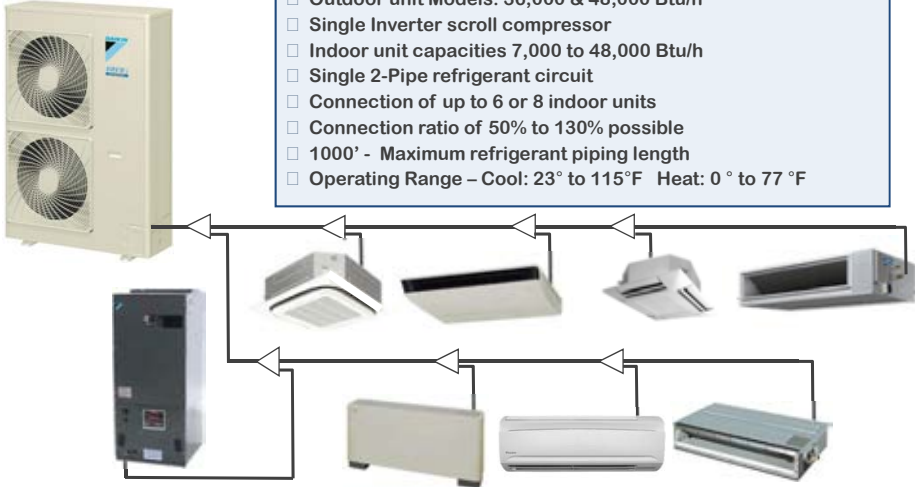
Slide 6 © 2012 Daikin AC

VRV Systems



VRV^{III}-S Heat Pump RXYMQ36&48P

- ❑ 208/230vac 1Ph - 30 amp power to Outdoor Unit
- ❑ Outdoor unit Models: 36,000 & 48,000 Btu/h
- ❑ Single Inverter scroll compressor
- ❑ Indoor unit capacities 7,000 to 48,000 Btu/h
- ❑ Single 2-Pipe refrigerant circuit
- ❑ Connection of up to 6 or 8 indoor units
- ❑ Connection ratio of 50% to 130% possible
- ❑ 1000' - Maximum refrigerant piping length
- ❑ Operating Range – Cool: 23° to 115°F Heat: 0° to 77°F



7
Slide 7 © 2012 Daikin AC

VRV Systems







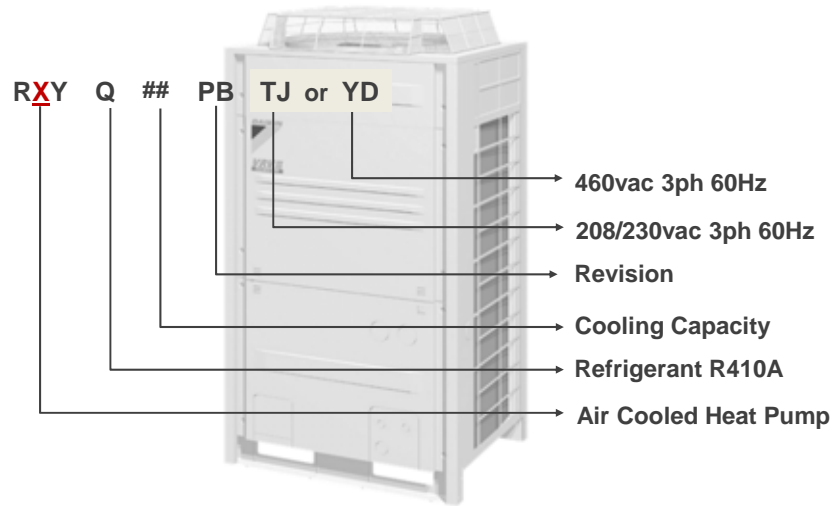
208/230 & 460vac Three Phase
Heat Pump & Heat Recovery Models
6 to 30 Ton Systems

Slide 8 © 2012 Daikin AC

VRV Nomenclature



VRV^{III} Heat Pump



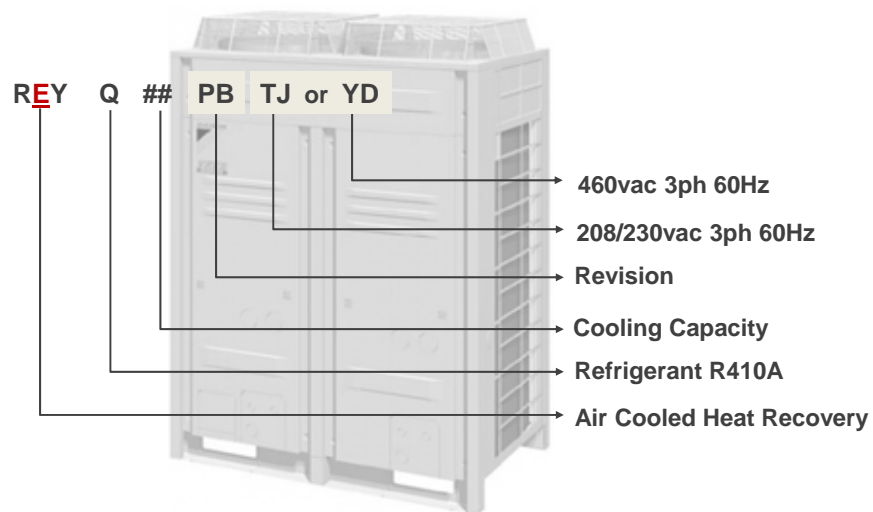
Heat Pump condensers are manufactured to be single piped or manifolded (Excl. RXYQ144PBTJ)

Slide 9 © 2012 Daikin AC

VRV Nomenclature



VRV^{III} Heat Recovery Single Piped



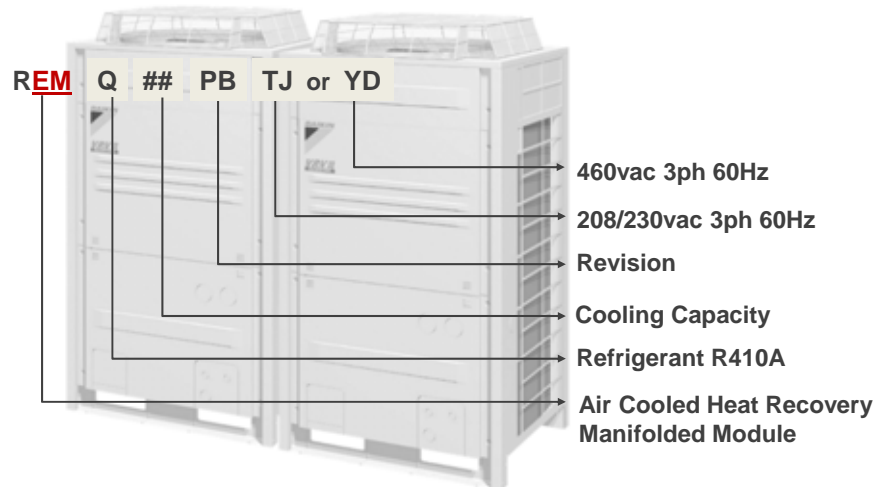
REYQ Heat Recovery condensers are manufactured to be single piped only: 6,8,10 & 12 ton (Excl. REYQ144PBVD)

Slide 10 © 2012 Daikin AC

VRV Nomenclature



VRV III Heat Recovery Manifolded Module



REMQ Heat Recovery condensers are manufactured to be manifolded only: 6,8,10 & 12 ton (Excl. REYQ144PBTJ)

Slide 11 © 2012 Daikin AC

VRV Systems



VRV III RXYQ & REY(M)Q



- ☐ 208/230vac 3ph and 460vac 3ph models
- ☐ Heat Pump and Heat Recovery models
- ☐ Dual scroll compressors – 1 Inverter and 1 Standard
 - ☐ Excl. 6 ton HP & HR units & 12 ton 208/230vac. units
- ☐ System capacities: HP 6 – 30 Ton / HR 6 – 28 Ton
- ☐ Connection of up to 62 indoor units
- ☐ Connection ratio of 50% to 200% possible
- ☐ 3,280' - Maximum refrigerant piping length
- ☐ Operating Range: Cool: 23° to 115°F Heat: 0° to 77°F

6

Slide 12 © 2012 Daikin AC

VRV Systems



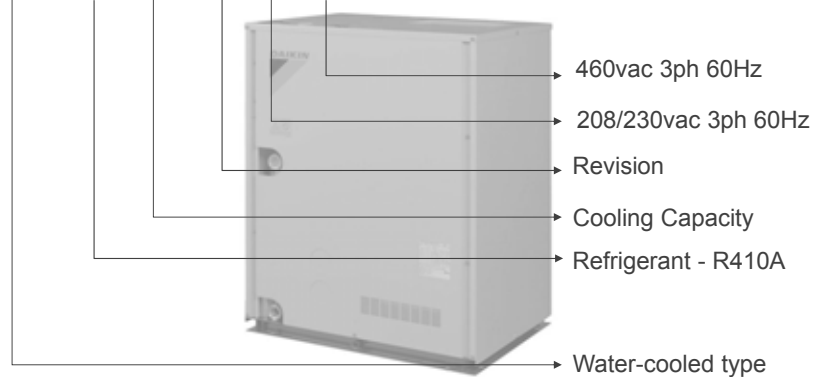
Slide 13 © 2012 Daikin AC

VRV Nomenclature



VRV-WIII


RWEY Q 72/84 P TJ YD U or N



Same unit model is used for Heat Pump - Heat Recovery & Geothermal operation.


Slide 14 © 2012 Daikin AC

VRV Systems



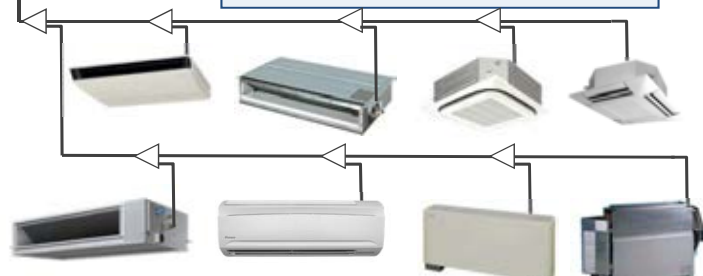
absolute comfort

VRV-WIII Water Cooled RWEYQ_P




Interior Installation Only

- ☐ 208/230vac & 460vac 3 phase models
- ☐ 6 & 7 ton single condenser models
 - ☐ Heat Pump / Heat Recovery operation
 - ☐ Geothermal
- ☐ Single inverter scroll compressor
- ☐ System capacities: 6 to 21 ton
- ☐ Standard EWT: 60°F to 113°F
 - ☐ Geothermal EWT: 14°F (heat)
- ☐ Max. refrigerant piping length: 980 ft.
- ☐ Connection of up to 12 – 32 fan coils
- ☐ Standard connection ratio: 50% to 130%




6
Field Configured Geothermal Operation
Slide 15 © 2012 Daikin AC

VRV Systems



absolute comfort

Indoor Units



12 Types
55 Models

All 208/230vac 1 Phase powered

Slide 16
© 2012 Daikin AC


DAIKIN VRV Product & Technology Introduction



VRV Basic Controls


© 2012 Daikin AC

VRV Basic Controls




Local Remote Controllers

BRC1E71




Navigation Remote Controller

BRC2A71



Simplified

BRC7C/7E/4C



Hand-held Wireless

DIII – NET 16vdc digital control network

Slide 18 © 2012 Daikin AC

VRV Basic Controls



Remote Sensor

KRCS01-1B (4B)

- ☐ **VRV** Fan Coil Units incorporate a built-in return air thermistor temperature sensor as standard (excl. FXTQ)
- ☐ 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



NOTE: KRCS01-4B Remote Sensor Kit for FXMQ_P, FXFQ_P and FXTQ Fan Coil Units

4

Slide 19 © 2012 Daikin AC

DAIKIN VRV Product & Technology Introduction

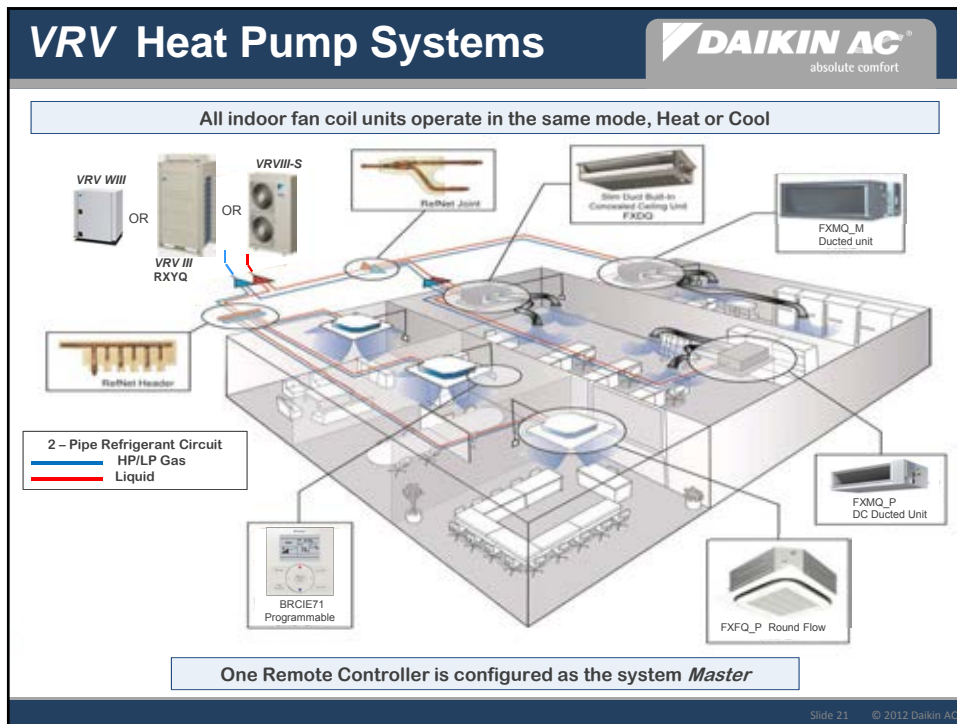


VRV System Types


Heat Pump / Heat Recovery



© 2012 Daikin AC



VRV Heat Pump Systems




absolute comfort


RefNet Components

- ☐ Daikin has designed *RefNet* Y Branch and Headers to be used for branching off from the main refrigerant lines.
 - ☐ Split the refrigerant circuit
 - ☐ Branch off to the indoor fan coils
- ☐ *RefNets* are engineered to control turbulence and maintain flow through the refrigerant system.
- ☐ *RefNets* are provided in 4 capacity Kits
 - ☐ Heat Pump Kit
 - ☐ Liq. & HP/LP Gas
- ☐ *RefNets* MUST be installed in specific positions
 - ☐ Y Branch: Level / UP / DOWN
 - ☐ Header – Level Only

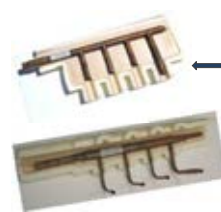
RefNet “Y” Branch – Gas



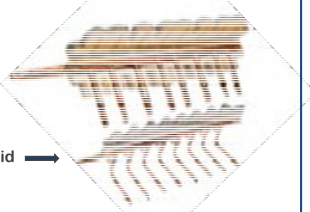
RefNet “Y” Branch Liquid



RefNet Header 4-port



RefNet Header 8-port



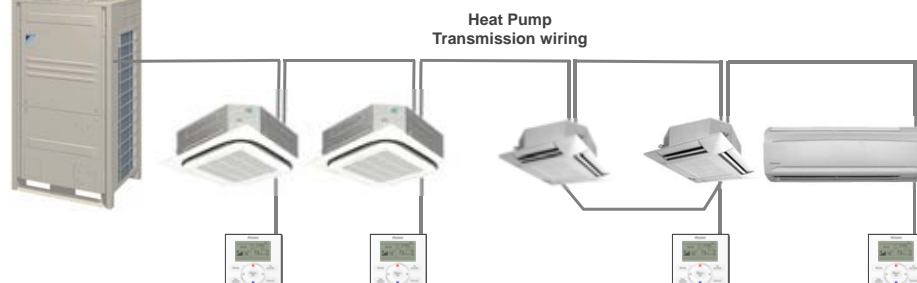
Gas →

← Liquid

VRV Heat Pump Systems



Daikin DIII-Net Architecture



- ☐ The *DIII-Net* communications is proprietary to Daikin VRV systems
- ☐ Simple 2 conductor wire, non polarity sensitive, 16vdc communications circuit
 - ☐ 16/18 awg. 2-conductor stranded, non-shielded
 - ☐ Daisy chain wiring to all system components
- ☐ Maximum system control wire length: 6,600 ft.

Slide 23 © 2012 Daikin AC

VRV Heat Pump Systems



Control Circuit Terminal Designations

- ☐ Fan Coil Control Terminal Circuits
 - ☐ **P1 P2** – Fan Coil to Remote Controller
 - ☐ Remote Controller power supply and data transfer
 - ☐ **F1 F2** – Communications from condenser to all Fan Coils
 - ☐ **T1 T2** – Forced Off (Default N.O.) External Contacts

All VRV Fan Coils



- ☐ Condenser Control Terminal Circuits
 - ☐ **F1 F2 In** – Condenser to Fan Coils
 - ☐ **F1 F2 Out** – Multi-Zone Control
 - ☐ iTouch
 - ☐ iTouch Manager
 - ☐ Gateway – LON Works or BACnet
 - ☐ **Q1 Q2** (VRV-III & VRV-WIII) – Manifolded Modules



VRV-III – VRV-WIII



VRV-III-S

1

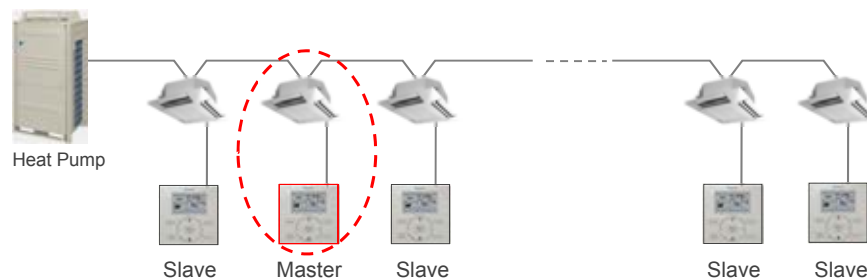
Slide 24 © 2012 Daikin AC

VRV Heat Pump Systems



Operation Mode Changeover

- ☐ Heat Pump controlled fan coils all operate in the same mode and require one Remote Controller to be configured as the Master
- ☐ The Master remote controller determines the system mode of operation (Cool, Dry, Heat, Fan) based on the Heat and Cool setpoints or user selected mode.
- ☐ The Master RC determines the mode that the slaves can operate under:
 - ☐ Master in Cool or Dry → Slaves: Cool, Dry and Fan are available
 - ☐ Master in Heat mode → Slaves: Heat and Fan are available
 - ☐ Master in Fan mode → Slaves: Fan is Available



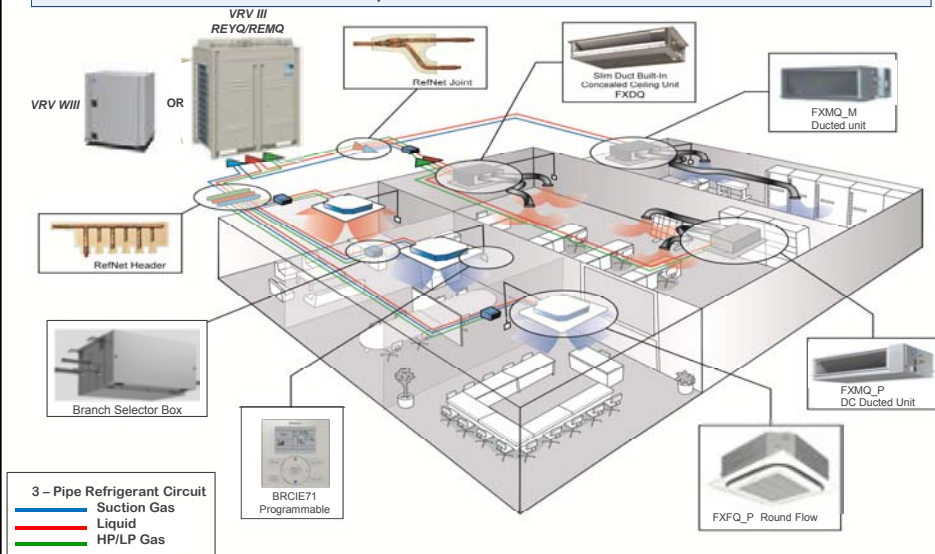
4

Slide 25 © 2012 Daikin AC

VRV Heat Recovery Systems



Indoor fan coil units operate in simultaneous Heat and Cool modes



Slide 26 © 2012 Daikin AC

VRV Heat Recovery Systems



Branch Selector Box

- ☐ Provides Heating/Cooling changeover to the connected fan coil or fan coils
- ☐ EEV refrigerant control
- ☐ Brazed refrigerant connections
- ☐ 208/230vac 1 ph. powered



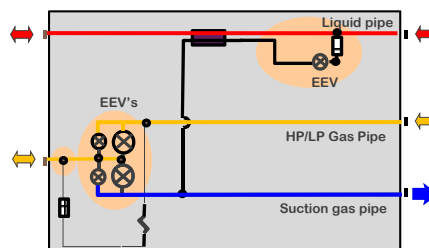
208-230vac.

Single Port Model Numbers:

BSVQ36PVJU 36,000 Btu - Up to 5 FC's

BSVQ60PVJU 60,000 Btu - Up to 8 FC's

BSVQ96PVJU 96,000 Btu - Up to 8 FC's



1

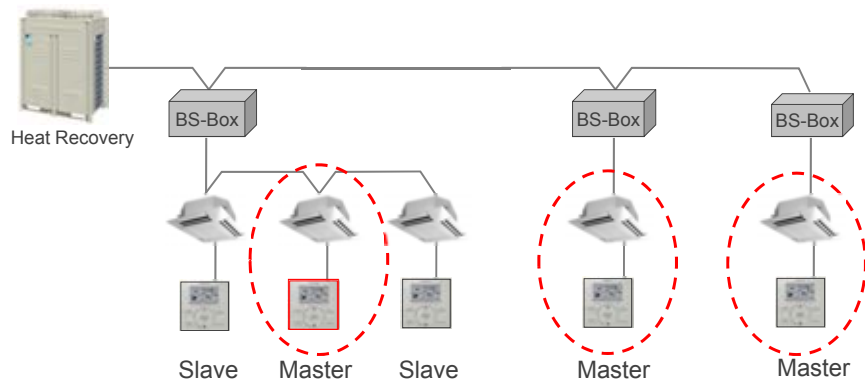
Slide 27 © 2012 Daikin AC

VRV Heat Recovery Systems



Operation Mode Changeover

- ☐ When two or more Fan Coils with dedicated Remote Controllers are connected to one BS-Box, one of the Remote Controllers must be configured as the Master
 - ☐ Master determines the BS-Box operation mode
 - ☐ The Slave indoor units follow the Master's operation mode



Slide 28 © 2012 Daikin AC

VRV Heat Recovery Systems

DAIKIN AC
absolute comfort

Branch Selector Control Circuits

- ☐ Same 2 conductor control wire used to connect all Branch Selectors to Condenser
- ☐ **F1 F2 In** daisy chain wired from Condenser terminal block to **F1 F2 Out** on Branch Selectors
- ☐ **F1 F2 In** from Branch Selector to **F1 F2** on connected fan coil(s)

1

Slide 29 © 2012 Daikin AC


DAIKIN VRV Product & Technology Introduction

DAIKIN AC
absolute comfort

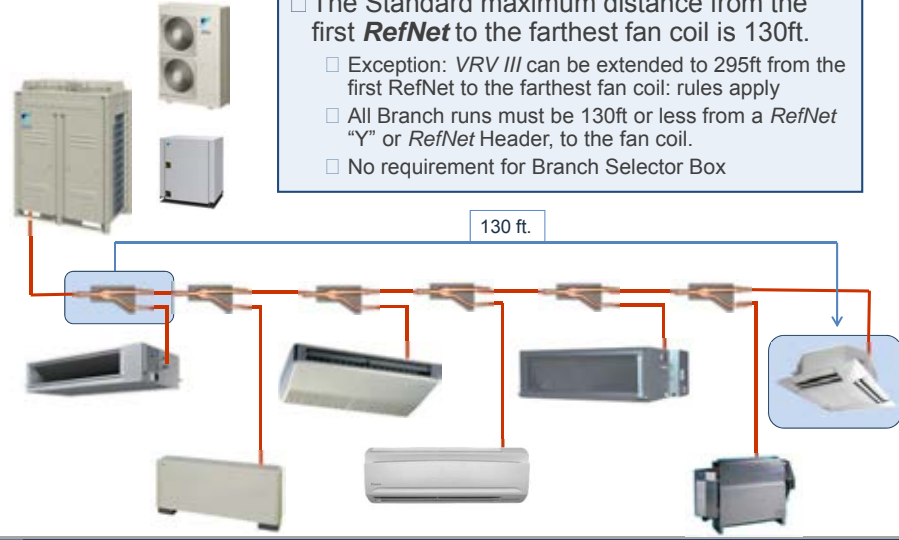
VRV Refrigerant Piping Lengths

© 2012 Daikin AC

VRV Refrigerant Piping



RefNet Piping Length Requirements



- ☐ The Standard maximum distance from the first **RefNet** to the farthest fan coil is 130ft.
- ☐ Exception: *VRV III* can be extended to 295ft from the first RefNet to the farthest fan coil: rules apply
- ☐ All Branch runs must be 130ft or less from a *RefNet* "Y" or *RefNet* Header, to the fan coil.
- ☐ No requirement for Branch Selector Box

4
Slide 31 © 2012 Daikin AC

DAIKIN VRV Product & Technology Introduction



VRV Basic System Control Operations



© 2012 Daikin AC

VRV Basic System Control



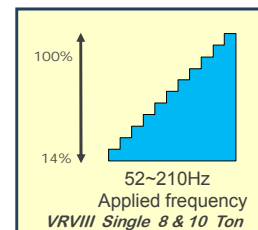
Compressor Capacity Control



InverterControl

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

37 Applied Capacity Steps



Control System

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

Condenser Control

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

2

Slide 33 © 2012 Daikin AC

VRV Basic System Control

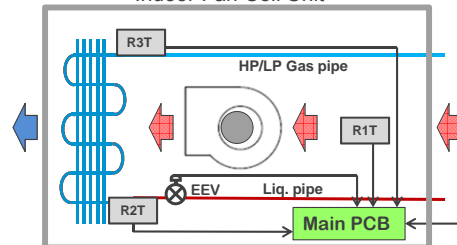


Electronic Expansion Valve Control

- ☐ VRV fan coils have 3 thermistor sensors (excl. FXTQ & FXMQ_MF)
 - ☐ 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 pulses to modulate open and close

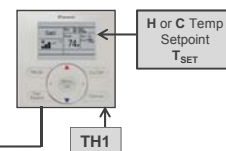


Indoor Fan Coil Unit



SENSOR LEGEND

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



1

Slide 34 © 2012 Daikin AC

VRV Basic System Control



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** (FXFQ FXZQ FXDQ FXMQ_P)
 - ☐ 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



4

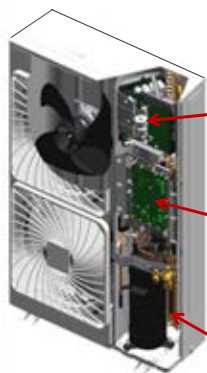
Slide 35 © 2012 Daikin AC

VRV Basic System Control



VRV VIII-S Heat Pump

RXYMQ36/48PVJU Single Phase



70 watt tandem modulating DC Fan Motors
Low Pressure Loss Bellmouth with
Aero Spiral Fans

Smooth Sine Wave Inverter

Digital Microprocessor

- Simple system commissioning at control PCB

Standard VRV Control Operations

- Auto Addressing
- Pump Down Residual
- Restart Standby
- Check Operation Mode
- Time/Temp Defrost
- Crankcase Heater Control

Single Reluctance Digitally Commutated
Daikin G2 Scroll Compressor

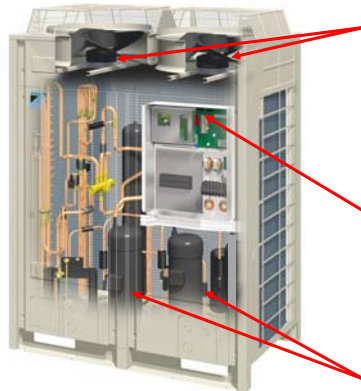
Slide 36 © 2012 Daikin AC

VRV Basic System Control



VRV^{III} Heat Pump & Heat Recovery Models

RXYQ REYQ/REMQ



Outdoor DC Fan(s)
Single or Dual modulating DC fan motors
Low Pressure Loss Bellmouth with Aero Spiral Fans
Field Adjustable Fan ESP

Advanced VRV Control system
Condenser Control PCB
Standard VRV Control Operations PLUS:
Auto Charge – Uninterrupted Heat in Defrost (HR)
Manifolded Condenser Rotation Start
Emergency Operation

Daikin G2 high efficiency scroll compressors
1-INV & 1 STD compressor

NOTE: 6 Ton Heat Pump Condenser has one Inverter scroll compressor only

Slide 37 © 2012 Daikin AC

VRV Basic System Control



VRV-^{III} Water Cooled

Single *Daikin G2* Scroll Compressor

Smooth Sine Wave Inverter

Condenser Control PCB
All standard VRV Control operations
Water Heat Exchanger - Oil Return
No Defrost operation needed



1

NOTE: Automatic Charge is not available for this product

Slide 38 © 2012 Daikin AC

DAIKIN VRV Product & Technology Introduction



VRV Multi-Zone Control Systems

© 2012 Daikin AC

VRV Multi-Zone Controls



Multi-Zone Control Systems



Intelligent Manager



Intelligent Controller



BACnet



LonWorks



Centralized Controller



Unified On/Off



Schedule Timer

Slide 40 © 2012 Daikin AC

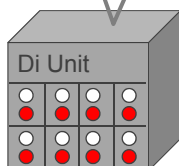
VRV Multi-Zone Controls



Digital Input and Input/Output units

- ☐ Equipment is controlled like an indoor unit
 - ☐ On / Off based monitoring / controlling
 - ☐ One DIII-Net address is assigned to each set for third party equipment
 - ☐ Power Supply: 24vac 40va (field supplied)

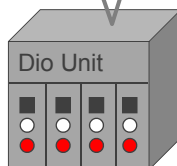
DIII-Net bus



8 sets of
 ○ 8-Status input
 ● 8-Alarm input

- On/Off Status from any equipment

DEC101A51-US2



4 sets of
 ■ 4-Output
 ○ 4-Status input
 ● 4-Alarm input

- Fan
- Damper
- Light
- AHU etc

DEC102A51-US2



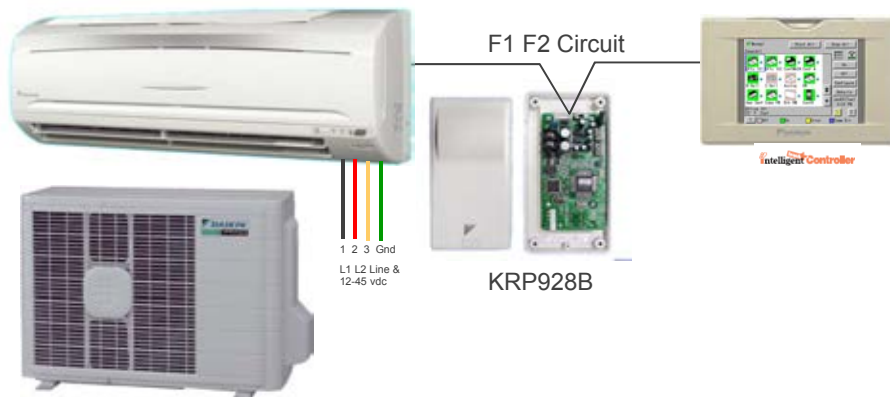
Slide 41 © 2012 Daikin AC

VRV Multi-Zone Controls

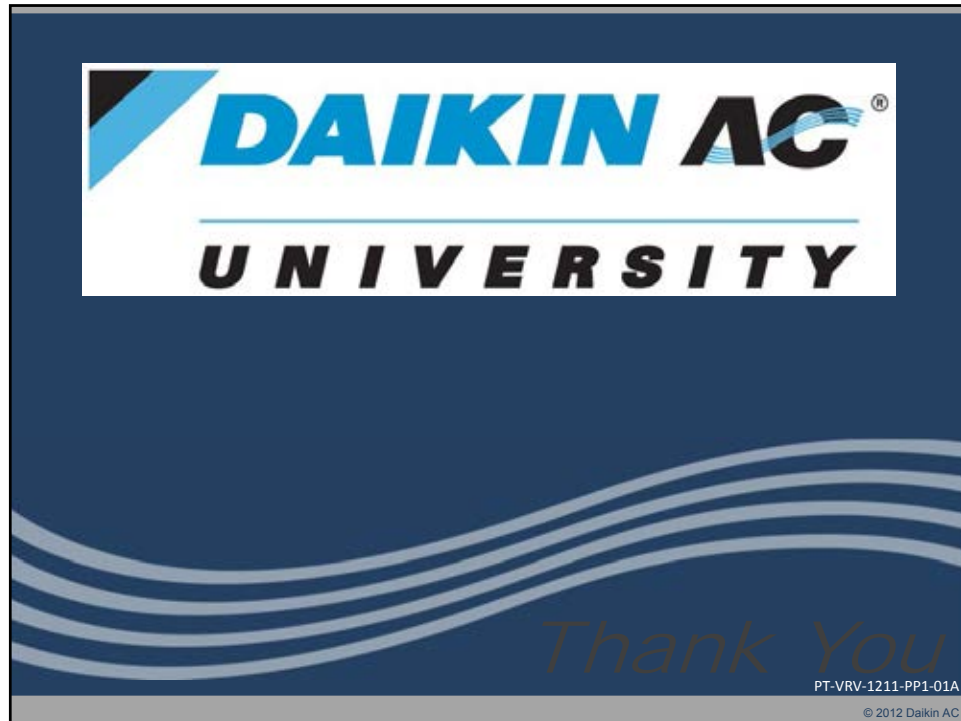


Mini-Split Interface Adapter KRP928B

Simple installation to interface Mini-split 4-wire communications to the VRV D-III Net 2-wire F1 F2 communications



Slide 42 © 2012 Daikin AC



VRV

Basic System Installation

Training
Department
May 2011



DAIKIN AC
absolute comfort

© 2010 Daikin AC

VRV

Basic System Installation Agenda

- VRV – Basic Refrigerant Piping
 - Piping Layout
 - Refrigerant Components
 - Basic piping length requirements
 - Xpress Piping Report
- VRV – Basic Piping Installation
 - Piping Installation Recommendations
 - VRV/III Manifoldded systems
 - Pressure Equalization piping
- VRV – Indoor Units
 - Fan Coil Installation
 - Branch Selector Box Installation
- VRV – Controls and Control Wiring
 - Local Remote Controls
 - Control Circuits
 - Xpress Wiring Report
- VRV – Condenser Basic Installation

DAIKIN AC
absolute comfort

Slide 2 © 2010 Daikin AC

VRV Basic Refrigerant Piping Specifications & Installation

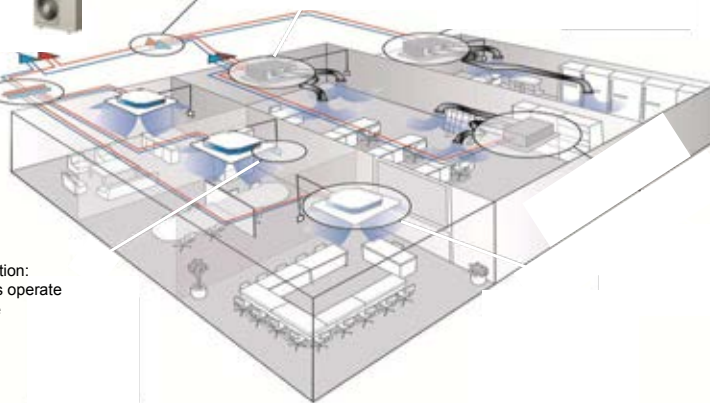


VRV Heat Pump Refrigerant Piping

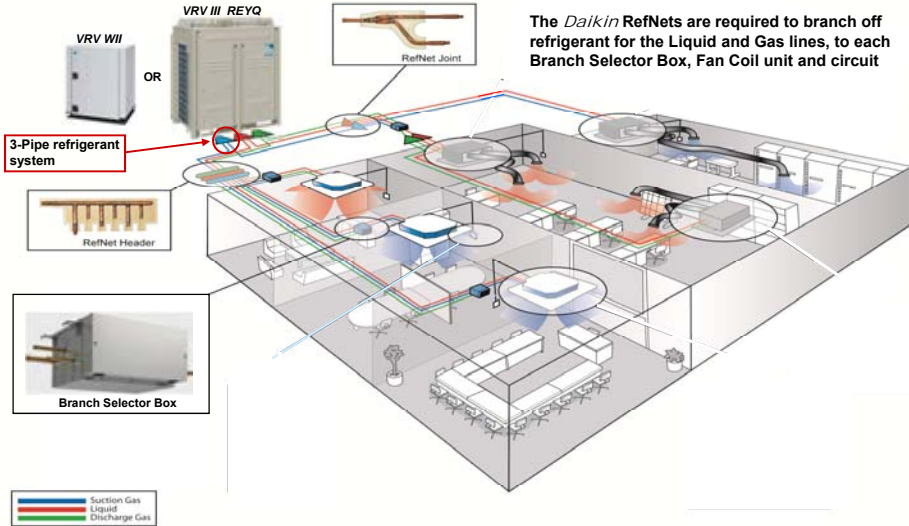


The *Daikin* RefNets are required to branch off refrigerant for the Liquid and Gas line, to each Fan Coil unit, and when splitting off the refrigerant circuit.

Heat Pump operation:
All indoor fan coils operate
in the same mode



VRV Heat Recovery Refrigerant Piping



One system provides simultaneous cooling and heating

Slide 5 © 2010 Daikin AC

RefNet Components




RefNet "Y" Branch – Gas & Liquid Kit



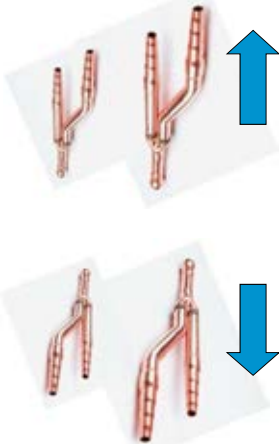
RefNet Header Gas & Liquid Kit
4-Port & 8-Port




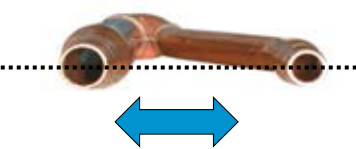
Slide 6 © 2010 Daikin AC



VRV RefNet “Y” Joint Installation









- ◆ RefNet Y Joints to be installed: straight up - straight down – level (+/- 15°)
- ◆ Each RefNet included in the branch kit is labeled to identify circuit:
Liquid – Gas – Suction (HR)

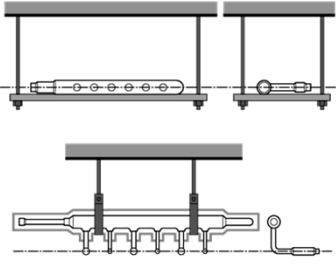
Slide 7 © 2010 Daikin AC

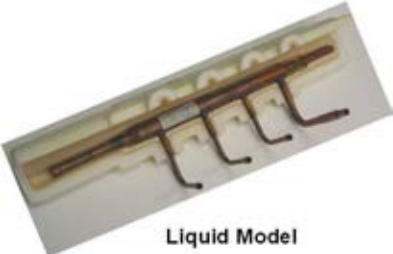


VRV RefNet Header Installation



Gas Model





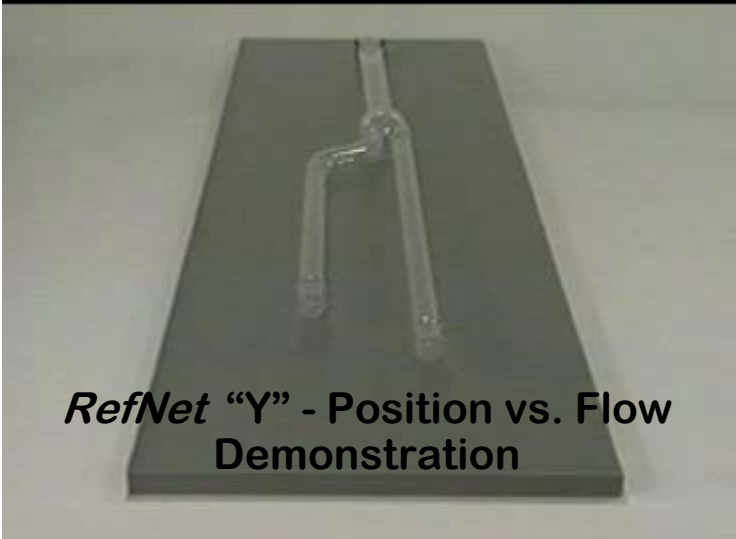


Liquid Model


- ◆ RefNet Headers must be installed in a level position only
- ◆ Properly support headers to insure solid installation
- ◆ Refrigerant circuit is terminated at header (Deadhead)
- ◆ Unused branch ports are to be brazed closed
- ◆ Each RefNet included in the branch kit is labeled to identify circuit: Liquid – Gas – Suction



Slide 8 © 2010 Daikin AC



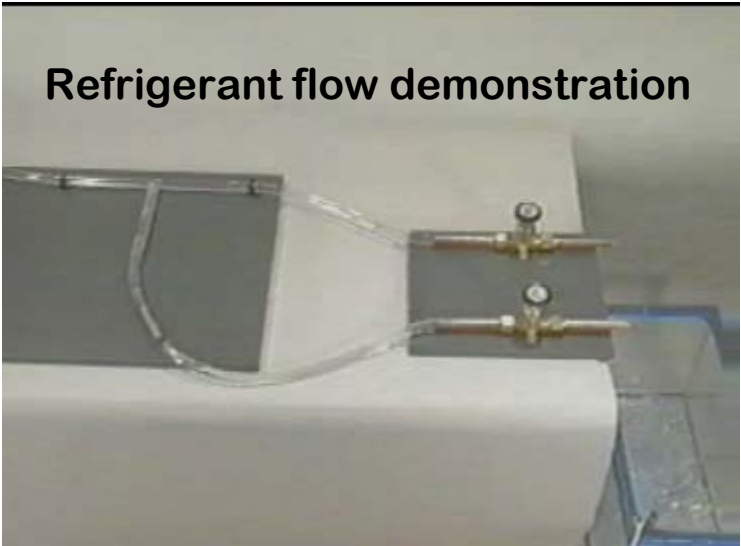



***RefNet* “Y” - Position vs. Flow
Demonstration**


Slide 9 © 2010 Daikin AC



Refrigerant flow demonstration





Slide 10 © 2010 Daikin AC



VRV

RefNet Branch Kits

- The Daikin *RefNets* are provided as "Branch Kits" for Heat Pump and Heat Recovery systems
 - Heat Pump – KHRP26____ Kit includes 2 *RefNets* (Liquid & Dual Pressure Gas)
 - Heat Recovery – KHRP25____ Kit includes 3 *RefNets* (Liquid, Suction & Dual Pressure Gas)
- Each *RefNet* included in the Branch Kits is individually labeled for proper identification

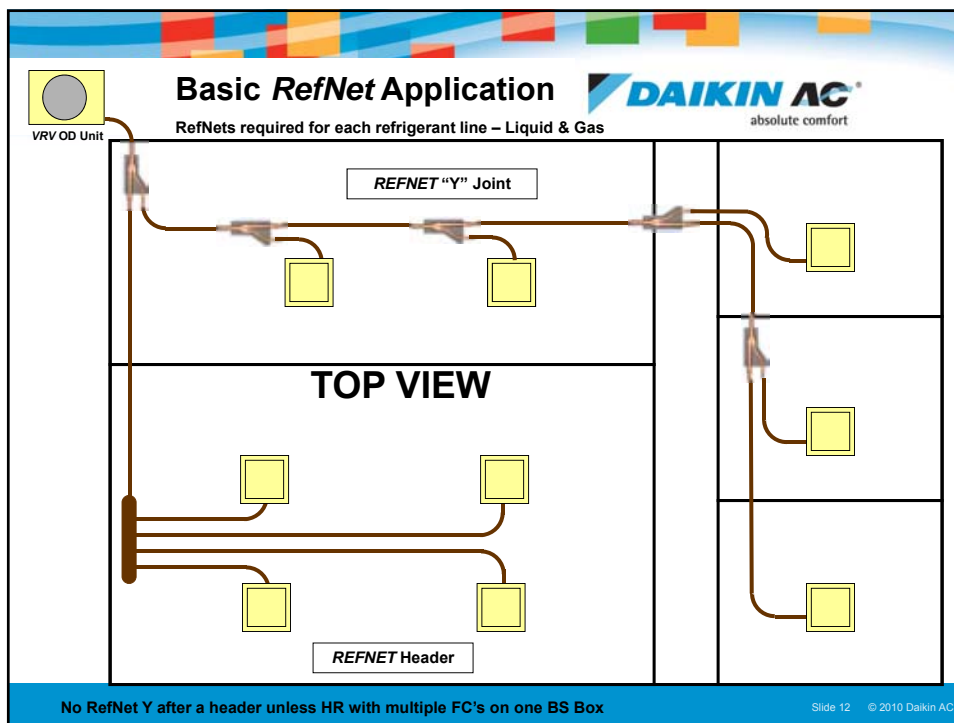



RefNet Branch Kits

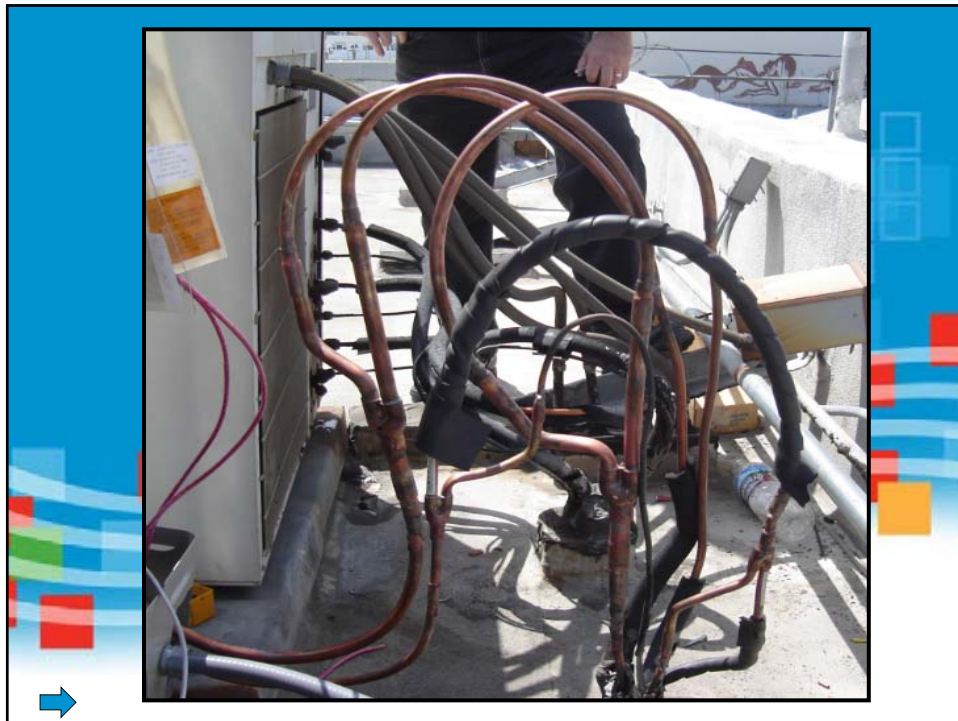
RefNet "Y" Joint Heat Pump (2-Pipe)	Heat Recovery (3-Pipe)	RefNet Header Heat Pump (2-Pipe)	Heat Recovery (3-Pipe)
KHRP26A22T	KHRP25A22T	4 - PORT KHRP26M22H(9)	_____
KHRP26A33T	KHRP25A33T(9)	8 - PORT KHRP26M33H(9)	8 - PORT KHRP25M33H(9)
KHRP26M72TU(9)	KHRP25M72TU(9)	8 - PORT KHRP26M72H(9)	8 - PORT KHRP25M72H(9)
KHRP26M73TU(9)	KHRP25M73TU(9)	8 - PORT KHRP26M73HU(9)	8 - PORT KHRP25M73HU(9)

RefNet Branch Kits are determined by the Outdoor Unit capacity and connected fan coil capacities in the refrigerant circuit

Slide 11 © 2010 Daikin AC



No RefNet Y after a header unless HR with multiple FC's on one BS Box





DAIKIN AC
absolute comfort



Excessive equivalent length

Slide 14 © 2010 Daikin AC



Unnecessary Trap

Slide 15 © 2010 Daikin AC

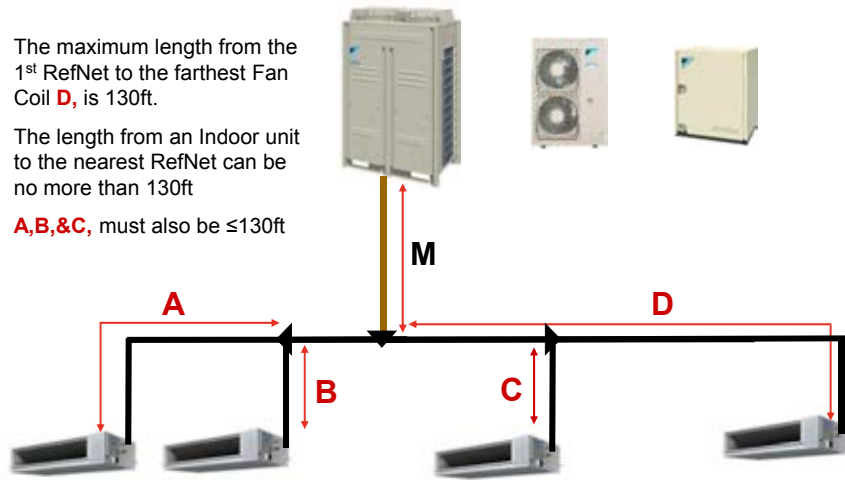


Unnecessary Trap

Slide 16 © 2010 Daikin AC

Piping Length

- The maximum length from the 1st RefNet to the farthest Fan Coil **D**, is 130ft.
- The length from an Indoor unit to the nearest RefNet can be no more than 130ft
- **A,B,&C**, must also be ≤ 130 ft



Slide 17 © 2010 Daikin AC

Piping Length

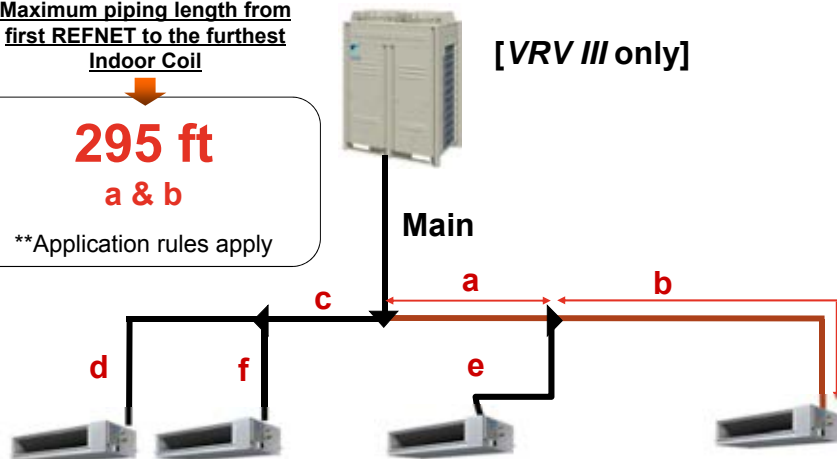
Maximum piping length from
first REFNET to the furthest
Indoor Coil

295 ft

a & b

****Application rules apply**

[VRV III only]



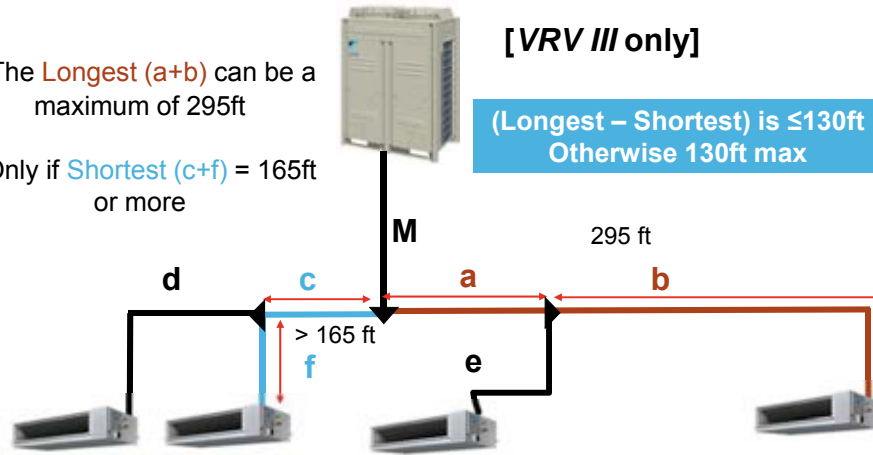
Slide 18 © 2010 Daikin AC

Piping Length

[VRV III only]

- The **Longest (a+b)** can be a maximum of 295ft
- Only if **Shortest (c+f) = 165ft** or more

(Longest – Shortest) is ≤130ft
Otherwise 130ft max



Slide 19 © 2010 Daikin AC

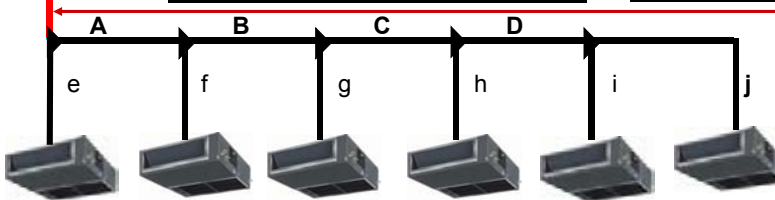
Main Piping Size

- If the outdoor unit to the furthest indoor unit has an equivalent length of ≥295 ft the main line (M) must be upsized
- Heat Pump – Liquid & Gas Pipes
- Heat Recovery – Liquid Pipe only



	Suction gas		Liquid	
	Std	One Size Up	Std	One Size Up
RXYQ72	φ 3/4	φ 7/8	φ 3/8	φ 1/2
RXYQ96	φ 7/8	N/A	φ 3/8	φ 1/2
RXYQ120	φ 1 1/8	N/A	φ 1/2	φ 5/8
RXYQ144	φ 1 1/8	N/A	φ 1/2	φ 5/8
RXYQ168	φ 1 1/8	N/A	φ 5/8	φ 3/4
RXYQ192	φ 1 1/8	N/A	φ 5/8	φ 3/4
RXYQ216	φ 1 1/8	N/A	φ 5/8	φ 3/4
RXYQ240	φ 1 3/8	N/A	φ 5/8	φ 3/4

	Liquid	
	Std	One Size Up
REYQ72	φ 3/8	φ 1/2
REYQ96	φ 3/8	φ 1/2
REYQ120	φ 1/2	φ 5/8
REYQ144	φ 1/2	φ 5/8
REYQ168	φ 5/8	φ 3/4
REYQ192	φ 5/8	φ 3/4
REYQ216	φ 5/8	φ 3/4
REYQ240	φ 5/8	φ 3/4

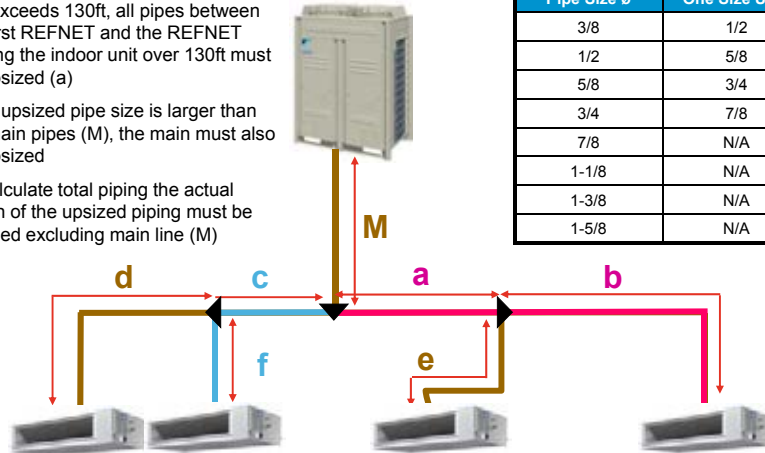


Slide 20 © 2010 Daikin AC

Long Piping Lengths

- If from the first REFNET to an indoor unit exceeds 130ft, all pipes between the first REFNET and the REFNET serving the indoor unit over 130ft must be upsized (a)
- If the upsized pipe size is larger than the main pipes (M), the main must also be upsized
- To calculate total piping the actual length of the upsized piping must be doubled excluding main line (M)

Piping Size (O.D)	
Pipe Size ϕ	One Size Up ϕ
3/8	1/2
1/2	5/8
5/8	3/4
3/4	7/8
7/8	N/A
1-1/8	N/A
1-3/8	N/A
1-5/8	N/A



Slide 21 © 2010 Daikin AC

Piping Length

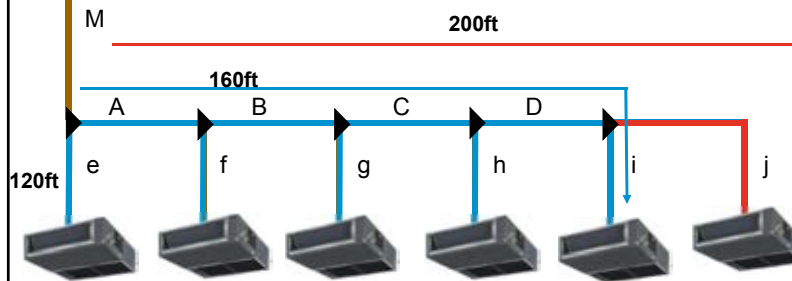


e = 120ft, this is within the ≤ 130 ft limit from an indoor unit to the nearest REFNET (**f, g, h, i & j** must also follow this rule)

A + B + C + D + j (longest length) = 200ft, the difference between the longest and shortest (**e**) is 80ft, this is within the limitations (longest – shortest ≤ 130 ft)

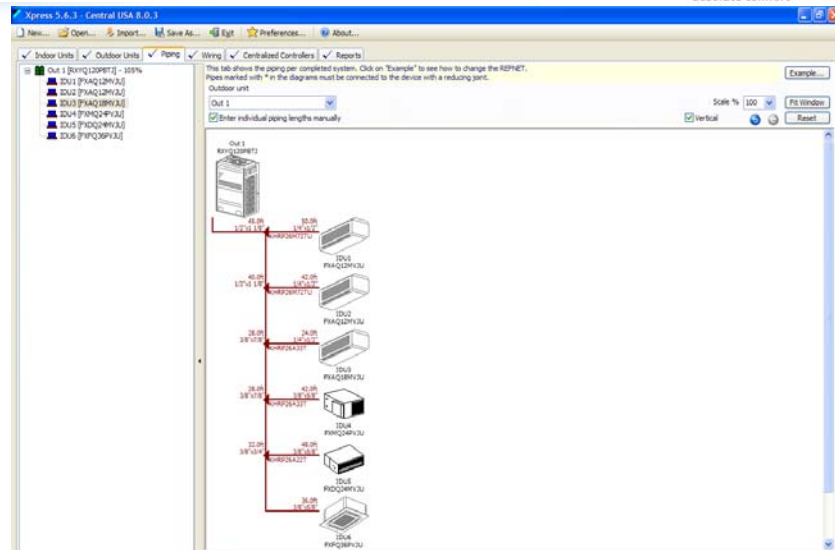
A + B + C + D + i = 160ft, from the first REFNET to indoor (**i**) is over **130ft** so the liquid and gas pipes must be upsized between REFNETS (A+B+C+D only) (HP/LP pipe is also upsized on a Heat Recovery System)

When calculating total actual pipe length in the example below $M + 2A + 2B + 2C + 2D + e + f + g + h + i + j \leq 3,280$ ft



Slide 22 © 2010 Daikin AC

VRV Xpress Piping Report



Slide 23 © 2010 Daikin AC

VRV Xpress Piping Report

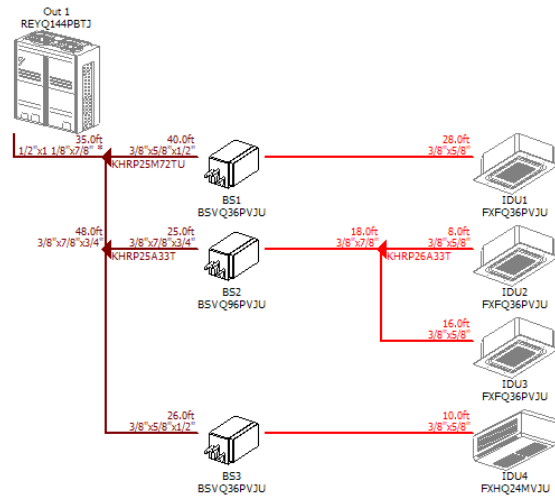


☐ Xpress refrigerant piping report

- ☐ Lays out all of the refrigerant piping including all system component model numbers and ID designations
 - ☐ Outdoor Unit (condenser)
 - ☐ Indoor Units
 - ☐ RefNets ("Y" and Header)
 - ☐ Branch selector boxes
- ☐ Indicates refrigerant piping line lengths
 - ☐ Automatically sizes piping based on components and lengths
- ☐ Xpress piping report must be updated to insure system accuracy

Slide 24 © 2010 Daikin AC

VRV Xpress Piping Report



Slide 25 © 2010 Daikin AC

VRV Piping Installation



VRV III Piping Accessories

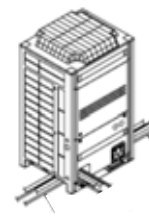
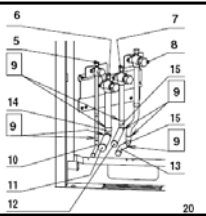


Supplied Copper fitting accessories for the Outdoor Unit

Name	Liquid and gas side accessory pipe (1)		Gas side accessory pipe (1)		Gas side accessory pipe (2)	
	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.
72SP type	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.
80SP type	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.
120SP type	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.
Shape						

Name	High side equalizer accessory pipe (1)		High side equalizer accessory pipe (2)		Low side equalizer accessory pipe (1)		Low side equalizer accessory pipe (2)		L type accessory joint (1)		L type accessory joint (2)	
	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.
72SP type	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.
80SP type	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.
120SP type	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.
Shape												

10. Liquid side accessory pipe (1)
11. Low side equalizer accessory pipe (1)
12. Gas side accessory pipe (1)
13. High side equalizer accessory pipe (1)
14. L type accessory joint (1)
15. L type accessory joint (2)
16. Liquid side accessory pipe (2)
17. Low side equalizer accessory pipe (2)
18. Gas side accessory pipe (1)
19. High side equalizer accessory pipe (2)



Slide 27 © 2010 Daikin AC

VRV Refrigerant Piping



- ☐ The Liquid and Gas piping must be completely insulated
- ☐ Recommended wall thickness – 3/4"
- ☐ All flare connections must be insulated

Fan Coil Installation Kit



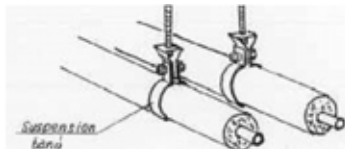
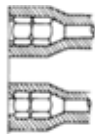
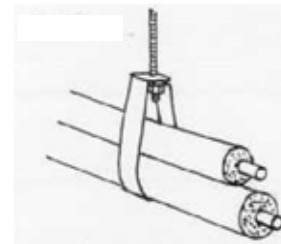
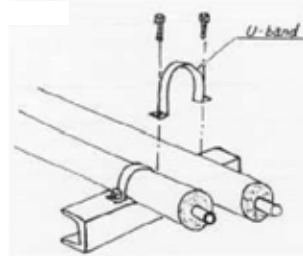
Slide 28 © 2010 Daikin AC

VRV Refrigerant Piping



VRV Refrigerant piping installation procedures

- Keep refrigerant piping clean and sealed during installation
 - Use Nitrogen purge during brazing process
 - Eliminate debris contamination in refrigerant piping
 - Installation period less than 30 days – pinch/braze or tape ends
 - Installation period more than 30 days – pinch/braze ends
- Refrigerant piping must be properly insulated
 - Recommended 3/4" wall insulation
 - Liquid and Gas pipes must be individually insulated
 - All Flare nut connections must be insulated
- Refrigerant piping must be properly supported
 - Follow local code requirements for piping support locations
 - Support piping within 12" of BS Box and Fan Coil unit
- Keep track of each refrigerant circuit during installation
 - Measure liquid lines as they are installed
 - Avoid crossing refrigerant lines during installation



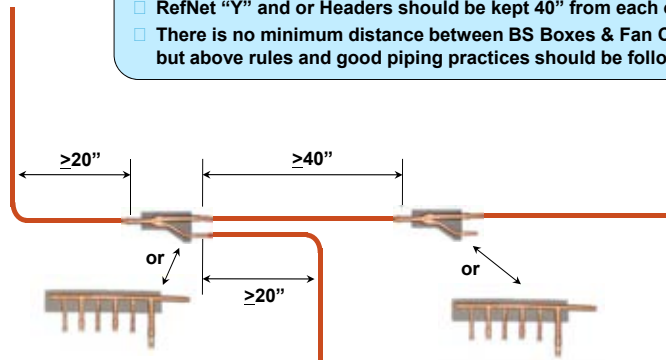
Slide 29 © 2010 Daikin AC

VRV RefNet

Installation recommendations



- 90° Elbows should be kept 20" from Fan Coils & BS Boxes
- 90° Elbows should be kept 20" from RefNets & Headers
- RefNet "Y" and or Headers should be kept 40" from each other
- There is no minimum distance between BS Boxes & Fan Coils, but above rules and good piping practices should be followed



NOTE: This procedure is recommended to avert potential noise issues in the piping

Slide 30 © 2010 Daikin AC

VRV III Manifolded System Refrigerant Piping



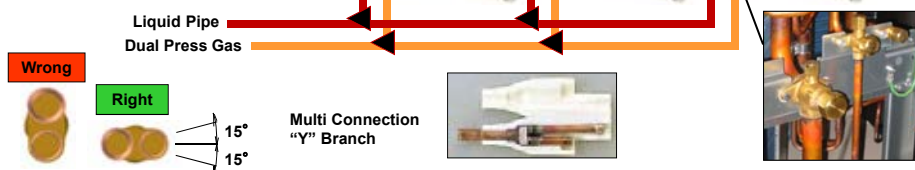
DAIKIN AC
absolute comfort

© 2010 Daikin AC

VRVIII Heat Pump Double & Triple Module Piping

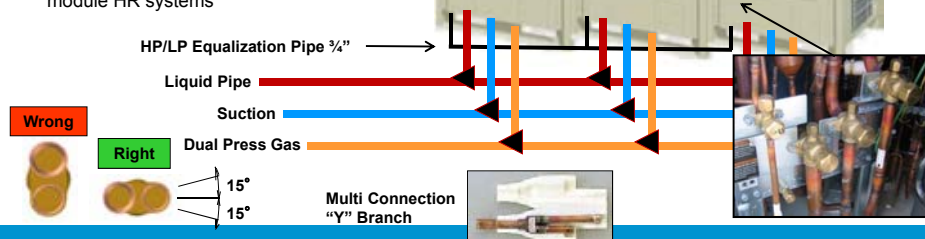
DAIKIN AC
absolute comfort

- ☐ High and Low pressure equalizing pipes are no longer required for heat pump manifolded systems
- ☐ No oil balance lines required
- ☐ **BHFP22P100U** "Y" Branch Kit for Double module HP systems
- ☐ **BHFP22P151U** "Y" Branch Kit for Triple module HP systems
- ☐ Faster installation with less labor and material cost



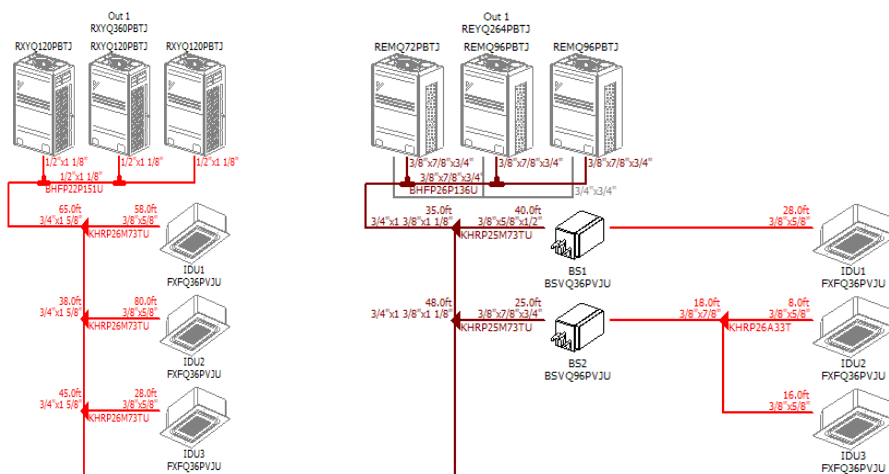
VRVIII Heat Recovery Double & Triple Module Piping

- ❑ Double & Triple manifolded Heat Recovery modules require a ¾" HP/LP Pressure Equalization pipe
- ❑ Uninterrupted Heat operation in the defrost mode
- ❑ **BHFP26P90U** "Y" Branch Kit for double module HR systems
- ❑ **BHFP26P136U** "Y" Branch Kit for triple module HR systems



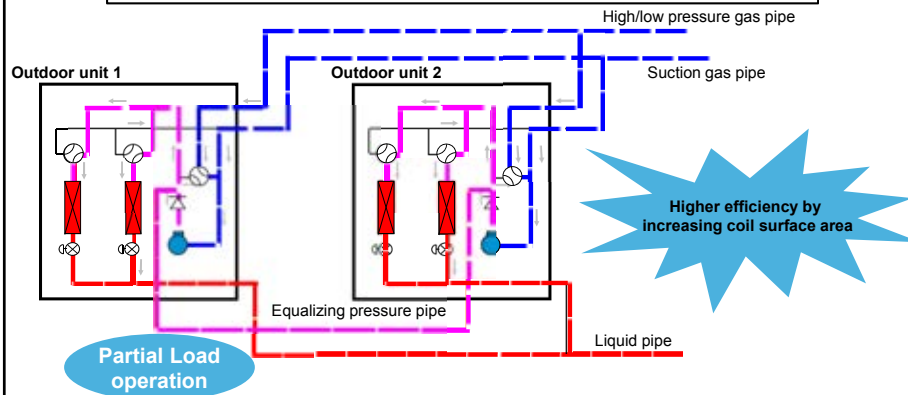
VRVIII Xpress

Manifolded system Piping Report



VRV^{III} Equalizing Pressure Pipe – Heat Recovery

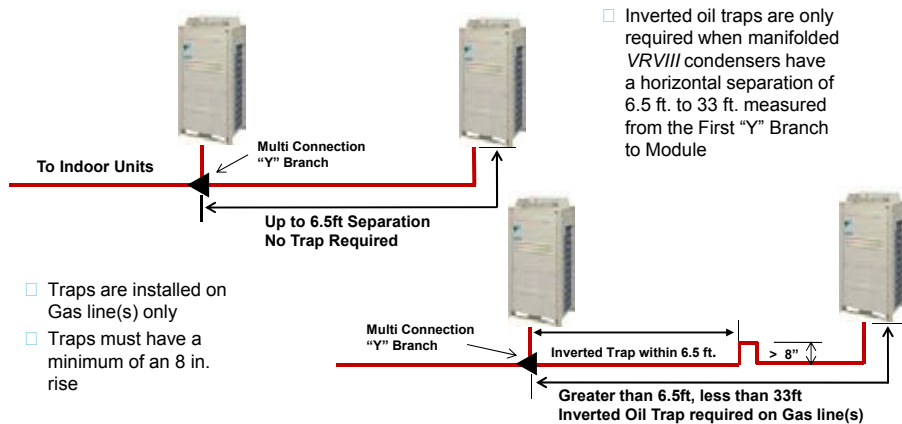
When a single condenser module is operating due to low load, refrigerant is bypassed to the other condenser through the pressure equalizing pipe. By utilizing both heat exchangers part load energy efficiency is improved



NOTE: No Equalizer circuits on Heat Pump Models ("PB" series)

Slide 35 © 2010 Daikin AC

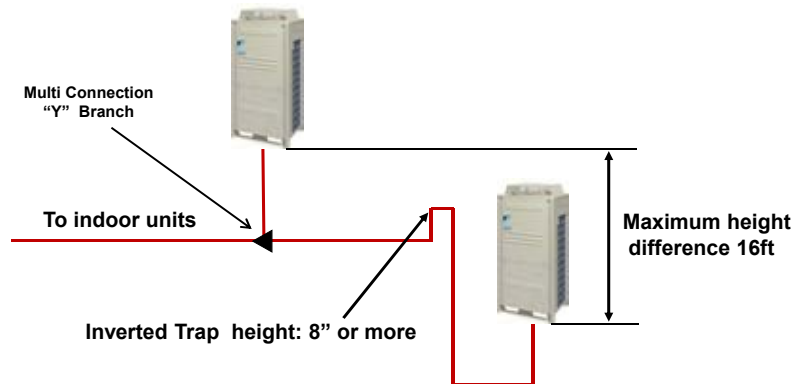
VRV^{III} Manifolded Systems Module Interconnecting Piping Lengths



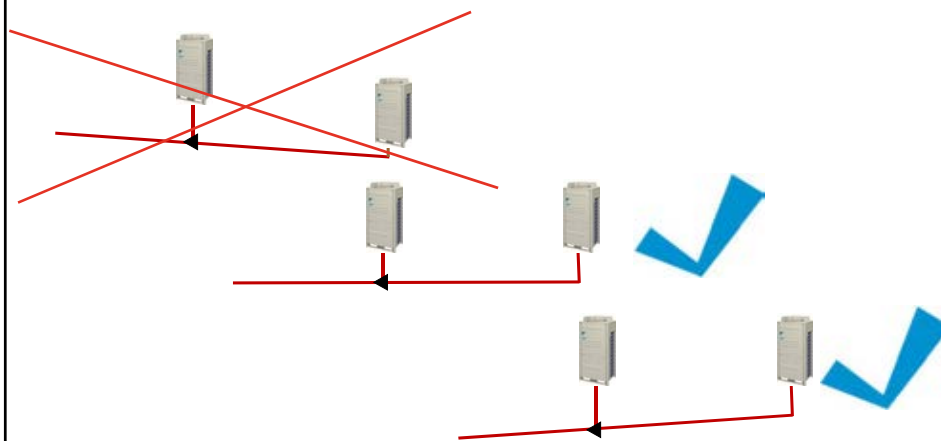
NOTE: Refer to condenser installation manual for all refrigerant piping requirements

Slide 36 © 2010 Daikin AC

VRVIII Manifolder Systems Module Interconnecting Piping Lengths



VRVIII Manifolder Systems Module Interconnecting Piping Lengths



VRV

Indoor Units
Fan Coil & BS Box
Basic Installation



VRV Ducted Units

FXDQ_MVJU Slim Duct Concealed



- ☐ Available from 7 MBtu to 24 MBtu
- ☐ Models: FXDQ07,09,12,18 & 24MVJU
 - ☐ Low Static (ESP .04 - .17 wg.)
 - ☐ Static Pressure can be selected with field setting at RC
- ☐ Fur-Down drop ceiling or minimal duct
- ☐ Low Profile – low sound level 36dB
- ☐ Standard Long Life Filter
- ☐ Condensate Lift Pump - 24" rise
- ☐ Field configured rear or bottom return
- ☐ Weight: 07,09,12 = 51 lb. 18 = 63 lb. 24 = 71 lb.

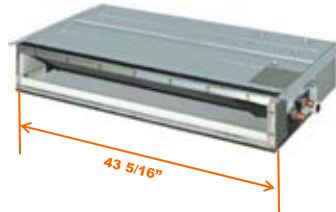


FXDQ Specifications

FXDQ07-09-12MVJU
H 7 7/8" / Depth 24 7/16"

FXDQ18MVJU
H 7 7/8" / Depth 24 7/16"

FXDQ24MVJU
H 7 7/8" / Depth 24 7/16"



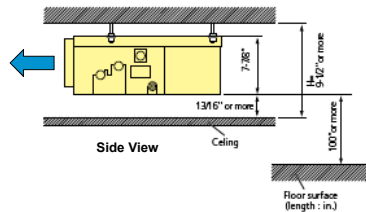
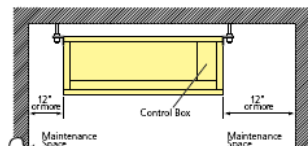
● Cabinet height and depth dimensions stay the same between capacity models. Only the width dimension changes

● External static pressure selectable by remote controller providing optimal flexibility and range of comfort.

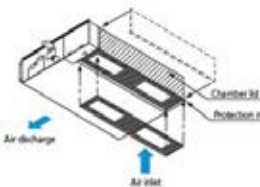
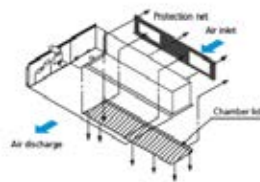
FXDQ07-12M models: in. Wg 0.12-0.04 factory set
FXDQ18-24M models: in. Wg 0.16-0.06 factory set

FXDQ Clearances Return Configuration

Front (discharge) View



Coil can be field configured for rear or bottom return



FXDQ Slim Duct Built-in Concealed Installation Examples



For minimal ducted applications
10ft to 15ft maximum lengths

NOTE: For attic installations,
entire fan coil cabinet must be
wrapped with min. 1" insulation

Custom ducted applications for rectangular or round duct

Field adjustable External Static
Pressure adjustment (Standard /
High) at the Remote Controller

Field supplied duct adapter

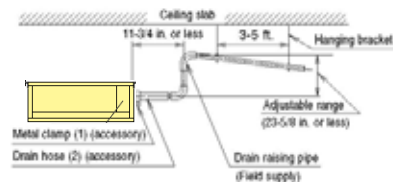


Slide 43 © 2010 Daikin AC

FXDQ Condensate Removal - Lift Pump (Standard)

- Max. drain riser height: 24"
- Flexible, insulated drain coupling is included
- Max. riser pipe diameter from coil outlet: 3/4" ID
 - Larger diameter pipe may generate an "AF" code
- Never connect drain piping to sewer vent

Fan Coil Installation Kit



Lift Pump Piping

Slide 44 © 2010 Daikin AC

FXDQ

Condensate Removal - Gravity

- Gravity Condensate Conversion
 - Unplug Lift Pump connector at PCB 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

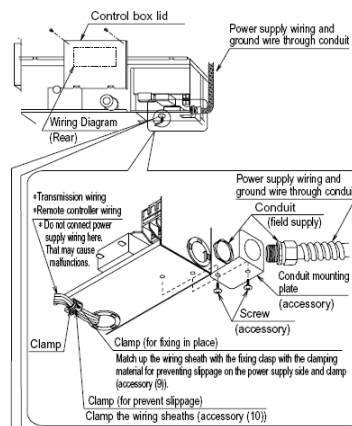


≥ 1/100°

FXDQ Line voltage and Control Voltage

10-1 HOW TO CONNECT WIRINGS

- Wire only after removing the control box lid as shown in Fig. 14.



[Connecting electrical wiring, remote controller wiring, and transmission wiring] (Refer to Fig. 15)

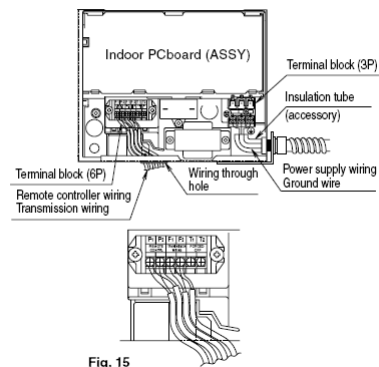


Fig. 15

FXMQ_PVJU DC Ducted Concealed



Models from 7 MBtu to 48 MBtu (FXMQ07- 48P)

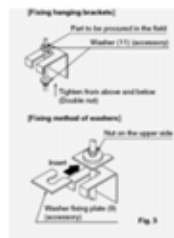
- ☐ Improved efficiency with our new DC (ECM) fan motor
- ☐ Medium ESP capabilities of up to 1" W.G
- ☐ "Auto" adjust or select SP range from Remote Controller
- ☐ 3 user select fan speeds available + Fan "Auto" Logic
- ☐ Low profile design – less than 12" high
- ☐ Built in Condensate Lift pump for 28" rise
- ☐ Field supplied filter box and filters
- ☐ Optional Filters (MERV 8 & 13)
- ☐ Mechanical service from below
- ☐ Weight: 55 lb. 07,09,12 80 lb. 18,24,30 102 lb. 36&48

Slide 47 © 2010 Daikin AC

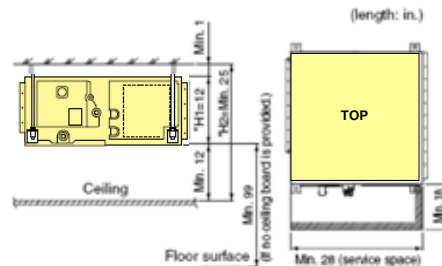
FXMQ_PVJU Installation



- ☐ Install Fan Coil with all-thread 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".

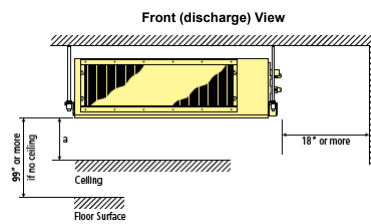
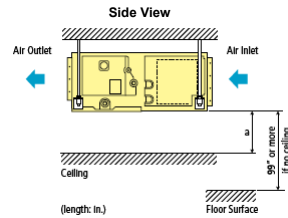
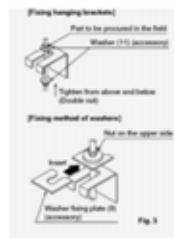
[Required installation place]
The dimensions indicate the minimum required space of installation.

Fig. 2-1

Slide 48 © 2010 Daikin AC

FXMQ_PVJU Installation

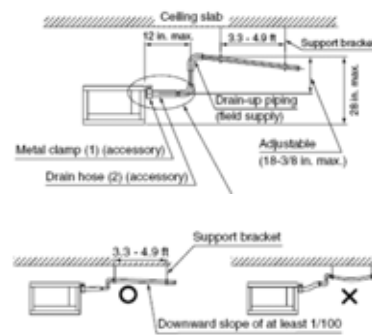
- Install Fan Coil with all-thread bolts
- Install nut and washer above and below each angle bracket
- Min. 1" open clearance from top of Fan Coil to bottom of structure
- Field supplied Supply Plenum



FXMQ_P Condensate Removal - Lift Pump (Standard)

- Max. drain riser height: 28"
- Flexible, insulated drain coupling is included
- Max. riser pipe diameter from coil outlet: 3/4" 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

FXMQ_P 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

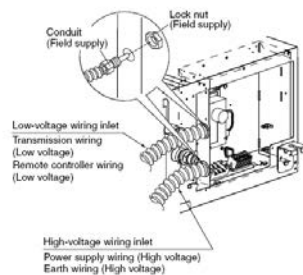


PCB "A1P"
X25A

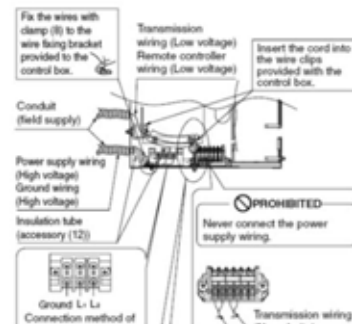


FXMQ_PVJU Line Voltage and Control Voltage

(2) Lay the wires in the control box through the wire inlet on the side of the control box.



(3) Follow the instructions below, and lay the wires in the control box.



FXMQ_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



FXMQ_M Medium Static Ducted Unit

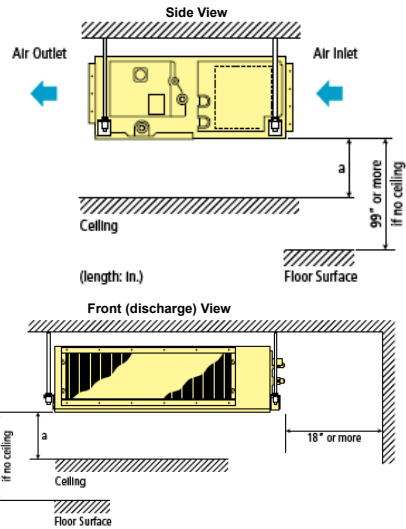


- ☐ FXMQ72 & 96MVJU
 - ☐ Greater design flexibility with a capacity range extended to 96MBH
 - ☐ Improved ductwork and filtration flexibility with high CFM and ESP capabilities of up to 1.1" W.G.
 - ☐ Field selectable static pressure
 - ☐ Low profile design of less than 19" high to reduce required installation space
 - ☐ Gravity condensate drain
 - ☐ Can be connected to all current North American 3 phase VRV Systems
 - ☐ Liquid Line Flare Connection – Gas Line is a brazed flange assembly
 - ☐ Weight: 302 lb.

FXMQ_MVJU Installation



- ☐ Install Fan Coil with all-thread bolts
- ☐ Install nut and washer above and below each angle bracket
- ☐ Min. 1" open clearance from top of Fan Coil to bottom of structure
- ☐ Field supplied Supply Plenum

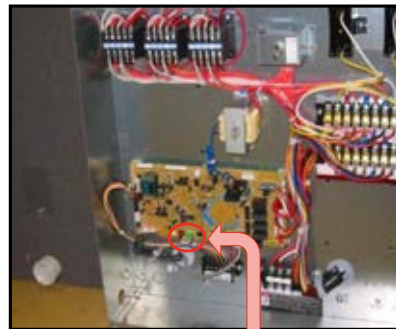


Slide 55 © 2010 Daikin AC

FXMQ_MVJU Condensate Pump



- ☐ A field supplied condensate pump must be used when gravity condensate removal is not possible
- ☐ Pump must be properly sized for the specific application
- ☐ Locate the X8A jumper on the FXMQ PCB and splice in the pump float switch wires

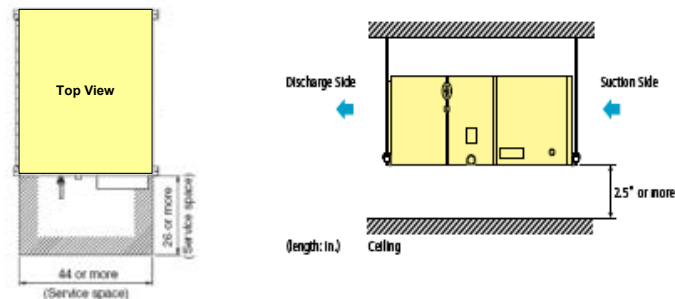


Slide 56 © 2010 Daikin AC

FXMQ_MVJU

Dimensions and Clearances

Capacity Model MBtu	72	96
Height	18 1/8"	18 1/8"
Depth	43 5/16"	43 5/16"
Width	54 3/8"	54 3/8"



Slide 57 © 2010 Daikin AC

FXTQ_PAVJU

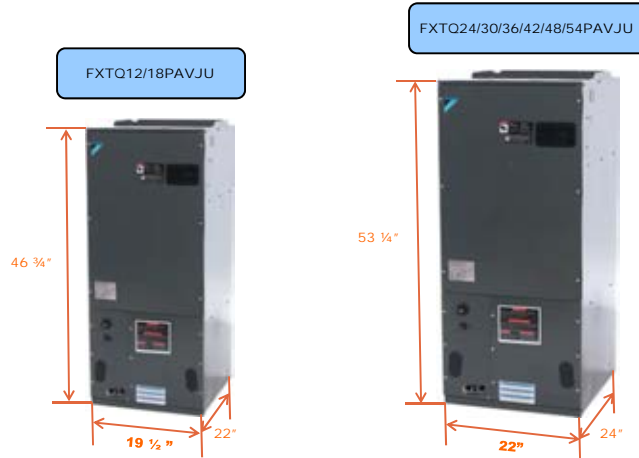
Vertical Air Handler

- ☐ Offered in 8 model sizes from 12 MBTU's to 54 MBTU's
- ☐ 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 20 kW
- ☐ **NOTE:** System Pressure Test to 450 psi only



Slide 58 © 2010 Daikin AC

FXTQ_PAVJU Multi-position Air Handler Specifications

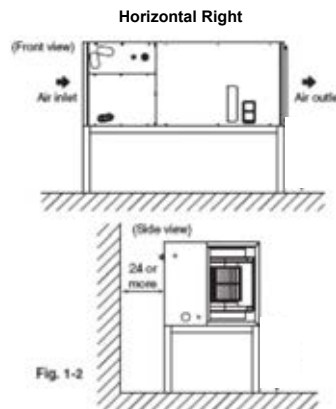
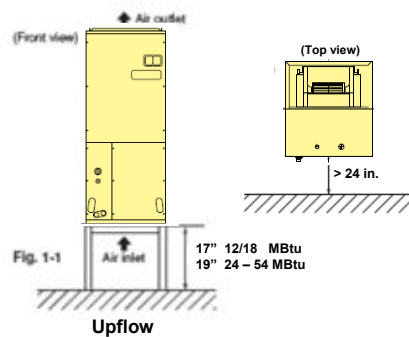


NOTE: High Efficiency Air Filters are not available for this product, and should not be used

Slide 59 © 2010 Daikin AC

FXTQ_PAVJU Installation

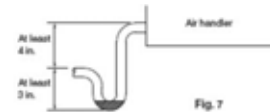
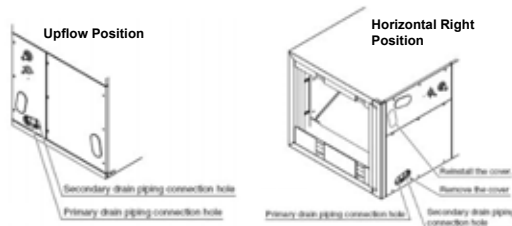
- The Fan Coil cabinet must be firmly supported on the bottom for upflow and the full underside when in the horizontal right position
- Insure that the cabinet is perfectly level



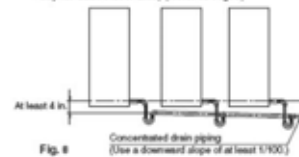
Slide 60 © 2010 Daikin AC

FXTQ_PAVJU Condensate Installation

- Fan Coil requires a "P Trap" for the condensate drain
- Copper type W, or sched'I 40 PVC tubing may be used for the condensate drain
- Provision should be made to clean the trap

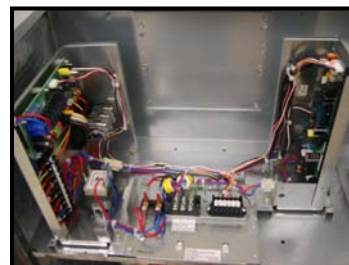


• Observe the following guidelines when installing concentrated drain piping. Select the thickness of the concentrated drain piping to reflect the capacity of the machine to which it will be connected. (Install a drain trap for each indoor unit.) (Refer to Fig. 8)



FXTQ_PAVJU Line & Control circuits

- PCB's, Line voltage and Control voltage connections
- Control transformer set for 240 vac
- For 208 vac power supply change transformer primary tap



Line Voltage

Control Voltage



FXTQ_PAVJU Temperature Control

- The **FXTQ-PAVJU** is not equipped with a return air sensor.



NOTE: BRC1E71 is factory default – Field setting change is required for Remote Sensor Applications

Slide 63 © 2010 Daikin AC

FXTQ_PAVJU Remote Sensor Application

- KRCS01-4B Remote Sensor Connection
- Control application using Simplified RC or no RC
- Any application using the Remote Sensor requires a field setting change at the Remote Controller [10(20) 2-02] "C9" or "CJ" fault code if field setting is not changed



X16A Remote Sensor Cable Connection




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

* Factory set

NOTE: Remote Sensor Cable uses a 4 pin (2-wire) connector at X16A

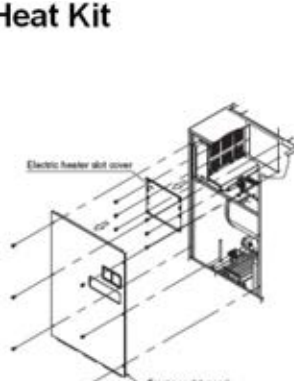
Slide 64 © 2010 Daikin AC



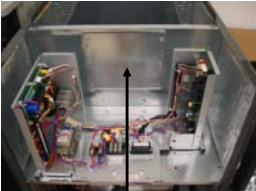
FXTQ_PAVJU Optional Electric Heat Kit

Strip Heat Modules

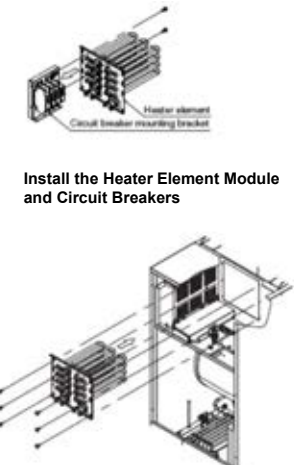
- SkyAir – 3kW to 10kW
- VRVIII-S – 3kW to 20kW



Remove Top Access Panel and Heater Element Cover




Electric strip heat module slot cover



Install the Heater Element Module and Circuit Breakers


Slide 65 © 2010 Daikin AC




FXTQ_PAVJU Optional Electric Heat Kit

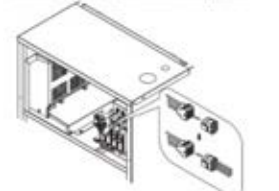
Strip Heat Modules

- VRV – 3kW to 20kW



Install the heater circuit breaker Mounting Bracket and Circuit Breakers





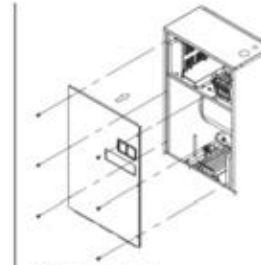
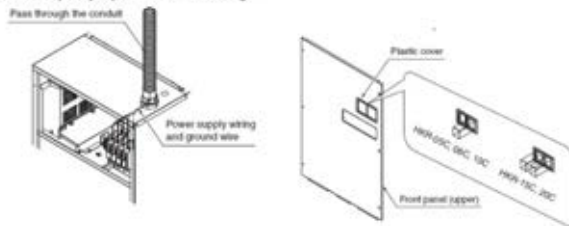
Connect heater relay harness to the harness on fan coil

Slide 66 © 2010 Daikin AC

FXTQ_PAVJU Optional Electric Heat Kit

- ☐ Install the line voltage wiring into top of cabinet
- ☐ Remove the breaker knockout cover on front panel
- ☐ Install Front Panel
- ☐ Field setting at remote controller is required

Pass the power supply wiring and the ground wire through the conduit (conduit should be field supplied). The hole for running wires through should be sealed completely to prevent air from entering.



(13) On-site setting of heater

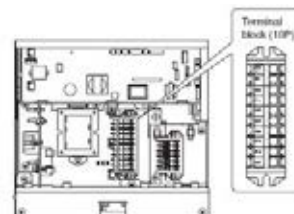
(13)-1 Electric heater capacity setting

Electric heater capacity setting (Optional kit)	Model No.	FIRST CODE NO.	SECOND CODE NO.
HWP-OS, OS, SS, AS, AS, SS, SS, 2S type	11 (2S)	5	01
Without heater			0F

* Factory set

FXTQ_PAVJU Optional Humidifier and Air Purifier

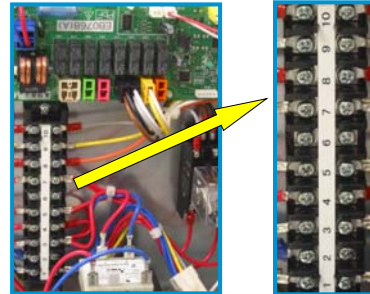
- ☐ Field supplied accessories can be controlled
- ☐ Run the wires through the low voltage hole
- ☐ Connect the device control wires on Terminal Block 10P
- ☐ Field setting at remote controller is required for fan control



Terminal No.	Input/output signal
1, 2	Output: Indoor unit ON signal (AC 24V)
3, 4	Output: Indoor unit cooling THERMO ON signal (AC 24V)
5, 6	Receives input: Air purifier operation ON signal (dry contact)
7, 8	Receives input: Humidifier operation ON signal (dry contact)
9, 10	Receives input: Forced closure of Indoor Unit (Electron) Expansion Valve during cooling operation (dry contact)

FXTQ_PAVJU Humidifier Interlock

- ☐ New control logic has been added to improve humidifier integration
 - ☐ No additional control board is required
- ☐ Switches the indoor unit fan to high fan speed when the humidifier on signal is received
 - ☐ Terminals 7-8, dry contact
- ☐ The fan residual run on timer can be programmed on site from 30-120 seconds
 - ☐ Helps remove excess moisture from ductwork



Terminal No.	Input/output signal			
7, 8	Receives input Humidifier operation ON signal. (dry contact)			
Mode No.	FIRST CODE NO.	01	02	03
14 (24)	4	FAN SPEED UNDER OPERATING purifier and humidifier	Refer to remote controller setting SPEED	H*
14 (24)	5	FAN RESIDUE TIME FOR HUMIDIFIER	30 [sec]	60* [sec] 120 [sec]

* factory set

VRV Duct-free Units

- ☐ FXAQ (7/9/12/18/24)MVJU – (7,000 to 24,000 Btu/h)

Wall Mounted

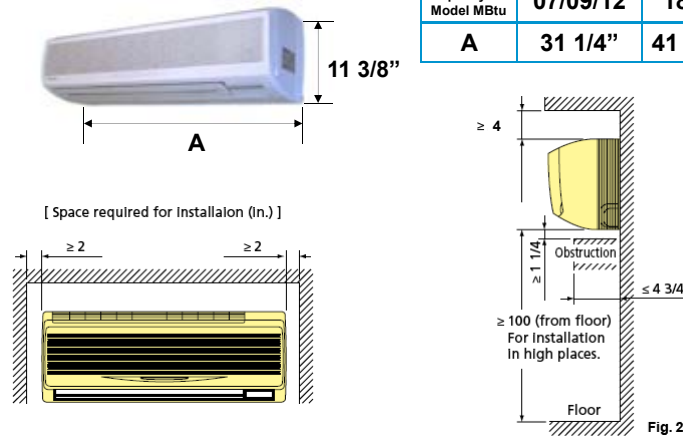
- ☐ Very low sound levels
- ☐ Auto-swing feature ensures efficient air distribution
- ☐ Louvers automatically close when unit is turned off
- ☐ Wide air discharge outlet distributes a comfortable airflow through the entire space
- ☐ Flexible routing of refrigerant and condensate lines

Options Include:

- ☐ Condensate Pump
- ☐ Controls



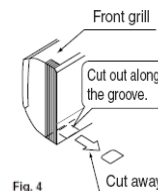
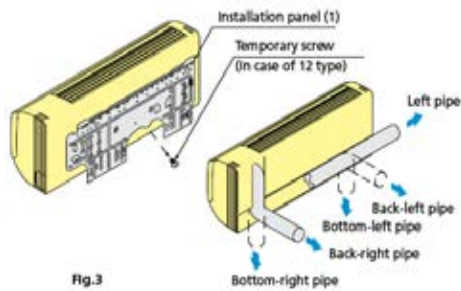
FXAQ Wallmount Dimensions and Clearances



Slide 71 © 2010 Daikin AC

FXAQ Wallmount Dimensions and Clearances

- ☐ 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



Slide 72 © 2010 Daikin AC



FXAQ

Wall Mounting Plate



Slide 73 © 2010 Daikin AC



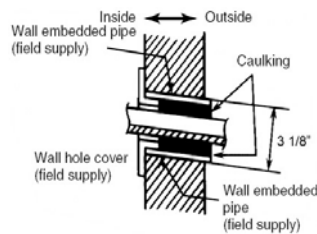
FXAQ



Slide 74 © 2010 Daikin AC

FXAQ

- Installing refrigerant and drain 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
 - Insure that the hole has a slight down angle from the inside to the outside



Slide 75 © 2010 Daikin AC

FXAQ

Rear of Wall Mount Unit - Right hand exit



Slide 76 © 2010 Daikin AC




FXAQ

Rear of Wall Mount Unit - Left hand exit




Slide 77 © 2010 Daikin AC



FXAQ

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.

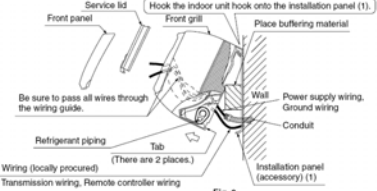
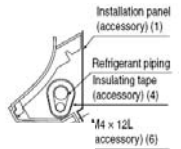


Fig. 9

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



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 cooking material.

Slide 78 © 2010 Daikin AC

FXAQ

Gravity Drain

- The drain pipe should be short with a downward slope and should prevent air pockets from forming.
- Watch out for the points in the figure 16 when performing drain work.

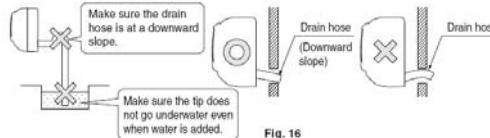


Fig. 16

- Make sure the diameter of the extension drain piping is the same as the indoor unit drain hose (hard vinyl chloride, I.D. 9/16") or bigger.
- In case of converging multiple drain pipes, install them referring to Fig. 18.
- Select diameter of drain piping which adapts to the capacity of the unit connected.

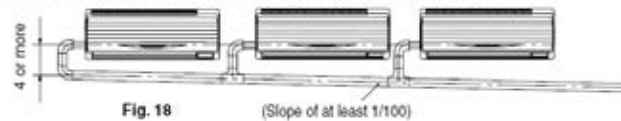


Fig. 18

When making the penetration on the left side of the unit it is possible to relocate the drain from right to left.

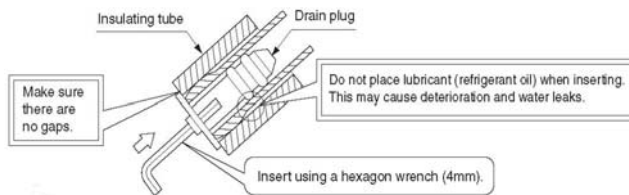


Fig. 9

FXAQ

Condensate Pump Right Hand Exit

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

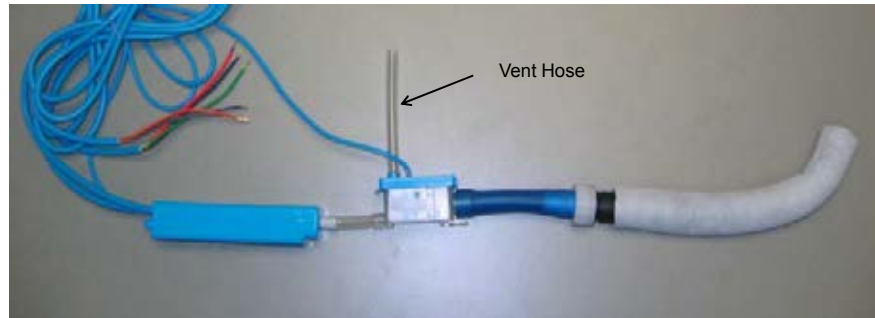


- Remove the drain plug from left hand side. (see above) Plug can be twisted out carefully without tools. Use Allen wrench method if plug seems tight.
- Grasp drain hose on unit very close to where it connects and gently twist out.
- Swap Insulation tube.
- Install drain plug in right hand side where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

FXAQ

Condensate Pump Right Hand Exit

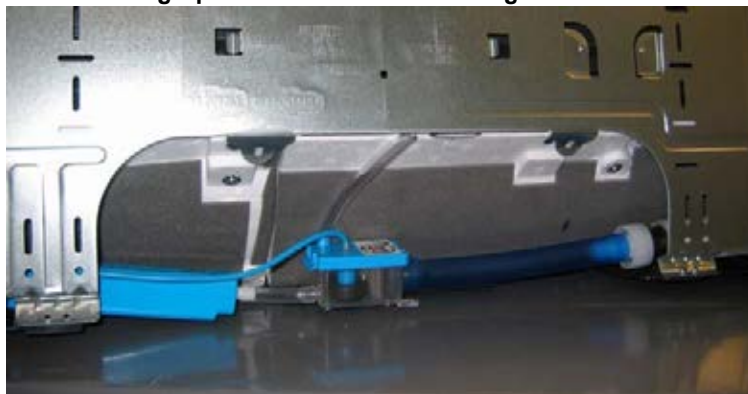
Complete Drain & Pump Assembly



Drain hose and fitting should be installed on Indoor Unit first.

FXAQ Condensate Pump

Setting Up Hose Connections For Right Hand Exit



Right Hand Exit View from Back

FXAQ

Condensate Pump Right Hand Exit

Setting Up Hose Connections For Right Hand Exit

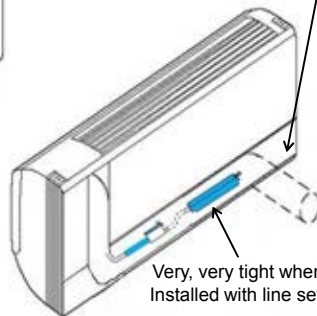
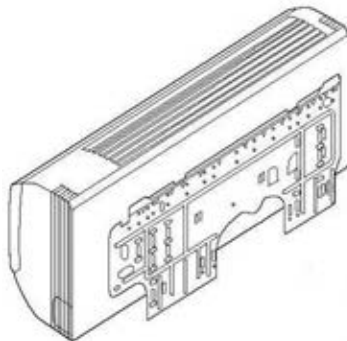
Hold back insulation and push corrugated tubing into fitting.
After it bottoms out slide insulation back towards fitting.



FXAQ

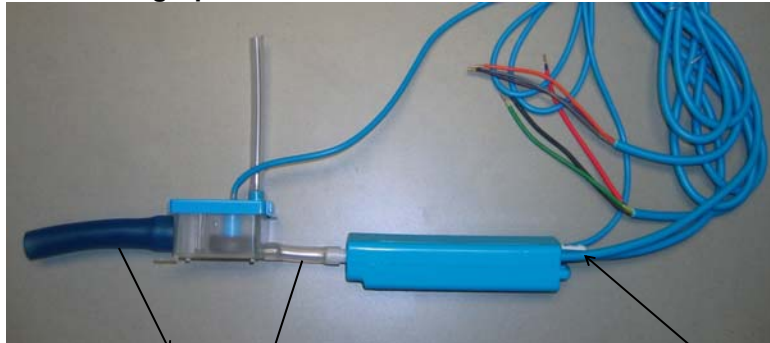
Condensate Pump Left Hand Exit

Using the left hand exit gives you very little room for the pump and float assembly



FXAQ Optional Condensate Pump Kit

Setting Up Hose Connections For Left Hand Exit



Cut tubing as you assemble pump, line set and drain assembly

Pump outlet connection. Run to main drain of building or equivalent.

Verify tubing lengths before cutting. Lengths may vary depending on installation.

Slide 85 © 2010 Daikin AC

VRV DIII-Net Alternate Condensate Safety

Alternate float switch connection from T1 T2 Forced Off to PCB jumper X15A or X8A . Interruption of safety through jumper disables operation of connected fan coil only, remaining fan coils continue full cool operation. Outdoor unit operation is not affected.

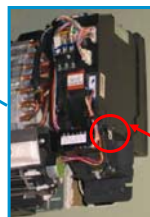


FXLQ/FXNQ
X8A Circuit interruption disables fan coil and generates an "A3" code

Splice in optional condensate pump float switch leads to jumper using crimp butt connectors or solder



FXAQ
X15A Circuit interruption disables fan coil and generates an "A3" code



X8A

X15A Jumper



FXHQ



Slide 86 © 2010 Daikin AC

FXAQ

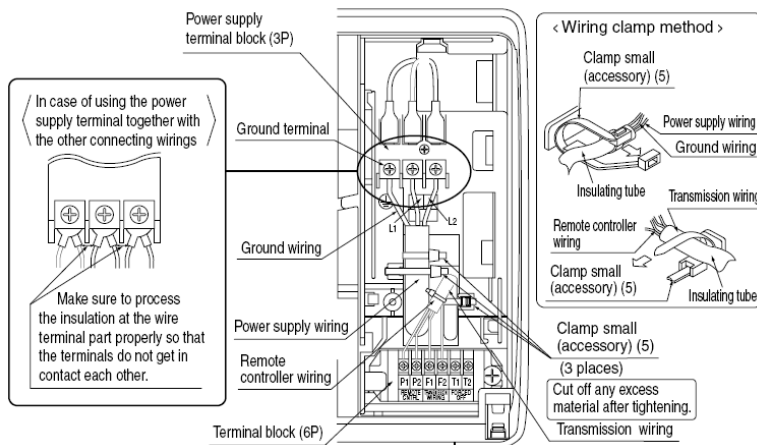
Priming Pump

Don't forget to prime pump! The pump will buzz for a minute of two while it is pulling the water through itself.



FXAQ

Wiring Connections



□ FXFQ (7/9/12/18/24/30/36)MVJU

3x3 4-Way Ceiling Cassette,

- Sound pressure levels as low as 28dB(A)
- Space-saving above ceiling height of unit less than 12"
- Selectable auto-swing louver positions
- Simple installation with easy-fit decorative panel
- Service access through RA grille – washable filter
- Condensate lift pump up to 22"
- Field configured for 2 or 3 way air discharge
- Branch duct provision
- Fresh-Air inlet provision

Options include:

- High efficiency air filter
- Fresh air intake kit
- Controls



FXFQ *Round Flow*

□ FXFQ (9/12/18/24/30/36/48)PVJU

(9,000 to 48,000 Btu/h)

Round Ceiling Cassette, 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



FXZQ

□ FXZQ (7/9/12/18)MVJU– (7,000 to 18,000 Btu/h)

□ 2 x 2 4-Way Ceiling Cassette

- Sound pressure levels as low as 25dB(A)
- Space-saving above ceiling height of unit less than 12"
- Selectable auto-swing louver positions
- Simple installation with easy-fit decorative panel
- Service access through RA grille – washable filter
- Condensate lift pump up to 22"
- Field configured for 2 or 3 way air discharge
- Fresh Air Inlet provision

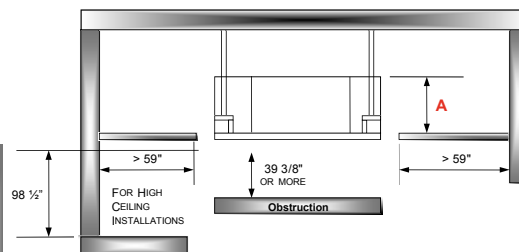
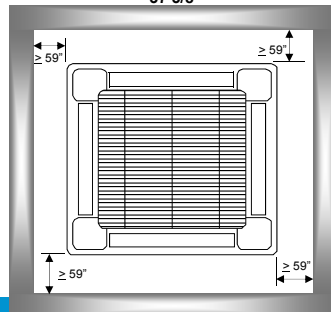
Options include:

- Fresh air intake kit
- Controls



FXFQ_M 3' x 3'

Installation

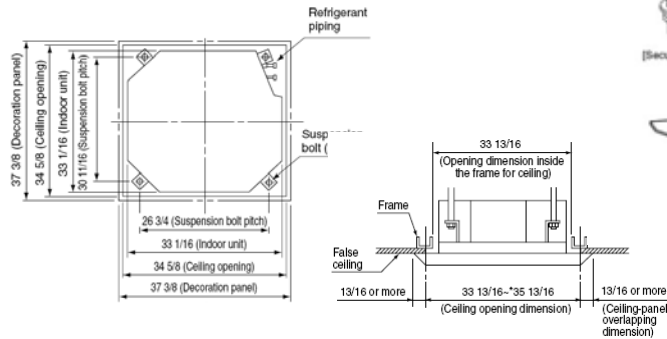


Model	H
FXFQ12, 18, 24MVJU	9 7/16" or more
FXFQ30, 36MVJU	11 3/4" or more

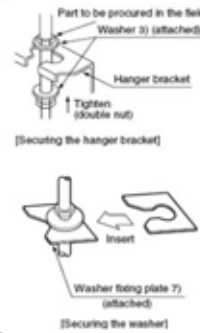
	07/09/12/18/24	30/36
A	9 1/8"	11 3/8"

FXFQ 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.



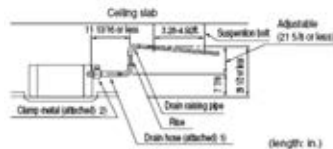
• Attach the hanger bracket to the suspension bolt. Be sure to fix it securely by using a nut and washer from the upper and lower sides of the hanger bracket. The washer fixing plate 7) will prevent the washer from falling.



FXFQ_P Installation

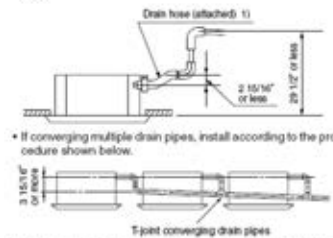
- Max. drain riser height: 33 1/2"
- Flexible, insulated drain coupling is included
- Max. riser pipe diameter from coil outlet: 3/4" ID
 - Larger diameter pipe may generate an "AF" code
- Never connect drain piping to sewer vent

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

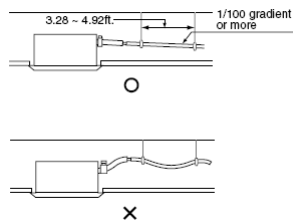


NOTE

- 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.



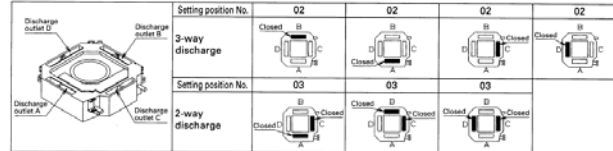
Select converging drain pipes whose gauge is suitable for the operating capacity of the unit.



FXFQ Installation

Caution

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



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.

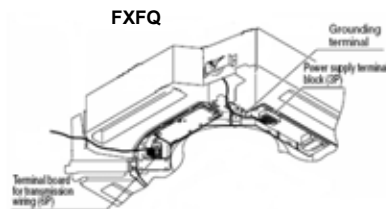
Setting of the direction of air discharge	Mode number	Setting switch number
	13 (23)	1

(Ceiling Height is reference value)							Ceiling height setting position number
	~71 type			80~125 type			
	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

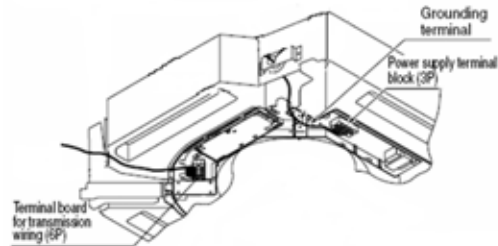
Refer to the table for the height of the ceiling for each direction of air outlet. (The setting of the ceiling height is also required.)

FXFQ/FXZQ Electrical Installation



FXFQ Installation

Electrical Specifications



Model	Power supply wiring		Transmission wiring	
	Field fuses 	Size	Wire	Size
FXFQ12 MVJU FXFQ18 MVJU FXFQ24 MVJU FXFQ30 MVJU FXFQ36 MVJU	15A	Wire size must comply with local codes.	Sheathed wire (2 wire)	AWG 18-16

Units				Power supply		Fan motor	
Model	Hz	Volts	Voltage range	MCA	MFA	W	FLA
FXFQ12 MVJU	60	208-230V	Max. 253 Min. 187	0.6	15	45	0.5
FXFQ18 MVJU				0.7	15	45	0.6
FXFQ24 MVJU				0.8	15	45	0.6
FXFQ30 MVJU				1.2	15	90	1.0
FXFQ36 MVJU				1.2	15	90	1.0

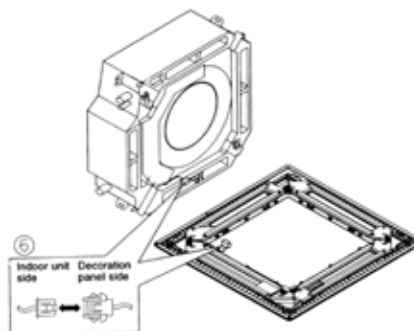
MCA: Min. Circuit Amps (A) MFA: Max. Fuse Amps (A)
kW: Fan Motor Rated Output (W) FLA: Full Load Amps (A)

Slide 97 © 2010 Daikin AC

FXFQ Decoration Panel Electrical 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



Slide 98 © 2010 Daikin AC



FXFQ Decoration Panel Installation





Mounting loop




Mounting tab



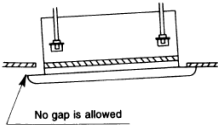
Adjustment Screw

Slide 99 © 2010 Daikin AC

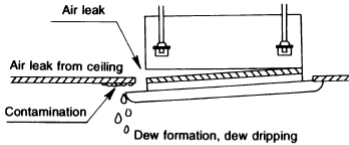


FXFQ Face Plate Installation

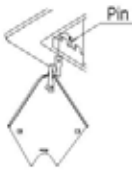
- If gap is still left between the ceiling and the decoration panel after screwing the screws, readjust the indoor unit body height. (Refer to Fig. 6)



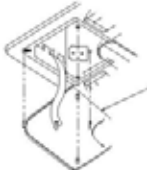
No gap is allowed



Air leak
Air leak from ceiling
Contamination
Dew formation, dew dripping



Pin



Install the service cover by sliding 4 latches to fit into the holes on the decoration panel.

Slide 100 © 2010 Daikin AC



FXZQ 2'x2' Ceiling Cassette

Decoration Panel Installation



- ☐ Install 2 of the 4 supplied mounting screws into the designated fan coil mounting straps
- ☐ Install the elongated mounting holes of the decoration panel onto these 2 screws to hold panel in place
- ☐ Rotate the swivel support finger on the





Dec



ort

➡
Slide 101 © 2010 Daikin AC



FXHQ

☐ FXHQ (12/24/36)MVJU – (12,000 to 36,000 Btu/h)

☐ *Ceiling Suspended*

- ☐ 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
- ☐ Direct Fresh Air Possible

Options Include:

- ☐ Condensate Pump
- ☐ Controls

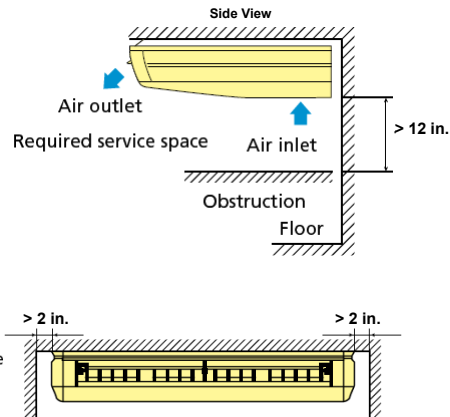
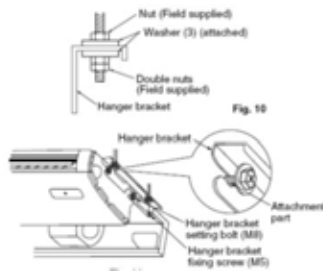




Slide 102 © 2010 Daikin AC

FXHQ Installation

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



FXHQ Installation

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

Control and Line voltage connections



Unit Bottom View



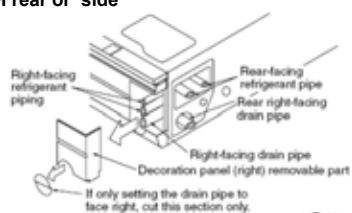
Unit Side View



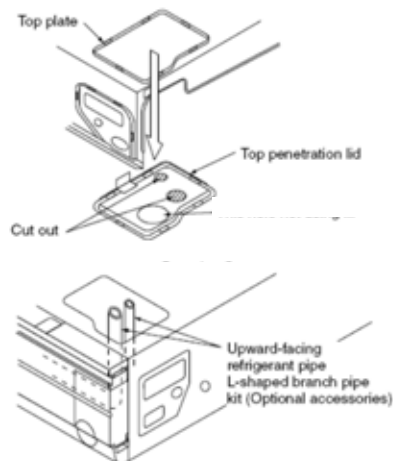
FXHQ Refrigerant & Condensate Lines

- ☐ 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



Slide 105 © 2010 Daikin AC

FXLQ

- ☐ FXLQ (12/18/24)MVJU – (12,000 to 24,000 Btu/h)
 - ☐ Floor Mounted, Exposed
 - ☐ Unit requires minimal installation space
 - ☐ Standard equipped with a washable, long-life, mildew-proof filter
 - ☐ Space-saving unit can be mounted freestanding or secured directly to the wall
 - ☐ Gravity condensate drain
 - ☐ Optional Condensate Pump



Slide 106 © 2010 Daikin AC

FXNQ

□ FXNQ (12/18/24)MVJU – (12,000 to 24,000 Btu/h)

□ *Floor Mounted, Concealed*

- No panels for custom enclosure installation
- Unit requires minimal installation space
- Standard equipped with a washable, long-life, mildew-proof filter

Options Include:

- Condensate Pump
- Controls



Slide 107 © 2010 Daikin AC

FXLQ

Remove and Replace Front Panel

- Open upper right and left access lids
- Remove the locking screw for each slide clip
- Loosen front slide clip screw – RH LH
- Move both right and left slide clips toward rear
- Lift the top grille panel
- Remove front panel – top forward
- Reverse procedure

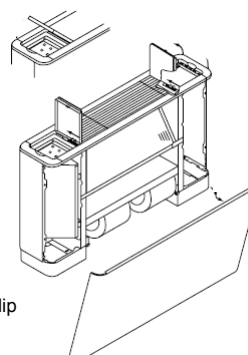


Top LH View

Remove this screw

Front panel release slide clip

Loosen this screw 1/8 turn

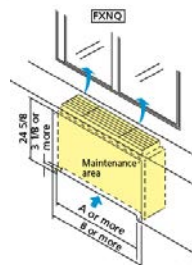
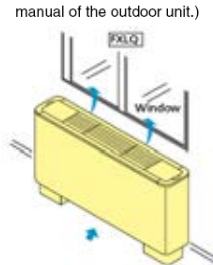


Slide 108 © 2010 Daikin AC

FXLQ/FXNQ

(1) Select an installation site where the following conditions are satisfied and that meets with your customer's approval.

- Where the floor is strong enough to bear the indoor unit weight.
- Where the floor is not significantly inclined.
- Where nothing blocks the air passage.
- Where condensate can be properly drained.
- Where sufficient clearance for installation and maintenance can be ensured.
- Where optimum air distribution can be ensured.
- Where there is no risk of flammable gas leakage.
- Where piping between indoor and outdoor units is possible within the allowable limit. (Refer to the installation manual of the outdoor unit.)

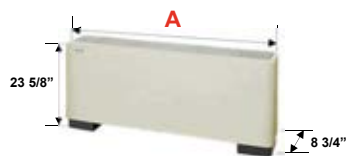
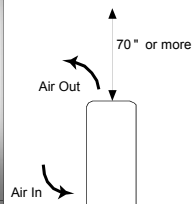
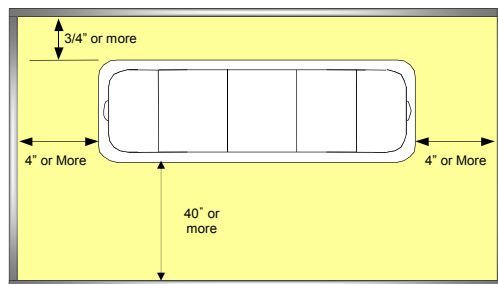


Model	A (in.)	B (in.)
FXNQ12MVJU	28	46
FXNQ18 - 24MVJU	39	57

Slide 109 © 2010 Daikin AC


FXLQ/FXNQ

Floor Mounted Clearances



	12	18	24
A	44 7/8"	55 7/8"	55 7/8"

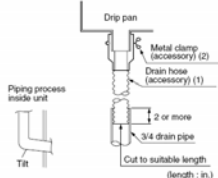
Slide 110 © 2010 Daikin AC





FXLQ/FXNQ Condensate Drain

Standard Gravity Condensate Drain

Connect the drain hose (1) using the attached hose and parts, as shown in the right drawing.

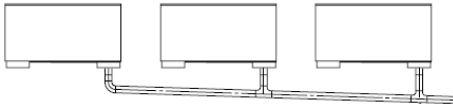


OR


Optional Self priming Condensate Pump Kit

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



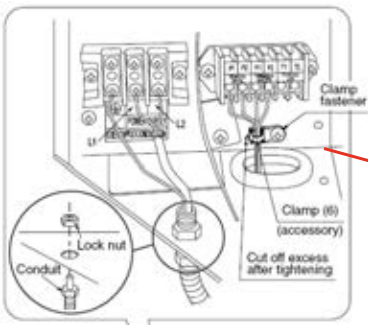
Slope downwards at a gradient of at least 1/100


Slide 111 © 2010 Daikin AC



FXLQ/FXNQ

Wiring Connections & Electrical Specifications






Slide out filter for cleaning

Model	Power supply wiring		Remote controller wiring	Transmission wiring
	Field fuses	Size	Wire	Size
FXLQ12 · 18 · 24 MVJU	15A	Size must comply with local codes.	Sheathed wire (2 wire)	AWG 18-16
FXNQ12 · 18 · 24 MVJU				


Slide 112 © 2010 Daikin AC

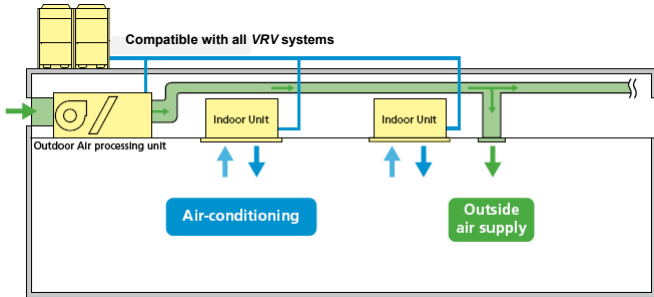


VRV 100% OA Processing Unit


□ FXMQ (48/72/96)MFVJU

- 4, 6 & 8 Ton capacity models
- ESP Max. 1.03" w.g.





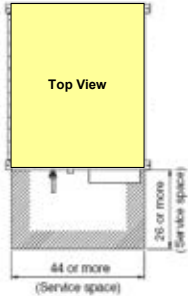
Slide 113 © 2010 Daikin AC



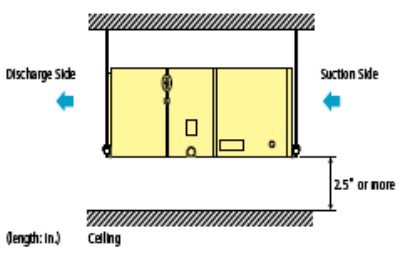
FXMQ_MFVJU

Dimensions and Clearances

Capacity Model MBtu	48	72/96
Height	18 1/2"	18 1/2"
Depth	43 1/2"	43 1/2"
Width	29 1/4"	54 3/8"



Top View



Discharge Side Suction Side

2.5" or more

(length: in.) Ceiling

Slide 114 © 2010 Daikin AC

FXMQ_MFVJU Electrical

- Line and Control circuits
 - Line voltage to X1M
 - Control voltage to X2M

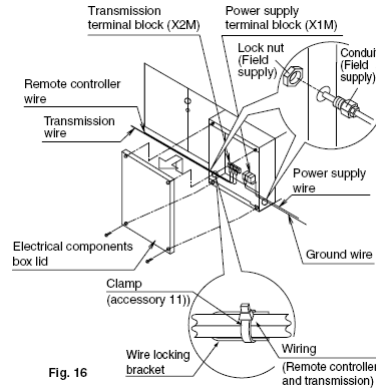
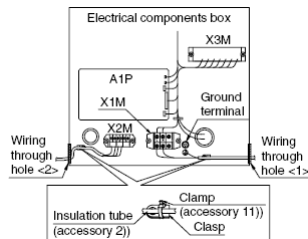


Fig. 16

FXMQ_MFVJU Control

- Unit is controlled by a programmed Field Setting for Heat and Cool discharge air temperature

11-4 Setting air discharge temperature
 • Change the SECOND CODE NO. according to Table 5 depending on user's need.
 (SECOND CODE NO. is set to "06" for cooling "08" for heating at factory set)

Mode No.	for cooling	for heating
FIRST CODE NO.	3	4
01	55°F	64°F
02	57°F	66°F
03	59°F	68°F
04	61°F	70°F
05	63°F	72°F
06	64°F	73°F
07	66°F	75°F
08	68°F	77°F
09	70°F	79°F
10	72°F	81°F
11	73°F	82°F
12	75°F	84°F
13	77°F	86°F

NOTE ⓘ
 Air discharge temperature is not displayed on remote controller.



DACA CP1-1 & CP2-1 Condensate Pump

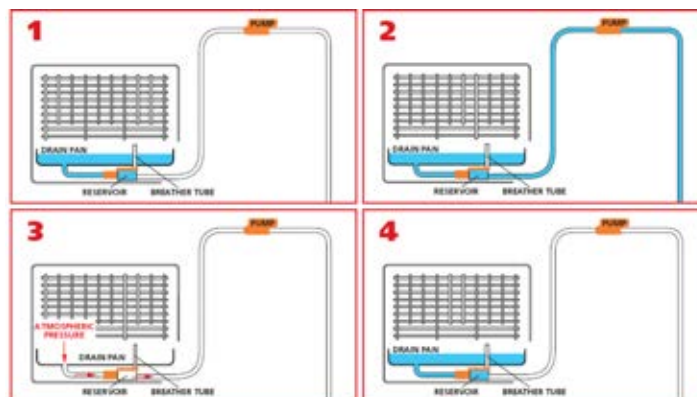
Installation Tips

- ☐ DACA condensate pumps must be installed properly to insure maximum performance and reliable service life
- ☐ DACA Condensate pumps do not include discharge tubing
- ☐ Condensate pump and float reservoir must be accessible for routine maintenance
- ☐ Connect float safety to **T1 T2** on fan coil terminal block



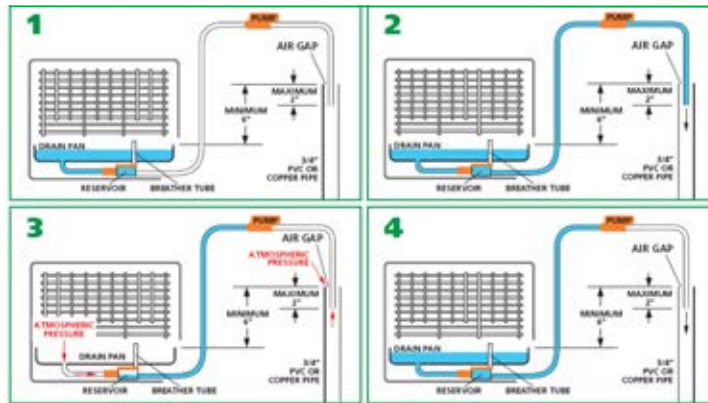
Incorrect Condensate Pump Installation

Incorrect Discharge pipe routing can create siphoning through pump motor causing dry start cycles



Correct Condensate Pump Installation

Discharge tubing must be terminated above the level of the condensate drain pan including an air gap when draining into a main drain line.

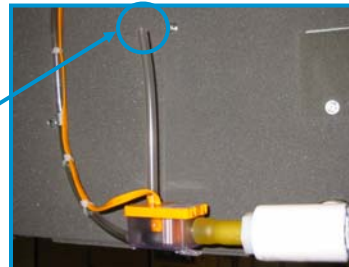


Slide 119 © 2010 Daikin AC

DACA CP1-1 & CP2-1 Condensate Pump

Installation Tips

- ☐ Insure that the float reservoir vent tube opens above the condensate drain pan
- ☐ The Float switch reservoir is a maintenance item and must be cleaned on a regular basis



Slide 120 © 2010 Daikin AC

VRV^{III} & VRV-W^{III}

BSVQ_PVJU Single Port Branch Selector Box

- 36, 60 & 96 capacity models
- Line voltage powered 208/230vac 1 Ph.
- Weight: 36/60: 26 lb. 96: 33 lb.
- Refrigerant Braze Connections
- BS Box must be installed level

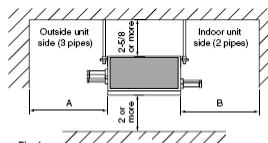
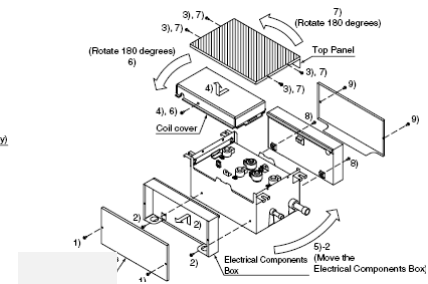
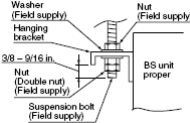


Fig. 1

BS Unit Name	A (in.)	B (in.)
BSVQ36P	10 or more (*1)	10 or more (*1)
BSVQ60P	10 or more (*2)	10 or more (*2)
BSVQ96P	12 or more (*3)	12 or more (*3)

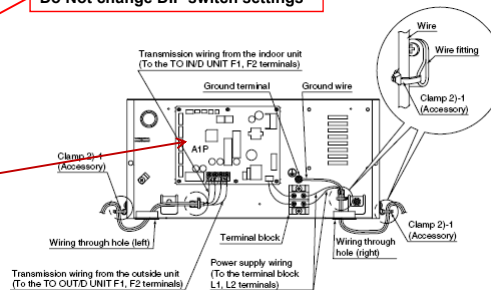


VRV^{III} & VRV-W^{III}

BSVQ_PVJU Branch Selector Box

- Branch Selector Box must be installed level
- Control circuit is daisy chain wired
- Field Reversible Electrical Box
- Green status LED

Do Not change DIP switch settings



NOTE: All Expansion Valves close when power is applied to the BS Box

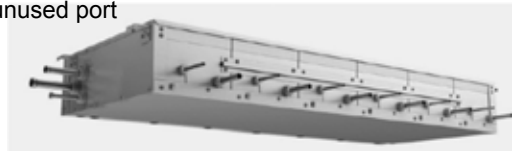
BSV4/6Q36PVJU

Centralized 4-Port & 6-Port Branch Selector Box

- ☐ BS box must be installed level
- ☐ Install unit with suspension bolts
- ☐ Line voltage powered 208/230vac 1 Ph.
 - ☐ MCA: .4/.6 amp
- ☐ BS Box shipped with all EEV's in open position
 - ☐ All EEV's close when line voltage power is applied
- ☐ All braze refrigerant connections
- ☐ "Closed Pipe Kit" is available for 1 unused port
- ☐ No condensate drain is required



BSV4Q36PVJU 4 - Port

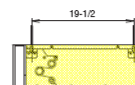
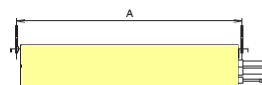


BSV6Q36PVJU 6 - Port

Slide 123 © 2010 Daikin AC

BSV4/6Q36PVJU

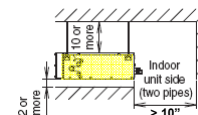
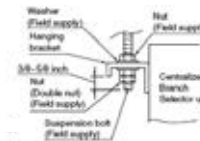
Installation



<Suspension bolt pitch>

centralized BS unit	A
BSV4Q36PVJU	45-3/8
BSV6Q36PVJU	64-1/8

- ☐ Install the Centralized BS box right side up only and level
- ☐ Allow for proper service clearances
 - ☐ Suspend with 3/8" or 5/16" Suspension bolts
 - ☐ Secure bolts with nut and washer above and below each angle bracket
 - ☐ Allow a minimum of 10" clearance above BS box
 - ☐ Refer to Installation Manual for all clearances
 - ☐ Support refrigerant lines within 40" or less of BS box

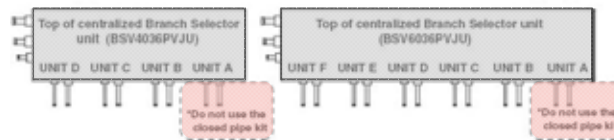


Slide 124 © 2010 Daikin AC

BSV4/6Q36PVJU Installation

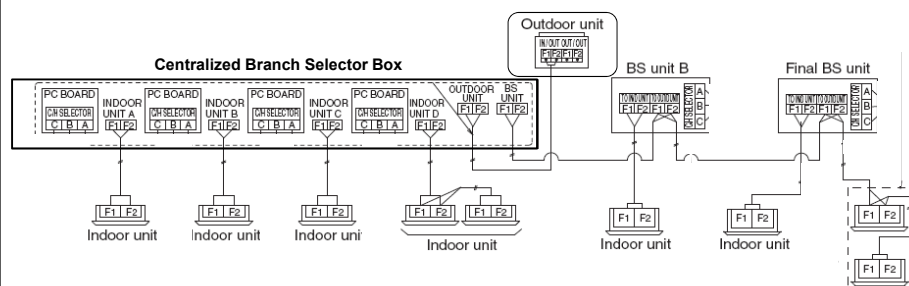
Optional KHFP26A100C “Closed Pipe Kit”

- A maximum of one closing kit per Branch Selector is allowed.
- A maximum of two closing kits per outdoor unit system are allowed.
- Do not use this closed pipe kit for the branch that is the furthest from the three-pipe side of the centralized Branch Selector unit.



BSV4/6Q36PVJU Installation – Control Wiring

- ☐ Standard Daikin control wire specification



VRV Local Controls Control Wiring



DAIKIN AC
absolute comfort
© 2010 Daikin AC

VRV Local Remote Controllers

BRC1E71



Navigation
Remote Controller

BRC2A71



Simplified

BRC7C/7E/4C



Wireless

KRCS01-1B (4B) Remote Sensor

- VRV Fan Coil Units incorporate a built-in return air thermistor temperature sensor as standard (excl. FXTQ)
 - KRCS01-1B 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 (KRCS01-1B)



NOTE: KRCS01-4B Remote Sensor Kit for FXMQ_P and FTQ/FXTQ Fan Coil Units

Slide 129 © 2010 Daikin AC

VRV Control Circuit Terminal Designations

- Fan Coil Control Terminal Circuits
 - **P1 P2** – Fan Coil 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
- Branch Selector Box
 - **F1 F2 Out** – BS Boxes to Condenser F1 F2 In
 - **F1 F2 In** – BS Box to Fan Coil F1 F2
- Condenser Control Terminal Circuits
 - **F1 F2 In** - Condenser to Fan Coil(s) or BS Boxes
 - **F1 F2 Out** – Centralized Controller
 - I-Touch
 - Gateway – Lon Works or BACnet
 - **Q1 Q2** – Manifolded Modules




BSVQ BS Box



VRV-III - VRV-III

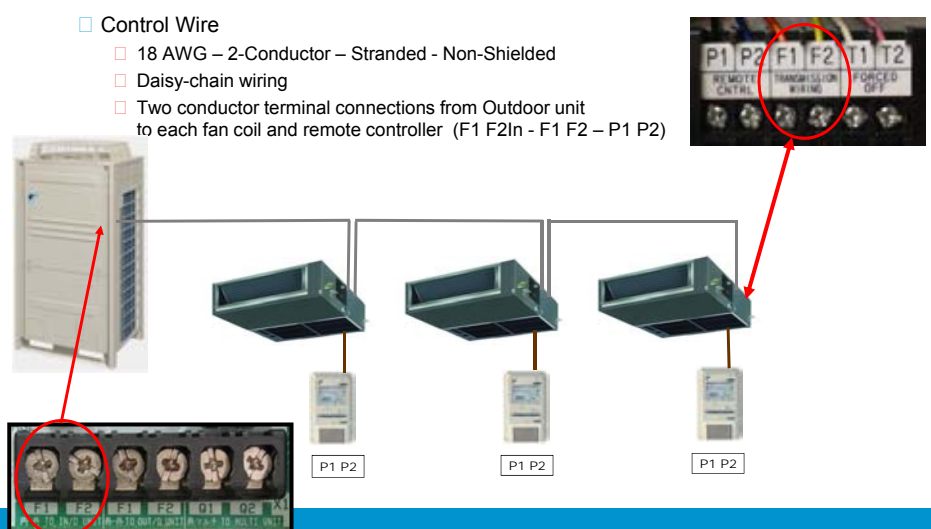


Slide 130 © 2010 Daikin AC




VRV Basic Control Wiring

- ☐ Control Wire
 - ☐ 18 AWG – 2-Conductor – Stranded - Non-Shielded
 - ☐ Daisy-chain wiring
 - ☐ Two conductor terminal connections from Outdoor unit to each fan coil and remote controller (F1 F2In - F1 F2 – P1 P2)

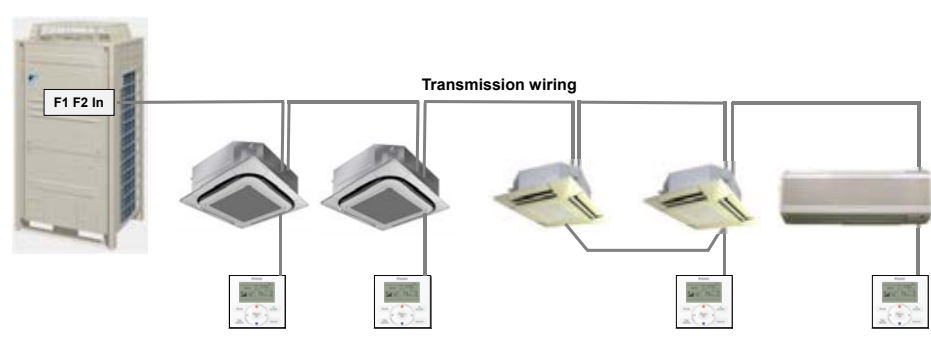


The diagram illustrates the basic control wiring for a VRV system. It shows an outdoor unit on the left and three indoor fan coil units on the right. A red circle highlights the terminal block on the outdoor unit, showing terminals labeled P1, P2, F1, F2, T1, and T2. A red arrow points from this terminal block to the terminal block on one of the indoor fan coil units, which also has terminals labeled P1, P2, F1, F2, T1, and T2. The indoor fan coil units are connected to a common transmission wiring bus.

Slide 131 © 2010 Daikin AC




Daikin DIII-Net Communications



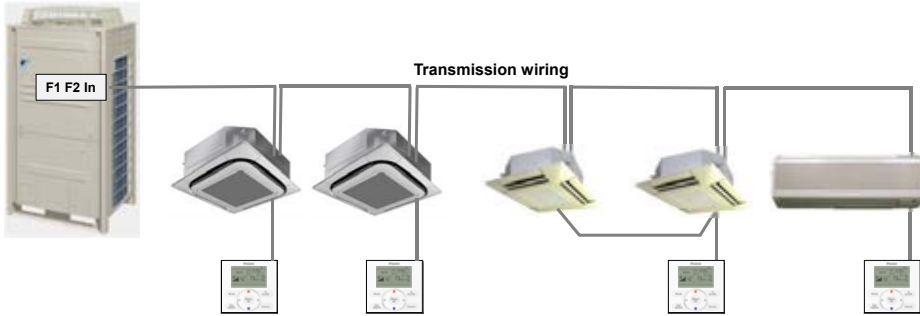
The diagram illustrates the DIII-Net communications wiring for a VRV system. It shows an outdoor unit on the left and five indoor fan coil units on the right. A red circle highlights the terminal block on the outdoor unit, showing terminals labeled F1, F2, and In. A red arrow points from this terminal block to the terminal block on one of the indoor fan coil units, which also has terminals labeled F1, F2, and In. The indoor fan coil units are connected to a common transmission wiring bus.

- ☐ Proprietary to *Daikin VRV* systems (single and three phase)
- ☐ Reliable 2-wire, 16vdc circuit
- ☐ Maximum control system wire length: 6,600 ft.
- ☐ Maximum single cable length: 3,300 ft
- ☐ Maximum cable length from Remote Controller to Fan Coil: 1,640 ft.

Slide 132 © 2010 Daikin AC




Daikin DIII-Net Basic Installation



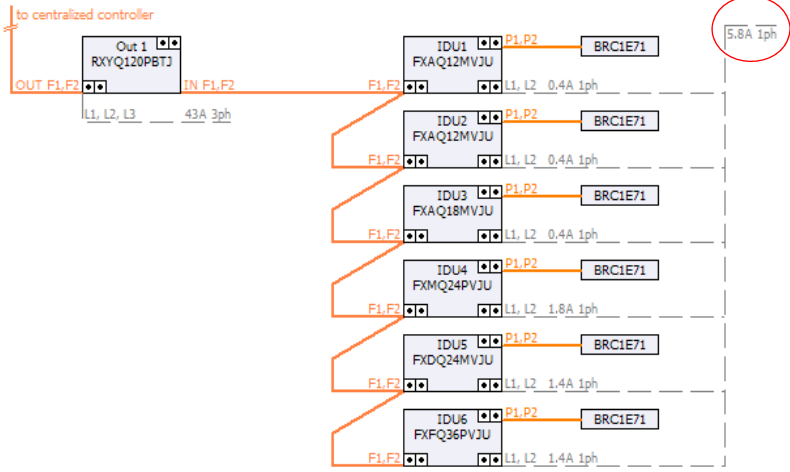
Transmission wiring

- ☐ Robust communications with no termination resistors or signal repeaters
- ☐ Avoid splices – no wire nut connections
- ☐ Do not strap control wiring to conduit with ac voltage or ac wiring (24 vac)
- ☐ Avoid “Star” or “Homerun” wiring
- ☐ Shield not required but if used, ground one end at every component

Slide 133 © 2010 Daikin AC



VRV Xpress HP Wiring Report



to centralized controller

Out 1
RXVQ120PBTJ
OUT F1, F2
L1, L2, L3 43A 3ph

IN F1, F2

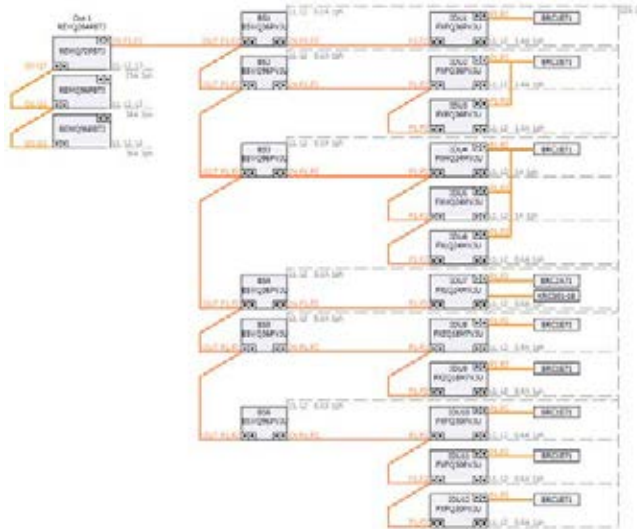
F1, F2

5.8A 1ph

IDU	Model	Power	Remote
IDU1	FXAQ12MVJU	0.4A 1ph	BRC1E71
IDU2	FXAQ12MVJU	0.4A 1ph	BRC1E71
IDU3	FXAQ18MVJU	0.4A 1ph	BRC1E71
IDU4	FXMQ24PVJU	1.8A 1ph	BRC1E71
IDU5	FXDQ24MVJU	1.4A 1ph	BRC1E71
IDU6	FXFQ36PVJU	1.4A 1ph	BRC1E71

Slide 134 © 2010 Daikin AC

VRV Xpress **Heat Recovery Control Wiring Report**

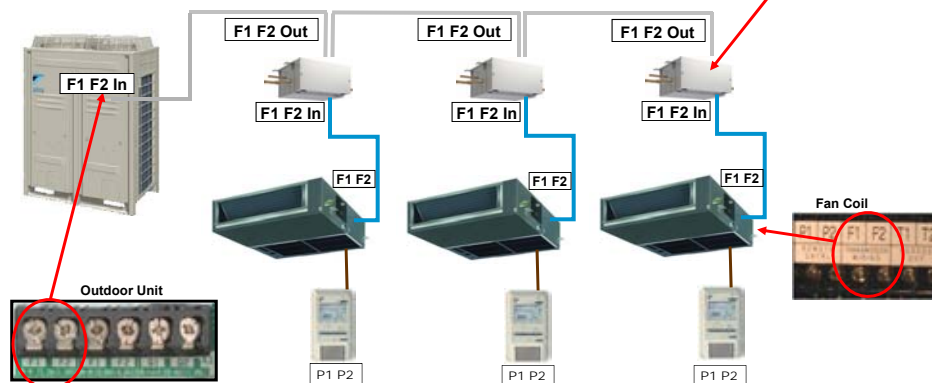


Slide 135 © 2010 Daikin AC

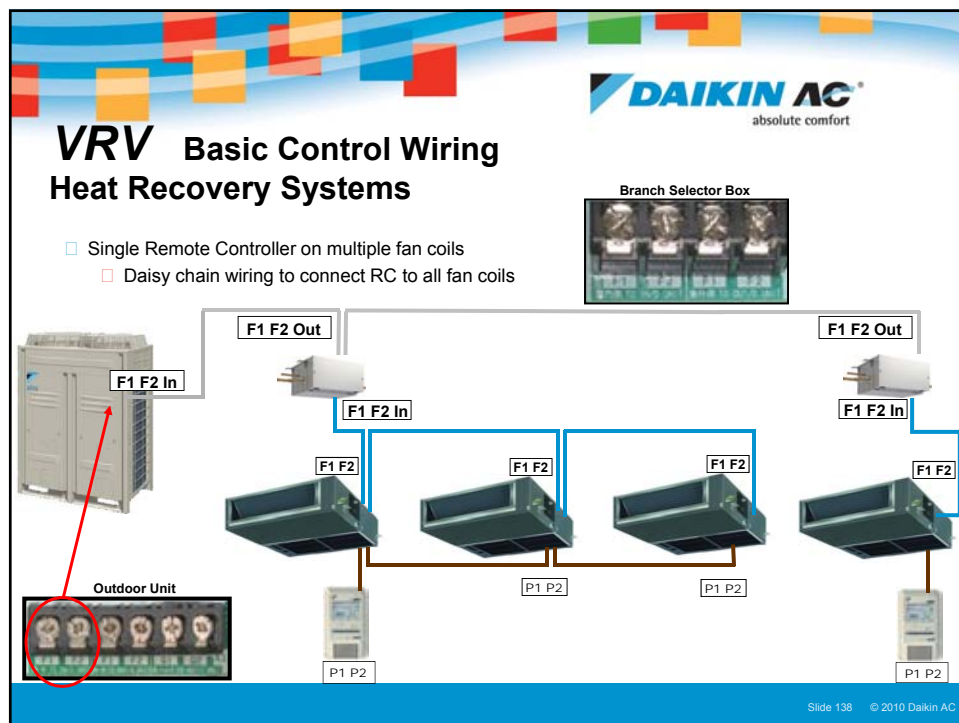
VRV Basic Control Wiring **Heat Recovery Systems**



□ When circuits are crossed - communications drop out



Slide 136 © 2010 Daikin AC





VRV Basic Control Wiring Fan Coil T1 T2 Forced Off

- VRV 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 to **External Protection Device** (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 RC's indicate U9 Fault Code
 - Auto reset on contact close






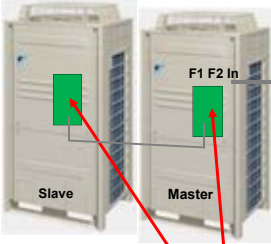



External Input	Mode No.	1 st Code No.	2 nd Code No.
Forced Off	12(22)	1	01 - Default
ON/OFF Op	12(22)	1	02
Ext Protection Device	12(22)	1	03


➔
Slide 139 © 2010 Daikin AC



VRV Basic Control Wiring Manifolded Systems

- Q1 Q2 - Manifolded Modules – VRV-III & VRV-WIII
 - The unit in which **F1 F2 In** is connected from the Indoor fan coils or BS Boxes becomes the Master Unit
 - The Master Unit Control PCB is used for the commissioning procedures

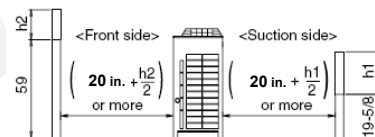
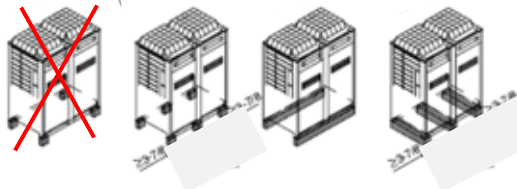
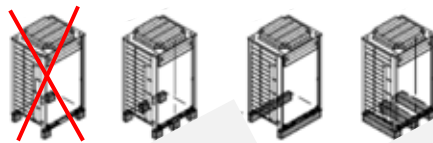


Slide 140 © 2010 Daikin AC

VRV Condenser Basic Installation



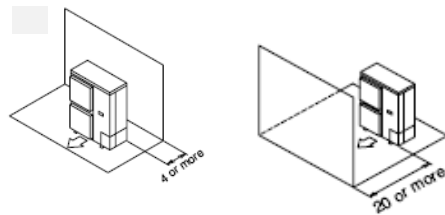
VRVIII Condenser Placement



Refer to the VRVIII Heat Pump
and Heat Recovery Installation
Manuals for all clearance
applications

VRVIII-S Condenser Placement

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



VRV-WIII Water cooled

Single Units RWEYQ72PTJU RWEYQ84PTJU



1 Unit = 6 or 7 Ton
Master Station

Multi Units RWEYQ144PTJU RWEYQ168PTJU



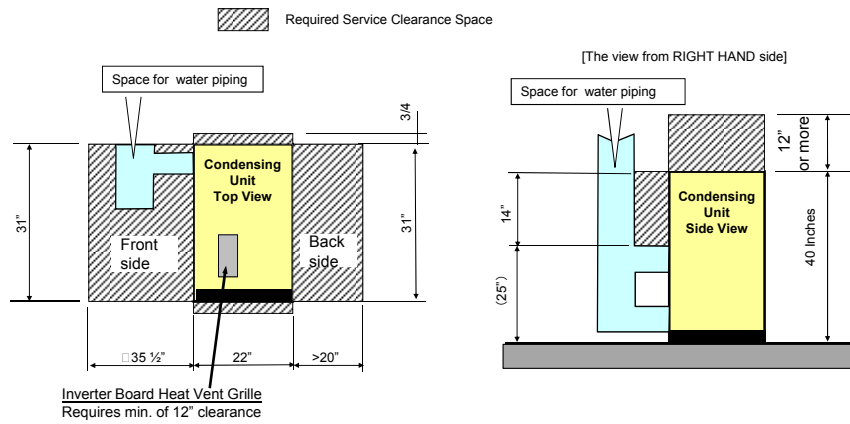
2 Units = 12 & 14 Ton
Master Station
Sub Station 1

Multi Units RWEYQ216PTJU RWEYQ252PTJU



3 Units = 18 & 21 Ton
Master Station
Sub Station 1
Sub Station 2

VRV-WIII Service space



Thank You

Basic VRV Remote Controller Installation & Configuration



RESIDENTIAL | LIGHT COMMERCIAL | COMMERCIAL

Objectives

- Understand the Daikin *DIII-Net* control features & Installation requirements
- Identify the Daikin *DIII-Net* Remote Controllers and understand the features
- Explain the installation procedures for each Remote Controller
- Explain the basic programming procedures for each Remote Controller
- Understand the Field Settings and Group Address procedures

Daikin DIII-Net – The Basics



Integrated communications architecture sharing a common protocol

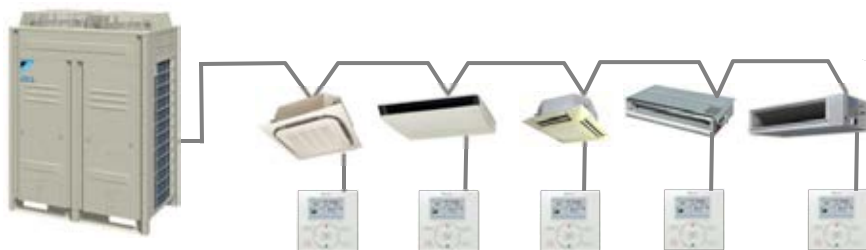
Proprietary to all Daikin VRV systems

Basic 2-conductor control wire design simplifies installation

Reliable daisy-chain communication wiring – 16vdc.

Slide 3 © 2012 Daikin AC

DIII-Net The Advantages

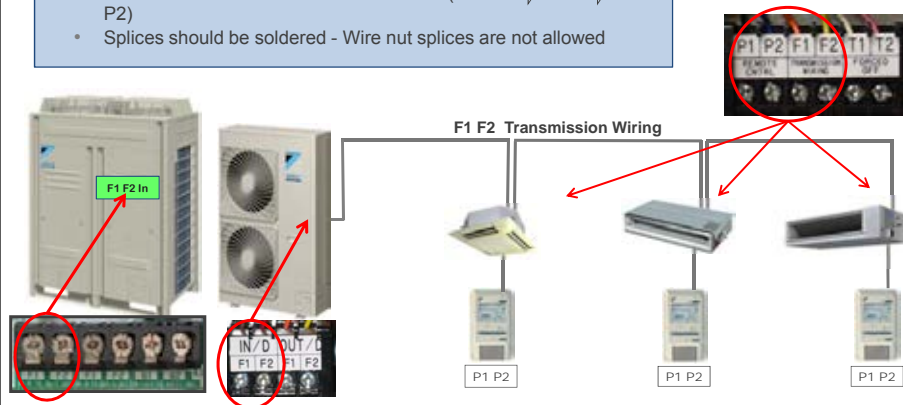


- The Daikin *DIII-Net* protocol is a system of bi-directional data packets that continuously move between the condenser and the indoor units
- Error checking insures accurate and reliable communications
- System auto-addressing as standard, simplifying commissioning
 - In the startup sequence, the condenser recognizes the number and type of indoor units
 - Assigns addresses for the *DIII-Net* communications
 - No manual Rotary or DIP switches are used for system component addressing
- Control system flexibility for simple to sophisticated applications

DIII-Net Basic Control Wiring



- Wire - 16/18 AWG ♦ 2-Conductor ♦ Stranded ♦ Non-Shielded
 - indoor unit PCB powers Remote Controller on 16 vdc circuit – P1 P2
 - Daisy-chain wiring
 - Two conductor terminal connections from Condenser unit to each indoor unit and remote controller (F1 F2In↔F1 F2Out↔P1 P2)
 - Splices should be soldered - Wire nut splices are not allowed



2

Slide 5 © 2012 Daikin AC

DIII-Net Remote Controllers



BRC1E72



BRC2A71



BRC4C/7C/7E/7F



DIII-Net Remote Controllers are compatible with all Daikin VRV and SkyAir RZQ/RZR systems

Slide 6 © 2012 Daikin AC

BRC1E72

Navigation Remote Controller



© 2012 Daikin AC

BRC1E72 Basic Features

- Large Backlit LCD Display
- Display configurable to Detailed, Standard, and Simple
- Room temperature display – Day and Time
- Selectable display languages & °F or °C Temp
- Automatic Changeover Heat Pump & Heat Recovery
- Weekly Schedule
 - 7-Day ♦ 5-2 ♦ 5-1-1 ♦ 1 (Everyday) schedules
 - Up to 5 events per day
- Dual and Single Cool & Heat setpoints
 - 60 °F to 90 °F, 1 °F increments
 - Configurable Setpoint Range Limitations
- Independent Setback Setpoints
 - 40 °F to 95 °F, 1 °F increments
- Selectable 12/24 hour clock display
 - 48 hour backup power for clock & day
- Auto-adjustable Daylight Savings Time (DST)
- Max. 16 connectable indoor units
- Optional Face Decals to hide unnecessary or locked out buttons



Slide 8 © 2012 Daikin AC

BRC1E72 Basic Operation



- Display Backlight Function
 - First button pressed enables backlight only
 - All Function Buttons are then fully enabled
 - Backlight automatically turns off 30 seconds after the last button is pressed



- Backlight must be illuminated for any of the function buttons to be enabled
 - When two remote controllers are used to control one indoor unit or a group of indoor units, only the first controller in use will have a functioning backlight.

2

Slide 9 © 2012 Daikin AC

BRC1E72 Basic Installation & Configuration



- Installation
 - Wall Mounting
 - Control Wiring
- Function Button Layout
- Initial Settings – Main Menu
 - Display Mode
 - Language
 - Clock Format
 - Date & Time
 - Daylight Savings
 - Celsius / Fahrenheit
- Service Settings
 - Field Settings
 - Group Address



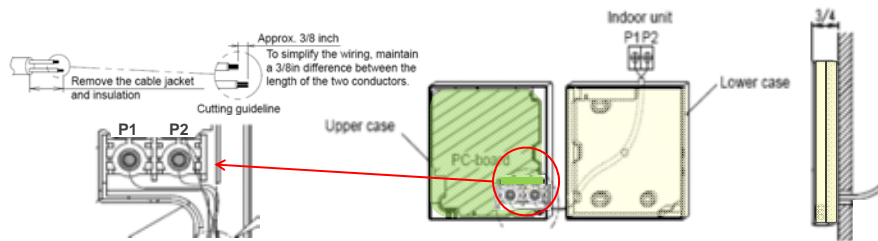
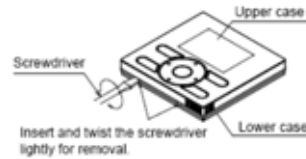
3

Slide 10 © 2012 Daikin AC

BRC1E72 Mounting & Wiring



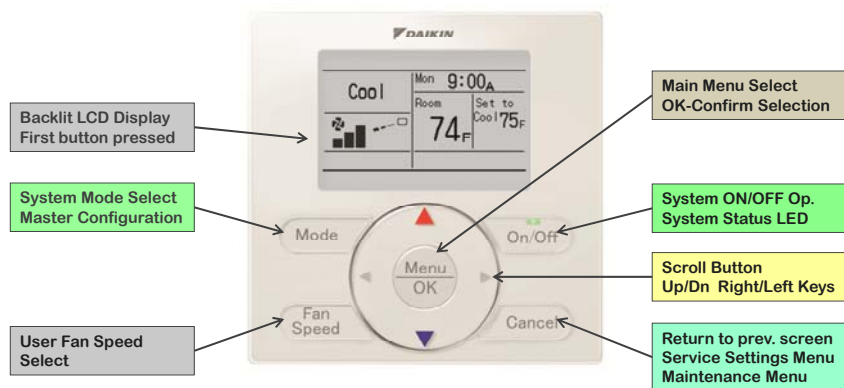
- Determine the proper controller location
 - Avoid direct sunlight
 - Avoid outside walls
- Separate controller upper & lower case
- Install controller on a solid wall surface
 - Electrical box – 2x4 Single or 4x4 Double gang box
 - Screws and drywall anchors
- Cut control wire conductor lengths with a 3/8" difference – Remove 2" of outer jacket



3

Slide 11 © 2012 Daikin AC

BRC1E72 Function Button Layout



7

Slide 12 © 2012 Daikin AC

BRC1E72 LCD Display Menus



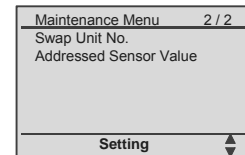
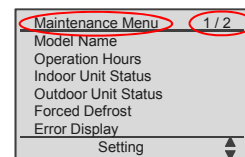
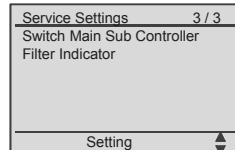
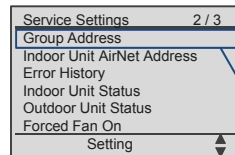
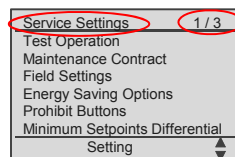
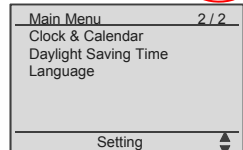
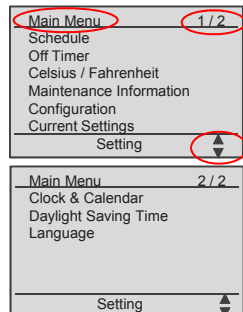
- There are 4 main display categories
 - Main Display
 - Main Menu
 - Service Settings Menu
 - Maintenance Menu
- Backlight must be ON before button functions are enabled
- Main Menu – Press Menu/OK one time
- Service Settings – Press & Hold Cancel (5 sec.)
- Maintenance Menu – Press & Hold Cancel while in Service Settings Menu (5 sec.)



BRC1E72 Configuration & Programming Menus



- 3 Menus for Settings, Configurations, and Status
- Menu Name and Number
 - Selections
 - Active Scroll Buttons ◀▶



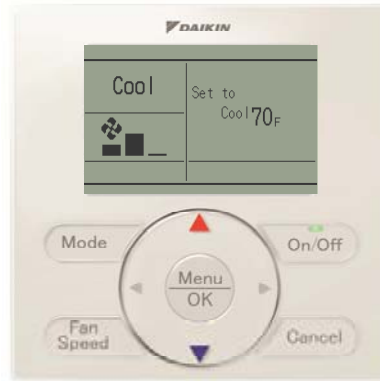
NOTE: Group Address setting will only appear when system (DIII-Net) is connected to a Multi-zone controller or Gateway

BRC1E72 Power up – Initial Settings

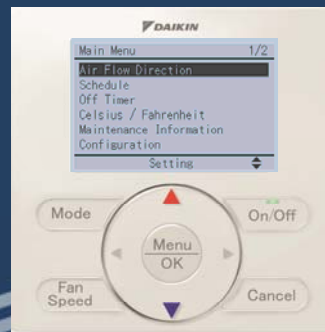


- Power is provided to the remote controller from the indoor unit PCB (16vdc – P1 P2)
- Upon Power Up of the indoor unit, the display on the Remote Controller will verify communications, and within 15 seconds the display will go into the “Standard” display mode.
- This Standard Display is very basic, and does not show the day of the week, current time, or space (room) ambient temperature.
- “Initial Settings” are required to configure a new BRC1E72 Remote Controller.
 - The “Initial Settings” are performed from the Main Menu

Standard Display - Factory Default



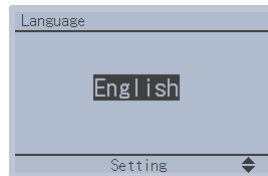
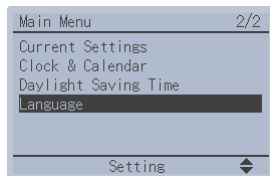
BRC1E72 Main Menu



BRC1E72 Initial Setting – Language



- English (Default) - French / Spanish selectable
- Language: Main Menu ▶ Language

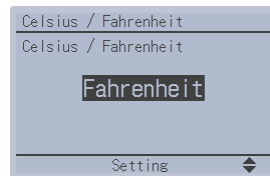
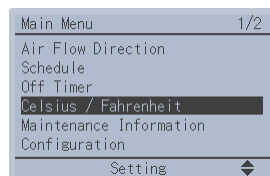


Slide 17 © 2012 Daikin AC

BRC1E72 Initial Setting – Fahrenheit to Celsius



- Fahrenheit (default) – Celsius selectable
- Main Menu ▶ Fahrenheit to Celsius

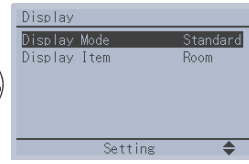
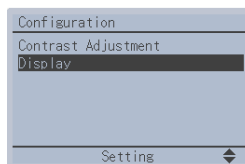
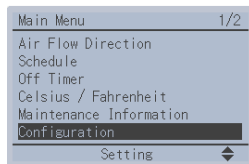


Slide 18 © 2012 Daikin AC

BRC1E72 Initial Setting – Display Mode



- To configure different display options, such as Room Temperature the “Standard” display can be changed to the “Detailed” or “Simple” display.
- Press any button to bring on the backlight
 - Press the **MENU/OK** button once for Main Menu
- Use DN arrow button to highlight Configuration
 - Press **MENU/OK** once
- Use DN arrow button to highlight Display
 - Press **MENU/OK** once
- Highlight is on Display Mode Standard
Press **MENU/OK**



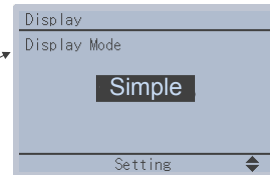
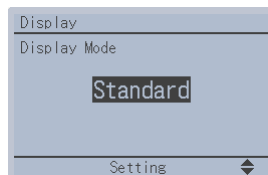
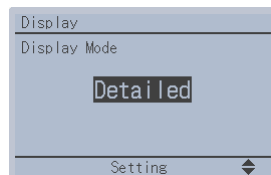
4

Slide 19 © 2012 Daikin AC

BRC1E72 Initial Setting – Display Mode



- Main Menu → Configuration → Display → Display Mode



Detailed

Standard

Simple



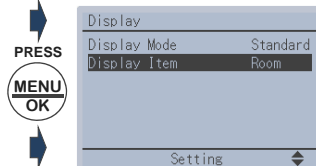
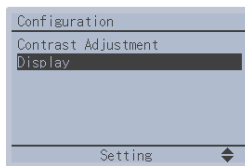
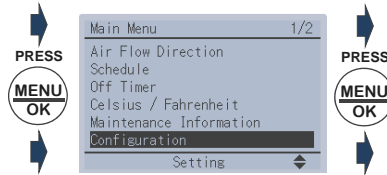
Slide 20 © 2012 Daikin AC

BRC1E72 Initial Setting – Display Item



Room Temperature

- The Room Temperature display is the default setting
- Backlight must be ON
- Press the **MENU/OK** button once
- Use DN arrow button to highlight Configuration
 - Press **MENU/OK** once
- Use arrow button to highlight Display
 - Press **MENU/OK** once
- Highlight is on Display Mode
- Use DN arrow key to select Display Item Room
 - Press **MENU/OK** once
- Pressing the **▼▲** displays the following:



BRC1E72 Display Overview



Configurable display mode – Detailed, Standard, and Simple **New**

Display Mode	Detailed	Standard	Simple New
Display image			
On/Off status on LED (LED blinks when an error is occurred)	X	X	X
Mode	X *1	X *1	X *1
Setpoint (Dual/Single)	X *2	X *2	X *2
Room temperature	X		X
Fan speed	X *3	X *3	X *3
Air flow direction (when a louver is available)	X		
Day and Time	X *3		
Status icon	X *3	X *3	
Key lock icon	X	X	
Error message	X	X	

*1. OFF can be displayed instead of the operation mode while the unit is turned off with the field setting **NEW**

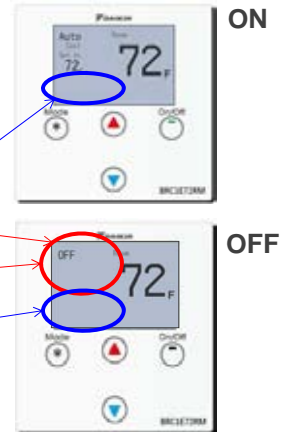
*2. Can be removed from the display while the unit is turned off with a field setting **NEW**

*3. Can be removed from the display with a field setting **Improved**

BRC1E72 Initial Setting – Display Configurations



- Following display configurations are available through field settings
 - Applicable to all three display mode
 - Display OFF instead of Mode while the unit is off
(1b-13-02)
 - No setpoint display while the unit is off
(1b-12-02)
 - No Fan Speed display
(1b-15-02)



Slide 23 © 2012 Daikin AC

BRC1E72 Status Icon Elimination



- Status icon and other information on the display can be eliminated through Field Setting
 - e.g. “Central Control” icon is not necessary in hotel room

Item	Available Display mode			Field Setting	
	Detailed	Standard	Simple	Code	Choice
STSandBY icon	X	X	X	1b-7	01: display in Defrost or Hot Start 02: Not display
Day/Clock	X			1b-11	01: display 02: Not display
CENTRAL CONTROL icons	X	X		1e-9	(MASTER CONTROL icon too) 01: display 02: Not display
Prohibit button message	X	X	X	1e-10	01: Key lock icon blinks for 5 sec (Key lock icon is not displayed in Simple display mode) 02: Message

Slide 24 © 2012 Daikin AC

BRC1E72 Initial Setting – Single Setpoint Display Mode w/Face Decal



	Theme	Everything	No Mode Change	Fan Speed Fixed
	LCD Display Image			
	Optional Face Decal Face Decal can be applied to Detailed and Standard display mode too.			
	M: Mandatory, O: Optional setting			
		BRC1E72RMF	BRC1E72RF	BRC1E72RM
M	Display mode - Simple (Main menu)	X	X	X
M	Display item - Room Temp (Main menu)	X	X	X
M	Single setpoint (Srv Menu → Min Setpoint Diff - Single SP)	X	X	X
M	Prohibit Menu/OK and Cancel buttons (Special sequence required)	X	X	X
M	Mode button prohibit (Srv menu → Prohibit functions → Prohibit button)		X	
M	Fan icon display off (Field Setting 1b-15-02) Fan button also prohibited			X
O	Off display instead of Mode while the unit is off (Field setting 1b-13-02)	X	X	X
O	Erase setpoint display while the unit is off (Field setting 1b-12-02)	X	X	X

Slide 25 © 2012 Daikin AC

BRC1E72 Initial Setting – Dual Setpoint Display Mode w/Face Decal Cont.



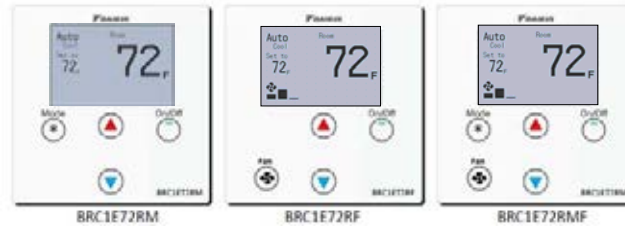
	Theme	Everything	No Mode Change	Fan Speed Fixed
	LCD Display Image			
	Optional Face Decal Face Decal can be applied to Detailed and Standard display mode too.			
	M: Mandatory, O: Optional setting			
		BRC1E72RMF2	BRC1E72RF2	BRC1E72RM2
M	Display mode - Simple (Main menu)	X	X	X
M	Display item - Room Temp (Main menu)	X	X	X
M	Dual setpoint (Srv Menu → Min Setpoint Diff - 0 to 7°F)	X	X	X
M	Prohibit Menu/OK and Cancel buttons (Special sequence required)	X	X	X
M	Mode button prohibit (Srv menu → Prohibit functions → Prohibit button)		X	
M	Fan icon display off (Field Setting 1b-15-02) Fan button also prohibited			X
O	Off display instead of Mode while the unit is off (Field setting 1b-13-02)	X	X	X
O	Erase setpoint display while the unit is off (Field setting 1b-12-02)	X	X	X

Slide 26 © 2012 Daikin AC

BRC1E72 Optional Face Decals



Single Setpoint Face Decals



Dual Setpoint Face Decals

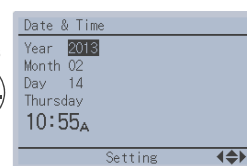
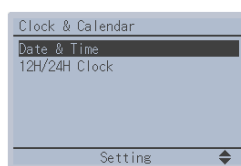
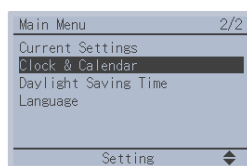


Slide 27 © 2012 Daikin AC

BRC1E72 Initial Setting – Date & Time



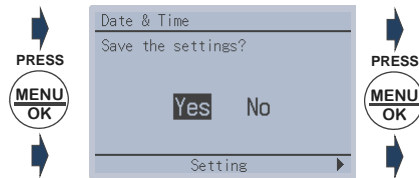
- To display Day of the Week and Time
- Backlight must be ON
 - Press the **MENU/OK** button once
- Use DN arrow button to highlight Clock & Calendar
 - Press **MENU/OK** once
- Use arrow button to highlight Date & Time
 - Press **MENU/OK** once
- Using the scroll arrows – set the Year, Month, Day, and current Time AM/PM



BRC1E72 Initial Setting – Date & Time Cont.



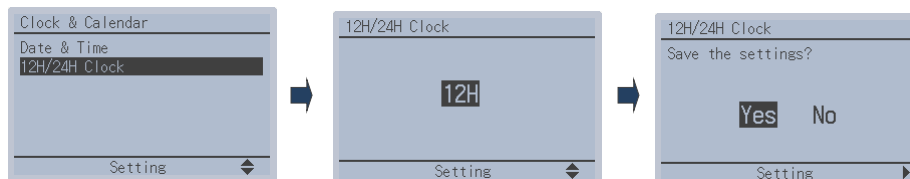
- Save the Date & Time settings: **"Yes"**
 - Press MENU/OK once
- Save the settings - Highlight **Yes**
 - Press MENU/OK
- Main Display should now be complete



BRC1E72 Initial Setting – Clock Format



- 12/24 Hour Clock Format Change
 - 12 hr. clock format is the default
 - 12 hr. is changed to 24 hr. through Clock & Calendar menu
 - Press the Menu/OK button after each screen selection



BRC1E72 Initial Setting – Enable Daylight Saving



- Main Menu ▶ Daylight Saving Time
 - Use the scroll buttons to select Enable/Disable. Press the Menu/OK button.
 - Use the scroll buttons to select Enable. Press the Menu/OK button.
 - Use the scroll buttons to select Yes. Press the Menu/OK button.



Slide 31 © 2012 Daikin AC

BRC1E72 Initial Setting – Set Daylight Saving Dates

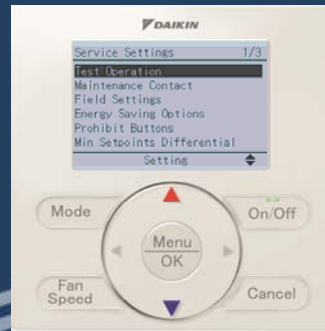


- Main Menu ▶ Daylight Saving Time (Default is US DST dates)
 - Use the scroll buttons to select DST Dates. Press the Menu/OK button.
 - Use the scroll buttons to select a month from 12 months (January to December) for the Start and End month.
 - Use the scroll buttons to select a week from 5 weeks (1st Sunday to Last Sunday) for both Start and End.
 - Press the Menu/OK button.
 - Use the scroll buttons to scroll to Yes. Press the Menu/OK button.



Slide 32 © 2012 Daikin AC

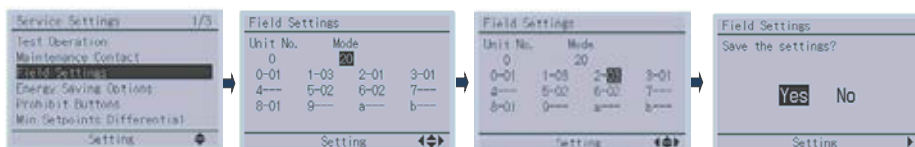
BRC1E72 Service Settings



© 2012 Daikin AC

BRC1E72 Field Settings

- Field Settings provide unique features and functions to be programmed into the control system for each or all indoor units connected to a remote controller.
- Only those program codes that apply to the connected indoor unit(s) will appear in the Field Settings code display.
- To access the Field Settings mode, bring on the display backlight: press and hold the **CANCEL** button for 5 sec. to enter the **Service Settings Mode** and select **Field Settings**
- Press the **Menu/OK** button to confirm each display selection, and use scroll arrows to select the desired code numbers



BRC1E72 Indoor Unit Field Settings



- There are two Modes for each setting; "Group" & "Individual"
- The first set of 2-digit numbers refers to Group and Individual, Group is the first number & Individual is in the parenthesis
- "Group ##" is used if there is only one indoor unit per Remote Controller or the setting you chose is intended for all indoor units being controlled by the same Remote Controller
- "Individual (##)" is used when there is more than one indoor unit being controlled by one Remote Controller and the settings being programmed are intended for one of the indoor units in the group

Mode No. (Note 1)	First Code No.	Description	Second Code No. (Note 2) (Cells in bold are factory default settings)			
			01	02	03	04
10(20)	2	Priority of thermistor sensors for space temperature control	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 (Note 3)	---	---
	6	The remote controller thermistor is used in Remote Controller Group	No	Yes	---	---
12(22)	0	KRP1B71 X1-X2 status output	Indoor unit Thermo-On/Off status	---	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 multizone 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 (Note 4)	2F (1C)	1F (0.5C)	---	---
	3	Fan Speed in Heating Thermo-Off	LL	User set	Off	---
	6	Fan Speed in Cooling Thermo-Off	LL	User set	Off	---
	8	Return air sensor offset	2C	None (for remote sensor)	---	---

3

Slide 35 © 2012 Daikin AC

BRC1E72 Indoor Unit Field Settings



- Field Setting codes are comprised of 3 segments: [Example: 10 – 2 - 03]
 - Mode No. – Program Setting for 1 indoor unit or Group
 - First Code No. - Setting Contents
 - Second Code No. - Specific Operation or Setting
- Specific Field Setting codes for a particular indoor unit can be found in the Indoor Unit Installation Manual or Engineering Manual
 - Any Field Setting codes that do not apply to the particular indoor unit will not be configurable
- Field Settings are stored in the non-volatile memory in the Control PCB of the Indoor Unit or Remote Controller

EXAMPLE: Field Setting for assigning the room temperature sensor

Mode No. (Note 1)	First Code No.	Description	Second Code No. (Note 2) (Cells in bold are factory default settings)			
			01	02	03	04
10(20)	2	Priority of thermistor sensors for space temperature control	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 (Note 3)	---	---
	6	The remote controller thermistor is used in Remote Controller Group	No	Yes	---	---

5

Slide 36 © 2012 Daikin AC

Field Setting Availability by Indoor Unit Type



Availability of Indoor Unit Field Settings (Control Related)

As of 12/01/2012

Mode No.	10				12							
First Code No.	2	3	5	6	0	1	2 (***)	3	6	8		
Second Code No.	01/02	03	01/02	01/02	01/03/04	01/02/03	01/02	01/02	03	01/02/03	01/02	
FXSQ_MVJU	X	X**	X**	X	X	X	X (02)	X	X**	X*	n/a	
FXMQ_MVJU	X	X*	X*	X	X	X	X (02)	X	X*	X*	n/a	
FXMQ72/96MVJU	X	X	X	X	X	X	X (02)	X	X	X	n/a	
FXMQ_PVJU	X	X	X	X	X	X	X (02)	X	X	X	n/a	
FBQ_PVJU	X	X	X	X	X	X	X (02)	X	X	X	n/a	
FXDQ_MVJU	X	X	X	X	X	X	X (02)	X	X	n/a	n/a	
FXTQ_PVJU	X	X	X	X	X	X	X (02)	X	X	X	n/a	
FTQ_PAVJU	X	X	X	X	X	X	X (02)	X	X	X	n/a	
FTQ_PBVJU	X	X	X	X	X	X	X (02)	X	X	X	n/a	
BEQ_MVJLR1 (FXOQ)	X	X	X	X	X	X	X (02)	X	X	X*	n/a	
FXLQ_MVJU	X	X*	X*	X	X	X	X (02)	X	X*	X*	n/a	
FXNQ_MVJU	X	X*	X*	X	X	X	X (02)	X	X*	X*	n/a	
FXAQ_MVJU	X	X*	X*	X	n/a	X	X (01)	X	X*	n/a	n/a	
FAQ_MVJU	X	X*	X*	X	n/a	X	X (01)	X	X*	n/a	n/a	
FAQ_PVJU	X	X	X	X	n/a	X	X (01)	X	X	n/a	n/a	
FXZQ_M7VJU	X	X*	X*	X	X	X	X (01)	X	X*	X*	n/a	
FXFQ_MVJU	X	n/a	n/a	n/a	X	X	X (01)	X	n/a	n/a	n/a	
FCQ_MVJU	X	n/a	n/a	n/a	X	X	X (01)	X	n/a	n/a	n/a	
FCQ_PVJU	X	X	X	X	X	X	X (01)	X	X	X	X	
FXHQ_MVJU	X	n/a	n/a	n/a	X	X	X (01)	X	n/a	n/a	n/a	
FHQ_MVJU	X	n/a	n/a	n/a	X	X	X (01)	X	n/a	n/a	n/a	
FHQ_PVJU	X	n/a	n/a	n/a	X	X	X (01)	X	n/a	n/a	n/a	

* Field settings highlighted in orange may not be available in units manufactured before 9/1/2009.

** Field settings highlighted in blue may not be available in units manufactured before 1/1/2007.

*** Factory default value is indicated in parenthesis.

Slide 37 © 2012 Daikin AC

Field Settings – Indoor unit



Field Settings – Indoor Units (Control Related)

Mode No. (Note 1)	First Code No.	Description	Second Code No. (Note 2) (Cells in bold are factory default settings)			
			01	02	03	04
10(20)	2	Priority of thermostat sensors for space temperature control	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 multi-zone controllers	Return air thermistor	Thermistor designated by 10-2 above (Note 3)	--	--
	6	The remote controller thermistor is used in Remote Controller Group	No	Yes	--	--
12(22)	0	KRP1B71 X1-X2 status output	Indoor unit Thermo-On/Off status	--	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 (Note 4)	2F (1C)	1F (0.5C)	--	--
	3	Fan Speed in Heating Thermo-Off	LL	User set	Off	--
	6	Fan Speed in Cooling Thermo-Off	LL	User set	Off	--
	8	Return air sensor offset	2C	None (for remote sensor)		

1. 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.

2. Any features not supported by the installed indoor unit will not be displayed.

3. When mode 10-2-01 is selected, only the return air temperature value is reported to the multi-zone controller.

4. The actual default deadband value will depend upon the indoor unit model.

Slide 38 © 2012 Daikin AC

Field Settings – BRC1E72



Field Settings – BRC1E72 (Green highlighted items are new from BRC1E71)

Mode No.	First Code No.	Description	Second Code No. (Cells in bold are factory default settings)			
1b	7	STANDBY icon	01 Display in Defrost or Hold Start	02 Not Displayed	03	04
	11	Day/Clock	Displayed	Not Displayed		
	12	Setpoint display while the unit is off	Displayed	Not Displayed		
	13	Mode display while the unit is off	Displayed	Display OFF instead of the mode		
	14	Fan Speed button configuration	Fan Speed	Fan ON/Auto (Fan LL in thermo-off) <i>(Applicable to SkyAir only)</i>	FAN ON/Auto (Fan Off in thermo-off) <i>(Applicable to SkyAir only)</i>	
	15	Fan icon display	Displayed	Not Displayed		
1c	1	Thermistor sensor used for Auto-changeover and Setback control	Return Air Thermistor – return air temperature displayed on controller as room temperature	Remote Controller Thermistor – remote controller temperature displayed on controller as room temperature		
	10	Temperature Sensor Offset	01: -3.4°F (-3.0°C) 02: -4.6°F (-2.5°C) 03: -3.9°F (-2.0°C) 04: -3.7°F (-1.5°C) 05: -1.9°F (-1.0°C) 06: -0.9°F (-0.5°C) 07: 0.0°F (0.0°C)	08: -0.9°F (-0.5°C) 09: -1.9°F (-1.0°C) 10: -2.7°F (-1.5°C) 11: -3.3°F (-2.0°C) 12: -4.6°F (-2.5°C) 13: -5.4°F (-3.0°C) 14: -6.3°F (-3.5°C)		
1e	2	Setback availability	NA	Heating mode only	Cooling mode only	Cooling/ Heating modes
	4	Schedule and Auto-changeover enabled when multi-zone controller is detected (Note 1)	No	Yes	--	--
	9	CENTRAL CONTROL icon	Not displayed	Displayed when under control by a multi-zone controller		
	10	Message when button pushed which has been prohibited by a multi-zone controller	Key lock icon blinks for 5 seconds	Message displayed on screen: "Under Centralized Control. Adjustments at the remote control are being restricted."		
	11	Auto changeover guard timer	15 min	30 min	60 min	90 min
	12	Auto changeover point	0.9°F (0.5°C)	1.8°F (1.0°C)	2.7°F (1.5°C)	3.6°F (2.0°C)
	13	Quick changeover point beyond the auto changeover point	0.9°F (0.5°C)	1.8°F (1.0°C)	2.7°F (1.5°C)	3.6°F (2.0°C)
	14	Quick changeover point beyond the auto changeover point	0.9°F (0.5°C)	1.8°F (1.0°C)	2.7°F (1.5°C)	3.6°F (2.0°C)

1. Native remote controller Schedule and Auto-changeover functions are disabled when a multi-zone controller is detected and a group address is assigned.

Factory Default Field Settings on BRC1E72



BRC1E72 Field Setting - Factory Default Values

- Do not change from the factory default value in the cells below highlighted in grey.
- This table would be referred to confirm the default value when you might have changed the unnecessary field setting accidentally.

First Code No.	Mode No.		
	1b	1c	1e
0	02	02	--
1	02	02	02
2	--	02	01
3	--	01	--
4	04	02	01
5	01	01	02
6	01	01	02
7	01	02	02
8	05	01	02
9	01	01	02
10	--	07	02
11	01	07	03
12	01	--	01
13	01	--	01
14	01	--	--
15	01	--	--

BRC1E72 Sensor - Field Settings



- To use only BRC1E72 sensor, set field settings as 10-2-03, 10-5-02, & 1C-1-02
- 10-2-03, 10-5-02 availability
 - always available: FXMQ_P, FXTQ_P, FXAQ_P, FXFQ_P, FBQ_P, FTQ_P, FCQ_PA
 - All _M series (except FXFQ, FXHQ, FCQ, FHQ)
 - Manufactured after 9/1/2009: always available
 - Manufactured before 9/1/2009: confirm if 10-2-03, 10-5-02 are available.
 - never available: FXFQ_MVJU, FXHQ_MVJU, FCQ_MVJU, FCQ_PVJU, FHQ_MVJU, FHQ_PVJU
 - Set 10-2-02 and use Remote sensor (or Return air sensor) only
- Field setting – 10-2, 10-5 and 1C-1 settings are necessary

Which single sensor is used?	For indoor unit control (Cool/Dry/Heat VRV and thermo-on/off control)	For BRC1E72 control (Auto changeover and setback control)	For Multi-zone Control
BRC1E72	10-2-03	1C-1-02 (default)	10-5-02
Remote sensor (or Return air sensor)	10-2-02 (it is always available)	1C-1-01	10-5-01 (default)

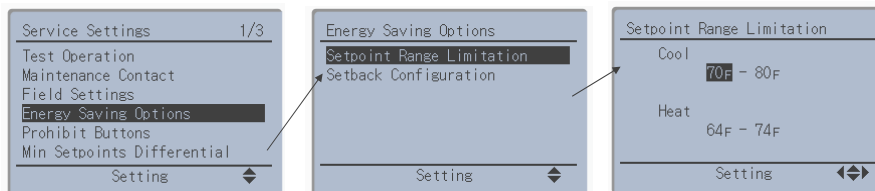
Recommended

Slide 41 © 2012 Daikin AC

Initial Setting – Setpoint Range



- Service Settings → Energy Saving Options → Setpoint Range Limitation



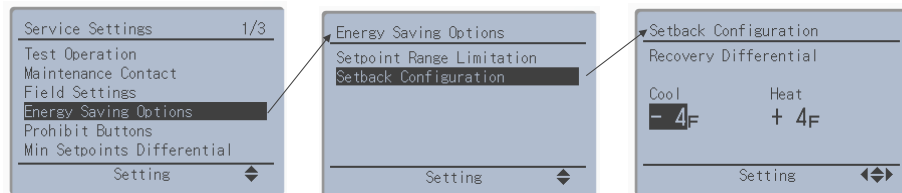
- User can change the setpoint within the range
- Setup setpoint is configurable between
“Cool setpoint max + 2°F (1°C)” and “95°F”
- Setback setpoint is configurable between
“Heat setpoint min – 2°F (1°C)” and “40°F”

Slide 42 © 2012 Daikin AC

Initial Setting – Setback Recovery Differential



- Service Settings → Energy Saving Options → Setback Configuration
 - Setback Configuration won't be available if you have not enabled the setback control (Field setting 1e-2-04 is necessary).
- Determine the point when unit is turned off again from the setback control (the unit is turned on by setback control when room temperature is above the setup setpoint or below the setback setpoint)
 - Setup setpoint - 4°F as default (2 - 10°F selectable)
 - Setback setpoint + 4°F as default (2 - 10°F selectable)



Slide 43 © 2012 Daikin AC

Initial Setting – Enable Setback



- Field setting is available in the Service Settings
 - Setback function is disabled (1e-2-01) by default
 - To enable it, set 1e-2-04

Mode No.	First Code No.	Description	Second Code No. (Cells in bold are factory default settings)			
			01	02	03	04
1e	2	Setback availability	N/A	Heating mode only	Cooling mode only	Cooling/ Heating modes

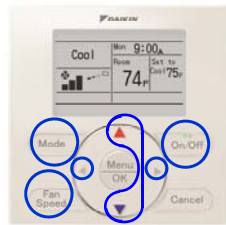
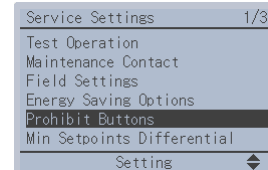
Default

Slide 44 © 2012 Daikin AC

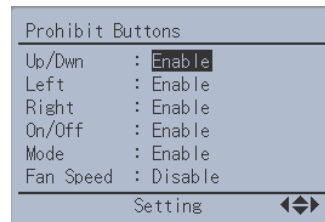
Initial Setting – Prohibit R/C buttons



- To configure which buttons to prohibit
 - Service Setting → Prohibit Functions → Prohibit Buttons
 - Enable = permit
 - Disable = prohibit
 - Disable in Off = prohibit only while the unit is off
- To enable Prohibit Buttons – see next slide



○ Operable buttons

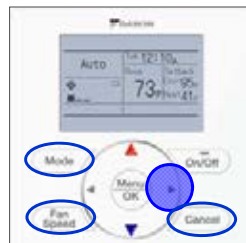


Menu/OK and Cancel button will be prohibited when any of the buttons are prohibited.

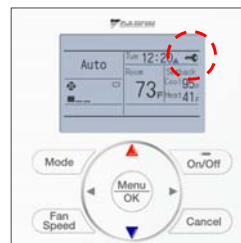
Enable/Disable Prohibit Buttons



- To enable Prohibit Buttons, holding Right arrow button, push Mode, Fan Speed and Cancel at the same time while the main screen is displayed
- To release it, same as above
- Then if you push prohibited button, you will see a key icon blinking three times
 - Key icon is available in Detailed and Standard display mode only (In simple display mode Key icon is not displayed)



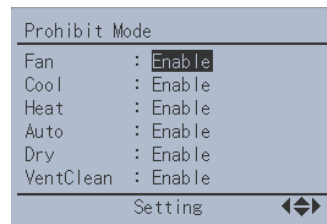
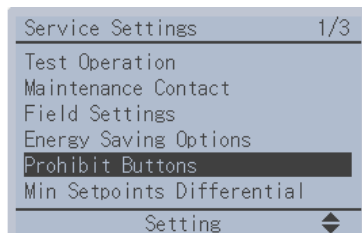
These buttons can be pressed from above the optional Face Decals to enable/disable prohibit buttons



Initial Setting – Prohibit Mode



- To configure modes which cannot be selected by a user
 - Service Setting → Prohibit Functions → Prohibit Mode
 - Enable = selectable, Disable = not selectable

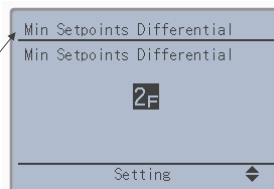
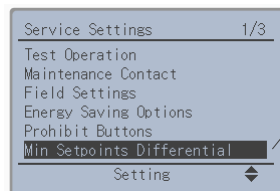


Slide 47 © 2012 Daikin AC

Initial Setting – Min. Setpoint Differential



- Service Settings → Min Setpoint Differential
- Configurable to 0 – 8°F (0 – 4°C), default is 2°F (1°C) for Dual SP or Single SP



- When the differential is set to 0 – 8F, Cool and Heat setpoints are maintained as
 - Cool setpoint \geq Heat setpoint + Differential
- When Single SP is set, there is one setpoint for Cool and Heat
- When a multi-zone controller is connected, the differential is set to Single SP automatically.

Slide 48 © 2012 Daikin AC

Schedule, Auto changeover disabled



- When a group address is assigned and a multi-zone controller is connected, Schedule and Auto changeover on BRC1E72 are disabled.
- To prevent conflict between BRC1E72 and I-TC or BMS control
- Min. setpoint differential would be set at Single SP
 - When setpoint is changed from a multi-zone controller, the both cooling and heating setpoints are overridden with the same value.
- Field setting 1e-4-02 re-enables BRC1E72 Schedule and Auto changeover. Make sure Schedule/Auto changeover is disabled in the I-TC/BMS to prevent conflict.

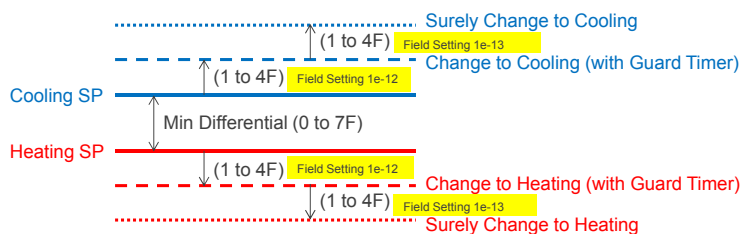
Mode No.	First Code No.	Description	Second Code No. (Cells in bold are factory default settings)			
			01	02	03	04
1e	4	Schedule and Auto-changeover enabled when multi-zone controller is detected (Note 1)	No Default	Yes	--	--

Slide 49 © 2012 Daikin AC

BRC1E72 - Auto-changeover



- Automatic changeover in Heat Pump and Heat Recovery Systems
 - At 1°F above cooling or 1°F below heating setpoint (default)
 - Configurable between 1°F – 4°F (**improved**) Field Setting 1e-12
 - **Another 1°F above cooling or 1°F below heating changeover points** immediate changeover ignoring guard timer (**new**)
 - Configurable between 1°F – 4°F (**new**) Field Setting 1e-13
 - Guard timer to prevent frequent mode change (**improved**)
 - 15, 30, 60 (**default**), or 90 minute guard timer settable Field Setting 1e-11

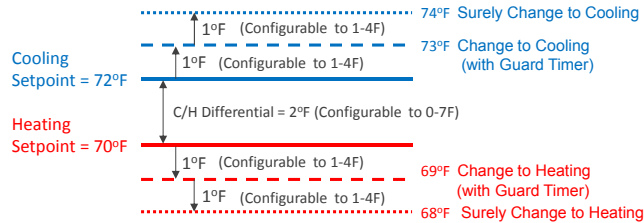


Slide 50 © 2012 Daikin AC

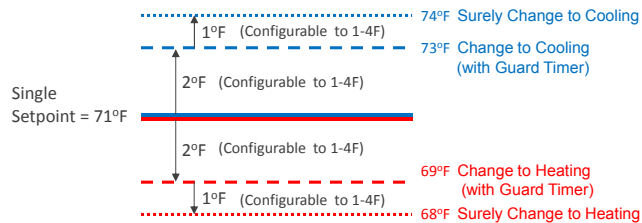
BRC1E72 - Auto-changeover



Example #1 = Dual Setpoints



Example #2 = Single Setpoint



Slide 51 © 2012 Daikin AC

BRC1E72 Settings Group Address



- When a multi-zone controller such as the iTouch Controller, iTouch Manager, or BMS Gateways are connected, Group Address settings must be configured through the Service Settings mode.
- A Group consists of 1 to 16 indoor units connected to the same Remote Controller.
- There are 64 Group Addresses available
 - 1-00 to 1-15
 - 2-00 to 2-15
 - 3-00 to 3-15
 - 4-00 to 4-15

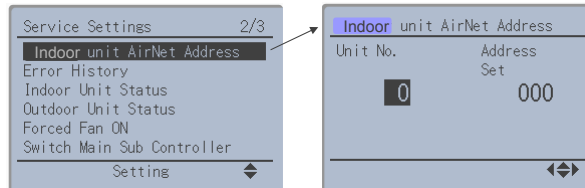


Slide 52 © 2012 Daikin AC

Set D-Net (AirNet) Address



- To Identify each indoor unit on the Service checker, D-Net (AirNet) address setting is available in Service Settings

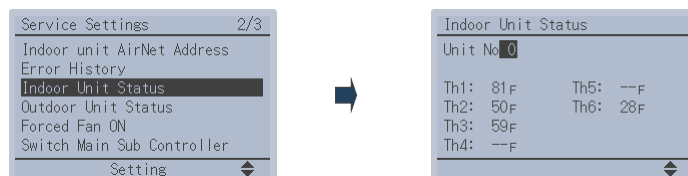


Slide 53 © 2012 Daikin AC

BRC1E72 Indoor Unit Sensor Display



- The connected indoor unit(s) temperature sensors may also be displayed on the Nav. Remote screen by accessing the "Indoor Unit Status" mode in the Service Settings Menu
- To access the Service Settings Menu, press and hold the **CANCEL** button 5 seconds
 - Scroll down and select "Indoor Unit Status" on the 2nd screen
 - Sensor values are displayed in Fahrenheit
 - Th1:** RA sensor (Remote Sensor) **Th2:** Liq. sensor **Th3:** Gas sensor **Th4:** Discharge
- Press the **CANCEL** button twice to return to the main display



NOTE: Service Settings "Indoor Unit Status" used for reading sensors on "P" series indoor units

Indoor Unit Temperatures



- Service Settings → Indoor Unit Status
 - Applicable for P-series indoor units (FXMQ_P, FXTQ_P)

Indoor Unit Status			
Unit No. 0			
Th1:	72°F	Th5:	--F
Th2:	27°F	Th6:	--F
Th3:	32°F		
Th4:	32°F		

Th #	Description
Th1	Return air sensor (Remote sensor) temperature
Th2	Liquid line temperature
Th3	Gas line temperature
Th4	Discharge air temperature (FXMQ_P only)
Th5	Remote controller sensor temperature
Th6	Temperature to be used for indoor unit control (See field setting 10(20) - 2)

Slide 55 © 2012 Daikin AC

BRC1E72 Indoor Unit Address ID



- To determine the group address and the unit number assigned to an indoor unit in a group, use the "Forced Fan ON" mode (indoor units must be turned OFF)
 - Press and hold the CANCEL button for 5 sec. - Service Settings
 - Scroll down to the second "Service Settings" screen and select Forced Fan On
- The "Forced Fan ON" screen appears with system address (Unit No.) "0"
 - Within several seconds the indoor unit assigned unit "0" will turn on
 - Use the scroll arrow to change the Unit No. from "0" to 1, 2, 3 etc. and the fans in those indoor units will energize in HH accordingly
- Press CANCEL button twice to de-energize the fan and return to Main Display

Service Settings	2/3
Indoor unit AirNet Address	
Error History	
Indoor Unit Status	
Outdoor Unit Status	
Forced Fan ON	
Switch Main Sub Controller	
Setting	◆



Forced Fan ON	
Unit No.	0
	◆

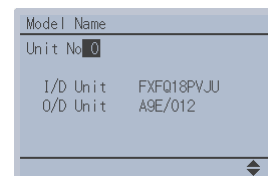
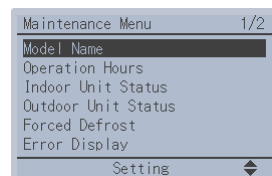
BRC1E72

Maintenance Menu



BRC1E72 Indoor Unit Model Display

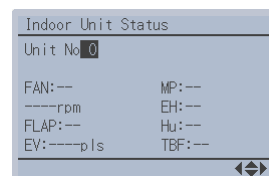
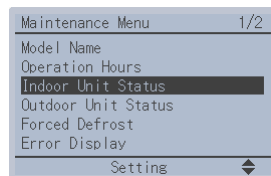
- The connected indoor unit(s) model number ("P" series only) may be displayed on the Nav. Remote screen by accessing the Maintenance menu
 - Press and hold the **CANCEL** button for 5 sec. - Service Settings
 - Press and hold the **CANCEL** button a 2nd time for 5 sec. for the Maintenance Menu
 - Select Model Name (**MENU/OK**)
- Press CANCEL twice to go back to the main display



BRC1E72 Indoor Unit Operating Status



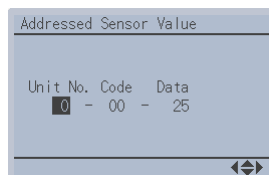
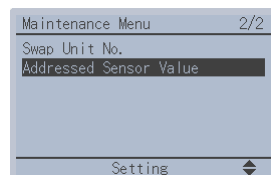
- The connected indoor unit(s) operating status may be displayed on the Nav. Remote screen by accessing the Maintenance menu
 - Press and hold the **CANCEL** button for 5 sec. twice for the Maintenance Menu
 - Select: **Indoor Unit Status** **MP**: Drain Pump ON/OFF **EH**: Elec. Htr. ON/OFF **Hu**: Humidifier ON/OFF
- Press CANCEL to go back to the main display



BRC1E72 Indoor Unit Sensor Display



- The connected indoor unit(s) temperature sensors may be displayed on the Nav. Remote screen by accessing the "Addressed Sensor Value" mode in the Maintenance Menu
- To access the Maintenance Menu, press and hold the **CANCEL** button 5 sec. to Service Settings
 - Press and hold the **CANCEL** button a 2nd time to the Maintenance Menu and scroll down to the second screen, then scroll and select "Addressed Sensor Value"
 - Scroll the to display each of 4 sensor codes - These sensor readings are in Celsius
 - Sensor "00" = RC sensor "01" = RA sensor "02" = Liq. sensor "03" = Gas sensor
- Press the **CANCEL** button twice to return to the main display



NOTE: Maintenance Menu "Addressed Sensor Values" used for reading sensors on "M" series indoor units

BRC2A71

Simplified Remote Controller



© 2012 Daikin AC

BRC2A71 – Basic Features

- English LCD Display
- System Operation Status LED
- System On/Off
- Operating Mode
 - (Cool, Dry, Heat, Fan, Auto*)
- Set-point (60-90°F; 1°F basis)
- Fan speed (H/L)
- Prohibit buttons with optional face plates
- Optional face plate to remove pictograms
- Fault Diagnosis (Error code)
- Field Settings
- Max. 16 connectable indoor units (Group)
- Internal mounting for remote temperature sensor**

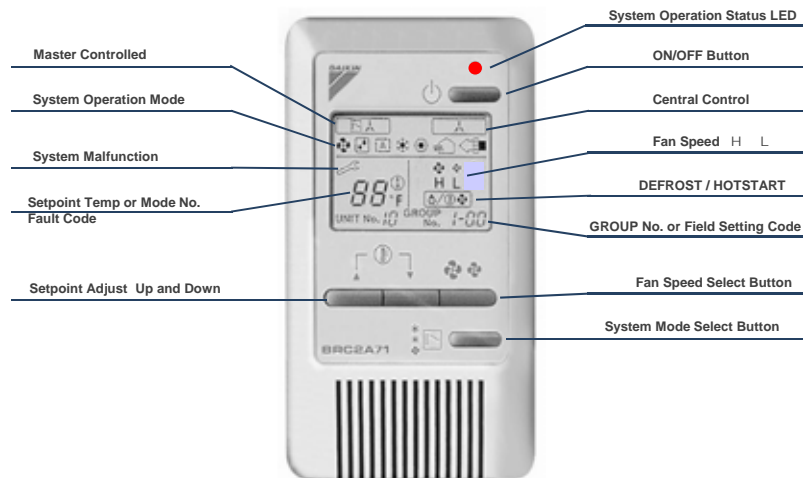


*Auto mode is available in the heat recovery system only

** Optional remote temperature sensor is separate and requires wiring to the indoor unit PCB.

The Simplified Remote Controller does not have a sensor for measuring space temperature

BRC2A71 – Button Layout



Slide 63 © 2012 Daikin AC

BRC2A71 – Basic Installation



- Installation
 - Cable Routing
 - Wall Mounting
 - Power on
- Service Settings
 - Field Settings
 - Group Address

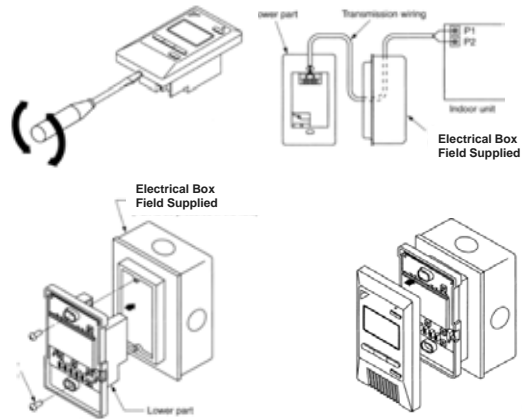


Slide 64 © 2012 Daikin AC

BRC2A71 – Mounting



- Separate and remove the upper part of the controller with a flat blade screwdriver
- Carefully route the control wire from the P1 P2 terminals
- Secure the Lower part of the controller to the electrical box with the screws provided
- Install cover onto the lower part and insure that all buttons operate.
- Cover must be removed for all Service Settings



BRC2A71 – Optional Face Plates



You can physically remove unnecessary buttons with optional face plates



BRC2A71RS



BRC2A71RU



BRC2A71R

INSTALLATION PROCEDURE



1. Remove the cover from the remote controller. Remove standard faceplate from the cover. Remove standard Mode button.

2. Remove film from adhesive backing on replacement faceplate. Affix new faceplate to the remote control cover.

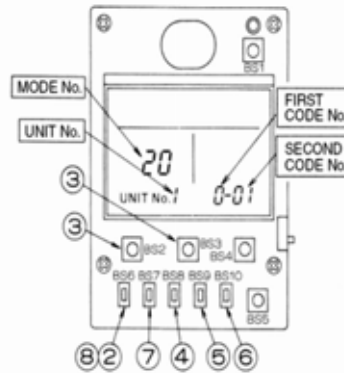


3. Reattach cover to remote controller.

BRC2A71 – Field Settings



- Remove cover from the controller
- Press **BS6** Button to enter Field Settings
- Press **BS2** and **BS3** to select the Mode No.
 - With multiple indoor units press BS8 to change Unit 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



Slide 67 © 2012 Daikin AC

BRC2A71 – Group Address



- Press **BS6** to enter Group Address Mode
 - 00 display for Centralized Controller
 - 01 display for no Centralized Controller
- GROUP No. flashing with 1-00 Group Address displayed
 - Press **BS7** if Group No. is not flashing
- Press **BS9** & **BS10** to set desired address – Max. 64
 - 1-00 to 1-15
 - 2-00 to 2-15
 - 3-00 to 3-15
 - 4-00 to 4-15
- Press **BS7** to lock in selection
 - GROUP No. on solid
- Press **BS6** to exit to normal display



Slide 68 © 2012 Daikin AC

BRC2A71 – Air Flow Adjustment



Wired Remote Controller (Simplified)

BRC2A71



Air flow adjustment

- The simplified remote controller does not provide for manual adjustment of the discharge louvers on indoor unit styles with louvers. This includes FXFQ, FXZQ, FXHQ and FXAQ unit types.
- In the cooling mode the louvers automatically adjust to discharge air in a horizontal pattern. (Factory default setting)
- In the heating mode the louvers automatically adjust to discharge air in a vertical pattern. (Factory default setting)
- An iTouch controller or Centralized Controller can set the louver action on indoor units. Additionally, a building automation system via the Daikin BACnet Interface can set the louver action. The LON Interface is excluded as there is no applicable network variable.
- A temporarily connected BRC1E72 remote controller can set the louver action on the indoor unit.

Slide 69 © 2012 Daikin AC

BRC4C/7C,E

Hand-Held Wireless Remote

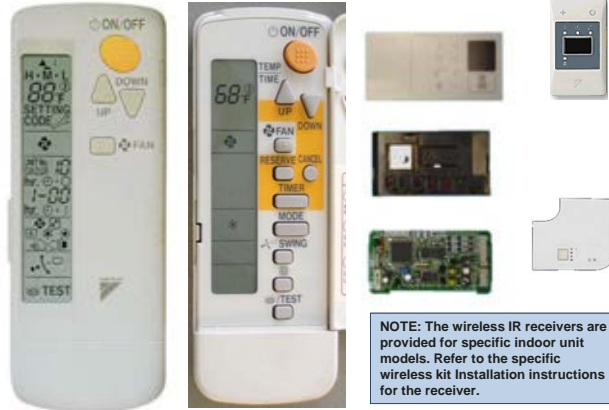


Slide 70 © 2012 Daikin AC
© 2012 Daikin AC

BRC4C/7CE – Hand-Held Wireless



- Wireless Remote Controllers are provided as "kits"
- Temperature display is setpoint (H or C)
- Wireless Controllers only communicate with the indoor unit when they are pointed at the receiver and a button is pressed
- Listen for a "beep" or "beep beep" for confirmation



NOTE: The wireless IR receivers are provided for specific indoor unit models. Refer to the specific wireless kit installation instructions for the receiver.

The Hand-Held Remote Controllers do not have a sensor for measuring space temperature

Slide 71 © 2012 Daikin AC

BRC4C/7CE – Field Settings



- 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 No. appears
- Press the **UP** button to set the first no.
- Press the **DOWN** button to set the second no.
- Press **RESERVE** button to lock in the field setting
- Listen for the "Beep Beep"
- Press **TEST** button twice



Slide 72 © 2012 Daikin AC

BRC4C/7CE – Group Address



- To set the Group Address press and hold the **TEST** button for 5 sec.
 - Display will change to "00"
- Press the **UP** button to set the first address no.
- Press the **DOWN** button to set the second address no.
 - Max 64 groups
- Press **RESERVE** to lock setting
 - "Beep Beep" to confirm
- Press **TEST** button to exit to normal display

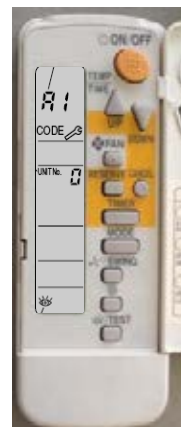


BRC4C/7CE – System Malfunction Code



When the System Status LED on the wireless receiver is flashing, the Hand-Held Controller is used to identify the specific Fault Code by performing the following procedure:

- Press the **TEST** button once to display CODE "00"
 - UNIT No. "0" is flashing
- Press the **MODE** button – Displays flashing CODE "0" on left
 - Press **UP** or **DN** buttons repeatedly to change the left CODE numbers until receiver emits 2 beeps
- Press the **MODE** button - Displays flashing CODE "0" on right
 - Press **UP** or **DN** buttons repeatedly to change the right CODE numbers until receiver emits one long beep
 - The applicable fault code is now displayed
- Press the **MODE** button to return to the normal display



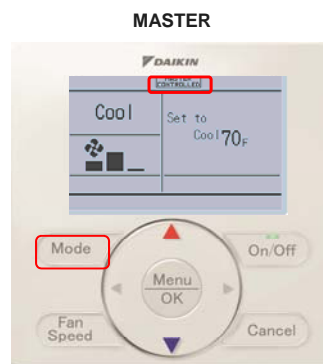
DIII-Net System Control

Setting the Changeover Master

A designated Remote Controller must be configured as the Changeover Master in a Heat Pump system, or in a Heat Recovery system where a Branch Selector Box is connected to multiple indoor units controlled by individual Remote Controllers.

DIII-Net – Configure Remote Controller Changeover Master

- To configure a **BRC1E72** (NAV Remote) as a Master on a new system:
 - Press any button to bring on the display back light
 - The **MASTER** icon will be flashing on all NAV remote controllers
 - Press the **Mode** button once and the icon will disappear on the Master RC
 - All other NAV Remote Controllers (slaves) will display **MASTER** solid
- To configure a **BRC2A71** (Simplified)
 - The Master Controller **MASTER** symbol will be flashing ("Changeover Under Control") on all Simplified RC's
 - Press the **Mode** button once and the symbol will disappear on the Master RC
 - All other "Simplified" Slave Remote Controllers will display **MASTER** solid
- To change the Master, press & hold the **Mode** button for 5 sec. on the Master RC
All RC's go into Master configuration mode with flashing icons



BRC1E72
Navigation Remote Controller



BRC2A71
Simplified Remote Controller

DIII-Net – Configure Wireless Hand-Held Remote Controller Changeover Master



- On power up of indoor units, all "Master Controlled" icons or symbols will be flashing on the wired Controllers ONLY. The wireless Controllers do not display an icon for Master
- Go to the wireless Controller you want set as the Changeover Master and while pointing the wireless Controller at the indoor unit receiver:
 - Press and hold the **MODE** button for approx. 4 seconds - you will hear "BEEP-BEEP" then a second "BEEP-BEEP"
 - Press the **MODE** button a second time and listen for a "BEEP-BEEP" again; this is the confirmation that you have configured this indoor unit Remote Controller as the system Master
- To change the Master to a different Remote Controller in the system
 - Press and HOLD the **MODE** button for 4 seconds until "BEEP-BEEP"
 - Go to the new Remote Controller and press the **MODE** button once to set the MASTER

Wireless Hand-Held Remote Controller



Slide 77 © 2012 Daikin AC

DIII-Net Remote Controller Additional Information



Refer to the specific Remote Controller model Installation and Operation Manuals for more information.

Indoor Unit Field Setting codes are found in both the specific indoor unit Installation Manuals, and Condenser Service Manuals - Indoor Unit sections.

All VRV and SkyAir system components must be correctly wired using the Daikin specified control wire and installation practices to insure reliable system communications and control operation.

Additional Controls Training: <http://daikinuniversity.com>
Controls Product & Application
Controls Installation & Commissioning
Controls Integrator



Slide 78 © 2012 Daikin AC



Thank You

PT-VRV-0113-PP0-01A

© 2012 Daikin AC

Field Settings for Daikin VRV / SkyAir indoor unit and BRC1E72

Control Engineering, Daikin AC (Americas)
7/31/2013

Availability of Indoor Unit Field Settings (Control Related)

As of 7/31/2013

Mode No.	10				12						
First Code No.	2		5	6	0	1	2 (****)	3		6	8
Second Code No.	01/02	03	01/02	01/02	01/03/04	01/02/03	01/02	01/02	03	01/02/03	01/02
FXSQ_MVJU	X	X***	X***	X	X	X	X (02)	X	X***	X**	n/a
FXMQ_MVJU	X	X**	X**	X	X	X	X (02)	X	X**	X**	n/a
FXMQ72/96MVJU	X	X	X	X	X	X	X (02)	X	X	X	n/a
FXMQ_PVJU	X	X	X	X	X	X	X (02)	X	X	X	n/a
FBQ_PVJU	X	X	X	X	X	X	X (02)	X	X	X	n/a
FXTQ_PVJU	X	X	X	X	X	X	X (02)	X	X	X	n/a
FTQ_PAVJU	X	X	X	X	X	X	X (02)	X	X	X	n/a
FTQ_PBVJU	X	X	X	X	X	X	X (02)	X	X	X	n/a
BEQ_MVJLR1 (FXOQ)	X	X	X	X	X	X	X (02)	X	X	X**	n/a
FXLQ_MVJU	X	X**	X**	X	X	X	X (02)	X	X**	X**	n/a
FXNQ_MVJU	X	X**	X**	X	X	X	X (02)	X	X**	X**	n/a
FXAQ_MVJU	X	X**	X**	X	n/a	X	X (01)	X	X**	n/a	n/a
FAQ_MVJU	X	X**	X**	X	n/a	X	X (01)	X	X	n/a	n/a
FAQ_PVJU	X	X	X	X	n/a	X	X (01)	X	X	n/a	n/a
FXZQ_M7VJU	X	X**	X**	X	X	X	X (01)	X	X**	X**	n/a
FXFQ_MVJU	X	n/a	n/a	n/a	X	X	X (01)	X	n/a	n/a	n/a
FCQ_MVJU	X	n/a	n/a	n/a	X	X	X (01)	X	n/a	n/a	n/a
FCQ_PVJU	X	X	X	X	X	X	X (01)	X	X	X	X
FXFQ_PVJU	X	X	X	X	X	X	X (01)	X	X	X	X
FCQ_PAVJU	X	X	X	X	X	X	X (01)	X	X	X	X
FXHQ_MVJU	X	n/a	n/a	n/a	X	X	X (01)	X	n/a	n/a	n/a
FHQ_MVJU	X	n/a	n/a	n/a	X	X	X (01)	X	n/a	n/a	n/a
FHQ_PVJU	X	n/a	n/a	n/a	X	X	X (01)	X	n/a	n/a	n/a

* Field settings highlighted in purple may not be available in units manufactured before 1/1/2013.

** Field settings highlighted in orange may not be available in units manufactured before 9/1/2009.

*** Field settings highlighted in blue may not be available in units manufactured before 1/1/2007.

**** Factory default value is indicated in parenthesis.

Field Settings – Indoor Units (Control Related)

Mode No. (Note 1)	First Code No.	Description	Second Code No. (Note 2) (Cells in bold are factory default settings)			
			01	02	03	04
10(20)	2	Priority of thermistor sensors for space temperature control	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 (Note 3)	--	--
	6	The remote controller thermistor is used in Remote Controller Group	No	Yes	--	--
12(22)	0	KRP1B71 X1-X2 status output	Indoor unit Thermo-On/Off status	--	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 multizone 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 (Note 4)	2F (1C)	1F (0.5C)	--	--
	3	Fan Speed in Heating Thermo-Off	LL	User set	Off	--
	6	Fan Speed in Cooling Thermo-Off	LL	User set	Off	--
	8	Return air sensor offset	2C	None (for remote sensor)		

- 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.
- Any features not supported by the installed indoor unit will not be displayed.
- When mode 10-2-01 is selected, only the return air temperature value is reported to the multizone controller.
- The actual default deadband value will depend upon the indoor unit model.

Field Settings – BRC1E72

(Green highlighted items are new from BRC1E71)

Mode No.	First Code No.	Description	Second Code No. (Cells in bold are factory default settings)					
			01	02	03	04		
1b	7	STANDBY icon	Display in Defrost or Hot Start	Not Displayed				
	11	Day/Clock	Displayed	Not Displayed				
	12	Setpoint display while the unit is off	Displayed	Not Displayed				
	13	Mode display while the unit is off	Displayed	Display OFF instead of the mode				
	14	Fan Speed button configuration	Fan Speed	Fan ON/Auto (Fan LL in thermo-off) (Applicable to SkyAir only)	FAN ON/Auto (Fan Off in thermo-off) (Applicable to SkyAir only)			
	15	Fan icon display	Displayed	Not Displayed				
1c	1	Thermistor sensor used for Auto-changeover and Setback control	Return Air Thermistor–return air temperature displayed on controller as room temperature	Remote Controller Thermistor – remote controller temperature displayed on controller as room temperature	--	--		
	10	Temperature Sensor Offset	01: -5.4°F (-3.0°C) 13: +5.4°F (+3.0°C)	02: -4.5°F (-2.5°C) 12: +4.5°F (+2.5°C)	03: -3.6°F (-2.0°C) 11: +3.6°F (+2.0°C)	04: -2.7°F (-1.5°C) 10: +2.7°F (+1.5°C)	05: -1.8°F (-1.0°C) 09: +1.8°F (+1.0°C)	06: -0.9°F (-0.5°C) 08: +0.9°F (+0.5°C)
1e	2	Setback availability	N/A	Heating mode only	Cooling mode only	Cooling/Heating modes		
	4	Schedule and Auto-changeover enabled when multizone controller is detected (Note 1)	No	Yes	--	--		
	9	CENTRAL CONTROL icon	Not displayed	Displayed when under control by a multizone controller				
	10	Message when button pushed which has been prohibited by a multizone controller	Key lock icon blinks for 5 seconds	Message displayed on screen: "Under Centralized Control. Adjustments at the remote control are being restricted."				
	11	Auto changeover guard timer	15 min	30 min	60 min	90 min		
	12	Auto changeover point	0.9°F (0.5°C)	1.8°F (1.0°C)	2.7°F (1.5°C)	3.6°F (2.0°C)		
	13	Quick changeover point beyond the auto changeover point	0.9°F (0.5°C)	1.8°F (1.0°C)	2.7°F (1.5°C)	3.6°F (2.0°C)		

- Native remote controller Schedule and Auto-changeover functions are disabled when a multizone controller is detected and a group address is assigned.

BRC1E72 Field Setting - Factory Default Values

- Do not change from the factory default value in the cells below highlighted in grey.
- This table would be referred to confirm the default value when you might have changed the unnecessary field setting accidentally.

Mode No. First Code No.	1b	1c	1e
0	02	02	--
1	02	02	02
2	--	02	01
3	--	01	--
4	04	02	01
5	01	01	02
6	01	01	02
7	01	02	02
8	05	01	02
9	01	01	02
10	--	07	02
11	01	07	03
12	01	--	01
13	01	--	01
14	01	--	--
15	01	--	--



Daikin
VRV
Commissioning Guide

Participant Guide

Preface



- This handbook is intended for use as an aid to Field Service Technicians with general technical knowledge and training on VRV equipment. If the Field Service Technician does not have any (or limited) technical knowledge and training on VRV or VRF equipment, do not attempt to install, commission or service any Daikin VRV product with this handbook. Instead, the Field Service Technician needs to complete training offered by Daikin AC (Americas), Inc. ("Daikin AC") before attempting any installation, commissioning or service of the VRV product.
- This reference handbook is available for Field Service Technicians as a simplistic reference guide for commissioning. It is not intended to be a substitute for the VRV Installation and Service Manuals or for training offered by Daikin AC.
- We assume the Field Service Technicians using this handbook are fully qualified to work on the VRV equipment.
- This handbook is intended as a demonstrative aid only. It is not intended as a substitute for training offered by Daikin AC. Anyone installing VRV equipment should first review the unit and inspect and evaluate the location where the unit is to be installed. Every installation varies in its individual circumstances and the Field Service Technician will have to use their professional judgment in each installation.
- Should you require further assistance contact our Technical Service Department.
- Every effort has been made to insure that the information and graphics included in this Commissioning Guide is as accurate as possible at the time of publication. DaikinAC Training Department shall not be held liable for any changes in procedures, specifications, or any system component information which are different from what is represented in this Guide.

Contributors:

Dale Kingma: Daikin Technical Trainer

Mark Harte: Daikin Sr. VRV Technician

Daikin AC University Locations



Daikin AC University
17570 Cartwright Road
Irvine, CA 92614
(949) 732-5000

Daikin AC University
1645 Wallace Rd
Carrollton, TX 75006
(972) 245-1510

Daikin AC University
43-24 21street Suite 203
Long Island City. NY. 11101
(718) 247-7757

Service Hotline: (866) 4-DAIKIN
<http://DaikinUniversity.com>

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical including photocopying without the prior consent of the publisher. Although every reasonable care has been taken to ensure the accuracy and objectivity of the information contained in this publication, neither the publisher or Daikin AC (Americas), Inc. can be held liable for any errors, inaccuracies, and/or omissions however caused.



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

***VRV[®] III* System Components**

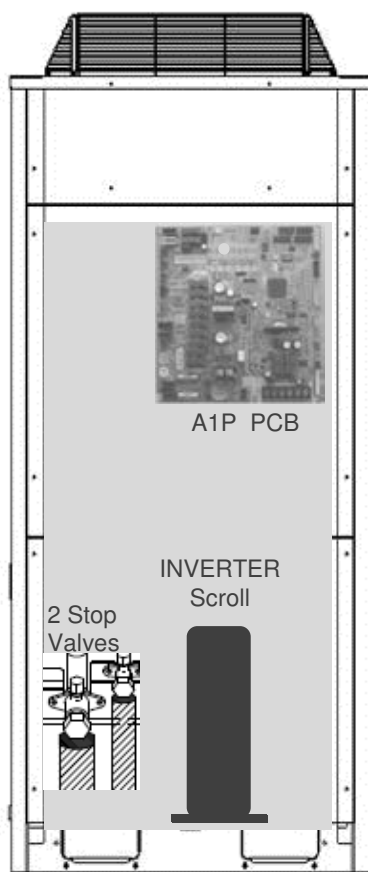
Condensers – Fan Coils – Branch Selector Boxes- Local Remote Controllers



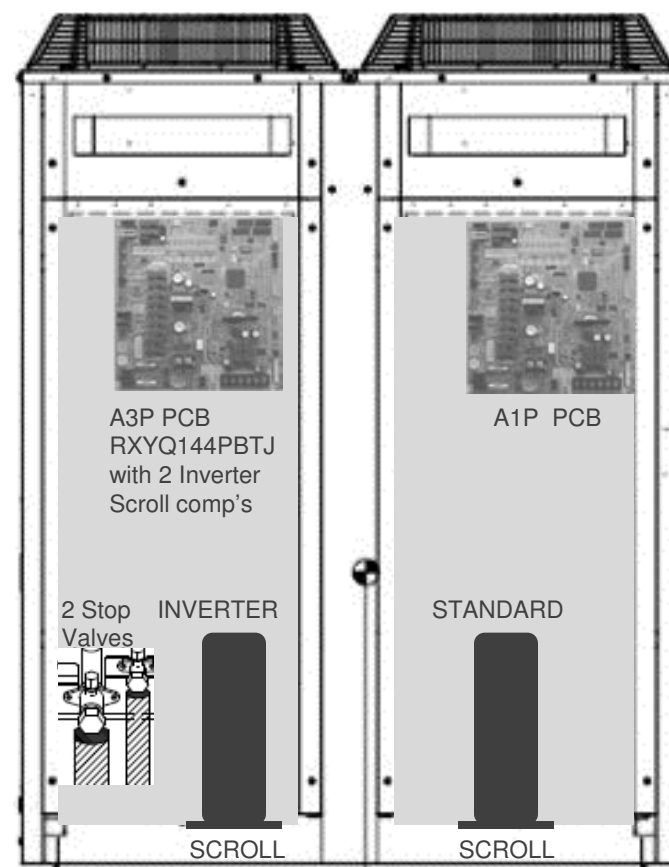
Heat Pump Condenser Styles



Base Single Modules



RXYQ72PB



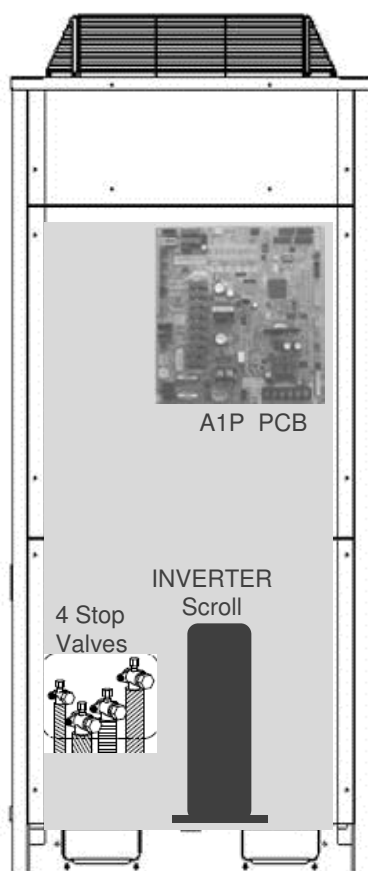
***RXYQ96,120,144PB**

***NOTE: RXYQ144PBTJ (208/230vac.) Utilizes 2 Inverter Scroll Compressors – Dual Fan & 3 stop valves**

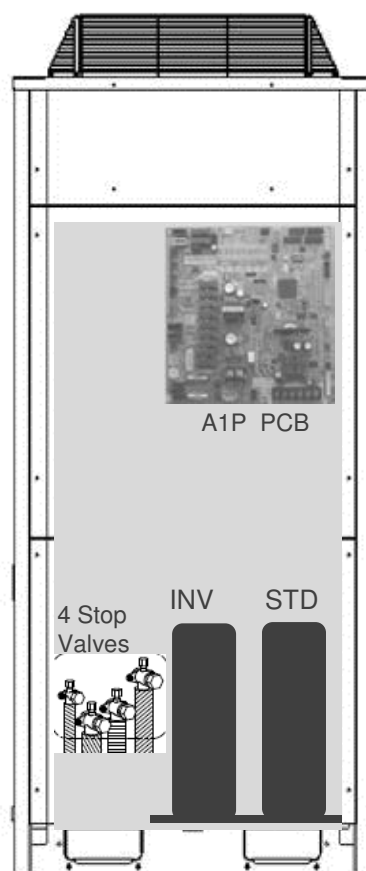
Heat Recovery Condenser Styles



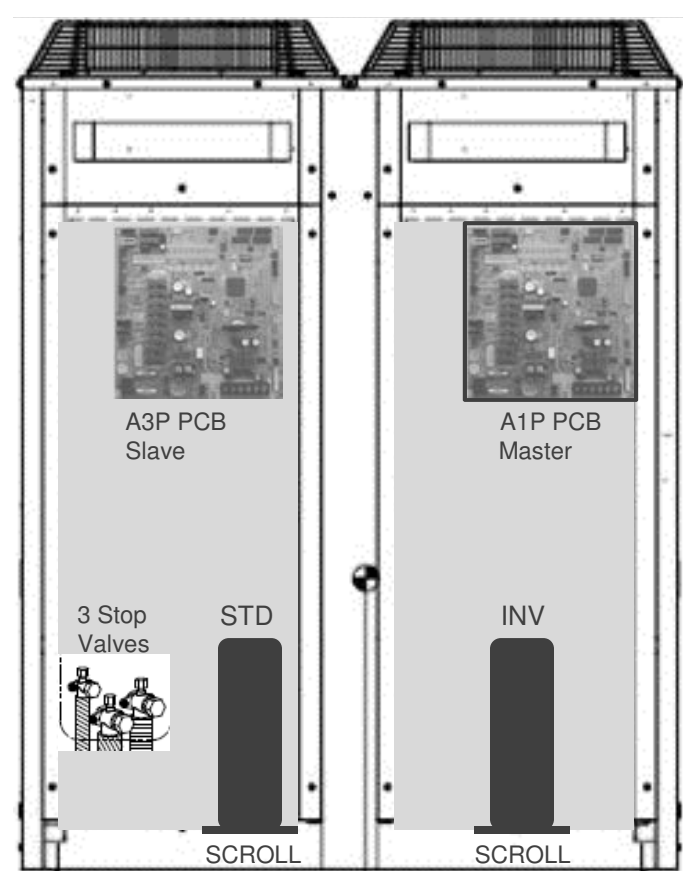
Single & Manifolded Modules



REM72PB



REM96/120PB



REY72,96,120,144PB

Heat Pump Systems



RXYQ_PBTJ (208/230vac 3Ph)

Single Module



6 Ton

8,10,12 Ton

Double Module



14 & 16 Ton



18 & 20 Ton

Triple Module



22,24,26 Ton

Triple Module



28 & 30 Ton

Heat Pump Systems



RXYQ_PBYD (460vac 3Ph)

Single Module



6 Ton

8 & 10 Ton



12 Ton

Double Module



14 & 16 Ton



18 & 20 Ton

Triple Module



22,24,26 Ton



28 & 30 Ton

Heat Recovery Systems



REYQ/REMQ_PBTJ (208/230vac 3Ph)

Single Module



6,8,10,12 Ton

Double Module



14,16,18,20 Ton

Triple Module



22,24,26,28 Ton

Heat Recovery Systems



REYQ/REMQ_PBYD (460vac 3Ph)

Single Module



6,8,10,12 Ton

Double Module



12,14,16,18,20 Ton

Triple Module

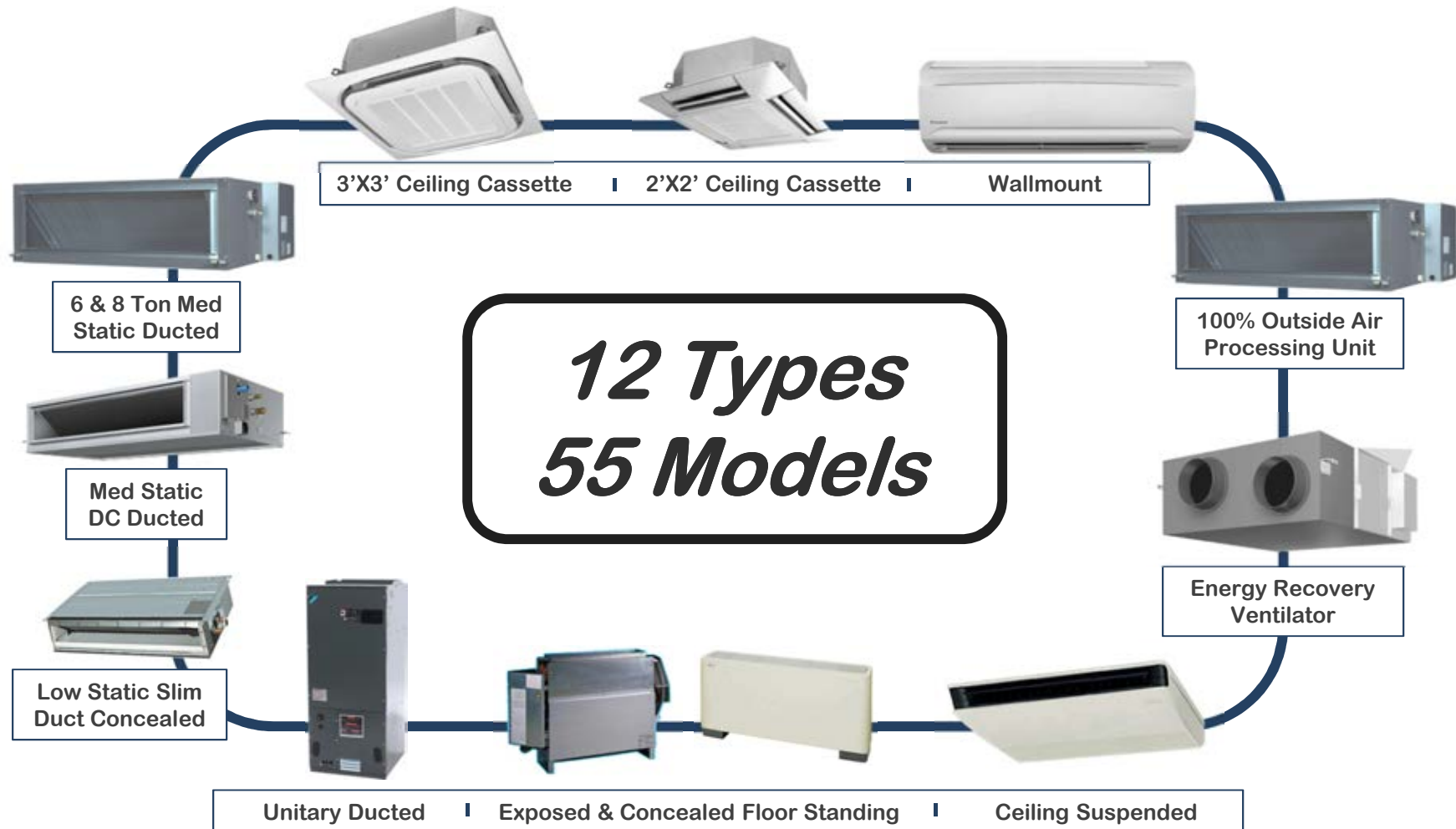


22,24,26,28 Ton

Indoor Units



VRV/III Models & Appearance – 208/230vac 1 Ph Indoor Units



Branch Selector Boxes



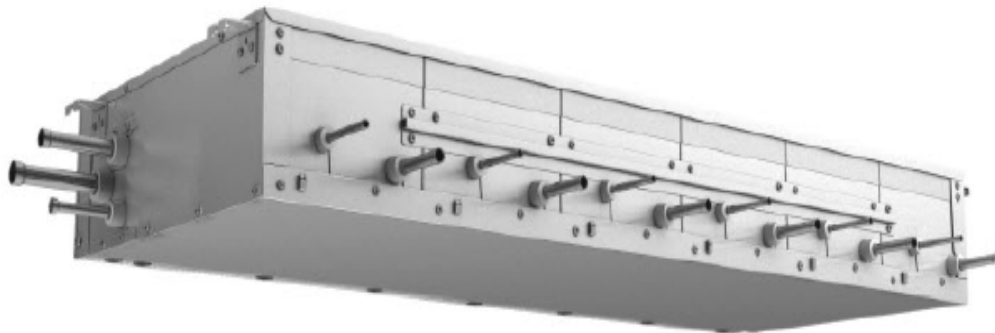
VRV^{III} Models & Appearance – 208/230vac 1 Ph Branch Selector Boxes



BSVQ36PVJU 36,000 Btu
BSVQ60PVJU 60,000 Btu
BSVQ96PVJU 96,000 Btu



BSV4Q36PVJU 4 - Port

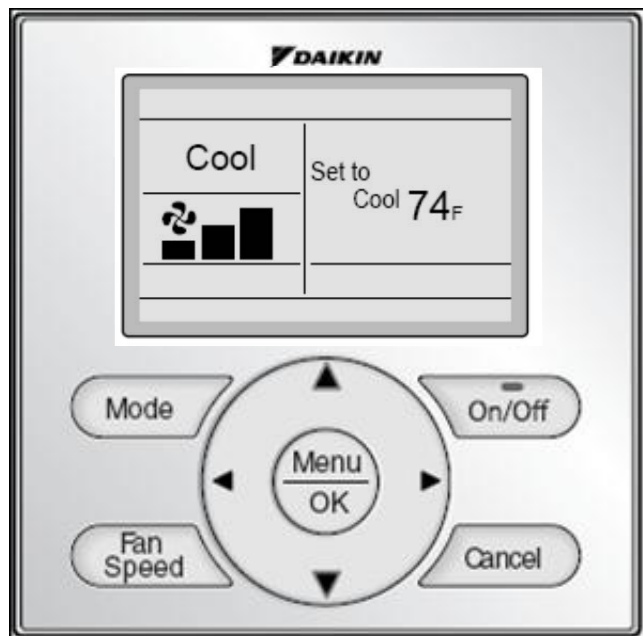


BSV6Q36PVJU 6 - Port

Local Remote Controllers



BRC1E72



Navigation Remote Controller

BRC2A71



**Simplified
Remote
Controller**



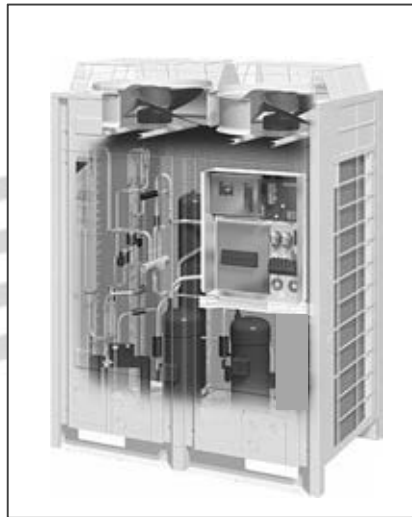
BRC7C/7E/4C



**Hand-held
Wireless
Remote
Controller**

Condenser - Unit Layout

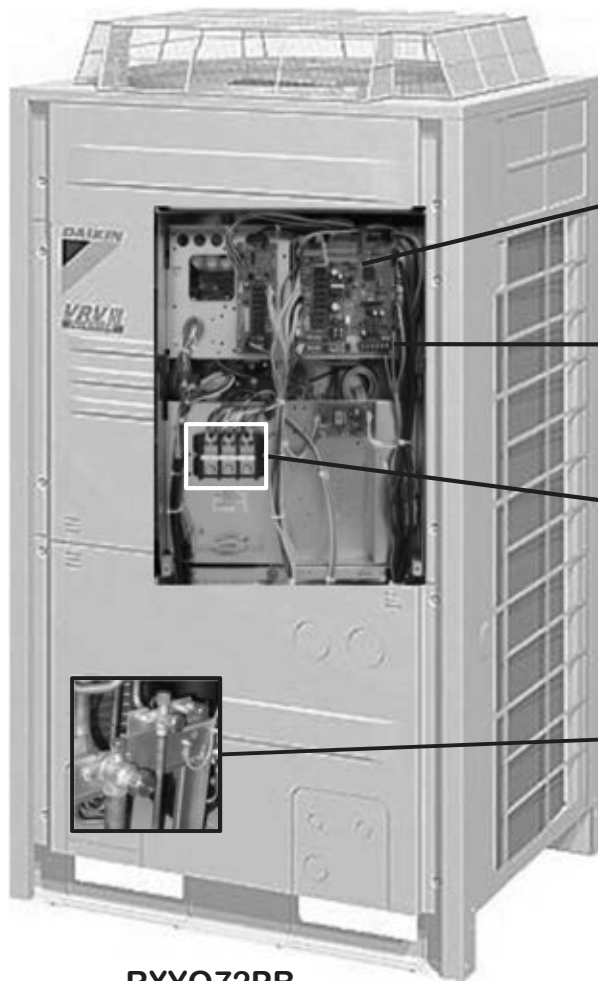
Line & Control Voltage – Stop Valves – Auto Charge Port – Control PCB



VRV/// Heat Pump – RXYQ



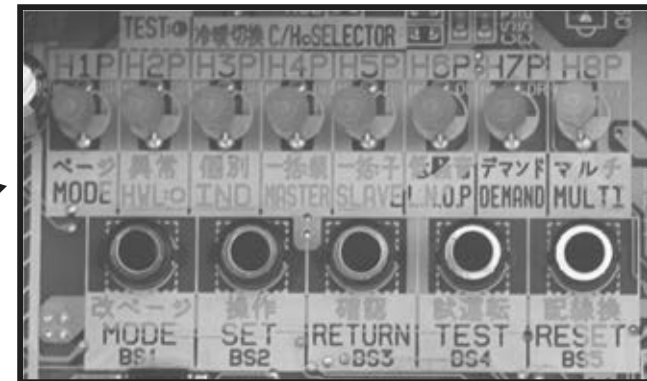
Single & Manifolded



RXYQ72PB

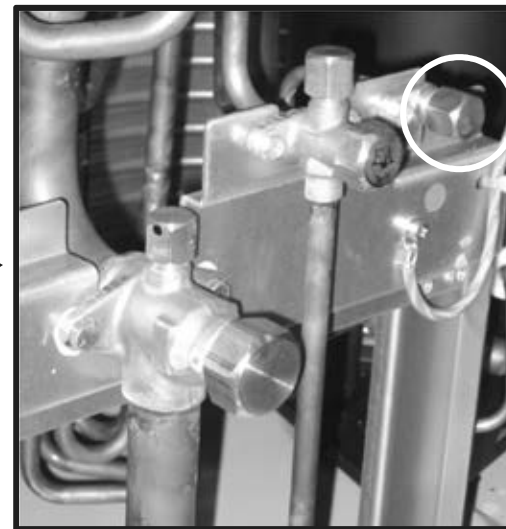
Control Voltage Connections

Line Voltage Connections



Control PCB (A1P)

2 Stop Valves



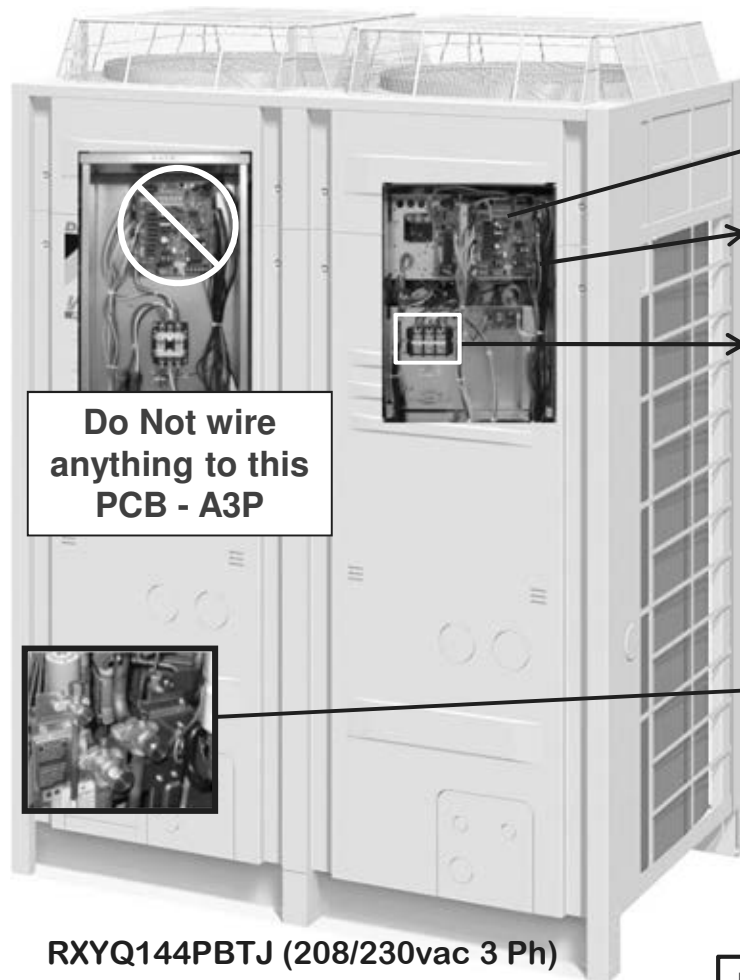
Auto Charge Port

HP/LP Gas Liquid

VRV^{III} Heat Pump – RXYQ144PBTJ



Single Piped



Do Not wire anything to this PCB - A3P

Control Voltage Connections

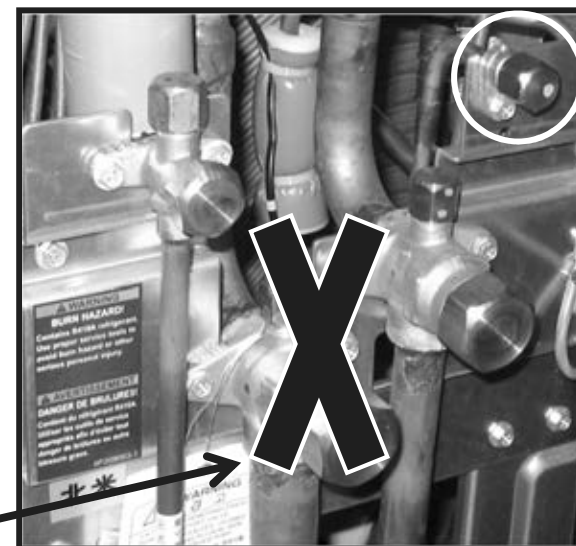
Line Voltage Connections



Control PCB (A1P)

3 Stop Valves

Auto Charge Port



Not Used on this model

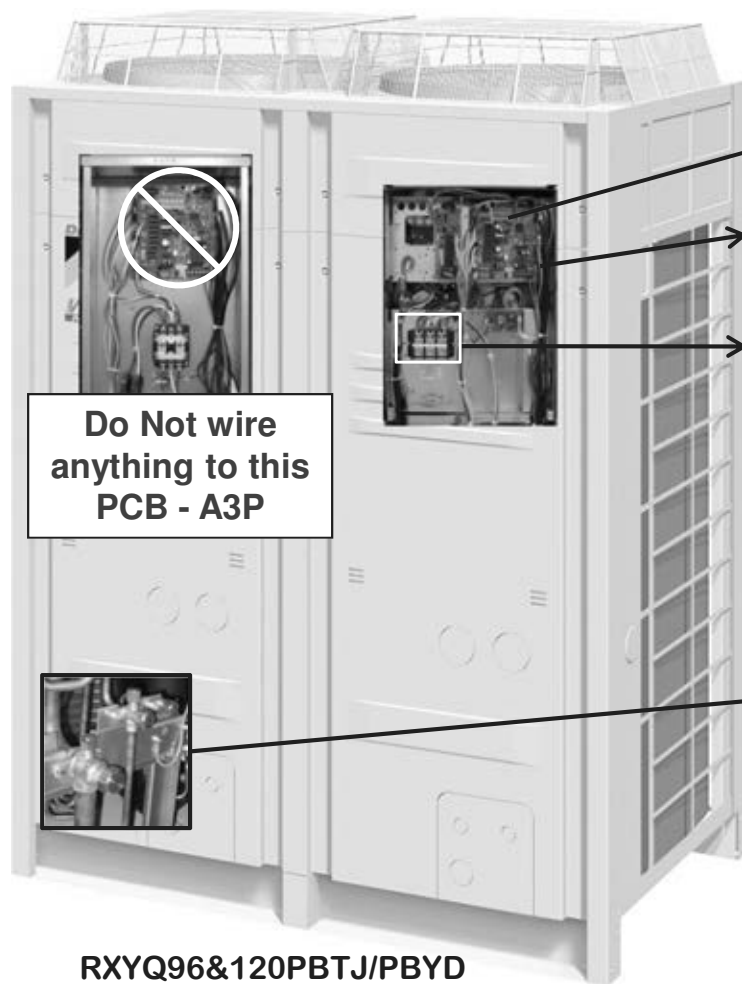
Liq. N/A HP/LP

NOTE: This model cannot be manifolded

VRV^{III} Heat Pump – RXYQ



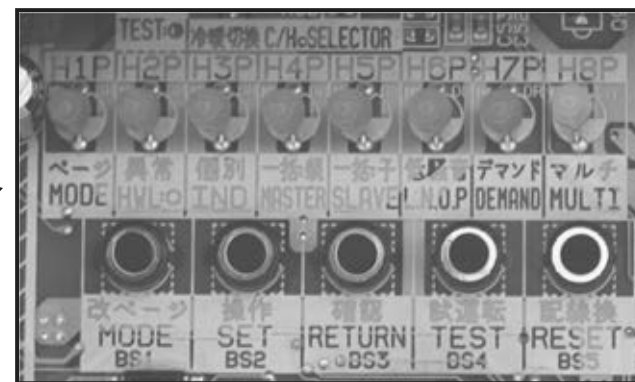
Single & Manifolded



Control Voltage Connections

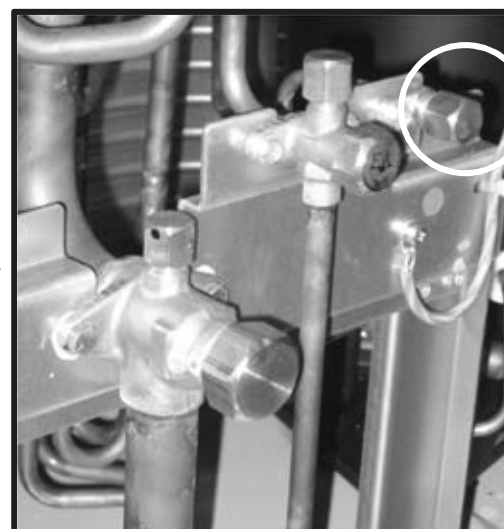
Line Voltage Connections

Do Not wire anything to this PCB - A3P



Control PCB (A1P)

2 Stop Valves



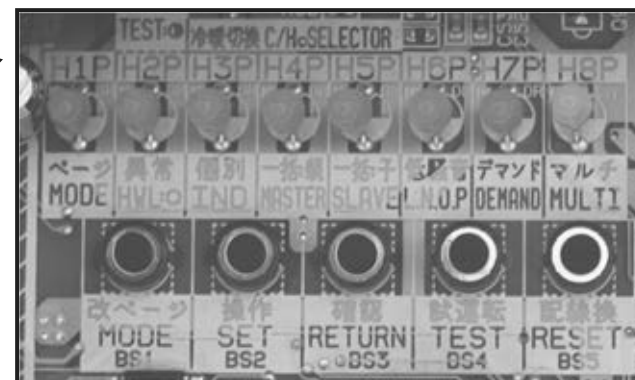
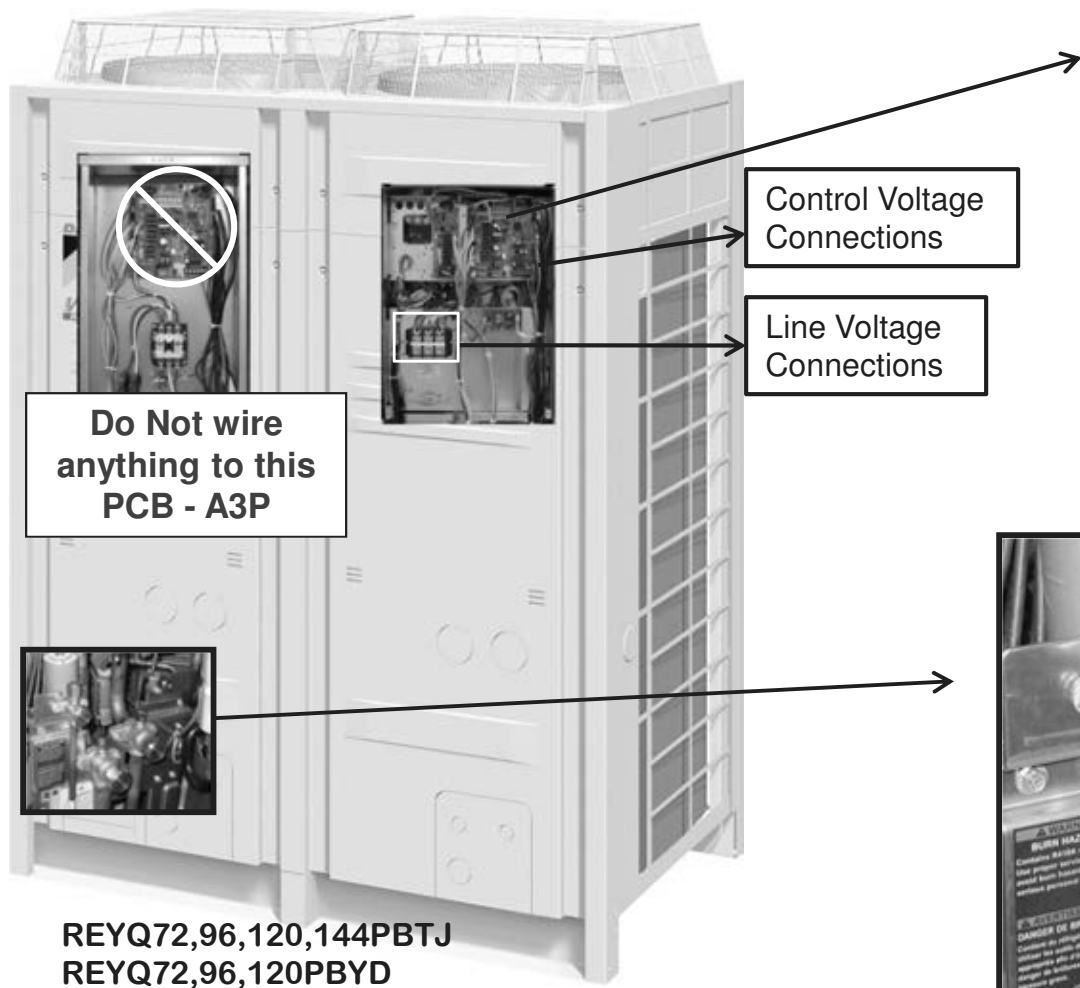
Auto Charge Port

HP/LP Gas Liquid

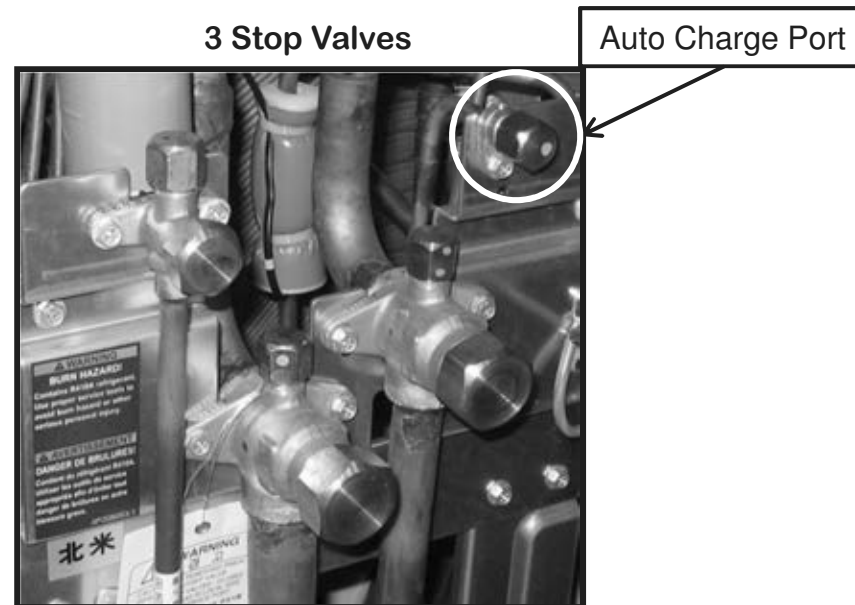
VRV VIII Heat Recovery – REYQ



Single Piped



Control PCB (A1P)

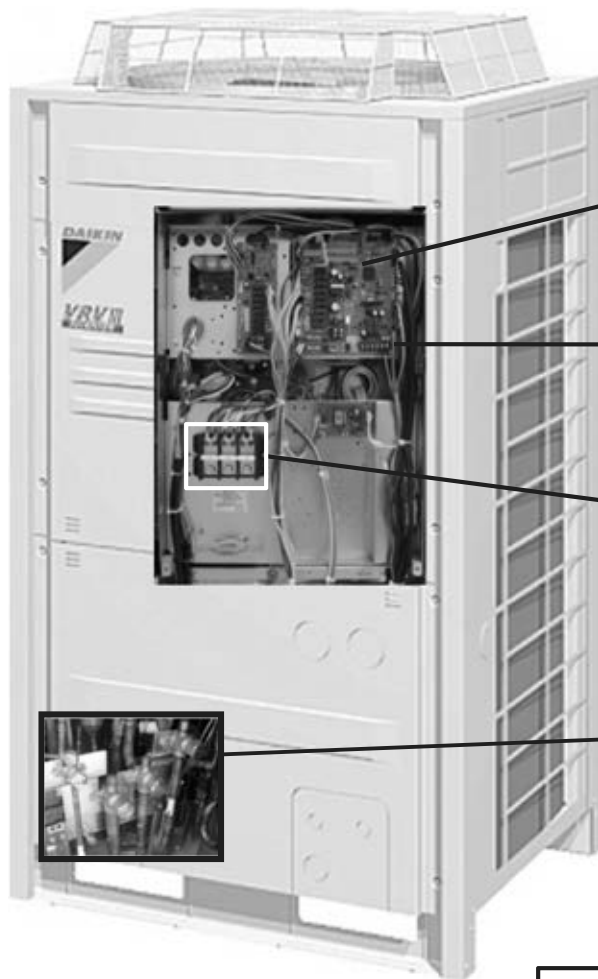


NOTE: These models cannot be manifolded

VRV^{III} Heat Recovery – REMQ



Manifolded Module

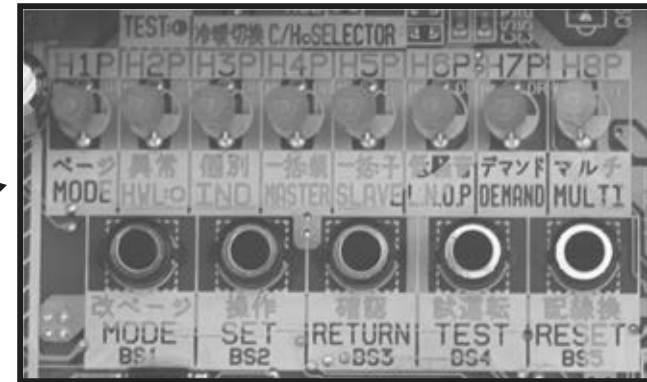


REMQ72,96,120PBTJ/PBYD

Control Voltage
Connections

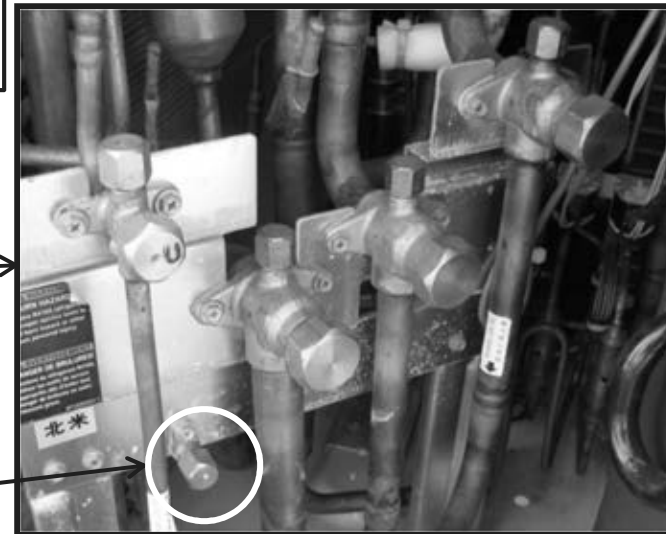
Line Voltage
Connections

Auto Charge Port



Control PCB (A1P)

4 Stop Valves



Liquid - Suction-HP/LP-Equalization

System Commissioning

Pre-Commissioning Checks & Commissioning Steps

Pre-Commissioning Checks 1 - 10

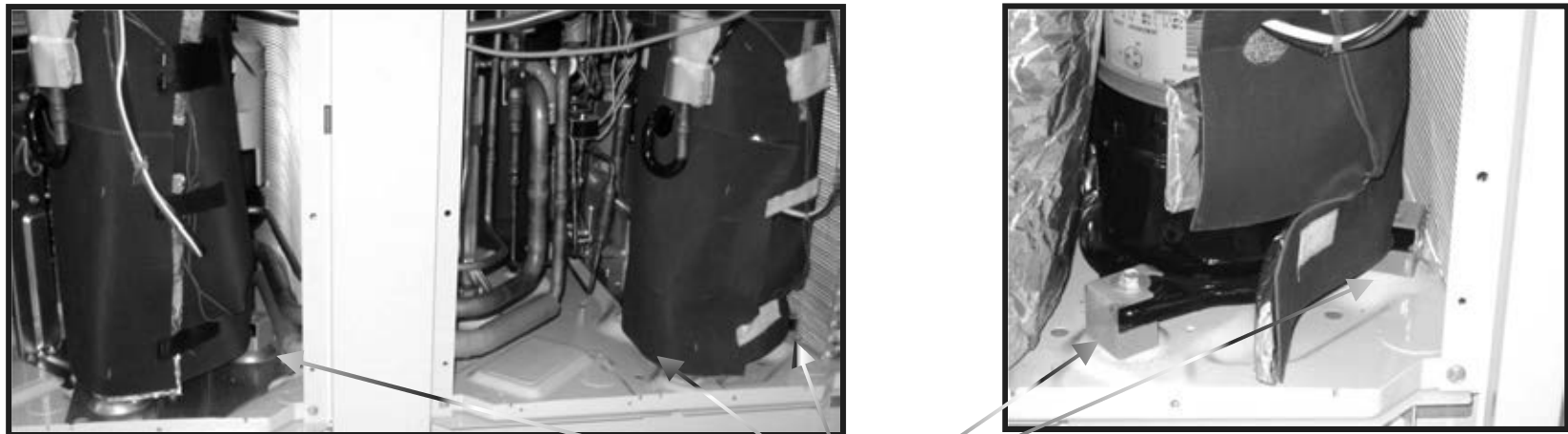


Pre-Commissioning Checks

1. Compressor shipping brackets removed
2. Stop Valves securely closed & field refrigerant piping pressure tested to 550 psi (450psi FXTQ) for 24 hours min. Include Pressure Equalization pipe on manifolded Heat Recovery systems (PB)
3. Triple evacuate to 500 microns or less; Include Pressure Equalization pipe on HR
4. All liquid lines are measured, “Additional Refrigerant Charge” is calculated and weighed into the system, breaking the final vacuum
Alternate: 50% (trim charge) of the calculated charge weighed in for “Auto Charge” operation
5. Stop Valves opened
6. All Remote Controllers installed and all control wiring is installed and properly connected at each terminal block
7. All condensate drain piping is connected, including fan coil tie-in, and insulated as required
8. Refrigerant lines (Pressure Equalization piping) are completely insulated including flare nut connections at Indoor Units
9. All ductwork is connected and air filters installed
10. Line Voltage is checked and verified to be within specified range for all system components

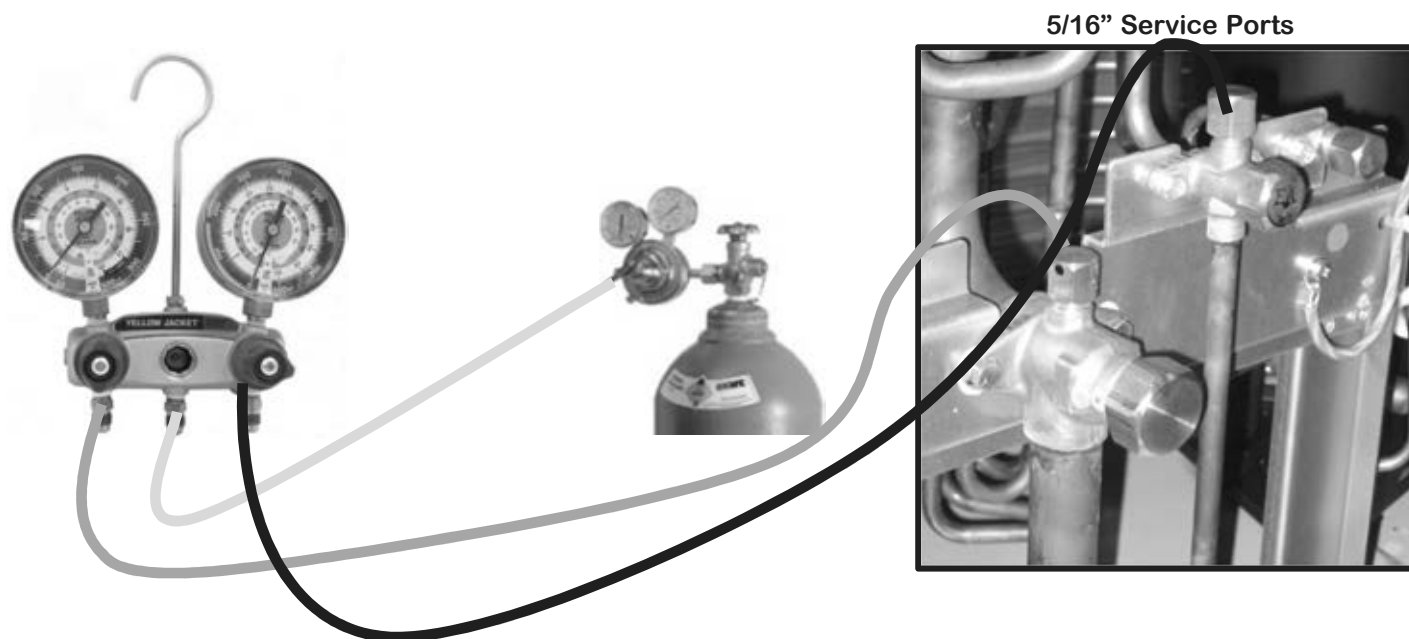
Compressor Shipping Brackets

- Compressor shipping brackets must be removed before system start up
- Each compressor is secured by 2 brackets, yellow in color, which are located under the compressor blankets
- Remove all of the brackets and retighten the compressor bolts
- Failure to remove the brackets can result in excessive noise during operation



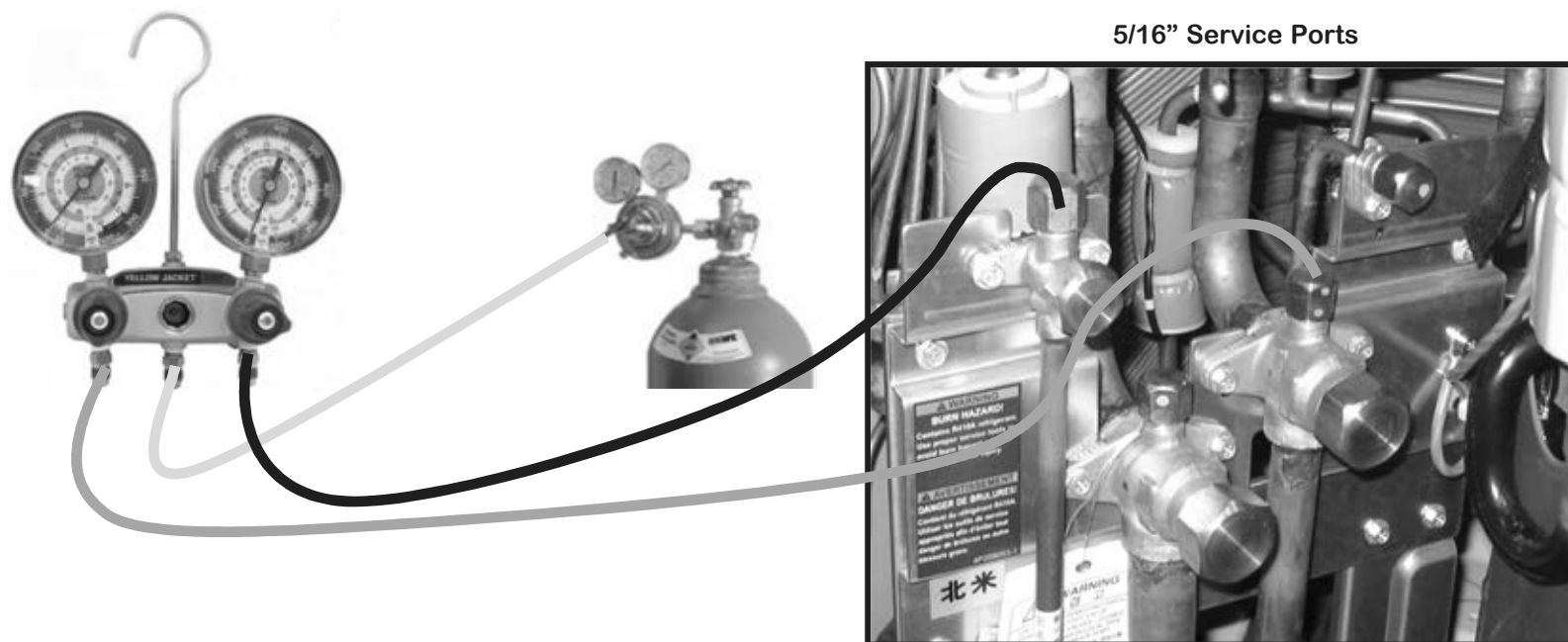
Shipping Brackets

Pressure Test Connections Heat Pump RXYQ - 2 Stop Valves



- Connect manifold gauges to the Liquid and Dual Pressure Gas Service Ports
 - On Manifolder systems connect gauges to the main condenser
- Connect Nitrogen cylinder with regulator to manifold
- Do not energize the indoor units. Indoor unit EEVs close when power is applied
 - If EEVs have closed use Recovery/Evacuation Mode to reopen all EEVs
- Follow the Pressure Test procedure, and perform a system leak test.

Pressure Test Connections Heat Pump & Heat Recovery 3 Stop Valves RXYQ144PBTJ, REYQ72,96,120,144PBTJ & REYQ72,96,120PBYD



- Connect manifold gauges to the Liquid and Dual Pressure Gas Service Ports
- Connect Nitrogen cylinder with regulator to manifold
- Do not energize the indoor units (or branch selector boxes for heat recovery). Indoor unit and branch selector box EEVs close when power is applied
 - If EEVs have closed use Recovery/Evacuation Mode to reopen all EEVs
- Follow the Pressure Test procedure, and perform a system leak test.

Pressure Test Connections Heat Recovery REMQ 4 Stop Valves

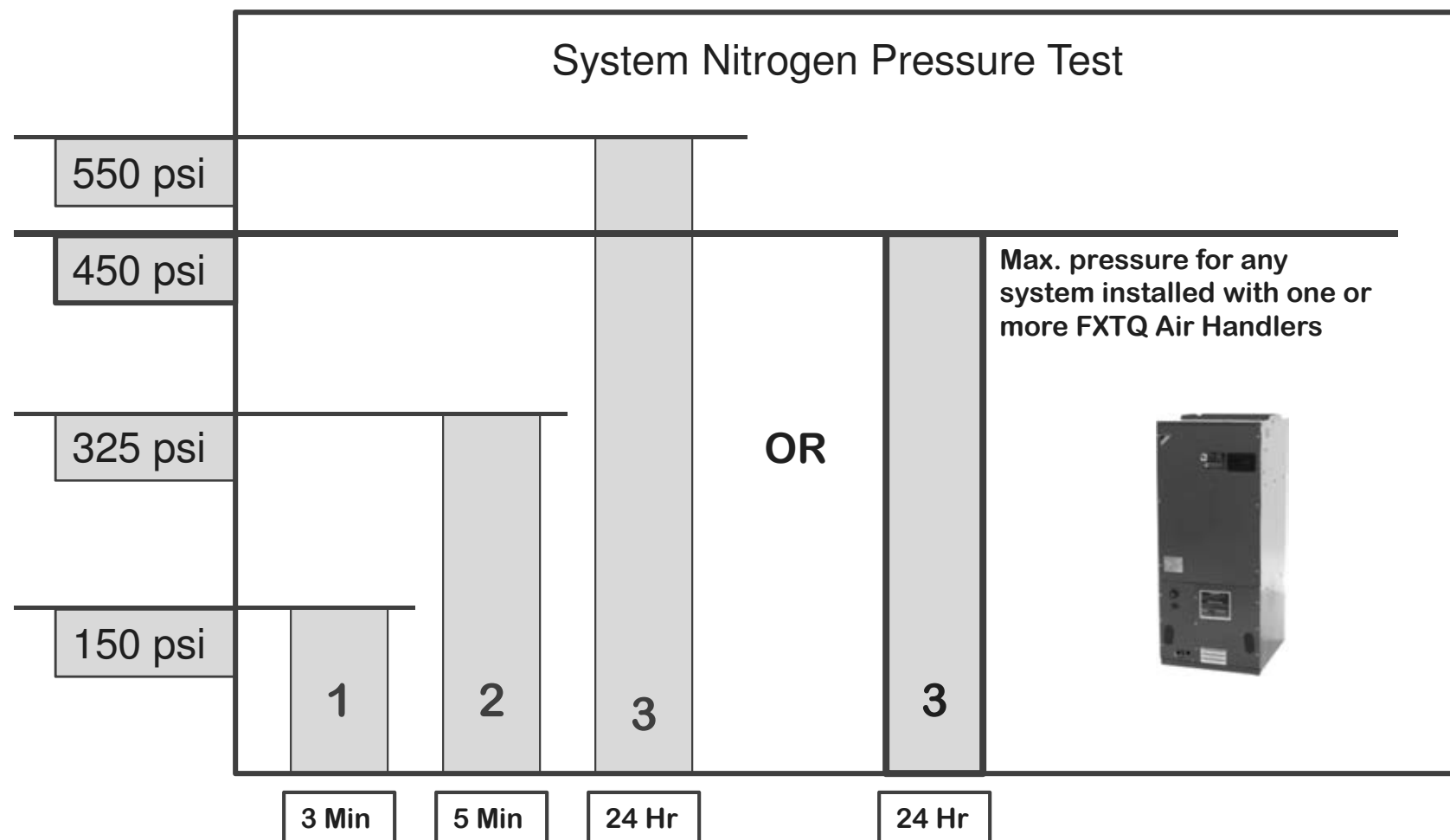


5/16" Service Ports

- Connect manifold gauges to the Liquid and Dual Pressure Gas Service Ports on the Main unit
 - Pressure test the Pressure Equalization Pipe separately
- Connect Nitrogen cylinder with regulator to manifold
- Do not energize the indoor units or branch selector boxes. Indoor unit and branch selector box EEVs close when power is applied
 - If EEVs have closed use Recovery/Evacuation Mode to reopen all EEVs
- Follow the Pressure Test procedure, and perform a system leak test.

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.

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

$$(T_p - T_c) \times 0.80 = \text{Pressure Drop}$$

System Triple Evacuation



- Minimum 6 cfm vacuum pump with check valve
 - Digital Micron Gauge
 - Insure Vacuum hoses are in good condition
 - Indoor units (and branch selector boxes, heat recovery only) must not be energized to insure EEVs are open
 - Evacuate the refrigerant piping to 4,000 microns
 - Break the vacuum with Dry Nitrogen to a level of 2-3 PSIG
 - Evacuate the system to 1,500 microns
 - Break the vacuum with Dry Nitrogen to a level of 2-3 PSIG
 - Evacuate the system to 500 microns or less
 - Conduct a micron rise test; system should hold 500 microns for 1 hour
- Hold vacuum for liquid refrigerant charging – Do Not remove manifold gauges

Evacuation Connections Heat Pump RXYQ 2 Stop Valves

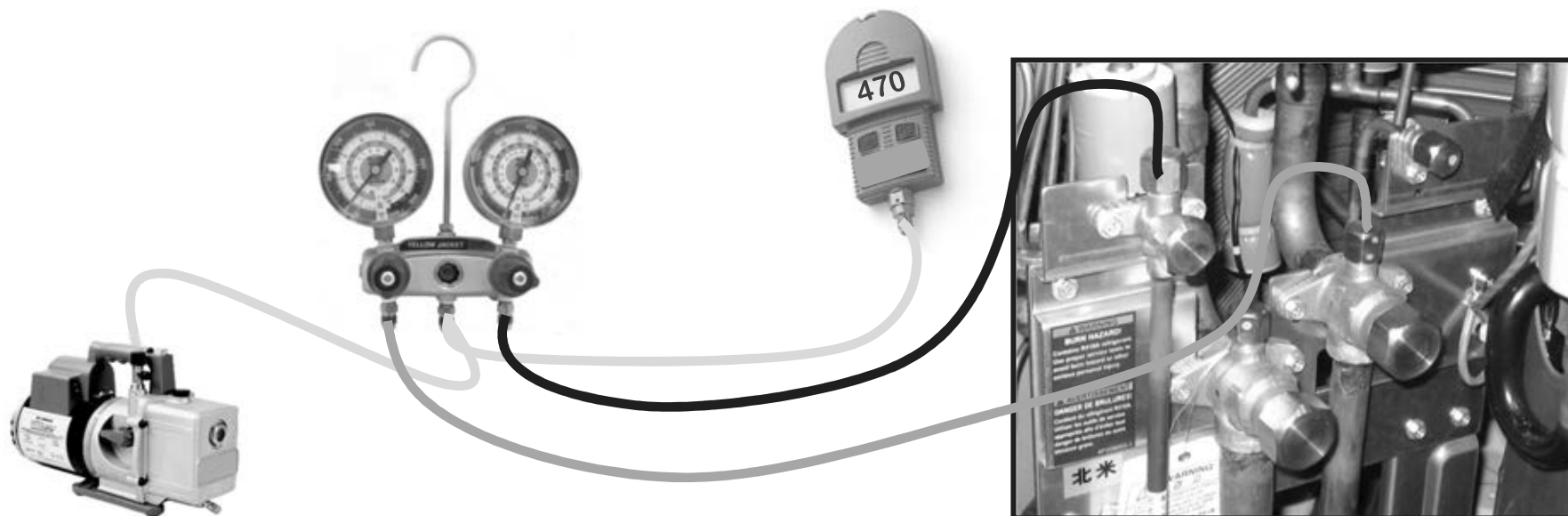


- Connect manifold gauges to the Liquid and Dual Pressure Gas Service Ports
 - On manifolded systems connect gauges to the main condenser
- Connect vacuum pump and micron gauge
- Do not energize the indoor units. Indoor unit EEVs close when power is applied
 - If EEVs have closed use Recovery/Evacuation Mode to reopen all EEVs
- Triple evacuation down to 500 microns or less using Dry Nitrogen to break vacuum
 - The final vacuum is used to draw in the calculated “Additional Refrigerant Charge” amount by weight

VRV/III Pre-Commissioning Check #3 Cont.

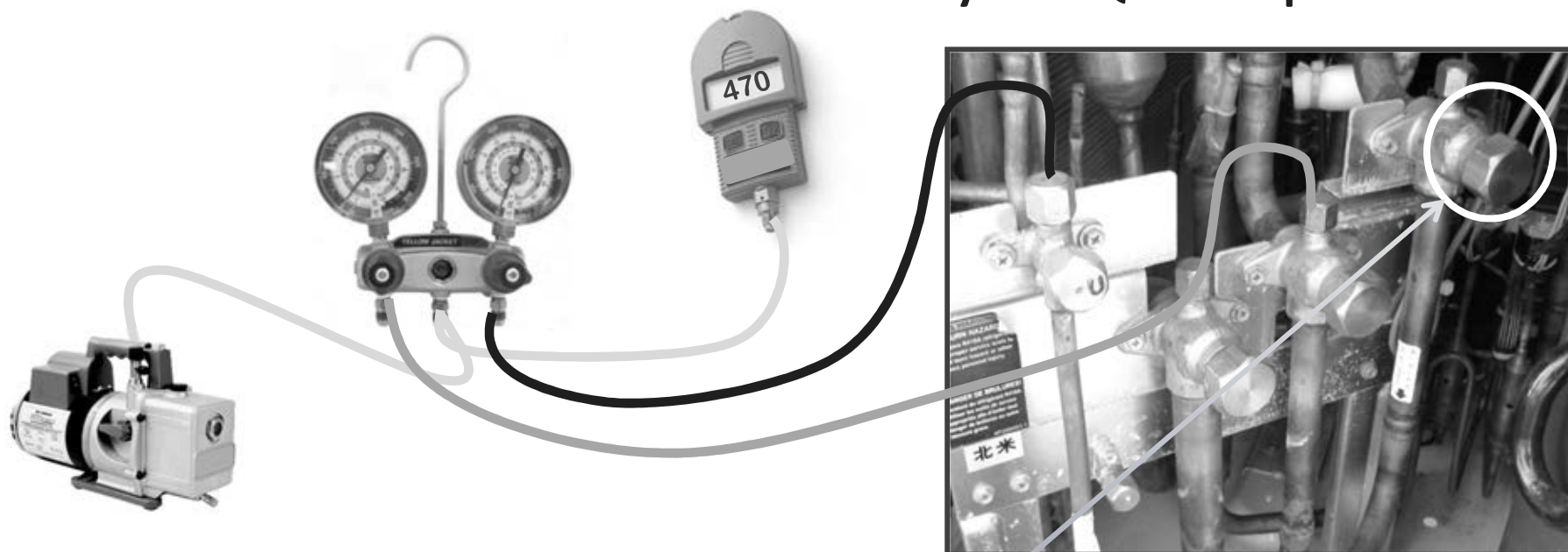


Evacuation Connections Heat Pump & Heat Recovery 3 Stop Valves RXYQ144PBTJ - REYQ72,96,120,144PBTJ & REYQ72,96,120PBYD



- Connect manifold gauges to the Liquid and Dual Pressure Gas Service Ports
- Connect vacuum pump and micron gauge
- Do not energize the indoor units (or branch selector boxes for heat recovery). Indoor unit EEVs close when power is applied
 - If EEVs have closed use Recovery/Evacuation Mode to reopen all EEVs
- Triple evacuation down to 500 microns or less using Dry Nitrogen to break vacuum
 - The final vacuum is used to draw in the calculated “Additional Refrigerant Charge” amount by weight

Evacuation Connections - Heat Recovery REMQ - 4 Stop Valves



- Connect manifold gauges to the Liquid and Dual Pressure Gas Service Ports on the Main unit
 - Pressure Equalization Pipe is evacuated separately
- Connect vacuum pump and micron gauge
- Do not energize the indoor units or branch selector boxes. Indoor unit and branch selector box EEVs close when power is applied
 - If EEVs have closed use Recovery/Evacuation Mode to reopen all EEVs
- Triple evacuation down to 500 microns or less using Dry Nitrogen to break vacuum cycles
 - The final vacuum is used to draw in the calculated “Additional Refrigerant Charge” amount by weight

VRVIII System Refrigerant Charging Facts

- Accurate refrigerant charging is critical for optimum system performance
- *Daikin VRV* systems cannot be charged by refrigerant operating pressures, superheat or subcooling temperatures; refrigerant is weighed into the system
- All *VRVIII* condensers have a factory refrigerant charge based on the unit model
 - The *VRVIII* Condensers state the factory refrigerant charge on the unit ID Plate
- Proper *VRVIII* system charging requires an “Additional Refrigerant Charge” amount to be calculated which is based in part by the total actual length of the system Liquid lines.
- The total system refrigerant charge is comprised of the factory charge in the condenser(s), and the “Additional Refrigerant Charge” amount calculated for that system



REFRIGERANT R410A 20.1 LBS.



TOTAL
SYSTEM
CHARGE

“Additional Refrigerant Charge”

VRVIII System Refrigerant Charge Procedures

- It is recommended that all VRVIII systems be manually charged based on the calculated “Additional Refrigerant Charge” for the system being commissioned
 - Measure the total linear footage of each Liquid line pipe size in the entire system
 - Calculate the “Additional Refrigerant Charge” based on the three part calculation procedure for the system being commissioned
 - After determining the amount of the “Additional Refrigerant Charge”, use the vacuum in the system from the final evacuation cycle, and weigh in liquid refrigerant through the Liquid service port.
 - If there is not enough vacuum to draw in the total charge, use the “Additional Refrigerant Charge Mode” to complete the system charging process
See Commissioning Step #5
 - If *Auto Charge* is to be used, use the final vacuum to charge the system with at least 50% of the calculated “Additional Refrigerant Charge” then using *Auto Charge* “Cool Mode” to complete the charging process. (See *Auto Charge* Limitations)
- After the system receives the full or partial charge, all of the stop valves may be opened (Pre-Commissioning Step #5)

VRV^{III} “Additional Refrigerant Charge” Manual Calculation

The example system for this exercise is: **RXYQ144PBTJ** Heat Pump
System Connection Ratio is 105%
Connection ratio can be found in the VRV Xpress file.

Calculation A

Total length (ft) of 1/4” liquid line 254 X .015 lbs/ft = 3.81

+

Total length (ft) of 3/8” liquid line 173 X .040 lbs/ft = 6.92

+

Total length (ft) of 1/2” liquid line 78 X .081 lbs/ft = 6.31

+

Total length (ft) of 5/8” liquid line 52 X .121 lbs/ft = 6.29

+

Total length (ft) of 3/4” liquid line 0 X .175 lbs/ft = 0.00

+

Total length (ft) of 7/8” liquid line 0 X .249 lbs/ft = 0.00

Liquid Line Example Total: 23.33 Lbs

Heat Pump RXYQ - Add total amount from **Calculation A** to **Calculation B**

OR

If Heat Recovery REYQ_
Multiply **Calculation A Total** by: **1.02** and add amount to **Calculation B**

Calculation B

Heat Pump

MODEL NAME	Refrigerant Amount
RXYQ 96, 120, 216, 240, 336, 360P	0.0 lb
RXYQ 72 , 168, 192, 264, 288, 312P	1.1 lb
RXYQ 144PBYD	2.2 lb
RXYQ 144PBTJ	7.9 lb

Heat Recovery

MODEL NAME	Refrigerant Amount
REYQ 72 ~ 120PBYD REYQ 72 ~ 144PBTJ	7.9 lb
REYQ 144PBYD REYQ 168 ~ 192P	2.2 lb
REYQ 216 ~ 240P	3.3 lb
REYQ 264 ~ 288P	5.5 lb
REYQ 312 ~ 336P	6.6 lb

Calculation A + Calculation B

23.33 lbs.

7.9 lbs.

VRVIII Pre-Commissioning Check #4 Cont.



NOTE: For systems with Connection Ratio above 130%, contact Service Hotline

Calculation C

Heat Pump		
Connection Ratio	RXYQ 72 ~ 312PBYD RXYQ 72 ~ 312PBTJ	RXYQ 336 ~ 360PBYD RXYQ 336 ~ 360PBTJ
MORE THAN 100% AND LESS THAN 120%	1.1 LB	1.1 LB
MORE THAN 120% AND LESS THAN 130%	1.1 LB	2.2 LB

If system Connection Ratio is 100% or less, no additional refrigerant is required for Calculation C

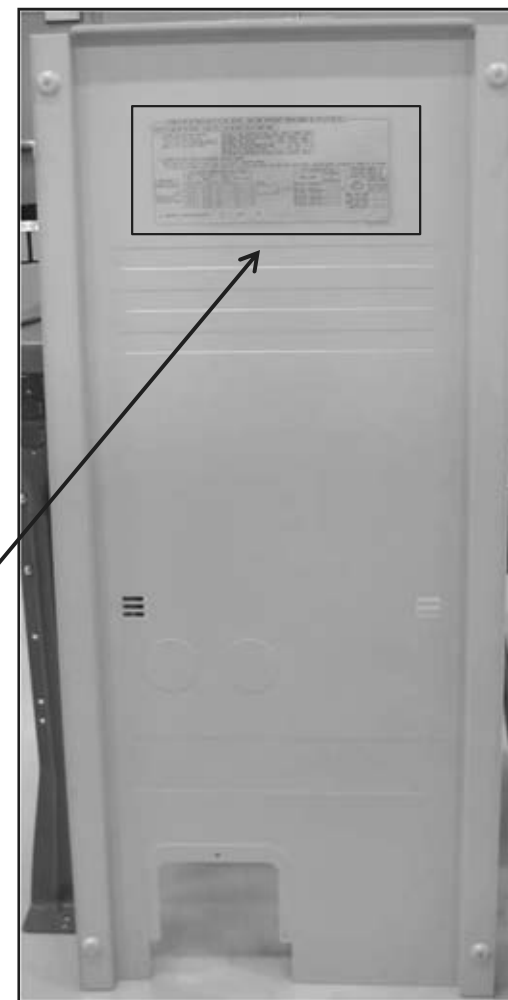
Heat Recovery		
Connection Ratio	REYQ 72 ~ 120PBYD REYQ 72 ~ 120PBTJ REYQ 144 ~ 312PBYD REYQ 168 ~ 312PBTJ	REYQ 336PBYD REYQ 336PBTJ
MORE THAN 100% AND LESS THAN 120%	1.1 LB	1.1 LB
MORE THAN 120% AND LESS THAN 130%	1.1 LB	2.2 LB

Calculation A + **Calculation B** + **Calculation C** = **Total**
 23.33 lbs. 7.9 lbs. 1.1 lbs. 32.3 lbs. (32 lbs. 5 oz.)

NOTE: .1 lbs. = 1.6 oz. (round up)

VRVIII System Refrigerant Charge Procedures

- Refrigerant Charging Instructions are listed on a field installed label located in the clear plastic packet which is taped to the control box cover
- Remove the label backing and apply the clear label to the inside of the condenser's access panel.
- Enter all of the liquid line lengths, and the calculated Additional Refrigerant Charge. This information is crucial for future service work



REQUEST FOR THE INDICATION OF SETTING CONTENTS, ADDITIONAL REFRIGERANT CHARGING AMOUNT AND INSTALLATION DATE

AFTER FILLING OUT THE BELOW, PLEASE PUT IT ON THE BACK SIDE OF FRONT PANEL

1. RECORD FOR SETTING CONTENTS
FOR THE SETTING CONTENTS OF ①-④
IN THE SETTING MODE 2,
MARK ○ IN THE RIGHT TABLE.

① NIGHT - TIME LOW NOISE SETTING	OFF • LEVEL1 • LEVEL2 • LEVEL3
② EXTERNAL LOW NOISE LEVEL SETTING	LEVEL1 • LEVEL2 • LEVEL3
③ DEMAND LEVEL SETTING	LEVEL1 • LEVEL2 • LEVEL3
④ EXTERNAL LOW NOISE DEMAND SETTING	OFF • ON
⑤ HIGH STATIC PRESSURE SETTING	OFF • ON

2. RECORD FOR ADDITIONAL REFRIGERANT CHARGING AMOUNT
MAKE SURE TO RECORD THE ADDITIONAL REFRIGERANT CHARGING AMOUNT,
(IF DO NOT USE AUTOMATIC REFRIGERANT CHARGING, CALCULATE AND CHARGE THE ADDITIONAL REFRIGERANT CHARGING AMOUNT FOLLOWING AS SHOWN ON THE BELOW.)

REFRIGERANT AMOUNT FOR FIELD PIPING				TOTAL
LIQUID PIPE SIZE (IN)	PIPE LENGTH (FT)	REFRIGERANT AMOUNT (LB)	SUB TOTAL	
#1/2	0.249	×		1 lb +
#3/4	0.125	×		
#5/8	0.121	×		
#1/2	0.081	×		
#3/8	0.040	×		
#1/4	0.015	×		

ADDITIONAL CHARGING AMOUNT: 1 lb

ROUND OFF TO ONE DECIMAL PLACE.

HEAT PUMP SYSTEM	
MODEL NAME	THE AMOUNT OF REFRIGERANT
RXY206, 120L, 216, 240, 336, 360P	0 lb
RXY272, 168, 192, 264, 288, 312P	1.1 lb
RXY2144PBYD	2.2 lb
RXY2144PBTJ	7.9 lb

REFRIGERANT AMOUNT FOR EXCEEDING CONNECTION CAPACITY OF INDOOR UNIT		
INDOOR CONNECTION CAPACITY	MODEL NAME	REFRIGERANT AMOUNT
	RXY272 - 312P	360P
MORE THAN 100W		1.1 lb
120W OR LESS		1.1 lb
MORE THAN 120W		2.2 lb
120W OR LESS		1.1 lb

3. RECORD OF INSTALLATION DATE DA MO YR

3P280962-1A

VRVIII Pre-Commissioning Check #4 Cont.



Example System: RXYQ144PBTJ - Connection Ratio: 105%

REQUEST FOR THE INDICATION OF SETTING CONTENTS, ADDITIONAL REFRIGERANT CHARGING AMOUNT AND INSTALLATION DATE

AFTER FILLING OUT THE BELOW, PLEASE PUT IT ON THE BACK SIDE OF FRONT PANEL

1. RECORD FOR SETTING CONTENTS
FOR THE SETTING CONTENTS OF ①~⑤
IN THE SETTING MODE 2,
MARK ○ IN THE RIGHT TABLE.

① NIGHT - TIME LOW NOISE SETTING	OFF • LEVEL1 • LEVEL2 • LEVEL3
② EXTERNAL LOW NOISE LEVEL SETTING	LEVEL1 • LEVEL2 • LEVEL3
③ DEMAND LEVEL SETTING	LEVEL1 • LEVEL2 • LEVEL3
④ EXTERNAL LOW NOISE DEMAND SETTING	OFF • ON
⑤ HIGH STATIC PRESSURE SETTING	OFF • ON

2. RECORD FOR ADDITIONAL REFRIGERANT CHARGING AMOUNT
MAKE SURE TO RECORD THE ADDITIONAL REFRIGERANT CHARGING AMOUNT.
(IF DO NOT USE AUTOMATIC REFRIGERANT CHARGING, CALCULATE AND CHARGE THE ADDITIONAL REFRIGERANT CHARGING AMOUNT FOLLOWING AS SHOWN ON THE BELOW.)

REFRIGERANT AMOUNT FOR FIELD PIPING			
LIQUID PIPE SIZE(in)	REFRIGERANT AMOUNT PER 1ft(lb/ft)	LENGTH OF LIQUID PIPE(ft)	SUB TOTAL
1/8	0.249	×	=
3/8	0.175	×	=
1/2	0.121	×	52 = 6.29
3/4	0.081	×	78 = 6.31
1	0.040	×	173 = 6.92
1 1/4	0.015	×	254 = 3.81

ADDITIONAL CHARGING AMOUNT
32.3 lb
(ROUND OFF TO ONE DECIMAL PLACE.)

TOTAL **23.33 lb** +

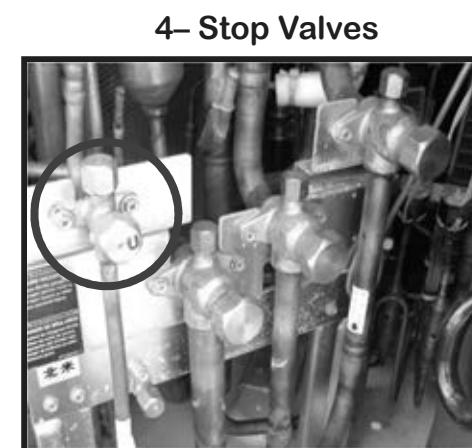
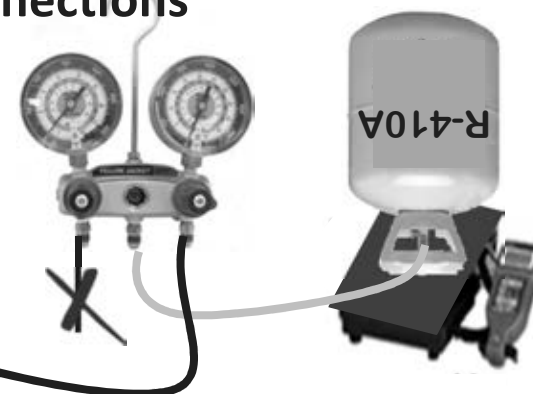
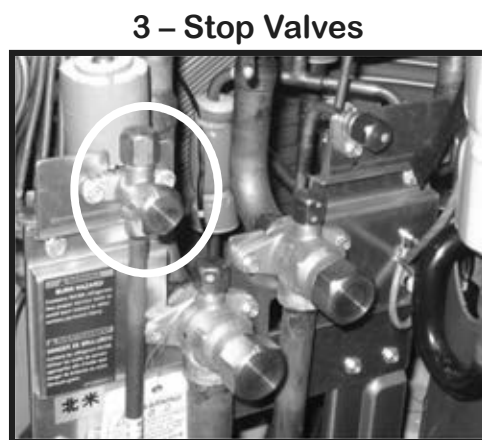
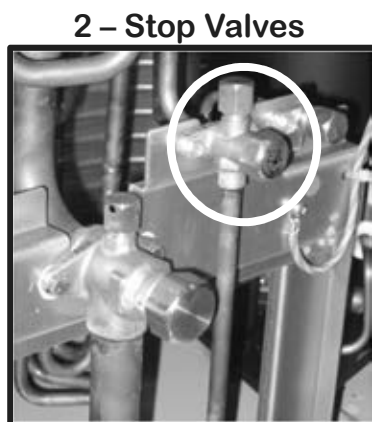
HEAT PUMP SYSTEM	
MODEL NAME	THE AMOUNT OF REFRIGERANT
RXYQ96, 120, 216, 240, 336, 360P	0 lb
RXYQ72, 168, 192, 264, 288, 312P	1.1 lb
RXYQ144PRD	2.2 lb
RXYQ144PBTJ	7.9 lb

REFRIGERANT AMOUNT FOR EXCEEDING CONNECTION CAPACITY OF INDOOR UNIT		
INDOOR CONNECTION CAPACITY	MODEL NAME	
	RXYQ72 ~312P	RXYQ336 ~360P
MORE THAN 100% 120% OR LESS	1.1 lb	
MORE THAN 120% 130% OR LESS	1.1 lb	2.2 lb

3. RECORD OF INSTALLATION DATE
DA 29 • MO 07 • YR 2011

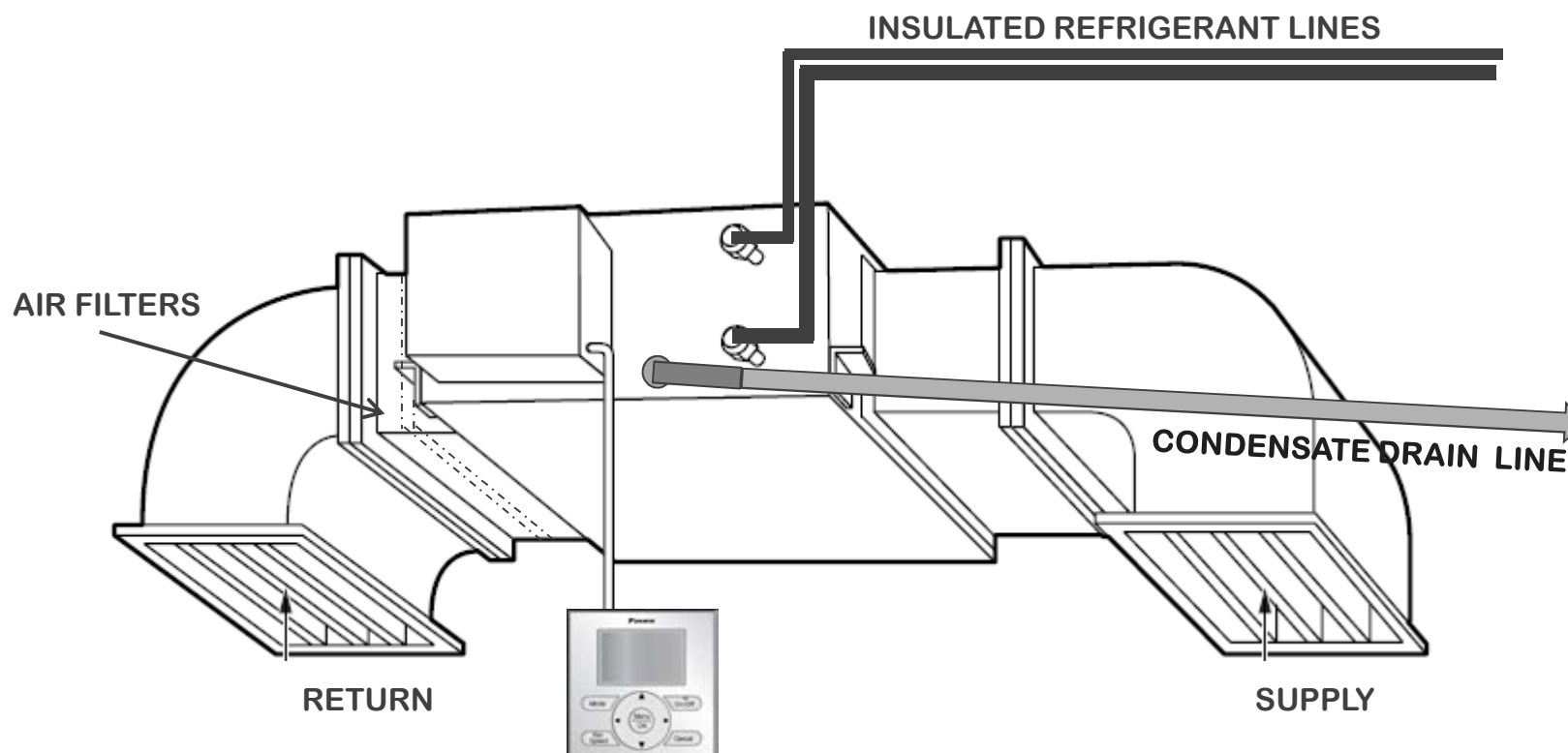
- Enter the piping lengths accurately for each liquid line diameter and multiply the charge factor
- Add the refrigerant amount for the model of the unit or system you are commissioning
- Add the refrigerant amount for the connection ratio your system has – If 100% or less, no add'l refrigerant amount required
- When charging the system manually, write in the total Additional Refrigerant Charge
- If *Auto Charge* COOL mode is used, write in the charge amount taken after *Auto Charge* is complete
- Write down the system commissioning date

Manual Refrigerant Charging Connections



- Low side manifold hose is not used for this procedure
- The high side manifold hose should still be connected to the Liquid service port, from evacuation
- Break the final vacuum by weighing in the entire calculated charge or as much as possible into the system
 - If there is not enough vacuum to draw in the calculated charge, use the “Additional Refrigerant Charge Mode” to complete
- When using *Auto Charge*: Weigh in, through the liquid port, at least 50% of the calculated “Additional Refrigerant Charge” amount to break the vacuum

- All Stop Valves on the Condenser(s) are full open
- All Remote Controllers are installed and properly wired
- All condensate piping is installed on condenser(s) as required and all fan coils
- Refrigerant lines are completely insulated including fan coil flare nut connections
- All ductwork is installed and sealed; all air filters are installed



Verify Power Supply Voltage



- Before energizing any of the system components, use a Voltmeter to verify that the line voltage power supply to the Condenser(s) and all Indoor Units corresponds to the equipment nameplate, and within the stated range.
 - 208/230vac 1Ph & 3Ph = 187 – 253vac
 - 460vac 3Ph = 416 – 508vac
- Verify all 3 phase legs to each condenser are in balance within 2%
 - A “U1” error code with unit stop can be generated for excessive phase imbalance, dropped phase, or reverse phase
 - A “U1” or “U7” error code with unit stop can be generated in a manifolded system
- All indoor units, fan coils and “BS” boxes are shipped with EEV’s open
 - EEV’s motor closed when line voltage power is applied to unit

System Commissioning

Commissioning Steps 1 - 9



Commissioning Steps

1. Power up all indoor units – Fan Coils and Branch Selector boxes (for heat recovery only)
2. Power up Condenser(s) to energize crankcase heaters (minimum 6 hrs) Initialization sequence starts and the system addresses are set – Setup Navigation Remote Controllers
3. Count Indoor Units: Branch Selector Boxes (for heat recovery only) and fan coil units
4. Selected Field Settings programmed at Remote Controllers (Static Pressure settings, etc.)
5. System refrigerant charge – “Manual” charge using the “Additional Refrigerant Charge Mode” or
ALTERNATE: “Auto Charge” Cool Mode - Step #A5
6. *Check Operation mode*
7. Configure the Remote Controller *Changeover Master* for the Heat Pump systems and the heat pump zones in Heat Recovery systems
8. Remaining System Field Settings
9. Verify system operation in Cool & Heat mode as outside ambient temperature conditions allow
(Heat mode is prohibited above 75.2°F outside air temperature)

Power up Indoor Units and Branch Selector Boxes

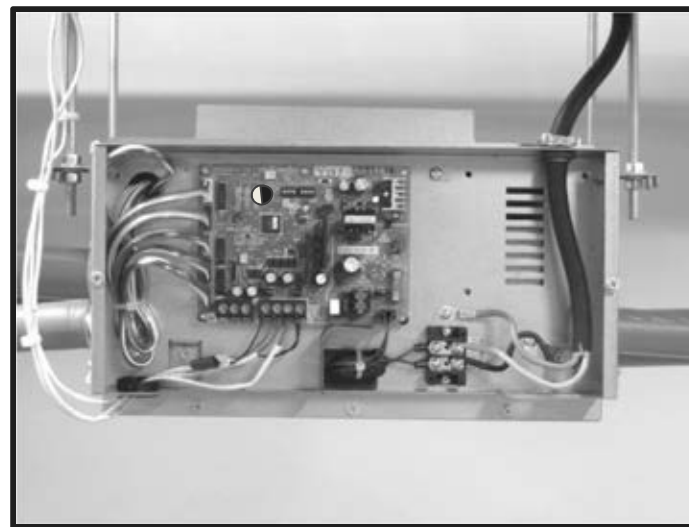
- Power up all Indoor Units and Branch Selector Boxes (Heat Recover only) **First**
 - Verify the Fan Coil and Branch Selector box control PCB's indicate normal operation with the Green flashing status LED on the board
 - Verify all wired Remote Controllers have a display but the status LED's (Green or Red) are OFF



Fan Coil Control PCB



Branch Selector Box PCB

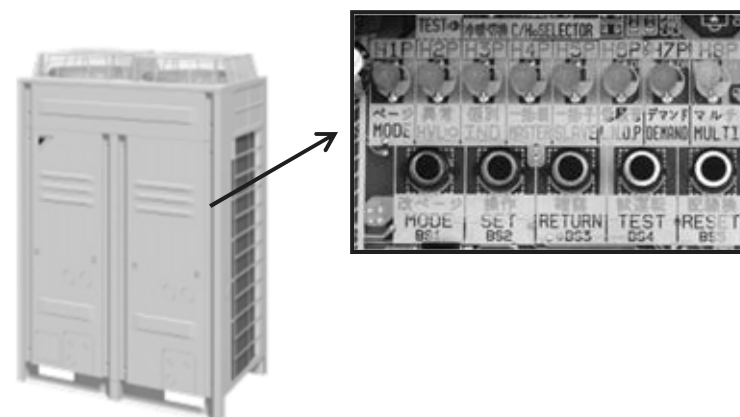


Condenser Power up

Condenser(s) are powered up after the Indoor Units and must not be operated for a period of 6 hours to insure crankcase heaters eliminate any liquid refrigerant in compressor(s). During this time, all of the Navigation Remote Controllers (BRC1E72) can be setup.

Initialization

- Upon power up of the condenser(s), the control PCB will perform the Initialization Operation for approximately 15 minutes. During this operation the addresses are assigned to the indoor units
- This mode is identified by **H2P** blinking and **H3P** solid
 - MASTER PCB on Manifolded systems
- Near completion of Initialization, **H2P** will change from blinking to solid
- When the Initialization Operation is completed **H2P** goes off and **H3P** stays on solid

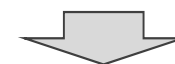


○ : ON ● : OFF ◐ : BLINK

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	NA
●	◐	○	●	●	●	●		



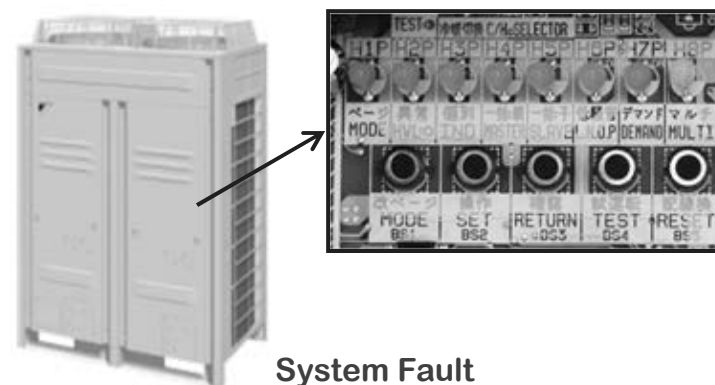
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	○	○	●	●	●	●	



H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	

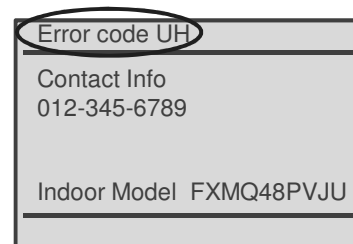
Initialization Complete
Normal System Status

Condenser Power up Error During Initialization

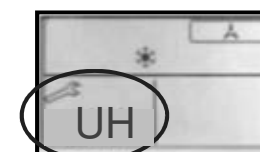


H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	●	●	●	●	●	

- If after 25 minutes **H2P** remains on solid, there is an error in the system
 - Turn on one of the Remote Controllers and verify the error code and resolve the fault
 - Recycle power on the Condenser (Master) press and hold the **RESET** button for 5 seconds to restart Initialization Operation
- When Initialization operation is complete with no errors, the **H2P** LED goes out and **H3P** LED will be on solid



BRC1E72



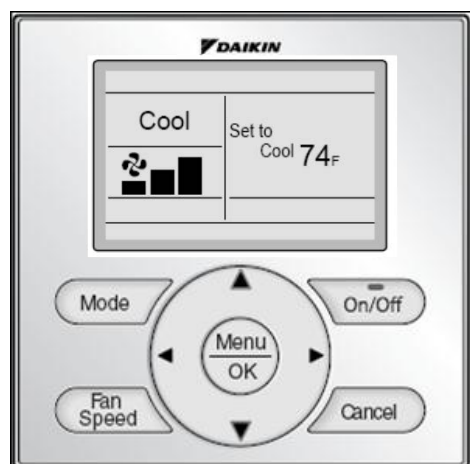
BRC2A71

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●		●	●	●	●	●	

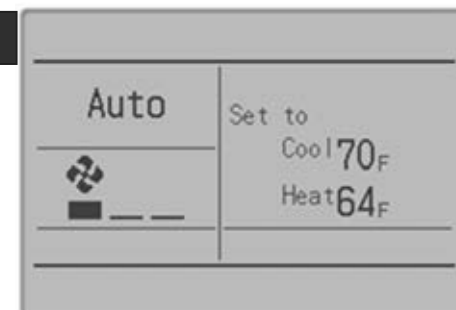
Normal System Status

BRC1E72 Navigation Remote Controller Initial Settings

- During the initial condenser power up time, all of the system BRC1E72 Remote Controllers, can be configured with the “Initial Settings” that apply. Settings can be made with Controllers in the OFF mode.



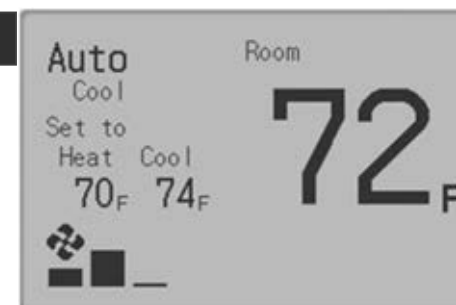
Standard



Detailed

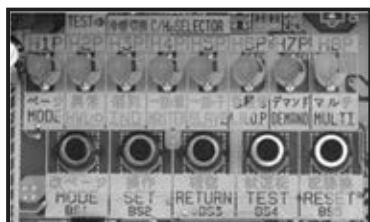


Simple



Condenser A1P Control PCB - Status LED Sequence

- Upon completion of the **Initialization** operation, the LED sequence on the single piped VRVIII condenser will have a solid H3P Note: On single piped dual fan units with 2 control PCB's, the A1P PCB will indicate H3P & H8P on solid
- Upon completion of **Initialization** on VRVIII manifolded modules, the following LED sequences will appear on the control PCB's
 - The Master A1P PCB is connected to the indoor units on **F1F2 IN**
 - Master PCB's display a solid H3P & H8P LED's to indicate normal status



○ : ON ● : OFF ◐ : BLINK

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	●

Single Piped Condenser

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	○

Manifolded Module
Master Condenser

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	●	●	●	●	●	◐

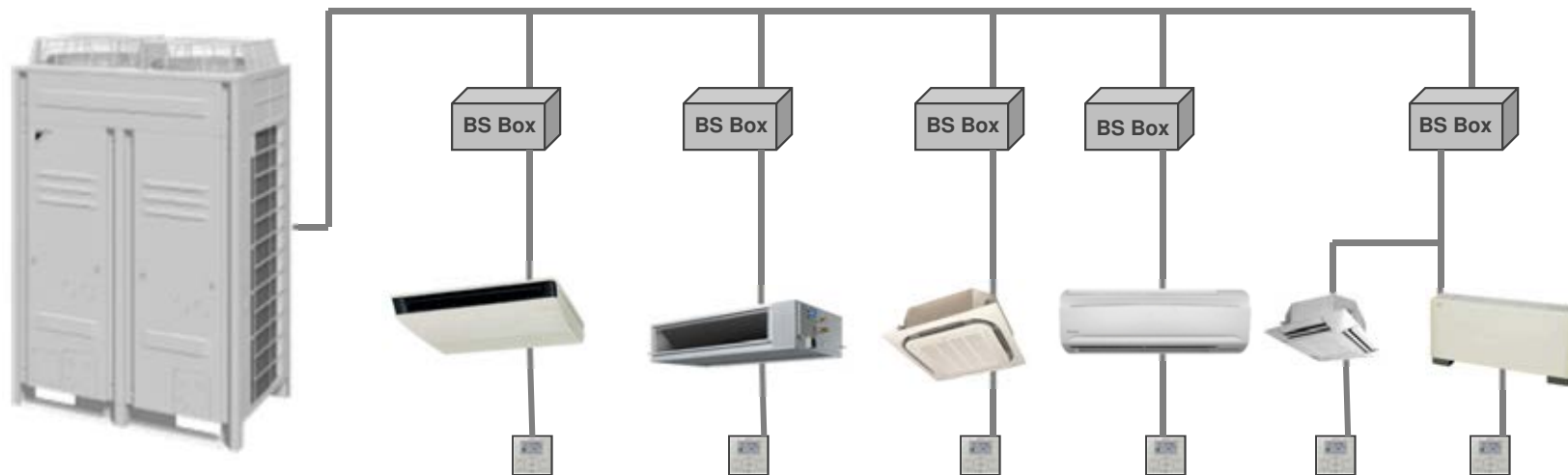
Manifolded Module
Slave 1 Condenser

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	●	●	●	●	●	●

Manifolded Module
Slave 2 Condenser

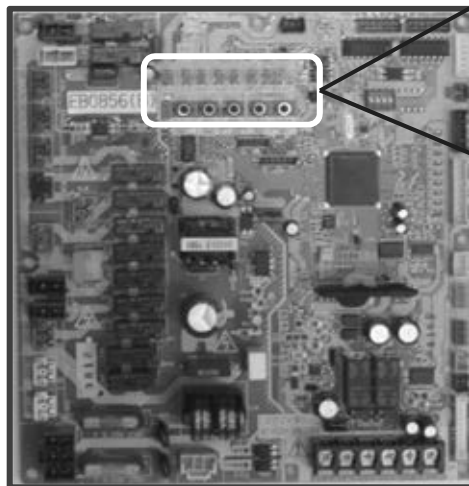
Verify System Control Communications

- When the **Initialization** operation has been completed the system must be checked to insure that all indoor units in the system are addressed and communicating.
- All system indoor units must communicate with the control system
- Using Monitor Mode 1 on the Master Control PCB on the Condenser, the Fan Coils and Branch Selector boxes in the system can be counted, verifying system communications
 - On a manifolded system, the indoor units are counted from the Control PCB on the Master Condenser



Binary Code Key for Counting Indoor Units (Example)

- Using the Condenser Control PCB status LED's, a binary number is applied to each LED: H1P through H7P as read from right to left
- When in the "Monitor Mode 1" or "Service Mode 2", the LEDs will display, using binary numbers, the number of times the "SET" button is pressed
- When counting indoor and outdoor units is enabled, the blinking LED's represent the number of units recognized in the control system



Example of binary value indications

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
0	32	16	8	4	2	1	N/A



● : OFF ◐ : BLINK

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
◐	●	●	●	●	●	●	

Value of "0"

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
◐	●	●	●	●	◐	●	

Value of "2"

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
◐	●	●	●	◐	◐	◐	

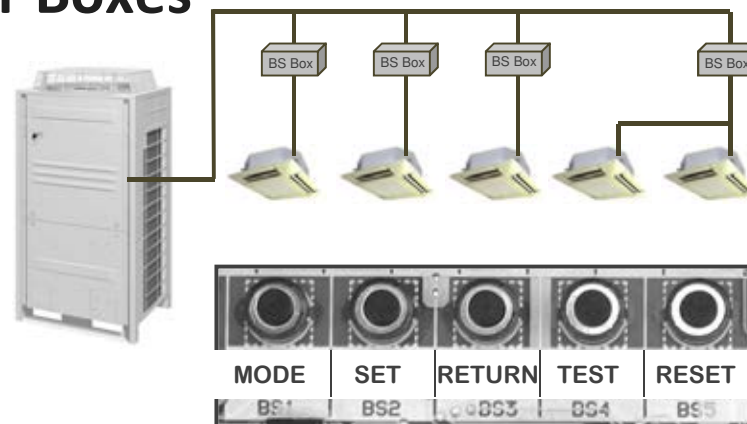
Value of "7"

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
◐	●	●	◐	◐	●	●	

Value of "12"

Counting Branch Selector Boxes

- System Monitor Mode 1 is accessed by pressing the “**MODE**” button one time – **H1P** LED flashing
- The number of times the “**SET**” button is pressed will be indicated by the corresponding binary numbers
- H1P** to **H7P** LED status is continuously updated when any button is pressed



- Press “**MODE**” once
H1P blinking
- Press “**SET**” 6 times
- Press “**RETURN**” once
Count up the blinking LED’s
- Press “**MODE**” once
return to normal status: **H3P** solid

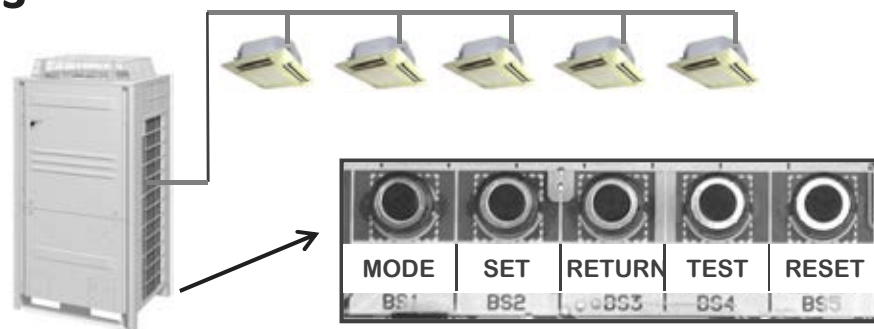
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
0	32	16	8	4	2	1	N/A
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P

Indoor Fan Coil & BS Box - Communication Troubleshooting Tips

- NOTE: If a branch selector box is not communicating in the DIII-Net system, the connected fan coil(s) will also not communicate
- Verify correct power supply voltage is present at Fan Coil and Branch Selector
 - PCB status: Green LED blinking
- Verify that all Remote Controllers have a display. This will also tell you that power is applied to the indoor units
- If there are Remote Controllers controlling more than one indoor unit, you must check the green LED on each PCB to see if it is flashing green. This will tell you that power is applied to the Indoor unit or BS box. Another method is to use your meter to check for voltage
- Turn on each Remote Controller one at a time. When you turn them on, note the error code if any appears on the display
- After you have turned them all on, you should see a pattern of the error codes. The pattern should show a few of the controllers with different error codes. The remote(s) with a different code is a good place to start checking your control wiring
- Check the control wiring to insure the conductors are connected to the correct terminals and 16vdc is measured
- On installations which have multiple VRV-*WIII* Heat Pump and Heat Recovery systems, Branch Selector boxes should be counted on the Heat Pump systems to verify correct system control wiring with no crossover
- After the issues are corrected, recycle power to the (Master) Condenser (Initialization mode starts) and press and hold the **“RESET”** button for 5 seconds on the Control PCB. This will enable the indoor unit or BS box to have an address assigned.

Counting Indoor Fan Coils

- System Monitor Mode 1 is accessed by pressing the “**MODE**” button one time – **H1P** LED blinking
- The number of times the “**SET**” button is pressed will be indicated by the corresponding binary numbers
- H1P** to **H7P** LED status is continuously updated when any button is pressed



- Press “**MODE**” once
H1P blinking
- Press “**SET**” 5 times
- Press “**RETURN**” once
Count up the blinking LED’s
- Press “**MODE**” once
return to normal status: **H3P** solid

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
0	32	16	8	4	2	1	N/A
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P

Fan Coil – Forced Fan On Mode

- A very effective procedure to help troubleshoot missing indoor Fan Coil units is to force the fan coil blowers to “ON”. By forcing the fans on, you will see what indoor units are communicating with that particular system.
- In jobs where you have multiple systems being installed, during the installation occasionally one indoor unit will get wired to the wrong outdoor unit. Using the “Forced Fan On” procedure, you will quickly see what units are connected by which fans turn on
- Using the Forced Fan ON operation, enables the control system to put the Fan Coil fan motor in High fan speed
- The fan coils that do not respond by switching on the fan motor are the units not communicating with the control system
- Use the following page to put the fan coil fan motors into this mode

Forced Fan ON Procedure

- At start - LED status Normal – H3P solid →
SERVICE MODE 2
- Press and Hold the “**MODE**” button for approx 5 seconds until you see the H1P LED on solid →
- Press the “**SET**” button 5 times
H1P-H7P LEDs will indicate the binary number for each press of the “**SET**” button →
- Press the “**RETURN**” button once
H7P flashing – This operation status: OFF →
- Press the “**SET**” button once
H6P flashing - Turn operation ON →
- Press the “**RETURN**” button once
H6P solid - Lock the setting →
- Press the “**RETURN**” button once
H6P Off - Activate the setting →
 - **STOP - Check all the fan coils for the blower(s) that are not running**
- Press the “**MODE**” button once
H3P solid - Normal Operation →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	●	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	○	●	○	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	●	◐	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	◐	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	○	●	

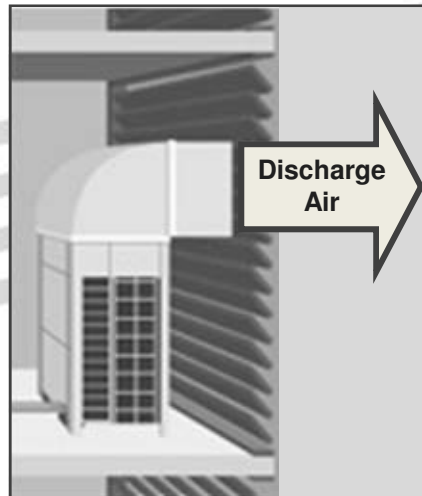
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	●	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	

System Commissioning

Selected Condenser Field Setting - Commissioning Step #4

**Outdoor Fan
High Static
Setting**



Required for interior condenser installations where the discharge air is ducted to outside of the building

VRVIII System Commissioning – Step #4



Condenser “Fan High Static Setting”

- **START** - H3P solid - Normal Status
- Press and HOLD the **“MODE”** button for 5 sec. until H1P LED is Solid
- Press the **“SET”** button 18 times
 - LEDs will indicate binary number for every press of the “SET” button 0+16+2
- Press the **“RETURN”** button once H7P flashing – This operation is OFF
- Press the **“SET”** button once H6P flashing – Turn operation ON
- Press the **“RETURN”** button once H6P solid – Lock the setting
- Press the **“RETURN”** button once H1P solid – High Static Fan has been activated
 - Outdoor Fans now operating at .32” wg. No relays actuate, just go right to next step.
- Press the **“MODE”** button to return to Normal mode, H3P will be on solid

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	●	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	○	●	●	○	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	●	◐	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	◐	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	○	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	●	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	

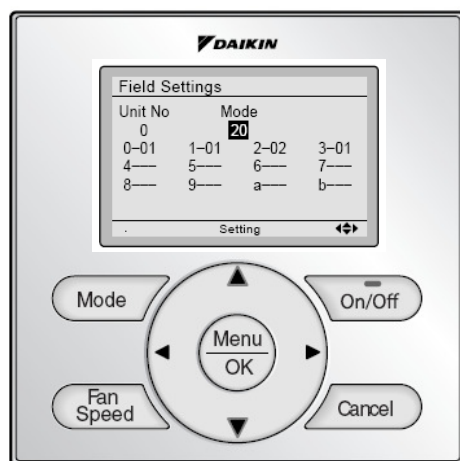
System Commissioning

Selected Indoor Unit Field Settings - Commissioning Step #4

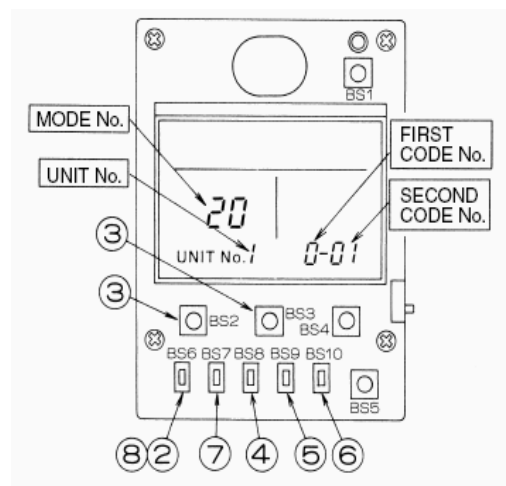


Fan Coil Field Settings

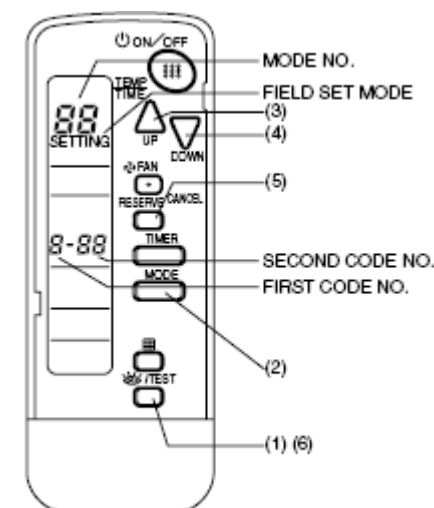
- System communications is now verified and fully operational
- All ductwork is connected and all air filters are installed
- Fan coil Field Settings related to airflow static pressure adjustments can now be programmed at the Remote Controllers, before Check Operation is enabled
 - Ducted fan coils may require the static pressure be adjusted or programmed
 - Ceiling Cassette fan coils must be programmed for 2-way & 3-way supply air distribution and ceiling height (FXFQ), to optimize unit operating parameters
- The field settings for each fan coil are listed in the unit Installation Manual



Navigation Remote



Simplified



Wireless

Fan Coil Field Settings

- Field settings provide unique features and functions to be programmed into the control system for selected fan coil(s) connected to a remote controller.
- Only those program codes that apply to the connected fan coil(s) will appear in the Field Settings code display on the Remote Controller.
- There are two Modes for each setting; “Group” & “Individual”
- The first set of 2-digit numbers refers to **Group** and **Individual**, Group is the first number & Individual is in the parenthesis
- “**Group ##**” is used if there is only one indoor unit per Remote Control or the setting you chose is intended for all indoor units being controlled by the connected Remote Controller
- “**Individual (##)**” is used when there is more than one indoor unit being controlled by one Remote Control and the settings being programmed are intended for one of the indoor units in the group

Mode No. (Note 1)	First Code No.	Description	Second Code No. (Note 2) (Cells in bold are factory default settings)			
			01	02	03	04
10(20)	2	Priority of thermistor sensors for space temperature control	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 (Note 3)	--	--
	6	The remote controller thermistor is used in Remote Controller Group	No	Yes	--	--
12(22)	0	KRP1B71 X1-X2 status output	Indoor unit Thermo-On/Off status	--	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 multizone 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 (Note 4)	2F (1C)	1F (0.5C)	--	--
	3	Fan Speed in Heating Thermo-Off	LL	User set	Off	--
	6	Fan Speed in Cooling Thermo-Off	LL	User set	Off	--
	8	Return air sensor offset	2C	None (for remote sensor)		

Fan Coil Field Settings

- Field Setting codes are comprised of 3 segments: Example: **12 -1- 03**
 - Mode No.** – Program Setting for 1 fan coil or Group of fan coils within Setting Contents
 - First Code No.** - Setting Contents
 - Second Code No.** - Specific Operation or Setting
- Specific Field Setting codes for a particular fan coil can be found in the Fan Coil Installation Manual or Engineering Manual
 - Any Field Setting codes that do not apply to the particular fan coil will not appear or be selectable
- Field Settings are programmed to permanent memory in the Fan Coil(s) Control PCB

EXAMPLE: Field Setting for optional condensate pump float switch connected to fan coil T1 T2 Forced Off

Mode No.	First Code No.	Setting Contents	Second Code No				Details No
			01	02	03	04	
	0	Optional accessories output selection (field selection of output for adaptor for wiring)	Indoor unit turned ON by thermostat	—	Operation output	Malfunction output	(5)
12 (22)	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	—	(6)

Fan Coil Field Settings – FXMQ_P Auto Static Adjust

- Enter the Field Setting into the Remote Controller
 - 11(21) 7-03 Start Auto Adjust**
- Save Field Setting and exit to main display
- Select FAN mode
- Place Remote Controller into the ON operation with solid status LED
- Fan Coil will go into the Auto Adjust mode and run the blower for 8 to 10 mins.
- On completion of the operation, fan will shut down and status LED on the Remote Controller will go Off.
- After unit shuts down check to see that Field Setting 11(21) 7-03 has changed to 11(21) 7-02, this indicates successful completion of Auto Airflow Adjustment



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

NOTE: If you choose to manually set static pressure the Field Setting for Auto Adjust must be OFF. Change code to: 11(21) 7-01

Fan Coil Field Settings – FXMQ_P Manual Static Pressure Adjust



- Specific static pressure can be programmed based on the static pressure codes provided for the specific FXMQ_P capacity model
 - Static pressure codes are listed in the Installation Manual
 - Codes which do not apply to a specific capacity model are not selectable
- Field Setting Code: **13(23) 06- ##**
- “Auto Adjust” must be OFF
11(21)7-01

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

Fan Coil Field Settings – FXDQ Static Pressure Change

- To change static from “Standard” to “High”, a field setting must be programmed at the remote controller
- Change Field Setting **13(23)** 5 – 01 to 02
- This static pressure change to HIGH is recommended for all FXDQ ducted applications



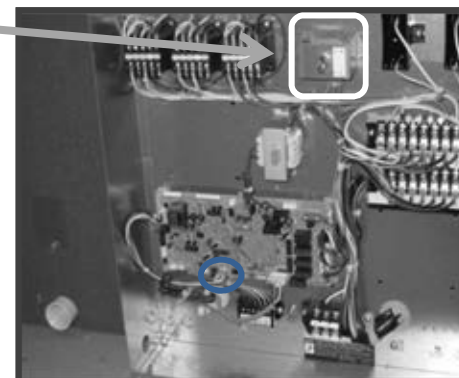
Mode No. Note 2	Setting Switch No.	Setting Contents	Second Code No.(Note 3)			
			01	02	03	04
13(23)	0	Setting of normal air flow	N	H	S	—
	1	Selection of air flow direction (Set when a blocking pad kit has been installed.)	F (4 directions)	T (3 directions)	W (2 directions)	—
	3	Operation of downward flow flap: Yes/No	Equipped	Not equipped	—	—
	4	Field set air flow position setting	Draft prevention	Standard	Ceiling Soiling prevention	—
	5	Setting of static pressure selection	Standard	High static pressure	—	—

FXMQ72/96MVJU Static Pressure Change



- The FXMQ72 and 96 fan coils have a manual toggle switch to increase static pressure from “LO” to “HI”
- The fan speed is user selectable from the Remote Controller for Lo or Hi air flow

NOTE: See Engineering Manual for fan performance specifications



Fan Coil Field Settings – FXFQ Ceiling Height Setting

- To insure proper air flow delivery, it is recommended to set the actual ceiling height field setting code
- To change setting from “Standard” to “High 1” or “High 2”, a field setting must be programmed at the remote controller
- Go to Field Setting 13(23) 0 - ##
- Second Code: 01 = Standard, 02 = High 1, 03 = High 2



		FXFQ - PVJU		MODE NO.	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

Fan Coil Field Settings – FXFQ_P & FXZQ_M7 Air Discharge Settings

- When the 4-way ceiling cassettes require changes to the discharge positions to 2-way or 3-way, a field setting change is required along with the blank-off kit
- To change setting from the factory default of 4-way discharge 13(23) 1-01, the change must be programmed at the remote controller
- Go to Field Setting 13(23) 1, and change the second code:
- Second Code: 02 = 3-way, 03 = 2-way



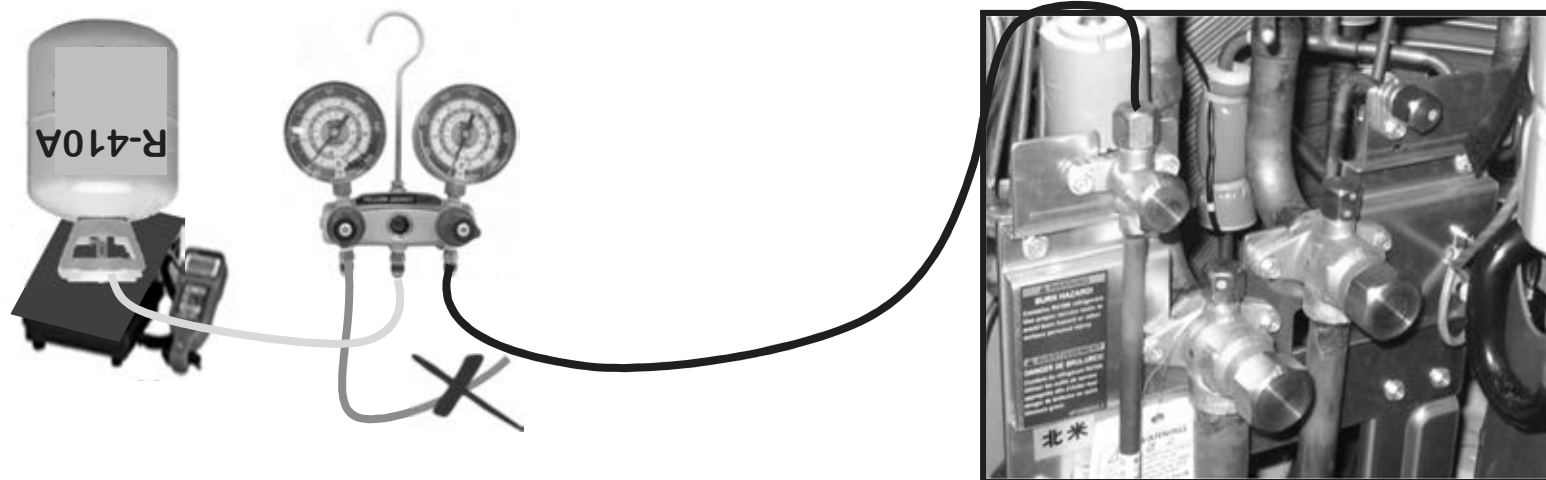
	Mode No.	First Code	Setting Contents	Second Code No.			
				01	02	03	04
	13(23)	1	Selection of airflow direction	F (4 directions)	T (3 directions)	W (2 directions)	-

System Commissioning

Manual System Refrigerant Charging - Commissioning Step #5



VRV/III Refrigerant Charging – “Additional Refrigerant Charge Mode”



- The “Additional Refrigerant Charge Mode” is used when there is not enough system vacuum from the final evacuation cycle to completely charge the system
- Close the Liquid Stop Valve – Gas Stop Valve(s) are open
- Connect the high side manifold hose to the Liquid service port, and bleed the hose
 - Low side manifold hose is not used for this procedure
 - On manifolded systems, close all liquid stop valves and connect high side hose to the Master condenser only
 - Refer to the weight of refrigerant taken on the last cycle of the triple evacuation operation
- Initiate the “Additional Refrigerant Charge Mode” at the condenser Control PCB
 - When the total calculated refrigerant charge is taken based on the scale reading, close off the High side gauge
 - Press the **“MODE”** button to terminate the operation
 - Close off the refrigerant bottle valve and remove the hose
 - Open the Liquid Stop Valve

“Additional Refrigerant Charge Mode”

- **START** - H3P solid - Normal Status
- Press and HOLD **“MODE”** button for 5 sec. until H1P is solid
- Press the **“SET”** button 20 times
LED will indicate binary number for every press of the **“SET”** button 0+16+4
- Press the **“RETURN”** button once
H7P flashing – This operation is OFF
- Press the **“SET”** button once
H6P flashing - Turn operation ON
- Press the **“RETURN”** button once
H6P solid - Lock the setting
- Press the **“RETURN”** button once to activate the setting
 - *Add Liquid Refrigerant now thru Liq. Service port, and watch scale for correct amount of refrigerant to add. When complete, close manifold valve.*
- Press the **“MODE”** button once
H3P solid - Normal mode

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	●	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	○	●	○	●	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	●	◐	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	◐	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	○	●	

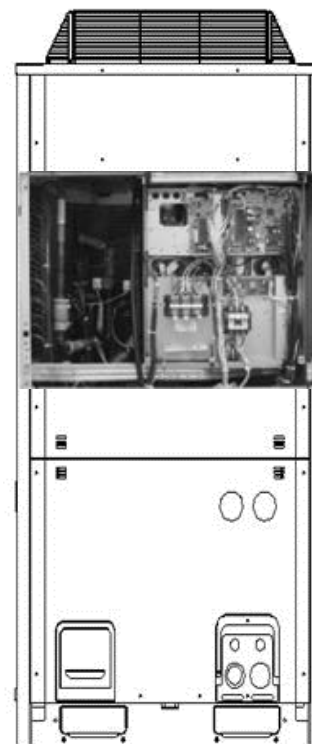
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	◐	○	○	○	○	○	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	

Note: If a **“U1”** or **“U7”** error code is generated see next page

Condenser Power Supply Error

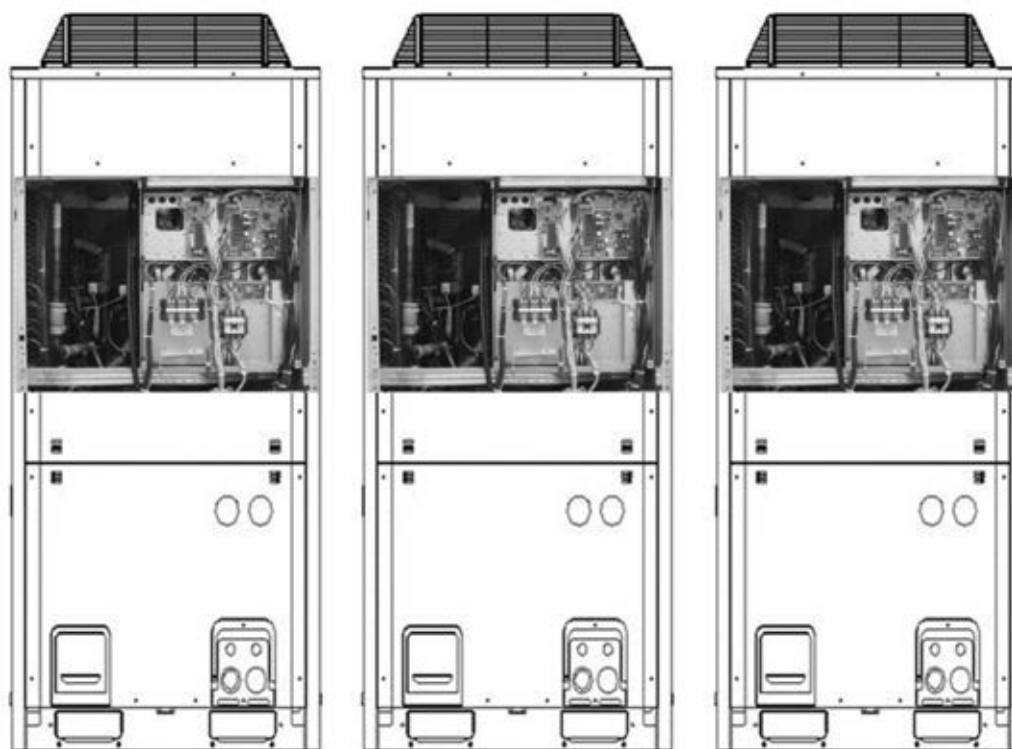
- When a Single module condenser is in “unit stop” due to a **“U1”** fault code, the main causes are Reversed Phase or Open Phase
- With a **“U1”** fault code, the compressor(s) in the condenser will not operate.
- To correct a Reversed Phase condition on a single module, reverse the wire connections on the line voltage terminals
- Restart condenser
- **“U1”** or **“U7”** error code displayed on a Manifolded system see next page



NOTE: The **“U1”** fault code refers to Power Supply Reverse Phase – Open Phase – Phase out of Balance

Verify “U1” or “U7” 3 Phase Error – Manifolded Systems

- When a Manifolded System (Dual or Triple modules) is in a “unit stop” due to a “U1” or “U7” fault code, “Monitor Mode 14” on the Master PCB can be used to determine the condenser module(s) at fault.
(refer to Service Manual SiUS341012_A, pages 329-332 for Monitor mode).
- With a “U1” or “U7” fault code, the compressors will not operate.
- Status LED on all Remote Controllers will be flashing with “U1” or “U7” error code indicated on displays
- See next pages



NOTE: The “U1” fault code refers to Power Supply Reverse Phase – Open Phase – Phase out of Balance
“U7” error code refers to communication problem between manifolded modules

Verify “U1” 3 Phase Error – Manifolded Systems Monitor “Mode 14” to determine condenser(s) with “U1” fault

- LED status on condenser power up →

Master Control PCB - A1P

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	○	○	●	●	●	●	

- Press “**MODE**” button once →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
◐	●	●	●	●	●	●	

- Press “**SET**” button 14 times →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
◐	●	●	○	○	○	●	

- Confirmation 1** – Press “**RETURN**” once
“First Digit” = “**U**” →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
◐	◐	●	◐	●	●	◐	

- Confirmation 2** – Press “**SET**” once
“Second Digit” = “**1**” →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
◐	N / A	A	●	●	●	◐	

- Confirmation 3** – Press “**SET**” button once
Display error location →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
◐	N / A	A	●	●	●	●	

Next page

Verify “U1” 3 Phase Error – Manifolded Systems “Monitor Mode 14” to Determine Condenser(s) with Fault Continued

- **Confirmation 4** – Press “SET” button once
Display Condenser ID - **H6P + H7P**
Master/Slave1/Slave 2



H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	N / A	●	●	●	●	●	●

MASTER

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	N / A	●	●	●	●	◐	●

SLAVE 1

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	N / A	●	●	●	◐	●	●

SLAVE 2

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	N / A	●	●	●	◐	◐	●

MASTER + SLAVE 1 + SLAVE 2

Next page

Verify “U1” 3 Phase Error – Manifolded Systems Continued

- Press “**RETURN**” button once
“Monitor Mode” initial status
- Press “**MODE**” once to return to the
original power up display with error.
- Power down the condensers and reverse
any two line voltage terminals
- Restart all Condensers with no “**U1**” errors



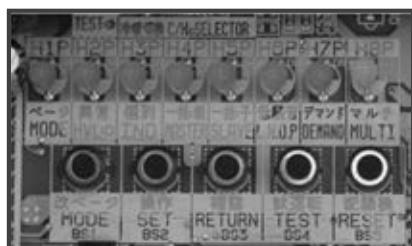
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
							N/A



H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
							N/A

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P

Normal Status
Master PCB



System Commissioning

Alternate System Refrigerant Charging “Auto Charge”
Commissioning Step #A5



Auto Charge Mode

NOTE: *Auto Charge* cannot be used on systems that include the FXTQ Air Handlers or the FXMQ_MF O.A. Processors

- The *Auto Charge* feature may be used as an alternative means of system refrigerant charging, however certain restrictions and limitations apply
- During *Auto Charge* Mode, the system will automatically select Cooling or Heating mode based on the following temperatures

Outdoor Temp:	32°F DB ~ 109°F DB	}	Cool Mode
Indoor Temp:	50°F DB ~ 90°F DB		
Below 32°F OD Temp / 50°F Ind. Temp			Heat Mode

- Cool Mode: *Auto Charge* will charge the system and shut off automatically
- Heat Mode: *Auto Charge* must be manually terminated when the full calculated “Additional Refrigerant Charge” amount is weighed into the system
- LED light combinations will indicate which mode is chosen

NOTE: *Auto Charge* does not display the amount of refrigerant charged

Connection Ratio Limitations When Using Auto Charge

Connection Ratio limitations are determined by the vertical separation between the Condenser and Indoor Fan Coils and the type of connected fan coils in the system

Example: FXMQ_M with 210ft vertical separation - Condenser above Fan Coil

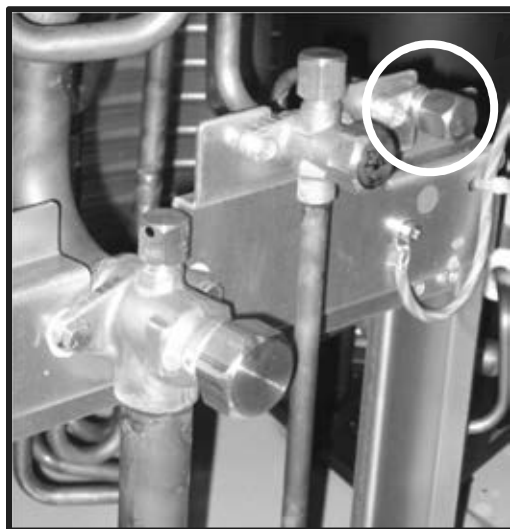
Vertical Separation Connection Ratio between Condenser and Indoor Units

CU Located Below FC											CU Located Above FC			
	0-133ft		134-200ft		201-216ft		217-266ft		267-295ft		0-164ft		165-295ft	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
FXFQ														
FXMQ_M														
FXHQ														
FXL/NQ														
FXZQ	60%	130%	80%	130%	90%	130%	100%	130%	110%	130%	60%	130%	80%	130%
FXDQ														
FXMQ_P														
FXAQ	60%	200%	80%	200%	90%	200%	100%	200%	110%	200%	60%	200%	80%	200%

Auto Charge Mode – Step 1 Charging Connection

- Connect high side gauge hose to the *Auto Charge* port (5/16") – Bleed hose
- Connect R-410A refrigerant bottle and purge the hoses
- Set refrigerant bottle on a digital scale to charge liquid only
- Install condenser front panels but leave area open to see the PCB status LEDs and access to the programming buttons

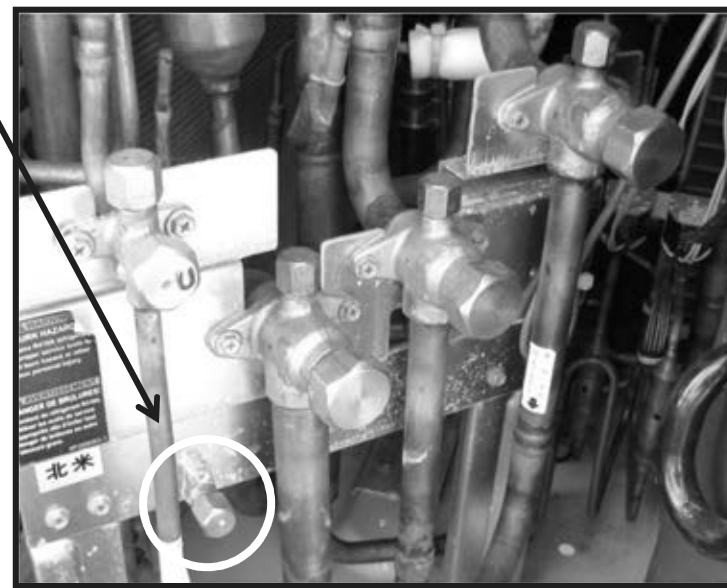
Auto Charge Port



RXYQ 2-Stop Valves



RXYQ-REYQ 3-Stop Valves



REMQ 4-Stop Valves

Auto Charge Mode – Step 2 Start Auto Charge Operation



- Verify that all Remote Controllers are in the “OFF” mode before starting Auto Charge
- To begin the *Auto Charge* operation Press the “**TEST**” button once, H1P to H7P go on solid
- Press and HOLD the “**TEST**” button for 5 sec. until LEDs change to H2P flashing

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	●

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	○	○	○	○	○	○	●

JUDGEMENT Mode

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	◐	●	●	●	●	●	●

- The **NAV** Remote Controllers will indicate  and “Test Operation” with system status LEDs ON solid
- The **Simplified** remote Controllers will indicate the Central Control symbol  with the status LED on solid
- All function buttons are disabled



BRC1E72



BRC2A71

Auto Charge Mode – Step 3 “Judgment Mode”

- *Auto Charge* will bring on all indoor & Outdoor fans, then compressor - When Indoor and Outdoor temps are verified to be within the temperature ranges (approx 15 mins.)
- *Auto Charge* will select the **Cool** mode & automatically stop when charging is complete
- If the Indoor/Outdoor temperatures are below the stated ranges, **Heat** mode will be selected for manual charging
- When either of these LED light patterns appear, the **“TEST”** button must be pressed within 5 mins.
 - **“P2”** error code will appear on Remote Controllers if **“TEST”** button is not pressed before timeout. Operation will stop and require restarting

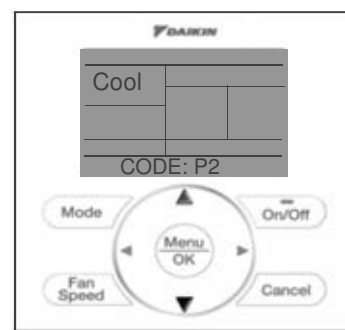
Outdoor Temp 32°F DB – 109°F DB
Indoor Temp 50°F DB – 90°F DB

COOL Mode

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P

HEAT Mode

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P



Auto Charge Mode – Step 4 Charging System in Cool Mode

- When LED light pattern indicates charging in the COOL mode, press the **“TEST”** button within 5 min.
- After the **“TEST”** button is pressed, open refrigerant gauge to the *Auto Charge* port to allow liquid refrigerant to flow into the system
- When the LED light pattern changes to this sequence, a **“PE”** code will appear on the Remote Controllers. Charging is almost complete

COOL Mode

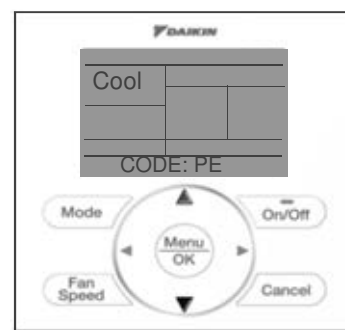
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P

→

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P

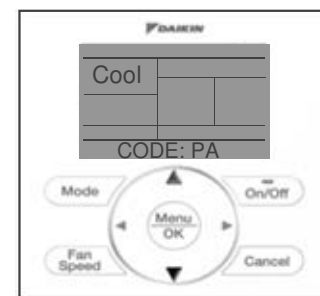
→

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P

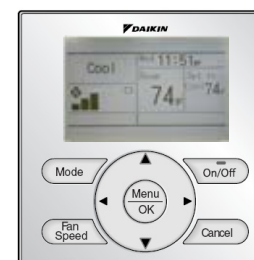
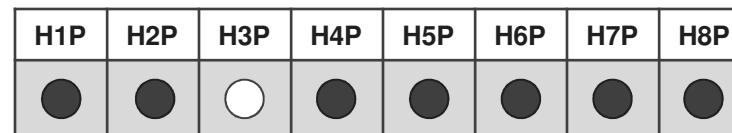
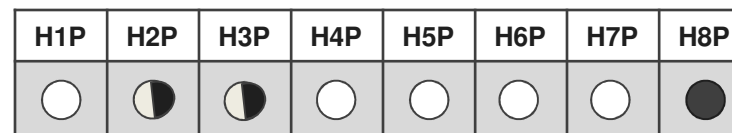


Auto Charge Mode – Step 5 Charging System in Cool Mode

- If during the charging process the refrigerant bottle becomes empty, Auto Charge will go into a 5 min. standby to change bottles and a “PA” code will appear on the Remote Controllers
- If the 5 min time frame lapses before the bottle is replaced, Auto Charge will stop and a “P2” code will appear requiring an operation restart.



- When this LED light pattern appears, charging is complete, *Auto Charge* will stop the refrigerant flow and a “P9” code will appear on the Remote Controllers
- Press the “**MODE**” button to terminate *Auto Charge* operation



Auto Charge Mode – Step 6 Record the TOTAL Additional Charge

- When Auto Charge is complete, record the amount of the refrigerant charge from the scale including the “Additional Charge” amount in the box on the access panel label
 - It is possible for Auto Charge to draw in a slightly higher or slightly lower amount of refrigerant than the manual calculation
- Enter the system commissioning date

REQUEST FOR THE INDICATION OF SETTING CONTENTS, ADDITIONAL REFRIGERANT CHARGING AMOUNT AND INSTALLATION DATE

AFTER FILLING OUT THE BELOW, PLEASE PUT IT ON THE BACK SIDE OF FRONT PANEL

1. RECORD FOR SETTING CONTENTS
FOR THE SETTING CONTENTS OF ①~⑤
IN THE [SETTING MODE 2],
MARK ○ IN THE RIGHT TABLE.

① NIGHT - TIME LOW NOISE SETTING	OFF • LEVEL1 • LEVEL2 • LEVEL3
② EXTERNAL LOW NOISE LEVEL SETTING	LEVEL1 • LEVEL2 • LEVEL3
③ DEMAND LEVEL SETTING	LEVEL1 • LEVEL2 • LEVEL3
④ EXTERNAL LOW NOISE DEMAND SETTING	OFF • ON
⑤ HIGH STATIC PRESSURE SETTING	OFF • ON

2. RECORD FOR ADDITIONAL REFRIGERANT CHARGING AMOUNT
MAKE SURE TO RECORD THE ADDITIONAL REFRIGERANT CHARGING AMOUNT.
(IF DO NOT USE AUTOMATIC REFRIGERANT CHARGING, CALCULATE AND CHARGE THE ADDITIONAL REFRIGERANT CHARGING AMOUNT FOLLOWING AS SHOWN ON THE BELOW.)

ADDITIONAL CHARGING AMOUNT

36.3 lb

(ROUND OFF TO ONE DECIMAL PLACE.)

LIQUID PIPE SIZE(in)	REFRIGERANT AMOUNT PER 1ft(lb/ft)	LENGTH OF LIQUID PIPE(ft)	SUB TOTAL
1/8	0.249	×	=
3/8	0.175	×	=
5/8	0.121	×	52 = 6.29
1/2	0.081	×	78 = 6.31
3/4	0.040	×	173 = 6.92
1/4	0.015	×	254 = 3.81

} **23.33 lb** +

MODEL NAME	THE AMOUNT OF REFRIGERANT
RXYQ96, 120, 216, 240, 336, 360P	0 lb
RXYQ72, 168, 192, 264, 288, 312P	1.1 lb
RXYQ144PBYD	2.2 lb
RXYQ144PBTJ	7.9 lb

+ {

INDOOR CONNECTION CAPACITY	MODEL NAME
	RXYQ72 ~312P RXYQ336 • 360P
MORE THAN 100% 120% OR LESS	1.1 lb
MORE THAN 120% 130% OR LESS	1.1 lb 2.2 lb

3. RECORD OF INSTALLATION DATE DA MO YR
 29 • 07 • 2011

Auto Charge COOL Mode Status Codes

PE	Charging is almost complete. Get ready to close refrigeration gauges.	
PA	The refrigeration tank is empty. Close refrigeration gauges and replace with full tank. Once tank is replaced and hose is purged, open refrigeration gauges again.	
PH	Fan does not stop running and the outdoor unit does not stop running.	
P8	Close refrigeration gauges and restart the Auto Charge procedure.	
P2	<p>Operation is interrupted. Close refrigeration gauges and check below items.</p> <ul style="list-style-type: none"> • Check to see if all stop valves are open. • Check that the refrigerant tank is connected and open. • Check indoor units for blockage of air inlet and outlet. 	After correcting the abnormality, restart the Auto Charge from the beginning.
P9	Charging is complete. Push “MODE” button (BS1). Close refrigeration gauges and disconnect tank from system.	

Auto Charge –Charging System in Heat Mode

- When LED light pattern indicates charging in the HEAT mode H1P-H2P Flashing - Press the **“TEST”** button within 5 min.
- After the **“TEST”** button is pressed, open refrigerant gauge to the *Auto Charge* port to allow liquid refrigerant to flow into the system
- Manually weigh in the balance of the calculated “Additional Refrigerant Charge”
- When the total amount of refrigerant is charged, close off the manifold gauge and refrigerant bottle – Remove hose
- Press the **“RETURN”** button to stop *Auto Charge*

HEAT Mode

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P

→

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P

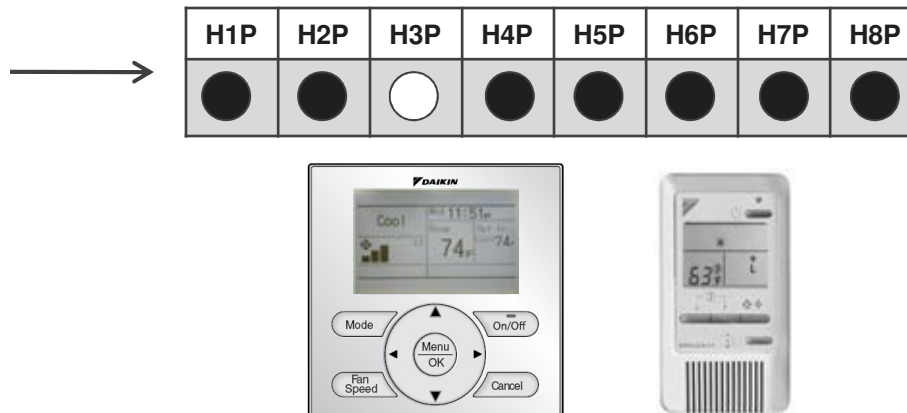
→

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P

Auto Charge Mode –Charging System in HEAT Mode

- Press the “**MODE**” button to terminate *Auto Charge* Heat operation

- Close off the refrigerant bottle and manifold/d gauge: remove charging hose
- Document the weight of refrigerant charged from the scale
- The Remote Controllers return to normal display and OFF



Heat Mode Status Codes

P8	Close refrigeration gauges and push “TEST” button (BS4) once. Restart the Auto Charge procedure.
P2	Operation is interrupted. Close refrigeration gauges and check below items. <ul style="list-style-type: none"> • Check to see if all stop valves are open. • Check that the refrigerant tank is connected and open. • Check indoor units for blockage of air inlet and outlet.

System Commissioning

Check Operation Mode - Commissioning Step #6



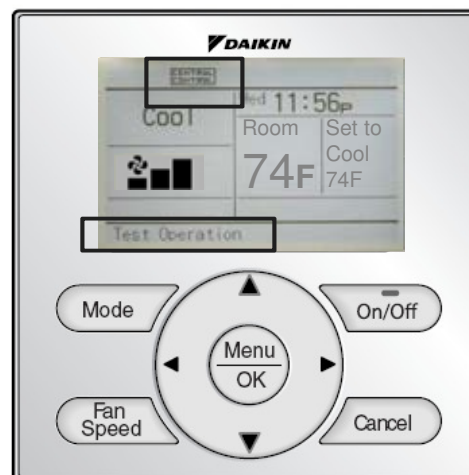
Check Operation Mode

- Verify that all Remote Controllers are “OFF” before starting the Check Operation mode or “U3” error will occur
- To start “Check Operation Mode” Press and HOLD the “TEST” button for 5 sec. until LED light sequence changes to H2P flashing & H7P solid

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	◐	●	●	●	●	○	

- Check Operation will take approximately 15 to 40 mins. to complete depending on the size of the system and number of indoor units
- Remote Controllers will indicate “Central Control” with Status LED’s on solid
- Check Operation always runs in the COOL mode



Check Operation Mode Sequence

- **START** - Normal Status
Press and HOLD “**TEST**” button
5 sec.
- **STEP 1** - Pressure Equalization
Time: 10 sec. to 10 mins.
- **STEP 2** - Cooling Start Control
Time: 3 – 5 mins.
- **STEP 3** - Stability waiting operation
Time: 10 mins.
- **STEP 4 to 6** - Judgement Function
 - Stop valve close check
 - Wrong Wiring check
 - Refrigerant over-charge check
 - Piping Length Check
 Time: 3 mins.

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	◐	●	●	●	●	○	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	◐	●	●	●	○	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	◐	●	●	●	○	○	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	◐	●	●	○	●	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	◐	●	●	○	●	○	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	◐	●	●	○	○	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	◐	●	●	○	○	○	

NEXT PAGE

Check Operation Mode Sequence Continued

- **STEP 7** - Pump down residual operation
Time: 10 sec. – 5 mins.



H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	◐	●	○	●	●	●	

- **STEP 8** - Standby for restarting
Time: 5 mins.



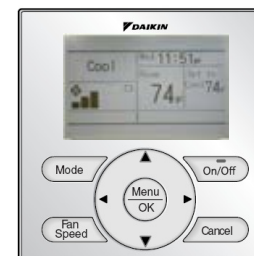
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	◐	●	○	●	●	○	

- Check Operation Completed
Return to Normal status



H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	

- Remote Controllers revert back to OFF mode with normal display



Listing of potential error codes which could occur during Check Operation Mode

<u>Error Code</u>	<u>Installation Error</u>	<u>Remedial Action</u>
E3, E4, F3, F6, UF	The stop valve of an outside unit is left closed.	Open stop valve.
U1 (see pages 84 ~85 for additional help)	The phases of the power to the outside unit(s) are reversed.	Exchange two of the three phases (L1, L2, L3). Swap L2 & L3
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 , BS or 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.
U7, U4, UF, UH	Field wiring is connected to Q1-Q2 terminals on outside unit PC-board when the system is one outdoor system.	Remove the wire from the Q1-Q2 terminals.

System Commissioning

Configure the Remote Controller *Changeover Master* - Step #7
Additional Field Settings - Step #8

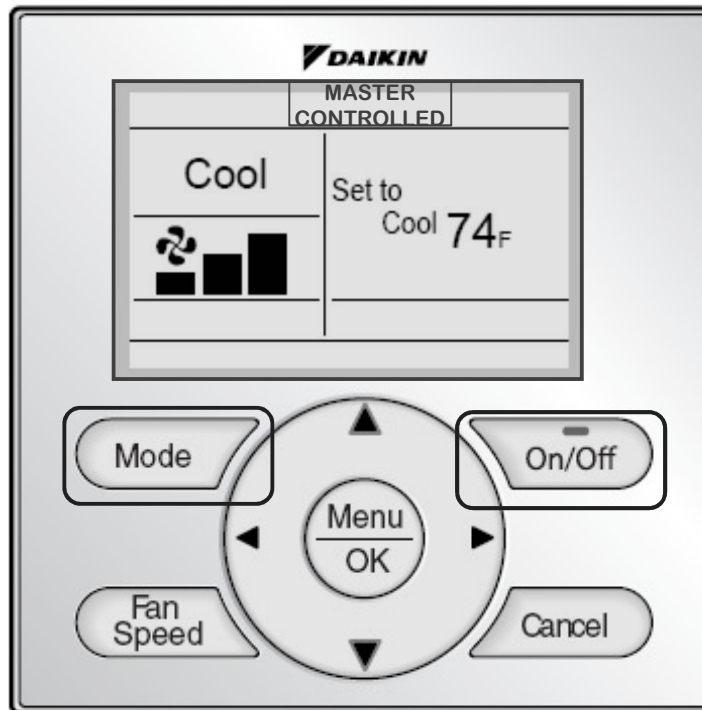


Configure Remote Controller *Changeover Master* for Heat Pump Applications

- A designated Remote Controller must be configured as the Master in a Heat Pump system, or Heat Recovery where a Branch Selector Box is connected to multiple fan coils with individual Remote Controllers.
- To configure a **BRC1E72** (NAV Remote) as a Master
 - Press any button to bring on the display back light
 - The **MASTER CONTROLLED** icon will be flashing on all NAV remote controllers
 - Press the **“Mode”** button once and the Icon will disappear on the Master
 - All other NAV Remote Controllers (slaves) will display **MASTER CONTROLLED** solid
- To configure a **BRC2A71** (Simplified)
 - The Master Controlled **人** symbol will be flashing (“Changeover Under Control”) on all Simplified RC’s
 - Press the **“Mode”** button once and the symbol will disappear on the Master
 - All other “Simplified” Slave Remote Controllers will display **人** solid
- To change the Master, press & hold the **“Mode”** button for 5 sec. on the Master RC
All RCs go into Master configuration mode

MASTER

BRC1E72 NAV Remote



MASTER

BRC2A71 Simplified



Configure Wireless Remote Controller *Changeover Master*

- On power up of indoor units, all “Master Controlled” icons will be flashing on wired controllers ONLY. Wireless controllers will NOT display icon
- Go to the wireless controller you want set as the Master and while pointing the wireless controller at the fan coil
- Press and hold the “**MODE**” button for approx 4 seconds . You will hear “BEEP BEEP” then another “BEEP BEEP”
- To change the Master to different zone, go to the Master wireless controller and hold “**MODE**” button for 4 seconds. Listen for the “BEEP BEEP”
- Go to another remote and press “**MODE**” button



Wireless Hand-Held Remote Controller



Additional Field Settings for Commissioning

- Any remaining system field settings can now be programmed
- Field Settings are listed in the Indoor Unit Installation Manuals and the VRVIII Service Manual
- Indoor Units (Suggested Examples)
 - T1 T2 Forced OFF configurations – ON/OFF – External Protection Device N.C.
 - Power Louvers Operation (see fan coil Installation Manual)
 - Remote Controller “Main-Sub” Configuration (see controller Installation Manual)
 - NAV remote sensor priority
 - Remote Sensor priority
 - KRP1C Status Output
 - Fan “Auto” Configuration (“P” series fan coils only)
 - Set Point ranges
 - Air Filter Alert

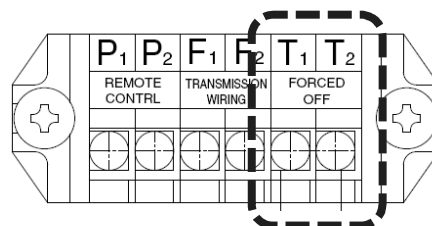
Fan Coil Field Settings – T1 T2 Forced Off – External Protection Device

- Any fan coils utilizing the optional condensate pumps must have the “Forced Off” field setting changed to accommodate the safety float switch operation (External Protection Device N.C.)
 - T1 T2 Forced Off has a factory default of N.O. Code 01
 - NOTE: When the float switch is connected to T1 T2, the Remote Controller will display  or  and cannot be turned on manually unless the field setting is changed to 03.
- Change the field setting to **12(22) 1-03** for condensate float switch operation: N.C. with automatic reset

EXAMPLE: Field Setting for optional condensate pump float switch connected to fan coil T1 T2 Forced Off

Mode No. Note 2	First Code No.	Setting Contents	Second Code No.(Note 3)				Details No
			01	02	03	04	
	0	Optional accessories output selection (field selection of output for adaptor for wiring)	Indoor unit turned ON by thermostat	—	Operation output	Malfunction output	(5)
12 (22)	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	—	(6)

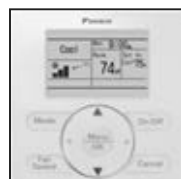
Indoor Unit Field Settings – T1 T2 Forced Off



- Forced Off is programmed for N.O. (Code 01) Manual Reset (Factory Setting)
 - Field Setting will reprogram dry contact configuration and restart sequence
 - Code 02 - ON-OFF operation (Start/Stop)
 - Code 03 – N.C. External Field Protection Device Auto Reset (Optional Condensate Pump Float Switch)

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

Indoor Unit Field Settings – Space Sensor Priority



Space Sensor priority can be changed for specific applications

- Return Air thermistor disabled (Direct fresh air / High ceiling return)
- FXTQ Air handler with BRC2A71 Simplified Remote Controller
- BRC1E72 Remote Controller Sensor Priority
- No Remote Controller used

Mode No. (Note 1)	First Code No.	Description	Second Code No. (Note 2) (Cells in bold are factory default settings)			
			01	02	03	04
10(20)	2	Priority of thermistor sensors for space temperature control	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.	--

Indoor Unit Field Settings – Space Sensor Priority



Space Sensor priority can be changed for specific applications

- Return Air thermistor disabled (Direct fresh air / High ceiling return)
- FXTQ Air handler with BRC2A71 Simplified Remote Controller
- BRC1E72 Remote Controller Sensor Priority
- No Remote Controller used

Mode No. (Note 1)	First Code No.	Description	(Cells in bold are factory default settings)			
			01	02	03	04
10(20)	2	Priority of thermistor sensors for space temperature control	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.	--

Indoor Unit Field Settings – FXMQ_MF O.A. Processor Discharge Temperature Setting

- A dedicated BRC1E72 Remote Controller is required to control the O.A. Processor Unit
 - A field Setting programs the operating discharge temperature for Heat and Cool
 - Mode No. 14 (24)
 - First Code No. 3 – Cooling 4 – Heating
 - Second Code No. Heat Discharge Temp
 - Cool Discharge Temp



NOTE: The discharge air temperature is not displayed on the Remote Controller

		for cooling	for heating
Mode No.		14 (24)	14 (24)
FIRST CODE NO.		3	4
SECOND CODE NO.	01	55°F	64°F
	02	57°F	66°F
	03	59°F	68°F
	04	61°F	70°F
	05	63°F	72°F
	06	64°F	73°F
	07	66°F	75°F
	08	68°F	77°F
	09	70°F	79°F
	10	72°F	81°F
	11	73°F	82°F
	12	75°F	84°F
	13	77°F	86°F

Indoor Unit Field Settings – VRV Fan “AUTO” Configuration

- The VRV fan coils operate with constant fan operation in the Thermo-off mode (zone satisfied)
 - Heat mode fan speed operates in LL speed
 - Cool mode fan speed operates on user selected speed: LL – H – HH
- Fan operation in the Thermo-off mode may be reprogrammed by changing the field setting for Heat or Cool modes

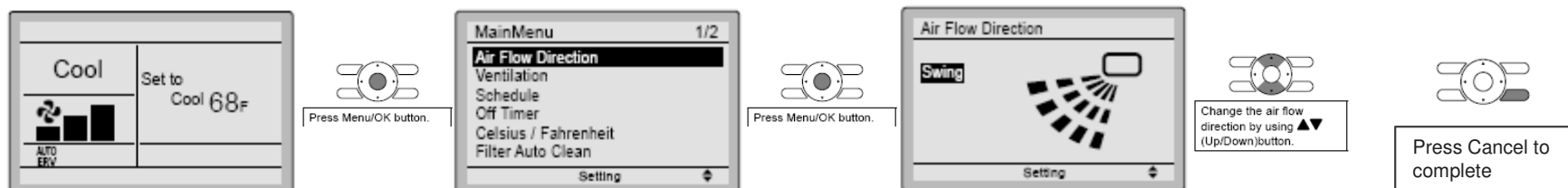
Fan Auto Configuration	Fan Speed LL	Fan Speed User Set	Fan Speed OFF
Fan Speed Heat Thermo-off	12(22)-3-01 Default	12(22)-3-02	12(22)-3-03
Fan Speed Cool Thermo-off	12(22)-6-01	12(22)-6-02 Default	12(22)-6-03

NOTE: Fan Auto Configuration is not available for the FXFQ_MVJU or FXHQ_MVJU fan coils

Indoor Unit Field Settings – Power Louver Operation



- The VRV fan coils with power louvers (flaps) can be programmed
 - Power Louver settings are programmed from the BRC1E72 Navigation Remote Controller only
 - Factory set operation: louvers oscillate up and down automatically when the fan coil is ON
 - From the Main Menu on the BRC1E72 Remote Controller, the louvers can be programmed to a selected angle when the fan coil is ON



System Commissioning

Selected Field Settings - Condensers



Selected Condenser Field Settings

- If during the course of system installation before commissioning, line voltage power was applied to the Fan Coils and Branch Selector Boxes, the *electronic expansion valves* will close. This will impede the pressure testing and evacuation procedures required to prepare the system for commissioning. Under these conditions, a service setting at the master condenser PCB for **“Refrigerant Recovery & Evacuation Mode”** can be used to re-open all of the system *electronic expansion valves*.
 - Note: For “Refrigerant Recovery & Evacuation” mode to operate correctly, all indoor units (BS Boxes & Fan Coil units) must communicate with the DIII-Net control system. Follow Commissioning Steps 1, 2 & 3.
- When a system is to be manually charged with refrigerant, a service setting at the master condenser PCB for **“Additional Refrigerant Charge Mode”** can be used to manually draw in liquid refrigerant using the compressor.
 - All Remote Controllers are Off. The Liquid Stop Valve(s) must be closed, leaving the Gas Stop Valve(s) Open. Liquid refrigerant will be manually charged through the Liquid Service Port on the indoor unit side of the refrigerant circuit.
- Use “Monitor Mode 14” to display all error codes related to the system Condenser(s)

“Refrigerant Recovery & Evacuation Mode”

- START - Normal Status →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	

- Press and HOLD “**MODE**” button 5 sec.
(Service Mode 2) H1P Solid →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	●	●	●	●	●	

- Press the “**SET**” button 21 times
 - LED will indicate binary number for every press of the “**SET**” button 16+4+1 →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	○	●	○	●	○	

- Press the “**RETURN**” button once →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	●	◐	

- Press the “**SET**” button once to turn ON →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	◐	●	

- Press the “**RETURN**” button once to lock on →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	○	●	

- Press the “**RETURN**” button once to activate the setting →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	●	●	

- Pressurize, Evacuate, or Recover now**

- Press the “**MODE**” button to return to Normal mode →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	

“Additional Refrigerant Charge Mode”

- START - Normal Status →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	

- Press and HOLD “**MODE**” button (Service Mode 2) H1P Solid →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	●	●	

- Press the “**SET**” button 20 times
 - LED will indicate binary number for every press of the “SET” button 0+16+4

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	○	●	○	●	●	

- Press the “**RETURN**” button once →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	●	◐	

- Press the “**SET**” button once to turn ON →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	◐	●	

- Press the “**RETURN**” button once to lock on →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	●	●	●	●	○	●	

- Press the “**RETURN**” button once to activate the setting →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
○	◐	○	○	○	○	○	

- Close Liq. Stop valve – HP/LP Gas stop valve(s) open. Add Liquid Refrigerant now thru Liq. Service port

- Press the “**MODE**” button to return to Normal mode →

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	

Manifolded Systems “Monitor Mode 14” to determine Condenser(s) with error code

- LED status on condenser
- Press “MODE” button once
- Press “SET” button 14 times
- Confirmation 1 – Press “RETURN” once
“First Digit” SEE Page 90
- Confirmation 2 – Press “SET” once
“Second Digit” SEE Page 91

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	●	○	●	●	●	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
◐	●	●	●	●	●	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
◐	●	●	◐	◐	◐	●	

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
See Next Page							

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
See Next Page							

NOTE: This must be used along with the *VRVIII* Service Manual so as to accurately determine and interpret the error code. See pgs. 329 - 332

Monitor Mode 1 LED Sequence to Error Code “Confirmation 1”- “RETURN” = 1st Digit of Error Code

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			●	●	◐	◐		= “E”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			●	◐	●	●		= “H”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			●	◐	●	◐		= “F”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			●	◐	◐	●		= “J”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			●	◐	◐	◐		= “L”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			◐	●	●	●		= “P”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			◐	●	●	◐		= “U”

= 1st DIGIT of Error Code

Continue to next page for 2nd Digit of Error Code

Monitor Mode 1 LED Sequence to Error Code “Confirmation 2” - “SET” = 2nd Digit of Error Code

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			●	●	●	◐		= “1”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			●	●	◐	●		= “2”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			●	●	◐	◐		= “3”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			●	◐	●	●		= “4”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			●	◐	●	◐		= “5”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			●	◐	◐	●		= “6”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			●	◐	◐	◐		= “7”

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			◐	●	●	●		= “8”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			◐	●	●	◐		= “9”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			◐	●	◐	●		= “A”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			◐	◐	●	●		= “C”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			◐	◐	◐	◐		= “F”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			◐	●	◐	◐		= “H”
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P	
			◐	◐	●	◐		= “J”

Manifolded Systems Monitor Mode 1 to Determine Condenser(s) with Fault Continued

- Confirmation 4 – Press “SET” button once
Display Condenser ID - H6P + H7P
Master/Slave1/Slave 2



H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	N / A	●	●	●	●	●	

MASTER

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	N / A	●	●	●	●	◐	

SLAVE 1

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	N / A	●	●	●	◐	●	

SLAVE 2








H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
●	N / A	●	●	●	◐	◐	

MASTER + SLAVE 1 + SLAVE 2








Next page

Manifolded Systems “Monitor Mode 1” to Determine Condenser(s) with Error Code Continued

- Press “RETURN” button once
“Monitor Mode” initial status

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
							

- Press “MODE” to return to the original power up display with error.
- Power down the condensers and correct the error issues
- Restart all Condensers

H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
							

Commissioning Completion

- Before any VRV installation is considered complete, the VRV^{III} system should be operated in the cool mode and the heat mode to insure proper operation, depending on the outside ambient temperature limitations.
- On Heat Recovery systems, every zone should be cycled to verify that the Branch Selector Boxes are functioning properly.
- Centralized control systems should be configured and programmed after the VRV^{III} system or systems are fully operational.
- Copies of the VRV IOM's should be kept by the installing contractor and on the job site with the end user for future reference.

Daikin eQuip is designed for both smart phones and tablets, placing information in your hands quickly and easily

Technical Data

Product Manuals

Marketing Flyers

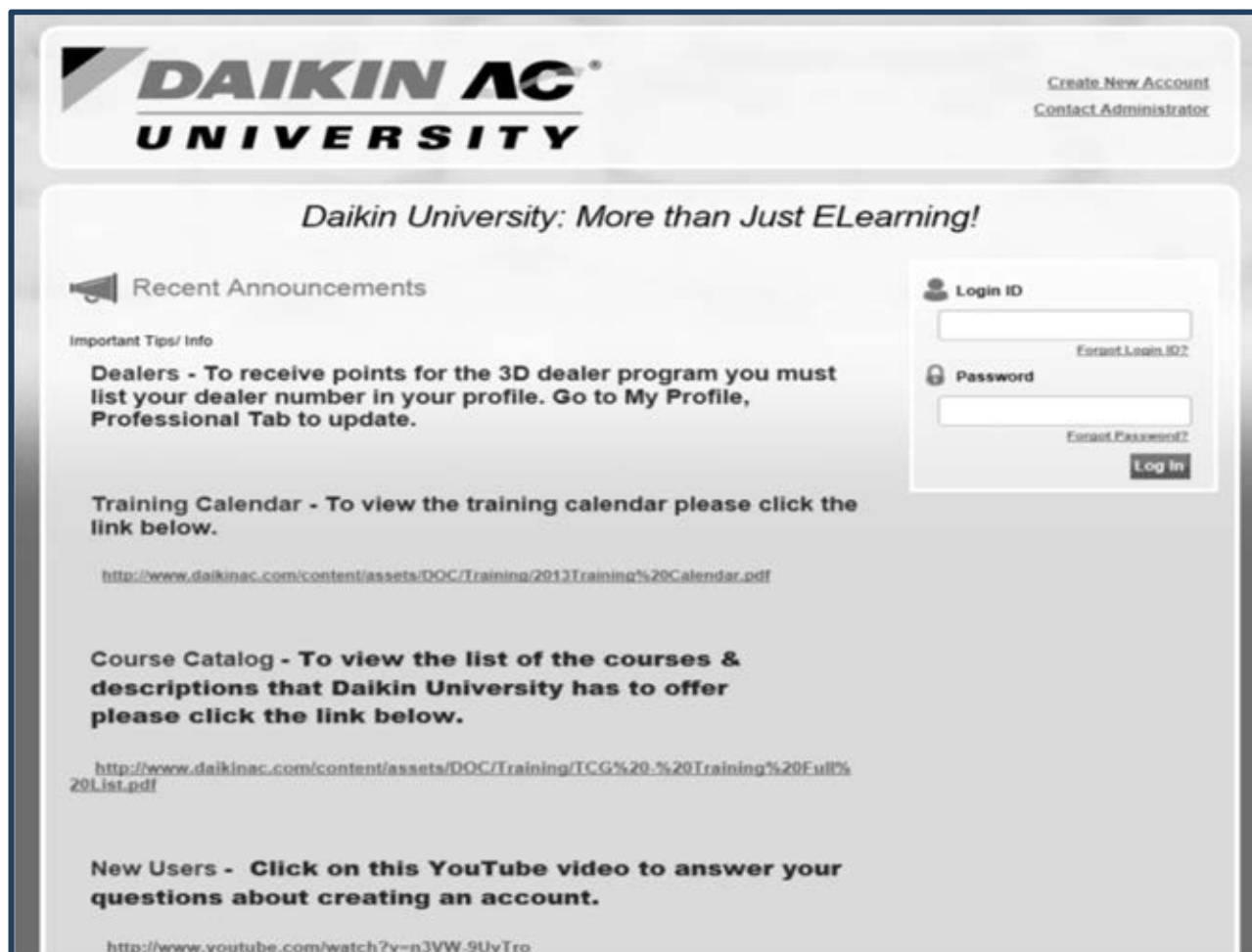
Repair Parts

And so much more !



A DaikinAC[®] Exclusive!

Professionally developed curriculum – Log on to DaikinUniversity.com




The screenshot shows the Daikin University website interface. At the top, there is a header with the Daikin AC logo and the text "absolute comfort". Below the header, the main content area features the Daikin University logo and the tagline "Daikin University: More than Just ELearning!". On the right side of the header, there are links for "Create New Account" and "Contact Administrator". The main content area is divided into several sections: "Recent Announcements" with a megaphone icon, "Important Tips/ Info" with a text block about dealer points, "Training Calendar" with a text block and a link to a PDF, "Course Catalog" with a text block and a link to a PDF, and "New Users" with a text block and a link to a YouTube video. On the right side of the main content area, there is a login form with fields for "Login ID" and "Password", each with a "Forgot" link, and a "Log In" button.

DAIKIN AC[®]
UNIVERSITY

Create New Account
Contact Administrator

Daikin University: More than Just ELearning!

 Recent Announcements

Important Tips/ Info

Dealers - To receive points for the 3D dealer program you must list your dealer number in your profile. Go to My Profile, Professional Tab to update.

Training Calendar - To view the training calendar please click the link below.


<http://www.daikinac.com/content/assets/DOC/Training/2012Training%20Calendar.pdf>

Course Catalog - To view the list of the courses & descriptions that Daikin University has to offer please click the link below.


<http://www.daikinac.com/content/assets/DOC/Training/TCG%20.%20Training%20Full%20List.pdf>

New Users - Click on this YouTube video to answer your questions about creating an account.

<http://www.youtube.com/watch?v=n3VW-9UyTro>

 Login ID

Forgot Login ID?

 Password

Forgot Password?

Log In



U N I V E R S I T Y

For more detailed information, refer to the Daikin *VRVIII* Service, Installation and Engineering Manuals. These materials are available as electronic copies through www.daikinac.com , TRL and *Daikin* eQuip App.

PT-VRV-1301-PP2-01C