System Tag #

Carrier Bryant VRF Installation Checklist

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Carrier Enterprise Technical Services

Site Name:

Address:

City, State: Zip:

Contact: Phone:

NOTE: Please fill one checklist out per system to be started up and commissioned.
Check boxes and fill in fields if applicable.

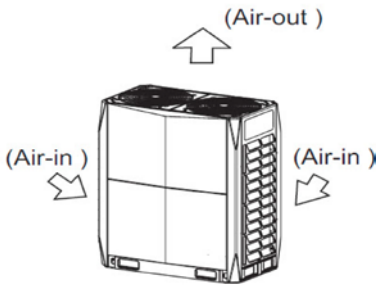
Heat Pump System: Select System Heat Recovery System: Select System

Total Number of VRF systems to be commissioned at time of request:

Centralized control type. If two, list both.
Use separate Centralized Control Checklist for startup request. Select Device Select Device

Prior to startup we recommend you walk the job site referencing the Refrigerant Piping and Control Wiring layout (from Selection Software), supplied by Carrier Enterprise. Note any changes on the selection software drawing and return the drawing to the designer for review. This is necessary to verify that any changes will not break the piping rules and/or alter the corrected capacity of the equipment. This is also what we will use to calculate the additional refrigerant charge for the system. After verification, a revised drawing will be provided. It is important to have the additional refrigerant charge calculation before the end of the evacuation process, see Section 9.3. Please plan accordingly.

1.1 Outdoor Unit – Placement:



Clearances - Enter actual measurements below:

Front Inches
≥ 40" service & air flow clearance.

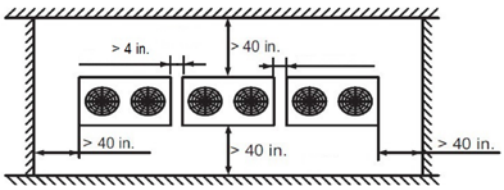
Back Inches
≥ 40" service & air flow clearance.

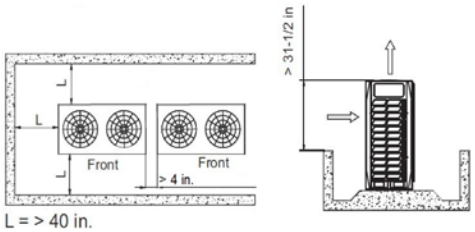
Sides Inches
≥ 4" service & air flow clearance.

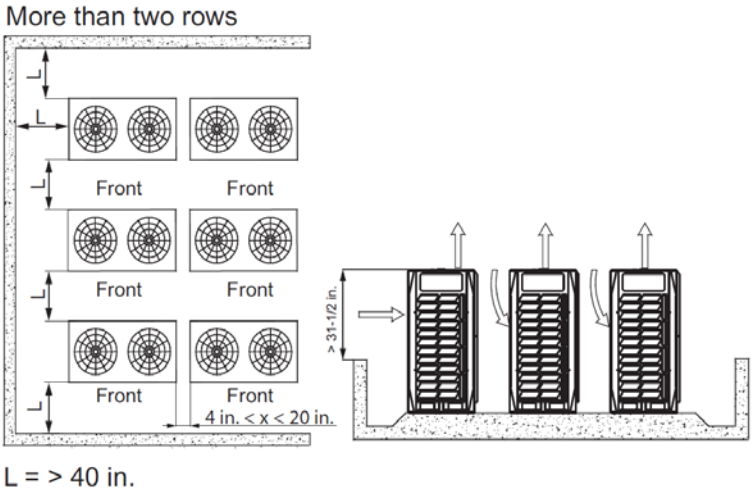
Top Inches
> 80" clearance to any obstacle above unit.

Between Unit(s): Inches
Recommend 8", Can be as little as 4".

Wall height around unit (If within 40" of unit) – height Inches







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Carrier Bryant VRF Installation Checklist

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Carrier Enterprise Technical Services

Contractor:

Address:

City, State: Zip:

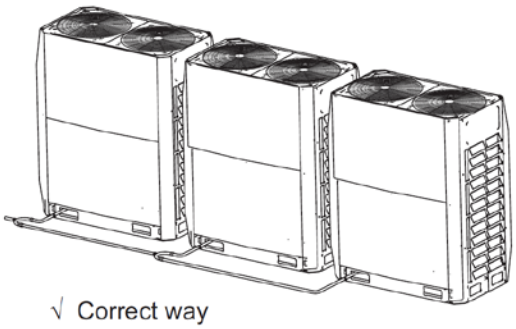
Contact: Phone:

1.2 Outdoor Unit – Placement Heat Pump Only:

If Heat Recovery skip to Section 2.

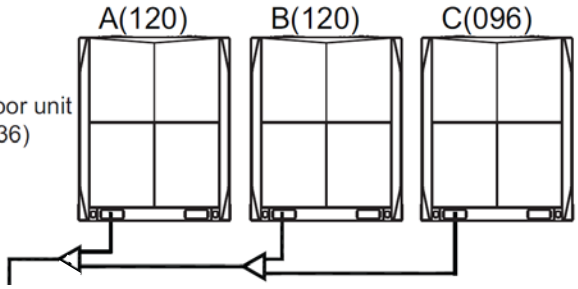
Heat Pump systems with more than one outdoor unit is sequenced from the highest capacity to the lowest.

Confirm all units are on the same level. Yes No



√ Correct way

- If there is an obstacle above the outdoor unit, leave a space of 80" or more to the top end of the outdoor unit.
- If there is a wall around the outdoor unit, make sure that its height does not exceed 31.5".



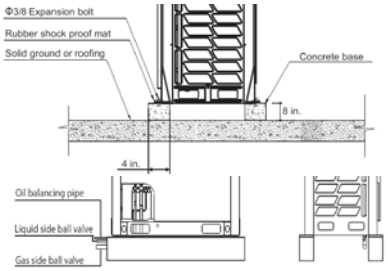
Header Unit (A): Select System

Follower Unit (B): Select System

Follower Unit (C): Select System

- The Header unit (A) is ≥ the capacity of the Follower unit (B)
- The Follower unit (B) is ≥ the capacity of the Follower unit (C)

2. Outdoor Units – Mounting:



The outdoor unit(s) are level.	☐ Yes	☐ No
The mounting base fully supports the unit across front and back.	☐ Yes	☐ No
All four anchor bolts have been installed and secured.	☐ Yes	☐ No
There is adequate water drainage, for defrost operation.	☐ Yes	☐ No
The mounting base height is more than the expected snow level.	☐ Yes	☐ No
Are the refrigerant lines installed underneath the outdoor unit.	☐ Yes	☐ No

If YES, enter the mounting base height. ☐ inches (Recommended > 8" clearance)

3. General Refrigerant Piping:

There are NOT any added refrigerant components - driers, sight glasses, solenoid valves, etc.	☐ Yes	☐ No
Full port ball valves may be used for future component isolation during service. Were ball valves installed.	☐ Yes	☐ No
If yes, verify all ball valves are in the open position.	☐ Yes	☐ No
Ball valves are installed in the correct configuration per their Installation instructions.	☐ Yes	☐ No
Nitrogen was purged through the system during all brazing.	☐ Yes	☐ No
Enter the pressure setting used to purge nitrogen.	☐ PSI	

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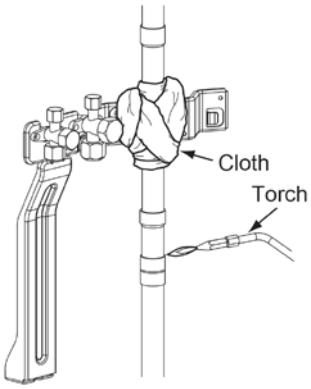


3. General Refrigerant Piping (cont.):

15% brazing rods must be used for all brazed joints. ☐ Yes ☐ No

During brazing, a wet cloth was wrapped around valves. ☐ Yes ☐ No

A R-410A rated flaring tool to form all flare connections. ☐ Yes ☐ No

A back up wrench and torque wrench were used on all flare fittings. ☐ Yes ☐ No

OUTSIDE DIAMETER (in.)	RECOMMENDED TORQUE (ft-lb)
1/4	15
3/8	26
1/2	41
5/8	48

4. Heat Pump Only – Combined Unit Y-Shaped Branching Joint Kits:

Heat Recovery systems skip to Section 5.

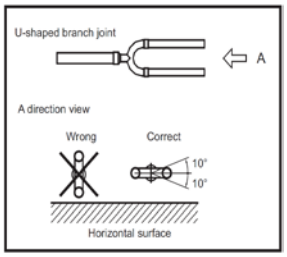
Branching Kits for Heat Pump:
40VM9000021 - 40VM9000022

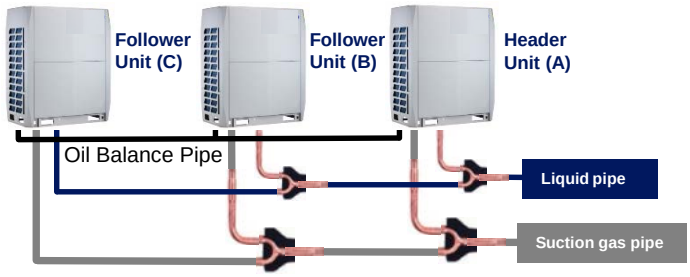
Y Branches mounted Horizontal ±10°.

☐ Yes ☐ No

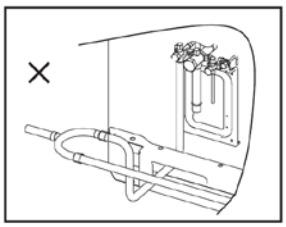
Y Branches are not vertical.

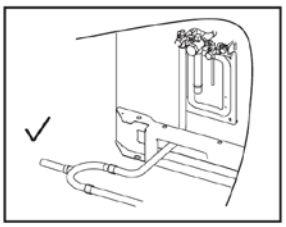
☐ Yes ☐ No

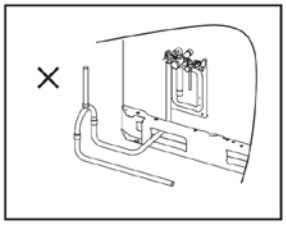


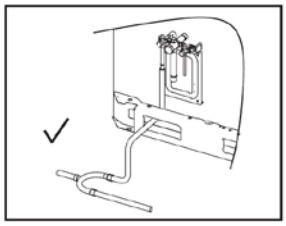


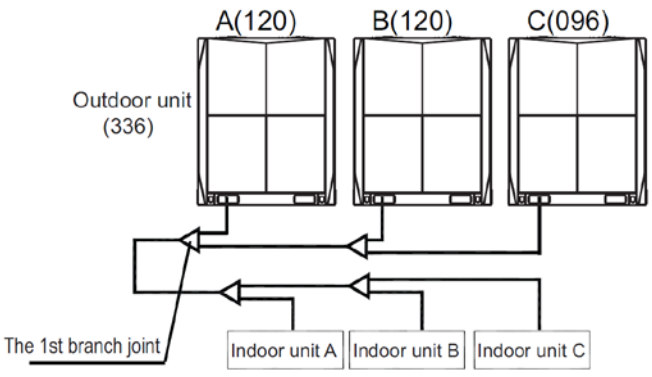
Confirm the Y branching piping matches allowable designs from the Installation Manual. Yes No











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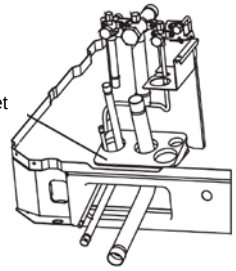
5. Outdoor Unit – Refrigerant Piping:



Piping can exits the unit from the FRONT or BOTTOM.
(Bottom recommended on all installs, best for future service access)

Factory supplied rubber piping gasket installed. ☐ Yes ☐ No

Field installed refrigerant lines are connected per the outdoor unit Install Manual. ☐ Yes ☐ No

Field installed refrigerant lines are within the allowable length & height differences.
Outdoor Unit Install Instructions, H/P pages 14 thru 18, HR pages 15 thru 18. ☐ Yes ☐ No

The field installed refrigerant line sizes and lengths, match the Selection Report* ☐ Yes ☐ No
*If at anytime there is a change in the actual piping installation from the design layout, it must be reported back to the designer for verification.

All refrigerant lines are insulated separately with min. ¾" insulation. ☐ Yes ☐ No
Check local code, some municipalities require thicker insulation.

6. Multiport Distribution Controller (MDC) – 40VMD006-016:

Heat Recovery Systems Only – Heat Pumps Systems go to Section 7.

Unit is located in an area where the operating sound will not be objectionable. ☐ Yes ☐ No

Unit is hanging in the horizontal position. ☐ Yes ☐ No

Clearance over unit (24" recommended). ☐ Inches

Unit is installed with proper clearances and service access. ☐ Yes ☐ No

The field installed refrigerant line sizes and lengths to the MDC match the Selection Report. ☐ Yes ☐ No
If at anytime there is a change in the actual piping installation from the design layout, it must be reported back to the designer for verification.

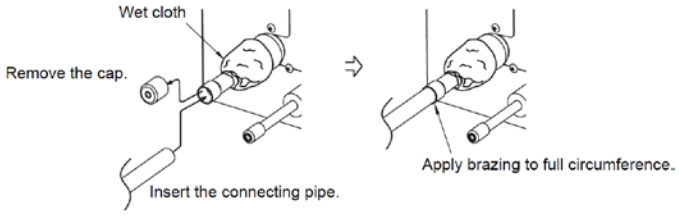
Nitrogen was purged through the system during all brazing. ☐ Yes ☐ No

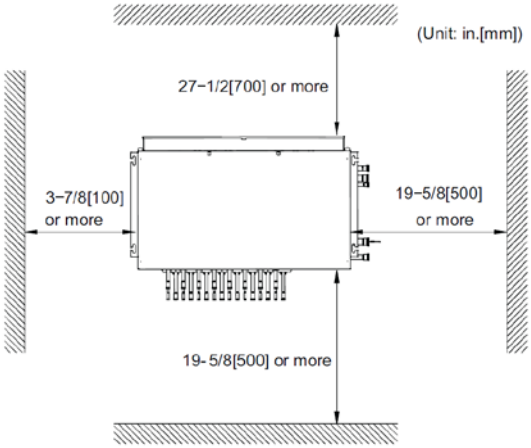
A wet cloth was used during brazing to protect the unit's internal components from overheating/damage. ☐ Yes ☐ No

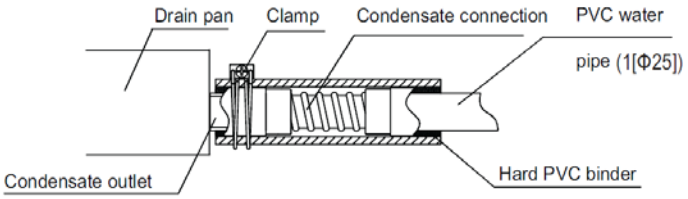
Refrigerant piping and connectors were installed correctly per the unit's Installation Manual. ☐ Yes ☐ No

Condensate drain is connected per the Installation Manual. ☐ Yes ☐ No

Be sure to wrap the pipe with wet cloth when applying brazing.







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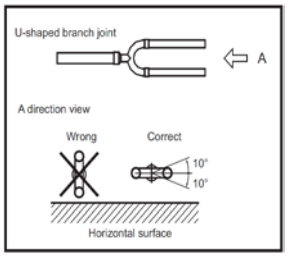
7. Indoor Unit – Mounting:

All indoor unit locations have been verified by Model/Size, site plans & Selection Report.	☐ Yes	☐ No
All indoor units are mounted and secured per their installation instructions.	☐ Yes	☐ No
All indoor units are level.	☐ Yes	☐ No

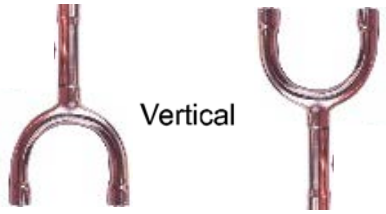
8. Refrigerant Piping – Y Branching Joints:

Branching Joints Heat Recovery – 40900041, 042, 043
Branching Joints Heat Pump – 40900031, 032, 033, 034, 035
Heat Recovery kits will have three Y's, Heat Pump will have two.

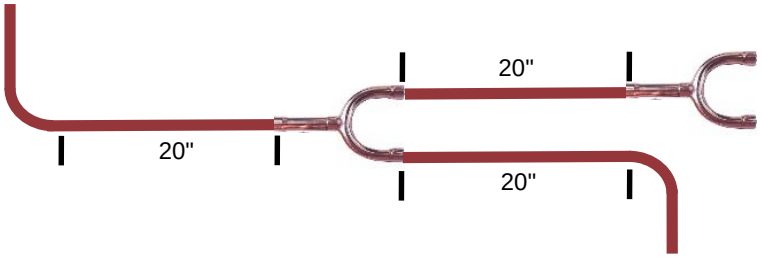


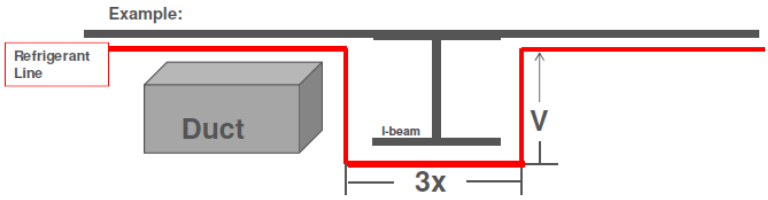
Horizontal within ±10° per instructions.	☐ Yes	☐ No
Are there any "Y's" installed vertically.	☐ Yes	☐ No
Installed with single end always towards outdoor unit.	☐ Yes	☐ No
Y Joints are supported before and after.	☐ Yes	☐ No
Sockets, joints and insulation were installed per instructions.	☐ Yes	☐ No
"Y" joints are the correct size and match the locations as shown on the Selection Report.	☐ Yes	☐ No
Maintain a minimum distance of 20" between branching joints, headers, elbows and equipment.	☐ Yes	☐ No
Recommend horizontal runs to be 3 times that of the vertical when traps cannot be avoided.	☐ Yes	☐ No

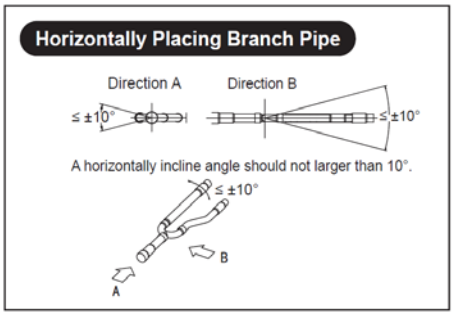
<Gas / Liquid side>
Install the branching pipes horizontally or vertically to make the flow split evenly.

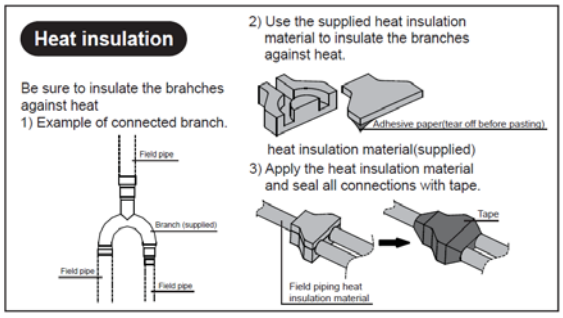


Installed with single end always towards outdoor unit.









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Carrier Bryant VRF Installation Checklist

9.1 Refrigerant Piping – Leak Check:

If Heat Recovery System connect to all three main refrigeration stop valves at outdoor unit. ☐ Yes ☐ No

If Heat Pump System connect to the two main refrigeration stop valves at outdoor unit. ☐ Yes ☐ No

Only use Dry Nitrogen. ☐ Yes ☐ No

Enter indoor temp/outdoor temps during 24hr Pressure Test start: Inside ____ °F Outside ____ °F

Pressure tested for 24hrs. @ 540PSI. ☐ Yes ☐ No

If not 540PSI enter your final pressure test. ____ PSI

If the pressure test resulted in a loss of pressure, locate and repair the leak(s). Then re-test as above while taken in to account the following. Compare temperature differences above - there could be an approximate 2.6 PSI difference for every 1°F of temperature change. i.e. - If there was a 10°F temperature rise from start to end, the pressure would have increased approx. 26 PSI. Likewise, if there was a 10°F temperature fall the pressure would have decreased by approx. 26 PSI.

9.2 Refrigerant Piping – Evacuation:

Note 1: If power was applied to indoor, MDC or outdoor units, you must use Evacuation mode, see Section 14.
Note 2: Do NOT open service valves until the deep vacuum of 500 microns or below has been achieved and the additional charge has been added! See Section 9.3 for additional charge instructions.

If Heat Recovery System connect to all three main refrigeration stop valves at outdoor unit. ☐ Yes ☐ No

A micron gauge was used. ☐ Yes ☐ No

Verify that the micron gauge is connected at a point where it can read the system's pressure at all times during this process, even when the vacuum pump is not running during the hold test.

All refrigeration piping has held below 500 microns for 1 hour. Enter final reading. ____ ☐ Yes ☐ No

Enter Triple Evacuation readings and times below.

Step 1	____ PSI	____	Day/Time	____	Length of Time
Step 2	____ PSI	____	Day/Time	____	Length of Time
Step 3	____ PSI	____	Day/Time	____	Length of Time

Vacuum was broke with additional refrigerant charge. ☐ Yes ☐ No

If not with what, please explain ____

9.3 Refrigerant Piping – Additional Refrigerant Charge:

Do NOT open unit service valves until additional refrigerant charge has been calculated, added and recorded. The selection software calculates the additional refrigerant charge based on the refrigerant piping layout. If at anytime there is a change in the actual piping installation from the design layout, it must be reported back to the designer for verification.

Has the updated copy of Refrigerant Piping & Wiring Layout been sent in to CE. ☐ Yes ☐ No

If not send your revised version to your sales representative for updating.

Enter additional refrigerant charge amount - R410A. ____ Lbs. ____ Oz.

Above is the preferred method of determining the additional refrigerant charge. Refer to the outdoor unit installation instructions for an alternate method. If the alternate method is used, please use the notes page of this document to show how the above amount was calculated. With the system at 500 microns or less the majority (or all) of the additional refrigerant. charge can be added at this time breaking the vacuum.

Digital refrigerant scale used to weight in the additional charge on the liquid side of the system. ☐ Yes ☐ No

Was the total additional charge added at this time. ☐ Yes ☐ No

If NO, enter the amount of charge added at this time. ____ Lbs. ____ Oz.

The remainder of the additional charge can be added during the system start up process.

Record additional charge amount inside the outdoor unit using a permanent marker. ☐ Yes ☐ No

Open the unit service valves - Suction, Discharge, Liquid and Balance (if combined units). ☐ Yes ☐ No

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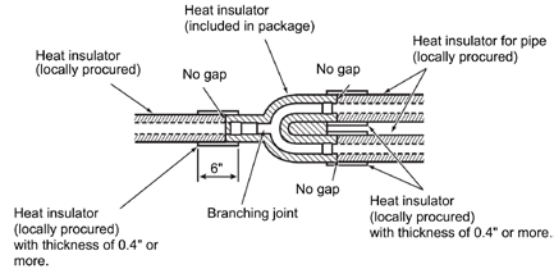
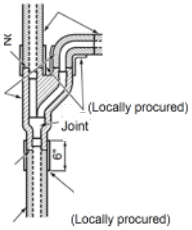
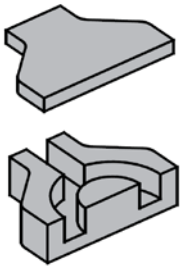
10. Refrigerant Piping – Insulation:

All refrigerant lines are insulated individually.	☐ Yes	☐ No
Pipe insulation has temperature rating > 248°F and ≥ 3/4" wall thickness. Check local codes where job site is located, some areas by code require 1.5" thickness.	☐ Yes	☐ No
Indoor unit line connections are insulated individually.	☐ Yes	☐ No
Heat insulators supplied with branching "Y" joints are installed per their instructions.	☐ Yes	☐ No
Heat insulators supplied with indoor units are installed per their instructions.	☐ Yes	☐ No
There are no gaps between heat insulators and pipe insulation.	☐ Yes	☐ No

<Gas, liquid side>





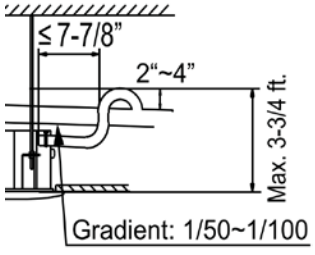


11. Indoor Unit – Condensate Drain Lines:

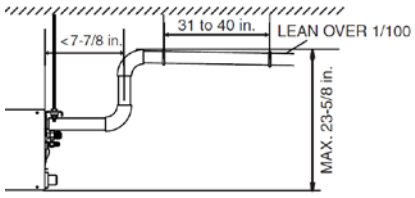
The following units either have an internal pump or the drain is located on the positive side of the blower.
High Wall; Compact 4 Way Cassette; 4 Way Cassette; Under Ceiling - Floor; Slim Duct; Medium Duct; High Static Duct (024~054kbtu - ONLY); Outside Air and Floor Console Units - Do Not require an external condensate trap.

Verify there are no external traps on the above indoor listed units.	☐ Yes	☐ No
Condensate lift pump accessories are available for most indoor units. Were any accessory pumps required for this application.	☐ Yes	☐ No
If YES, verify these accessories have been installed per their instructions.	☐ Yes	☐ No
Are there condensate pump safety switch(s) wired to the indoor unit.	☐ Yes	☐ No
Cassette's; Slim, Medium & High Static Ducted (024-054) units have a built in condensate lift pump. Verify the drain line is installation within the limitations shown in the installation instructions.	☐ Yes	☐ No

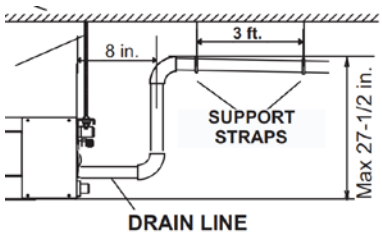
3x3 Cassette



2x2 Cassette



Slim Ducted & Med. Ducted
High Static (024-054 only)



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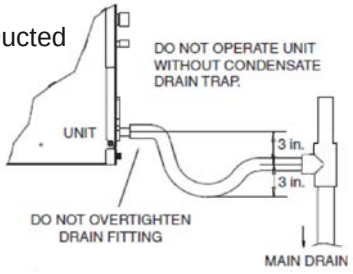
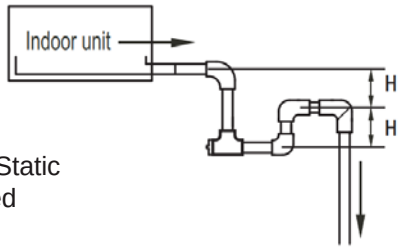
11. Indoor Unit – Condensate Drain Lines(cont.):

The following units require an external condensate trap.
Vertical & High Static Ducted (072-096).

Vertical Ducted



High Static Ducted



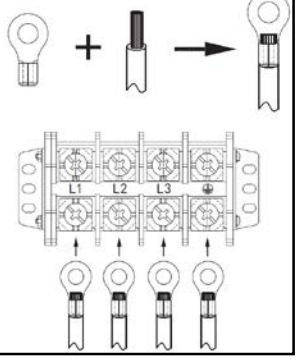
All drains have been insulated. ☐ Yes ☐ No
All drains have been checked for leaks. ☐ Yes ☐ No
All drains installed per instructions and local codes.
All drains are sloped properly. ☐ Yes ☐ No
All drains are supported properly. ☐ Yes ☐ No

12.1 Electric Wiring – Power Wiring Outdoor Unit:

Every outdoor unit must have a dedicated power supply.
Power supply wiring shall be installed in compliance with NEC and local codes.

Header Unit (A) circuit breaker size. _____ AMP
Follower Unit (B) circuit breaker size. _____ AMP
Follower Unit (C) circuit breaker size. _____ AMP
Header Unit (A) Wire Size. _____ AWG
Follower Unit (B) Wire Size. _____ AWG
Follower Unit (C) Wire Size. _____ AWG
L1, L2, L3 wiring connected. ☐ Yes ☐ No
Crimp style ring connectors used. ☐ Yes ☐ No
Ring crimp connectors used. ☐ Yes ☐ No
Ground wire connected. ☐ Yes ☐ No
Strain relief wire strap is tight. ☐ Yes ☐ No

Ring connectors shipped with outdoor unit's Manuals



Correct

Not Acceptable

12.2 Electric Wiring – Power Wiring Indoor Unit & MDC:

The power supply for the indoor units must be separate from the outdoor unit.

Enter circuit breaker size. _____ AMP
Enter line voltage wire size. _____ AWG
Number of units on same circuit (include MDC's). _____
MDC's on same circuit as indoor units. ☐ Yes ☐ No

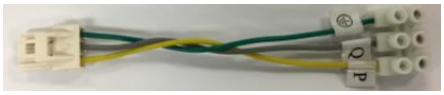
L1, L2 wiring connected. ☐ Yes ☐ No
Ground wire connected. ☐ Yes ☐ No
Strain relief wire clamp is tight. ☐ Yes ☐ No

System Tag #

Carrier Bryant VRF Installation Checklist

12.3 Electric Wiring – Control Wiring:

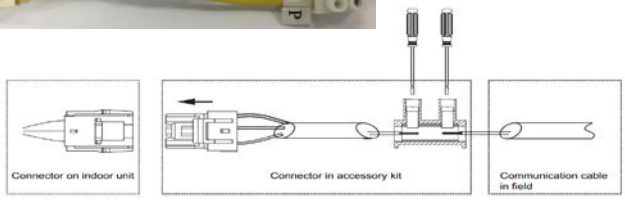
Reference the Selection Report's for Control Wiring layout drawing.



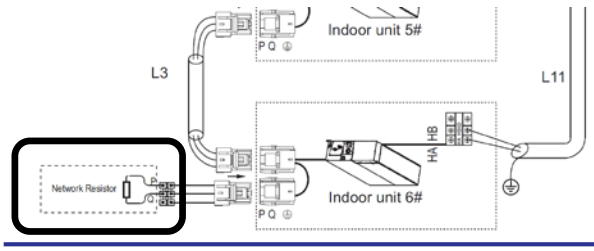
All Control wiring is stranded, 2-conductor, non-polarity, shielded wire 16 AWG. ☐ Yes ☐ No

If not, enter what was used here. ☐

Wiring shield is connected to the "Earth" screw. ☐ Yes ☐ No

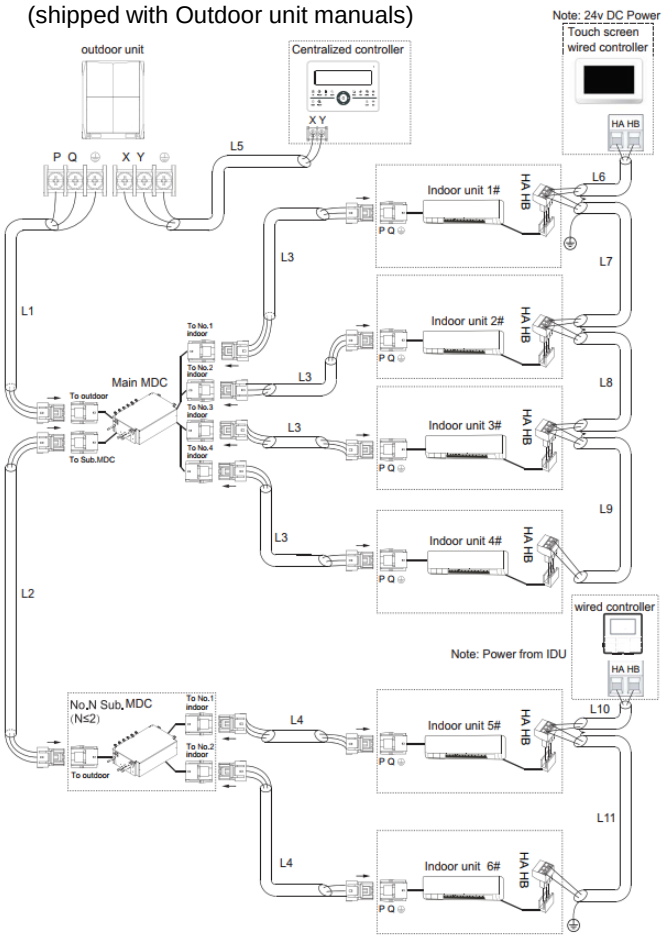


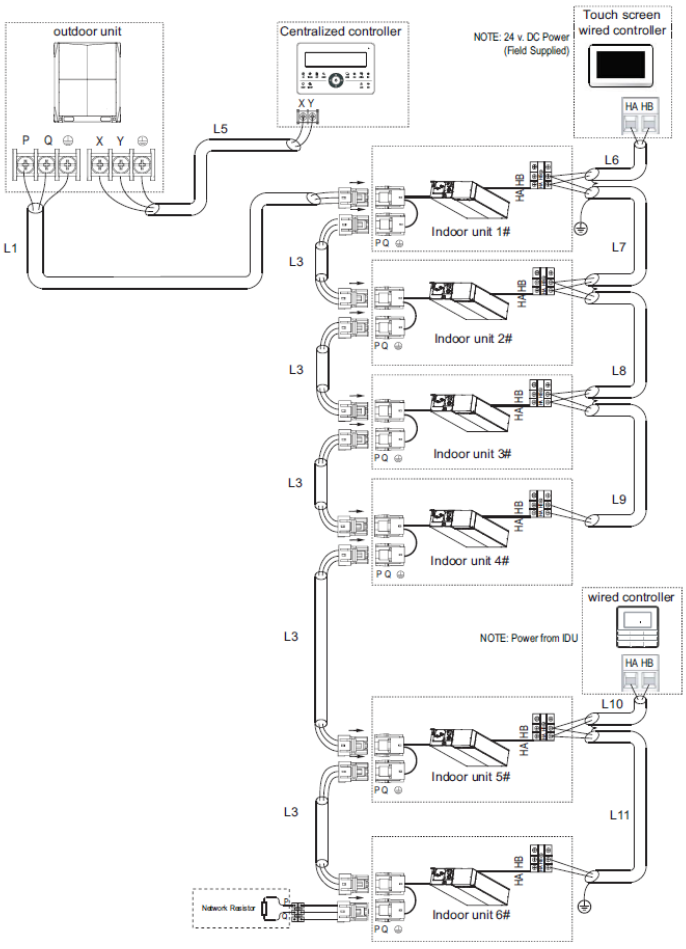
P & Q control wiring is connected from the Header outdoor unit and daisy chained to each indoor unit and stopping at the last indoor unit on this refrigerant circuit. ☐ Yes ☐ No



Twinned or Triple Outdoor Unit Combinations has control wiring is connected from the outdoor Header unit (A) H1 & H2 to the outdoor Follower unit (B) & (C) H1 & H2. ☐ Yes ☐ No

Heat Pumps ONLY – Install network resister on last fan coil. (shipped with Outdoor unit manuals) ☐ Yes ☐ No





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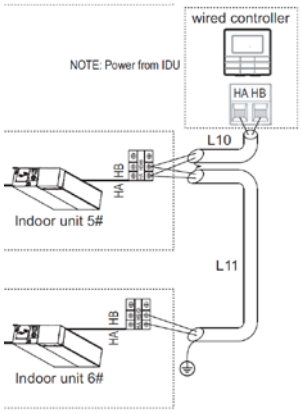
12.4 Electric Wiring – Control Wiring Wired Remote Controller:

Reference the Selection Report's for Control Wiring layout drawing.



Remote Controller wiring is stranded, 2-conductor, non-polarity, 16 AWG wire. ☐ Yes ☐ No
The remote controller does not have to be shielded.

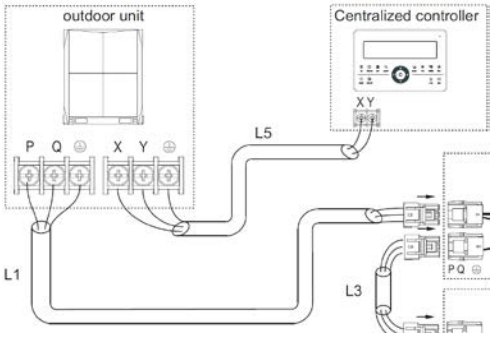
If the remote controller wire is different then above, enter type of wire used. ☐

Remote controller is connected to HA & HB on corresponding indoor unit. ☐ Yes ☐ No

For group control of indoor units, HA & HB wiring is connected to the header indoor unit of the group and daisy chained to the follower unit's HA & HB terminals. ☐ Yes ☐ No

Are there any group controlled. ☐ Yes ☐ No

12.5 Electric Wiring – Control Wiring Outdoor Unit:



Indoor Unit / MDC daisy chain connected to P, Q. ☐ Yes ☐ No

Control wire shield connected to "Earth". ☐ Yes ☐ No

Follower Units B & C daisy chained to H1, H2. ☐ Yes ☐ No

13. Final Installation Checks:

All indoor units, flow selectors and outdoor units are installed per the installation instructions. ☐ Yes ☐ No

All condensate lines have been installed, insulated and supported per indoor unit installation instructions, local codes and state codes. ☐ Yes ☐ No

All refrigerant piping has been installed, insulated and supported per indoor unit, flow selector & outdoor unit installation instructions, local and state codes. ☐ Yes ☐ No

All control and power wiring has been installed and secured per indoor & outdoor unit installation instructions, local codes and national codes. ☐ Yes ☐ No

All wired controllers have been installed per the installation instructions. ☐ Yes ☐ No

All outdoor units stop valves are open. ☐ Yes ☐ No

All shipping supports (blue tape) have been removed from the indoor blower wheels. ☐ Yes ☐ No

All equipment covers and panels have been re-installed. ☐ Yes ☐ No

After the additional refrigerant charge has been added and all of the outdoor unit service valves have been fully opened, power should be applied to the outdoor unit only - for a minimum of 24 hours. If this is not done start up will not be able to be performed. ☐ Yes ☐ No

Carrier Bryant VRF Installation Checklist

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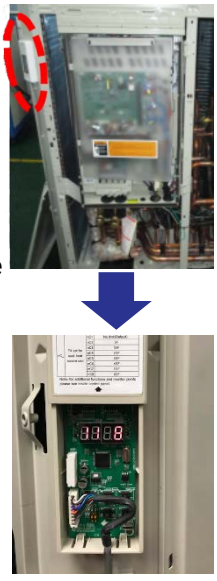
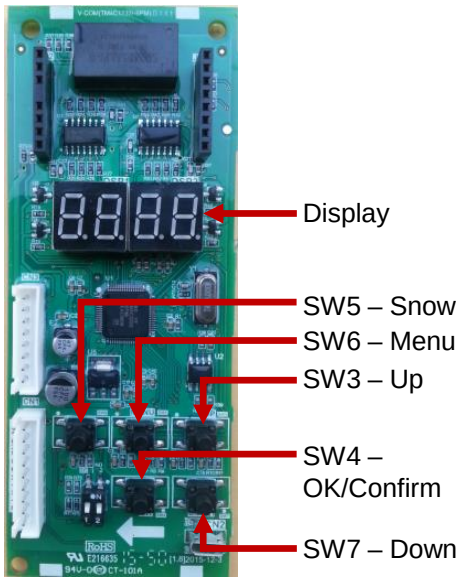
14. Evacuation Mode – All Indoor EEV Valves Open:

More detailed information can be found in the Service Manual.

These settings can also be done on the Main Control PCB. We will use the control under the left corner panel. The control cover slides up.





1. Press the MENU(SW6) button for five seconds to enter the parameter setting function. n11 Displayed
2. Press UP(SW3) once. n21 displayed
3. Press OK(SW4) once. Curser moves under "1"
4. Press UP (SW3) twice. n23 displayed
5. Press OK (SW4) once. Mode is ON
6. To end, recycle power to outdoor unit(s)

Table 48 - "SW4" Setting Parameter

Symbol	Function	Item	Description
n2_	Refrigerant recycle function	n21	Refrigerant recycled to outdoor unit
		n22	Refrigerant recycled to indoor units
		n23	Refrigerant recycled to piping (Field vacuum to open valves)

15. Start Up Assistance Request:

For start-up assistance - coordinate with CE Technical Support a minimum of 2 weeks prior to the expected start-up date. Send us this fully completed form for each system requiring an assisted commissioning. If you have a Centralized Control such as a Touch Screen, BACnet or LonWorks, please fill out a Controls Installation Checklist as well and send both to:

1st Choice Scheduled Date:

2nd Choice Scheduled Date:

Once received our VRF Specialist will call to review these forms, once reviewed CE will confirm a date for commissioning.

Forms must be completed by Installing Contractor.

Today's Date:

Company Name:

Technician / Installer:

Signature:

By signing this the contractor confirms all information provided is correct. If CE arrives on site and system is not ready for commissioning additional fees may be charged.