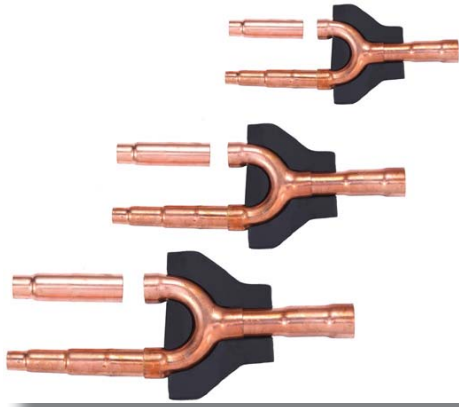




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Dallas, Texas, USA



INSTALLATION INSTRUCTIONS

Mode Selection Box Branch Pipe Kit (VRA Heat Recovery only)

VRF SYSTEMS -- BRANCH PIPE KITS
507457-04
12/2015

THIS MANUAL MUST BE LEFT WITH THE OWNER FOR FUTURE REFERENCE

Shipping and Packing List

Package 1 of 1 contains: kit contents vary. See table on page 3 for each kit's contents.

Application

Use to connect outdoor unit piping and Mode Selection (MS) boxes, for VRF Heat Recovery systems only.

NOTE - Outdoor unit is shipped for bottom pipe entry. Additional parts for front pipe entry provided in bag assembly.

| Model No. | Catalog No. |
|-----------|-------------|
| V8MSBP01 | 12A40 |
| V8MSBP02 | 12A41 |
| V8MSBP03 | 12A42 |
| V8MSBP04 | 12A43 |
| V8MSBP05 | 12A44 |

These instructions are intended as a general guide and do not supersede local codes in any way. Consult authorities having jurisdiction before installation.

Installation

Mode selection branch kits can be installed in horizontal and vertical piping runs as long as the following parameters are observed.

Horizontal Runs

When installed horizontally, mode selection branch kits **MUST** be installed level $\pm 10^\circ$.

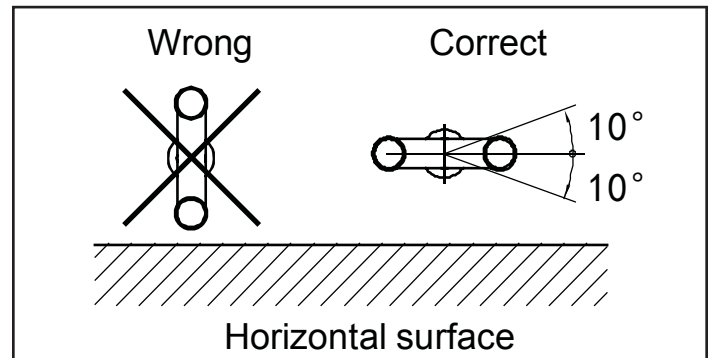


Figure 1. Horizontal Installation

Vertical Runs

When installed vertically, mode selection branch kits **MUST** be installed straight up or straight down.

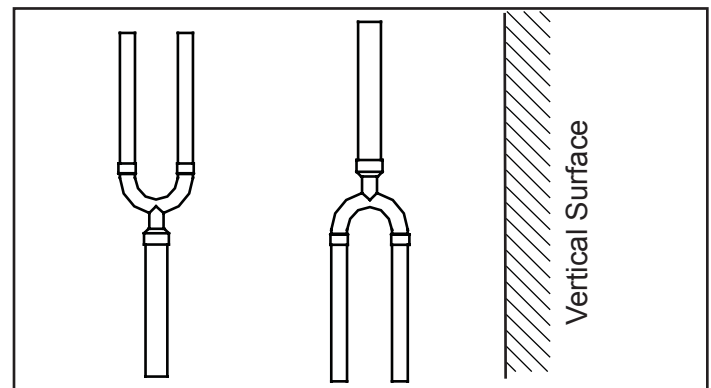


Figure 2. Vertical Installation

Mode selection box branch kits have graduated piping diameters. The piping can be cut to suit the installation needs. Use a pipe cutter designed for refrigeration tubing. Discard unused pipe.

IMPORTANT!
Locate first branch pipe kit of the system centrally to ensure correct distribution of refrigerant.

Refer to the Lennox VRF Selection Software (LVSS) pipe sizing diagram to obtain the correct inlet and outlet sizes for the installation.
Keep all components sealed until brazing.

Branch Pipe Kit Placement

Provide 24 to 36 inches of straight pipe before and after each branch pipe kit to avoid creating refrigerant turbulence and flash points. Failure to follow 24 inch minimum guideline can lead to reduced capacity and equipment damage.

CAUTION
24" minimum straight pipe required before and after branch pipe kit to prevent capacity loss and equipment damage.

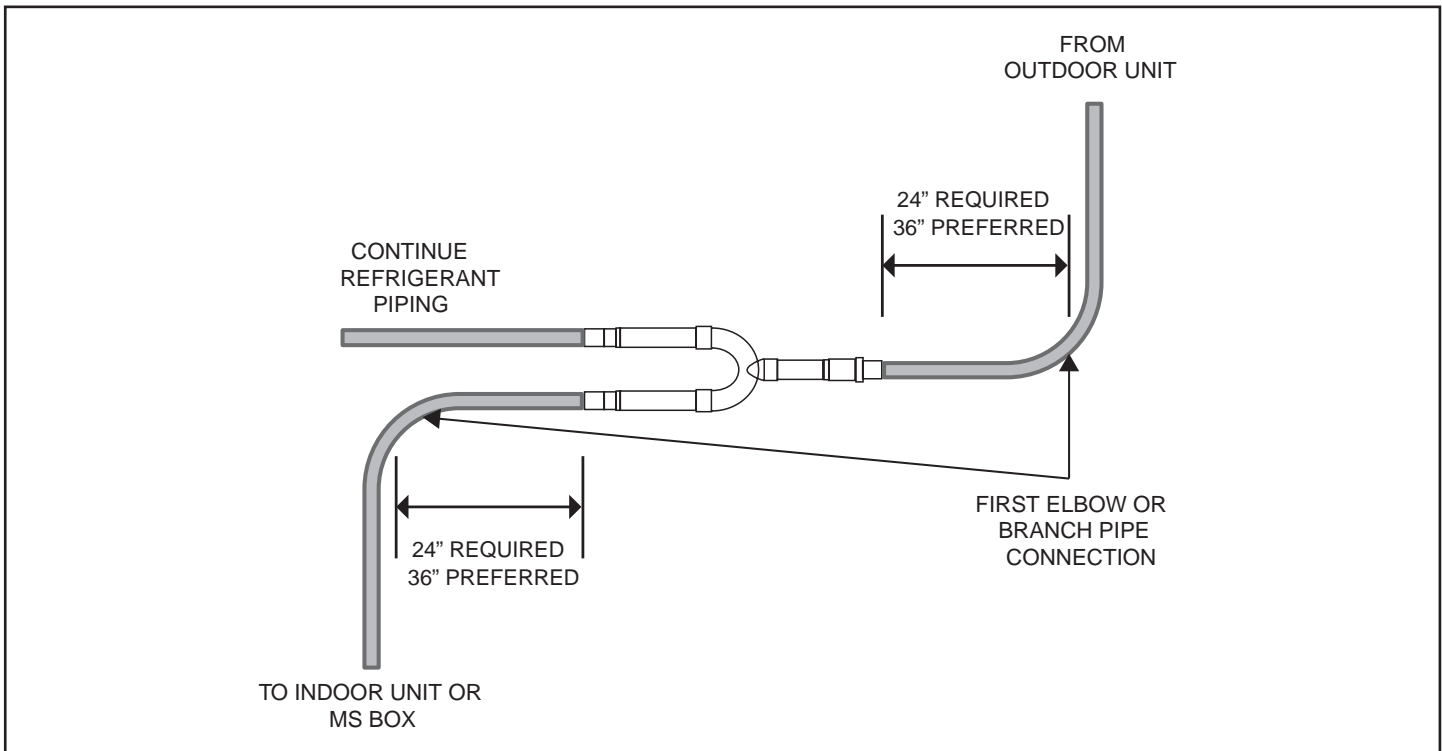


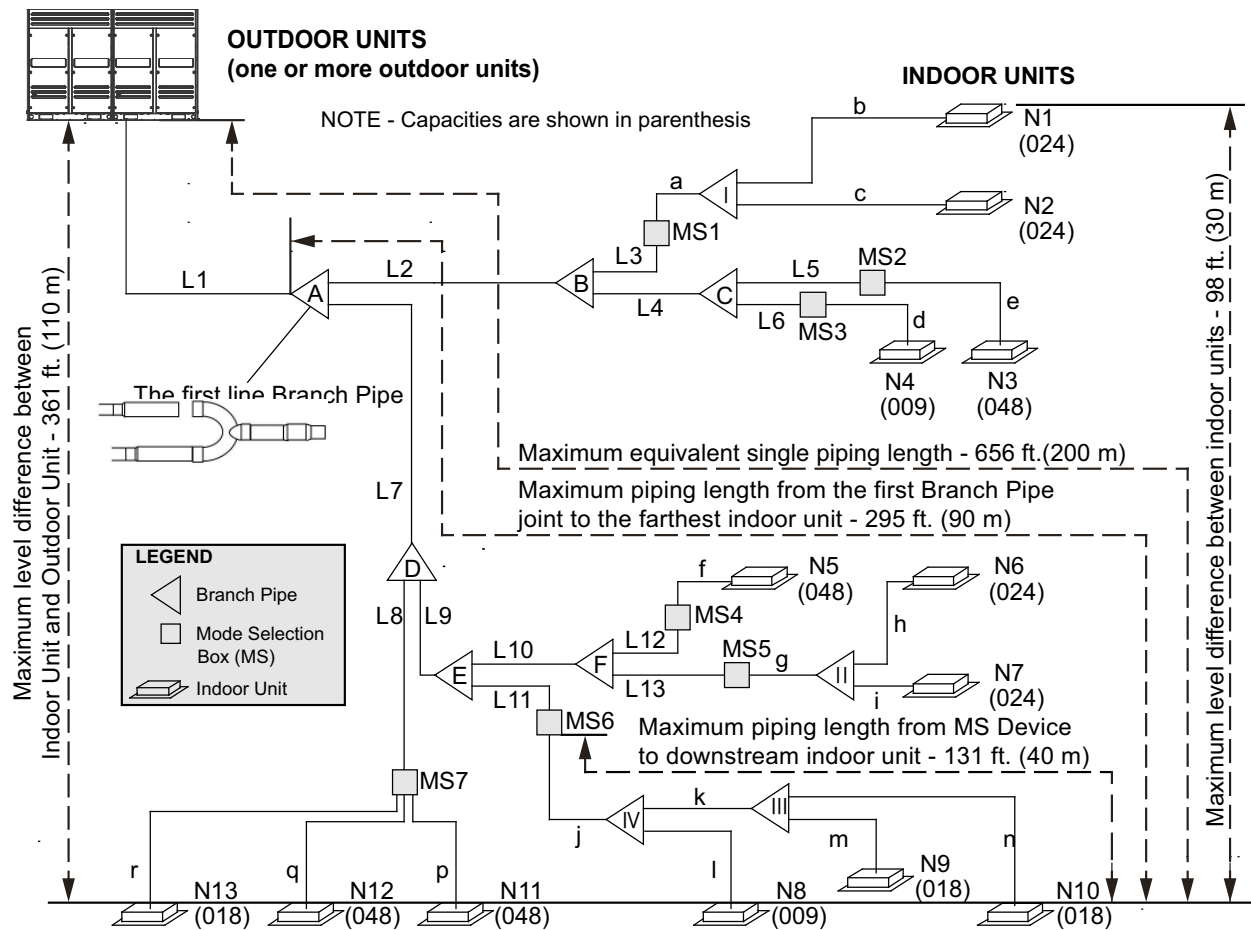
Figure 3. 24 to 36" of Straight Pipe Before and After Branch Pipe Kit

Branch Pipe Kits

| | Low-Pressure Gas Side Joints - Inch | High-Pressure Gas Side Joints - Inch | Liquid Side Joints - Inch | Adapter Pipe - Inch | Insulation Material (furnished) |
|-----------------|-------------------------------------|--------------------------------------|---------------------------|---------------------|---------------------------------|
| V8MSBP01 | | | | | |
| V8MSBP02 | | | | | |
| V8MSBP03 | | | | | |
| V8MSBP04 | | | | | |
| V8MSBP05 | | | | | |

Refrigerant Piping Details VRA Heat Recovery

Maximum Permitted Refrigerant Pipe Length and Maximum Height Difference



| Piping Length | | Permitted value | Piping |
|--|---|------------------------------------|---|
| Piping Length | Total piping length | ¹ 3280 ft. (1000 m) | $L1+(L2+L3+L4+L5+L6+L7+L8+L9+L10+L11+L12+L13) \times 2+a+b+c+d+e+f+g+h+i+j+k+l+m+n+p+q+r$ |
| | Single piping length | Actual length | 574 ft. (175 m) |
| | | Equivalent length | ² 656 ft. (200 m) |
| | Piping length from the first branch joint to the farthest indoor unit | ³ 132/295 ft. (40/90 m) | $L7+L9+L11+j+k+n$ |
| Piping length from Mode Selection Box (MS) to the downstream indoor unit of itself | 132 ft. (40 m) | $j+k+n$ | |
| Level Difference | Level difference between indoor unit and outdoor unit | Outdoor unit up | ⁴ 230 ft. (70 m) |
| | | Outdoor unit down | 360 ft. (110 m) |
| | Level difference between indoor units | 98 ft. (30 m) | --- |

NOTES:

The indoor units must be installed as close to equal as possible on both sides of the Branch Pipe joint.

¹ When counting the total piping length, double the actual length of the distribution pipes between first Branch Pipe joint and Mode Selection Box (MS): Installation.

Total piping length = $L1+(L2+L3+L4+L5+L6+L7+L8+L9+L10+L11+L12+L13) \times 2+a+b+c+d+e+f+g+h+i+j+k+l+m+n+p+q+r \leq 3280 \text{ ft. (1000 m)}$.

² Each Branch Pipe is equivalent to 20 in. (508 mm).

³ The maximum allowable piping length from the first Branch Pipe joint to the farthest indoor unit must be $\leq 132 \text{ ft. (40 m)}$, but if the following conditions are met, the maximum allowable length can be extended to 295 ft. (90 m):

- The piping length from each indoor unit to the nearest Branch Pipe joint or direct connected Mode Selection Box (MS) must be less than 132 ft. (40m) (b to r).

- The difference in length between the outdoor unit to the farthest indoor unit, and the outdoor unit to the nearest indoor unit is $\leq 132 \text{ ft. (40 m)}$.

Example: The farthest indoor unit is N10, The nearest indoor unit is N11 ($L1+L7+L9+L11+j+k+n$) minus ($L1+L7+L8+p$) $\leq 132 \text{ ft. (40 m)}$.

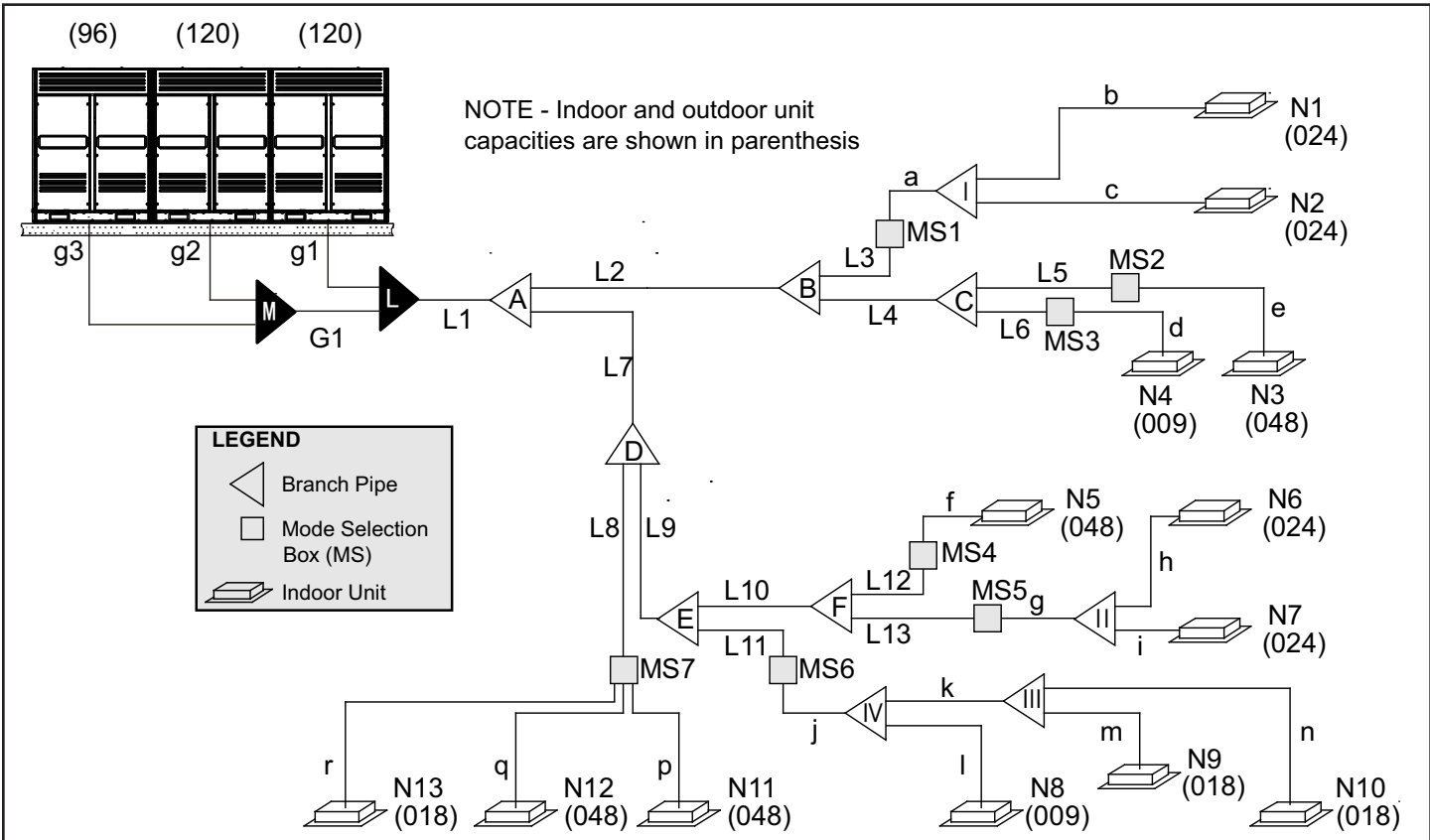
- Increase the distribution pipe diameter between the first Branch Pipe and Mode Selection Box (MS) L2-L13. If the pipe diameter is the same as the main outdoor pipe, it does not need to be increased.

Pipe Size Allowable Increase Diameters (in.):

| | | | | | | | |
|------------|------------|------------|------------|--------------|----------------|----------------|----------------|
| 3/8 to 1/2 | 1/2 to 5/8 | 5/8 to 3/4 | 3/4 to 7/8 | 7/8 to 1-1/8 | 1-1/8 to 1-3/8 | 1-3/8 to 1-5/8 | 1-5/8 to 2-1/8 |
|------------|------------|------------|------------|--------------|----------------|----------------|----------------|

⁴ When the outdoor unit is higher than indoor units and the level difference is over 65.6 ft. (20 m), it is recommended to set an oil return bend every 32.8 ft. (10 m) in the gas pipe of the main pipe. Refer to Installation Instructions for additional details.

⁵ When the outdoor unit is lower than indoor units and the level difference is more than 132 ft. (40 m), the main liquid pipe need to increase by one size.



PIPE AND COMPONENT NAMES

| Name | Designation |
|--|--|
| Outdoor Unit Connection Pipe | g1, g2, g3, G1 |
| Outdoor Unit Branch Pipe Assembly | L, M |
| Main Pipe | L1 |
| Indoor Unit Main Pipe | L2, L3, L4, L5, L6, L7, L8, L9, L10, L11, L12, L13 |
| Branch Pipe Assembly between Main Pipe and Mode Selection Box (MS) | A, B, C, D, E, F |
| Mode Selection Box (MS) | MS1, MS2, MS3, etc. |
| Branch Pipe Assembly between Mode Selection Box (MS) and Indoor Unit | I, II, III, IV |
| Indoor Unit auxiliary pipe between Mode Selection Box (MS) and downstream Branch Pipe joint | a, g, j, k |
| Indoor Unit auxiliary pipe from Indoor Unit to the nearest Branch Pipe joint or direct connected Mode Selection Box (MS) | b, c, d, e, f, h, i, l, m, n, p, q, r |
| Indoor Unit | N1, N2, N3, etc. |

OUTDOOR UNIT MAIN PIPE SELECTION (L1)

| Outdoor Unit Size | Main Pipe Diameter (in.) | | | | | | | |
|-------------------|--|------------------------|-------------|----------------------------|--|------------------------|-------------|----------------------------|
| | Equivalent length of all liquid pipes is <u>less</u> than 295 ft. (90 m) | | | First Branch Pipe Assembly | Equivalent length of all liquid pipes is <u>more</u> than 295 ft. (90 m) | | | First Branch Pipe Assembly |
| | Low Pressure Gas Pipe | High Pressure Gas Pipe | Liquid Pipe | | Low Pressure Gas Pipe | High Pressure Gas Pipe | Liquid Pipe | |
| 072 | 7/8 | 3/4 | 3/8 | V8MSBP02 | 7/8 | 3/4 | 1/2 | V8MSBP02 |
| 096 | 7/8 | 3/4 | 1/2 | V8MSBP02 | 7/8 | 3/4 | 1/2 | V8MSBP02 |
| 120 | 1-1/8 | 3/4 | 1/2 | V8MSBP03 | 1-1/8 | 3/4 | 5/8 | V8MSBP03 |
| 144-145 | 1-1/8 | 7/8 | 5/8 | V8MSBP03 | 1-1/8 | 7/8 | 5/8 | V8MSBP03 |
| 168-216 | 1-3/8 | 1-1/8 | 5/8 | V8MSBP04 | 1-3/8 | 1-1/8 | 3/4 | V8MSBP04 |
| 240 | 1-3/8 | 1-1/8 | 5/8 | V8MSBP04 | 1-3/8 | 1-1/8 | 3/4 | V8MSBP04 |
| 264-312 | 1-3/8 | 1-1/8 | 3/4 | V8MSBP04 | 1-3/8 | 1-1/8 | 7/8 | V8MSBP04 |
| 336-432 | 1-5/8 | 1-3/8 | 3/4 | V8MSBP05 | 1-5/8 | 1-3/8 | 7/8 | V8MSBP05 |

Note - The Main Pipe (L1) can be selected from the Outdoor Unit Main Pipe Selection table or the Indoor Unit Main Pipe Selection table, the larger size should be used.

INDOOR UNIT MAIN PIPE SELECTION (L1 to L13)

| Indoor Unit Total Capacity (kBtuh) | Indoor Unit Main Pipe Diameter (in.) | | | Branch Pipe Assembly |
|------------------------------------|--------------------------------------|------------------------|-------------|----------------------|
| | Low Pressure Gas Pipe | High Pressure Gas Pipe | Liquid Pipe | |
| A < 018 | 1/2 | 3/8 | 1/4 | V8MSBP01 |
| 018 ≤ A < 056 | 3/4 | 5/8 | 3/8 | V8MSBP01 |
| 056 ≤ A < 078 | 7/8 | 3/4 | 3/8 | V8MSBP02 |
| 078 ≤ A < 112 | 7/8 | 3/4 | 1/2 | V8MSBP02 |
| 112 ≤ A < 156 | 1-1/8 | 7/8 | 1/2 | V8MSBP03 |
| 156 ≤ A < 224 | 1-1/8 | 7/8 | 5/8 | V8MSBP03 |
| 224 ≤ A < 314 | 1-3/8 | 1-1/8 | 3/4 | V8MSBP04 |
| 314 ≤ A < 460 | 1-5/8 | 1-3/8 | 3/4 | V8MSBP05 |
| ≤ 460 | 1-5/8 | 1-3/8 | 7/8 | V8MSBP05 |

OUTDOOR UNIT PIPE SELECTION (g1, g2, g3, G1)

| Pipe | Outdoor Unit Size | Pipe Diameter (in.) | | |
|------------|-------------------|-----------------------|------------------------|-------------|
| | | Low Pressure Gas Pipe | High Pressure Gas Pipe | Liquid Pipe |
| g1, g2, g3 | 6 or 8 ton | 7/8 | 3/4 | 1/2 |
| | 10 or 12 ton | 1-1/8 | 3/4 | 5/8 |
| G1 | --- | 1-3/8 | 1-1/8 | 3/4 |

OUTDOOR UNIT BRANCH PIPE ASSEMBLY SELECTION (L, M)

| Outdoor Unit Quantity | Parallel Connection with Branch Pipes |
|-----------------------|---------------------------------------|
| 2 units | L use V8ODBP02HR |
| 3 units | L + M use V8ODBP03HR |

INDOOR UNIT AUXILIARY PIPE SELECTION (Between Branch Box (MS) And Downstream Branch Joint) (a, g, j, k)

| Indoor Unit Capacity (kBtuh) | Pipe Diameter (in.) | | Available Branch Pipe |
|------------------------------|---------------------|-------------|-----------------------|
| | Gas Pipe | Liquid Pipe | |
| A<56 | 5/8 | 3/8 | V8IDBP01 |

INDOOR UNIT AUXILIARY PIPE SELECTION

(From Indoor Unit To The Nearest Branch Joint Or Direct Connected Mode Selection Box (MS) (b, c, d, e, f, h, i, l, m, n, p, q, r)

| Indoor Unit Capacity (kBtuh) | Pipe Diameter (in.) | | | |
|------------------------------|--|-------------|---|----------|
| | Pipe length from indoor unit to nearest branch joint or direct connected Mode Selection Box (MS) | | | |
| | Pipe length <u>less</u> than 33 ft (10 m) | | Pipe length <u>more</u> than 33 ft (10 m) | |
| | Gas Pipe | Liquid Pipe | Gas Pipe | Gas Pipe |
| A<18 | 1/2 | 1/4 | 5/8 | 3/8 |
| 18≤A<54 | 5/8 | 3/8 | 3/4 | 1/2 |