

Carrier

SUPER DIGITAL INVERTER

ENGINEERING DATABOOK

Indoor Unit

Model name:

4-way Air Discharge Cassette Type

RAV-SP180UT-UL

RAV-SP240UT-UL

RAV-SP300UT-UL

RAV-SP360UT-UL

RAV-SP420UT-UL

Ceiling Type

RAV-SP180CT-UL

RAV-SP240CT-UL

RAV-SP300CT-UL

RAV-SP360CT-UL

RAV-SP420CT-UL

High-wall Type

RAV-SP180KRT-UL

RAV-SP240KRT-UL

Outdoor Unit

Model name:

RAV-SP180AT-UL

RAV-SP240AT-UL

RAV-SP300AT-UL

RAV-SP360AT-UL

RAV-SP420AT-UL

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1. OVERVIEW

1-1. Feature and Benefits

1-2. Line up

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2. 4-WAY CASSETTE TYPE

2-1. Specifications

■ 4-way cassette USA

| System | | 018 | 024 | 030 | 036 | 042 | |
|-----------------|------------------------------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------|
| System | Outdoor Model | RAV-SP180AT2-UL | RAV-SP240AT2-UL | RAV-SP300AT2-UL | RAV-SP360AT2-UL | RAV-SP420AT2-UL | |
| | Indoor Model | RAV-SP180UT-UL | RAV-SP240UT-UL | RAV-SP300UT-UL | RAV-SP360UT-UL | RAV-SP420CT-UL | |
| | Cooling Rated Capacity (Btu/h) | 19000 | 25000 | 32000 | 36400 | 40500 | |
| Performance | SEER | 20.5 | 20.7 | 21.0 | 21.0 | 19.0 | |
| | EER | 10.7 | 11.0 | 14.0 | 13.0 | 11.5 | |
| | Heating Rated Capacity (Btu/h) | 18800 | 26000 | 33400 | 36000 | 46000 | |
| | HSPF | 11.5 | 9.5 | 11.0 | 11.9 | 10.3 | |
| | Wireless (°C, °F, Convertible) | °F | °F | °F | °F | °F | |
| Controls | Wireless Range ft. | 23 | 23 | 23 | 23 | 23 | |
| | IR or RF | IR | IR | IR | IR | IR | |
| | Wired (°C, °F, Convertible) | °F | °F | °F | °F | °F | |
| Operating Range | Cooling | Outdoor Min - Max DB (°F) *1 | 23 to 109 | 23 to 109 | 23 to 109 | 23 to 109 | 23 to 109 |
| | | Indoor Min - Max DB (°F) | 70 to 89 | 70 to 89 | 70 to 89 | 70 to 89 | 70 to 89 |
| | | Indoor Min - Max WB (°F) | 59 to 75 | 59 to 75 | 59 to 75 | 59 to 75 | 59 to 75 |
| | Heating | Outdoor WB Min - Max (°F) | -4 to 59 | -4 to 59 | -4 to 59 | -4 to 59 | -4 to 59 |
| | | Indoor DB Min - Max (°F) | 59 to 86 | 59 to 86 | 59 to 86 | 59 to 86 | 59 to 86 |
| Piping | Standard Piping Length (ft.) | 25 | 25 | 25 | 25 | 25 | |
| | Min. Piping Length (ft.) | 16'5" | 16'5" | 9'8" | 9'8" | 9'8" | |
| | Max. Piping Length (ft.) | 164'1" | 164'1" | 246'1" | 246'1" | 246'1" | |
| | Lift (Outdoor below Indoor) (ft.) | 98'5" | 98'5" | 98'5" | 98'5" | 98'5" | |
| | Lift (Outdoor above Indoor) (ft.) | 98'5" | 98'5" | 98'5" | 98'5" | 98'5" | |
| | Gas Pipe (size/connection type) | 1/2" | 5/8" | 5/8" | 5/8" | 5/8" | |
| | Liquid Pipe (size/connection type) | 1/4" | 3/8" | 3/8" | 3/8" | 3/8" | |
| | Additional refrigerant charge under long piping connection | 0.22oz/ft (65" to 164'1") | 0.43oz/ft (98'5" to 164'1") | 0.43oz/ft (98'5" to 246'1") | 0.43oz/ft (98'5" to 246'1") | 0.43oz/ft (98'5" to 246'1") | |
| | Outdoor Model Piping Orientation | Side | Yes | Yes | Yes | Yes | Yes |
| | | Back | Yes | Yes | Yes | Yes | Yes |
| | | Bottom | Yes | Yes | Yes | Yes | Yes |
| | Drain Pump Lift | 33.5 (from the bottom of ceiling) | 33.5 (from the bottom of ceiling) | 33.5 (from the bottom of ceiling) | 33.5 (from the bottom of ceiling) | 33.5 (from the bottom of ceiling) | |
| Electrical | Voltage | 208/230-1-60 | 208/230-1-60 | 208/230-1-60 | 208/230-1-60 | 208/230-1-60 | |
| | Indoor Unit Connected from Outdoor (Yes/No) | Yes | Yes | Yes | Yes | Yes | |
| | Number Of Conductors Between Indoor and Outdoor Units | 4 | 4 | 4 | 4 | 4 | |
| | Type of Wire (Shielded - yes or no) | No | No | No | No | No | |
| | Cooling Power Consumption (W) | 1776 | 2273 | 2286 | 2800 | 3522 | |
| | Heating Power Consumption (W) | 1430 | 2270 | 2240 | 2770 | 3720 | |
| | Cooling Running Current (A) | 7.91 | 10.25 | 10.30 | 12.47 | 15.71 | |
| | Heating Running Current (A) | 6.36 | 10.20 | 10.10 | 12.32 | 16.56 | |
| | Maximum Current Amps (A) | 17 | 24 | 24 | 24 | 24 | |
| | Maximum Over Protection Device Amps (A)*2 | 30 | 40 | 40 | 40 | 40 | |
| | Breaker (A) | 20 | 25 | 25 | 25 | 25 | |
| Outdoor | Dimensions | Height (in.) | 21.7 | 35.0 | 52.8 | 52.8 | 52.8 |
| | | Width (in.) | 30.7 | 35.4 | 35.4 | 35.4 | 35.4 |
| | | Length (in.) | 11.4 | 12.6 | 12.6 | 12.6 | 12.6 |
| | Weight-Net/Gross (lbs.) | 98/105 | 144.5/157 | 211.5/226 | 211.5/226 | 211.5/226 | |
| | Refrigerant charged (lbs.) | 3.1 | 4.6 | 6.8 | 6.8 | 6.8 | |
| | Variable Speed Outdoor Motor (Yes/No) | Yes | Yes | Yes | Yes | Yes | |
| Appearance | Silky shade (Muncel 1Y8.5/0.5) | Silky shade (Muncel 1Y8.5/0.5) | Silky shade (Muncel 1Y8.5/0.5) | Silky shade (Muncel 1Y8.5/0.5) | Silky shade (Muncel 1Y8.5/0.5) | | |
| | Sound Pressure (dB (A)) | 48/49 | 49/50 | 50/51 | 52/52 | 52/52 | |
| Compressor | Type | Hermetic compressor | Hermetic compressor | Hermetic compressor | Hermetic compressor | Hermetic compressor | |
| | Motor (kw) | 1.1 | 2 | 3.75 | 3.75 | 3.75 | |
| Indoor | Dimensions | Width (in.) | 33.1 | 33.1 | 33.1 | 33.1 | 33.1 |
| | | Height (in.) | 10.1 | 10.1 | 12.6 | 12.6 | 12.6 |
| | | Length (in.) | 33.1 | 33.1 | 33.1 | 33.1 | 33.1 |
| | Weight-Net/Gross (lbs.) | 44/53 | 44/53 | 53/64 | 53/64 | 53/64 | |
| | Number of Fan Speeds | 3, Auto | 3, Auto | 3, Auto | 3, Auto | 3, Auto | |
| Gille | Sound Pressure at Different Speeds (dB (A)) (H/M/L) | 37/35/34 | 39/35/34 | 46/40/36 | 47/41/38 | 47/41/38 | |
| | Air flow DRY (CFM) (H/M/L) | 600/500/450 | 700/550/460 | 1150/820/670 | 1200/820/700 | 1200/820/700 | |
| Gille | Model name | RBC-U31PG(W)-UL | RBC-U31PG(W)-UL | RBC-U31PG(W)-UL | RBC-U31PG(W)-UL | RBC-U31PG(W)-UL | |
| | Dimensions | Width (in.) | 37.4 | 37.4 | 37.4 | 37.4 | 37.4 |
| | | Height (in.) | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| | | Length (in.) | 37.4 | 37.4 | 37.4 | 37.4 | 37.4 |
| | Weight -Net/Gross (lbs.) | 10/15.5 | 10/15.5 | 10/15.5 | 10/15.5 | 10/15.5 | |
| Appearance | moon white 2.5GY9.0/0.5 | moon white 2.5GY9.0/0.5 | moon white 2.5GY9.0/0.5 | moon white 2.5GY9.0/0.5 | moon white 2.5GY9.0/0.5 | | |

Note : Rated conditions

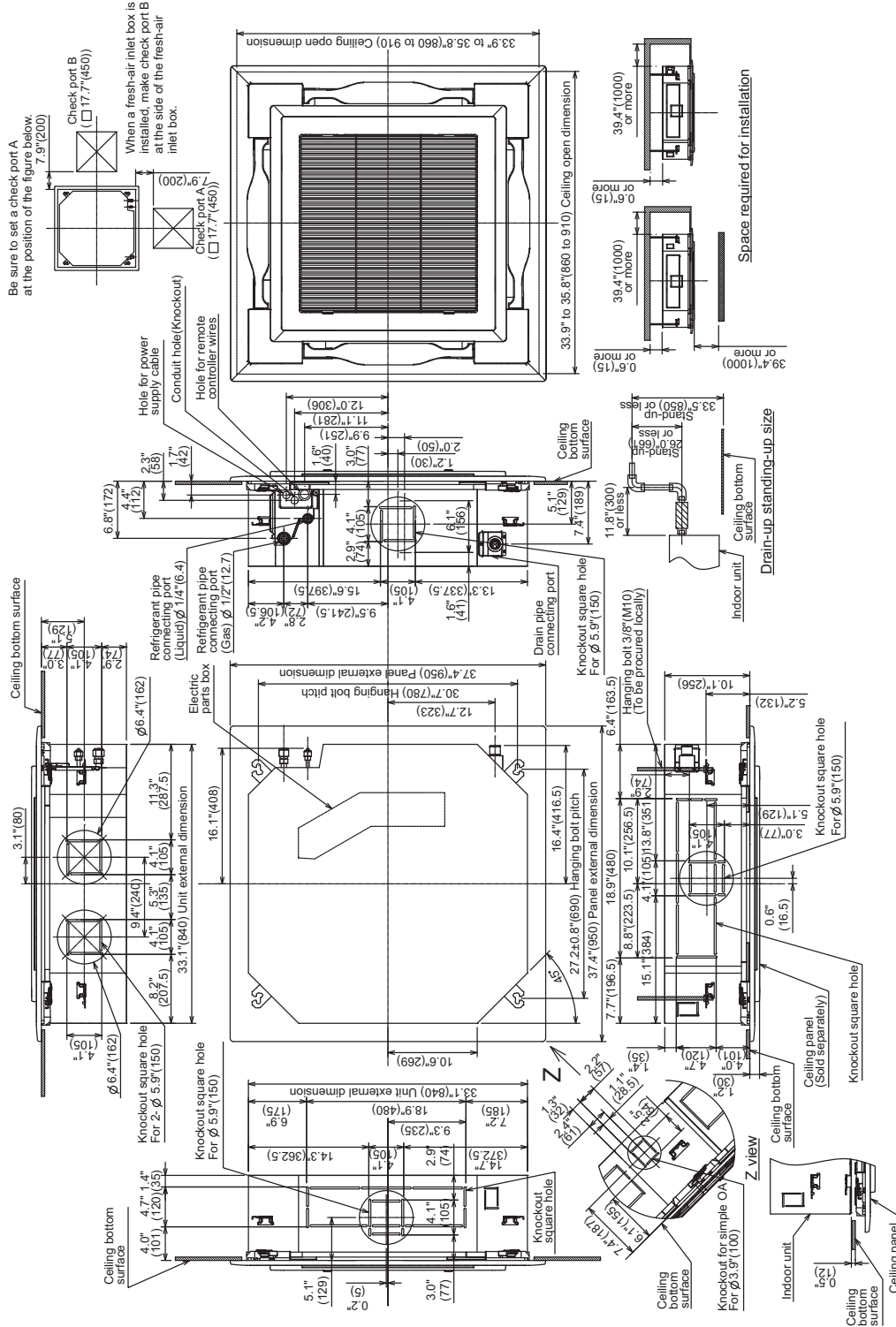
Cooling : Indoor air temperature 80F(27C) DB / 67 (19C)WB, Outdoor air temperature 95F(35C)DB

Heating : Indoor air temperature 70F(21C)DB, Outdoor air temperature 47F(8C)DB/43F(6C)WB

2-2. Dimension

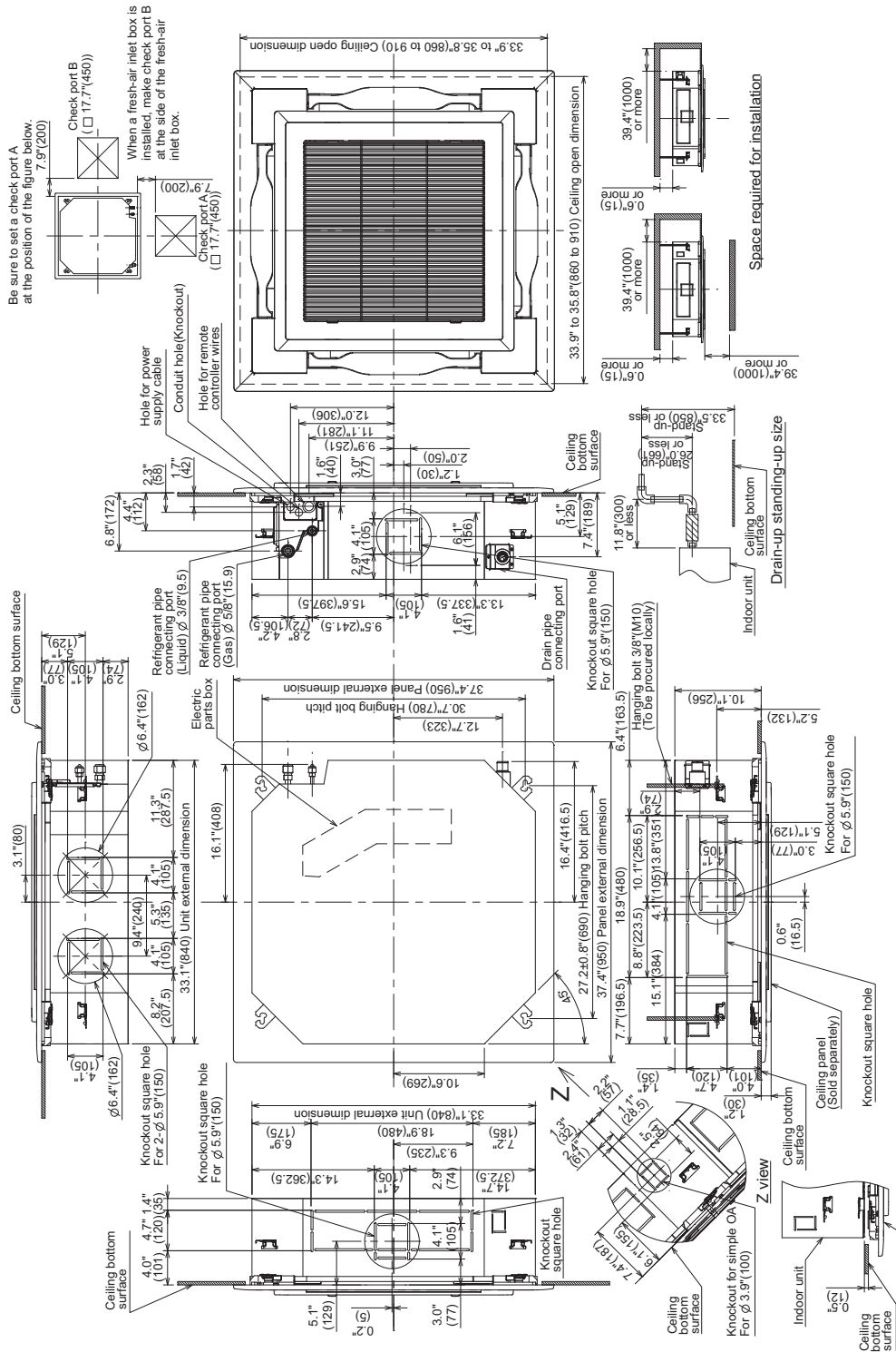
RAV-SP180UT-UL

Unit:in(mm)



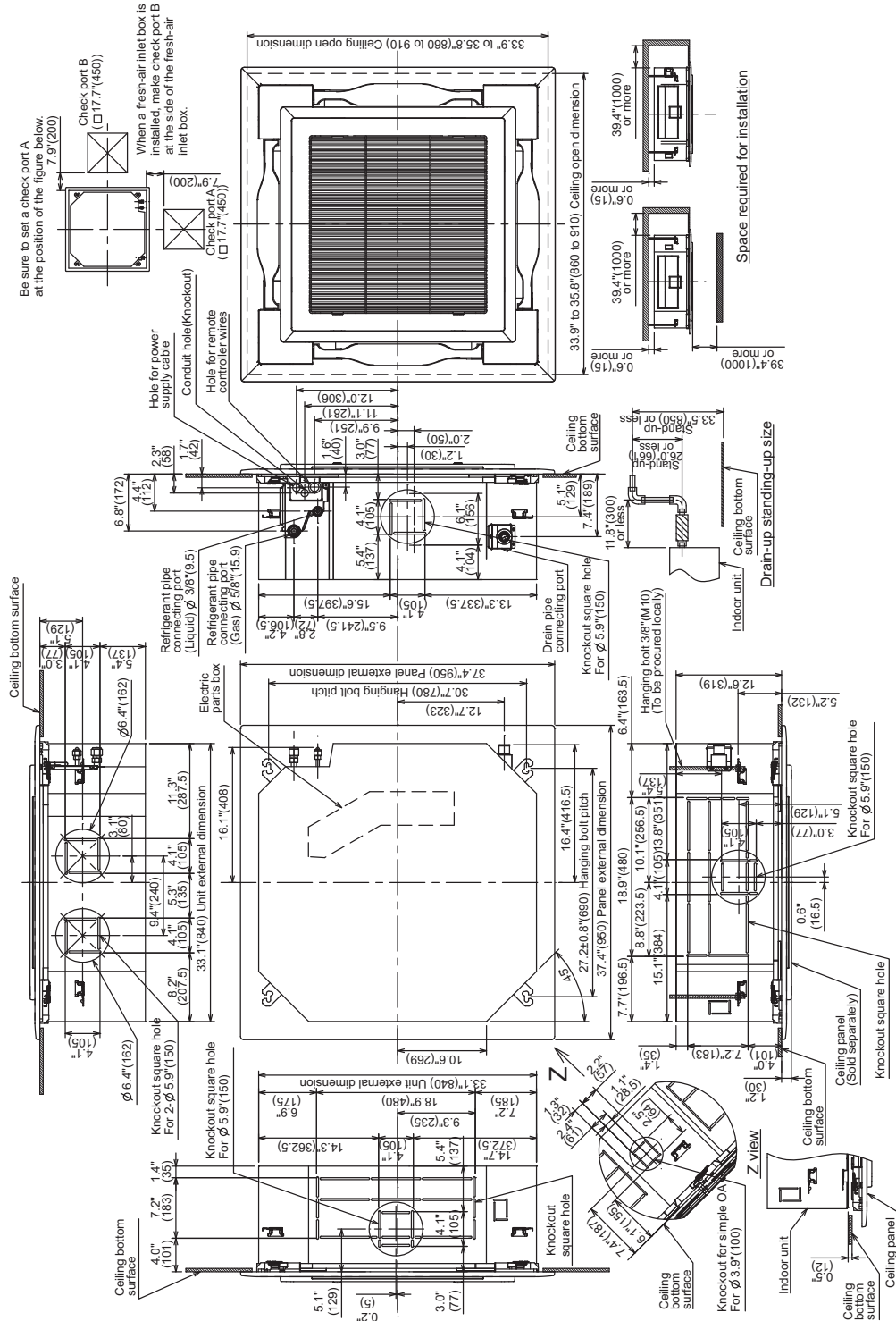
RAV-SP240UT-UL

Unit:in(mm)

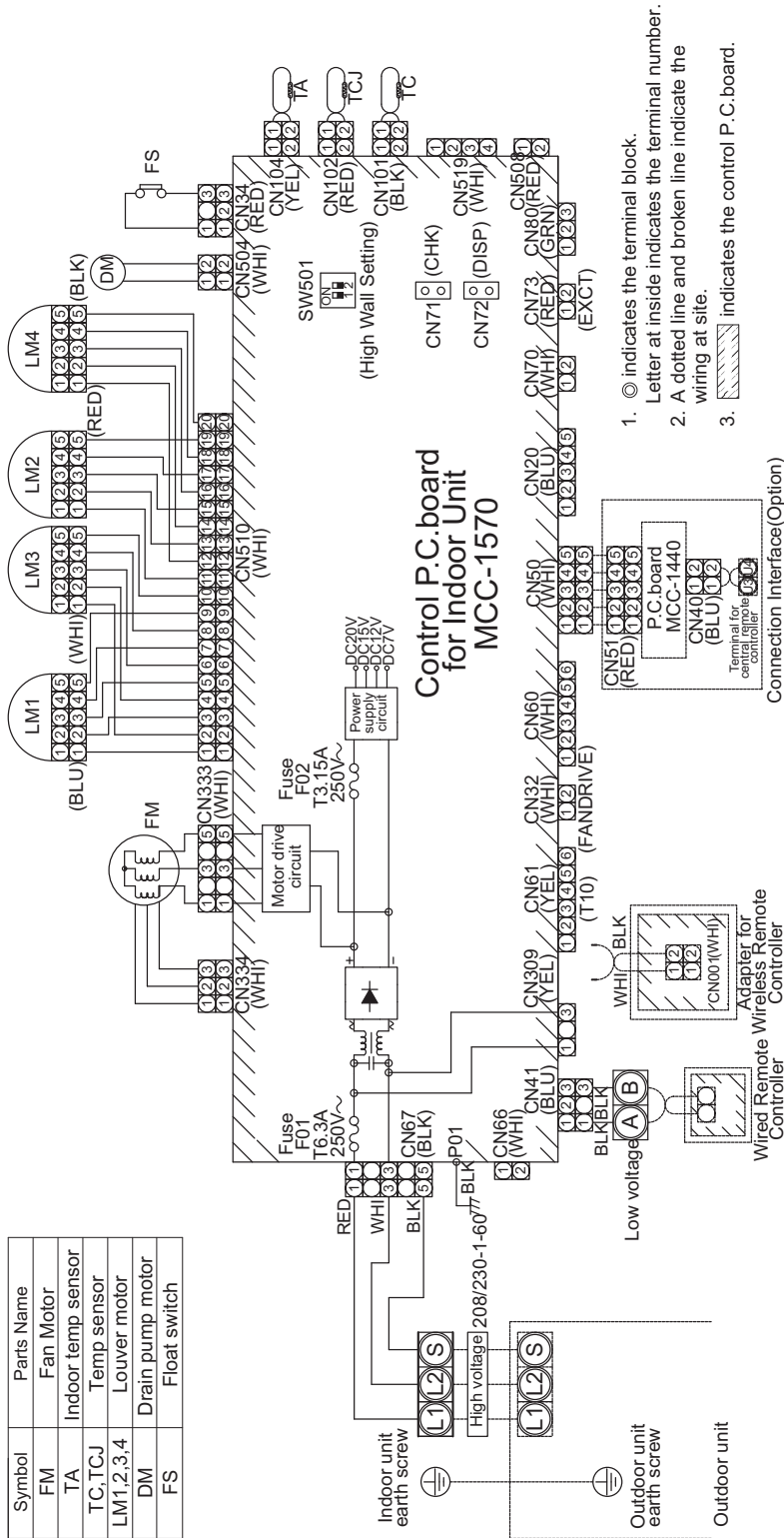


RAV-SP300UT-UL, RAV-SP360UT-UL, RAV-SP420UT-UL

Unit:in(mm)



2-3. Wiring Diagram



| unit size | outdoor air temp. DB | 57 WB 68 DB | | 59 WB 71 DB | | 61 WB 73 DB | | 63 WB 76 DB | | 64 WB 79 DB | | 66 WB 81 DB | | 68 WB 82 DB | | 72 WB 86 DB | | 75 WB 90 DB | |
|-----------|----------------------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|
| | | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC |
| 36k | 50.0 | 34200 | 24200 | 36000 | 25500 | 37700 | 26700 | 39100 | 27700 | 40400 | 28600 | 41600 | 29500 | 42800 | 30300 | 45300 | 32100 | 47400 | 33600 |
| | 54.0 | 34000 | 24100 | 35800 | 25400 | 37600 | 26700 | 38900 | 27600 | 40200 | 28500 | 41400 | 29300 | 42600 | 30200 | 45100 | 32000 | 47200 | 33500 |
| | 57.0 | 33800 | 24000 | 35500 | 25200 | 37300 | 26400 | 38600 | 27400 | 39900 | 28300 | 41100 | 29100 | 42300 | 30000 | 44800 | 31800 | 46800 | 33200 |
| | 61.0 | 33500 | 23700 | 35300 | 25000 | 37000 | 26200 | 38300 | 27100 | 39600 | 28100 | 40800 | 28900 | 42000 | 29800 | 44400 | 31500 | 46500 | 33000 |
| | 64.0 | 33300 | 23600 | 35000 | 24800 | 36700 | 26000 | 38000 | 26900 | 39300 | 27900 | 40500 | 28700 | 41700 | 29600 | 44100 | 31300 | 46100 | 32700 |
| | 68.0 | 32900 | 23300 | 34700 | 24600 | 36400 | 25800 | 37700 | 26700 | 39000 | 27600 | 39000 | 28400 | 41200 | 29200 | 43700 | 31000 | 45700 | 32400 |
| | 70.0 | 32900 | 23300 | 34600 | 24500 | 36300 | 25700 | 37600 | 26700 | 38900 | 27600 | 40000 | 28400 | 41100 | 29100 | 43600 | 30900 | 45600 | 32300 |
| | 73.0 | 32500 | 23000 | 34200 | 24200 | 35900 | 25400 | 37200 | 26400 | 38500 | 27300 | 39600 | 28100 | 40700 | 28800 | 43100 | 30500 | 45100 | 32000 |
| | 77.0 | 32100 | 22800 | 33800 | 24000 | 35500 | 25200 | 36700 | 26000 | 38000 | 26900 | 39100 | 27700 | 40200 | 28500 | 42600 | 30200 | 44500 | 31500 |
| | 81.0 | 31800 | 22500 | 33400 | 23700 | 35100 | 24900 | 36300 | 25700 | 37600 | 26700 | 38700 | 27400 | 39800 | 28200 | 42200 | 29900 | 44100 | 31300 |
| | 84.0 | 31300 | 22200 | 32900 | 23300 | 34600 | 24500 | 35800 | 25400 | 37000 | 26200 | 38100 | 27000 | 39200 | 27800 | 41500 | 29400 | 43400 | 30800 |
| | 88.0 | 30900 | 21900 | 32500 | 23000 | 34100 | 24200 | 35300 | 25000 | 36500 | 25900 | 37600 | 26700 | 38700 | 27400 | 41000 | 29100 | 42800 | 30300 |
| | 91.0 | 30400 | 21500 | 32000 | 22700 | 33600 | 23800 | 34800 | 24700 | 35900 | 25400 | 37000 | 26200 | 38100 | 27000 | 40300 | 28600 | 42200 | 29900 |
| | 95.0 | 29900 | 21200 | 31500 | 22300 | 33000 | 23400 | 34200 | 24200 | 35400 | 25100 | 36400 | 25800 | 37400 | 26500 | 39700 | 28100 | 41500 | 29400 |
| | 99.0 | 29300 | 20800 | 30900 | 21900 | 32400 | 23000 | 33500 | 23700 | 34700 | 24600 | 35700 | 25300 | 36700 | 26000 | 38900 | 27600 | 40700 | 28800 |
| 102.0 | 28700 | 20300 | 30200 | 21400 | 31700 | 22500 | 32900 | 23300 | 34000 | 24100 | 35000 | 24800 | 36000 | 25500 | 38100 | 27000 | 39900 | 28300 | |
| 106.0 | 25100 | 17800 | 26400 | 18700 | 27800 | 19700 | 28700 | 20300 | 29700 | 21100 | 30600 | 21700 | 31500 | 22300 | 33300 | 23600 | 34900 | 24700 | |
| 109.0 | 24400 | 17300 | 25700 | 18200 | 26900 | 19100 | 27900 | 19800 | 28900 | 20500 | 29700 | 21100 | 30500 | 21600 | 32400 | 23000 | 33800 | 24000 | |

| unit size | outdoor air temp. DB | 57 WB 68 DB | | 59 WB 71 DB | | 61 WB 73 DB | | 63 WB 76 DB | | 64 WB 79 DB | | 66 WB 81 DB | | 68 WB 82 DB | | 72 WB 86 DB | | 75 WB 90 DB | |
|-----------|----------------------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|
| | | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC |
| 42k | 50.0 | 38000 | 26200 | 40000 | 27600 | 42000 | 28900 | 43500 | 30000 | 45000 | 31000 | 46300 | 31900 | 47600 | 32800 | 50400 | 34700 | 52700 | 36300 |
| | 54.0 | 37800 | 26000 | 39800 | 27400 | 41700 | 28700 | 43200 | 29800 | 44700 | 30800 | 46000 | 31700 | 47300 | 32600 | 50100 | 34500 | 52400 | 36100 |
| | 57.0 | 37500 | 25800 | 39500 | 27200 | 41500 | 28600 | 42900 | 29600 | 44400 | 30600 | 45700 | 31500 | 47000 | 32400 | 49800 | 34300 | 52100 | 35900 |
| | 61.0 | 37300 | 25700 | 39200 | 27000 | 41200 | 28400 | 42600 | 29300 | 44100 | 30400 | 45400 | 31300 | 46700 | 32200 | 49500 | 34100 | 51700 | 35600 |
| | 64.0 | 37000 | 25500 | 38900 | 26800 | 40800 | 28100 | 42300 | 29100 | 43700 | 30100 | 45000 | 31000 | 46300 | 31900 | 49000 | 33800 | 51300 | 35300 |
| | 68.0 | 36700 | 25300 | 38600 | 26600 | 40500 | 27900 | 42000 | 28900 | 43400 | 29900 | 44700 | 30800 | 46000 | 31700 | 48700 | 33500 | 50900 | 35100 |
| | 70.0 | 36600 | 25200 | 38500 | 26500 | 40400 | 27800 | 41800 | 28800 | 43200 | 29800 | 44500 | 30700 | 45800 | 31600 | 48500 | 33400 | 50700 | 34900 |
| | 73.0 | 36100 | 24900 | 38000 | 26200 | 39900 | 27500 | 41300 | 28500 | 42700 | 29400 | 44000 | 30300 | 45300 | 31200 | 47900 | 33000 | 50100 | 34500 |
| | 77.0 | 35700 | 24600 | 37600 | 25900 | 39500 | 27200 | 40900 | 28200 | 42300 | 29100 | 43500 | 30000 | 44700 | 30800 | 47400 | 32700 | 49600 | 34200 |
| | 81.0 | 35300 | 24300 | 37200 | 25600 | 39000 | 26900 | 40400 | 27800 | 41800 | 28800 | 43000 | 29600 | 44200 | 30400 | 46800 | 32200 | 49000 | 33800 |
| | 84.0 | 34900 | 24000 | 36700 | 25300 | 38500 | 26500 | 39900 | 27500 | 41200 | 28400 | 42444 | 29200 | 43700 | 30100 | 46200 | 31800 | 48400 | 33300 |
| | 88.0 | 34300 | 23600 | 36100 | 24900 | 37900 | 26100 | 39300 | 27100 | 40600 | 28000 | 41800 | 28800 | 43000 | 29600 | 45500 | 31300 | 47600 | 32800 |
| | 91.0 | 33800 | 23300 | 35600 | 24500 | 37400 | 25800 | 38700 | 26700 | 40000 | 27600 | 41200 | 28400 | 42400 | 29200 | 44900 | 30900 | 46900 | 32300 |
| | 95.0 | 33300 | 22900 | 35000 | 24100 | 36700 | 25300 | 38000 | 26200 | 39300 | 27100 | 40500 | 27900 | 41700 | 28700 | 44100 | 30400 | 46100 | 31800 |
| | 99.0 | 32600 | 22500 | 34300 | 23600 | 36000 | 24800 | 37300 | 25700 | 38600 | 26600 | 39700 | 27300 | 40800 | 28100 | 43200 | 29800 | 45200 | 31100 |
| 102.0 | 32000 | 22000 | 33600 | 23100 | 35300 | 24300 | 36500 | 25100 | 37800 | 26000 | 38900 | 26800 | 40000 | 27600 | 42400 | 29200 | 44300 | 30500 | |
| 106.0 | 27900 | 19200 | 29400 | 20300 | 30800 | 21200 | 31900 | 22000 | 33000 | 22700 | 34000 | 23400 | 35000 | 24100 | 37000 | 25500 | 38700 | 26700 | |
| 109.0 | 27200 | 18700 | 28600 | 19700 | 30000 | 20700 | 31100 | 21400 | 32200 | 22200 | 33100 | 22800 | 34000 | 23400 | 36100 | 24900 | 37700 | 26000 | |

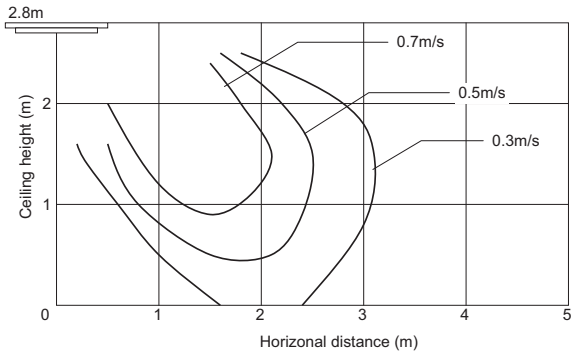
TC:Total Capacity [Btu/h]

SHC:Sensible Heat Capacity [Btu/h]

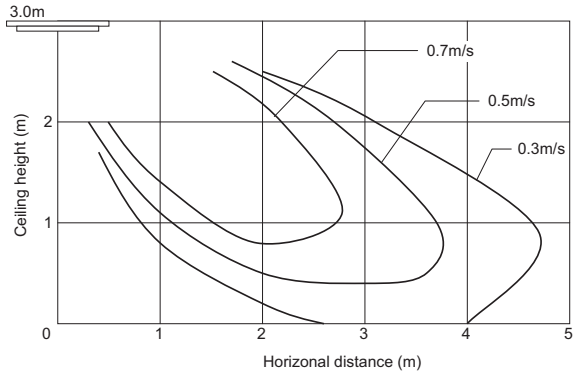
2-5. Capacity / Input Change Characteristic

2-6. Air Speed Characteristics

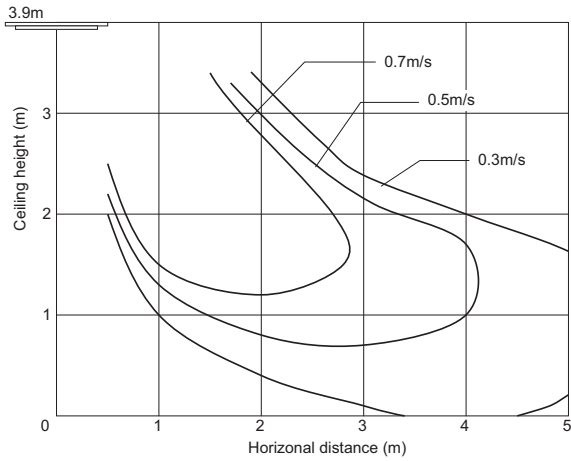
RAV-SP180UT-UL



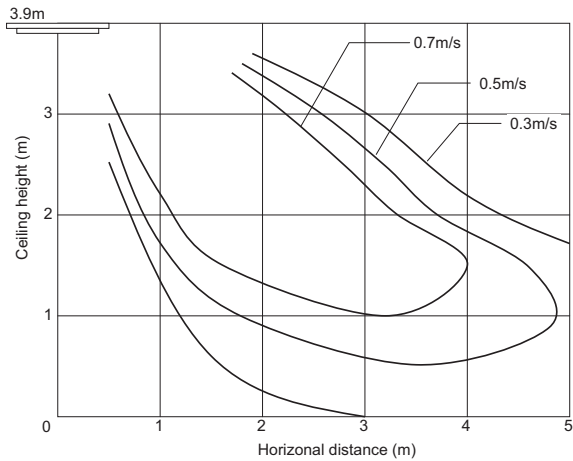
RAV-SP240UT-UL



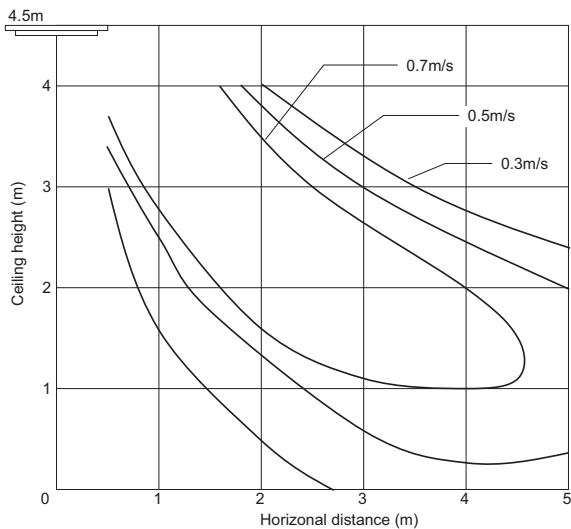
RAV-SP300UT-UL



RAV-SP360UT-UL, RAV-SP420UT-UL



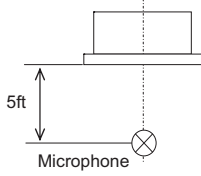
RAV-SP360UT-UL, RAV-SP420UT-UL
(High Ceiling)



2-7. Sound Characteristics (NC curve)

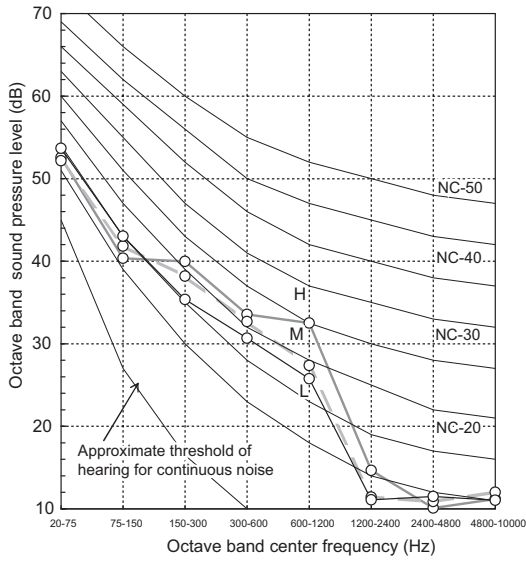
■ 4-Way Cassette Type

[Measuring location]



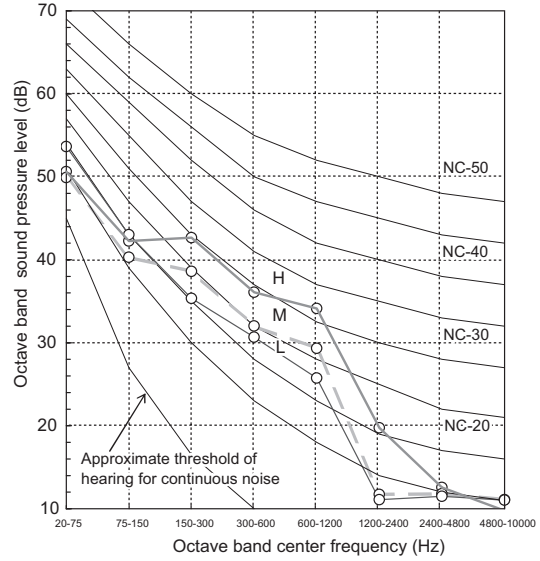
RAV-SP180UT-UL

| Fan tap | H | M | L |
|------------------------------|----|----|----|
| Sound pressure level (dB(A)) | 37 | 35 | 34 |



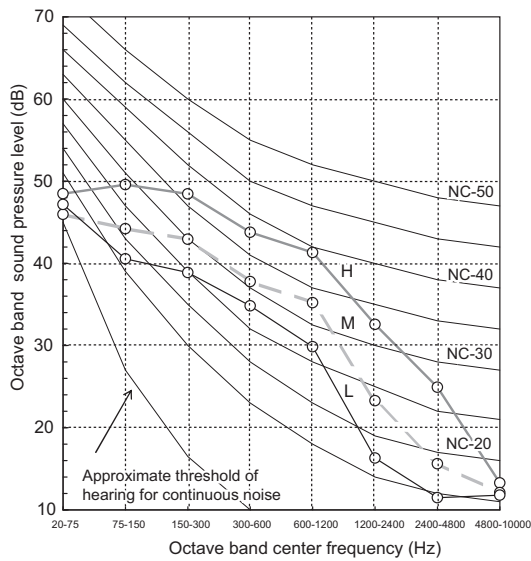
RAV-SP240UT-UL

| Fan tap | H | M | L |
|------------------------------|----|----|----|
| Sound pressure level (dB(A)) | 39 | 35 | 34 |



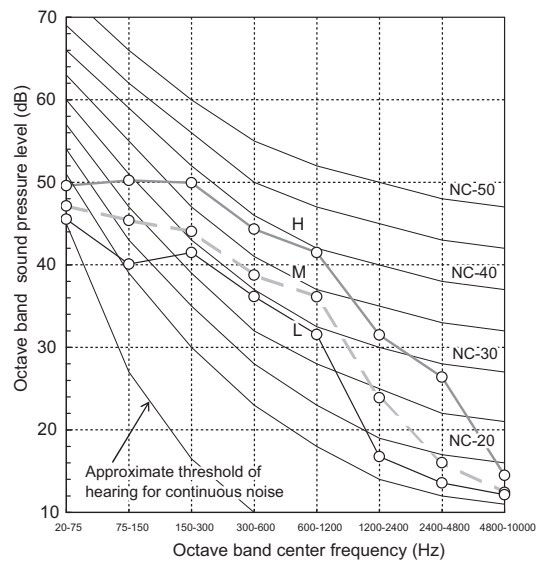
RAV-SP300UT-UL

| Fan tap | H | M | L |
|------------------------------|----|----|----|
| Sound pressure level (dB(A)) | 46 | 40 | 36 |



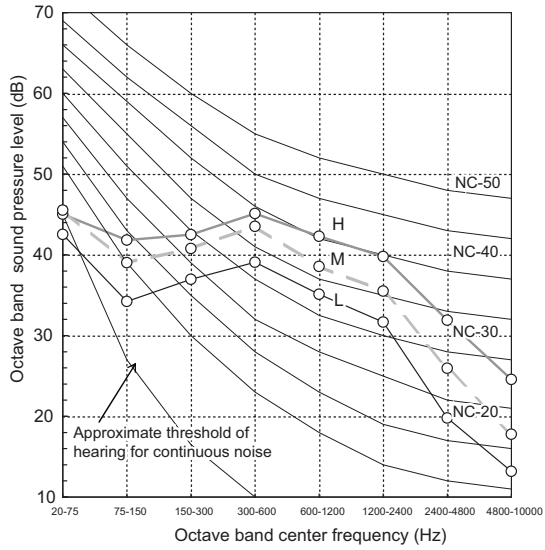
RAV-SP360UT-UL

| Fan tap | H | M | L |
|------------------------------|----|----|----|
| Sound pressure level (dB(A)) | 47 | 41 | 38 |



RAV-SP420UT-UL

| Fan tap | H | M | L |
|------------------------------|----|----|----|
| Sound pressure level (dB(A)) | 47 | 41 | 38 |



2-8. Accessory

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3. CEILING TYPE

3-1. Specifications

■ Ceiling USA

| System | | 018 | 024 | 030 | 036 | 042 | |
|-------------------------|------------------------------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|-----------|
| System | Outdoor Model | RAV-SP180AT2-UL | RAV-SP240AT2-UL | RAV-SP300AT2-UL | RAV-SP360AT2-UL | RAV-SP420AT2-UL | |
| | Indoor Model | RAV-SP180CT-UL | RAV-SP240CT-UL | RAV-SP300CT-UL | RAV-SP360CT-UL | RAV-SP420CT-UL | |
| | Indoor Model | RAV-SP180CT-UL | RAV-SP240CT-UL | RAV-SP300CT-UL | RAV-SP360CT-UL | RAV-SP420CT-UL | |
| Performance | Cooling Rated Capacity (Btu/h) | 17000 | 23600 | 30000 | 36000 | 41000 | |
| | SEER | 17.00 | 19.50 | 20.6 | 20.4 | 18.8 | |
| | EER | 8.6 | 9.0 | 13.0 | 12.0 | 9.7 | |
| | Heating Rated Capacity (Btu/h) | 19000 | 28800 | 29800 | 38000 | 44500 | |
| | HSPF | 10.8 | 10.30 | 8.5 | 11.00 | 11.00 | |
| Controls | Wireless (°C, °F, Convertible) | °F | °F | °F | °F | °F | |
| | Wireless Range ft. | 23 | 23 | 23 | 23 | 23 | |
| | IR or RF | IR | IR | IR | IR | IR | |
| | Wired (°C, °F, Convertible) | °F | °F | °F | °F | °F | |
| Operating Range | Cooling | Outdoor Min - Max DB (°F) *1 | 23 to 109 | 23 to 109 | 23 to 109 | 23 to 109 | 23 to 109 |
| | | Indoor Min - Max DB (°F) | 70 to 89 | 70 to 89 | 70 to 89 | 70 to 89 | 70 to 89 |
| | | Indoor Min - Max WB (°F) | 59 to 75 | 59 to 75 | 59 to 75 | 59 to 75 | 59 to 75 |
| | Heating | Outdoor WB Min - Max (°F) | -4 to 59 | -4 to 59 | -4 to 59 | -4 to 59 | -4 to 59 |
| | | Indoor DB Min - Max (°F) | 59 to 86 | 59 to 86 | 59 to 86 | 59 to 86 | 59 to 86 |
| Piping | Standard Piping Length (ft.) | 25 | 25 | 25 | 25 | 25 | |
| | Min. Piping Length (ft.) | 16'5" | 16'5" | 9'8" | 9'8" | 9'8" | |
| | Max. Piping Length (ft.) | 164'1" | 164'1" | 246'1" | 246'1" | 246'1" | |
| | Lift (Outdoor below Indoor) (ft.) | 98'5" | 98'5" | 98'5" | 98'5" | 98'5" | |
| | Lift (Outdoor above Indoor) (ft.) | 98'5" | 98'5" | 98'5" | 98'5" | 98'5" | |
| | Gas Pipe (size/connection type) | 1/2" | 5/8" | 5/8" | 5/8" | 5/8" | |
| | Liquid Pipe (size/connection type) | 1/4" | 3/8" | 3/8" | 3/8" | 3/8" | |
| | Additional refrigerant charge under long piping connection | 0.22oz/ft (65'7"ft to 164'1"ft) | 0.43oz/ft (98'5"ft to 164'1"ft) | 0.43oz/ft (98'5"ft to 246'1"ft) | 0.43oz/ft (98'5"ft to 246'1"ft) | 0.43oz/ft (98'5"ft to 246'1"ft) | |
| | Indoor Unit Piping Orientation | Back | Yes | Yes | Yes | Yes | Yes |
| | | Left | - | - | - | - | - |
| | | Right | Yes | Yes | Yes | Yes | Yes |
| | | Top | Yes | Yes | Yes | Yes | Yes |
| | Outdoor Model Piping Orientation | Side | Yes | Yes | Yes | Yes | Yes |
| | | Back | No | Yes | Yes | Yes | Yes |
| | | Bottom | No | Yes | Yes | Yes | Yes |
| | Drain Pump Lift | - | - | - | - | - | |
| | Drain Pump Lift (with a part of sold separately) (in.) | 23.8 (from product top) | 23.8 (from product top) | 23.8 (from product top) | 23.8 (from product top) | 23.8 (from product top) | |
| Electrical | Voltage | 208/230-1-60 | 208/230-1-60 | 208/230-1-60 | 208/230-1-60 | 208/230-1-60 | |
| | Indoor Unit Connected from Outdoor (Yes/No) | Yes | Yes | Yes | Yes | Yes | |
| | Number Of Conductors Between Indoor and Outdoor Units | 4 | 4 | 4 | 4 | 4 | |
| | Type of Wire (Shielded - yes or no) | No | No | No | No | No | |
| | Cooling Power Consumption (W) | 1977 | 2622 | 2308 | 3000 | 4227 | |
| | Heating Power Consumption | 1790 | 2840 | 2390 | 3210 | 3940 | |
| | Cooling Running Current (A) | 8.86 | 11.88 | 10.50 | 13.66 | 18.94 | |
| | Heating Running Current (A) | 12.74 | 12.74 | 10.71 | 14.34 | 17.58 | |
| | Maximum Current Amps (A) | 17 | 24 | 24 | 24 | 24 | |
| | Maximum Over Protection Device Amps (A)*2 | 30 | 40 | 40 | 40 | 40 | |
| | Breaker (A) | 20 | 25 | 25 | 25 | 25 | |
| Outdoor | Dimensions | Height (in.) | 21.7 | 35.0 | 52.8 | 52.8 | 52.8 |
| | | Width (in.) | 30.7 | 35.4 | 35.4 | 35.4 | 35.4 |
| | | Length (in.) | 11.4 | 12.6 | 12.6 | 12.6 | 12.6 |
| | Weight-Net/Gross (lbs.) | 98/105 | 144.5/157 | 211.5/226 | 211.5/226 | 211.5/226 | |
| | Refrigerant charged (lbs.) | 3.1 | 4.6 | 6.8 | 6.8 | 6.8 | |
| | Variable Speed Outdoor Motor (Yes/No) | Yes | Yes | Yes | Yes | Yes | |
| | Appearance | Silky shade (Muncel 1Y8.5/0.5) | Silky shade (Muncel 1Y8.5/0.5) | Silky shade (Muncel 1Y8.5/0.5) | Silky shade (Muncel 1Y8.5/0.5) | Silky shade (Muncel 1Y8.5/0.5) | |
| Sound Pressure (dB (A)) | 48/49 | 49/50 | 50/51 | 52/52 | 52/52 | | |
| Compressor | Type | Hermetic compressor | Hermetic compressor | Hermetic compressor | Hermetic compressor | Hermetic compressor | |
| | Motor (kW) | 1.1 | 2.0 | 3.75 | 3.75 | 3.75 | |
| Indoor | Dimensions | Width (in.) | 35.8 | 46.5 | 62.8 | 62.8 | 62.8 |
| | | Height (in.) | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 |
| | | Length (in.) | 26.8 | 26.8 | 26.8 | 26.8 | 26.8 |
| | | Weight-Net/Gross (lbs.) | 46/60 | 55/75 | 73/95 | 73/95 | 73/95 |
| | Appearance | shine white 10Y9.3/0.4 | shine white 10Y9.3/0.4 | shine white 10Y9.3/0.4 | shine white 10Y9.3/0.4 | shine white 10Y9.3/0.4 | |
| | Number of Fan Speeds | 3, Auto | 3, Auto | 3, Auto | 3, Auto | 3, Auto | |
| | Sound Pressure at Different Speeds (dB (A)) | 40/37/34 | 42/40/37 | 45/42/38 | 47/44/40 | 47/44/40 | |
| | Air flow DRY (CFM) (H/M/L) | 410/360/320 | 590/530/470 | 860/750/660 | 950/820/730 | 950/820/730 | |

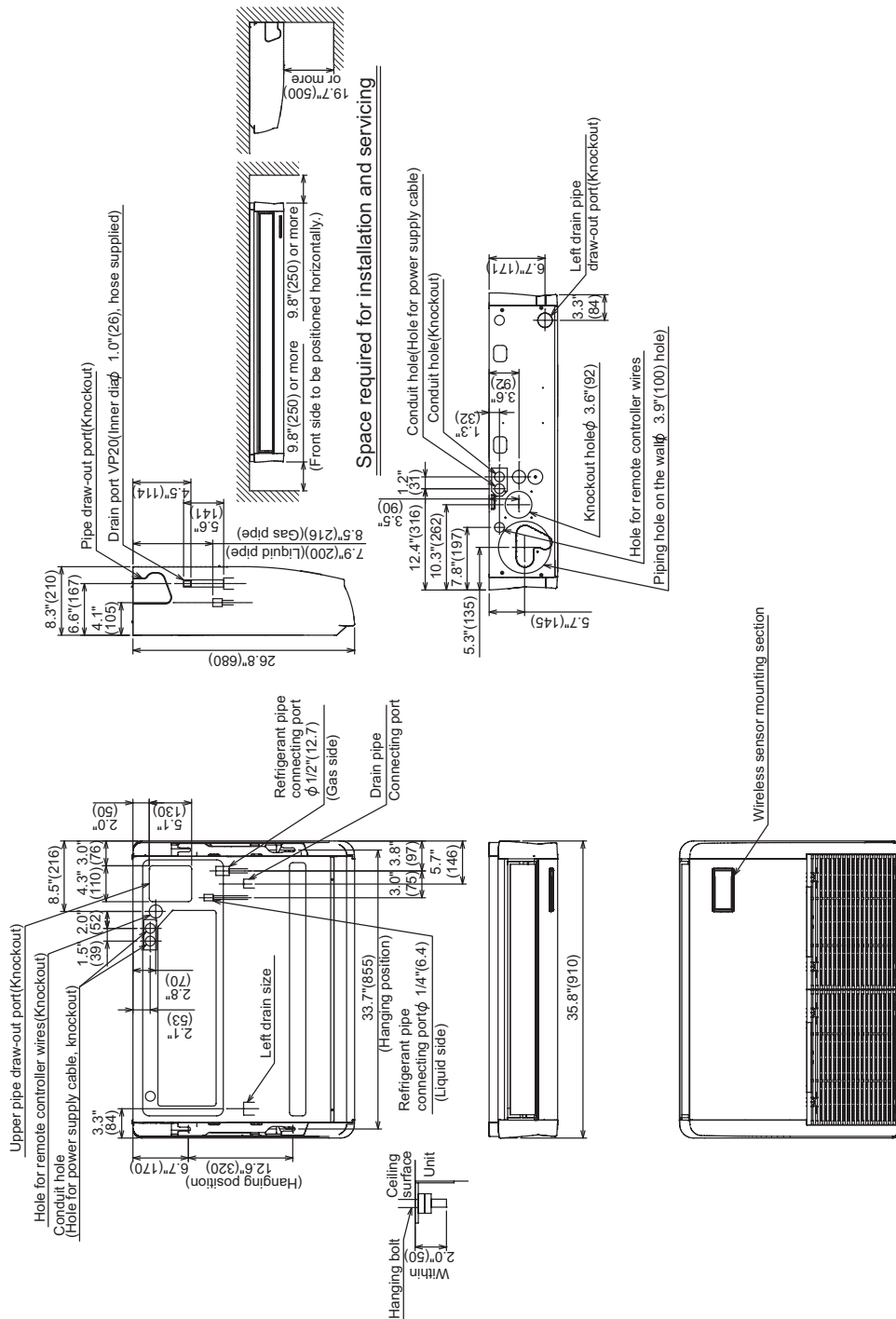
* 1 When installed a duct or wind shield so that it is not affected by the wind. The minimum outside temperature will be 5°F

* 2 UL value

3-2. Dimension

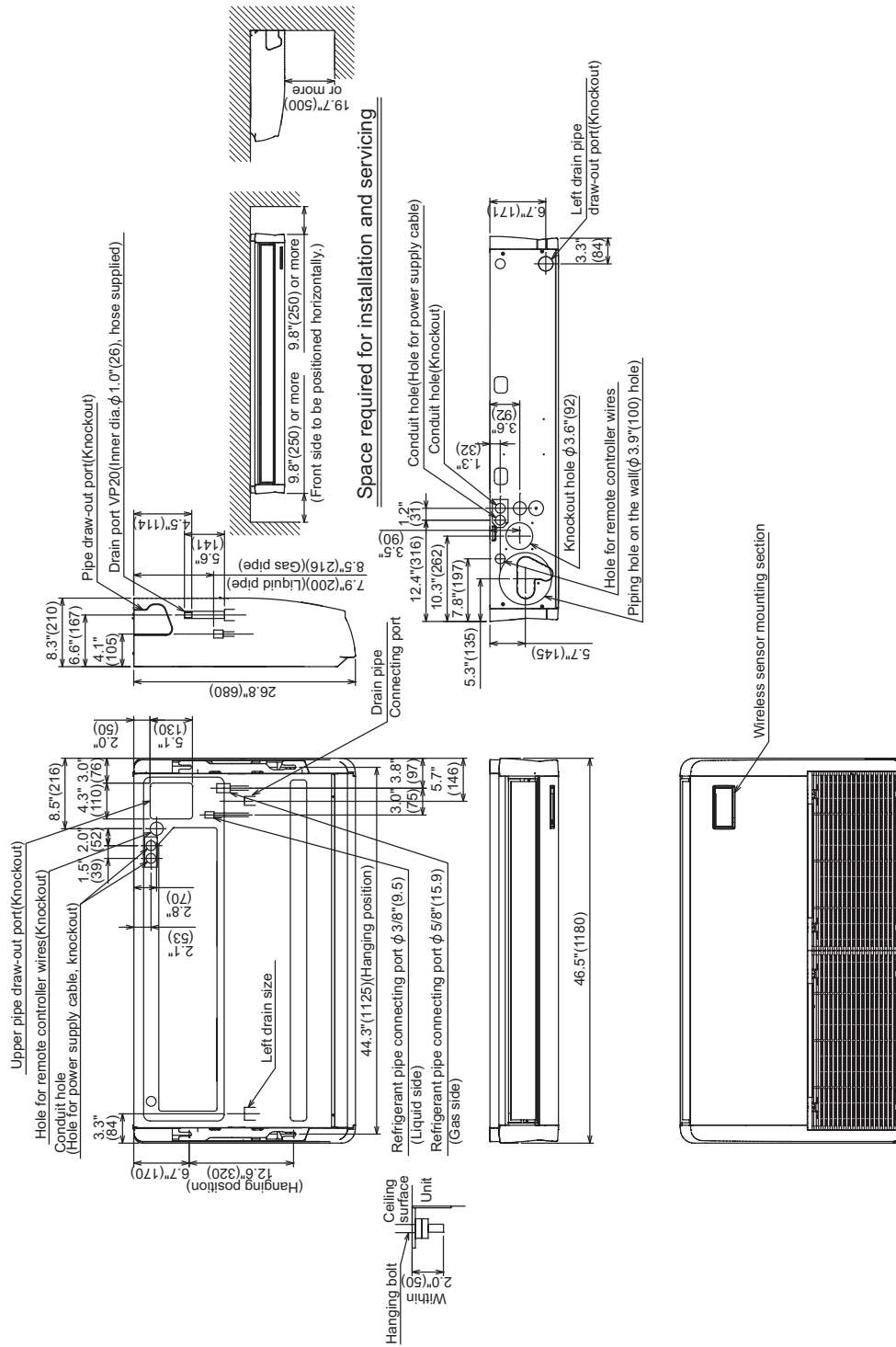
RAV-SP180CT-UL

Unit:in(mm)



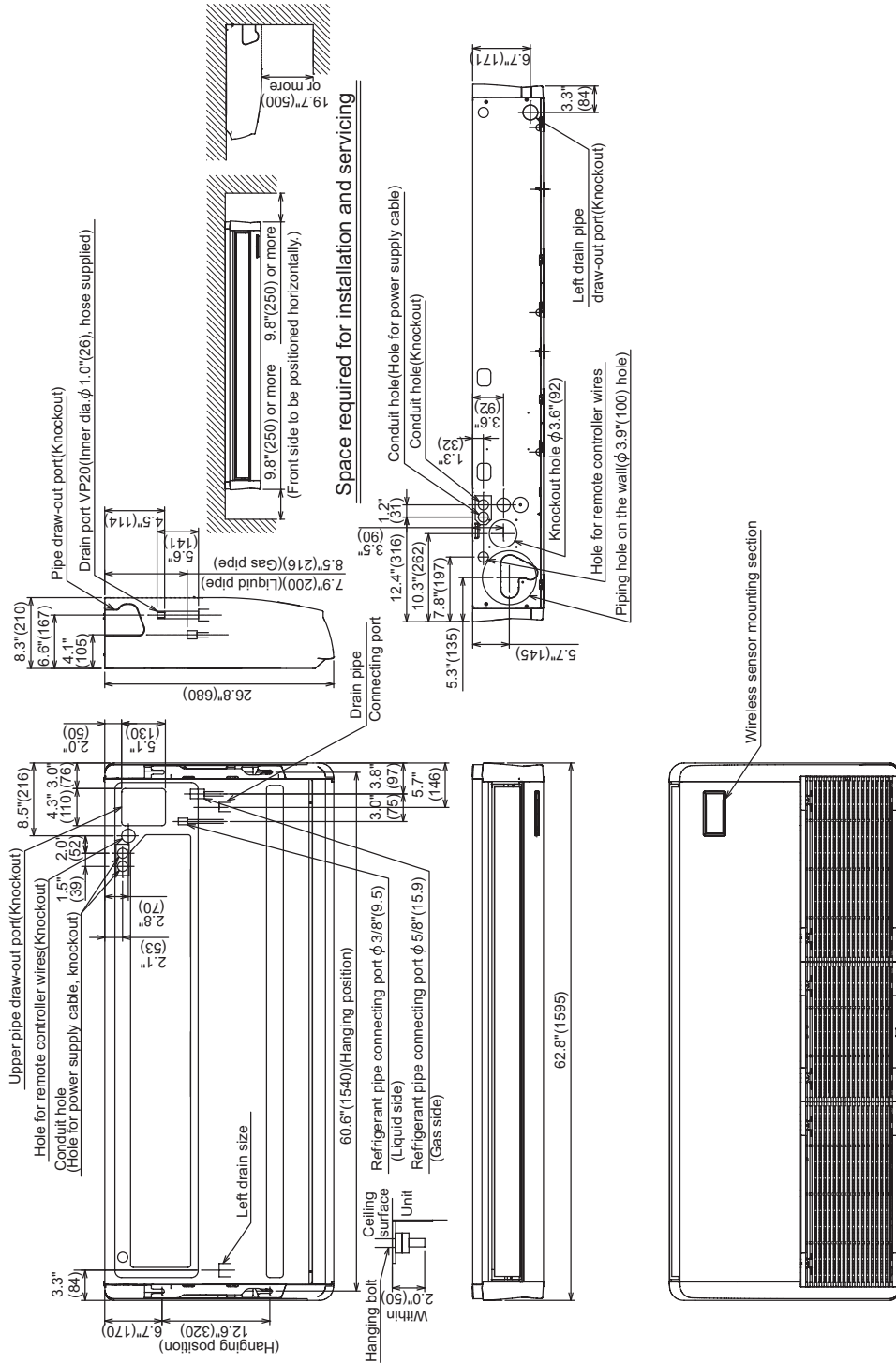
RAV-SP240CT-UL

Unit:in(mm)

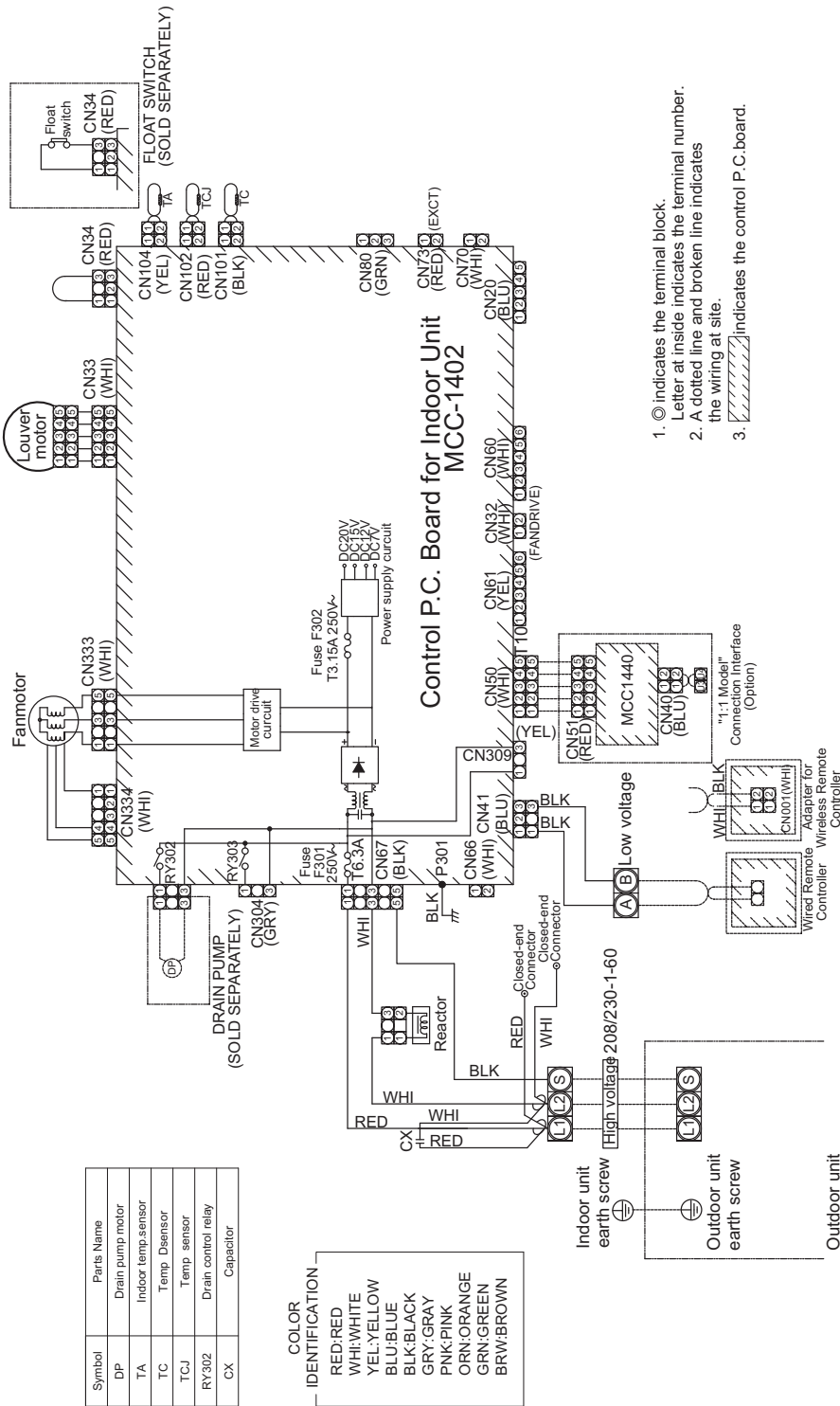


RAV-SP300CT-UL, RAV-SP360CT-UL, RAV-SP420CT-UL

Unit:in(mm)



3-3. Wiring Diagram



| unit size | outdoor air temp. DB | 57 WB 68 DB | | 59 WB 71 DB | | 61 WB 73 DB | | 63 WB 76 DB | | 64 WB 79 DB | | 66 WB 81 DB | | 68 WB 82 DB | | 72 WB 86 DB | | 75 WB 90 DB | |
|-----------|----------------------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|
| | | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC |
| 36k | 50.0 | 33800 | 22000 | 35500 | 23100 | 37300 | 24200 | 38600 | 25100 | 39900 | 25900 | 41100 | 26700 | 42300 | 27500 | 44800 | 29100 | 46800 | 30400 |
| | 54.0 | 33600 | 21800 | 35300 | 22900 | 37100 | 24100 | 38400 | 25000 | 39700 | 25800 | 40900 | 26600 | 42100 | 27400 | 44600 | 29000 | 46600 | 30300 |
| | 57.0 | 33300 | 21600 | 35100 | 22800 | 36800 | 23900 | 38100 | 24800 | 39400 | 25600 | 40600 | 26400 | 41800 | 27200 | 44200 | 28700 | 46300 | 30100 |
| | 61.0 | 33200 | 21600 | 34900 | 22700 | 36600 | 23800 | 37900 | 24600 | 39200 | 25500 | 40400 | 26300 | 41600 | 27000 | 44000 | 28600 | 46000 | 29900 |
| | 64.0 | 32900 | 21400 | 34600 | 22500 | 36300 | 23600 | 37600 | 24400 | 38900 | 25300 | 40000 | 26000 | 41100 | 26700 | 43600 | 28300 | 45600 | 29600 |
| | 68.0 | 32600 | 21200 | 34300 | 22300 | 36000 | 23400 | 37300 | 24200 | 38600 | 25100 | 39700 | 25800 | 40800 | 26500 | 43200 | 28100 | 45200 | 29400 |
| | 70.0 | 32400 | 21100 | 34100 | 22200 | 35800 | 23300 | 37100 | 24100 | 38400 | 25000 | 39500 | 25700 | 40600 | 26400 | 43000 | 28000 | 45000 | 29300 |
| | 73.0 | 32100 | 20900 | 33800 | 22000 | 35500 | 23100 | 36700 | 23900 | 38000 | 24700 | 39100 | 25400 | 40200 | 26100 | 42600 | 27700 | 44500 | 28900 |
| | 77.0 | 31800 | 20700 | 33400 | 21700 | 35100 | 22800 | 36300 | 23600 | 37600 | 24400 | 38700 | 25200 | 39800 | 25900 | 42200 | 27400 | 44100 | 28700 |
| | 81.0 | 31400 | 20400 | 33000 | 21500 | 34700 | 22600 | 35900 | 23300 | 37100 | 24100 | 38200 | 24800 | 39300 | 25600 | 41600 | 27000 | 43500 | 28300 |
| | 84.0 | 31000 | 20200 | 32600 | 21200 | 34200 | 22200 | 35400 | 23000 | 36600 | 23800 | 37700 | 24500 | 38800 | 25200 | 41100 | 26700 | 43000 | 28000 |
| | 88.0 | 30600 | 19900 | 32200 | 20900 | 33700 | 21900 | 34900 | 22700 | 36100 | 23500 | 37200 | 24200 | 38300 | 24900 | 40500 | 26300 | 42400 | 27600 |
| | 91.0 | 30100 | 19600 | 31600 | 20500 | 33200 | 21600 | 34400 | 22400 | 35600 | 23100 | 36600 | 23800 | 37600 | 24400 | 39900 | 25900 | 41700 | 27100 |
| | 95.0 | 29600 | 19200 | 31100 | 20200 | 32700 | 21300 | 33800 | 22200 | 35000 | 22800 | 36000 | 23400 | 37000 | 24100 | 39200 | 25500 | 41000 | 26700 |
| | 99.0 | 29000 | 18900 | 30500 | 19800 | 32000 | 20800 | 33200 | 21600 | 34300 | 22300 | 35300 | 22900 | 36300 | 23600 | 38500 | 25000 | 40200 | 26100 |
| 102.0 | 28400 | 18500 | 29900 | 19400 | 31400 | 20400 | 32500 | 21100 | 33600 | 21800 | 34600 | 22500 | 35600 | 23100 | 37700 | 24500 | 39400 | 25600 | |
| 106.0 | 24800 | 16100 | 26100 | 17000 | 27400 | 17800 | 28400 | 18500 | 29300 | 19000 | 30200 | 19600 | 31100 | 20200 | 32900 | 21400 | 34400 | 22400 | |
| 109.0 | 24100 | 15700 | 25400 | 16500 | 26700 | 17400 | 27600 | 17900 | 28600 | 18600 | 29400 | 19100 | 30200 | 19600 | 32000 | 20800 | 33500 | 21800 | |

| unit size | outdoor air temp. DB | 57 WB 68 DB | | 59 WB 71 DB | | 61 WB 73 DB | | 63 WB 76 DB | | 64 WB 79 DB | | 66 WB 81 DB | | 68 WB 82 DB | | 72 WB 86 DB | | 75 WB 90 DB | |
|-----------|----------------------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|
| | | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC |
| 42k | 50.0 | 38500 | 25100 | 40500 | 26400 | 42500 | 27700 | 44100 | 28700 | 45600 | 29700 | 46900 | 30500 | 48200 | 31400 | 51100 | 33300 | 53400 | 34800 |
| | 54.0 | 38300 | 24900 | 40300 | 26200 | 42300 | 27500 | 43800 | 28500 | 45300 | 29500 | 46600 | 30300 | 47900 | 31200 | 50800 | 33100 | 53100 | 34600 |
| | 57.0 | 38000 | 24700 | 40000 | 26000 | 42000 | 27400 | 43500 | 28300 | 45000 | 29300 | 46300 | 30200 | 47600 | 31000 | 50400 | 32800 | 52700 | 34300 |
| | 61.0 | 37800 | 24600 | 39800 | 25900 | 41700 | 27200 | 43200 | 28100 | 44700 | 29100 | 46000 | 30000 | 47300 | 30800 | 50100 | 32600 | 52400 | 34100 |
| | 64.0 | 37500 | 24400 | 39400 | 25700 | 41400 | 27000 | 42800 | 27900 | 44300 | 28800 | 45600 | 29700 | 46900 | 30500 | 49700 | 32400 | 52000 | 33900 |
| | 68.0 | 37100 | 24200 | 39100 | 25500 | 41000 | 26700 | 42500 | 27700 | 43900 | 28600 | 45200 | 29400 | 46500 | 30300 | 49200 | 32000 | 51500 | 33500 |
| | 70.0 | 37000 | 24100 | 38900 | 25300 | 40800 | 26600 | 42300 | 27500 | 43700 | 28500 | 45000 | 29300 | 46300 | 30200 | 49000 | 31900 | 51300 | 33400 |
| | 73.0 | 36600 | 23800 | 38500 | 25100 | 40500 | 26400 | 41900 | 27300 | 43300 | 28200 | 44600 | 29000 | 45900 | 29900 | 48600 | 31600 | 50800 | 33100 |
| | 77.0 | 36200 | 23600 | 38100 | 24800 | 40000 | 26000 | 41400 | 27000 | 42800 | 27900 | 44100 | 28700 | 45400 | 29600 | 48000 | 31300 | 50200 | 32700 |
| | 81.0 | 35700 | 23200 | 37600 | 24500 | 39500 | 25700 | 40900 | 26600 | 42300 | 27500 | 43500 | 28300 | 44700 | 29100 | 47400 | 30900 | 49600 | 32300 |
| | 84.0 | 35300 | 23000 | 37100 | 24200 | 39000 | 25400 | 40400 | 26300 | 41700 | 27200 | 42968 | 28000 | 44200 | 28800 | 46800 | 30500 | 49000 | 31900 |
| | 88.0 | 34800 | 22700 | 36600 | 23800 | 38500 | 25100 | 39800 | 25900 | 41200 | 26800 | 42400 | 27600 | 43600 | 28400 | 46200 | 30100 | 48300 | 31500 |
| | 91.0 | 34300 | 22300 | 36000 | 23400 | 37800 | 24600 | 39200 | 25500 | 40500 | 26400 | 41700 | 27200 | 42900 | 27900 | 45400 | 29600 | 47500 | 30900 |
| | 95.0 | 33700 | 21900 | 35400 | 23100 | 37200 | 24200 | 38500 | 25100 | 39800 | 25900 | 41000 | 26700 | 42200 | 27500 | 44700 | 29100 | 46700 | 30400 |
| | 99.0 | 33000 | 21500 | 34700 | 22600 | 36500 | 23800 | 37800 | 24600 | 39100 | 25500 | 40200 | 26200 | 41300 | 26900 | 43800 | 28500 | 45800 | 29800 |
| 102.0 | 32400 | 21100 | 34100 | 22200 | 35700 | 23200 | 37000 | 24100 | 38300 | 24900 | 39400 | 25700 | 40500 | 26400 | 42900 | 27900 | 44900 | 29200 | |
| 106.0 | 28300 | 18400 | 29700 | 19300 | 31200 | 20300 | 32300 | 21000 | 33400 | 21800 | 34400 | 22400 | 35400 | 23100 | 37500 | 24400 | 39200 | 25500 | |
| 109.0 | 27500 | 17900 | 29000 | 18900 | 30400 | 19800 | 31500 | 20500 | 32500 | 21200 | 33500 | 21800 | 34500 | 22500 | 36500 | 23800 | 38200 | 24900 | |

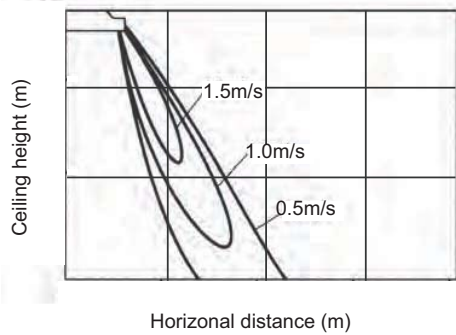
TC:Total Capacity [Btu/h]

SHC:Sensible Heat Capacity [Btu/h]

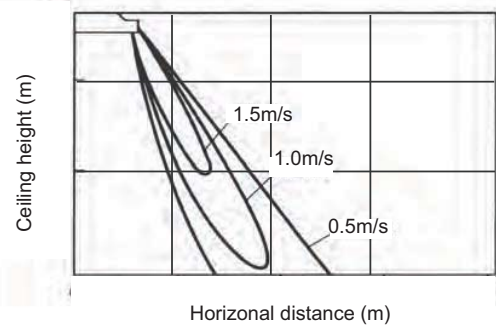
3-5. Capacity / Input Change Characteristic

3-6. Air Speed Characteristics

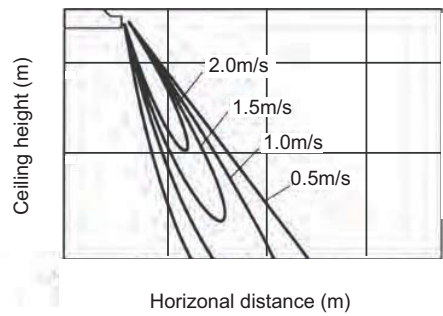
RAV-SP180CT-UL



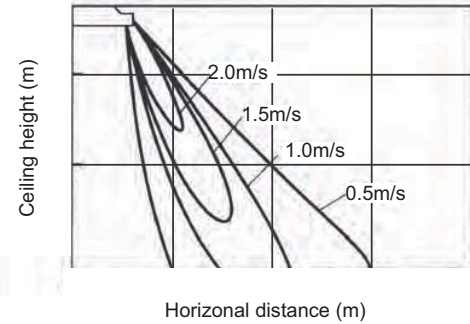
RAV-SP240CT-UL



RAV-SP300CT-UL



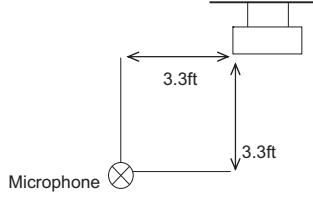
RAV-SP360CT-UL, RAV-SP420CT-UL



3-7. Sound Characteristics (NC curve)

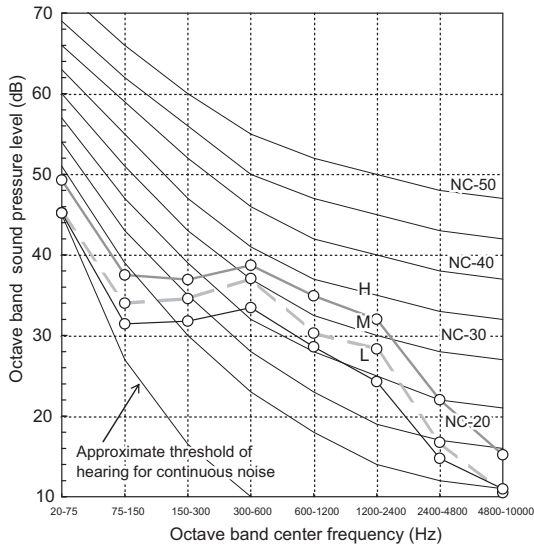
■ Ceiling Type

[Measuring location]



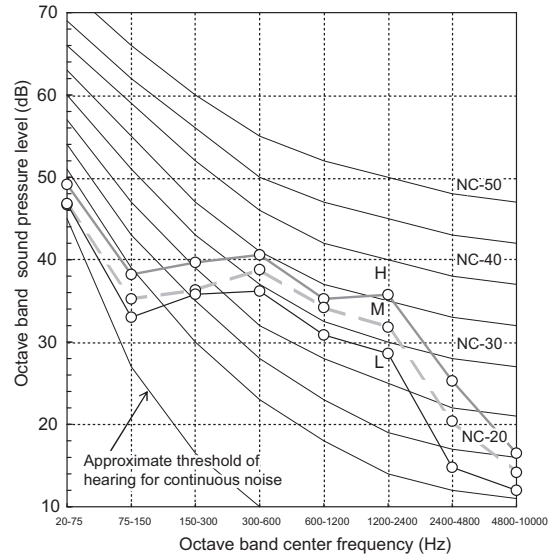
RAV-SP180CT-UL

| Fan tap | H | M | L |
|------------------------------|----|----|----|
| Sound pressure level (dB(A)) | 40 | 37 | 34 |



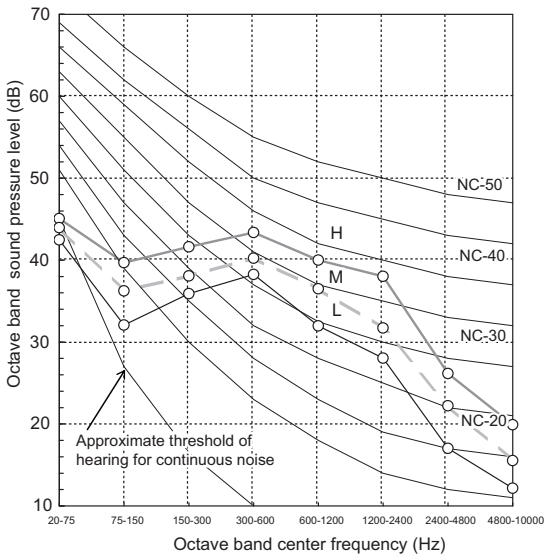
RAV-SP240CT-UL

| Fan tap | H | M | L |
|------------------------------|----|----|----|
| Sound pressure level (dB(A)) | 42 | 40 | 37 |



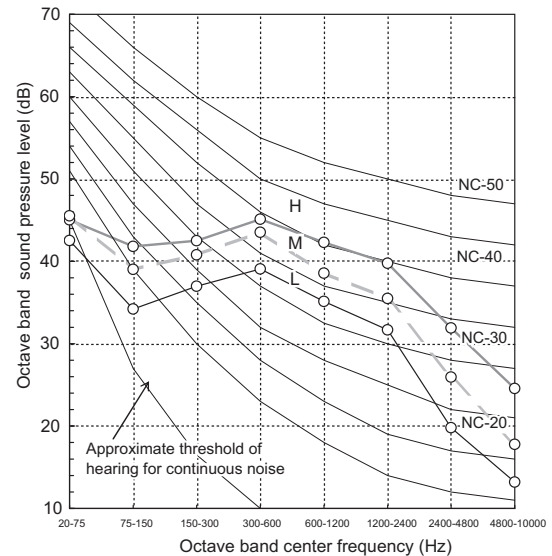
RAV-SP300CT-UL

| Fan tap | H | M | L |
|------------------------------|----|----|----|
| Sound pressure level (dB(A)) | 45 | 42 | 38 |



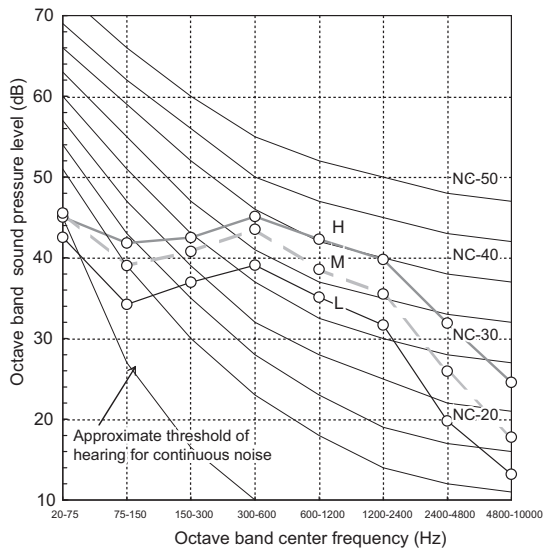
RAV-SP360CT-UL

| Fan tap | H | M | L |
|------------------------------|----|----|----|
| Sound pressure level (dB(A)) | 47 | 44 | 40 |



RAV-SP420CT-UL

| Fan tap | H | M | L |
|------------------------------|----|----|----|
| Sound pressure level (dB(A)) | 47 | 44 | 40 |



3-8. Accessory

Contents

| | |
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4. HIGH WALL TYPE

4-1. Specifications

■ Highwall USA

| System | | 018 | 024 |
|------------------------------------------------------------|----------------------------------|--------------------------------|--------------------------------|
| Outdoor Model | | RAV-SP180AT2-UL | RAV-SP240AT2-UL |
| Indoor Model | | RAV-SP180KRT-UL | RAV-SP240KRT-UL |
| Performance | | | |
| Cooling Rated Capacity (Btu/h) | | 18000 | 25000 |
| SEER | | 19.5 | 16.7 |
| EER | | 10.0 | 9.1 |
| Heating Rated Capacity (Btu/h) | | 19000 | 26400 |
| HSPF | | 11.5 | 9.8 |
| Controls | | | |
| Wireless (°C, °F, Convertible) | | Convertible | Convertible |
| Wireless Range (ft.) | | 23 | 23 |
| IR or RF | | IR | IR |
| Wired (°C, °F, Convertible) | | °F | °F |
| Operating Range | | | |
| Cooling | Outdoor Min - Max DB (°F) *1 | 23 to 109 | 23 to 109 |
| | Indoor Min - Max DB (°F) | 70 to 89 | 69 to 89 |
| | Indoor Min - Max WB (°F) | 59 to 75 | 59 to 75 |
| Heating | Outdoor WB Min - Max (°F) | -4 to 59 | -4 to 59 |
| | Indoor DB Min -Max (°F) | 59 to 86 | 59 to 86 |
| Piping | | | |
| Standard Piping Length (ft.) | | 25 | 25 |
| Min. Piping Length (ft.) | | 16'5" | 16'5" |
| Max. Piping Length (ft.) | | 164'1" | 164'1" |
| Lift (Outdoor below Indoor) (ft.) | | 98'5" | 98'5" |
| Lift (Outdoor above Indoor) (ft.) | | 98'5" | 98'5" |
| Gas Pipe (size/connection type) | | 1/2" | 5/8" |
| Liquid Pipe (size/connection type) | | 1/4" | 3/8" |
| Additional refrigerant charge under long piping connection | | 0.22oz/ft (65'7" to 164'1") | 0.43oz/ft (98'5" to 164'1") |
| Indoor Model Piping Orientation | Left Back | Yes | Yes |
| | Right Back | Yes | Yes |
| | Left Bottom | Yes | Yes |
| | Right Bottom | Yes | Yes |
| | Left | Yes | Yes |
| | Outdoor Model Piping Orientation | Side | Yes |
| | Back | No | Yes |
| | Bottom | No | Yes |
| Drain Pump Lift (in.) | | - | - |
| Electrical | | | |
| Voltage | | 208/230-1-60 | 208/230-1-60 |
| Indoor Unit Connected from Outdoor (Yes/No) | | Yes | Yes |
| Number Of Conductors Between Indoor and Outdoor Units | | 4 | 4 |
| Type of Wire (Shielded - yes or no) | | | |
| Cooling Power Consumption (W) | | 1800 | 2747 |
| Heating Power Consumption | | 1710 | 2780 |
| Cooling Running Current (A) | | 7.96 | 12.20 |
| Heating Running Current (A) | | 7.53 | 12.52 |
| Maximum Current Amps (A) | | 17 | 24 |
| Maximum Over Protection Device Amps (A)*2 | | 30 | 40 |
| Breaker (A) | | 20 | 25 |
| Outdoor | | | |
| Dimensions | Height (in.) | 21.7 | 35.0 |
| | Width (in.) | 30.7 | 35.4 |
| | Length (in.) | 11.4 | 12.6 |
| Weight -Net/Gross (lbs.) | | 98/105 | 144.5/157 |
| Refrigerant charged (lbs.) | | 3.1 | 4.6 |
| Variable Speed Outdoor Motor (Yes/No) | | Yes | Yes |
| Appearance | | Silky shade (Muncel 1Y8.5/0.5) | Silky shade (Muncel 1Y8.5/0.5) |
| Sound Pressure (dB (A)) | | 48/49 | 49/50 |
| Compressor | | | |
| Type | | Hermetic compressor | Hermetic compressor |
| Motor | | 1.1 | 2.0 |
| Indoor | | | |
| Dimensions | Width (in.) | 9 | 9 |
| | Height (in.) | 12.6 | 12.6 |
| | Length (in.) | 41.3 | 41.3 |
| Weight -Net/Gross (lbs.) | | 31/36 | 31/36 |
| Appearance | | Moon White (2.5GY9.0/0.5) | Moon White (2.5GY9.0/0.5) |
| Sound Pressure at Different Speeds (dB (A)) | | 43/41/38 | 46/41/38 |
| Air flow DRY (CFM) (H/M/L) | | 490/430/400 | 560/460/410 |

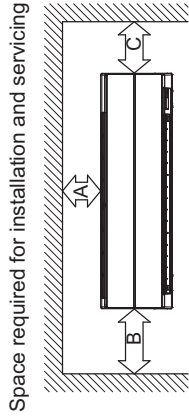
* 1 When installed a duct or wind shield so that it is not affected by the wind. The minimum outside temperature will be 5°F

* 2 UL value

4-2. Dimension

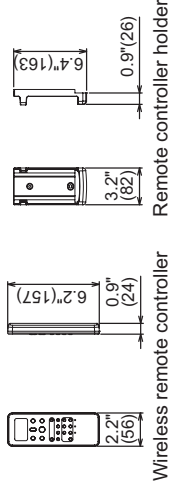
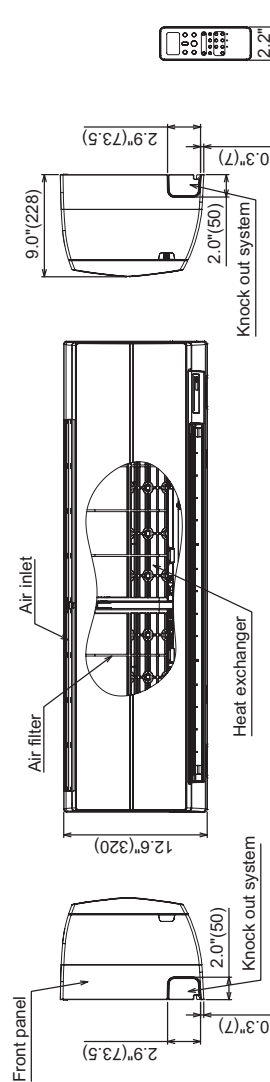
RAV-SP180KRT-UL

Unit:in(mm)

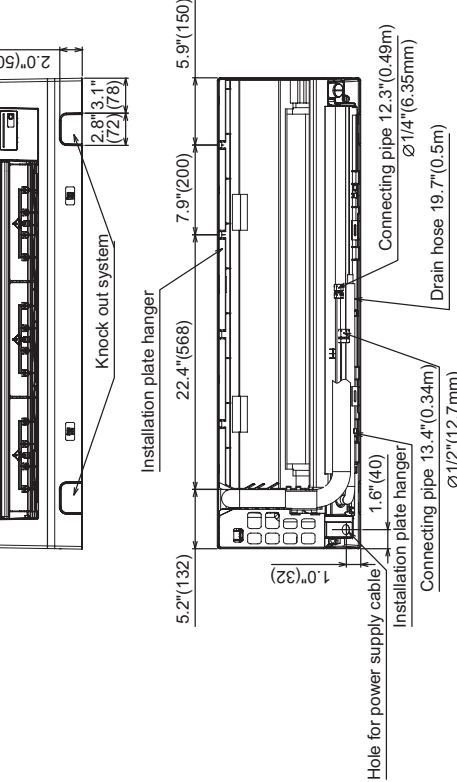
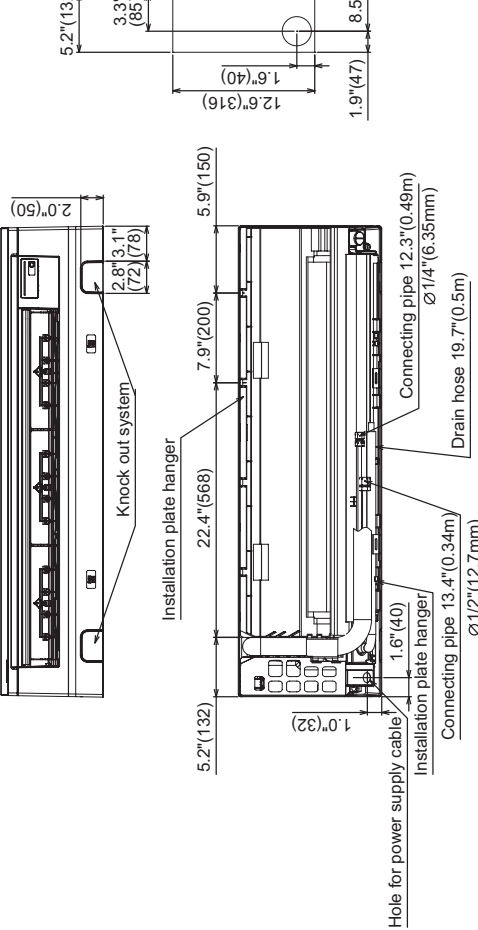


CAUTION
Connecting pipe cannot be connected to the right side of the indoor unit when conduit pipe is used.
When connecting pipe is connected on the left or bottom of the indoor unit, connect the conduit pipe on other side.

| Distance | Comments |
|----------------------|--------------------------------|
| A 2.0"(50) or more | For exchange of cross flow fan |
| B 33.5"(850) or more | |
| C 6.7"(170) or more | |

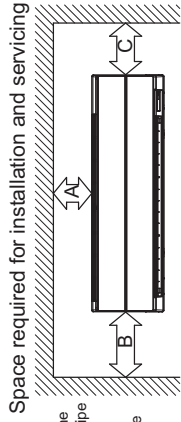


Wireless remote controller Remote controller holder



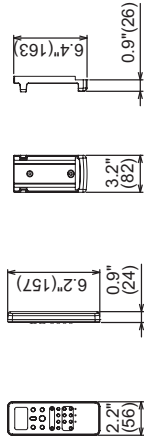
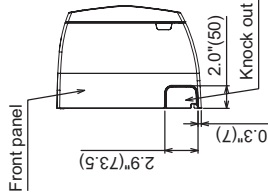
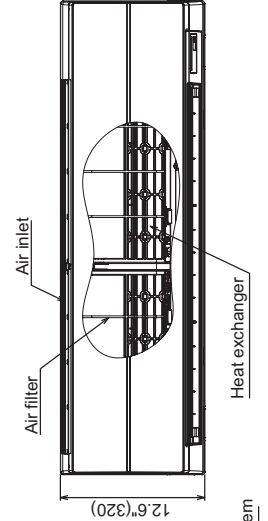
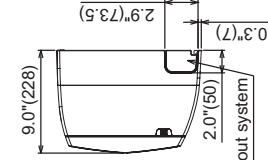
RAV-SP240KRT-UL

Unit:in(mm)

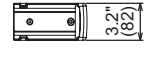


CAUTION
Connecting pipe cannot be connected to the right side of the indoor unit when conduit pipe is used.
When connecting pipe is connected on the left or bottom of the indoor unit, connect the conduit pipe on other side.

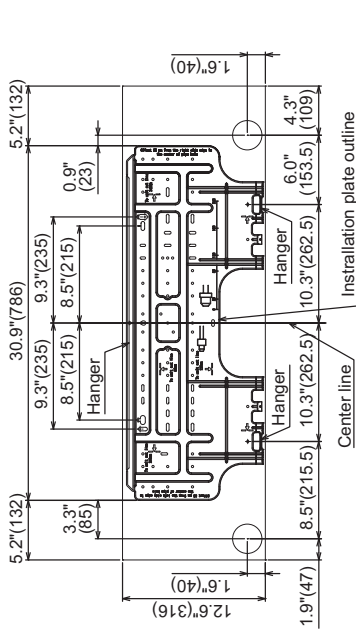
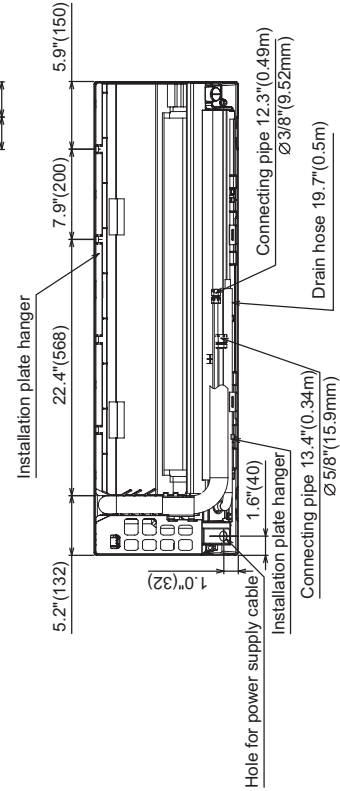
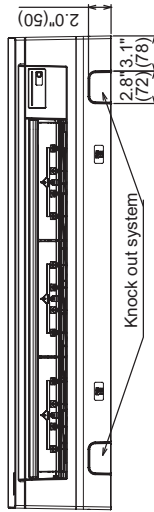
| Distance | Comments |
|----------------------|--------------------------------|
| A 2.0"(50) or more | |
| B 33.5"(850) or more | For exchange of cross flow fan |
| C 6.7"(170) or more | |



Wireless remote controller

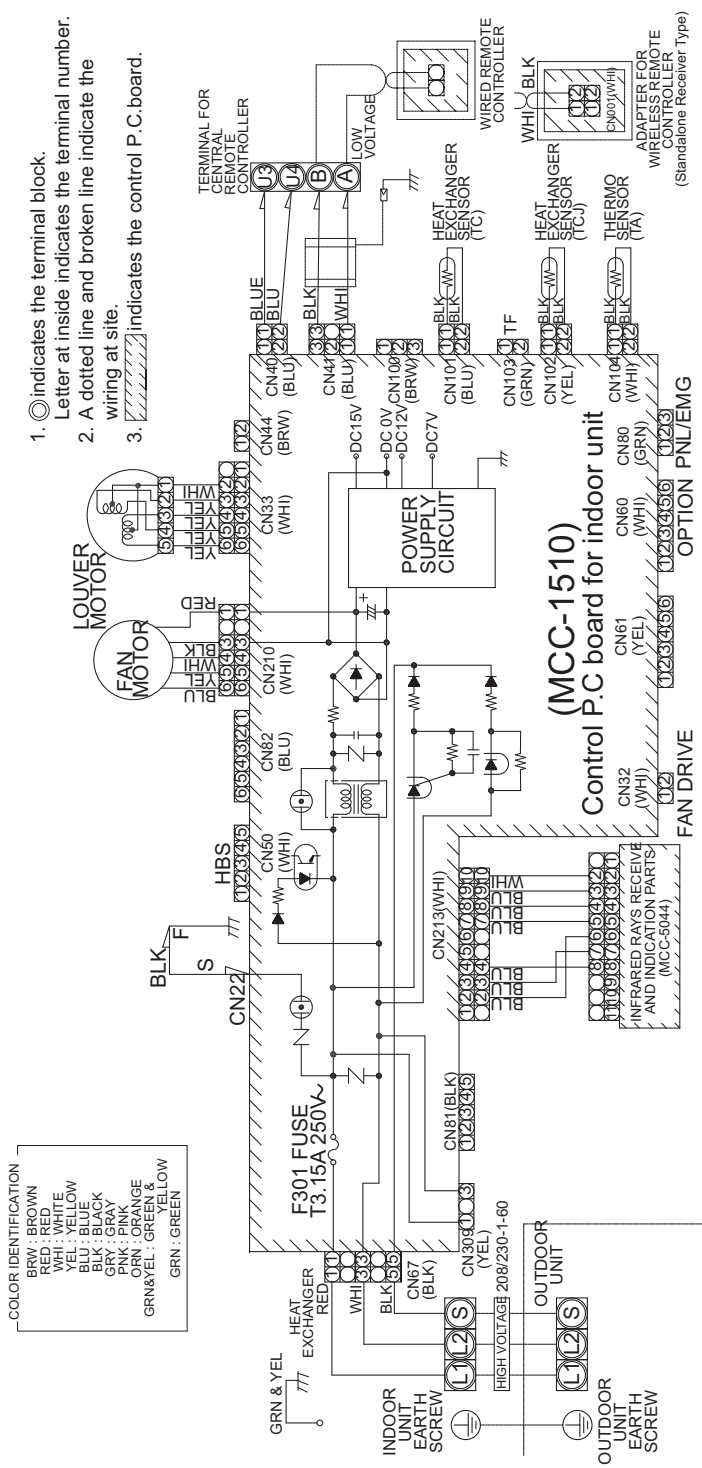


Remote controller holder



Installation plate outline

4-3. Wiring Diagram



4-4. Sensible Capacity Table

| unit size | outdoor air temp. DB | 57 WB 68 DB | | 59 WB 71 DB | | 61 WB 73 DB | | 63 WB 76 DB | | 64 WB 79 DB | | 66 WB 81 DB | | 68 WB 82 DB | | 72 WB 86 DB | | 75 WB 90 DB | |
|-----------|----------------------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|
| | | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC |
| 18k | 50.0 | 16900 | 11500 | 17800 | 12100 | 18700 | 12700 | 19300 | 13100 | 20000 | 13600 | 20600 | 14000 | 21200 | 14400 | 22400 | 15200 | 23500 | 15900 |
| | 54.0 | 16800 | 11400 | 17600 | 11900 | 18500 | 12500 | 19200 | 13000 | 19800 | 13400 | 20400 | 13800 | 21000 | 14200 | 22200 | 15000 | 23200 | 15700 |
| | 57.0 | 16700 | 11300 | 17500 | 11900 | 18400 | 12500 | 19100 | 12900 | 19700 | 13400 | 20300 | 13800 | 20900 | 14200 | 22100 | 15000 | 23100 | 15700 |
| | 61.0 | 16600 | 11300 | 17500 | 11900 | 18300 | 12400 | 19000 | 12900 | 19600 | 13300 | 20200 | 13700 | 20800 | 14100 | 22000 | 14900 | 23000 | 15600 |
| | 64.0 | 16400 | 11100 | 17300 | 11700 | 18100 | 12300 | 18800 | 12700 | 19400 | 13100 | 20000 | 13600 | 20600 | 14000 | 21800 | 14800 | 22800 | 15500 |
| | 68.0 | 16300 | 11000 | 17200 | 11700 | 18100 | 12300 | 18700 | 12700 | 19300 | 13100 | 19900 | 13500 | 20500 | 13900 | 21700 | 14700 | 22700 | 15400 |
| | 70.0 | 16300 | 11000 | 17100 | 11600 | 18000 | 12200 | 18600 | 12600 | 19200 | 13000 | 19800 | 13400 | 20400 | 13800 | 21600 | 14600 | 22600 | 15300 |
| | 73.0 | 16100 | 10900 | 16900 | 11500 | 17800 | 12100 | 18400 | 12500 | 19000 | 12900 | 19600 | 13300 | 20200 | 13700 | 21400 | 14500 | 22300 | 15100 |
| | 77.0 | 15900 | 10800 | 16800 | 11400 | 17600 | 11900 | 18200 | 12300 | 18800 | 12700 | 19400 | 13100 | 20000 | 13600 | 21100 | 14300 | 22100 | 15000 |
| | 81.0 | 15700 | 10600 | 16500 | 11200 | 17300 | 11700 | 17900 | 12100 | 18600 | 12600 | 19100 | 12900 | 19600 | 13300 | 20800 | 14100 | 21800 | 14800 |
| | 84.0 | 15500 | 10500 | 16300 | 11000 | 17100 | 11600 | 17800 | 12100 | 18400 | 12500 | 18900 | 12800 | 19400 | 13100 | 20600 | 14000 | 21500 | 14600 |
| | 88.0 | 15300 | 10400 | 16100 | 10900 | 16900 | 11500 | 17500 | 11900 | 18100 | 12300 | 18600 | 12600 | 19100 | 12900 | 20300 | 13800 | 21200 | 14400 |
| | 91.0 | 15000 | 10200 | 15800 | 10700 | 16600 | 11300 | 17200 | 11700 | 17800 | 12100 | 18300 | 12400 | 18800 | 12700 | 19900 | 13500 | 20800 | 14100 |
| | 95.0 | 14800 | 10000 | 15600 | 10600 | 16300 | 11000 | 16900 | 11500 | 17500 | 11900 | 18000 | 12200 | 18500 | 12500 | 19600 | 13300 | 20500 | 13900 |
| | 99.0 | 14500 | 9800 | 15300 | 10400 | 16100 | 10900 | 16600 | 11300 | 17200 | 11700 | 17700 | 12000 | 18200 | 12300 | 19300 | 13100 | 20200 | 13700 |
| | 102.0 | 14200 | 9600 | 15000 | 10200 | 15700 | 10600 | 16200 | 11000 | 16800 | 11400 | 17300 | 11700 | 17800 | 12100 | 18800 | 12700 | 19700 | 13400 |
| 106.0 | 12400 | 8400 | 13100 | 8900 | 13700 | 9300 | 14200 | 9600 | 14700 | 10000 | 15100 | 10200 | 15500 | 10500 | 16400 | 11100 | 17200 | 11700 | |
| 109.0 | 12100 | 8200 | 12700 | 8600 | 13300 | 9000 | 13800 | 9400 | 14300 | 9700 | 14700 | 10000 | 15100 | 10200 | 16000 | 10800 | 16700 | 11300 | |

| unit size | outdoor air temp. DB | 57 WB 68 DB | | 59 WB 71 DB | | 61 WB 73 DB | | 63 WB 76 DB | | 64 WB 79 DB | | 66 WB 81 DB | | 68 WB 82 DB | | 72 WB 86 DB | | 75 WB 90 DB | |
|-----------|----------------------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|
| | | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC | TC | SHC |
| 24k | 50.0 | 23500 | 14900 | 24700 | 15600 | 25900 | 16400 | 26900 | 17000 | 27800 | 17600 | 28600 | 18100 | 29400 | 18600 | 31200 | 19700 | 32600 | 20600 |
| | 54.0 | 23300 | 14700 | 24500 | 15500 | 25800 | 16300 | 26700 | 16900 | 27600 | 17400 | 28400 | 18000 | 29200 | 18500 | 30900 | 19500 | 32400 | 20500 |
| | 57.0 | 23200 | 14700 | 24400 | 15400 | 25600 | 16200 | 26500 | 16700 | 27400 | 17300 | 28200 | 17800 | 29000 | 18300 | 30700 | 19400 | 32100 | 20300 |
| | 61.0 | 23000 | 14500 | 24200 | 15300 | 25400 | 16100 | 26300 | 16600 | 27200 | 17200 | 28000 | 17700 | 28800 | 18200 | 30500 | 19300 | 31900 | 20200 |
| | 64.0 | 22800 | 14400 | 24000 | 15200 | 25200 | 15900 | 26100 | 16500 | 27000 | 17100 | 27800 | 17600 | 28600 | 18100 | 30300 | 19100 | 31700 | 20000 |
| | 68.0 | 22700 | 14300 | 23900 | 15100 | 25000 | 15800 | 25900 | 16400 | 26800 | 16900 | 27600 | 17400 | 28400 | 17900 | 30100 | 19000 | 31400 | 19800 |
| | 70.0 | 22600 | 14300 | 23800 | 15000 | 24900 | 15700 | 25800 | 16300 | 26700 | 16900 | 27500 | 17400 | 28300 | 17900 | 30000 | 19000 | 31300 | 19800 |
| | 73.0 | 22300 | 14100 | 23500 | 14900 | 24700 | 15600 | 25500 | 16100 | 26400 | 16700 | 27200 | 17200 | 28000 | 17700 | 29600 | 18700 | 31000 | 19600 |
| | 77.0 | 22100 | 14000 | 23200 | 14700 | 24400 | 15400 | 25300 | 16000 | 26100 | 16500 | 26900 | 17000 | 27700 | 17500 | 29300 | 18500 | 30600 | 19300 |
| | 81.0 | 21800 | 13800 | 23000 | 14500 | 24100 | 15200 | 25000 | 15800 | 25800 | 16300 | 26600 | 16800 | 27400 | 17300 | 29000 | 18300 | 30300 | 19100 |
| | 84.0 | 21500 | 13600 | 22600 | 14300 | 23800 | 15000 | 24600 | 15500 | 25500 | 16100 | 26200 | 16600 | 26900 | 17000 | 28500 | 18000 | 29800 | 18800 |
| | 88.0 | 21200 | 13400 | 22300 | 14100 | 23400 | 14800 | 24200 | 15300 | 25100 | 15900 | 25800 | 16300 | 26500 | 16700 | 28100 | 17800 | 29400 | 18600 |
| | 91.0 | 20900 | 13200 | 22000 | 13900 | 23000 | 14500 | 23900 | 15100 | 24700 | 15600 | 25400 | 16100 | 26100 | 16500 | 27700 | 17500 | 28900 | 18300 |
| | 95.0 | 20500 | 13000 | 21600 | 13700 | 22700 | 14300 | 23500 | 14900 | 24300 | 15400 | 25000 | 15800 | 25700 | 16200 | 27200 | 17200 | 28500 | 18000 |
| | 99.0 | 20100 | 12700 | 21200 | 13400 | 22200 | 14000 | 23000 | 14500 | 23800 | 15000 | 24500 | 15500 | 25200 | 15900 | 26700 | 17900 | 17600 | 19700 |
| | 102.0 | 19700 | 12500 | 20700 | 13100 | 21800 | 13800 | 22500 | 14200 | 23300 | 14700 | 24000 | 15200 | 24700 | 15600 | 26100 | 16500 | 27300 | 17300 |
| 106.0 | 17200 | 10900 | 18100 | 11400 | 19000 | 12000 | 19700 | 12500 | 20400 | 12900 | 21000 | 13300 | 21600 | 13700 | 22900 | 14500 | 23900 | 15100 | |
| 109.0 | 16800 | 10600 | 17600 | 11100 | 18500 | 11700 | 19200 | 12100 | 19800 | 12500 | 20400 | 12900 | 21000 | 13300 | 22200 | 14000 | 23200 | 14700 | |

TC:Total Capacity [Btu/h]

SHC:Sensible Heat Capacity [Btu/h]

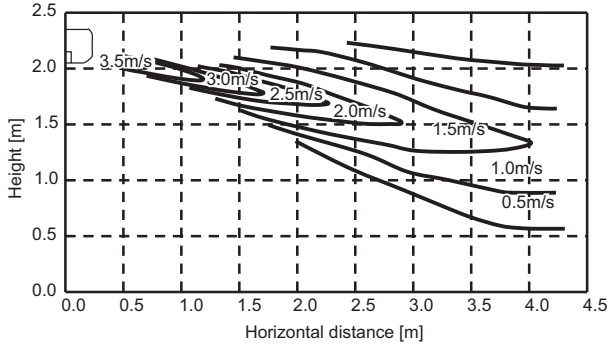
4-5. Capacity / Input Change Characteristic

4-6. Air Speed Characteristics

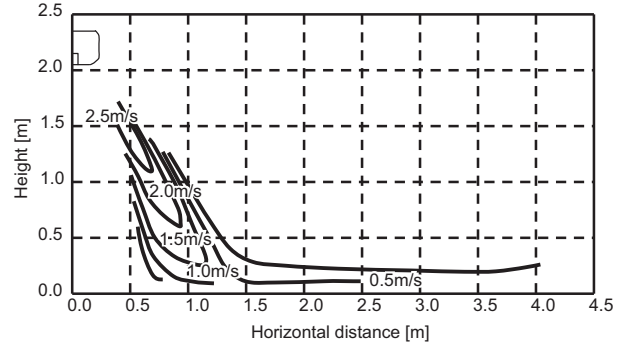
■ Air Speed Distribution

RAV-SP180KRT-UL

Cooling

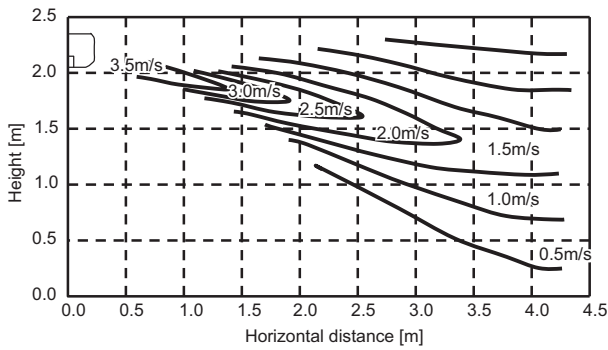


Heating

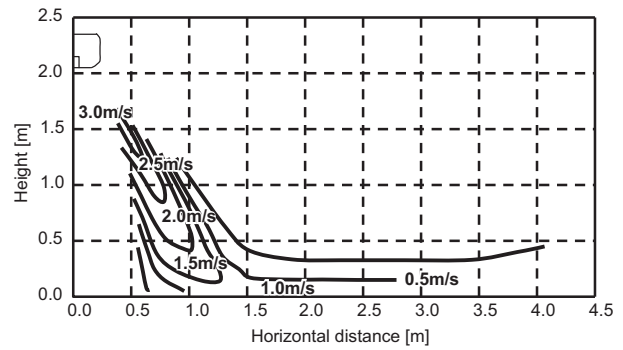


RAV-SP240KRT-UL

Cooling



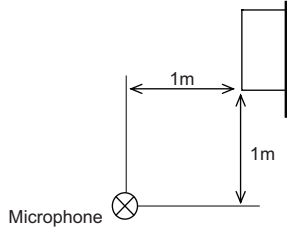
Heating



4-7. Sound Characteristics (NC curve)

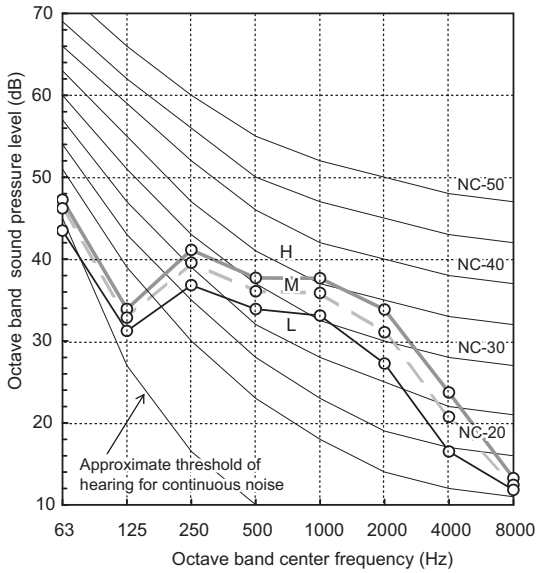
■ High Wall Type

[Measuring location]



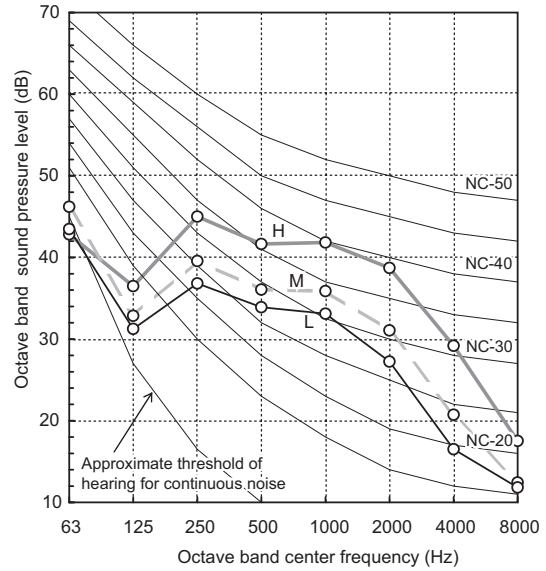
RAV-SP180KRT-UL

| Fan tap | H | M | L |
|------------------------------|----|----|----|
| Sound pressure level (dB(A)) | 43 | 41 | 38 |



RAV-SP240KRT-UL

| Fan tap | H | M | L |
|------------------------------|----|----|----|
| Sound pressure level (dB(A)) | 46 | 41 | 38 |



4-8. Accessory

Contents

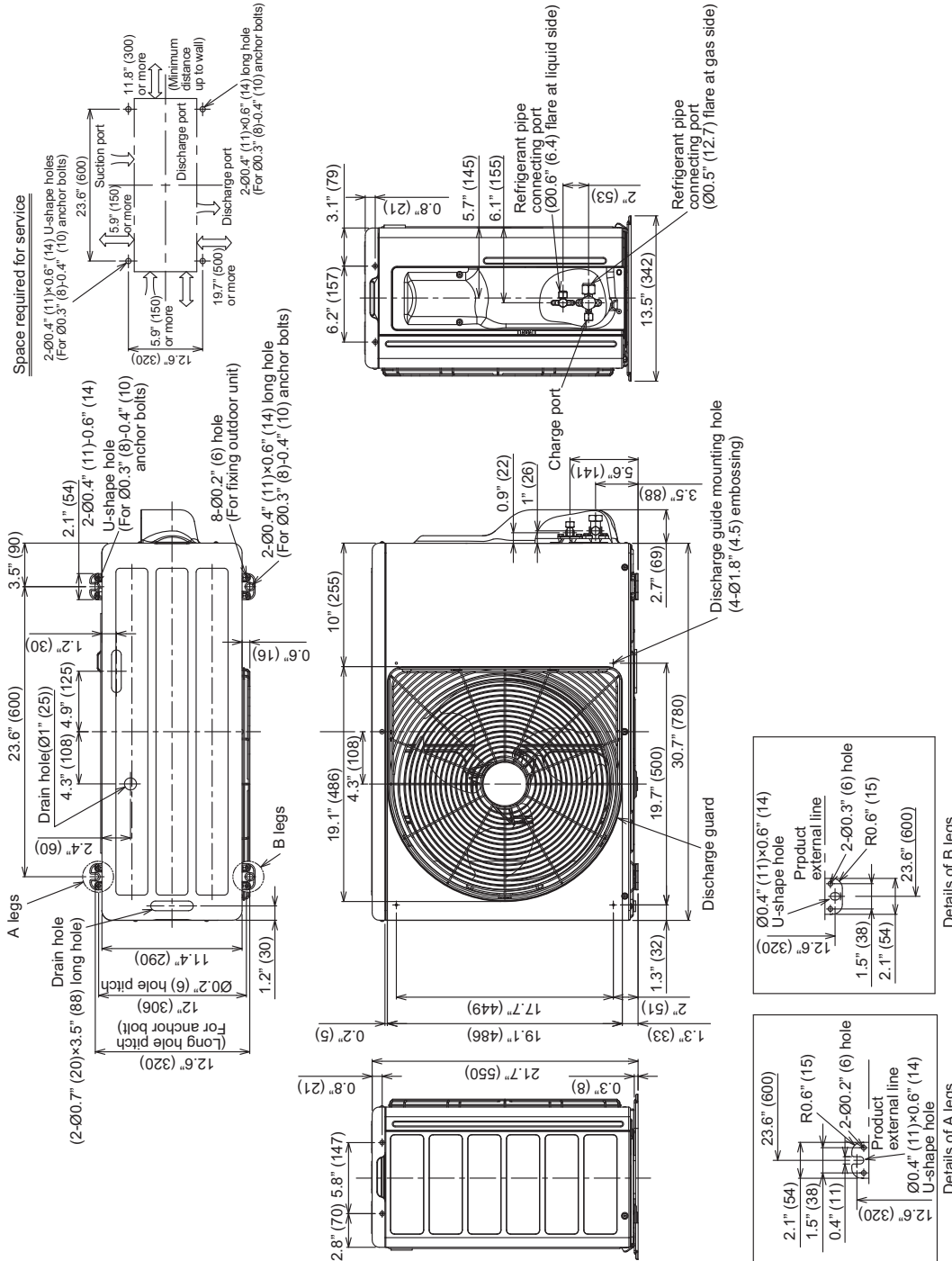
| | |
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5. OUTDOOR UNIT

5-1. Dimension

RAV-SP180AT2-UL

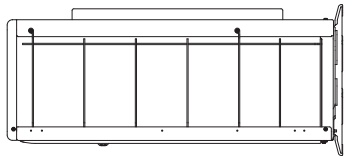
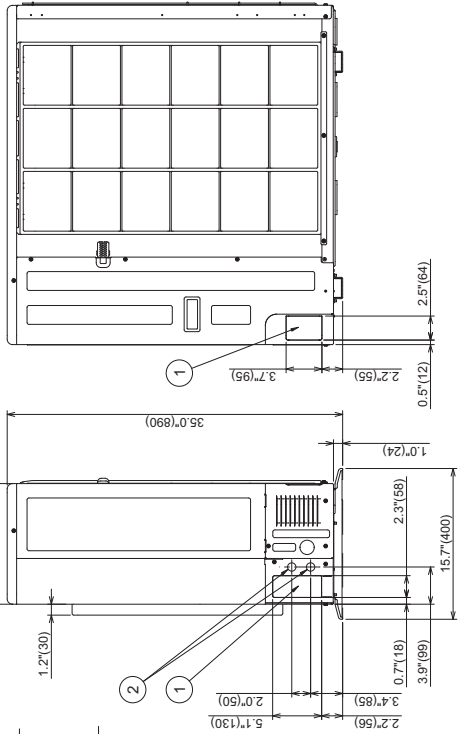
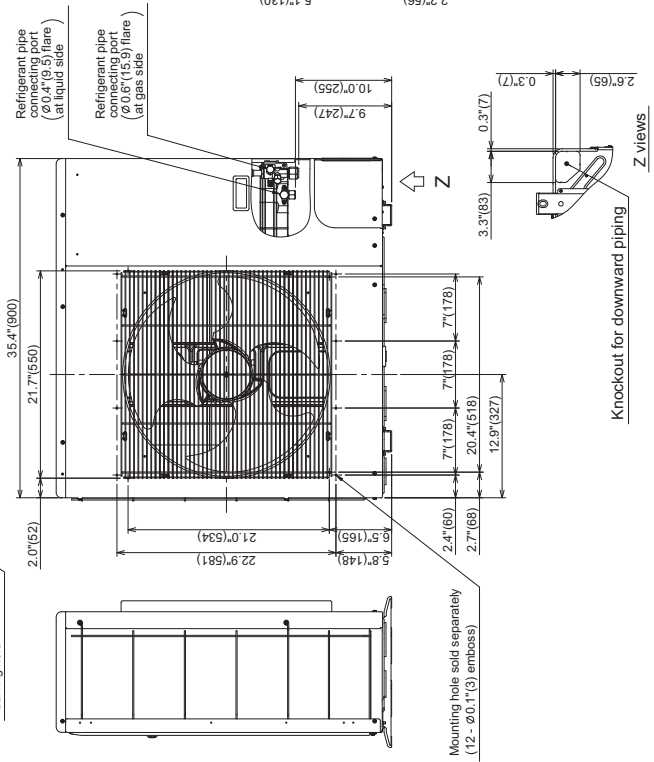
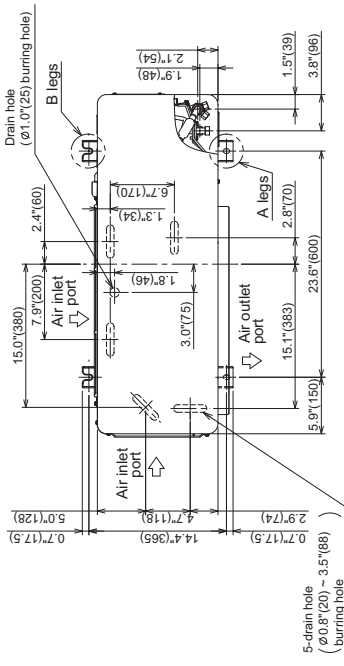
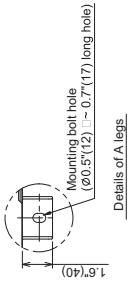
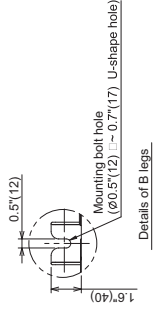
Unit:in(mm)



RAV-SP240AT2-UL

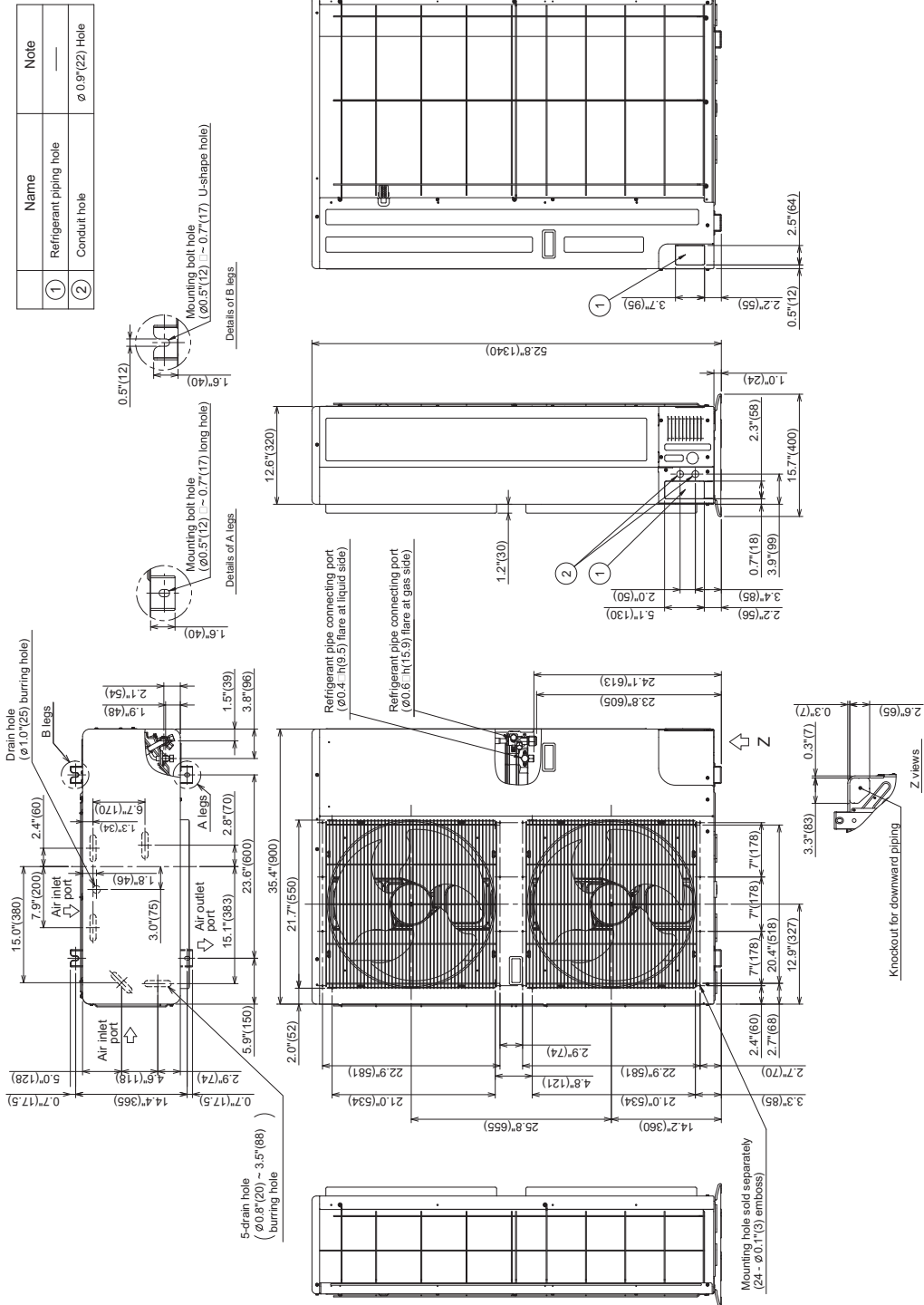
Unit:in(mm)

| | Name | Note |
|---|-------------------------|-----------------|
| ① | Refrigerant piping hole | — |
| ② | Conduit hole | ø 0.9”(22) Hole |



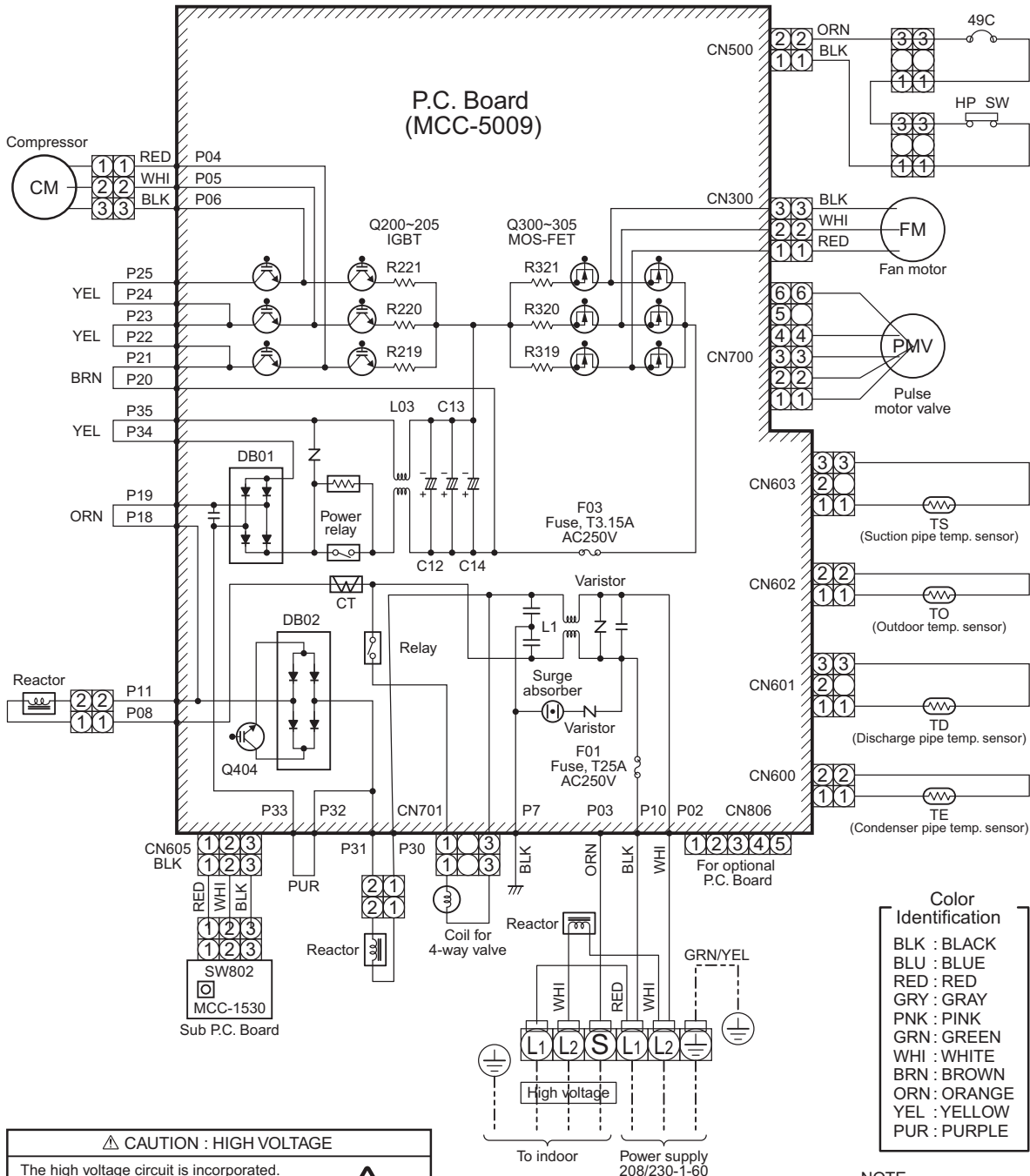
RAV-SP300AT2-UL, RAV-SP360AT2-UL, RAV-SP420AT2-UL

Unit:in(mm)



5-2. Wiring Diagram

RAV-SP180AT2-UL



CAUTION : HIGH VOLTAGE

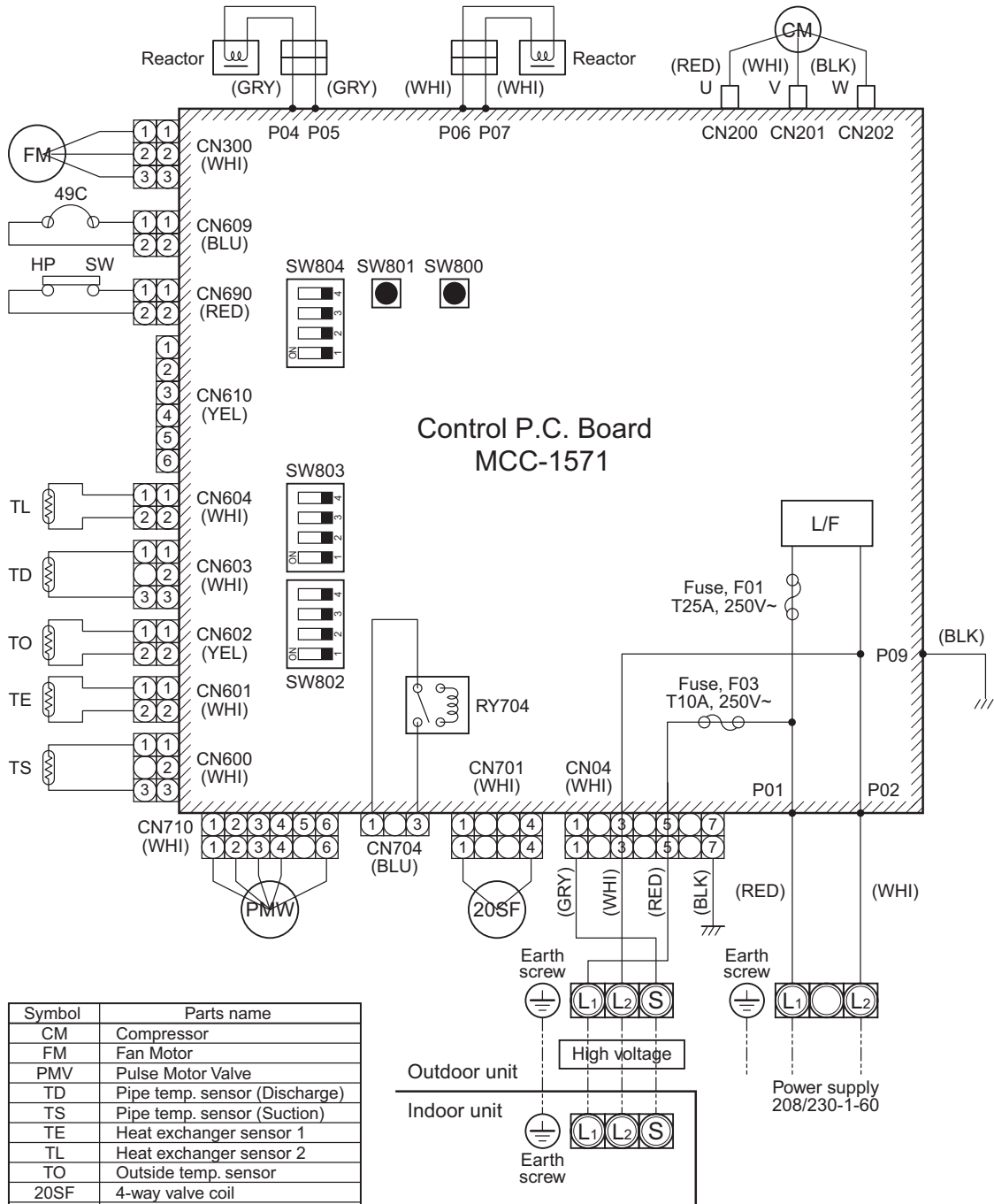
The high voltage circuit is incorporated. Be careful to do the check service, as the electric shock may be caused in case of touching parts on the P.C. board by hand.

The 4-way valve coil is turned on while the cooling operation

1. ○ indicates the terminal block. Alphanumeric characters in the circle indicate the terminal No.
2. The two-dot chain line indicates the wiring procured locally.
3. ▨ indicates the P.C. board.
4. For the indoor unit circuit, refer to the wiring diagram of the indoor unit.

- NOTE**
- CM : Compressor
 - PMV : Pulse Motor Valve
 - FM : Fan Motor
 - TE : Heat Exchanger Temp. Sensor
 - TD : Discharge Temp. Sensor
 - TO : Outdoor Temp. Sensor
 - TS : Suction Temp. Sensor
 - IGBT : Insulated Gate Bipolar Transistor
 - DB : Rectifier
 - CT : Current Transformer
 - 49C : Compressor Case Thermostat
 - HP SW : High pressure switch

RAV-SP240AT2-UL

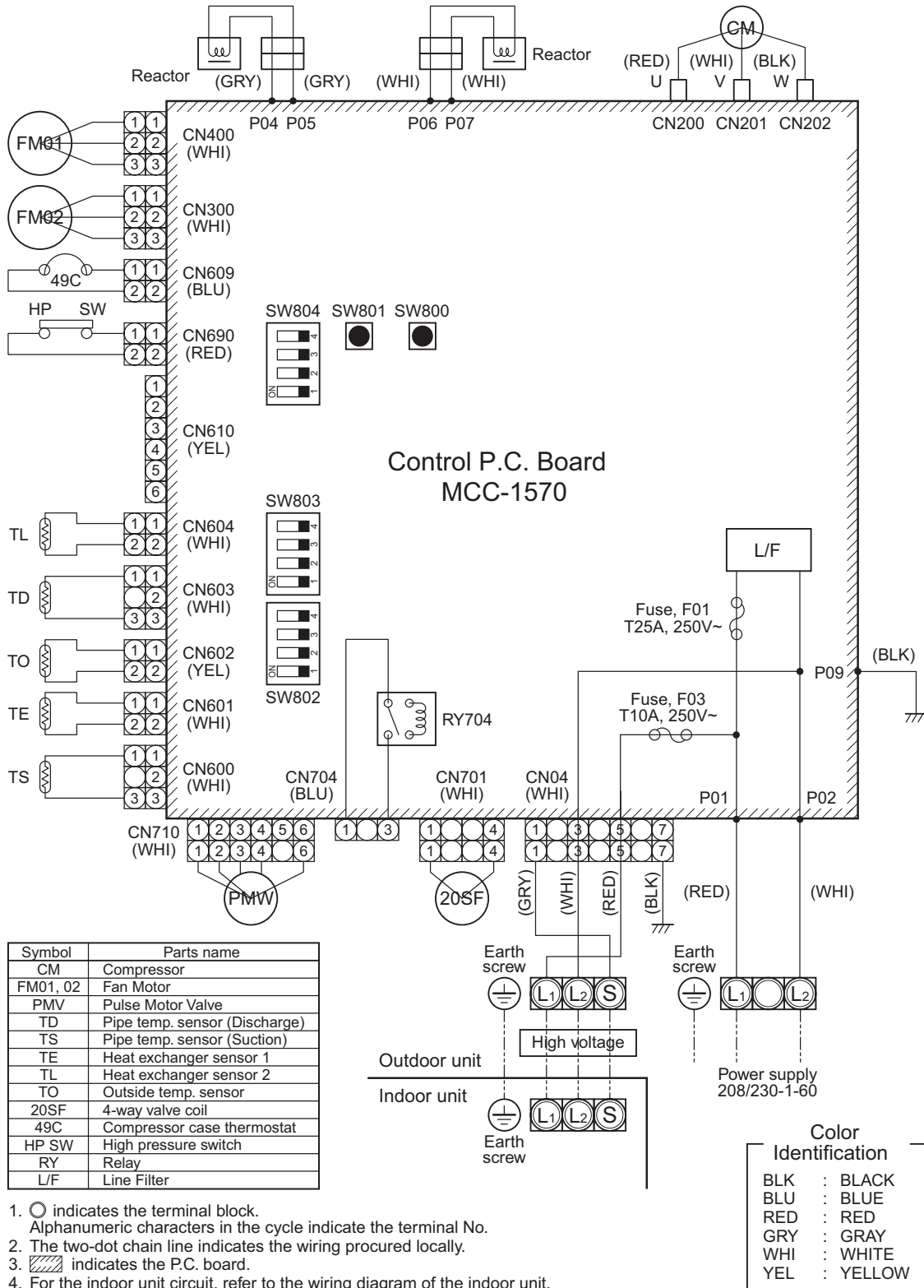


| Symbol | Parts name |
|--------|-------------------------------|
| CM | Compressor |
| FM | Fan Motor |
| PMV | Pulse Motor Valve |
| TD | Pipe temp. sensor (Discharge) |
| TS | Pipe temp. sensor (Suction) |
| TE | Heat exchanger sensor 1 |
| TL | Heat exchanger sensor 2 |
| TO | Outside temp. sensor |
| 20SF | 4-way valve coil |
| 49C | Compressor case thermostat |
| HP SW | High pressure switch |
| RY | Relay |
| L/F | Line Filter |

1. ○ indicates the terminal block.
Alphanumeric characters in the cycle indicate the terminal No.
2. The two-dot chain line indicates the wiring procured locally.
3. ▨ indicates the P.C. board.
4. For the indoor unit circuit, refer to the wiring diagram of the indoor unit.

| Color Identification | |
|----------------------|----------|
| BLK | : BLACK |
| BLU | : BLUE |
| RED | : RED |
| GRY | : GRAY |
| WHI | : WHITE |
| YEL | : YELLOW |

RAV-SP300AT2-UL, RAV-SP360AT2-UL, RAV-SP420AT2-UL

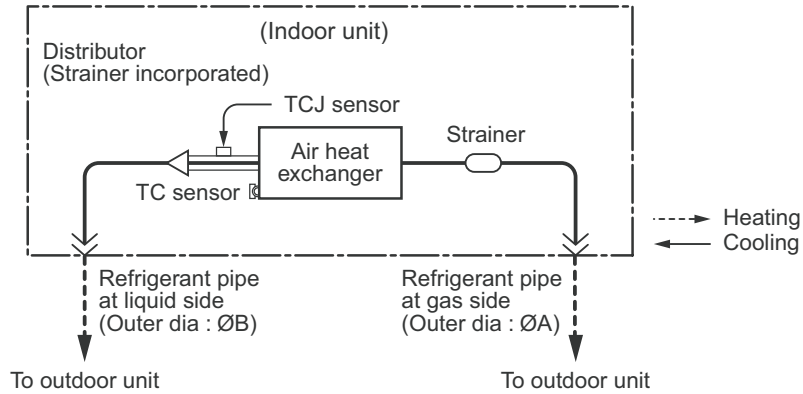


5-3. Wiring Design

5-4. Refrigerant Cycle Diagram

■ Indoor Unit

- Single type (Combination of 1 indoor unit and 1 outdoor unit)

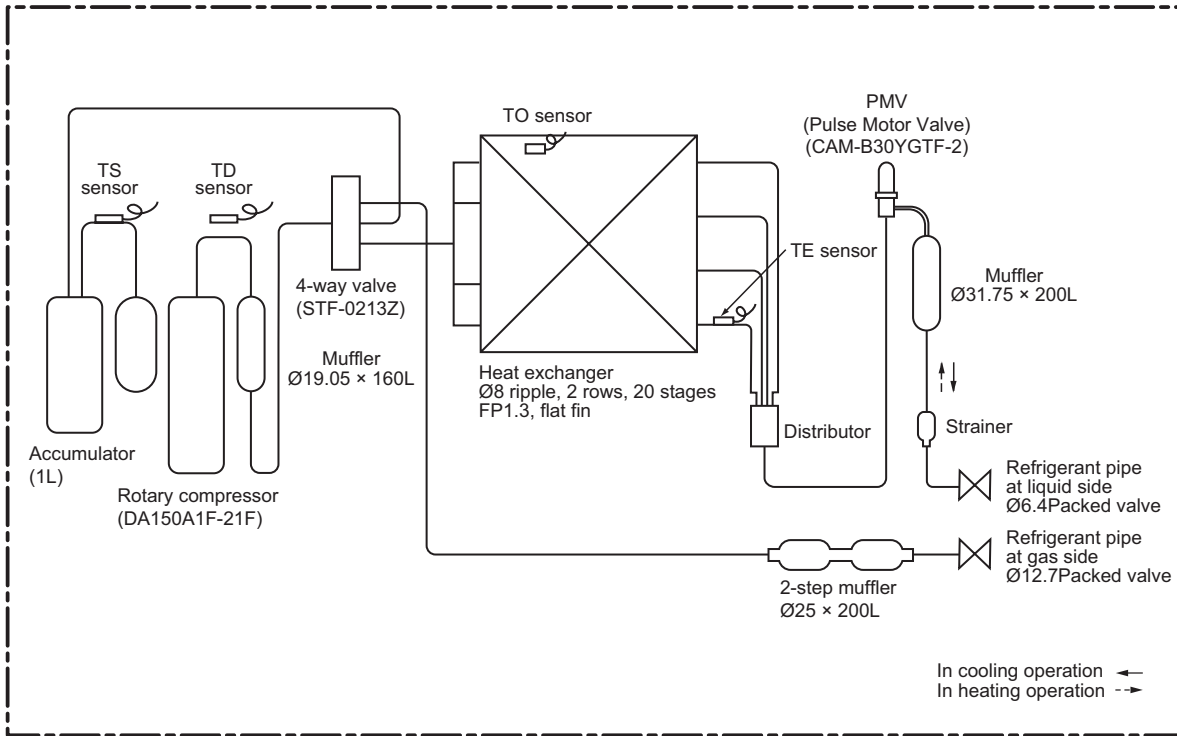


Dimension table

| Indoor unit | Outer diameter of refrigerant pipe | |
|--------------------------------|------------------------------------|----------------|
| | Gas side ØA | Liquid side ØB |
| RAV-SP180AT2-UL | 1/2" (12.7) | 1/4" (6.4) |
| RAV-SP240, 300, 360, 420AT2-UL | 5/8" (15.9) | 3/8" (9.5) |

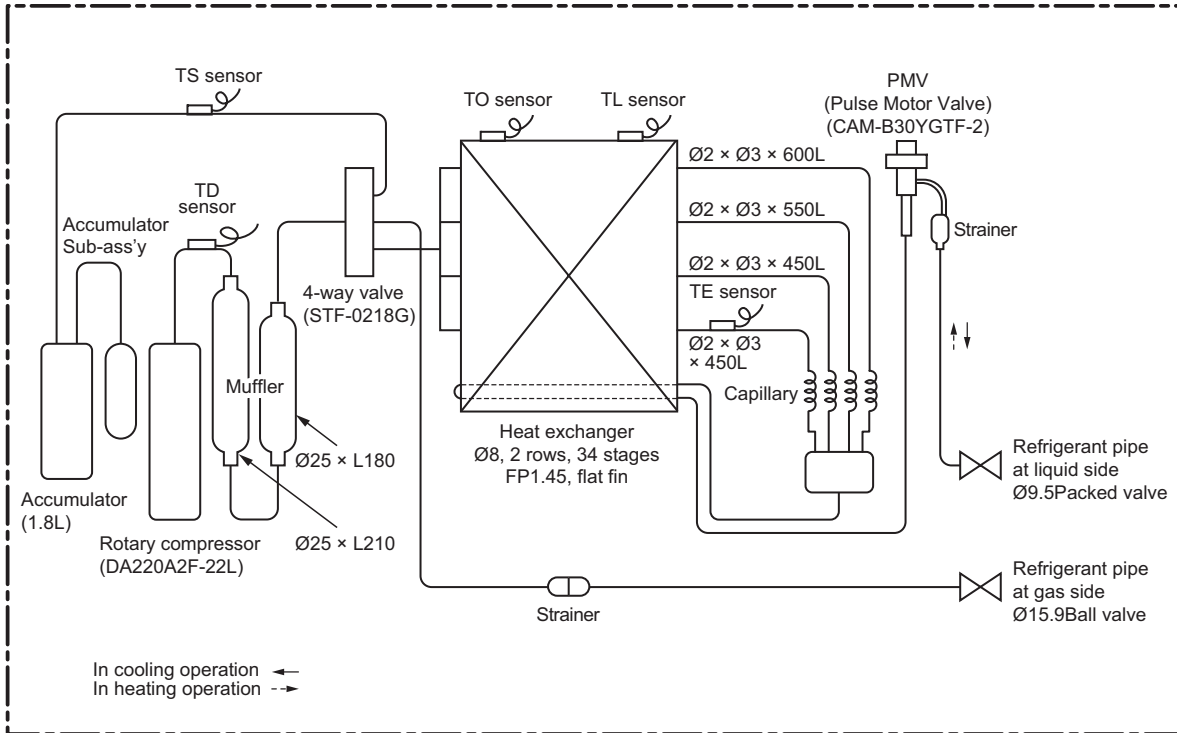
Outdoor Unit

RAV-SP180AT2-UL



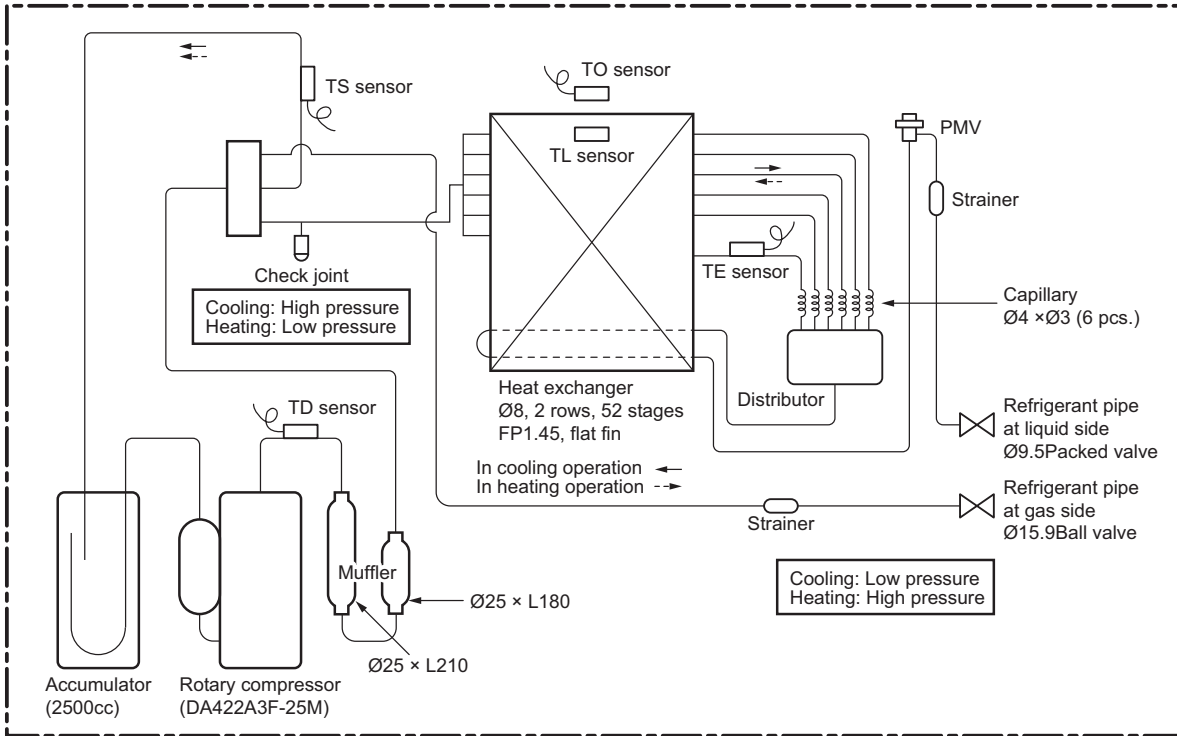
| | | Pressure | | | | Pipe surface temperature °F (°C) | | | | Compressor drive revolution frequency (rps) | Indoor fan | Indoor/Outdoor temp. conditions (DB/WB) °F (°C) | |
|---------|----------|----------|-------|-------|------|----------------------------------|------------|-----------------------|------------------------|---------------------------------------------|------------|-------------------------------------------------|-------------------|
| | | (psi) | | (MPa) | | Discharge | Suction | Indoor heat exchanger | Outdoor heat exchanger | | | Indoor | Outdoor |
| | | Pd | Ps | Pd | Ps | (TD) | (TS) | (TC) | (TE) | | | | |
| Cooling | Standard | 416.2 | 145.0 | 2.87 | 1.00 | 161.6 (72) | 60.8 (16) | 55.4 (13) | 107.6 (42) | 58 | HIGH | 80.6/66.2 (27/19) | 95/- (35/-) |
| | Overload | 517.7 | 159.5 | 3.57 | 1.10 | 190.4 (88) | 68 (20) | 66.2 (19) | 125.6 (52) | 65 | HIGH | 89.6/75.2 (32/24) | 109.4/- (43/-) |
| | Low load | 248.0 | 110.2 | 1.71 | 0.76 | 113.0 (45) | 53.6 (12) | 44.6 (7) | 55.4 (13) | 30 | LOW | 64.4/59.9 (18/15.5) | 23/- (-5/-) |
| Heating | Standard | 327.7 | 98.6 | 2.26 | 0.68 | 150.8 (66) | 42.8 (6) | 98.6 (37) | 37.4 (3) | 64 | HIGH | 68/- (20/-) | 44.6/42.8 (7/6) |
| | Overload | 471.3 | 165.3 | 3.25 | 1.14 | 172.4 (78) | 68.0 (20) | 127.4 (53) | 60.8 (16) | 30 | LOW | 86/- (30/-) | 75.2/64.4 (24/18) |
| | Low load | 290.0 | 36.3 | 2.00 | 0.25 | 172.4 (78) | -0.4 (-18) | 93.2 (34) | -0.4 (-18) | 88 | HIGH | 59/- (15/-) | 5/- (-15/-) |

RAV-SP240AT2-UL



| | | Pressure | | | | Pipe surface temperature °F (°C) | | | | Compressor drive revolution frequency (rps) | Indoor fan | Indoor/Outdoor temp. conditions (DB/WB) °F °C | |
|---------|----------|----------|-------|-------|------|----------------------------------|---------------|-----------------------|------------------------|---------------------------------------------|------------|-----------------------------------------------|----------------------|
| | | (psi) | | (MPa) | | Discharge | Suction | Indoor heat exchanger | Outdoor heat exchanger | | | Indoor | Outdoor |
| | | Pd | Ps | Pd | Ps | (TD) | (TS) | (TC) | (TE) | | | | |
| Cooling | Standard | 404.6 | 129.1 | 2.79 | 0.89 | 158.0 (70) | 55.4 (13) | 51.8 (11) | 102.2 (39) | 58.2 | HIGH | 80.6/66.2 (27/19) | 95/- (35/-) |
| | Overload | 511.9 | 155.2 | 3.53 | 1.07 | 177.8 (81) | 62.6 (17) | 57.2 (14) | 118.4 (48) | 65.0 | HIGH | 89.6/75.2 (32/24) | 109.4/- (43/-) |
| | Low load | 248.0 | 104.4 | 1.71 | 0.72 | 107.6 (42) | 44.6 (7) | 37.4 (3) | 64.4 (18) | 30.0 | LOW | 64.4/59.9 (18/15.5) | 23/- (-5/-) |
| Heating | Standard | 384.3 | 98.6 | 2.65 | 0.68 | 165.2 (74) | 39.2 (4) | 111.2 (44) | 37.4 (3) | 61.5 | HIGH | 68 (20/-) | 44.6/42.8 (7/6) |
| | Overload | 464.0 | 161.0 | 3.2 | 1.11 | 168.8 (76) | 66.2 (19) | 125.6 (52) | 59 (15) | 28.0 | LOW | 86/- (30/-) | 75.2/64.4 (24/18) |
| | Low load | 337.9 | 30.5 | 2.33 | 0.21 | 199.4 (93) | -0.4 (-18) | 87.8 (31) | -4 (-20) | 99.6 | HIGH | 59/- (15/-) | 5/- (-15/-) |

RAV-SP300AT2-UL, RAV-SP360AT2-UL, RAV-SP420AT2-UL



RAV-SP300AT2-UL

| | | Pressure | | | | Pipe surface temperature °F (°C) | | | | | Compressor drive revolution frequency (rps) | Indoor fan | Indoor/Outdoor temp. conditions (DB/WB) °F (°C) | |
|---------|----------|----------|-------|-------|------|----------------------------------|--------------|----------------------------|------------------------|------------|---------------------------------------------|------------|-------------------------------------------------|-------------------|
| | | (psi) | | (MPa) | | Discharge (TD) | Suction (TS) | Indoor heat exchanger (TC) | Outdoor heat exchanger | | | | Indoor | Outdoor |
| | | Pd | Ps | Pd | Ps | | | | (TL) | (TE) | | | | |
| Cooling | Standard | 372.7 | 143.6 | 2.57 | 0.99 | 150.8 (66) | 57.2 (14) | 53.6 (12) | 111.2 (44) | 104.0 (38) | 38 | HIGH | 80.6/66.2 (27/19) | 95/- (35/-) |
| | Overload | 478.5 | 158.1 | 3.30 | 1.09 | 172.4 (78) | 48.2 (9) | 55.4 (13) | 120.2 (49) | 109.4 (43) | 53 | HIGH | 89.6/75.2 (32/24) | 109.4/- (43/-) |
| | Low load | 252.3 | 108.8 | 1.74 | 0.75 | 114.8 (46) | 44.6 (7) | 41.0 (5) | 89.6 (32) | 77.0 (25) | 21 | LOW | 64.4/59.9 (18/15.5) | 23/- (-5/-) |
| Heating | Standard | 336.4 | 105.9 | 2.32 | 0.73 | 149.0 (65) | 37.4 (3) | 102.2 (39) | 35.6 (2) | 37.4 (3) | 43 | HIGH | 68/- (20/-) | 44.6/42.8 (7/6) |
| | Overload | 466.9 | 169.7 | 3.22 | 1.17 | 163.4 (73) | 66.2 (19) | 129.2 (54) | 57.2 (14) | 59.0 (15) | 26 | LOW | 86/- (30/-) | 75.2/64.4 (24/18) |
| | Low load | 314.7 | 43.5 | 2.17 | 0.30 | 188.6 (87) | 5 (-15) | 100.4 (38) | 6.8 (-14) | 8.6 (-13) | 71 | HIGH | 59/- (15/-) | 5/- (-15/-) |

* This compressor has 4-pole motor. The value when compressor frequency (Hz) is measured by a clamp meter becomes 2 times of No. of compressor revolutions (rps).

RAV-SP360AT2-UL, RAV-SP420AT2-UL

| | | Pressure | | | | Pipe surface temperature °F (°C) | | | | | Compressor drive revolution frequency (rps) | Indoor fan | Indoor/Outdoor temp. conditions (DB/WB) °F °C | |
|---------|----------|----------|-------|-------|------|----------------------------------|---------------|-----------------------|------------------------|---------------|---------------------------------------------|------------|-----------------------------------------------|----------------------|
| | | (psi) | | (MPa) | | Discharge | Suction | Indoor heat exchanger | Outdoor heat exchanger | | | | Indoor | Outdoor |
| | | Pd | Ps | Pd | Ps | | | | (TD) | (TS) | | | | |
| Cooling | Standard | 394.4 | 130.5 | 2.72 | 0.90 | 163.4 (73) | 53.6 (12) | 50 (10) | 114.8 (46) | 100.4 (38) | 51 | HIGH | 80.6/66.2 (27/19) | 95/- (35/-) |
| | Overload | 484.3 | 155.2 | 3.34 | 1.07 | 176.0 (80) | 48.2 (9) | 55.4 (13) | 123.8 (51) | 113.0 (45) | 55 | HIGH | 89.6/75.2 (32/24) | 109.4/- (43/-) |
| | Low load | 253.8 | 110.2 | 1.75 | 0.76 | 116.6 (47) | 46.4 (8) | 42.8 (6) | 91.4 (33) | 77.0 (25) | 21 | LOW | 64.4/59.9 (18/15.5) | 23/- (-5/-) |
| Heating | Standard | 375.6 | 100.1 | 2.59 | 0.69 | 167 (45) | 37.4 (3) | 109.4 (43) | 35.6 (2) | 35.6 (2) | 53 | HIGH | 68/- (20/-) | 44.6/42.8 (7/6) |
| | Overload | 453.9 | 152.3 | 3.13 | 1.05 | 161.6 (72) | 60.8 (16) | 127.4 (53) | 53.6 (12) | 55.4 (13) | 26 | LOW | 86/- (30/-) | 75.2/64.4 (24/18) |
| | Low load | 348.0 | 30.45 | 2.40 | 0.21 | 206.6 (97) | -7.6 (-22) | 107.6 (42) | -2.2 (-19) | -0.4 (-18) | 90 | HIGH | 59/- (15/-) | 5/- (-15/-) |

* This compressor has 4-pole motor. The value when compressor frequency (Hz) is measured by a clamp meter becomes 2 times of No. of compressor revolutions (rps).

5-5. Sound Characteristics (NC curve)

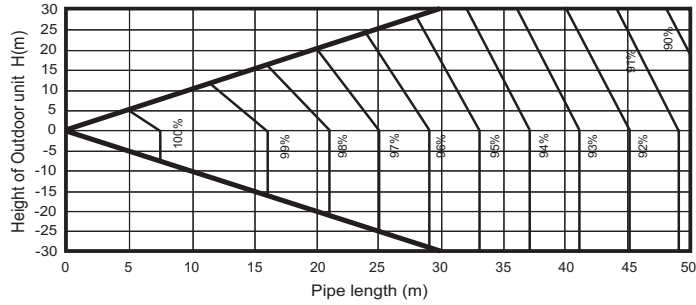
5-6. Piping Design

5-7. Capacity Correction

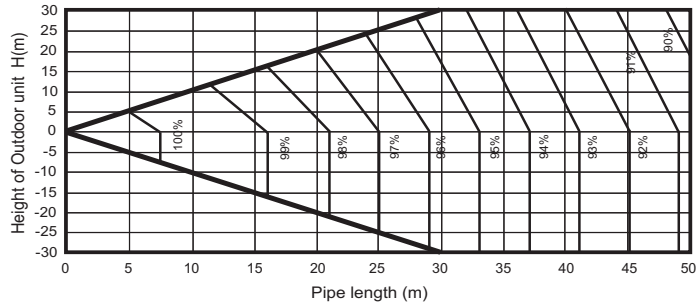
Connecting pipe length and lift difference between indoor units vs. capacity correction value

RAV-SP180AT2-UL

[Cooling]

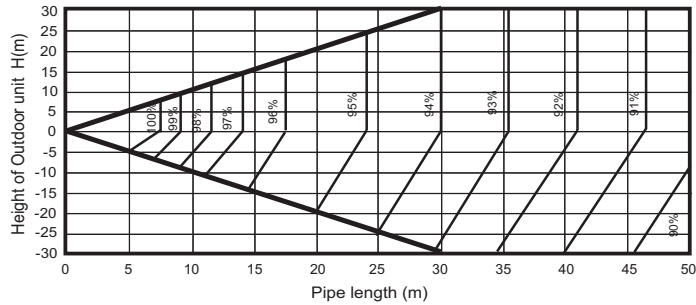


[Heating]

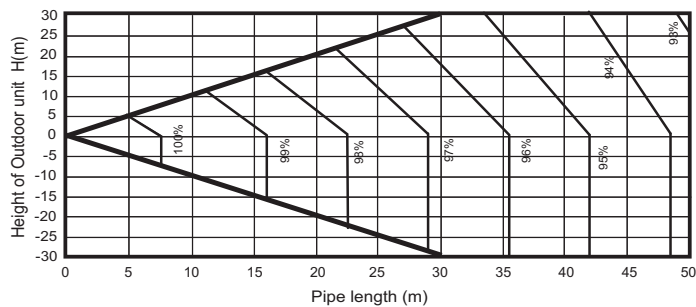


RAV-SP240AT2-UL

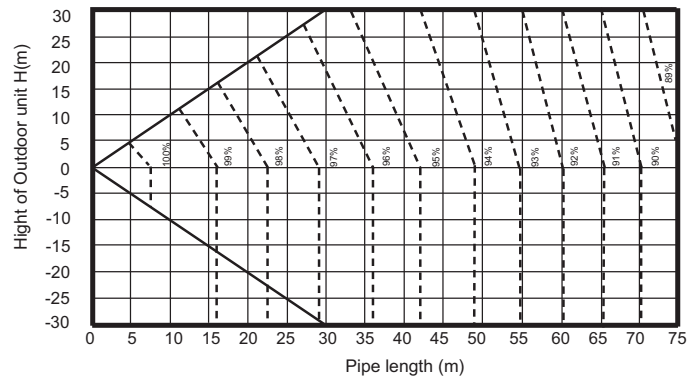
[Cooling]



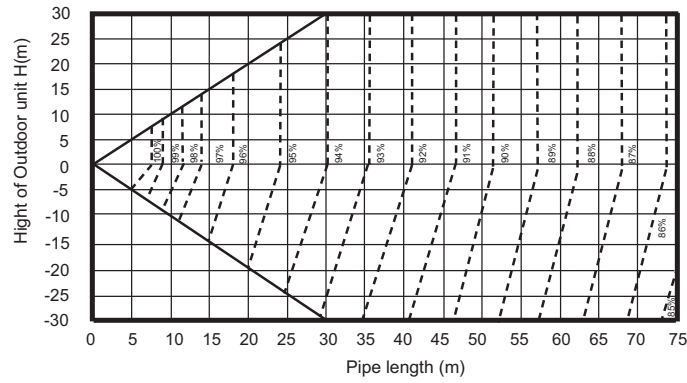
[Heating]



RAV-SP300AT2-UL, RAV-SP360AT2-UL, RAV-SP420AT2-UL
[Cooling]

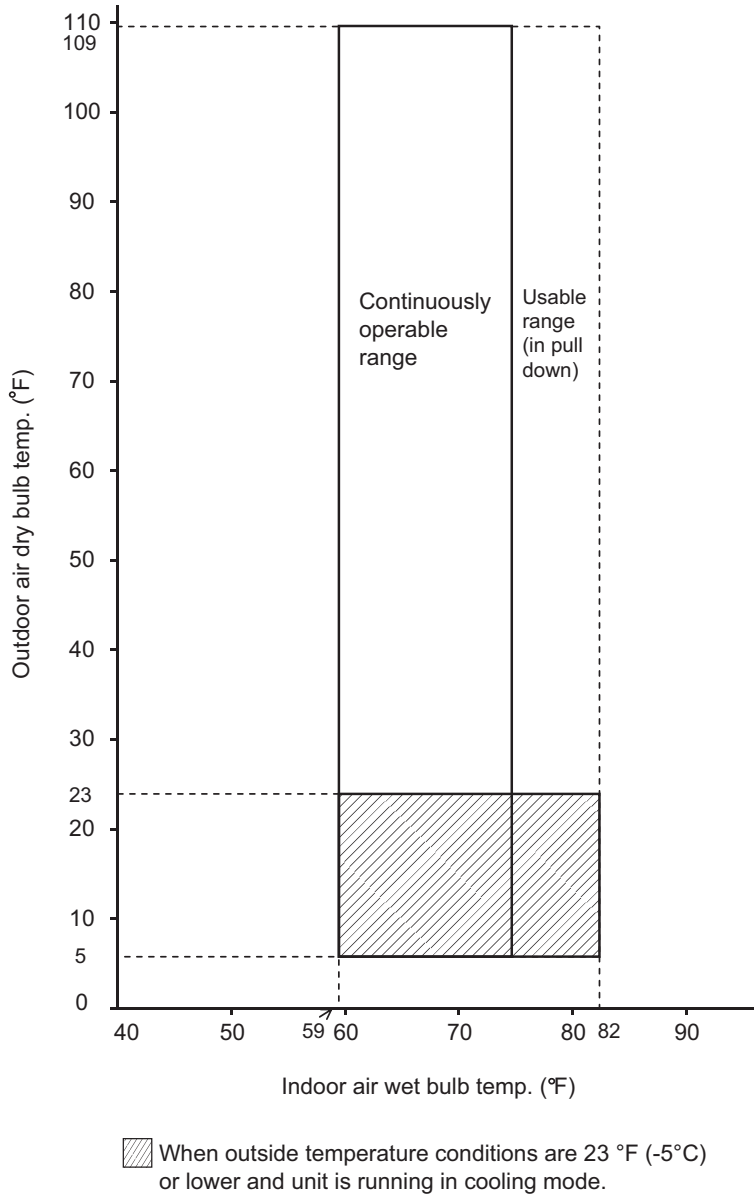


[Heating]

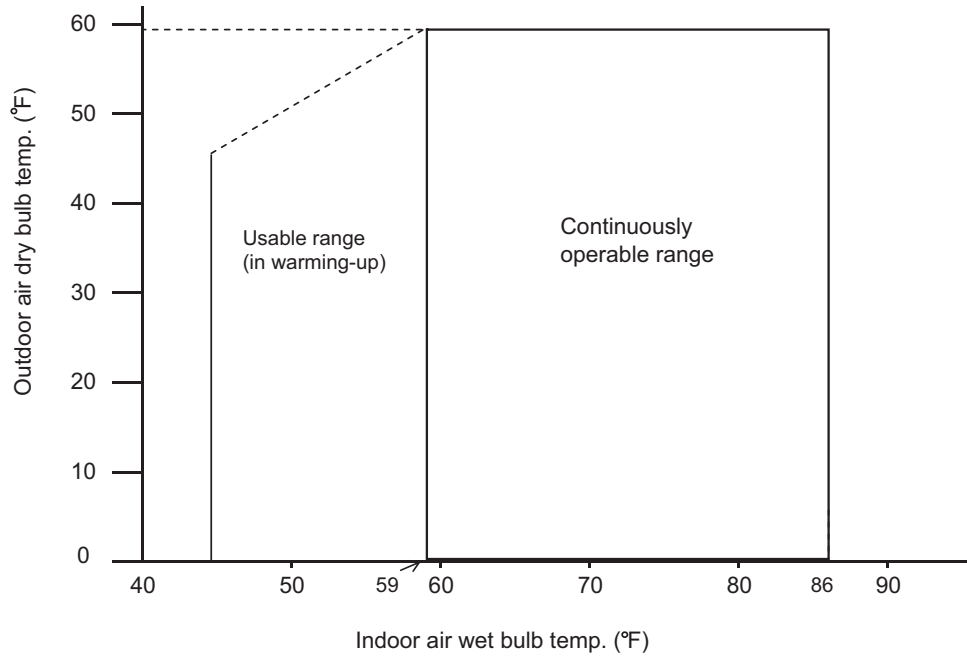


5-8. Operation Temperature Range

■ Cooling



■ Heating



Contents

6. CONTROLLER 54

6. CONTROLLER

| Indoor unit Remote controller | 4-Way Cassette Type RAV-SP**0UT-UL  | Ceiling Type RAV-SP**0CT-UL  | High-Wall Type RAV-SP**0KRT-UL  |
|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| RBC-AMT32UL Wired remote controller  | × | × | × |
| RBC-AS21UL Simple wired remote controller  | × | × | × |
| TBC-AX31U(W)-UL Wireless remote controller kit  | × | - | - |
| RBC-AX22CUL Wireless remote controller kit  | - | × | - |
| TCB-AX21UL Wireless remote controller kit  | × | × | × |
| RBC-AMS41UL Remote controller with schedule timer  | × | × | × |

| | 4-Way Cassette Type | Ceiling Type | High-Wall Type |
|----------------------|---------------------|--------------|----------------|
| Group control | × | × | × |

TOSHIBA CARRIER CORPORATION